

**2013 Resource Options Report Update**

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**Appendix 3**

**Resource Options Database (RODAT)  
Summary Sheets**

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# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: DSM Energy Option 1

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Option 1 represents a scaling back of the current DSM activities to generally meet 66% of the load growth over the 20-year planning period, based on the 2012 Load Forecast.

A set of codes and standards and conservation rate structures (similar to that in Energy Option 2) form the foundation for this option. These tools are then complemented by a mix of programs to support and facilitate customer energy saving actions. Program energy savings are reduced from Energy Option 2, particularly over the near and mid term, while maintaining customer coverage for equity and comprehensiveness.

### Technical Information

Projected Capacity Savings by 2020 (MW)	1196
Projected Annual Energy Savings by 2020 (GWh)	6120

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$32
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density:	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Energy Option 1

Resource Category: Demand-Side Management

Region: Province Wide

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$1,897	\$745	\$451
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>	31,755	11,028	5,345
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$190.399	\$98.992	\$59.631

With regard to the economic development attributes, the BC Stats model split the DSM expenditures into many categories, including consumer spending, labour, imported equipment, and locally manufactured equipment. In comparison to the supply side options, the expenditures were not divided between capital and operations. As such the economic development outputs have been represented as one single number.

### Data Confidence

<b>Level of Study</b>	Design
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	Medium

The resource acquisition activities are similar to Energy Option 2 which is in implementation. This option has been risk adjusted. Further experience is required to assess long-term deliverability risk.

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: DSM Energy Option 2

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Energy Option 2 is an update of BC Hydro's current DSM plan, that was included in the 2008 Long Term Acquisition Plan and the 2012 Draft IRP. This option includes a balanced offering of codes and standards, conservation rate structures, and programs. It reflects updates for new information such as the 2012 Load Forecast and current economic conditions and also reflects adjustments to program expenditures in the near-term to manage energy portfolio costs.

### Technical Information

Projected Capacity Savings by 2020 (MW)	1421
Projected Annual Energy Savings by 2020 (GWh)	7606

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$32
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>						
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>						
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *						
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Energy Option 2

Resource Category: Demand-Side Management

Region: Province Wide

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	PM 2.5	PM 10	PM Total			
<i>Tonnes/GWh</i>						

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$2,036	\$855	\$494
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>	34,088	12,630	5,855
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$204.382	\$113.753	\$65.329

With regard to the economic development attributes, the BC Stats model split the DSM expenditures into many categories, including consumer spending, labour, imported equipment, and locally manufactured equipment. In comparison to the supply side options, the expenditures were not divided between capital and operations. As such the economic development outputs have been represented as one single number.

### Data Confidence

<b>Level of Study</b>	Implementation
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	Medium

This option is currently being implemented. This option has been risk-adjusted. Further experience is required to assess long-term deliverability risk.

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: DSM Energy Option 3

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Energy Option 3 has been updated for new load forecast and economic information and expands program activity based on a higher threshold for cost-effectiveness and provides additional energy savings. Codes and standards and rate structures are the same as Option 2.

### Technical Information

Projected Capacity Savings by 2020 (MW)	1511
Projected Annual Energy Savings by 2020 (GWh)	8299

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$35
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Energy Option 3

Resource Category: Demand-Side Management

Region: Province Wide

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$2,388	\$969	\$573
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>	39,979	14,270	6,785
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$239.698	\$129.139	\$75.696

With regard to the economic development attributes, the BC Stats model split the DSM expenditures into many categories, including consumer spending, labour, imported equipment, and locally manufactured equipment. In comparison to the supply side options, the expenditures were not divided between capital and operations. As such the economic development outputs have been represented as one single number.

### Data Confidence

<b>Level of Study</b>	Design
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	Medium

The resource acquisition activities are similar to Energy Option 2 which is in implementation. This option has been risk adjusted. Further experience is required to assess long-term deliverability risk.

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: DSM Energy Option 4

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Energy Option 4 goes beyond Energy Option 3 by expanding the codes and standards and conservation rate structure tools and adding initial steps to facilitate the achievement of the societal transformation reflected in Energy Option 5. Some program curtailment relative to Energy Option 3 occurs as an element in the transition to Energy Option 4.

This option represents a bridge to Energy Option 5 by undertaking activities and pilot initiatives that facilitate the market and social transformations represented by that option.

### Technical Information

Projected Capacity Savings by 2020 (MW)	1491
Projected Annual Energy Savings by 2020 (GWh)	9446

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$47
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>						
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>						
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>						
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Energy Option 4

Resource Category: Demand-Side Management

Region: Province Wide

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$3,978	\$1,729	\$965
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>	66,581	25,503	11,432
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$399.181	\$230.257	\$127.550

With regard to the economic development attributes, the BC Stats model split the DSM expenditures into many categories, including consumer spending, labour, imported equipment, and locally manufactured equipment. In comparison to the supply side options, the expenditures were not divided between capital and operations. As such the economic development outputs have been represented as one single number.

### Data Confidence

<b>Level of Study</b>	Design
<b>Resource Type Uncertainty</b>	High
<b>Cost Uncertainty</b>	Medium-High

This option employs more untested and therefore uncertain tactics relative to Energy Option 3.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Energy Option 5

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Energy Option 5 reflects an aggressive effort to change market parameters and societal norms and patterns to save electricity. It contains aggressive codes and standards and conservation rate structures, with programs positioned as enablers or even disappearing over time.

### Technical Information

Projected Capacity Savings by 2020 (MW)	1585
Projected Annual Energy Savings by 2020 (GWh)	9610

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$49
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>						
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>						
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>						
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Energy Option 5

Resource Category: Demand-Side Management

Region: Province Wide

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$4,576	\$1,876	\$1,085
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>	76,605	27,501	12,849
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>	\$459.267	\$250.394	\$143.356

With regard to the economic development attributes, the BC Stats model split the DSM expenditures into many categories, including consumer spending, labour, imported equipment, and locally manufactured equipment. In comparison to the supply side options, the expenditures were not divided between capital and operations. As such the economic development outputs have been represented as one single number.

### Data Confidence

<b>Level of Study</b>	Concept
<b>Resource Type Uncertainty</b>	High
<b>Cost Uncertainty</b>	High

The strategies and concepts behind this option diverge substantially from Energy Option 3.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Capacity Option - Industrial Load Curtailment

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Industrial load curtailment targets large customers who agree to curtail load on short notice in return for financial payment. BC Hydro has implemented load curtailment as an operational contingency for several years.

### Technical Information

Projected Capacity Savings by 2020 (MW)	383
Projected Annual Energy Savings by 2020 (GWh)	

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$31
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>				
	Remoteness - Linear Disturbance Density:	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Capacity Option - Industrial Load Curtailment

Resource Category: Demand-Side Management

Region: Province Wide

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>			
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>			
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>			

The calculation of the economic development attributes for the three capacity focused options was not completed as these options were not considered in portfolio decisions. If capacity focused DSM options are considered in future portfolio outputs, the economic development attributes will be calculated and provided.

### Data Confidence

<b>Level of Study</b>	Feasibility
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	Medium

Industrial Load Curtailment has been undertaken in the past as an operational resource, but has yet to be considered as a firm resource for long term resource planning.

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: DSM Capacity Option - Capacity-Focused Programs

Resource Category: Demand-Side Management

Region: Province Wide

### Project Description

Capacity Option 3 contains programs that leverage equipment and load management systems to enable peak load reductions to occur (automatically or with intervention by the utility).

Programs have been targeted at capacity savings in all three customer sectors (residential, commercial, and industrial). They are designed to provide savings that can be dispatched under utility control.

### Technical Information

Projected Capacity Savings by 2020 (MW)	191
Projected Annual Energy Savings by 2020 (GWh)	

\* The savings are with transmission and distribution losses for the energy options, and are at Customer Meter for the capacity options.

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	
Fixed Operating & Maintenance Cost (\$1000s/year)	
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	
Variable Taxes (\$1000s)	
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$55
Project Life (Years)	
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>						
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>						
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>						
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: DSM Capacity Option - Capacity-Focused Programs

Resource Category: Demand-Side Management

Region: Province Wide

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>\$ (million)</i>			
<b>Employment</b>	Direct	Indirect	Induced
<i>Person-Years</i>			
<b>Provincial Government Revenues</b>	Direct	Indirect	Induced
<i>\$ (million)</i>			

The calculation of the economic development attributes for the three capacity focused options was not completed as these options were not considered in portfolio decisions. If capacity focused DSM options are considered in future portfolio outputs, the economic development attributes will be calculated and provided.

### Data Confidence

<b>Level of Study</b>	Feasibility
<b>Resource Type Uncertainty</b>	High
<b>Cost Uncertainty</b>	High

Capacity-focused programs have not generally been undertaken in low-cost hydro-electric based jurisdictions, so experience will need to be gained.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_SP

Resource Category: Wood Based Biomass

Region: Peace River

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential. Total potential in South Peace estimated at 56 MW (446 GWh) but plant size in the range of 35 MW is more typical.

### Technical Information

Installed Capacity (MW)	56
Average Annual Energy (GWh/year)	446
Dependable Capacity (MW)	56
Annual Firm Energy (GWh/year)	446

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$265,454
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,290.9
Variable Operating & Maintenance Cost (\$/MWh)	\$43.2
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$132
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		2.1	7.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	3.6	0.8	2.3	3.3			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.1	0.2	2.5	0.0	7.2		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	10.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_SP

Resource Category: Wood Based Biomass

Region: Peace River

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$92	\$58	\$30
<i>Operation \$/Year (million)</i>	\$11	\$10	\$3

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,128	727	361
<i>Operation FTEs (Full-Time Equivalents)</i>	101	132	40

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15.270	\$8.890	\$4.025
<i>Operation \$/Year (million)</i>	\$1.220	\$1.846	\$0.449

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_EPR

Resource Category: Wood Based Biomass

Region: North Coast

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential.

### Technical Information

Installed Capacity (MW)	12.3
Average Annual Energy (GWh/year)	98.2
Dependable Capacity (MW)	12.3
Annual Firm Energy (GWh/year)	98.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$58,422
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,044.8
Variable Operating & Maintenance Cost (\$/MWh)	\$34.3
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$123
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		6.4	3.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	2.4	0.8	3.8	3.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	0.1	0.0	9.8	0.1	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	10.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_EPR

Resource Category: Wood Based Biomass

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)					
		<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury	
		<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
			Fine Particulates				
		PM 2.5	PM 10	PM Total			
	<i>Tonnes/GWh</i>		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$20	\$13	\$7
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	248	160	79
<i>Operation FTEs (Full-Time Equivalents)</i>	22	21	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.361	\$1.956	\$0.886
<i>Operation \$/Year (million)</i>	\$0.262	\$0.292	\$0.088

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_PG

Resource Category: Wood Based Biomass

Region: North Coast

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential.

### Technical Information

Installed Capacity (MW)	13.3
Average Annual Energy (GWh/year)	105.8
Dependable Capacity (MW)	13.3
Annual Firm Energy (GWh/year)	105.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$62,968
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,203.9
Variable Operating & Maintenance Cost (\$/MWh)	\$48.2
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$137
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	3.1	4.8	2.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	2.3	0.5	2.7	4.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		8.1	1.9		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	10.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_PG

Resource Category: Wood Based Biomass

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)					
		<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury	
		<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
			Fine Particulates				
		PM 2.5	PM 10	PM Total			
	<i>Tonnes/GWh</i>		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22	\$14	\$7
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	268	173	86
<i>Operation FTEs (Full-Time Equivalents)</i>	28	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.622	\$2.109	\$0.955
<i>Operation \$/Year (million)</i>	\$0.335	\$0.422	\$0.117

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_WPR

Resource Category: Wood Based Biomass

Region: North Coast

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential.

### Technical Information

Installed Capacity (MW)	12.2
Average Annual Energy (GWh/year)	97.1
Dependable Capacity (MW)	12.2
Annual Firm Energy (GWh/year)	97.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$57,765
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,021.8
Variable Operating & Maintenance Cost (\$/MWh)	\$33.7
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$122
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		10.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	4.5	0.6	1.9	3.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	1.0	0.0	8.5		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	9.5	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_WPR

Resource Category: Wood Based Biomass

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)					
		<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury	
		<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
			Fine Particulates				
		PM 2.5	PM 10	PM Total			
	<i>Tonnes/GWh</i>		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$20	\$13	\$7
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	246	158	79
<i>Operation FTEs (Full-Time Equivalents)</i>	21	22	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.323	\$1.934	\$0.876
<i>Operation \$/Year (million)</i>	\$0.258	\$0.308	\$0.088

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_MAC

Resource Category: Wood Based Biomass

Region: Central Interior

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential.

### Technical Information

Installed Capacity (MW)	40.8
Average Annual Energy (GWh/year)	324.9
Dependable Capacity (MW)	40.8
Annual Firm Energy (GWh/year)	324.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$193,381
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,768.4
Variable Operating & Maintenance Cost (\$/MWh)	\$48.2
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$137
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		9.2	0.8		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	2.2	1.0	3.8	3.0	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			0.0	0.0	10.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	2.3	7.7	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_MAC

Resource Category: Wood Based Biomass

Region: Central Interior

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$67	\$42	\$22
<i>Operation \$/Year (million)</i>	\$10	\$7	\$3

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	822	530	263
<i>Operation FTEs (Full-Time Equivalents)</i>	90	89	33

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.124	\$6.476	\$2.932
<i>Operation \$/Year (million)</i>	\$1.085	\$1.212	\$0.366

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_KM

Resource Category: Wood Based Biomass

Region: Kelly Nicola

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential. Total potential in Kamloop estimated at 60 MW (476 GWh) but plant size in the range of 35 MW is more typical.

### Technical Information

Installed Capacity (MW)	60
Average Annual Energy (GWh/year)	476.5
Dependable Capacity (MW)	60
Annual Firm Energy (GWh/year)	476.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$283,564
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,924.8
Variable Operating & Maintenance Cost (\$/MWh)	\$52.6
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$141
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	1.4	8.6				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	1.2	0.6	3.2	5.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					10.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	10.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_KM

Resource Category: Wood Based Biomass

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$98	\$62	\$33
<i>Operation \$/Year (million)</i>	\$14	\$11	\$4

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,205	777	385
<i>Operation FTEs (Full-Time Equivalents)</i>	131	148	50

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16.312	\$9.496	\$4.299
<i>Operation \$/Year (million)</i>	\$1.585	\$2.043	\$0.557

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_VI

Resource Category: Wood Based Biomass

Region: Vancouver Island

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential. Total potential on Vancouver Island estimated at 89 MW (707 GWh) but plant size in the range of 35 MW is more typical.

### Technical Information

Installed Capacity (MW)	88.7
Average Annual Energy (GWh/year)	707.1
Dependable Capacity (MW)	88.7
Annual Firm Energy (GWh/year)	707.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$420,838
Fixed Operating & Maintenance Cost (\$1000s/year)	\$14,729.3
Variable Operating & Maintenance Cost (\$/MWh)	\$43.6
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$132
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	5.3	0.2	4.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	3.5	0.3	1.6	4.7			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					6.1		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	6.1	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_VI

Resource Category: Wood Based Biomass

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
		0.180	0.360			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$145	\$92	\$48
<i>Operation \$/Year (million)</i>	\$19	\$15	\$6
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,789	1,153	572
<i>Operation FTEs (Full-Time Equivalents)</i>	179	190	66
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$24.209	\$14.093	\$6.381
<i>Operation \$/Year (million)</i>	\$2.154	\$2.576	\$0.742

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_LM

Resource Category: Wood Based Biomass

Region: Lower Mainland

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential. Total potential in Lower Mainland estimated at 89 MW (707 GWh) but plant size in the range of 35 MW is more typical.

### Technical Information

Installed Capacity (MW)	88.7
Average Annual Energy (GWh/year)	707.1
Dependable Capacity (MW)	88.7
Annual Firm Energy (GWh/year)	707.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$420,838
Fixed Operating & Maintenance Cost (\$1000s/year)	\$14,729.3
Variable Operating & Maintenance Cost (\$/MWh)	\$44.3
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$133
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	1.4	7.3	1.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	0.3	0.2	2.5	7.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					9.7		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	9.8	0.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_LM

Resource Category: Wood Based Biomass

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$145	\$92	\$48
<i>Operation \$/Year (million)</i>	\$18	\$15	\$6

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,789	1,153	572
<i>Operation FTEs (Full-Time Equivalents)</i>	170	203	66

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$24.209	\$14.093	\$6.381
<i>Operation \$/Year (million)</i>	\$2.050	\$2.793	\$0.735

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_WK

Resource Category: Wood Based Biomass

Region: Selkirk

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential. Total potential in West Kootenay estimated at 66 MW (530 GWh) but plant size in the range of 35 MW is more typical.

### Technical Information

Installed Capacity (MW)	66.5
Average Annual Energy (GWh/year)	529.9
Dependable Capacity (MW)	66.5
Annual Firm Energy (GWh/year)	529.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$315,365
Fixed Operating & Maintenance Cost (\$1000s/year)	\$11,037.8
Variable Operating & Maintenance Cost (\$/MWh)	\$42.6
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$131
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		2.2	7.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	2.3	0.8	2.7	4.3			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>		0.1	0.4	0.0	9.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	10.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_WK

Resource Category: Wood Based Biomass

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$109	\$69	\$36
<i>Operation \$/Year (million)</i>	\$13	\$12	\$4

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,340	864	429
<i>Operation FTEs (Full-Time Equivalents)</i>	119	158	48

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18.141	\$10.561	\$4.782
<i>Operation \$/Year (million)</i>	\$1.436	\$2.228	\$0.531

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_EK

Resource Category: Wood Based Biomass

Region: East Kootenay

### Project Description

Wood based biomass potential considering woodwaste, roadside debris and pulp log potential.

### Technical Information

Installed Capacity (MW)	28.2
Average Annual Energy (GWh/year)	224.9
Dependable Capacity (MW)	28.2
Annual Firm Energy (GWh/year)	224.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$133,846
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,684.6
Variable Operating & Maintenance Cost (\$/MWh)	\$50.4
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	15
Project Lead Time (Years)	0

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		10.0				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	2.4	0.8	3.2	3.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>			0.1	1.2	8.8		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	10.0	0.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
Affected Stream Length:	Length							
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: WBBio\_EK

Resource Category: Wood Based Biomass

Region: East Kootenay

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)					
		<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury	
		<i>Tonnes/GWh</i>	0.039	0.360	0.540	0.026	
			Fine Particulates				
		PM 2.5	PM 10	PM Total			
	<i>Tonnes/GWh</i>		0.180	0.360			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$46	\$29	\$15
<i>Operation \$/Year (million)</i>	\$7	\$5	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	569	367	182
<i>Operation FTEs (Full-Time Equivalents)</i>	62	66	23

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.700	\$4.482	\$2.029
<i>Operation \$/Year (million)</i>	\$0.749	\$0.902	\$0.258

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Foothills Blvd

Resource Category: Biogas

Region: Central Interior

### Project Description

Biogas - Landfill Site with Existing capture system.

### Technical Information

Installed Capacity (MW)	2.1
Average Annual Energy (GWh/year)	16.7
Dependable Capacity (MW)	2
Annual Firm Energy (GWh/year)	16.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$5,483
Fixed Operating & Maintenance Cost (\$1000s/year)	\$658.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$70
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>			80.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>				80.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>				80.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	0.0	80.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Foothills Blvd

Resource Category: Biogas

Region: Central Interior

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2	\$2	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	24	21	9
<i>Operation FTEs (Full-Time Equivalents)</i>	2	1	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.277	\$0.235	\$0.104
<i>Operation \$/Year (million)</i>	\$0.025	\$0.011	\$0.007

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Cache Creek

Resource Category: Biogas

Region: Kelly Nicola

### Project Description

Biogas - Landfill Site with Existing capture system.

### Technical Information

Installed Capacity (MW)	3.5
Average Annual Energy (GWh/year)	27.4
Dependable Capacity (MW)	3.3
Annual Firm Energy (GWh/year)	27.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$9,216
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,116.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$73
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		36.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>		4.1	31.9		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>				36.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	36.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Cache Creek

Resource Category: Biogas

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3	\$3	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	40	36	15
<i>Operation FTEs (Full-Time Equivalents)</i>	3	2	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.455	\$0.396	\$0.172
<i>Operation \$/Year (million)</i>	\$0.043	\$0.018	\$0.012

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mission Flats

Resource Category: Biogas

Region: Kelly Nicola

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	0.7
Average Annual Energy (GWh/year)	5.7
Dependable Capacity (MW)	0.7
Annual Firm Energy (GWh/year)	5.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,848
Fixed Operating & Maintenance Cost (\$1000s/year)	\$332.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$106
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		32.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>			3.5	28.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					32.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	32.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mission Flats

Resource Category: Biogas

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$0
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	11	11	5
<i>Operation FTEs (Full-Time Equivalents)</i>	1	1	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.128	\$0.124	\$0.051
<i>Operation \$/Year (million)</i>	\$0.013	\$0.006	\$0.004

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Bailey

Resource Category: Biogas

Region: Lower Mainland

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	1.5
Average Annual Energy (GWh/year)	11.8
Dependable Capacity (MW)	1.4
Annual Firm Energy (GWh/year)	11.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$3,343
Fixed Operating & Maintenance Cost (\$1000s/year)	\$376.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$59
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	31.5	3.5			
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>		16.3	18.7		
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>				35.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	35.0	0.0	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Bailey

Resource Category: Biogas

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	17	13	6
<i>Operation FTEs (Full-Time Equivalents)</i>	1	1	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.195	\$0.141	\$0.069
<i>Operation \$/Year (million)</i>	\$0.014	\$0.006	\$0.004

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Ecowaste

Resource Category: Biogas

Region: Lower Mainland

### Project Description

Biogas - Landfill Site with Existing capture system.

### Technical Information

Installed Capacity (MW)	1.6
Average Annual Energy (GWh/year)	13
Dependable Capacity (MW)	1.6
Annual Firm Energy (GWh/year)	13

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$5,542
Fixed Operating & Maintenance Cost (\$1000s/year)	\$726.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$96
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	56.4	60.6			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>		6.1	26.5	84.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>				117.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	117.0	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Ecowaste

Resource Category: Biogas

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2	\$2	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	19	22	8
<i>Operation FTEs (Full-Time Equivalents)</i>	2	1	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.216	\$0.243	\$0.092
<i>Operation \$/Year (million)</i>	\$0.028	\$0.013	\$0.008

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Minnie's Pit

Resource Category: Biogas

Region: Lower Mainland

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	0.9
Average Annual Energy (GWh/year)	7.1
Dependable Capacity (MW)	0.9
Annual Firm Energy (GWh/year)	7.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,593
Fixed Operating & Maintenance Cost (\$1000s/year)	\$253.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$70
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>	0.8	7.6	5.7	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>			0.0	14.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					14.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	14.0	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Minnie's Pit

Resource Category: Biogas

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$0
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	14	10	5
<i>Operation FTEs (Full-Time Equivalents)</i>	1	0	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.159	\$0.109	\$0.055
<i>Operation \$/Year (million)</i>	\$0.010	\$0.004	\$0.003

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Campbell Mtn

Resource Category: Biogas

Region: Selkirk

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	0.9
Average Annual Energy (GWh/year)	7.2
Dependable Capacity (MW)	0.9
Annual Firm Energy (GWh/year)	7.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$3,319
Fixed Operating & Maintenance Cost (\$1000s/year)	\$372.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$95
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		14.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>			2.2	11.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>				0.1	13.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	14.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Campbell Mtn

Resource Category: Biogas

Region: Selkirk

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$0
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	14	13	6
<i>Operation FTEs (Full-Time Equivalents)</i>	1	1	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.162	\$0.143	\$0.062
<i>Operation \$/Year (million)</i>	\$0.014	\$0.006	\$0.004

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Glenmore

Resource Category: Biogas

Region: Selkirk

### Project Description

Biogas - Landfill Site with Existing capture system.

### Technical Information

Installed Capacity (MW)	2.3
Average Annual Energy (GWh/year)	18.3
Dependable Capacity (MW)	2.2
Annual Firm Energy (GWh/year)	18.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$6,155
Fixed Operating & Maintenance Cost (\$1000s/year)	\$745.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$73
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	9.9	132.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>		1.4	7.5	133.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>				142.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	142.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Glenmore

Resource Category: Biogas

Region: Selkirk

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2	\$2	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	27	24	10
<i>Operation FTEs (Full-Time Equivalents)</i>	2	1	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.304	\$0.265	\$0.115
<i>Operation \$/Year (million)</i>	\$0.029	\$0.012	\$0.008

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Greater Vernon

Resource Category: Biogas

Region: Selkirk

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	0.9
Average Annual Energy (GWh/year)	7.4
Dependable Capacity (MW)	0.9
Annual Firm Energy (GWh/year)	7.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$3,653
Fixed Operating & Maintenance Cost (\$1000s/year)	\$316.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$10
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$91
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>			14.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	6.2	4.7	2.9	0.3			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					14.0		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	14.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Greater Vernon

Resource Category: Biogas

Region: Selkirk

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	17	14	6
<i>Operation FTEs (Full-Time Equivalents)</i>	1	0	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.191	\$0.150	\$0.069
<i>Operation \$/Year (million)</i>	\$0.022	\$0.005	\$0.003

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Alberni Valley

Resource Category: Biogas

Region: Vancouver Island

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	0.8
Average Annual Energy (GWh/year)	6.6
Dependable Capacity (MW)	0.8
Annual Firm Energy (GWh/year)	6.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,526
Fixed Operating & Maintenance Cost (\$1000s/year)	\$256.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$75
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		15.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	15.0				
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>				3.0	12.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	15.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Alberni Valley

Resource Category: Biogas

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$0
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	13	10	5
<i>Operation FTEs (Full-Time Equivalents)</i>	1	0	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.147	\$0.107	\$0.052
<i>Operation \$/Year (million)</i>	\$0.010	\$0.004	\$0.003

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Campbell River

Resource Category: Biogas

Region: Vancouver Island

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	0.5
Average Annual Energy (GWh/year)	4.3
Dependable Capacity (MW)	0.5
Annual Firm Energy (GWh/year)	4.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$3,783
Fixed Operating & Maintenance Cost (\$1000s/year)	\$304.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$154
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>			7.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	1.3	0.6	0.1	5.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					7.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	7.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Campbell River

Resource Category: Biogas

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2	\$1	\$1
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	20	15	7
<i>Operation FTEs (Full-Time Equivalents)</i>	1	0	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.230	\$0.159	\$0.080
<i>Operation \$/Year (million)</i>	\$0.012	\$0.005	\$0.003

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Comox Valley

Resource Category: Biogas

Region: Vancouver Island

### Project Description

Biogas - Landfill Site with No existing capture system.

### Technical Information

Installed Capacity (MW)	1
Average Annual Energy (GWh/year)	8.2
Dependable Capacity (MW)	1
Annual Firm Energy (GWh/year)	8.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,532
Fixed Operating & Maintenance Cost (\$1000s/year)	\$328.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$69
Project Life (Years)	20
Project Lead Time (Years)	1

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>			10.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	1.7	0.9	0.1	7.3		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					10.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	10.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Comox Valley

Resource Category: Biogas

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.108	1.670	4.460	4.860	
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.015			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1	\$1	\$0
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	12	10	4
<i>Operation FTEs (Full-Time Equivalents)</i>	1	0	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.136	\$0.108	\$0.050
<i>Operation \$/Year (million)</i>	\$0.012	\$0.005	\$0.003

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: MSW2\_LM

Resource Category: MSW

Region: Lower Mainland

### Project Description

Mass Burn Incineration (conventional combustion), with pre-processing of waste to remove oversized, non-combustible, hazardous or explosive materials.

### Technical Information

Installed Capacity (MW)	25.3
Average Annual Energy (GWh/year)	210.9
Dependable Capacity (MW)	24.6
Annual Firm Energy (GWh/year)	210.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$382,512
Fixed Operating & Maintenance Cost (\$1000s/year)	\$24,790.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$85
Project Life (Years)	25
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	1.2	1.7	1.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	1.0	0.2	0.7	2.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					3.2		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	3.2	0.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: MSW2\_LM

Resource Category: MSW

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	694.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.240	0.970	0.160	0.012	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.024			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$62	\$107	\$33
<i>Operation \$/Year (million)</i>	\$5	\$10	\$3

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	766	1,358	387
<i>Operation FTEs (Full-Time Equivalents)</i>	48	152	32

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.890	\$14.871	\$4.316
<i>Operation \$/Year (million)</i>	\$1.106	\$1.373	\$0.359

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: MSW3\_SE

Resource Category: MSW

Region: Selkirk

### Project Description

Mass Burn Incineration (conventional combustion), with pre-processing of waste to remove oversized, non-combustible, hazardous or explosive materials.

### Technical Information

Installed Capacity (MW)	13.5
Average Annual Energy (GWh/year)	112.4
Dependable Capacity (MW)	13.1
Annual Firm Energy (GWh/year)	112.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$226,578
Fixed Operating & Maintenance Cost (\$1000s/year)	\$15,411.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$184
Project Life (Years)	25
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	1.1	1.9	1.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	0.4	0.1	0.6	2.9		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>				0.0	4.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	4.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: MSW3\_SE

Resource Category: MSW

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	694.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.240	0.970	0.160	0.012	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.024			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$37	\$63	\$19
<i>Operation \$/Year (million)</i>	\$3	\$6	\$2

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	454	804	229
<i>Operation FTEs (Full-Time Equivalents)</i>	30	94	20

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.266	\$8.809	\$2.557
<i>Operation \$/Year (million)</i>	\$0.688	\$0.853	\$0.223

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: MSW1\_VI

Resource Category: MSW

Region: Vancouver Island

### Project Description

Mass Burn Incineration (conventional combustion), with pre-processing of waste to remove oversized, non-combustible, hazardous or explosive materials.

### Technical Information

Installed Capacity (MW)	12.2
Average Annual Energy (GWh/year)	101.4
Dependable Capacity (MW)	11.8
Annual Firm Energy (GWh/year)	101.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$207,291
Fixed Operating & Maintenance Cost (\$1000s/year)	\$14,905.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$117
Project Life (Years)	25
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.6	1.5	1.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	2.2	0.3	0.9	0.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.7	0.0	2.4	0.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	3.6	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>						
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: MSW1\_VI

Resource Category: MSW

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	694.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.240	0.970	0.160	0.012	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.024			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$34	\$58	\$18
<i>Operation \$/Year (million)</i>	\$3	\$6	\$2

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	415	736	210
<i>Operation FTEs (Full-Time Equivalents)</i>	29	91	19

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.817	\$8.059	\$2.339
<i>Operation \$/Year (million)</i>	\$0.665	\$0.825	\$0.216

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC15

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	232.3
Average Annual Energy (GWh/year)	622.9
Effective Load Carrying Capability (MW)	60.4
Annual Firm Energy (GWh/year)	622.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$930,892
Fixed Operating & Maintenance Cost (\$1000s/year)	\$11,653.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$3,760
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$176
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.9	1,959.0	162.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	980.8	219.2	615.6	326.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	7.4	140.9	468.3	394.5	1,130.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		46.8	2,071.9	23.5	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	18.2	3.4	6.5	12.2	3.9
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC15

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$81	\$227	\$55
<i>Operation \$/Year (million)</i>	\$4	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,003	2,792	646
<i>Operation FTEs (Full-Time Equivalents)</i>	37	37	18

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12.506	\$32.182	\$7.209
<i>Operation \$/Year (million)</i>	\$5.585	\$0.488	\$0.198

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC10

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	96.6
Average Annual Energy (GWh/year)	279.8
Effective Load Carrying Capability (MW)	25.1
Annual Firm Energy (GWh/year)	279.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$298,316
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,309.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$215
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$122
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		83.0	59.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	12.4	7.1	49.2	74.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		43.8		98.8		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	142.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.0	0.7				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC10

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12	\$69	\$13
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	149	841	159
<i>Operation FTEs (Full-Time Equivalents)</i>	12	13	6

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.836	\$9.839	\$1.774
<i>Operation \$/Year (million)</i>	\$1.046	\$0.188	\$0.067

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC11

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	75.9
Average Annual Energy (GWh/year)	195.1
Effective Load Carrying Capability (MW)	19.7
Annual Firm Energy (GWh/year)	195.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$240,921
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,072.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$252
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		27.1	125.4		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	28.9	7.9	39.6	76.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		37.6		114.9	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	152.5	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.9	0.7	1.1		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC11

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11	\$56	\$11
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	136	683	133
<i>Operation FTEs (Full-Time Equivalents)</i>	9	9	4

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.689	\$7.977	\$1.479
<i>Operation \$/Year (million)</i>	\$0.734	\$0.133	\$0.048

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC22

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	207
Average Annual Energy (GWh/year)	442.3
Effective Load Carrying Capability (MW)	53.8
Annual Firm Energy (GWh/year)	442.3

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$684,792
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,345.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,205
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$172
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	56.2	626.4	41.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	216.8	59.9	270.6	176.7		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	48.3	675.7				

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	724.0	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	8.0	4.8	0.1	0.9	4.6
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC22

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$38	\$161	\$34
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	462	1,971	399
<i>Operation FTEs (Full-Time Equivalents)</i>	21	23	11

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.710	\$22.941	\$4.449
<i>Operation \$/Year (million)</i>	\$2.055	\$0.316	\$0.118

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC23

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	55.2
Average Annual Energy (GWh/year)	149.7
Effective Load Carrying Capability (MW)	14.4
Annual Firm Energy (GWh/year)	149.7

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$198,514
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,575.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$510
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$154
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>	24.6	271.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	144.6	19.2	97.8	34.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	114.4	181.8			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	296.2	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	5.5	1.4	1.7		2.1	
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC23

Resource Category: Onshore Wind

Region: Central Interior

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$47	\$11
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	175	576	126
<i>Operation FTEs (Full-Time Equivalents)</i>	8	8	4

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.242	\$6.678	\$1.405
<i>Operation \$/Year (million)</i>	\$0.938	\$0.109	\$0.042

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC24

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	285.1
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	285.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$386,651
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,648.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$635
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$153
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	59.1	314.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	159.0	19.7	113.1	81.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	130.6	242.8			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	373.4	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	5.0	4.3	3.0	5.7	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC24

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21	\$91	\$19
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	254	1,110	223
<i>Operation FTEs (Full-Time Equivalents)</i>	13	14	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.132	\$12.930	\$2.489
<i>Operation \$/Year (million)</i>	\$1.288	\$0.201	\$0.074

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC25

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	158.7
Average Annual Energy (GWh/year)	450.4
Effective Load Carrying Capability (MW)	41.3
Annual Firm Energy (GWh/year)	450.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$485,481
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,928.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$325
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$123
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	18.7	187.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	73.7	9.3	63.0	59.9	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	42.6	163.2			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	205.9	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.4	2.1	0.0	2.7	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC25

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$20	\$112	\$22
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	241	1,367	258
<i>Operation FTEs (Full-Time Equivalents)</i>	19	21	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.989	\$15.990	\$2.880
<i>Operation \$/Year (million)</i>	\$1.620	\$0.302	\$0.108

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC45

Resource Category: Onshore Wind

Region: Central Interior

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	48.3
Average Annual Energy (GWh/year)	111.1
Effective Load Carrying Capability (MW)	12.6
Annual Firm Energy (GWh/year)	111.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$171,358
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,909.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$404
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$174
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	37.4	190.9	19.7		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	73.1	24.6	100.6	49.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	30.6	217.4			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	248.0	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.1	1.7	0.2	1.0	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC45

Resource Category: Onshore Wind

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11	\$41	\$9
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	134	498	105
<i>Operation FTEs (Full-Time Equivalents)</i>	6	6	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.667	\$5.785	\$1.171
<i>Operation \$/Year (million)</i>	\$0.644	\$0.081	\$0.031

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI37

Resource Category: Onshore Wind

Region: East Kootenay

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	87.3
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	87.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$107,973
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,340.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$57
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$138
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		20.2	6.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	4.1	2.7	8.4	11.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	1.5	1.4	0.2	12.6	10.6	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	26.3	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.3	0.4	0.2		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI37

Resource Category: Onshore Wind

Region: East Kootenay

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4	\$25	\$5
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	52	302	57
<i>Operation FTEs (Full-Time Equivalents)</i>	4	4	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.650	\$3.539	\$0.635
<i>Operation \$/Year (million)</i>	\$0.264	\$0.058	\$0.021

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI38

Resource Category: Onshore Wind

Region: East Kootenay

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	236.5
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	236.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$315,305
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,638.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$171
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$147
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		104.5	8.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	25.2	9.2	15.7	62.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>				39.1	73.7		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	102.9	10.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.3	0.4				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI38

Resource Category: Onshore Wind

Region: East Kootenay

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12	\$72	\$14
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	150	886	166
<i>Operation FTEs (Full-Time Equivalents)</i>	10	11	5

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.849	\$10.366	\$1.848
<i>Operation \$/Year (million)</i>	\$0.636	\$0.159	\$0.056

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC17

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	289.8
Average Annual Energy (GWh/year)	824.5
Effective Load Carrying Capability (MW)	75.3
Annual Firm Energy (GWh/year)	824.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,090,363
Fixed Operating & Maintenance Cost (\$1000s/year)	\$14,674.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$3,657
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$156
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.9	1,842.5	207.7		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	847.9	223.3	631.8	368.2	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	33.4	33.4	451.1	399.4	1,153.8

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		81.1	1,990.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	18.5	3.8	6.4	12.3	3.9
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC17

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$88	\$262	\$62
<i>Operation \$/Year (million)</i>	\$5	\$4	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,087	3,218	729
<i>Operation FTEs (Full-Time Equivalents)</i>	45	45	22

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13.769	\$37.184	\$8.131
<i>Operation \$/Year (million)</i>	\$6.234	\$0.617	\$0.245

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI01

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	246.1
Average Annual Energy (GWh/year)	552.8
Effective Load Carrying Capability (MW)	64
Annual Firm Energy (GWh/year)	552.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$736,025
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,428.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$290
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$146
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	35.0	58.1	113.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	13.1	14.6	97.1	81.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	0.9	81.6	0.3	18.4	105.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	206.3	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.7				2.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI01

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27	\$168	\$32
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	327	2,063	381
<i>Operation FTEs (Full-Time Equivalents)</i>	23	25	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.029	\$24.157	\$4.250
<i>Operation \$/Year (million)</i>	\$1.333	\$0.369	\$0.130

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI02

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	69
Average Annual Energy (GWh/year)	151.2
Effective Load Carrying Capability (MW)	17.9
Annual Firm Energy (GWh/year)	151.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$223,820
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,435.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$294
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$164
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	26.4	105.3	31.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	14.5	9.9	63.3	75.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		17.3	27.9	7.8	109.8

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	162.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.8	0.3	3.9		0.9
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI02

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11	\$52	\$11
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	133	639	125
<i>Operation FTEs (Full-Time Equivalents)</i>	7	7	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.628	\$7.454	\$1.398
<i>Operation \$/Year (million)</i>	\$0.578	\$0.105	\$0.039

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI03

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	151.8
Average Annual Energy (GWh/year)	355
Effective Load Carrying Capability (MW)	39.5
Annual Firm Energy (GWh/year)	355

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$465,761
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,500.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$329
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$145
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		154.0	51.1		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	14.5	5.6	69.6	115.4	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		56.8	14.5	7.4	126.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	205.1	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.7	1.0	0.4		
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI03

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$19	\$107	\$21
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	231	1,314	248
<i>Operation FTEs (Full-Time Equivalents)</i>	15	16	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.835	\$15.363	\$2.764
<i>Operation \$/Year (million)</i>	\$1.061	\$0.240	\$0.086

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI04

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	96.6
Average Annual Energy (GWh/year)	252.5
Effective Load Carrying Capability (MW)	25.1
Annual Firm Energy (GWh/year)	252.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$297,643
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,897.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$205
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$133
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	2.2	127.9	0.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	41.5	6.0	37.2	45.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>		19.8	15.1	11.2	84.0		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	130.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.2					
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI04

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12	\$68	\$13
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	149	839	158
<i>Operation FTEs (Full-Time Equivalents)</i>	11	12	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.838	\$9.807	\$1.768
<i>Operation \$/Year (million)</i>	\$0.839	\$0.170	\$0.061

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI05

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	144.9
Average Annual Energy (GWh/year)	354.8
Effective Load Carrying Capability (MW)	37.7
Annual Firm Energy (GWh/year)	354.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$436,167
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,409.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$186
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$137
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		113.9				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	22.8	18.1	51.8	21.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>			84.0	7.7	22.3		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	113.9	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI05

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16	\$100	\$19
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	196	1,223	226
<i>Operation FTEs (Full-Time Equivalents)</i>	15	16	7

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.417	\$14.323	\$2.526
<i>Operation \$/Year (million)</i>	\$0.974	\$0.237	\$0.084

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI06

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	131.1
Average Annual Energy (GWh/year)	293.9
Effective Load Carrying Capability (MW)	34.1
Annual Firm Energy (GWh/year)	293.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$404,106
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,571.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$303
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$152
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		97.2	70.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	1.4	3.5	29.1	133.2	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			41.5	8.0	117.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	167.2	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.7	1.6			
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI06

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16	\$93	\$18
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	203	1,141	216
<i>Operation FTEs (Full-Time Equivalents)</i>	13	14	6

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.502	\$13.337	\$2.408
<i>Operation \$/Year (million)</i>	\$0.864	\$0.199	\$0.071

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI08

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	256
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	256

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$360,748
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,974.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$252
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$155
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		94.6	49.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	5.3	8.6	64.6	65.5			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>			53.2	64.5	26.3		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	144.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>		0.3				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI08

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$83	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	178	1,017	192
<i>Operation FTEs (Full-Time Equivalents)</i>	11	12	6

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.196	\$11.897	\$2.140
<i>Operation \$/Year (million)</i>	\$0.718	\$0.173	\$0.062

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI09

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	96.6
Average Annual Energy (GWh/year)	211.9
Effective Load Carrying Capability (MW)	25.1
Annual Firm Energy (GWh/year)	211.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$293,141
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,248.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$138
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$151
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	2.9	42.7	53.1		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	2.3	7.9	37.5	51.0	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			31.3	67.4	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	98.7	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.2		0.5		
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI09

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11	\$67	\$13
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	135	823	153
<i>Operation FTEs (Full-Time Equivalents)</i>	9	10	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.658	\$9.631	\$1.705
<i>Operation \$/Year (million)</i>	\$0.521	\$0.142	\$0.050

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI10

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	312.7
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	312.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$359,631
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,811.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$236
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$130
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		81.7	72.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	18.0	10.5	39.2	86.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		5.4	37.7	3.0	107.8

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	153.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.3	0.3			4.2
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI10

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$83	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	175	1,013	190
<i>Operation FTEs (Full-Time Equivalents)</i>	13	14	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.152	\$11.853	\$2.125
<i>Operation \$/Year (million)</i>	\$1.045	\$0.210	\$0.075

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI15

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	303.6
Average Annual Energy (GWh/year)	814.1
Effective Load Carrying Capability (MW)	78.9
Annual Firm Energy (GWh/year)	814.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$905,107
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,353.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$330
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$126
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>	8.7	164.6	62.4		
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	59.4	14.2	76.1	85.9	
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		62.5	22.9	33.4	116.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	235.7	0.0		
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	1.2	0.1	2.9	0.7		
Reservoir Aquatic Area:	Area						
	<i>ha</i>						
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI15

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$32	\$207	\$39
<i>Operation \$/Year (million)</i>	\$3	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	398	2,535	467
<i>Operation FTEs (Full-Time Equivalents)</i>	33	37	17

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.897	\$29.693	\$5.212
<i>Operation \$/Year (million)</i>	\$2.444	\$0.541	\$0.190

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI16

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	662.4
Average Annual Energy (GWh/year)	1631.7
Effective Load Carrying Capability (MW)	172.2
Annual Firm Energy (GWh/year)	1631.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,952,701
Fixed Operating & Maintenance Cost (\$1000s/year)	\$24,646.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$468
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$133
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	26.4	249.5	49.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	123.8	20.9	129.0	51.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			157.0	17.8	150.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	325.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.5				
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI16

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$67	\$445	\$84
<i>Operation \$/Year (million)</i>	\$7	\$6	\$3

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	820	5,454	997
<i>Operation FTEs (Full-Time Equivalents)</i>	66	73	34

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.109	\$63.928	\$11.121
<i>Operation \$/Year (million)</i>	\$4.110	\$1.080	\$0.379

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI18

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	335.4
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	335.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$390,264
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,429.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$688
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$135
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	5.9	271.8	90.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	99.9	33.1	99.3	135.6	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	134.8	51.3	27.6	23.1	131.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	367.9	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.6				1.2
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI18

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
<i>Tonnes/GWh</i>						

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21	\$92	\$19
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	262	1,124	227
<i>Operation FTEs (Full-Time Equivalents)</i>	15	17	8

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.233	\$13.080	\$2.534
<i>Operation \$/Year (million)</i>	\$1.688	\$0.235	\$0.086

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI19

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	55.2
Average Annual Energy (GWh/year)	148.3
Effective Load Carrying Capability (MW)	14.4
Annual Firm Energy (GWh/year)	148.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$173,588
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,303.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$142
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$133
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		54.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	30.1	4.0	11.1	8.9	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	37.3	5.1	0.9	9.4	1.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	50.7	3.4	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.7	0.2	0.1			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI19

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8	\$40	\$8
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	93	489	94
<i>Operation FTEs (Full-Time Equivalents)</i>	6	7	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.148	\$5.708	\$1.046
<i>Operation \$/Year (million)</i>	\$0.533	\$0.100	\$0.036

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI20

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	41.4
Average Annual Energy (GWh/year)	122
Effective Load Carrying Capability (MW)	10.8
Annual Firm Energy (GWh/year)	122

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$131,574
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,892.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$111
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$124
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		35.0	7.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	21.4	2.1	9.1	9.6	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	14.8	4.3	8.3	8.5	6.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	42.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.2				0.7
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI20

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6	\$30	\$6
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	71	370	71
<i>Operation FTEs (Full-Time Equivalents)</i>	5	6	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.884	\$4.327	\$0.796
<i>Operation \$/Year (million)</i>	\$0.485	\$0.082	\$0.030

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI22

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	48.3
Average Annual Energy (GWh/year)	126
Effective Load Carrying Capability (MW)	12.6
Annual Firm Energy (GWh/year)	126

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$146,125
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,901.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$31
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$130
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		4.4	14.7		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	15.5		3.0	0.6	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		14.1	3.3	0.1	1.6

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	19.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI22

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5	\$33	\$6
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	62	407	75
<i>Operation FTEs (Full-Time Equivalents)</i>	5	6	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.769	\$4.774	\$0.833
<i>Operation \$/Year (million)</i>	\$0.342	\$0.083	\$0.029

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI23

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	193.2
Average Annual Energy (GWh/year)	569.3
Effective Load Carrying Capability (MW)	50.2
Annual Firm Energy (GWh/year)	569.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$601,639
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,852.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$566
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$122
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		38.6	164.1	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	139.6	1.7	22.1	39.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	34.9	91.7	17.9	32.1	26.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	141.4	61.3	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.2					0.7
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI23

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26	\$139	\$28
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	326	1,703	328
<i>Operation FTEs (Full-Time Equivalents)</i>	24	27	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.032	\$19.900	\$3.654
<i>Operation \$/Year (million)</i>	\$2.313	\$0.385	\$0.138

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI26

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	263.5
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	263.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$365,066
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,482.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$906
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$159
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	26.7	282.9	138.5			
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	72.2	32.1	195.3	148.5		
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>		23.8	150.4	100.0	173.9	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	59.4	388.7	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.1				
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI26

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$23	\$87	\$19
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	285	1,067	224
<i>Operation FTEs (Full-Time Equivalents)</i>	13	14	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.493	\$12.382	\$2.499
<i>Operation \$/Year (million)</i>	\$1.575	\$0.192	\$0.073

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI28

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	89.7
Average Annual Energy (GWh/year)	260.9
Effective Load Carrying Capability (MW)	23.3
Annual Firm Energy (GWh/year)	260.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$315,099
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,355.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$758
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$141
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>			297.0		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	78.2	22.1	87.4	109.3	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	8.0	53.3	61.1	104.5	70.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	29.6	128.0	139.4	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.6	7.4			1.4
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI28

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$20	\$75	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	243	919	192
<i>Operation FTEs (Full-Time Equivalents)</i>	13	13	6

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.987	\$10.671	\$2.147
<i>Operation \$/Year (million)</i>	\$1.568	\$0.187	\$0.070

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI29

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	313.6
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	313.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$407,300
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,253.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$940
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$150
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		0.4	354.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	120.8	24.9	103.1	105.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	0.6	53.3	87.0	37.9	175.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	145.2	0.0	209.4	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	7.9	4.2	2.9		3.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI29

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25	\$97	\$21
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	308	1,186	247
<i>Operation FTEs (Full-Time Equivalents)</i>	15	16	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.778	\$13.774	\$2.754
<i>Operation \$/Year (million)</i>	\$1.795	\$0.226	\$0.085

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI30

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	151.8
Average Annual Energy (GWh/year)	395.9
Effective Load Carrying Capability (MW)	39.5
Annual Firm Energy (GWh/year)	395.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$512,600
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,529.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,021
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$148
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		59.7	327.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	114.0	29.4	113.7	130.2		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.7	25.9	168.0	16.9	175.9	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	177.8	0.0	209.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	8.6	4.0	2.5		3.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI30

Resource Category: Onshore Wind

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$29	\$121	\$26
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	360	1,484	303
<i>Operation FTEs (Full-Time Equivalents)</i>	19	20	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.422	\$17.252	\$3.381
<i>Operation \$/Year (million)</i>	\$2.048	\$0.282	\$0.105

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI31

Resource Category: Onshore Wind

Region: Kelly Nicola

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	144.9
Average Annual Energy (GWh/year)	340.1
Effective Load Carrying Capability (MW)	37.7
Annual Firm Energy (GWh/year)	340.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$485,579
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,637.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$917
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$161
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		409.4	32.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	71.4	31.2	95.3	243.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>		52.7	27.6	46.6	314.6		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	370.5	71.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	4.9	1.0	1.1	0.9	13.6	
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI31

Resource Category: Onshore Wind

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27	\$114	\$24
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	336	1,402	285
<i>Operation FTEs (Full-Time Equivalents)</i>	16	17	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.135	\$16.307	\$3.183
<i>Operation \$/Year (million)</i>	\$1.656	\$0.243	\$0.091

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI27

Resource Category: Onshore Wind

Region: Lower Mainland

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	89.7
Average Annual Energy (GWh/year)	248.8
Effective Load Carrying Capability (MW)	23.3
Annual Firm Energy (GWh/year)	248.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$297,133
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,016.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$492
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$137
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		5.9	176.5		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	48.5	13.0	39.4	81.5	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		18.7	8.6	96.0	59.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	182.4	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.2	1.8	2.0		5.5
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI27

Resource Category: Onshore Wind

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16	\$70	\$14
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	195	854	171
<i>Operation FTEs (Full-Time Equivalents)</i>	11	12	6

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.399	\$9.942	\$1.913
<i>Operation \$/Year (million)</i>	\$1.198	\$0.174	\$0.064

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC07

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	128.8
Average Annual Energy (GWh/year)	333.2
Effective Load Carrying Capability (MW)	33.5
Annual Firm Energy (GWh/year)	333.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$556,480
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,640.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,653
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$198
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.9	1,308.3	162.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	604.1	135.7	452.9	298.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	16.0	21.7	443.2	341.0	669.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		25.1	1,444.2	22.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	9.1	5.5	5.5	12.2	3.4
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC07

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$55	\$137	\$34
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	672	1,691	406
<i>Operation FTEs (Full-Time Equivalents)</i>	22	21	10

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.398	\$19.425	\$4.533
<i>Operation \$/Year (million)</i>	\$3.616	\$0.275	\$0.115

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC08

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	161
Average Annual Energy (GWh/year)	490.2
Effective Load Carrying Capability (MW)	41.9
Annual Firm Energy (GWh/year)	490.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$611,460
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,843.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,087
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$149
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	124.5	760.1				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	789.5	26.1	61.5	7.4		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	84.8	453.7	179.4	166.6		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		26.5	858.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	15.6	7.9	6.5	17.3	2.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC08

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$58	\$145	\$36
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	711	1,780	429
<i>Operation FTEs (Full-Time Equivalents)</i>	28	26	13

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.503	\$20.525	\$4.786
<i>Operation \$/Year (million)</i>	\$3.815	\$0.362	\$0.150

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC09

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	144.9
Average Annual Energy (GWh/year)	438.2
Effective Load Carrying Capability (MW)	37.7
Annual Firm Energy (GWh/year)	438.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$572,760
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,153.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,203
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$157
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	124.4	786.8				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	848.3	19.7	40.2	3.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	84.8	531.7	161.7	133.0		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		24.3	886.9		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	15.5	7.2	6.3	17.4	2.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC09

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$59	\$136	\$35
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	723	1,677	417
<i>Operation FTEs (Full-Time Equivalents)</i>	27	24	13

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.706	\$19.292	\$4.649
<i>Operation \$/Year (million)</i>	\$3.761	\$0.330	\$0.140

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC19

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	279.1
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	279.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$331,868
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,423.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$415
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$136
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		188.6	61.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	76.0	20.6	74.3	78.8		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	1.7	67.4	161.9	18.7		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			18.5	231.2	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.1	1.4	0.9	1.6	0.6	
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC19

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16	\$77	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	196	946	185
<i>Operation FTEs (Full-Time Equivalents)</i>	12	13	6

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.428	\$11.031	\$2.069
<i>Operation \$/Year (million)</i>	\$1.164	\$0.192	\$0.070

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC20

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	294.5
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	294.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$324,820
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,584.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$311
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$127
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		129.9	57.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	100.6	10.5	38.3	37.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	1.7	78.3	93.3	13.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			18.5	168.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.5	0.8	0.6	0.6	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC20

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$75	\$15
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	174	921	177
<i>Operation FTEs (Full-Time Equivalents)</i>	13	14	6

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.140	\$10.757	\$1.970
<i>Operation \$/Year (million)</i>	\$1.165	\$0.200	\$0.072

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC21

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	218.5
Average Annual Energy (GWh/year)	589.1
Effective Load Carrying Capability (MW)	56.8
Annual Firm Energy (GWh/year)	589.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$698,223
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,366.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$912
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$135
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		413.6	43.0	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	195.2	35.0	158.6	67.9	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	83.3	209.3	128.3	35.6	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		34.6		422.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	4.5	4.3	0.7			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC21

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
<i>Tonnes/GWh</i>						

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$34	\$162	\$33
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	423	1,990	393
<i>Operation FTEs (Full-Time Equivalents)</i>	26	28	13

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.253	\$23.213	\$4.380
<i>Operation \$/Year (million)</i>	\$2.496	\$0.406	\$0.148

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC22

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	259.9
Average Annual Energy (GWh/year)	696.9
Effective Load Carrying Capability (MW)	67.6
Annual Firm Energy (GWh/year)	696.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$781,395
Fixed Operating & Maintenance Cost (\$1000s/year)	\$10,661.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$370
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$127
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		194.5	33.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	97.6	13.9	72.4	44.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	33.9	67.2	125.9	1.0			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		37.6	2.8	187.7	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.6	2.2				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC22

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$30	\$179	\$35
<i>Operation \$/Year (million)</i>	\$3	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	375	2,188	411
<i>Operation FTEs (Full-Time Equivalents)</i>	29	32	15

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.709	\$25.616	\$4.581
<i>Operation \$/Year (million)</i>	\$2.192	\$0.464	\$0.165

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC23

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	277.5
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	277.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$349,982
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,577.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$683
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$145
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		285.3	113.0		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	177.0	29.4	104.7	87.3	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	17.7	231.7	141.2	7.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		11.2	7.3	379.9	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	4.3	3.1	0.6		
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC23

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21	\$82	\$18
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	255	1,009	208
<i>Operation FTEs (Full-Time Equivalents)</i>	13	14	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.183	\$11.733	\$2.325
<i>Operation \$/Year (million)</i>	\$1.439	\$0.196	\$0.074

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC24

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	131.1
Average Annual Energy (GWh/year)	321.1
Effective Load Carrying Capability (MW)	34.1
Annual Firm Energy (GWh/year)	321.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$453,856
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,427.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,038
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$161
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		567.8	55.4		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	72.9	37.0	280.9	232.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	1.7	33.1	44.0	214.5	329.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		22.3	83.3	517.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.3	2.3		0.3	2.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC24

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$28	\$108	\$23
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	343	1,321	275
<i>Operation FTEs (Full-Time Equivalents)</i>	16	17	8

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.213	\$15.338	\$3.067
<i>Operation \$/Year (million)</i>	\$1.800	\$0.233	\$0.088

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC25

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	158.7
Average Annual Energy (GWh/year)	425.5
Effective Load Carrying Capability (MW)	41.3
Annual Firm Energy (GWh/year)	425.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$519,894
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,862.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$834
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$140
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		376.6	110.3		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	125.3	32.0	188.8	140.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	4.6	37.9	56.4	23.4	364.5

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		26.2	229.7	231.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.1	0.3			1.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC25

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27	\$122	\$25
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	335	1,492	298
<i>Operation FTEs (Full-Time Equivalents)</i>	19	21	10

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.122	\$17.385	\$3.330
<i>Operation \$/Year (million)</i>	\$1.975	\$0.297	\$0.109

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC01

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	561.2
Average Annual Energy (GWh/year)	1729.5
Effective Load Carrying Capability (MW)	145.9
Annual Firm Energy (GWh/year)	1729.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,924,591
Fixed Operating & Maintenance Cost (\$1000s/year)	\$28,498.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$4,356
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$132
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	366.9	1,038.7				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	969.8	72.0	264.9	99.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	102.7	268.5	793.6	168.8			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	571.6	0.0	760.1	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	32.5	14.7	10.0	4.8	1.1	39.3
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>		249.6	8.2
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A	15.8	6.1	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A	101.5	59.6	



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC01

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$118	\$456	\$98
<i>Operation \$/Year (million)</i>	\$9	\$7	\$3

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,453	5,598	1,165
<i>Operation FTEs (Full-Time Equivalents)</i>	82	87	41

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$17.887	\$65.021	\$13.002
<i>Operation \$/Year (million)</i>	\$10.189	\$1.228	\$0.457

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC02

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	234.6
Average Annual Energy (GWh/year)	666.1
Effective Load Carrying Capability (MW)	61
Annual Firm Energy (GWh/year)	666.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$778,738
Fixed Operating & Maintenance Cost (\$1000s/year)	\$10,826.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,388
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$136
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	131.8	240.8				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	312.8	8.0	34.7	17.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	12.2	2.1	292.9	3.5		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	268.1	0.0	57.5	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	5.3	2.2	1.5	0.6	1.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	8.8	53.2	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	40.0	8.0
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	50.6	

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC02

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$44	\$183	\$39
<i>Operation \$/Year (million)</i>	\$3	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	539	2,242	457
<i>Operation FTEs (Full-Time Equivalents)</i>	31	33	15

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.694	\$26.087	\$5.096
<i>Operation \$/Year (million)</i>	\$3.358	\$0.467	\$0.173

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC05

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	262.2
Average Annual Energy (GWh/year)	660.4
Effective Load Carrying Capability (MW)	68.2
Annual Firm Energy (GWh/year)	660.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,079,836
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,723.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$4,659
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$192
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	272.1	550.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	722.3	10.8	64.2	25.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	51.0	400.0	260.1		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	708.7	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	12.8	8.1	6.1	1.7	0.5
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>		72.0	36.6
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	18.3	4.7
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	303.8	9.5

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC05

Resource Category: Onshore Wind

Region: North Coast

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
			PM 2.5	PM 10	PM Total	
		<i>Tonnes/GWh</i>				

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$96	\$266	\$64
<i>Operation \$/Year (million)</i>	\$4	\$3	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,183	3,267	758
<i>Operation FTEs (Full-Time Equivalents)</i>	41	41	20

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14.553	\$37.618	\$8.456
<i>Operation \$/Year (million)</i>	\$6.441	\$0.534	\$0.218

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC06

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	200.1
Average Annual Energy (GWh/year)	553.7
Effective Load Carrying Capability (MW)	52
Annual Firm Energy (GWh/year)	553.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$839,358
Fixed Operating & Maintenance Cost (\$1000s/year)	\$10,579.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$3,760
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$180
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	208.2	720.7				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	766.6	27.4	110.5	24.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	60.3	475.6	284.9			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	821.1	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	14.7	11.4	5.9	0.2	0.5
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>		95.7	28.6
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	22.2	5.3
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	233.2	9.2

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC06

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$76	\$207	\$50
<i>Operation \$/Year (million)</i>	\$4	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	942	2,548	596
<i>Operation FTEs (Full-Time Equivalents)</i>	34	34	16

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.585	\$29.319	\$6.646
<i>Operation \$/Year (million)</i>	\$5.473	\$0.444	\$0.180

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC07

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	322.4
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	322.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$364,714
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,005.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$311
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$129
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		147.9	47.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	81.7	6.6	51.0	55.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	67.5	24.0	103.5	0.2	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	195.1	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.5	1.1	1.1	0.1	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC07

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15	\$84	\$17
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	191	1,031	197
<i>Operation FTEs (Full-Time Equivalents)</i>	14	15	7

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.354	\$12.052	\$2.195
<i>Operation \$/Year (million)</i>	\$1.194	\$0.218	\$0.078

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC08

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	195.5
Average Annual Energy (GWh/year)	463.4
Effective Load Carrying Capability (MW)	50.8
Annual Firm Energy (GWh/year)	463.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$588,942
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,093.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$280
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$141
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		193.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	76.5	6.2	38.7	71.8		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	63.4	38.7	91.1			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	193.2	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.0	0.6	2.8			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC08

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22	\$135	\$26
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	272	1,653	307
<i>Operation FTEs (Full-Time Equivalents)</i>	19	21	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.359	\$19.346	\$3.430
<i>Operation \$/Year (million)</i>	\$1.253	\$0.310	\$0.110

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC09

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	333.5
Average Annual Energy (GWh/year)	1024.8
Effective Load Carrying Capability (MW)	86.7
Annual Firm Energy (GWh/year)	1024.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$998,534
Fixed Operating & Maintenance Cost (\$1000s/year)	\$15,562.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$432
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$113
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	11.2	249.6	42.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	135.3	16.6	74.5	77.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	70.5	0.0	122.7	110.4	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	303.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.8	0.3	0.6	0.5	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC09

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$37	\$229	\$44
<i>Operation \$/Year (million)</i>	\$4	\$4	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	450	2,800	519
<i>Operation FTEs (Full-Time Equivalents)</i>	42	46	21

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.542	\$32.793	\$5.785
<i>Operation \$/Year (million)</i>	\$3.753	\$0.681	\$0.240

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC12

Resource Category: Onshore Wind

Region: North Coast

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	75.9
Average Annual Energy (GWh/year)	229.7
Effective Load Carrying Capability (MW)	19.7
Annual Firm Energy (GWh/year)	229.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$261,923
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,774.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$562
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	11.1	308.4	23.5		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	44.6	24.6	151.1	122.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	8.9	0.5	172.1	161.5	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.0	343.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.6	0.5	0.6	1.1	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_NC12

Resource Category: Onshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16	\$62	\$13
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	193	760	157
<i>Operation FTEs (Full-Time Equivalents)</i>	11	12	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.387	\$8.827	\$1.754
<i>Operation \$/Year (million)</i>	\$1.315	\$0.163	\$0.060

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC10

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	163.3
Average Annual Energy (GWh/year)	458.5
Effective Load Carrying Capability (MW)	42.5
Annual Firm Energy (GWh/year)	458.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$676,180
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,087.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,918
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$176
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	124.5	1,074.3				
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	1,118.0	22.3	54.4	4.0		
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	84.8	580.4	339.2	194.3		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		113.1	1,085.6		
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	18.5	8.8	6.9	17.9	2.8
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC10

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$80	\$160	\$44
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	981	1,979	522
<i>Operation FTEs (Full-Time Equivalents)</i>	31	26	14

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13.420	\$22.694	\$5.822
<i>Operation \$/Year (million)</i>	\$4.459	\$0.356	\$0.161

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC11

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	151.8
Average Annual Energy (GWh/year)	386.4
Effective Load Carrying Capability (MW)	39.5
Annual Firm Energy (GWh/year)	386.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$597,078
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,252.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,244
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$181
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	124.4	992.4				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	1,010.6	20.2	70.4	15.7		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	84.9	508.9	320.8	202.2		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		160.5	956.4		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	15.9	9.5	7.0	17.7	2.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC11

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
			PM 2.5	PM 10	PM Total	
		<i>Tonnes/GWh</i>				

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$53	\$144	\$35
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	653	1,774	414
<i>Operation FTEs (Full-Time Equivalents)</i>	23	23	11

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.326	\$20.448	\$4.621
<i>Operation \$/Year (million)</i>	\$3.300	\$0.300	\$0.124

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC12

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	108.1
Average Annual Energy (GWh/year)	289.9
Effective Load Carrying Capability (MW)	28.1
Annual Firm Energy (GWh/year)	289.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$461,626
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,762.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,111
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$189
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low	Medium	High		
		0 to <69	69 to <369	>369		
	<i>ha/class</i>	124.4	877.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	908.6	18.3	60.8	13.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	84.9	431.0	283.3	202.4	

Freshwater	Priority Fish Species: no. of priority species / watershed	None	Low	Moderate	High		
		0	1 to 12	13 to 23	24 to 38		
	<i>ha/class</i> *		43.9	957.6			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	15.1	8.2	6.9	17.7	2.8	1.2
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic	Shallow	Deep	Abyssal
		0 < 20m	20 < 200m	200 < 1000m	>=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC12

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$48	\$112	\$29
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	597	1,384	344
<i>Operation FTEs (Full-Time Equivalents)</i>	19	18	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.743	\$15.897	\$3.837
<i>Operation \$/Year (million)</i>	\$3.005	\$0.234	\$0.101

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC13

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	161
Average Annual Energy (GWh/year)	480.6
Effective Load Carrying Capability (MW)	41.9
Annual Firm Energy (GWh/year)	480.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$604,811
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,502.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,990
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$150
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	124.4	787.8	10.0			
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	815.5	25.2	64.4	17.0		
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	84.9	351.5	210.9	274.8	0.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		20.3	901.9		
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	12.6	5.4	6.6	17.9	2.8
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC13

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$50	\$145	\$34
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	618	1,777	407
<i>Operation FTEs (Full-Time Equivalents)</i>	26	26	13

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.937	\$20.529	\$4.536
<i>Operation \$/Year (million)</i>	\$3.603	\$0.356	\$0.142

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC18

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	167.9
Average Annual Energy (GWh/year)	425.7
Effective Load Carrying Capability (MW)	43.7
Annual Firm Energy (GWh/year)	425.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$501,888
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,464.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$174
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$132
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		74.7	46.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	84.0	8.8	16.7	11.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	21.9	8.1	83.5	7.2	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			27.5	93.2	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.7	0.3			
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC18

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18	\$115	\$22
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	221	1,405	259
<i>Operation FTEs (Full-Time Equivalents)</i>	17	19	9

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.726	\$16.455	\$2.889
<i>Operation \$/Year (million)</i>	\$1.178	\$0.283	\$0.100

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC26

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	163.3
Average Annual Energy (GWh/year)	375.5
Effective Load Carrying Capability (MW)	42.5
Annual Firm Energy (GWh/year)	375.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$510,768
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,911.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$502
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$151
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		59.5	264.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	69.1	17.5	117.4	119.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	15.7	60.5	49.0	148.0	50.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			323.5		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.7	1.5	0.4		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_BC26

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22	\$118	\$23
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	276	1,448	278
<i>Operation FTEs (Full-Time Equivalents)</i>	16	18	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.399	\$16.919	\$3.105
<i>Operation \$/Year (million)</i>	\$1.261	\$0.257	\$0.093

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC01

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	151.8
Average Annual Energy (GWh/year)	455
Effective Load Carrying Capability (MW)	39.5
Annual Firm Energy (GWh/year)	455

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$536,926
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,673.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,380
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	20.8	613.8	161.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	158.0	97.1	300.3	241.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	2.3	97.7	154.8	144.0	397.7	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	25.0	771.5	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.9	2.5	1.4	10.3	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC01

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$37	\$127	\$28
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	451	1,565	336
<i>Operation FTEs (Full-Time Equivalents)</i>	23	23	11

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.663	\$18.149	\$3.753
<i>Operation \$/Year (million)</i>	\$2.873	\$0.327	\$0.125

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC02

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	138
Average Annual Energy (GWh/year)	371
Effective Load Carrying Capability (MW)	35.9
Annual Firm Energy (GWh/year)	371

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$492,970
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,384.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,321
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$154
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.8	582.2	161.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	182.3	82.4	277.1	223.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	11.2	126.8	154.9	74.3	397.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	25.0	739.9	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	4.4	3.3	1.4	10.1	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photoc 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC02

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$35	\$117	\$26
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	426	1,439	312
<i>Operation FTEs (Full-Time Equivalents)</i>	19	20	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.356	\$16.681	\$3.479
<i>Operation \$/Year (million)</i>	\$2.362	\$0.271	\$0.105

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC03

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	62.1
Average Annual Energy (GWh/year)	222.4
Effective Load Carrying Capability (MW)	16.1
Annual Firm Energy (GWh/year)	222.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$262,188
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,042.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,156
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$145
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	20.8	491.6	161.7			
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	149.6	85.7	243.8	195.0		
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.2	89.9	173.3	46.6	364.2	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	25.0	649.1	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.6	2.9	3.2	8.6	
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC03

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$24	\$64	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	298	792	186
<i>Operation FTEs (Full-Time Equivalents)</i>	13	13	6

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.718	\$9.114	\$2.081
<i>Operation \$/Year (million)</i>	\$2.097	\$0.170	\$0.068

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC04

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	348.8
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	348.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$371,915
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,836.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,007
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$128
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.8	413.1	155.7		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	127.4	63.4	239.7	159.2	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		90.5	178.6	4.9	315.6

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	25.0	564.7	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	4.2	2.1	2.2	6.0	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC04

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26	\$89	\$20
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	315	1,089	234
<i>Operation FTEs (Full-Time Equivalents)</i>	17	18	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.913	\$12.620	\$2.612
<i>Operation \$/Year (million)</i>	\$2.359	\$0.250	\$0.094

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC05

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	96.6
Average Annual Energy (GWh/year)	352.5
Effective Load Carrying Capability (MW)	25.1
Annual Firm Energy (GWh/year)	352.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$351,682
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,902.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,003
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$122
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.8	393.4	146.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	191.2	54.4	214.3	100.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	13.8	76.7	285.8	28.6	155.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	25.0	535.2	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.6	2.6	1.4	0.7	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC05

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25	\$84	\$19
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	313	1,031	225
<i>Operation FTEs (Full-Time Equivalents)</i>	17	18	9

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.927	\$11.935	\$2.512
<i>Operation \$/Year (million)</i>	\$2.449	\$0.252	\$0.096

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC06

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	243
Average Annual Energy (GWh/year)	761.2
Effective Load Carrying Capability (MW)	63.2
Annual Firm Energy (GWh/year)	761.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$701,336
Fixed Operating & Maintenance Cost (\$1000s/year)	\$11,890.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$830
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$110
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	20.8	306.9	145.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	215.3	42.0	172.0	44.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	13.6	73.1	191.4	47.5	147.7	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	24.9	448.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.3	4.3	0.4	0.7	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC06

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$34	\$163	\$33
<i>Operation \$/Year (million)</i>	\$3	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	414	1,994	391
<i>Operation FTEs (Full-Time Equivalents)</i>	33	36	17

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.155	\$23.262	\$4.361
<i>Operation \$/Year (million)</i>	\$3.404	\$0.517	\$0.186

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC07

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	325.2
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	325.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$407,628
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,436.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$945
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$145
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.8	378.0	161.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	88.8	54.4	208.6	208.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	3.0	63.3	107.2	0.1	386.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	25.0	535.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.1	1.8	1.4	9.2	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC07

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25	\$97	\$21
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	312	1,186	248
<i>Operation FTEs (Full-Time Equivalents)</i>	16	17	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.854	\$13.773	\$2.767
<i>Operation \$/Year (million)</i>	\$1.884	\$0.233	\$0.088

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC08

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	41.4
Average Annual Energy (GWh/year)	130.1
Effective Load Carrying Capability (MW)	10.8
Annual Firm Energy (GWh/year)	130.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$171,858
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,380.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$706
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$159
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	20.7	236.5	145.6			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	145.6	42.1	172.0	43.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>		41.8	176.4	31.7	153.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	24.9	378.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.1	2.5	0.6	0.7	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC08

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15	\$42	\$10
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	185	517	119
<i>Operation FTEs (Full-Time Equivalents)</i>	7	8	4

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.289	\$5.957	\$1.332
<i>Operation \$/Year (million)</i>	\$1.181	\$0.100	\$0.040

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC09

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	207
Average Annual Energy (GWh/year)	713.4
Effective Load Carrying Capability (MW)	53.8
Annual Firm Energy (GWh/year)	713.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$589,320
Fixed Operating & Maintenance Cost (\$1000s/year)	\$11,009.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$577
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$100
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	20.7	170.3	145.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	161.4	31.8	113.9	29.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	4.7	43.5	132.2	24.5	131.4		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	24.9	311.5	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.6	2.0		0.7		
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC09

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26	\$136	\$27
<i>Operation \$/Year (million)</i>	\$3	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	323	1,670	322
<i>Operation FTEs (Full-Time Equivalents)</i>	30	33	15

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.996	\$19.504	\$3.591
<i>Operation \$/Year (million)</i>	\$3.344	\$0.480	\$0.171

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC10

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	297
Average Annual Energy (GWh/year)	1022.7
Effective Load Carrying Capability (MW)	77.2
Annual Firm Energy (GWh/year)	1022.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$819,030
Fixed Operating & Maintenance Cost (\$1000s/year)	\$15,553.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$464
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$97
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.7	126.3	138.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	137.1	22.7	89.5	36.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	3.6	49.8	106.7	21.2	104.3

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	24.8	260.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.6	1.5	0.6		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC10

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$32	\$188	\$36
<i>Operation \$/Year (million)</i>	\$4	\$4	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	389	2,303	431
<i>Operation FTEs (Full-Time Equivalents)</i>	42	46	21

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.792	\$26.949	\$4.805
<i>Operation \$/Year (million)</i>	\$4.404	\$0.680	\$0.240

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC11

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	126
Average Annual Energy (GWh/year)	473.1
Effective Load Carrying Capability (MW)	32.8
Annual Firm Energy (GWh/year)	473.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$383,616
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,520.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$695
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$101
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		386.7				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	203.0	40.3	106.2	37.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	32.4	239.5	63.9	38.1	12.8		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	386.7	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.1	2.4	1.8	0.5		
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC11

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$23	\$90	\$19
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	278	1,101	227
<i>Operation FTEs (Full-Time Equivalents)</i>	21	23	11

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.528	\$12.803	\$2.538
<i>Operation \$/Year (million)</i>	\$2.598	\$0.324	\$0.119

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC12

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	96.6
Average Annual Energy (GWh/year)	308.4
Effective Load Carrying Capability (MW)	25.1
Annual Firm Energy (GWh/year)	308.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$322,117
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,962.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$566
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$123
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		337.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	120.5	34.5	117.1	65.8		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		174.8	113.1	33.5	16.5	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	337.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.7	1.9	2.4	1.1		
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC12

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18	\$75	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	222	926	188
<i>Operation FTEs (Full-Time Equivalents)</i>	14	15	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.764	\$10.775	\$2.102
<i>Operation \$/Year (million)</i>	\$1.654	\$0.214	\$0.079

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC13

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	135
Average Annual Energy (GWh/year)	541
Effective Load Carrying Capability (MW)	35.1
Annual Firm Energy (GWh/year)	541

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$397,988
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,421.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$556
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$92
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		322.1				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	147.2	32.1	109.9	32.9			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	31.8	189.2	58.2	30.1	12.8		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	322.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.4	2.0	0.3	0.5		
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC13

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$20	\$93	\$19
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	245	1,137	225
<i>Operation FTEs (Full-Time Equivalents)</i>	23	25	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.026	\$13.259	\$2.511
<i>Operation \$/Year (million)</i>	\$2.712	\$0.367	\$0.131

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC14

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	144
Average Annual Energy (GWh/year)	526.8
Effective Load Carrying Capability (MW)	37.4
Annual Firm Energy (GWh/year)	526.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$410,700
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,114.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$393
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$96
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>			237.4	0.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	95.3	27.4	75.7	39.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	16.2	151.4	54.6	2.1	13.1	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *		0.0	0.0	237.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.3	1.2	0.4			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC14

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
<i>Tonnes/GWh</i>						

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18	\$95	\$19
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	226	1,162	224
<i>Operation FTEs (Full-Time Equivalents)</i>	22	24	11

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.815	\$13.578	\$2.504
<i>Operation \$/Year (million)</i>	\$2.485	\$0.354	\$0.126

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC15

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	108
Average Annual Energy (GWh/year)	381.9
Effective Load Carrying Capability (MW)	28.1
Annual Firm Energy (GWh/year)	381.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$306,686
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,864.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$260
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$98
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		168.8	1.7		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	74.0	12.8	47.6	36.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	1.1	100.1	52.5	2.1	14.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	170.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.8	0.5			
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC15

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13	\$71	\$14
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	162	867	166
<i>Operation FTEs (Full-Time Equivalents)</i>	16	17	8

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.003	\$10.128	\$1.848
<i>Operation \$/Year (million)</i>	\$1.774	\$0.256	\$0.091

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC16

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	99
Average Annual Energy (GWh/year)	376.9
Effective Load Carrying Capability (MW)	25.7
Annual Firm Energy (GWh/year)	376.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$288,396
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,842.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$340
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$95
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		195.9	1.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	97.7	14.5	51.0	34.5			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	25.3	106.4	49.0	2.1	14.8		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	197.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.6	0.6				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC16

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$67	\$14
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	170	820	161
<i>Operation FTEs (Full-Time Equivalents)</i>	16	17	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.112	\$9.566	\$1.792
<i>Operation \$/Year (million)</i>	\$1.840	\$0.254	\$0.091

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC17

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	103.5
Average Annual Energy (GWh/year)	315.2
Effective Load Carrying Capability (MW)	26.9
Annual Firm Energy (GWh/year)	315.2

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$337,548
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,009.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$499
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		124.8	122.6			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	113.4	6.1	86.0	41.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>		54.0	44.5	1.5	147.4		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	247.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.1	0.1				1.3
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC17

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$17	\$79	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	210	967	192
<i>Operation FTEs (Full-Time Equivalents)</i>	14	15	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.588	\$11.267	\$2.140
<i>Operation \$/Year (million)</i>	\$1.527	\$0.217	\$0.079

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC18

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	138
Average Annual Energy (GWh/year)	486.2
Effective Load Carrying Capability (MW)	35.9
Annual Firm Energy (GWh/year)	486.2

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$412,805
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,346.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$136
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$101
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		79.3	23.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	20.1	5.3	53.7	23.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		48.8	14.4		39.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	102.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.6	1.4			
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC18

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15	\$94	\$18
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	182	1,155	213
<i>Operation FTEs (Full-Time Equivalents)</i>	20	22	10

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.250	\$13.526	\$2.375
<i>Operation \$/Year (million)</i>	\$2.053	\$0.322	\$0.113

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC19

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117
Average Annual Energy (GWh/year)	441.3
Effective Load Carrying Capability (MW)	30.4
Annual Firm Energy (GWh/year)	441.3

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$329,240
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,742.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$242
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$92
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		126.0				
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	63.3	10.7	35.0	17.0		
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	33.9	81.0	11.1			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	126.0	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.9	2.5	0.1	0.7	
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC19

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$76	\$15
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	168	928	176
<i>Operation FTEs (Full-Time Equivalents)</i>	18	20	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.093	\$10.851	\$1.967
<i>Operation \$/Year (million)</i>	\$1.989	\$0.294	\$0.104

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC20

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	158.7
Average Annual Energy (GWh/year)	608.8
Effective Load Carrying Capability (MW)	41.3
Annual Firm Energy (GWh/year)	608.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$488,521
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,323.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$370
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$98
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		239.6			
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	46.0	17.3	97.7	78.7	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		122.5	88.5	18.8	9.8

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	239.6	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.2	0.9	0.5		
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC20

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$20	\$112	\$22
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	251	1,378	262
<i>Operation FTEs (Full-Time Equivalents)</i>	25	28	13

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.119	\$16.107	\$2.924
<i>Operation \$/Year (million)</i>	\$2.782	\$0.407	\$0.144

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC21

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	99
Average Annual Energy (GWh/year)	371.4
Effective Load Carrying Capability (MW)	25.7
Annual Firm Energy (GWh/year)	371.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$275,845
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,656.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$154
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$92
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		55.9	37.2		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	19.1	9.0	38.1	26.8	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	20.9	61.8	5.8	0.3	4.3

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	93.1	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.0	0.1			
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC21

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11	\$63	\$12
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	139	773	147
<i>Operation FTEs (Full-Time Equivalents)</i>	15	17	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.766	\$9.044	\$1.636
<i>Operation \$/Year (million)</i>	\$1.625	\$0.247	\$0.087

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC26

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	126
Average Annual Energy (GWh/year)	416
Effective Load Carrying Capability (MW)	32.8
Annual Firm Energy (GWh/year)	416

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$365,998
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,492.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$434
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$106
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		169.9	45.8		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	128.5	11.3	49.8	26.1	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	34.0	61.8	88.6		31.3

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	215.7	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.6	2.2	0.3	0.6	
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC26

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18	\$85	\$17
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	220	1,039	205
<i>Operation FTEs (Full-Time Equivalents)</i>	18	19	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.755	\$12.128	\$2.284
<i>Operation \$/Year (million)</i>	\$1.957	\$0.282	\$0.102

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC27

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	110.4
Average Annual Energy (GWh/year)	333.3
Effective Load Carrying Capability (MW)	28.7
Annual Firm Energy (GWh/year)	333.3

### Financial Information (in Fiscal \$ 2011 )

Direct Capital Cost (\$1000s)*	\$330,204
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,035.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$96
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$114
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		70.8				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	21.0	7.6	15.4	26.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>				24.7	46.1		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	70.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.1	0.3	0.3			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC27

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12	\$75	\$14
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	142	923	169
<i>Operation FTEs (Full-Time Equivalents)</i>	13	15	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.752	\$10.817	\$1.890
<i>Operation \$/Year (million)</i>	\$1.144	\$0.221	\$0.077

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC28

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	153
Average Annual Energy (GWh/year)	590.8
Effective Load Carrying Capability (MW)	39.8
Annual Firm Energy (GWh/year)	590.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$429,204
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,020.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$316
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$90
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		152.0	30.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	89.1	21.7	49.0	22.9	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	64.0	36.7	47.9		34.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	182.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.5	0.2		0.7	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC28

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18	\$99	\$19
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	219	1,210	230
<i>Operation FTEs (Full-Time Equivalents)</i>	24	27	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.719	\$14.147	\$2.564
<i>Operation \$/Year (million)</i>	\$2.655	\$0.394	\$0.139

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC29

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	89.7
Average Annual Energy (GWh/year)	201.1
Effective Load Carrying Capability (MW)	23.3
Annual Firm Energy (GWh/year)	201.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$268,783
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,048.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$73
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$146
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		14.6	40.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	13.3	9.7	17.5	14.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			21.8	32.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	54.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.2			0.6	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC29

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
			PM 2.5	PM 10	PM Total	
		<i>Tonnes/GWh</i>				

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9	\$61	\$12
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	115	751	138
<i>Operation FTEs (Full-Time Equivalents)</i>	8	9	4

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.425	\$8.801	\$1.537
<i>Operation \$/Year (million)</i>	\$0.450	\$0.133	\$0.047

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC32

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	151.8
Average Annual Energy (GWh/year)	367.9
Effective Load Carrying Capability (MW)	39.5
Annual Firm Energy (GWh/year)	367.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$447,446
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,528.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$58
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>		15.1	43.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	44.2	2.9	7.4	4.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					58.5	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	58.5	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC32

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15	\$102	\$19
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	180	1,247	226
<i>Operation FTEs (Full-Time Equivalents)</i>	15	16	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.217	\$14.623	\$2.523
<i>Operation \$/Year (million)</i>	\$0.853	\$0.242	\$0.085

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC34

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	351.9
Average Annual Energy (GWh/year)	906.3
Effective Load Carrying Capability (MW)	91.5
Annual Firm Energy (GWh/year)	906.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,042,258
Fixed Operating & Maintenance Cost (\$1000s/year)	\$13,709.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$291
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$129
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		63.2	153.9	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	55.4	49.3	79.5	32.9	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>			27.2	6.1	183.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	217.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.4	0.1	0.4		4.5	0.4
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC34

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$36	\$238	\$45
<i>Operation \$/Year (million)</i>	\$4	\$4	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	445	2,914	534
<i>Operation FTEs (Full-Time Equivalents)</i>	37	41	19

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.485	\$34.142	\$5.958
<i>Operation \$/Year (million)</i>	\$2.483	\$0.600	\$0.211

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC36

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	172.5
Average Annual Energy (GWh/year)	424.9
Effective Load Carrying Capability (MW)	44.9
Annual Firm Energy (GWh/year)	424.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$520,071
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,495.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$246
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$136
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>		4.0	168.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	40.7	28.3	71.1	32.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					172.5	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	172.5	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.7					1.3
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC36

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$19	\$119	\$23
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	239	1,459	271
<i>Operation FTEs (Full-Time Equivalents)</i>	17	19	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.951	\$17.086	\$3.027
<i>Operation \$/Year (million)</i>	\$1.202	\$0.284	\$0.100

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC37

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	72
Average Annual Energy (GWh/year)	231.4
Effective Load Carrying Capability (MW)	18.7
Annual Firm Energy (GWh/year)	231.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$240,972
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,895.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$692
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$126
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	20.8	220.4	139.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	151.6	33.5	129.8	65.6		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.5	87.4	153.4	25.3	113.9	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	24.9	355.5	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.0	2.9	1.0		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC37

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$17	\$58	\$13
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	215	706	154
<i>Operation FTEs (Full-Time Equivalents)</i>	11	12	6

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.699	\$8.180	\$1.723
<i>Operation \$/Year (million)</i>	\$1.532	\$0.166	\$0.063

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC38

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	131.1
Average Annual Energy (GWh/year)	329.8
Effective Load Carrying Capability (MW)	34.1
Annual Firm Energy (GWh/year)	329.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$404,372
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,120.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$307
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$138
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	9.8	92.9	55.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	96.5	7.3	25.2	29.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			0.5	49.4	108.1

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	158.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.1	0.2	0.5		1.7
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC38

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$17	\$93	\$18
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	209	1,140	217
<i>Operation FTEs (Full-Time Equivalents)</i>	14	15	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.601	\$13.329	\$2.422
<i>Operation \$/Year (million)</i>	\$1.085	\$0.223	\$0.080

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC40

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	350.1
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	350.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$351,188
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,299.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$111
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$115
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		63.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	51.3	2.3	7.2	3.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	8.8	28.8	23.0	0.1	3.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	63.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.2		0.5			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC40

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13	\$80	\$15
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	155	982	181
<i>Operation FTEs (Full-Time Equivalents)</i>	14	16	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.919	\$11.501	\$2.020
<i>Operation \$/Year (million)</i>	\$1.194	\$0.232	\$0.082

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC41

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	45
Average Annual Energy (GWh/year)	155.3
Effective Load Carrying Capability (MW)	11.7
Annual Firm Energy (GWh/year)	155.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$129,509
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,383.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$97
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$101
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		50.7				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	12.1	6.8	12.9	18.9		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	8.2	42.4				
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	50.7	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.8	0.8	0.3			
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
Affected Stream Length:	Length							
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC41

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6	\$30	\$6
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	68	365	70
<i>Operation FTEs (Full-Time Equivalents)</i>	6	7	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.857	\$4.263	\$0.778
<i>Operation \$/Year (million)</i>	\$0.700	\$0.104	\$0.037

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC42

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	63
Average Annual Energy (GWh/year)	219.4
Effective Load Carrying Capability (MW)	16.4
Annual Firm Energy (GWh/year)	219.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$182,714
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,386.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$182
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$101
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		103.9			
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	61.8	9.8	23.9	8.3	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		52.4	48.8	0.1	2.6

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	103.9	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.2	0.3			
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC42

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8	\$42	\$8
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	100	518	100
<i>Operation FTEs (Full-Time Equivalents)</i>	9	10	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.232	\$6.051	\$1.113
<i>Operation \$/Year (million)</i>	\$1.045	\$0.148	\$0.053

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC43

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	41.4
Average Annual Energy (GWh/year)	139.2
Effective Load Carrying Capability (MW)	10.8
Annual Firm Energy (GWh/year)	139.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$145,768
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,274.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$321
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		65.8				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	10.0	3.1	30.4	22.3			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>		36.1	24.6	2.6	2.5		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	65.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.2	0.1	0.1	0.2		
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC43

Resource Category: Onshore Wind

Region: Peace River

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9	\$34	\$7
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	112	420	88
<i>Operation FTEs (Full-Time Equivalents)</i>	7	7	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.369	\$4.872	\$0.984
<i>Operation \$/Year (million)</i>	\$0.853	\$0.098	\$0.036

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC44

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	104.8
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	104.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$123,377
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,746.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$285
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$138
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		150.0	0.0		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	72.1	13.6	39.1	25.1	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		61.7	65.5	5.5	17.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	150.0	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.8	1.4		0.6	2.6
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC44

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8	\$29	\$6
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	98	358	76
<i>Operation FTEs (Full-Time Equivalents)</i>	5	5	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.229	\$4.155	\$0.845
<i>Operation \$/Year (million)</i>	\$0.633	\$0.075	\$0.028

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC47

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	107.7
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	107.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$115,609
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,713.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$170
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		38.3	99.6			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	8.6	11.9	43.3	74.2		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>		22.0	44.6		71.4	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.3	137.7	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.2	1.2	0.6		2.0
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC47

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6	\$27	\$6
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	72	331	66
<i>Operation FTEs (Full-Time Equivalents)</i>	5	5	2

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.894	\$3.856	\$0.733
<i>Operation \$/Year (million)</i>	\$0.535	\$0.074	\$0.027

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC48

Resource Category: Onshore Wind

Region: Peace River

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	151.8
Average Annual Energy (GWh/year)	504.5
Effective Load Carrying Capability (MW)	39.5
Annual Firm Energy (GWh/year)	504.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$455,587
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,640.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$178
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$106
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		129.0				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	40.6	20.1	44.4	23.9			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.7	75.8	32.0	11.9	8.6		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	129.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.4	0.3	0.3			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_PC48

Resource Category: Onshore Wind

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16	\$104	\$20
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	202	1,277	236
<i>Operation FTEs (Full-Time Equivalents)</i>	20	23	11

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.491	\$14.952	\$2.630
<i>Operation \$/Year (million)</i>	\$2.019	\$0.335	\$0.118

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI11

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	138
Average Annual Energy (GWh/year)	329.9
Effective Load Carrying Capability (MW)	35.9
Annual Firm Energy (GWh/year)	329.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$413,707
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,016.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$150
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.7	65.7	6.9		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	0.8	1.7	21.5	69.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		35.3	0.1	2.3	55.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	93.3	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.7	1.5			
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI11

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15	\$95	\$18
<i>Operation \$/Year (million)</i>	\$1	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	182	1,159	213
<i>Operation FTEs (Full-Time Equivalents)</i>	13	15	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.237	\$13.571	\$2.382
<i>Operation \$/Year (million)</i>	\$0.849	\$0.220	\$0.077

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI12

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	186.3
Average Annual Energy (GWh/year)	545.2
Effective Load Carrying Capability (MW)	48.4
Annual Firm Energy (GWh/year)	545.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$563,145
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,317.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$293
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$119
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		45.3	144.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	10.0	8.1	53.4	118.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		55.2	6.9	1.5	126.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	190.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.1	0.3			
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI12

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21	\$129	\$25
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	262	1,582	295
<i>Operation FTEs (Full-Time Equivalents)</i>	22	25	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.218	\$18.520	\$3.287
<i>Operation \$/Year (million)</i>	\$1.932	\$0.364	\$0.128

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI13

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	236.9
Average Annual Energy (GWh/year)	566.7
Effective Load Carrying Capability (MW)	61.6
Annual Firm Energy (GWh/year)	566.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$729,771
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,820.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$591
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$143
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		67.1	212.9		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	23.0	32.2	107.5	117.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	12.8	102.0	28.6	16.2	120.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	30.2	249.8	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.0			1.6	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI13

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$30	\$168	\$33
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	374	2,062	392
<i>Operation FTEs (Full-Time Equivalents)</i>	24	26	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.594	\$24.110	\$4.370
<i>Operation \$/Year (million)</i>	\$1.813	\$0.384	\$0.138

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI14

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	82.8
Average Annual Energy (GWh/year)	232.5
Effective Load Carrying Capability (MW)	21.5
Annual Firm Energy (GWh/year)	232.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$266,008
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,669.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$327
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$131
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>	14.9	45.2	132.6		
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	32.6	11.8	52.5	95.7	
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		29.2	8.4	2.9	152.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	192.7	0.0		
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	2.7	1.5				
Reservoir Aquatic Area:	Area						
	<i>ha</i>						
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI14

Resource Category: Onshore Wind

Region: Revelstoke Ashton Creek

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13	\$62	\$12
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	154	758	148
<i>Operation FTEs (Full-Time Equivalents)</i>	10	11	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.893	\$8.847	\$1.650
<i>Operation \$/Year (million)</i>	\$0.992	\$0.159	\$0.058

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI32

Resource Category: Onshore Wind

Region: Selkirk

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	89
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	89

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$107,733
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,362.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$54
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$135
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		50.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	8.1	4.4	25.5	12.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>		10.2	31.8	7.1	1.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	50.1	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_SI32

Resource Category: Onshore Wind

Region: Selkirk

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4	\$25	\$5
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	50	302	56
<i>Operation FTEs (Full-Time Equivalents)</i>	4	4	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.622	\$3.539	\$0.629
<i>Operation \$/Year (million)</i>	\$0.271	\$0.060	\$0.021

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI02

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	172.5
Average Annual Energy (GWh/year)	466.8
Effective Load Carrying Capability (MW)	44.9
Annual Firm Energy (GWh/year)	466.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$597,203
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,829.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,361
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$148
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	41.9	683.1	89.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	175.3	25.7	215.9	397.3		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>		0.4	0.1	605.4	208.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	814.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	21.3	9.6	11.8	4.0	21.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI02

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$38	\$142	\$31
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	463	1,737	364
<i>Operation FTEs (Full-Time Equivalents)</i>	23	24	11

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.738	\$20.162	\$4.065
<i>Operation \$/Year (million)</i>	\$2.661	\$0.336	\$0.127

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI04

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	62.1
Average Annual Energy (GWh/year)	177.6
Effective Load Carrying Capability (MW)	16.1
Annual Firm Energy (GWh/year)	177.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$266,462
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,394.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,219
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$179
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	63.8	584.5	70.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	104.9	17.5	192.2	404.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		7.8	555.8	154.2	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	717.7	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	17.0	8.3	10.3	3.9	21.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI04

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$24	\$66	\$16
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	301	810	190
<i>Operation FTEs (Full-Time Equivalents)</i>	11	11	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.701	\$9.319	\$2.117
<i>Operation \$/Year (million)</i>	\$1.796	\$0.143	\$0.058

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI05

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	255.3
Average Annual Energy (GWh/year)	702.7
Effective Load Carrying Capability (MW)	66.4
Annual Firm Energy (GWh/year)	702.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$821,109
Fixed Operating & Maintenance Cost (\$1000s/year)	\$11,191.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,154
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	63.8	578.0	70.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	107.1	14.7	187.1	403.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		7.8	593.6	109.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	711.2	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	15.3	7.9	9.9	3.9	21.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI05

Resource Category: Onshore Wind

Region: Vancouver Island

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$41	\$192	\$39
<i>Operation \$/Year (million)</i>	\$3	\$3	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	500	2,349	463
<i>Operation FTEs (Full-Time Equivalents)</i>	31	34	16

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.142	\$27.382	\$5.170
<i>Operation \$/Year (million)</i>	\$3.108	\$0.486	\$0.177

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI06

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	117.3
Average Annual Energy (GWh/year)	333.1
Effective Load Carrying Capability (MW)	30.5
Annual Firm Energy (GWh/year)	333.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$420,124
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,661.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,130
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$147
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	63.8	543.3	70.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	71.1	14.1	188.3	404.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>		7.7	552.8	115.8		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	676.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	15.7	8.0	10.3	3.9	21.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI06

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$28	\$100	\$22
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	345	1,232	262
<i>Operation FTEs (Full-Time Equivalents)</i>	17	18	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.232	\$14.287	\$2.926
<i>Operation \$/Year (million)</i>	\$2.136	\$0.243	\$0.092

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI07

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	165.6
Average Annual Energy (GWh/year)	502.1
Effective Load Carrying Capability (MW)	43.1
Annual Firm Energy (GWh/year)	502.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$561,278
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,192.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,150
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$131
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	134.5	372.2	65.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	35.2	12.0	171.0	354.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		10.2	491.3	58.4	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	560.2	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	12.7	5.5	9.5	3.9	21.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	7.6	6.7	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	1.3	1.7
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI07

Resource Category: Onshore Wind

Region: Vancouver Island

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$32	\$133	\$28
<i>Operation \$/Year (million)</i>	\$2	\$2	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	399	1,626	333
<i>Operation FTEs (Full-Time Equivalents)</i>	23	25	12

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.895	\$18.909	\$3.718
<i>Operation \$/Year (million)</i>	\$2.794	\$0.354	\$0.131

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI08

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	41.4
Average Annual Energy (GWh/year)	113
Effective Load Carrying Capability (MW)	10.8
Annual Firm Energy (GWh/year)	113

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$128,126
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,727.5
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$60
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$128
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		16.4	15.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	22.3	1.4	3.6	4.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>			3.1	28.5			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	31.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.4	0.2				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI08

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5	\$29	\$6
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	61	359	67
<i>Operation FTEs (Full-Time Equivalents)</i>	5	5	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.759	\$4.196	\$0.749
<i>Operation \$/Year (million)</i>	\$0.364	\$0.075	\$0.027

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI10

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	89.1
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	89.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$113,364
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,414.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$137
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$144
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		58.2	5.3		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	15.2	2.7	25.9	19.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>			0.0	35.1	28.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	63.5	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.3	1.5	0.4		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI10

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5	\$26	\$5
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	67	321	63
<i>Operation FTEs (Full-Time Equivalents)</i>	4	4	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.823	\$3.748	\$0.705
<i>Operation \$/Year (million)</i>	\$0.360	\$0.061	\$0.022

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI11

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	48.3
Average Annual Energy (GWh/year)	111.7
Effective Load Carrying Capability (MW)	12.6
Annual Firm Energy (GWh/year)	111.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$147,561
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,700.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$52
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$145
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		12.7	32.9		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	17.6	1.4	14.6	12.0	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		11.6		5.9	28.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	45.6	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.7	0.3			
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI11

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5	\$34	\$6
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	65	413	76
<i>Operation FTEs (Full-Time Equivalents)</i>	5	5	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.811	\$4.837	\$0.851
<i>Operation \$/Year (million)</i>	\$0.275	\$0.074	\$0.026

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI12

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	48.3
Average Annual Energy (GWh/year)	150.9
Effective Load Carrying Capability (MW)	12.6
Annual Firm Energy (GWh/year)	150.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$147,485
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,286.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$51
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$113
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	8.2	29.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	28.5	2.7	5.0	2.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		19.1	3.0	16.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	38.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.4		0.4		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI12

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5	\$34	\$6
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	65	413	76
<i>Operation FTEs (Full-Time Equivalents)</i>	6	7	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.812	\$4.833	\$0.850
<i>Operation \$/Year (million)</i>	\$0.553	\$0.100	\$0.035

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI13

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	104.7
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	104.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$107,510
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,595.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$50
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$118
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		36.4		
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	24.0	8.8	3.7	
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	15.3	0.1	21.1	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	36.4	0.0	
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.7	0.0			
Reservoir Aquatic Area:	Area						
		<i>ha</i>					
Affected Stream Length:	Length						
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
		<i>ha/class</i>	N/A		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI13

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4	\$25	\$5
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	51	301	56
<i>Operation FTEs (Full-Time Equivalents)</i>	4	5	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.631	\$3.527	\$0.628
<i>Operation \$/Year (million)</i>	\$0.384	\$0.070	\$0.025

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI14

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	34.5
Average Annual Energy (GWh/year)	112.6
Effective Load Carrying Capability (MW)	9
Annual Firm Energy (GWh/year)	112.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$108,996
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,727.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$72
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$113
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>		49.9		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	18.5	4.9	12.2	14.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	20.4		1.5	28.0	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	49.9	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.1		0.8		0.5	
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI14

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4	\$25	\$5
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	55	307	58
<i>Operation FTEs (Full-Time Equivalents)</i>	5	5	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.680	\$3.587	\$0.647
<i>Operation \$/Year (million)</i>	\$0.475	\$0.075	\$0.027

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI15

Resource Category: Onshore Wind

Region: Vancouver Island

### Project Description

Potential onshore wind site identified in the 2009 BC Hydro Wind Data Studies.

### Technical Information

Installed Capacity (MW)	41.4
Average Annual Energy (GWh/year)	125.7
Effective Load Carrying Capability (MW)	10.8
Annual Firm Energy (GWh/year)	125.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$131,406
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,943.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$109
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$121
Project Life (Years)	20
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>	4.5	35.8	7.6		
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	21.9	3.7	13.3	9.0	
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		1.4	45.5		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	46.8	0.0		
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	0.9	0.7	0.1			
Reservoir Aquatic Area:	Area						
	<i>ha</i>						
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>			1.0	
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.2		
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A	4.0		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_VI15

Resource Category: Onshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
			PM 2.5	PM 10	PM Total	
		<i>Tonnes/GWh</i>				

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6	\$30	\$6
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	70	370	71
<i>Operation FTEs (Full-Time Equivalents)</i>	5	6	3

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.855	\$4.324	\$0.791
<i>Operation \$/Year (million)</i>	\$0.511	\$0.085	\$0.030

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC14-1

Resource Category: Offshore Wind

Region: North Coast

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	460.8
Average Annual Energy (GWh/year)	1911.3
Effective Load Carrying Capability (MW)	119.8
Annual Firm Energy (GWh/year)	1911.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,590,681
Fixed Operating & Maintenance Cost (\$1000s/year)	\$86,026.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$7,164
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$192
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low	Medium	High		
		0 to <69	69 to <369	>369		
	<i>ha/class</i>	364.1	530.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	794.1	10.8	64.3	25.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	55.7	357.5	286.4		

Freshwater	Priority Fish Species: no. of priority species / watershed	None	Low	Moderate	High		
		0	1 to 12	13 to 23	24 to 38		
	<i>ha/class</i> *		697.5				
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	12.9	8.3	6.1	1.7	0.5	
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic	Shallow	Deep	Abyssal
		0 < 20m	20 < 200m	200 < 1000m	>=1000 m
	<i>ha/class</i>		162.1	36.6	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A	48.7	56.8	0.1
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A	337.6	9.5	



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC14-1

Resource Category: Offshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$170	\$557	\$129
<i>Operation \$/Year (million)</i>	\$22	\$36	\$11

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,100	6,891	1,529
<i>Operation FTEs (Full-Time Equivalents)</i>	207	413	131

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25.862	\$74.725	\$17.057
<i>Operation \$/Year (million)</i>	\$16.977	\$4.605	\$1.466

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC3

Resource Category: Offshore Wind

Region: North Coast

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	108
Average Annual Energy (GWh/year)	402.7
Effective Load Carrying Capability (MW)	28.1
Annual Firm Energy (GWh/year)	402.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$557,388
Fixed Operating & Maintenance Cost (\$1000s/year)	\$19,483.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$893
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$196
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>	67.0	73.5		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	104.2	3.9	15.7	16.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	1.9		98.0	3.3	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		60.4		57.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.8	0.6	1.4		0.6	1.1
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	0.2	39.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A	38.1	2.6	0.0
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A	0.3	0.8	

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC3

Resource Category: Offshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$29	\$116	\$25
<i>Operation \$/Year (million)</i>	\$5	\$8	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	357	1,430	300
<i>Operation FTEs (Full-Time Equivalents)</i>	46	94	30

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.454	\$15.454	\$3.343
<i>Operation \$/Year (million)</i>	\$2.999	\$1.050	\$0.329

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC7-1

Resource Category: Offshore Wind

Region: North Coast

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	471.6
Average Annual Energy (GWh/year)	1812.1
Effective Load Carrying Capability (MW)	122.6
Annual Firm Energy (GWh/year)	1812.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,391,708
Fixed Operating & Maintenance Cost (\$1000s/year)	\$86,255.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$5,593
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$190
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>	225.7	48.1		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
		<i>ha/class</i>	216.2	10.5	25.1	22.1
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80
		<i>ha/class</i>	11.3	0.7	92.5	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *		101.0			
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.0	0.4			
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	4.0	186.1	
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	132.4	17.4
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	146.2	62.6

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC7-1

Resource Category: Offshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$144	\$508	\$115
<i>Operation \$/Year (million)</i>	\$22	\$36	\$11

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,774	6,279	1,362
<i>Operation FTEs (Full-Time Equivalents)</i>	204	415	131

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21.872	\$68.006	\$15.190
<i>Operation \$/Year (million)</i>	\$15.047	\$4.636	\$1.464

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC8-1

Resource Category: Offshore Wind

Region: North Coast

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	478.8
Average Annual Energy (GWh/year)	1966.9
Effective Load Carrying Capability (MW)	124.5
Annual Firm Energy (GWh/year)	1966.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,511,178
Fixed Operating & Maintenance Cost (\$1000s/year)	\$87,793.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$4,974
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$182
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low	Medium	High		
		0 to <69	69 to <369	>369		
	<i>ha/class</i>	405.4	967.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	937.0	72.0	264.5	99.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	102.3	268.2	736.9	168.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None	Low	Moderate	High		
		0	1 to 12	13 to 23	24 to 38		
	<i>ha/class</i> *		515.0		759.9		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	32.8	14.6	10.1	4.8	1.1	39.3
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photoc	Shallow	Deep	Abyssal
		0 < 20m	20 < 200m	200 < 1000m	>=1000 m
	<i>ha/class</i>	3.2	279.3	8.2	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A	20.6	6.6	0.0
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A	126.3	60.9	

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC8-1

Resource Category: Offshore Wind

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$139	\$528	\$117
<i>Operation \$/Year (million)</i>	\$22	\$36	\$11

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,715	6,520	1,385
<i>Operation FTEs (Full-Time Equivalents)</i>	207	422	133

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21.171	\$70.543	\$15.454
<i>Operation \$/Year (million)</i>	\$14.971	\$4.727	\$1.487

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC24-1

Resource Category: Offshore Wind

Region: Vancouver Island

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	475.2
Average Annual Energy (GWh/year)	1892.3
Effective Load Carrying Capability (MW)	123.6
Annual Firm Energy (GWh/year)	1892.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$2,181,776
Fixed Operating & Maintenance Cost (\$1000s/year)	\$84,764.2
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,524
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$166
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	88.2	624.8	84.1		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	95.4	33.5	244.2	424.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		7.2	1.0	693.8	83.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			783.4		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	21.7	7.9	10.7	3.9	21.1
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	10.2	9.6	0.0
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	3.7	2.6
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	72.2	5.7



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC24-1

Resource Category: Offshore Wind

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$84	\$440	\$90
<i>Operation \$/Year (million)</i>	\$20	\$36	\$11

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,036	5,438	1,066
<i>Operation FTEs (Full-Time Equivalents)</i>	194	409	127

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12.886	\$58.602	\$11.898
<i>Operation \$/Year (million)</i>	\$11.056	\$4.601	\$1.422

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC25-1

Resource Category: Offshore Wind

Region: Vancouver Island

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	334.8
Average Annual Energy (GWh/year)	1347.3
Effective Load Carrying Capability (MW)	87
Annual Firm Energy (GWh/year)	1347.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,563,285
Fixed Operating & Maintenance Cost (\$1000s/year)	\$60,031.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$1,452
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$167
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	20.2	482.1	190.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	112.6	26.5	162.2	391.2	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	0.0	2.3	9.3	546.7	128.4

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			686.2		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	14.8	13.8	16.7	3.9	20.2
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	7.3	4.6	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	1.2	1.4
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	10.9	4.2

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC25-1

Resource Category: Offshore Wind

Region: Vancouver Island

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
	Fine Particulates					
			PM 2.5	PM 10	PM Total	
<i>Tonnes/GWh</i>						

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$65	\$318	\$66
<i>Operation \$/Year (million)</i>	\$15	\$25	\$8

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	805	3,926	783
<i>Operation FTEs (Full-Time Equivalents)</i>	138	289	90

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.009	\$42.335	\$8.733
<i>Operation \$/Year (million)</i>	\$8.239	\$3.254	\$1.009

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC28

Resource Category: Offshore Wind

Region: Vancouver Island

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	396
Average Annual Energy (GWh/year)	1441.5
Effective Load Carrying Capability (MW)	103
Annual Firm Energy (GWh/year)	1441.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,820,138
Fixed Operating & Maintenance Cost (\$1000s/year)	\$69,704.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$860
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$181
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	32.1	97.3	174.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	74.5	15.1	67.2	147.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>		4.0	2.7	183.0	92.9	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *			282.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	8.7	3.5	6.3	2.4	0.7
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	3.0	21.4	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	20.1	5.3
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	46.6	8.8

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC28

Resource Category: Offshore Wind

Region: Vancouver Island

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$65	\$364	\$73
<i>Operation \$/Year (million)</i>	\$17	\$29	\$9

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	800	4,503	870
<i>Operation FTEs (Full-Time Equivalents)</i>	158	336	105

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.972	\$48.494	\$9.706
<i>Operation \$/Year (million)</i>	\$8.316	\$3.787	\$1.168

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC29

Resource Category: Offshore Wind

Region: Vancouver Island

### Project Description

Potential offshore wind site in ocean depth of up to 40 m.

### Technical Information

Installed Capacity (MW)	259.2
Average Annual Energy (GWh/year)	1014.4
Effective Load Carrying Capability (MW)	67.4
Annual Firm Energy (GWh/year)	1014.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,321,092
Fixed Operating & Maintenance Cost (\$1000s/year)	\$47,170.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$2,500
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$186
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>	89.1	91.1	94.3		
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	146.5	10.9	40.8	76.3	
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		0.5	0.2	159.4	54.5

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *				214.5		
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	3.7	6.1	5.6	0.7		
Reservoir Aquatic Area:	Area						
	<i>ha</i>						
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>	40.4	16.3		
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	22.0	5.0	0.0
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A	56.8	37.2	

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Wind\_OBC29

Resource Category: Offshore Wind

Region: Vancouver Island

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$72	\$277	\$61
<i>Operation \$/Year (million)</i>	\$12	\$20	\$6

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	890	3,421	725
<i>Operation FTEs (Full-Time Equivalents)</i>	111	227	72

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.013	\$36.998	\$8.084
<i>Operation \$/Year (million)</i>	\$7.731	\$2.541	\$0.798

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Canoe Creek / Valemont

Resource Category: Geothermal

Region: Kelly Nicola

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$155,142
Fixed Operating & Maintenance Cost (\$1000s/year)	\$104.8
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$122
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$141
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	0.7	31.8	0.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	23.1	0.6	4.2	4.7	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	21.4	4.5	2.5	4.3	0.0
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	29.8	1.2	1.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.3				
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Canoe Creek / Valemont

Resource Category: Geothermal

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27	\$62	\$17
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	339	662	198
<i>Operation FTEs (Full-Time Equivalents)</i>	20	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.033	\$8.739	\$2.211
<i>Operation \$/Year (million)</i>	\$0.493	\$0.352	\$0.113

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Harrison Hot Springs

Resource Category: Geothermal

Region: Lower Mainland

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$154,036
Fixed Operating & Maintenance Cost (\$1000s/year)	\$64.2
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$106
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	16.8	5.1	20.6		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	8.4	2.6	10.1	21.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	0.7	0.4	0.3	0.4	40.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	1.0	40.1	1.3	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	0.4	0.4	0.1	3.8	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Harrison Hot Springs

Resource Category: Geothermal

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
<i>Tonnes/GWh</i>						

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26	\$62	\$16
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	320	661	194
<i>Operation FTEs (Full-Time Equivalents)</i>	20	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.709	\$8.739	\$2.162
<i>Operation \$/Year (million)</i>	\$0.469	\$0.352	\$0.111

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Cayley

Resource Category: Geothermal

Region: Lower Mainland

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	50
Average Annual Energy (GWh/year)	394.2
Dependable Capacity (MW)	50
Annual Firm Energy (GWh/year)	394.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$318,836
Fixed Operating & Maintenance Cost (\$1000s/year)	\$472.7
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$672
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$105
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low	Medium	High			
		0 to <69	69 to <369	>369			
	<i>ha/class</i>	39.1	18.0	210.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	120.8	19.4	90.5	36.6		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	4.9	1.7	0.9	213.9	45.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None	Low	Moderate	High		
		0	1 to 12	13 to 23	24 to 38		
	<i>ha/class</i> *	179.5	86.3	0.4	0.9		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	5.9	3.7	6.8	0.3	22.6	
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic	Shallow	Deep	Abyssal
		0 < 20m	20 < 200m	200 < 1000m	>=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Cayley

Resource Category: Geothermal

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$41	\$141	\$35
<i>Operation \$/Year (million)</i>	\$4	\$6	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	500	1,498	417
<i>Operation FTEs (Full-Time Equivalents)</i>	38	69	21

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.117	\$19.707	\$4.651
<i>Operation \$/Year (million)</i>	\$1.403	\$0.765	\$0.237

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Garibaldi

Resource Category: Geothermal

Region: Lower Mainland

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	50
Average Annual Energy (GWh/year)	394.2
Dependable Capacity (MW)	50
Annual Firm Energy (GWh/year)	394.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$273,571
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2.3
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$3
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$91
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>	2.3	3.1	3.9	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	5.3	0.4	1.2	2.3	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	2.8	1.1	0.9	3.3	0.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	2.2	4.4	2.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>		0.0	0.1			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Garibaldi

Resource Category: Geothermal

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$28	\$128	\$30
<i>Operation \$/Year (million)</i>	\$4	\$6	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	339	1,344	357
<i>Operation FTEs (Full-Time Equivalents)</i>	36	68	20

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.954	\$18.009	\$3.978
<i>Operation \$/Year (million)</i>	\$0.683	\$0.752	\$0.225

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Pebble Creek

Resource Category: Geothermal

Region: Lower Mainland

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	100
Average Annual Energy (GWh/year)	788.4
Dependable Capacity (MW)	100
Annual Firm Energy (GWh/year)	788.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$603,994
Fixed Operating & Maintenance Cost (\$1000s/year)	\$569.2
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$846
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$99
Project Life (Years)	40
Project Lead Time (Years)	4

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	51.9	286.7	47.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	141.7	18.6	135.7	89.6	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	33.5	68.5	2.8	168.7	112.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	2.4	55.5	8.0	319.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	12.8	5.7	5.2	0.5	22.4
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Pebble Creek

Resource Category: Geothermal

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$70	\$273	\$66
<i>Operation \$/Year (million)</i>	\$8	\$11	\$4

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	866	2,885	786
<i>Operation FTEs (Full-Time Equivalents)</i>	74	138	42

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.370	\$38.203	\$8.770
<i>Operation \$/Year (million)</i>	\$2.264	\$1.521	\$0.464

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: South Meager Creek

Resource Category: Geothermal

Region: Lower Mainland

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	100
Average Annual Energy (GWh/year)	788.4
Dependable Capacity (MW)	100
Annual Firm Energy (GWh/year)	788.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$603,994
Fixed Operating & Maintenance Cost (\$1000s/year)	\$569.2
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$846
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$99
Project Life (Years)	40
Project Lead Time (Years)	4

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	51.9	286.7	47.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	141.7	18.6	135.7	89.6	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	33.5	68.5	2.8	168.7	112.0

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	2.4	55.5	8.0	319.6	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	12.8	5.7	5.2	0.5	22.4
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: South Meager Creek

Resource Category: Geothermal

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$70	\$273	\$66
<i>Operation \$/Year (million)</i>	\$8	\$11	\$4

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	866	2,885	786
<i>Operation FTEs (Full-Time Equivalents)</i>	74	138	42

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.370	\$38.203	\$8.770
<i>Operation \$/Year (million)</i>	\$2.264	\$1.521	\$0.464

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Feasibility
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Hoodoo Mountain

Resource Category: Geothermal

Region: North Coast

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	50
Average Annual Energy (GWh/year)	394.2
Dependable Capacity (MW)	50
Annual Firm Energy (GWh/year)	394.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$371,181
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,298.7
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$1,442
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$122
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	216.0	156.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	370.9	1.8	0.0	0.0	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	70.8	213.6	88.2		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	372.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	6.9	8.3	3.7	13.3	2.9
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Hoodoo Mountain

Resource Category: Geothermal

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$68	\$151	\$44
<i>Operation \$/Year (million)</i>	\$5	\$6	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	838	1,633	516
<i>Operation FTEs (Full-Time Equivalents)</i>	44	70	23

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.361	\$21.113	\$5.762
<i>Operation \$/Year (million)</i>	\$2.298	\$0.775	\$0.259

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Lakelse Lake

Resource Category: Geothermal

Region: North Coast

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$149,992
Fixed Operating & Maintenance Cost (\$1000s/year)	\$29.3
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$46
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$136
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>	0.3	23.0	0.2		
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	3.4	0.4	2.9	16.8	
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	2.0	0.0	14.8	6.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	1.4	0.0	22.1		
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	0.5	0.2	0.2			
Reservoir Aquatic Area:	Area						
	<i>ha</i>						
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Lakelse Lake

Resource Category: Geothermal

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25	\$61	\$16
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	309	647	189
<i>Operation FTEs (Full-Time Equivalents)</i>	19	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.578	\$8.583	\$2.109
<i>Operation \$/Year (million)</i>	\$0.406	\$0.350	\$0.111

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Edziza

Resource Category: Geothermal

Region: North Coast

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	200
Average Annual Energy (GWh/year)	1576.8
Dependable Capacity (MW)	200
Annual Firm Energy (GWh/year)	1576.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,172,392
Fixed Operating & Maintenance Cost (\$1000s/year)	\$762.0
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$1,167
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$97
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	129.1	401.9				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	502.6	8.2	20.1	0.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	75.3	323.9	120.2	11.6		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	531.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	9.8	3.6	6.3	16.8	2.8
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Edziza

Resource Category: Geothermal

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$130	\$536	\$129
<i>Operation \$/Year (million)</i>	\$15	\$22	\$7

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,602	5,650	1,524
<i>Operation FTEs (Full-Time Equivalents)</i>	147	274	82

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18.976	\$75.083	\$17.003
<i>Operation \$/Year (million)</i>	\$3.961	\$3.031	\$0.919

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Hudson's Hope

Resource Category: Geothermal

Region: Peace River

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$148,143
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12.9
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$19
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.1	2.0	15.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	4.5	0.5	5.8	7.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.1	0.5	0.6	0.1	16.5		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.6	17.2	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.0	0.1				0.8
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Hudson's Hope

Resource Category: Geothermal

Region: Peace River

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25	\$61	\$16
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	303	641	187
<i>Operation FTEs (Full-Time Equivalents)</i>	19	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.512	\$8.514	\$2.084
<i>Operation \$/Year (million)</i>	\$0.378	\$0.350	\$0.110

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Arrow Lake

Resource Category: Geothermal

Region: Revelstoke Ashton Creek

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$156,940
Fixed Operating & Maintenance Cost (\$1000s/year)	\$113.7
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$148
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$142
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>	1.6	12.2	21.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>	20.2	0.9	6.6	7.9	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>	0.8	12.9	5.0	0.4	16.5

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	35.6	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.2	0.3	0.5			
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Arrow Lake

Resource Category: Geothermal

Region: Revelstoke Ashton Creek

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$28	\$63	\$17
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	341	668	200
<i>Operation FTEs (Full-Time Equivalents)</i>	20	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.036	\$8.811	\$2.228
<i>Operation \$/Year (million)</i>	\$0.520	\$0.352	\$0.113

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Kootenay Lake

Resource Category: Geothermal

Region: Selkirk

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$147,235
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4.0
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$5
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	1.5	3.1	0.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	2.9	0.2	1.3	1.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	1.3	0.9	0.2	0.2	2.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.8	4.6	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Kootenay Lake

Resource Category: Geothermal

Region: Selkirk

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$24	\$60	\$16
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	300	638	186
<i>Operation FTEs (Full-Time Equivalents)</i>	19	31	10

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.474	\$8.478	\$2.072
<i>Operation \$/Year (million)</i>	\$0.363	\$0.350	\$0.110

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Lower Arrow Lake

Resource Category: Geothermal

Region: Selkirk

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$172,307
Fixed Operating & Maintenance Cost (\$1000s/year)	\$231.3
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$376
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$155
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	0.1	36.5	155.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	29.4	1.5	10.3	151.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	6.1	11.4	3.9	0.1	170.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.9	191.4	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	1.2	0.9	4.9	3.0	8.0
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Lower Arrow Lake

Resource Category: Geothermal

Region: Selkirk

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$30	\$68	\$18
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	371	728	216
<i>Operation FTEs (Full-Time Equivalents)</i>	20	32	10

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.349	\$9.485	\$2.405
<i>Operation \$/Year (million)</i>	\$0.754	\$0.357	\$0.115

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Okanagan Valley

Resource Category: Geothermal

Region: Selkirk

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	20
Average Annual Energy (GWh/year)	140.2
Dependable Capacity (MW)	20
Annual Firm Energy (GWh/year)	140.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$200,816
Fixed Operating & Maintenance Cost (\$1000s/year)	\$482.7
Variable Operating & Maintenance Cost (\$/MWh)	\$42.8
Fixed Taxes (\$1000s)	\$797
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$179
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	0.2	350.8	1.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	24.0	15.7	123.6	188.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	0.0	0.3	0.7	0.9	350.2

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	1.7	350.5	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.9	0.5	0.6	0.9	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Okanagan Valley

Resource Category: Geothermal

Region: Selkirk

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$36	\$76	\$21
<i>Operation \$/Year (million)</i>	\$2	\$3	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	448	832	249
<i>Operation FTEs (Full-Time Equivalents)</i>	22	33	11

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.274	\$10.644	\$2.776
<i>Operation \$/Year (million)</i>	\$1.198	\$0.367	\$0.121

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Silverthorne

Resource Category: Geothermal

Region: Vancouver Island

### Project Description

Conventional geothermal potential assumed to be developable with flash-steam or binary-cycle power plant technologies.

### Technical Information

Installed Capacity (MW)	50
Average Annual Energy (GWh/year)	394.2
Dependable Capacity (MW)	50
Annual Firm Energy (GWh/year)	394.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$412,600
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,245.3
Variable Operating & Maintenance Cost (\$/MWh)	\$31.6
Fixed Taxes (\$1000s)	\$2,058
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	40
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	186.2	177.8	433.8		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	259.9	33.9	173.4	330.5	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	34.2	16.5	152.2	197.7	347.9

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.1	749.3	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	13.3	3.3	7.0	7.2	0.7
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>		52.1	10.1
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	31.0	9.6
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	104.6	

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Mt. Silverthorne

Resource Category: Geothermal

Region: Vancouver Island

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)					
		<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury	
		<i>Tonnes/GWh</i>					
			Fine Particulates				
			PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>						

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$59	\$169	\$44
<i>Operation \$/Year (million)</i>	\$4	\$6	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	723	1,849	520
<i>Operation FTEs (Full-Time Equivalents)</i>	42	73	23

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.635	\$23.623	\$5.807
<i>Operation \$/Year (million)</i>	\$2.849	\$0.796	\$0.254

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-170\_CI

Resource Category: Run-of-River Hydro

Region: Central Interior

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	50.6
Average Annual Energy (GWh/year)	166.9
Effective Load Carrying Capability (MW)	7.5
Annual Firm Energy (GWh/year)	120.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$216,763
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,974.3
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,963
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$168
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	100.3	736.3	176.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	449.3	54.9	299.6	208.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	90.1	85.1	126.5	412.3	298.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	87.5	0.3	0.0	924.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	8.7	10.0	6.6	5.7	2.3	9.4
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	6.1						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-170\_CI

Resource Category: Run-of-River Hydro

Region: Central Interior

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$52	\$61	\$22
<i>Operation \$/Year (million)</i>	\$3	\$1	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	643	756	260
<i>Operation FTEs (Full-Time Equivalents)</i>	30	7	11
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.302	\$8.338	\$2.903
<i>Operation \$/Year (million)</i>	\$3.491	\$0.065	\$0.123

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-180\_CI

Resource Category: Run-of-River Hydro

Region: Central Interior

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	17.7
Average Annual Energy (GWh/year)	49.3
Effective Load Carrying Capability (MW)	0.1
Annual Firm Energy (GWh/year)	47.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$59,493
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,179.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$837
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$172
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	14.7	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	2.9	0.6	2.3	8.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.2	5.3	9.1	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	14.7		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.1	0.9	0.0	0.0	0.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	5.8						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-180\_CI

Resource Category: Run-of-River Hydro

Region: Central Interior

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15	\$17	\$6
<i>Operation \$/Year (million)</i>	\$2	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	184	208	73
<i>Operation FTEs (Full-Time Equivalents)</i>	17	2	6
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.448	\$2.282	\$0.812
<i>Operation \$/Year (million)</i>	\$1.130	\$0.018	\$0.067

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-190\_CI

Resource Category: Run-of-River Hydro

Region: Central Interior

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	47.4
Average Annual Energy (GWh/year)	156.4
Effective Load Carrying Capability (MW)	0.3
Annual Firm Energy (GWh/year)	145

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$217,487
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,531.5
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,036
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$183
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	317.0	334.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	100.9	59.2	261.5	229.7		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.9	17.4	12.8	620.1	0.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	26.4	0.0	0.0	624.8		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	6.9	5.2	6.3	9.5	3.6	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	9.4						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-190\_CI

Resource Category: Run-of-River Hydro

Region: Central Interior

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$50	\$61	\$21
<i>Operation \$/Year (million)</i>	\$5	\$1	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	617	760	254
<i>Operation FTEs (Full-Time Equivalents)</i>	44	7	16
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.942	\$8.360	\$2.831
<i>Operation \$/Year (million)</i>	\$3.797	\$0.067	\$0.176

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	47.3
Average Annual Energy (GWh/year)	147.1
Effective Load Carrying Capability (MW)	1.5
Annual Firm Energy (GWh/year)	107.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$126,386
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,500.2
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,841
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$124
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	22.4	20.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	3.5	0.9	7.1	30.9			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.0	0.0	0.0	42.4		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	21.8	20.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.5	0.7	0.2	1.4	1.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.9						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$30	\$35	\$13
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	369	434	148
<i>Operation FTEs (Full-Time Equivalents)</i>	36	4	13
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.877	\$4.754	\$1.654
<i>Operation \$/Year (million)</i>	\$2.474	\$0.040	\$0.144

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-150\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	26.1
Average Annual Energy (GWh/year)	94.5
Effective Load Carrying Capability (MW)	2.6
Annual Firm Energy (GWh/year)	74.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$93,220
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,804.3
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,361
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	52.6	35.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	3.3	3.9	20.6	59.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.0	0.0	5.1	81.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	8.8	0.0	43.1	35.1		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.6	1.6	0.0	1.4	0.0	0.4
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-150\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$23	\$26	\$10
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	289	325	114
<i>Operation FTEs (Full-Time Equivalents)</i>	26	3	9
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.818	\$3.564	\$1.271
<i>Operation \$/Year (million)</i>	\$1.813	\$0.029	\$0.103

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-170\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	57.9
Average Annual Energy (GWh/year)	193.2
Effective Load Carrying Capability (MW)	3
Annual Firm Energy (GWh/year)	156.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$216,207
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,802.2
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,234
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$154
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	15.0	247.6	93.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	93.8	21.9	103.4	136.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	2.9	18.1	10.1	45.2	279.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	7.3	0.0	214.2	134.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	3.2	2.9	11.7	9.2	1.1	0.2
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	17.0						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-170\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$52	\$61	\$22
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	640	754	258
<i>Operation FTEs (Full-Time Equivalents)</i>	53	7	19
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.369	\$8.285	\$2.876
<i>Operation \$/Year (million)</i>	\$4.151	\$0.069	\$0.210

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	31.6
Average Annual Energy (GWh/year)	111.1
Effective Load Carrying Capability (MW)	2.3
Annual Firm Energy (GWh/year)	88.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$147,569
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,729.9
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,258
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$184
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	6.7	150.7	0.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	19.8	8.7	47.2	81.7		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	0.2	8.5	9.2	47.7	91.9	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	1.9	0.0	155.5	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.6	1.1	5.2	3.1	1.5	0.0
	Reservoir Aquatic Area:	Area					
	<i>ha</i>	0.0					
	Affected Stream Length:	Length					
<i>km</i>	21.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_EK

Resource Category: Run-of-River Hydro

Region: East Kootenay

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$37	\$42	\$15
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	458	523	182
<i>Operation FTEs (Full-Time Equivalents)</i>	39	5	14
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.044	\$5.750	\$2.029
<i>Operation \$/Year (million)</i>	\$2.943	\$0.048	\$0.157

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_100-110\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	74.7
Average Annual Energy (GWh/year)	217.5
Effective Load Carrying Capability (MW)	2.6
Annual Firm Energy (GWh/year)	189.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$154,951
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,738.4
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,117
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$101
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	108.8	102.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	73.5	8.7	55.8	73.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	44.7	33.3	65.7	31.0	36.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	1.5	0.0	209.7		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	2.4	4.1	1.9	0.6	2.4	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	4.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_100-110\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$35	\$43	\$15
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	434	535	178
<i>Operation FTEs (Full-Time Equivalents)</i>	36	5	13
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.626	\$5.877	\$1.989
<i>Operation \$/Year (million)</i>	\$2.738	\$0.047	\$0.143

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-130\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	53.9
Average Annual Energy (GWh/year)	173.4
Effective Load Carrying Capability (MW)	4
Annual Firm Energy (GWh/year)	104.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$150,800
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,834.9
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,201
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$122
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369						
		<i>ha/class</i>	0.0	37.7	86.5					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2					
	<i>ha/class</i>	64.7	5.2	19.0	35.3					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80				
	<i>ha/class</i>	0.0	2.8	9.7	54.4	57.3				
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38					
		<i>ha/class</i> *	0.0	0.0	0.0	124.2				
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6			
		<i>ha</i>	1.9	2.2	3.7	1.1	0.4	0.0		
	Reservoir Aquatic Area:	Area								
		<i>ha</i>	0.0							
	Affected Stream Length:	Length								
	<i>km</i>	14.9								

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-130\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$37	\$42	\$15
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	457	517	181
<i>Operation FTEs (Full-Time Equivalents)</i>	40	5	14

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.034	\$5.660	\$2.018
<i>Operation \$/Year (million)</i>	\$2.895	\$0.047	\$0.159

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-150\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	40.4
Average Annual Energy (GWh/year)	117.3
Effective Load Carrying Capability (MW)	2.4
Annual Firm Energy (GWh/year)	79.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$116,194
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,242.2
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,734
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$142
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	18.4	37.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	14.3	4.7	12.2	24.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.6	1.8	15.8	37.3		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	4.1	0.0	51.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.1	1.1	1.2	0.6	0.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.9						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-150\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$28	\$32	\$12
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	343	399	137
<i>Operation FTEs (Full-Time Equivalents)</i>	33	4	12
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.515	\$4.363	\$1.530
<i>Operation \$/Year (million)</i>	\$2.302	\$0.037	\$0.130

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-170\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	41.5
Average Annual Energy (GWh/year)	131.4
Effective Load Carrying Capability (MW)	2.6
Annual Firm Energy (GWh/year)	106.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$153,923
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,770.8
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,324
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$162
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	1.5	132.6	126.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	31.9	11.7	76.1	141.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	8.2	49.1	12.9	164.6	25.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	6.1	5.9	248.7		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	5.4	4.4	4.7	3.6	0.6	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	17.0						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-170\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$38	\$44	\$16
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	469	541	187
<i>Operation FTEs (Full-Time Equivalents)</i>	39	5	14

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.140	\$5.945	\$2.087
<i>Operation \$/Year (million)</i>	\$3.003	\$0.049	\$0.156

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	47.9
Average Annual Energy (GWh/year)	157.6
Effective Load Carrying Capability (MW)	5.3
Annual Firm Energy (GWh/year)	120.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$203,491
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,503.4
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,076
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$177
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	1.5	272.8	59.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	83.4	18.2	93.6	139.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	9.1	26.7	51.5	209.2	37.6		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	19.3	0.2	314.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	4.8	4.6	8.4	5.3	2.1	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	18.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$50	\$58	\$21
<i>Operation \$/Year (million)</i>	\$5	\$0	\$1
Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	620	717	248
<i>Operation FTEs (Full-Time Equivalents)</i>	48	7	17
Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.102	\$7.889	\$2.767
<i>Operation \$/Year (million)</i>	\$3.911	\$0.065	\$0.192

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-210\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	58.6
Average Annual Energy (GWh/year)	168.1
Effective Load Carrying Capability (MW)	0.4
Annual Firm Energy (GWh/year)	155.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$247,965
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,519.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,464
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$198
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	22.3	378.2	56.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	64.1	22.8	99.8	270.5			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.1	5.3	64.2	379.1	8.6		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	10.7	0.0	124.3	322.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	8.9	6.8	10.8	7.1	2.1	0.6
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	26.8						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-210\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$62	\$71	\$26
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	765	874	304
<i>Operation FTEs (Full-Time Equivalents)</i>	61	8	22

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.103	\$9.616	\$3.392
<i>Operation \$/Year (million)</i>	\$4.529	\$0.076	\$0.244

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_90-100\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	71.8
Average Annual Energy (GWh/year)	220.1
Effective Load Carrying Capability (MW)	1.9
Annual Firm Energy (GWh/year)	198.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$146,079
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,810.3
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,047
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$97
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	16.6	35.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	14.9	1.9	9.7	25.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.6	0.3	17.8	32.8		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	51.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.0	0.0	0.0	2.8	1.1	1.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	5.8						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_90-100\_KN

Resource Category: Run-of-River Hydro

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$33	\$40	\$14
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	412	499	168
<i>Operation FTEs (Full-Time Equivalents)</i>	39	4	14
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.401	\$5.471	\$1.871
<i>Operation \$/Year (million)</i>	\$2.731	\$0.045	\$0.157

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_100-110\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	101.5
Average Annual Energy (GWh/year)	328.7
Effective Load Carrying Capability (MW)	18.3
Annual Firm Energy (GWh/year)	222.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$242,572
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,511.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,356
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$104
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	17.9	135.8	134.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	46.1	26.0	108.5	107.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.0	4.2	198.7	84.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	196.5	0.5	91.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	6.2	3.8	3.2	5.2	11.3	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_100-110\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$56	\$67	\$24
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	694	836	282
<i>Operation FTEs (Full-Time Equivalents)</i>	61	7	22
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.075	\$9.167	\$3.144
<i>Operation \$/Year (million)</i>	\$4.424	\$0.074	\$0.245

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	167.9
Average Annual Energy (GWh/year)	648.8
Effective Load Carrying Capability (MW)	28.6
Annual Firm Energy (GWh/year)	534.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$596,992
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,835.3
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$8,520
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	318.3	308.8	742.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	541.5	91.5	437.7	299.3			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	137.0	10.9	337.1	731.0	151.4		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	1,040.6	1.1	325.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	33.0	19.7	27.3	35.8	37.2	15.6
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	32.4						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	4.8	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	2.3	1.3	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	12.0	4.3	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$140	\$168	\$59
<i>Operation \$/Year (million)</i>	\$13	\$1	\$4
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,726	2,082	703
<i>Operation FTEs (Full-Time Equivalents)</i>	126	19	45
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22.366	\$22.906	\$7.848
<i>Operation \$/Year (million)</i>	\$10.707	\$0.186	\$0.504

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-140\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	58.2
Average Annual Energy (GWh/year)	205.6
Effective Load Carrying Capability (MW)	9.7
Annual Firm Energy (GWh/year)	154.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$207,053
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,638.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,996
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$137
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	35.2	72.4	66.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	17.1	7.7	50.2	99.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.0	0.0	0.0	102.0	72.1	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.5	173.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	3.9	3.0	4.3	2.4	8.3	3.5
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	20.2						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-140\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$51	\$58	\$21
<i>Operation \$/Year (million)</i>	\$5	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	622	720	249
<i>Operation FTEs (Full-Time Equivalents)</i>	49	7	18
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.094	\$7.904	\$2.776
<i>Operation \$/Year (million)</i>	\$3.850	\$0.065	\$0.196

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-150\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	94.2
Average Annual Energy (GWh/year)	325.9
Effective Load Carrying Capability (MW)	19.4
Annual Firm Energy (GWh/year)	246.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$341,396
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,937.6
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$5,101
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$143
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	95.4	236.0	239.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	225.0	39.6	167.2	138.9			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	49.5	0.7	142.1	341.4	36.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	473.5	15.3	81.9		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	13.2	7.0	9.0	16.7	1.9	3.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	33.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-150\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	1.0	9.4	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	3.9	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$85	\$97	\$35
<i>Operation \$/Year (million)</i>	\$9	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,046	1,206	418
<i>Operation FTEs (Full-Time Equivalents)</i>	81	11	29
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13.682	\$13.271	\$4.659
<i>Operation \$/Year (million)</i>	\$6.514	\$0.109	\$0.325

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-160\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	128.6
Average Annual Energy (GWh/year)	460.5
Effective Load Carrying Capability (MW)	27.3
Annual Firm Energy (GWh/year)	348.3

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$526,038
Fixed Operating & Maintenance Cost (\$1000s/year)	\$9,025.0
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$7,628
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$156
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	128.8	408.9	487.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	310.3	70.2	403.3	241.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	72.2	23.9	133.3	574.8	219.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	531.3	188.8	303.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	30.9	17.2	13.7	14.6	70.9	6.3
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	40.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-160\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	1.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	1.2	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	2.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$130	\$148	\$54
<i>Operation \$/Year (million)</i>	\$13	\$1	\$4

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,599	1,834	638
<i>Operation FTEs (Full-Time Equivalents)</i>	119	17	43

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21.003	\$20.160	\$7.114
<i>Operation \$/Year (million)</i>	\$9.707	\$0.164	\$0.477

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-170\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	91.3
Average Annual Energy (GWh/year)	324.7
Effective Load Carrying Capability (MW)	16.4
Annual Firm Energy (GWh/year)	256.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$390,315
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,994.4
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$5,722
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$164
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	56.3	100.3	307.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	102.3	32.4	169.4	160.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	8.9	15.9	16.3	246.8	176.2	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	303.6	9.1	151.4		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	11.7	9.2	6.0	16.0	9.9	1.4
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	40.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-170\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.5	4.5	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	1.9	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$98	\$111	\$40
<i>Operation \$/Year (million)</i>	\$10	\$1	\$3
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,204	1,378	479
<i>Operation FTEs (Full-Time Equivalents)</i>	97	12	34
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15.808	\$15.161	\$5.344
<i>Operation \$/Year (million)</i>	\$7.398	\$0.123	\$0.384

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-180\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	81.2
Average Annual Energy (GWh/year)	294.6
Effective Load Carrying Capability (MW)	15.7
Annual Firm Energy (GWh/year)	246.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$372,980
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,500.5
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$5,714
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$173
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	78.9	272.9	204.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	135.3	30.0	163.5	227.5			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	12.1	1.8	94.1	257.3	190.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	178.6	7.8	369.1		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	14.0	5.9	8.6	10.9	17.5	0.8
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	39.1						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-180\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	1.0	3.5	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	4.5	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$93	\$107	\$39
<i>Operation \$/Year (million)</i>	\$10	\$1	\$3
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,147	1,322	458
<i>Operation FTEs (Full-Time Equivalents)</i>	91	12	33
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$15.036	\$14.551	\$5.107
<i>Operation \$/Year (million)</i>	\$7.295	\$0.120	\$0.363

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-190\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	103.4
Average Annual Energy (GWh/year)	401.4
Effective Load Carrying Capability (MW)	22.4
Annual Firm Energy (GWh/year)	309.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$581,859
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,536.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$8,269
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$185
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	537.7	391.4	1,086.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	1,006.8	133.8	620.1	255.2		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	197.7	35.7	547.2	1,030.7	201.2	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	1,644.7	115.0	252.5		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	56.9	30.4	37.0	51.0	88.2	21.8
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	25.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-190\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.5	13.5	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	4.6	2.6	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	17.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$138	\$165	\$58
<i>Operation \$/Year (million)</i>	\$10	\$1	\$3
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,696	2,043	692
<i>Operation FTEs (Full-Time Equivalents)</i>	98	19	35
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21.811	\$22.522	\$7.723
<i>Operation \$/Year (million)</i>	\$9.970	\$0.180	\$0.394

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-210\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	78.3
Average Annual Energy (GWh/year)	263.7
Effective Load Carrying Capability (MW)	14.3
Annual Firm Energy (GWh/year)	202.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$396,628
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,586.8
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$5,886
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$199
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	114.7	408.0	423.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	207.6	70.0	373.9	294.4		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	41.9	20.3	114.0	453.1	308.2	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	453.0	59.4	425.2		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	25.4	16.8	15.7	17.2	21.4	1.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	37.0						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-210\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	3.2	3.8	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	16.4	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$99	\$114	\$41
<i>Operation \$/Year (million)</i>	\$9	\$1	\$3
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,225	1,407	489
<i>Operation FTEs (Full-Time Equivalents)</i>	87	13	31
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$16.026	\$15.505	\$5.455
<i>Operation \$/Year (million)</i>	\$7.399	\$0.126	\$0.348

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_80-100\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	62.4
Average Annual Energy (GWh/year)	224
Effective Load Carrying Capability (MW)	10.1
Annual Firm Energy (GWh/year)	181.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$151,267
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,882.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,241
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$97
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	1.8	26.3	73.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	17.5	10.4	36.6	37.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.0	0.4	24.7	76.4		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	23.2	78.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.8	2.6	1.8	2.3	0.1	0.6
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	16.2						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_80-100\_LM

Resource Category: Run-of-River Hydro

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$38	\$43	\$16
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	468	528	185
<i>Operation FTEs (Full-Time Equivalents)</i>	42	5	15
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.186	\$5.793	\$2.064
<i>Operation \$/Year (million)</i>	\$2.962	\$0.048	\$0.165

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	28.6
Average Annual Energy (GWh/year)	103.6
Effective Load Carrying Capability (MW)	0.8
Annual Firm Energy (GWh/year)	90.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$90,621
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,667.0
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,306
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$123
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	3.5	24.5	44.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	9.6	3.4	25.5	34.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.0	0.0	0.0	0.0	72.9	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.1	0.0	72.9	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.1	0.2	2.4	0.0	0.0	11.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	5.2						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21	\$25	\$9
<i>Operation \$/Year (million)</i>	\$2	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	263	310	106
<i>Operation FTEs (Full-Time Equivalents)</i>	23	3	8
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.459	\$3.392	\$1.180
<i>Operation \$/Year (million)</i>	\$1.712	\$0.028	\$0.093

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-160\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	11.8
Average Annual Energy (GWh/year)	35.2
Effective Load Carrying Capability (MW)	0.8
Annual Firm Energy (GWh/year)	21.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$37,085
Fixed Operating & Maintenance Cost (\$1000s/year)	\$699.0
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$531
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$145
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	19.9	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	1.7	1.9	9.0	7.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	5.9	0.5	4.9	8.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	19.9	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.2	0.1	0.5	0.4	0.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	4.0						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-160\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9	\$10	\$4
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	114	130	45
<i>Operation FTEs (Full-Time Equivalents)</i>	10	1	3

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.507	\$1.423	\$0.505
<i>Operation \$/Year (million)</i>	\$0.701	\$0.011	\$0.039

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-180\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	37.5
Average Annual Energy (GWh/year)	134.1
Effective Load Carrying Capability (MW)	2.1
Annual Firm Energy (GWh/year)	118.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$177,448
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,963.4
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,532
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$174
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	245.5	51.5	0.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	173.1	15.0	65.4	43.7			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.2	15.6	33.4	24.5	223.6		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	82.3	0.2	214.8	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	5.4	4.0	2.7	11.3	1.3	2.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	13.1						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-180\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$48	\$48	\$19
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	587	603	224
<i>Operation FTEs (Full-Time Equivalents)</i>	36	5	13
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.931	\$6.598	\$2.503
<i>Operation \$/Year (million)</i>	\$3.174	\$0.053	\$0.146

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	52.8
Average Annual Energy (GWh/year)	162.4
Effective Load Carrying Capability (MW)	2.6
Annual Firm Energy (GWh/year)	121.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$225,083
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,178.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,385
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$193
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	46.3	84.4	20.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	50.1	12.8	49.7	39.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	5.6	14.5	6.9	26.8	97.8		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	22.4	0.2	129.1	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	2.4	2.0	4.2	3.7	0.6	2.5
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	23.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_MCA

Resource Category: Run-of-River Hydro

Region: Mica

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$58	\$64	\$24
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	711	789	279
<i>Operation FTEs (Full-Time Equivalents)</i>	60	7	21
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.418	\$8.662	\$3.114
<i>Operation \$/Year (million)</i>	\$4.432	\$0.072	\$0.239

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-120\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	44.7
Average Annual Energy (GWh/year)	158.4
Effective Load Carrying Capability (MW)	0.2
Annual Firm Energy (GWh/year)	129.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$138,958
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,437.6
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,795
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$115
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	9.9	95.6	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	102.7	0.4	1.6	0.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	2.3	103.3	0.0	0.0	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	105.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.8	0.7	0.7	0.6	6.5	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	4.0						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-120\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$41	\$36	\$15
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	502	450	182
<i>Operation FTEs (Full-Time Equivalents)</i>	28	4	10
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.979	\$4.886	\$2.035
<i>Operation \$/Year (million)</i>	\$2.294	\$0.037	\$0.111

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-120\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	37.8
Average Annual Energy (GWh/year)	135.2
Effective Load Carrying Capability (MW)	4.7
Annual Firm Energy (GWh/year)	107.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$114,941
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,113.0
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,473
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$115
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	36.4	96.5	40.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	117.0	14.2	26.1	16.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	56.4	103.0	2.8	0.0	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.1	0.0	36.4	127.2		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	2.9	0.5	5.3	1.0	1.2	0.7
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	8.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-120\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	4.4	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$30	\$31	\$12
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	365	392	142
<i>Operation FTEs (Full-Time Equivalents)</i>	27	3	9
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.915	\$4.287	\$1.580
<i>Operation \$/Year (million)</i>	\$1.937	\$0.033	\$0.106

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-140\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	24.4
Average Annual Energy (GWh/year)	90.3
Effective Load Carrying Capability (MW)	4.2
Annual Firm Energy (GWh/year)	73.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$84,226
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,577.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,072
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	4.0	72.9	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	25.0	4.2	14.9	32.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	9.1	24.1	27.4	15.9	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	1.0	0.0	24.2	51.4		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.3	1.4	2.6	0.0	0.3	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	6.7						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-140\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22	\$24	\$9
<i>Operation \$/Year (million)</i>	\$2	\$0	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	277	292	107
<i>Operation FTEs (Full-Time Equivalents)</i>	20	2	7

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.725	\$3.203	\$1.189
<i>Operation \$/Year (million)</i>	\$1.424	\$0.024	\$0.080

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-160\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	56
Average Annual Energy (GWh/year)	199.4
Effective Load Carrying Capability (MW)	1.6
Annual Firm Energy (GWh/year)	163

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$219,720
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,007.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,981
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$149
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	19.0	114.7	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	115.8	2.9	11.6	3.3			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	2.6	131.1	0.0	0.0	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	133.7		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	2.1	0.8	1.5	1.8	4.7	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	10.4						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-160\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$60	\$58	\$24
<i>Operation \$/Year (million)</i>	\$5	\$0	\$2

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	743	730	279
<i>Operation FTEs (Full-Time Equivalents)</i>	51	6	18

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.158	\$7.954	\$3.112
<i>Operation \$/Year (million)</i>	\$3.875	\$0.063	\$0.202

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-160\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	88.1
Average Annual Energy (GWh/year)	319
Effective Load Carrying Capability (MW)	10.7
Annual Firm Energy (GWh/year)	253.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$369,173
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,031.9
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$4,973
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$151
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	157.9	466.4	21.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	393.2	30.7	129.3	92.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	95.2	201.1	295.7	8.8	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	394.4	204.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	12.3	9.9	9.2	5.7	0.5	1.4
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	19.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-160\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	47.8	0.2	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	6.4	5.5	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	121.5	54.2	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$92	\$104	\$38
<i>Operation \$/Year (million)</i>	\$8	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,138	1,291	452
<i>Operation FTEs (Full-Time Equivalents)</i>	73	11	26
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14.945	\$14.197	\$5.045
<i>Operation \$/Year (million)</i>	\$6.238	\$0.110	\$0.290

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-180\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	25.2
Average Annual Energy (GWh/year)	90.1
Effective Load Carrying Capability (MW)	3.3
Annual Firm Energy (GWh/year)	71.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$113,292
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,179.3
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,574
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$174
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	6.2	70.0	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	29.6	5.7	20.3	20.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	5.0	28.5	27.1	15.6	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	31.6	44.6		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.5	2.1	1.5	0.1	0.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-180\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$30	\$32	\$12
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	364	396	142
<i>Operation FTEs (Full-Time Equivalents)</i>	30	3	11

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$4.882	\$4.345	\$1.582
<i>Operation \$/Year (million)</i>	\$2.099	\$0.034	\$0.120

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	43
Average Annual Energy (GWh/year)	154.5
Effective Load Carrying Capability (MW)	2.4
Annual Firm Energy (GWh/year)	126.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$209,324
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,874.0
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,751
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$181
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	24.0	186.3	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	194.1	4.0	9.8	2.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	16.8	192.6	0.9	0.0	0.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	210.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	3.1	1.9	1.8	10.5	2.9	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	10.9						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$55	\$56	\$22
<i>Operation \$/Year (million)</i>	\$5	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	681	703	260
<i>Operation FTEs (Full-Time Equivalents)</i>	49	6	18
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.232	\$7.682	\$2.903
<i>Operation \$/Year (million)</i>	\$3.616	\$0.060	\$0.195

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	46.1
Average Annual Energy (GWh/year)	165.8
Effective Load Carrying Capability (MW)	6.3
Annual Firm Energy (GWh/year)	132.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$234,744
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,163.3
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,137
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$186
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	87.1	300.4	23.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	233.2	25.3	111.9	40.5			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	92.1	147.2	166.1	0.0	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	235.5	170.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	7.9	2.4	7.6	9.1	6.2	0.7
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	20.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_NC

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	5.4	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	6.1	2.8	0.1	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	6.3	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$63	\$66	\$25
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	778	819	300
<i>Operation FTEs (Full-Time Equivalents)</i>	52	7	19

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.487	\$8.995	\$3.343
<i>Operation \$/Year (million)</i>	\$4.053	\$0.068	\$0.208

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-200\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	49.8
Average Annual Energy (GWh/year)	174.2
Effective Load Carrying Capability (MW)	3.1
Annual Firm Energy (GWh/year)	141.4

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$256,406
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,498.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,624
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$196
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	6.3	279.5	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	283.0	0.4	1.6	0.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	3.9	281.9	0.0	0.0	0.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	285.8		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	5.3	1.8	2.1	1.3	13.4	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	10.4						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-200\_BQL

Resource Category: Run-of-River Hydro

Region: North Coast

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$76	\$67	\$29
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	936	840	340
<i>Operation FTEs (Full-Time Equivalents)</i>	55	7	20
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13.035	\$9.144	\$3.798
<i>Operation \$/Year (million)</i>	\$4.605	\$0.073	\$0.219

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-140\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	42.6
Average Annual Energy (GWh/year)	131.1
Effective Load Carrying Capability (MW)	1.4
Annual Firm Energy (GWh/year)	106.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$127,461
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,371.2
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,825
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$136
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	9.9	28.4	45.9			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	16.6	5.7	32.4	29.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.0	0.0	0.0	0.0	84.2	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	7.8	0.0	0.0	76.3		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.6	1.4	1.5	0.1	1.0	0.6
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	12.9						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-140\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$33	\$36	\$13
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	400	446	157
<i>Operation FTEs (Full-Time Equivalents)</i>	33	4	12

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.303	\$4.895	\$1.756
<i>Operation \$/Year (million)</i>	\$2.402	\$0.040	\$0.132

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-150\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	43.9
Average Annual Energy (GWh/year)	149.3
Effective Load Carrying Capability (MW)	0.9
Annual Firm Energy (GWh/year)	118.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$157,371
Fixed Operating & Maintenance Cost (\$1000s/year)	\$2,934.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,297
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$147
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	18.4	6.2	126.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	11.4	7.7	43.9	88.2		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.0	0.0	0.0	0.0	151.3	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	98.8	0.0	0.0	52.5		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.3	0.5	5.2	0.0	6.9	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	13.8						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-150\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$38	\$44	\$16
<i>Operation \$/Year (million)</i>	\$4	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	465	547	187
<i>Operation FTEs (Full-Time Equivalents)</i>	41	5	15
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.095	\$6.001	\$2.085
<i>Operation \$/Year (million)</i>	\$3.016	\$0.049	\$0.165

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-160\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	26.4
Average Annual Energy (GWh/year)	75.4
Effective Load Carrying Capability (MW)	1.2
Annual Firm Energy (GWh/year)	48.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$87,744
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,509.4
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,269
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$155
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	0.0	9.6	84.4			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	49.4	9.1	25.3	10.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	8.0	6.5	6.8	11.8	60.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	94.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.9	1.1	4.3	0.8	0.0	0.6
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	7.3						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-160\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22	\$25	\$9
<i>Operation \$/Year (million)</i>	\$2	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	270	306	107
<i>Operation FTEs (Full-Time Equivalents)</i>	20	3	7
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.512	\$3.360	\$1.194
<i>Operation \$/Year (million)</i>	\$1.617	\$0.027	\$0.080

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-180\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	47.9
Average Annual Energy (GWh/year)	142
Effective Load Carrying Capability (MW)	1.7
Annual Firm Energy (GWh/year)	103.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$174,720
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,322.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,683
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$174
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	29.6	9.3	51.5			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	16.5	5.8	30.4	37.7		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.0	1.6	5.3	5.3	78.2	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	90.4		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.9	0.6	5.3	0.0	0.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	21.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-180\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$44	\$49	\$18
<i>Operation \$/Year (million)</i>	\$5	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	539	613	214
<i>Operation FTEs (Full-Time Equivalents)</i>	49	5	17
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.121	\$6.737	\$2.384
<i>Operation \$/Year (million)</i>	\$3.532	\$0.056	\$0.194

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	71.7
Average Annual Energy (GWh/year)	195.1
Effective Load Carrying Capability (MW)	2.5
Annual Firm Energy (GWh/year)	134.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$269,655
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,959.2
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,893
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$190
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	16.2	32.9	133.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	56.0	15.7	55.2	55.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	1.0	2.2	3.6	10.4	165.2		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	4.1	0.0	49.1	129.1		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	2.8	3.7	3.9	1.8	0.0	2.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	24.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_REV

Resource Category: Run-of-River Hydro

Region: Revelstoke Ashton Creek

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$66	\$75	\$27
<i>Operation \$/Year (million)</i>	\$7	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	811	932	323
<i>Operation FTEs (Full-Time Equivalents)</i>	69	8	25
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$10.624	\$10.208	\$3.603
<i>Operation \$/Year (million)</i>	\$5.092	\$0.084	\$0.275

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	28.1
Average Annual Energy (GWh/year)	87.8
Effective Load Carrying Capability (MW)	0.4
Annual Firm Energy (GWh/year)	73.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$78,935
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,425.0
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,132
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	6.3	53.4	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	26.6	5.9	16.8	10.4			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	9.2	8.8	0.1	0.1	41.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.7	0.0	0.0	59.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.6	0.1	1.7	0.1	0.6	0.3
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	5.2						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$18	\$22	\$8
<i>Operation \$/Year (million)</i>	\$2	\$0	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	224	270	91
<i>Operation FTEs (Full-Time Equivalents)</i>	20	2	7

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.897	\$2.955	\$1.015
<i>Operation \$/Year (million)</i>	\$1.470	\$0.025	\$0.078

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-150\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	59.7
Average Annual Energy (GWh/year)	189.3
Effective Load Carrying Capability (MW)	1.7
Annual Firm Energy (GWh/year)	148.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$190,481
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,497.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$2,699
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$139
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	12.7	110.4	2.3			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	48.3	12.1	39.2	25.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	18.5	17.6	0.1	0.1	89.1		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	1.4	0.0	0.0	124.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.1	0.5	3.5	0.2	1.1	1.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	14.9						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-150\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$46	\$53	\$19
<i>Operation \$/Year (million)</i>	\$5	\$0	\$1
Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	571	658	228
<i>Operation FTEs (Full-Time Equivalents)</i>	48	6	17
Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.491	\$7.214	\$2.542
<i>Operation \$/Year (million)</i>	\$3.536	\$0.059	\$0.192

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-170\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	71
Average Annual Energy (GWh/year)	217.6
Effective Load Carrying Capability (MW)	2.4
Annual Firm Energy (GWh/year)	155.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$238,708
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,681.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,610
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$159
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	15.1	61.8	0.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	12.5	4.0	28.4	32.2		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	0.0	0.0	0.0	0.0	77.1	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	77.1		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.9	1.2	1.3	2.3	0.0	1.8
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	22.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_150-170\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$60	\$66	\$24
<i>Operation \$/Year (million)</i>	\$7	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	739	820	290
<i>Operation FTEs (Full-Time Equivalents)</i>	70	7	25
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.858	\$8.978	\$3.233
<i>Operation \$/Year (million)</i>	\$4.827	\$0.077	\$0.277

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	23.9
Average Annual Energy (GWh/year)	68.4
Effective Load Carrying Capability (MW)	0.4
Annual Firm Energy (GWh/year)	53.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$89,908
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,754.6
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,326
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$184
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	6.8	31.3	0.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	9.3	1.4	14.8	12.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	0.1	0.0	0.4	37.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	38.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.4	0.3	1.2	1.2	0.0	0.3
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	10.1						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-190\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$23	\$26	\$9
<i>Operation \$/Year (million)</i>	\$3	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	280	316	111
<i>Operation FTEs (Full-Time Equivalents)</i>	26	3	9
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.709	\$3.475	\$1.233
<i>Operation \$/Year (million)</i>	\$1.770	\$0.028	\$0.102

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-210\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	47.9
Average Annual Energy (GWh/year)	143.2
Effective Load Carrying Capability (MW)	1.1
Annual Firm Energy (GWh/year)	107.6

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$205,709
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,866.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,018
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$200
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	18.4	64.8	60.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	50.7	7.5	30.9	54.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	9.2	9.2	0.1	0.7	124.1		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	0.0	143.2		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	1.1	3.8	1.4	0.3	0.8	1.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	23.8						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_190-210\_SE

Resource Category: Run-of-River Hydro

Region: Selkirk

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	0.0	0.0	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	0.0	0.0	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	0.0	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$51	\$58	\$21
<i>Operation \$/Year (million)</i>	\$6	\$0	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	628	714	249
<i>Operation FTEs (Full-Time Equivalents)</i>	55	6	20
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.316	\$7.838	\$2.778
<i>Operation \$/Year (million)</i>	\$3.979	\$0.065	\$0.219

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_100-110\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	118.8
Average Annual Energy (GWh/year)	450.3
Effective Load Carrying Capability (MW)	28.9
Annual Firm Energy (GWh/year)	394.8

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$353,172
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,584.5
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$5,019
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$108
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	160.3	186.6	437.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	295.9	34.2	139.8	315.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	46.1	19.3	89.7	225.5	371.7		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.1	0.0	693.1	59.1		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	11.6	6.5	7.3	6.3	0.7	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_100-110\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	34.6	4.2	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	22.1	8.3	0.2	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	69.4	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$81	\$99	\$35
<i>Operation \$/Year (million)</i>	\$7	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	993	1,232	410
<i>Operation FTEs (Full-Time Equivalents)</i>	69	11	25
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12.729	\$13.561	\$4.572
<i>Operation \$/Year (million)</i>	\$6.212	\$0.109	\$0.276

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-120\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	94.1
Average Annual Energy (GWh/year)	385.5
Effective Load Carrying Capability (MW)	12.7
Annual Firm Energy (GWh/year)	309.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$317,540
Fixed Operating & Maintenance Cost (\$1000s/year)	\$5,115.9
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$4,107
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$113
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	184.5	51.8	402.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	145.8	32.5	133.5	327.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	18.9	11.1	114.7	123.3	347.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	614.9	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	9.1	5.5	2.3	8.5	0.7	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	5.8						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_110-120\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	16.7	4.3	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	11.4	3.3	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	37.2	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$73	\$89	\$31
<i>Operation \$/Year (million)</i>	\$6	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	896	1,105	369
<i>Operation FTEs (Full-Time Equivalents)</i>	60	10	21
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.525	\$12.157	\$4.114
<i>Operation \$/Year (million)</i>	\$5.145	\$0.094	\$0.240

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	26.2
Average Annual Energy (GWh/year)	116.2
Effective Load Carrying Capability (MW)	6.2
Annual Firm Energy (GWh/year)	85.2

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$110,225
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,690.1
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$1,600
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$125
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	122.3	61.5	79.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	77.8	22.6	66.9	96.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	3.2	6.1	38.4	93.9	98.1	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.3	0.0	239.8	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	3.0	0.3	3.2	0.0	0.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	5.2						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_120-130\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	23.4	1.3	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	11.0	4.4	0.4	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	104.4	8.9	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$25	\$31	\$11
<i>Operation \$/Year (million)</i>	\$2	\$0	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	308	386	128
<i>Operation FTEs (Full-Time Equivalents)</i>	21	4	7
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$3.925	\$4.250	\$1.425
<i>Operation \$/Year (million)</i>	\$1.959	\$0.035	\$0.083

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-140\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	119.6
Average Annual Energy (GWh/year)	491.7
Effective Load Carrying Capability (MW)	17.9
Annual Firm Energy (GWh/year)	391.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$491,880
Fixed Operating & Maintenance Cost (\$1000s/year)	\$6,955.5
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$7,055
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$134
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	456.6	141.0	983.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	454.1	83.6	361.2	681.8			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	100.9	60.0	246.9	440.9	694.8		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.1	0.0	1,311.6	232.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	23.9	14.3	16.1	21.7	12.0	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_130-140\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	25.5	8.3	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	20.3	5.8	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	24.6	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$112	\$140	\$48
<i>Operation \$/Year (million)</i>	\$8	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,374	1,733	572
<i>Operation FTEs (Full-Time Equivalents)</i>	78	17	28
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$17.400	\$19.133	\$6.387
<i>Operation \$/Year (million)</i>	\$8.408	\$0.154	\$0.316

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-150\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	135.3
Average Annual Energy (GWh/year)	557.8
Effective Load Carrying Capability (MW)	21.1
Annual Firm Energy (GWh/year)	399.7

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$593,428
Fixed Operating & Maintenance Cost (\$1000s/year)	\$8,115.7
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$8,559
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$142
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369						
		<i>ha/class</i>	388.2	916.1	509.9					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2					
	<i>ha/class</i>	729.9	76.6	378.1	629.5					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80				
	<i>ha/class</i>	157.9	65.2	608.2	491.5	406.7				
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38					
		<i>ha/class</i> *	0.3	0.0	1,625.7	104.8				
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6			
		<i>ha</i>	40.1	22.9	23.4	20.1	19.7	0.0		
	Reservoir Aquatic Area:	Area								
		<i>ha</i>	0.0							
	Affected Stream Length:	Length								
	<i>km</i>	11.9								

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_140-150\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	1.8	71.3	13.8	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	37.6	12.2	0.2	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	189.9	117.9	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>	0.000	0.000	0.000		

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$135	\$169	\$58
<i>Operation \$/Year (million)</i>	\$9	\$1	\$3
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,663	2,095	693
<i>Operation FTEs (Full-Time Equivalents)</i>	89	20	32
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21.024	\$23.139	\$7.730
<i>Operation \$/Year (million)</i>	\$10.091	\$0.186	\$0.358

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-170\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	87.9
Average Annual Energy (GWh/year)	373.9
Effective Load Carrying Capability (MW)	15.4
Annual Firm Energy (GWh/year)	326.5

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$490,258
Fixed Operating & Maintenance Cost (\$1000s/year)	\$7,033.5
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$7,013
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$168
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	385.4	150.4	934.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	429.8	69.0	317.1	654.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	78.2	45.7	188.0	411.8	695.1		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.1	0.0	1,311.3	107.4		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	22.3	9.5	11.5	20.1	4.6	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	11.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_160-170\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	47.3	8.3	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	32.3	11.2	0.2	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	83.3	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$112	\$139	\$48
<i>Operation \$/Year (million)</i>	\$8	\$1	\$2
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,385	1,722	573
<i>Operation FTEs (Full-Time Equivalents)</i>	80	16	29
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$17.633	\$18.994	\$6.396
<i>Operation \$/Year (million)</i>	\$8.399	\$0.153	\$0.323

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-180\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	56
Average Annual Energy (GWh/year)	231.8
Effective Load Carrying Capability (MW)	13.5
Annual Firm Energy (GWh/year)	180.1

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$331,409
Fixed Operating & Maintenance Cost (\$1000s/year)	\$4,240.5
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$4,797
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$178
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	255.0	784.7	75.1			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>	519.1	42.6	238.7	314.4		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>	125.7	59.1	508.7	292.4	74.7	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.3	0.0	1,061.6	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	29.3	19.3	19.4	9.6	19.6	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	9.5						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_170-180\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	1.8	37.1	9.7	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	15.5	3.9	0.0	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	127.0	117.9	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>	0.000	0.000	0.000		

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$76	\$95	\$33
<i>Operation \$/Year (million)</i>	\$5	\$1	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	933	1,181	390
<i>Operation FTEs (Full-Time Equivalents)</i>	43	12	16
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.711	\$13.060	\$4.349
<i>Operation \$/Year (million)</i>	\$5.543	\$0.104	\$0.176

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

### Project Description

Bundle of run of river hydroelectric potential project in BC, as identified and updated in the Kerr Wood Leidal (KWL) entitled "Run-of-River Hydroelectric Resource Assessment for British Columbia, 2010 Update".

### Technical Information

Installed Capacity (MW)	41.8
Average Annual Energy (GWh/year)	167.9
Effective Load Carrying Capability (MW)	8.7
Annual Firm Energy (GWh/year)	147.9

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$248,544
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,828.9
Variable Operating & Maintenance Cost (\$/MWh)	
Fixed Taxes (\$1000s)	\$3,629
Variable Taxes (\$1000s)	
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$194
Project Life (Years)	40
Project Lead Time (Years)	

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	121.4	71.6	437.7			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	140.3	31.4	135.4	323.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	0.0	11.5	34.3	182.5	369.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.1	0.0	598.1	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	9.1	2.5	5.3	5.5	0.7	0.0
	Reservoir Aquatic Area:	Area						
		<i>ha</i>	0.0					
	Affected Stream Length:	Length						
	<i>km</i>	10.9						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: ROR\_180-200\_VI

Resource Category: Run-of-River Hydro

Region: Vancouver Island

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>	0.0	34.5	4.2	0.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A	22.1	8.3	0.2	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A	69.3	0.0	0.0		
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	0.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.000	0.000	0.000	0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	0.000	0.000	0.000			

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$57	\$70	\$25
<i>Operation \$/Year (million)</i>	\$5	\$1	\$1
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	708	873	292
<i>Operation FTEs (Full-Time Equivalents)</i>	47	8	17
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.061	\$9.625	\$3.252
<i>Operation \$/Year (million)</i>	\$4.449	\$0.078	\$0.190

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Survey
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Haynon - Chochiwa

Resource Category: Pumped Storage

Region: Kelly Nicola

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,254,889
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,517.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$626
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$121
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		142.3	82.9		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	116.6	6.6	41.8	60.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	21.4	36.2	40.6	32.6	94.5

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	0.0	0.2	225.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.9	1.9	5.4		5.2
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Haynon - Chochiwa

Resource Category: Pumped Storage

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$175	\$495	\$120
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,159	6,094	1,423
<i>Operation FTEs (Full-Time Equivalents)</i>	18	24	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26.787	\$67.895	\$15.872
<i>Operation \$/Year (million)</i>	\$2.496	\$0.306	\$0.096

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Blinch - Stave

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,268,241
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,635.8
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$711
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$122
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>	0.1	91.4	222.3			
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	28.3	21.6	99.7	164.2		
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>				313.8		

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
	<i>ha/class</i> *	0.0	136.1	177.7	0.0			
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6		
	<i>ha</i>	6.2	5.2	4.0	0.1		1.3	
Reservoir Aquatic Area:	Area							
	<i>ha</i>							
Affected Stream Length:	Length							
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m		
	<i>ha/class</i>						
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5			
	<i>ha/class</i>	N/A					
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf			
	<i>ha/class</i>	N/A					

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Blinch - Stave

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$177	\$500	\$121
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,184	6,152	1,437
<i>Operation FTEs (Full-Time Equivalents)</i>	18	24	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27.072	\$68.548	\$16.035
<i>Operation \$/Year (million)</i>	\$2.595	\$0.309	\$0.097

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Burwell - Seymour

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,258,599
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,550.1
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$503
Variable Taxes (\$1000s)	\$7
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$121
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		148.9	62.7		
Remoteness - Linear Disturbance Density <sup>2</sup> :		Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	17.0	12.0	51.6	131.0	
High Priority Species Count (percentile):		0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>				204.3	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	175.8	28.1	0.0	
Riparian Area Stream Order:		Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.6	0.7		7.7	
Reservoir Aquatic Area:		Area					
		<i>ha</i>					
Affected Stream Length:		Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	4.5	6.7	
Valued Ecological Features: no. of valued ecological features		None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	7.7	
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)		0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	6.9	



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Burwell - Seymour

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$174	\$498	\$120
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,149	6,124	1,425
<i>Operation FTEs (Full-Time Equivalents)</i>	18	24	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26.633	\$68.241	\$15.899
<i>Operation \$/Year (million)</i>	\$2.382	\$0.306	\$0.094

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Kenyon - Stave

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,227,348
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,229.3
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$635
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$118
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	0.1	91.3	201.4		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	23.0	20.1	87.1	162.6	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>		12.1	2.0		278.7

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	136.1	156.7	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	5.0	5.0	4.0		1.3
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Kenyon - Stave

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$171	\$484	\$117
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,107	5,960	1,390
<i>Operation FTEs (Full-Time Equivalents)</i>	18	23	8

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26.110	\$66.405	\$15.511
<i>Operation \$/Year (million)</i>	\$2.461	\$0.299	\$0.093

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Palisade - Seymour

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,289,872
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,863.7
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$490
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$124
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		148.9	59.2		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	17.0	12.0	47.3	131.8	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>				200.8	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.0	172.4	28.1	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	2.6	0.7	7.7		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	4.5	6.7	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	7.7	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	6.9	

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Palisade - Seymour

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$179	\$510	\$123
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,201	6,279	1,460
<i>Operation FTEs (Full-Time Equivalents)</i>	18	24	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27.273	\$69.962	\$16.293
<i>Operation \$/Year (million)</i>	\$2.417	\$0.314	\$0.096

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Deserted - Un-named

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,223,133
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,165.9
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$1,028
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$118
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	27.1		400.5		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	144.7	34.1	114.4	134.4	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	10.4	29.9	12.0	328.9	46.5

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	319.6	108.1	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	9.6	5.4	8.9	12.1	6.7
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Deserted - Un-named

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$173	\$480	\$117
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,133	5,904	1,388
<i>Operation FTEs (Full-Time Equivalents)</i>	19	24	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26.430	\$65.784	\$15.480
<i>Operation \$/Year (million)</i>	\$2.829	\$0.300	\$0.097

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Misery - Lower Misery

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,247,515
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,408.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$935
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$120
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	36.3	59.6	191.3		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>	84.4	28.3	79.5	95.1	
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>	67.9	4.2	93.2	116.5	

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	281.9	0.0	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	3.3	3.8	0.6		
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	1.8	4.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A	4.8	
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A	11.7	



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Misery - Lower Misery

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$176	\$490	\$119
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,163	6,033	1,414
<i>Operation FTEs (Full-Time Equivalents)</i>	19	24	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$26.782	\$67.219	\$15.776
<i>Operation \$/Year (million)</i>	\$2.777	\$0.306	\$0.098

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Vancouver - Lower Vancouver

Resource Category: Pumped Storage

Region: Lower Mainland

### Project Description

Project identified in the Knight Piesold study of PS potential in the LM/VI region.

### Technical Information

Installed Capacity (MW)	1000
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	1000
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,241,887
Fixed Operating & Maintenance Cost (\$1000s/year)	\$12,384.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$982
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$120
Project Life (Years)	70
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		98.9	187.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	133.4	21.5	60.9	70.1			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	145.1	3.9	36.5	96.3			

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	282.2	0.0	0.0	0.0	
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	2.8	2.8				
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>	1.8	2.0	
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A	3.8		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A	11.7		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Upper Vancouver - Lower Vancouver

Resource Category: Pumped Storage

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$177	\$487	\$119
<i>Operation \$/Year (million)</i>	\$9	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,176	5,996	1,411
<i>Operation FTEs (Full-Time Equivalents)</i>	19	24	9

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$27.049	\$66.797	\$15.748
<i>Operation \$/Year (million)</i>	\$2.820	\$0.304	\$0.099

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Pumped Storage at Mica Generating Station

Resource Category: Pumped Storage

Region: Mica

### Project Description

Project to install a pump-turbine at Mica generating station. The pump-turbine would be on the left bank of the dam and would make use of existing diversion tunnels.

### Technical Information

Installed Capacity (MW)	500
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	465
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$662,735
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,641.4
Variable Operating & Maintenance Cost (\$/MWh)	\$0.9
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$100
Project Life (Years)	50
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	0.1				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>			0.1	0.0		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					0.1	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class</i> *	0.1				
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Pumped Storage at Mica Generating Station

Resource Category: Pumped Storage

Region: Mica

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$89	\$271	\$68
<i>Operation \$/Year (million)</i>	\$3	\$1	\$0
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,100	3,529	801
<i>Operation FTEs (Full-Time Equivalents)</i>	5	7	2
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$12.874	\$37.396	\$8.939
<i>Operation \$/Year (million)</i>	\$0.551	\$0.088	\$0.026

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Medium
<b>Cost Uncertainty</b>	High

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: Site C Clean Energy Project

Resource Category: Large Hydro

Region: Peace River

### Project Description

The Peace River Site C Clean Energy Project is a potential third dam and hydroelectric generating station on the Peace River in northeast BC.

Information based on Site C Environmental Impact Statement (EIS) submission filed in January 2013.

### Technical Information

Monthly average is dependent on GMS operating decisions.

Installed Capacity (MW)	1100
Average Annual Energy (GWh/year)	5100
Dependable Capacity (MW)	1100
Annual Firm Energy (GWh/year)	4700

### FINANCIAL INFORMATION (in Fiscal \$ 2013 )

Capital costs will change upon completion of the updated capital cost estimate based on the optimized project design. The capital costs shown here are based on Scenario G from the Stage 1 report (based on the historical design).

Direct Capital Cost (\$1000s) *	\$5,775,000
Fixed Operating And Maintenance Cost (\$1000s/year)	\$7,800
Sustaining Capital (\$1000s/year)	\$10,600
Variable Operating And Maintenance Cost (\$1000s/year)	\$0
Fixed Taxes and Grants-in-Lieu (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost (\$/MWh) **	\$83
Project Life (Years)	70
Project Lead Time (Years)	10

\* Direct Capital Cost excludes inflation, interest during construction (IDC), and Corporate Overhead (CO). The total Site C capital cost including these costs is \$7.9 billion.

\*\* The provided UEC is updated from \$95/MWh used previously based on a change in discount rate from 6% to 5%.

### Environmental Information

<b>Land</b>	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369	
	<i>ha/class</i>		2,284.4	3,376.6	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2
	<i>ha/class</i>	3,072.3	478.1	1,359.2	751.5
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80
<i>ha/class</i>					5,661.1

\* Project footprint includes dam site, reservoir footprint, and transmission corridor widening.

<b>Freshwater</b>	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>			5,661.1			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.3	0.4	0.3			1.3
	Reservoir Aquatic Area:	Area					
	<i>ha</i>	9,310.0					
	Affected Stream Length:	Length					
<i>km</i>	122.6						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Site C Clean Energy Project

Resource Category: Large Hydro

Region: Peace River

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$792	\$2,336	\$548
<i>Operation \$/Year (million)</i>	\$10	\$3	\$2

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	9,754	27,997	6,497
<i>Operation FTEs (Full-Time Equivalents)</i>	25	29	20

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$125.396	\$320.000	\$72.492
<i>Operation \$/Year (million)</i>	\$4.115	\$0.340	\$0.233

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Feasibility
Resource Type Uncertainty	Medium
Cost Uncertainty	Low-Medium

The Environmental and Economic Development attributes are planning-level numbers. Site C is currently undergoing an Environmental Assessment that assesses the project Environmental and Economic effects in greater detail.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: GMS Units 1-5 Capacity Increase

Resource Category: Resource Smart

Region: Peace River

### Project Description

This project entails upgrades to GMS units 1 to 5 turbines with more efficient turbines to provide up to 220 MW of dependable capacity when all 5 units are rewound.

### Technical Information

Installed Capacity (MW)	220
Average Annual Energy (GWh/year)	
Dependable Capacity (MW)	220
Annual Firm Energy (GWh/year)	

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$81,750
Fixed Operating & Maintenance Cost (\$1000s/year)	\$50.0
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$35
Project Life (Years)	40
Project Lead Time (Years)	8

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>						
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>						
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *						
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: GMS Units 1-5 Capacity Increase

Resource Category: Resource Smart

Region: Peace River

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
<i>ha/class</i>	N/A				

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>			
<i>Operation \$/Year (million)</i>			

<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>			
<i>Operation FTEs (Full-Time Equivalents)</i>			

<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>			
<i>Operation \$/Year (million)</i>			

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

<b>Level of Study</b>	Concept
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Revelstoke Unit 6

Resource Category: Resource Smart

Region: Revelstoke Ashton Creek

### Project Description

The existing Revelstoke Generating Station consists of four 495 MW generating units. The addition of Revelstoke Unit 5 was approved by the BCUC in July 2007 and put in-service in December 2010. There is one remaining empty bay where a sixth unit could be installed in the future. This project describes the installation of the sixth generating unit at the existing powerhouse. The dependable capacity is less than the installed capacity because of head losses in the winter period when the reservoir is drawdown plus the effect of higher tail water when all six units are operated. The energy associated with this unit is mainly an energy efficiency gain at Revelstoke G.S. since this new unit would be selected to operate ahead of the original four units. Revelstoke Unit 6 would also provide some additional system energy shaping benefits beyond those achieved with Revelstoke Unit 5. Estimates of energy efficiency gains and energy shaping benefits vary with system modelling assumptions particularly load/resource balance and HLH/LLH energy price differentials. Fixed O&M includes allowance for sustaining capital and grants-in-lieu of taxes.

The project requires bulk transmission upgrades, including a series capacitor on the 5L76/79 lines and a RAS (Remedial Action Scheme) or new 500 kV transmission between Revelstoke and Mica. The cost of the bulk transmission upgrade is not included in the direct capital cost of the project.

### Technical Information

The DGC was re-assessed to be 488 MW with revised Water Licence.

Installed Capacity (MW)	500
Average Annual Energy (GWh/year)	26
Dependable Capacity (MW)	488
Annual Firm Energy (GWh/year)	26

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$334,234
Fixed Operating & Maintenance Cost (\$1000s/year)	\$1,475.6
Variable Operating & Maintenance Cost (\$/MWh)	\$0.0
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$50
Project Life (Years)	50
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
		<i>ha/class</i>					
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Revelstoke Unit 6

Resource Category: Resource Smart

Region: Revelstoke Ashton Creek

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>			
<i>Operation \$/Year (million)</i>			
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>			
<i>Operation FTEs (Full-Time Equivalents)</i>			
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>			
<i>Operation \$/Year (million)</i>			

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 100 MW Simple Cycle Gas Turbine - KL

Resource Category: Natural Gas

Region: Kelly Nicola

### Project Description

A GE LMS100PA unit has been used to characterize a peaking gas-fired unit in the Kelly Lake region. The unit would be equipped with water injection for NOx control.

### Technical Information

Assumes that the unit will be used for peaking purposes mainly during the high load months of December and January.

Installed Capacity (MW)	103
Average Annual Energy (GWh/year)	154
Dependable Capacity (MW)	98
Firm Energy (GWh/year)	154
Average Heat Rate (GJ/GWh)	9208

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$86,805
Fixed Operating & Maintenance Cost (\$1000s/year)	\$812.9
Variable Operating & Maintenance Cost (\$/MWh)	\$4.7
Fixed Taxes (\$1000s)	\$71
Variable Taxes (\$1000s)	\$0
Unit Capacity Cost at Point of Interconnection (\$/kW-yr)	\$84
Project Life (Years)	30
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	3.5	14.3	14.1			
	Remoteness - Linear Disturbance Density <sup>c</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	1.4	0.4	2.5	27.6			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					31.9		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
	<i>ha/class</i> *	0.0	0.0	31.9	0.0			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	0.2					1.8	
	Reservoir Aquatic Area:	Area						
	<i>ha</i>							
	Affected Stream Length:	Length						
<i>km</i>								

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 100 MW Simple Cycle Gas Turbine - KL

Resource Category: Natural Gas

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	477.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.000	0.370	1.400		
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.030			

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8	\$17	\$4
<i>Operation \$/Year (million)</i>	\$1	\$6	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	95	221	53
<i>Operation FTEs (Full-Time Equivalents)</i>	6	20	6

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$1.382	\$2.493	\$0.588
<i>Operation \$/Year (million)</i>	\$0.424	\$0.834	\$0.062

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 250 MW Combined Cycle Gas Turbine

Resource Category: Natural Gas

Region: Kelly Nicola

### Project Description

A GE S107FA unit is used to characterize this option.

### Technical Information

Assumes that the unit will be run almost continuously throughout the year except in May and June (freshet period). The average annual capacity factor was assumed to be 70%.

Installed Capacity (MW)	263
Average Annual Energy (GWh/year)	1450
Dependable Capacity (MW)	236
Firm Energy (GWh/year)	1860.6
Average Heat Rate (GJ/GWh)	7350

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$359,730
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,607.1
Variable Operating & Maintenance Cost (\$/MWh)	\$5.1
Fixed Taxes (\$1000s)	\$70
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$62
Project Life (Years)	30
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	10.8	28.6	20.6			
	Remoteness - Linear Disturbance Density <sup>c</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	7.4	2.8	11.7	38.0			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>					60.0		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class</i> *	0.0	0.0	60.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	0.2				1.8	
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
	Affected Stream Length:	Length						
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 250 MW Combined Cycle Gas Turbine

Resource Category: Natural Gas

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	365.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.004	0.050	0.060		
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.030			

### Economic Development Information

<b>Provincial GDP</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$31	\$70	\$18
<i>Operation \$/Year (million)</i>	\$3	\$45	\$3
<b>Employment</b>	Direct	Indirect	Induced
<i>Construction Person-Years</i>	377	898	212
<i>Operation FTEs (Full-Time Equivalents)</i>	28	156	37
<b>Provincial Government Revenues*</b>	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$5.590	\$10.141	\$2.362
<i>Operation \$/Year (million)</i>	\$2.423	\$6.178	\$0.412

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 50 MW Combined Cycle Gas Turbine

Resource Category: Natural Gas

Region: Kelly Nicola

### Project Description

A GE LM6000PD dry low NOx technology unit is used to characterize this option.

### Technical Information

Assumes that the unit will be run almost continuously throughout the year except in May and June (freshet period). The average annual capacity factor was assumed to be 70%.

Installed Capacity (MW)	56
Average Annual Energy (GWh/year)	300
Dependable Capacity (MW)	49
Firm Energy (GWh/year)	386.3
Average Heat Rate (GJ/GWh)	7580

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$159,117
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,590.1
Variable Operating & Maintenance Cost (\$/MWh)	\$7.1
Fixed Taxes (\$1000s)	\$42
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$92
Project Life (Years)	30
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	6.6	17.7	14.0		
	Remoteness - Linear Disturbance Density <sup>c</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	3.8	1.4	6.0	27.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					38.2	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	38.2	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.2					1.5
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 50 MW Combined Cycle Gas Turbine

Resource Category: Natural Gas

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	390.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.003	0.040	0.180		
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.020			

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$14	\$31	\$8
<i>Operation \$/Year (million)</i>	\$3	\$10	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	173	398	95
<i>Operation FTEs (Full-Time Equivalents)</i>	28	41	15

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2.572	\$4.493	\$1.064
<i>Operation \$/Year (million)</i>	\$0.881	\$1.398	\$0.168

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 500 MW Combined Cycle Gas Turbine

Resource Category: Natural Gas

Region: Kelly Nicola

### Project Description

A GE S207FA Combined Cycle package is used to characterize this option.

### Technical Information

Assumes that the unit will be run almost continuously throughout the year except in May and June (freshet period). The average annual capacity factor was assumed to be 70%.

Installed Capacity (MW)	530
Average Annual Energy (GWh/year)	2940
Dependable Capacity (MW)	479
Firm Energy (GWh/year)	3776.4
Average Heat Rate (GJ/GWh)	7362

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$602,664
Fixed Operating & Maintenance Cost (\$1000s/year)	\$3,815.2
Variable Operating & Maintenance Cost (\$/MWh)	\$4.8
Fixed Taxes (\$1000s)	\$70
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$58
Project Life (Years)	30
Project Lead Time (Years)	5

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>	9.0	227.8	17.5			
	Remoteness - Linear Disturbance Density <sup>c</sup>	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	10.5	14.8	81.5	147.5		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					254.3	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	254.3	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>		0.1				4.0
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 500 MW Combined Cycle Gas Turbine

Resource Category: Natural Gas

Region: Kelly Nicola

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	365.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.004	0.050	0.060		
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.030			

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$50	\$117	\$30
<i>Operation \$/Year (million)</i>	\$3	\$90	\$6

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	619	1,500	351
<i>Operation FTEs (Full-Time Equivalents)</i>	30	306	66

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$9.201	\$16.953	\$3.917
<i>Operation \$/Year (million)</i>	\$4.427	\$12.435	\$0.735

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes.

Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE **2013 Resource Options Report Update Appendix 3**

## Project: Small Co-generation projects

Resource Category: Cogen

Region: Lower Mainland

### Project Description

Small Combined Heat and Power projects at greenhouses, hospitals, etc.

### Technical Information

Installed Capacity (MW)	10
Average Annual Energy (GWh/year)	80
Dependable Capacity (MW)	10
Firm Energy (GWh/year)	80
Average Heat Rate (GJ/GWh)	5780

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$22,440
Fixed Operating & Maintenance Cost (\$1000s/year)	\$0.0
Variable Operating & Maintenance Cost (\$/MWh)	\$15.3
Fixed Taxes (\$1000s)	\$0
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$74
Project Life (Years)	25
Project Lead Time (Years)	3

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>	9.9	7.3	0.0		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	0.0	0.7	1.2	15.2		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					17.1	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	17.1	0.0	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	0.1					
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: Small Co-generation projects

Resource Category: Cogen

Region: Lower Mainland

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	240.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.005	0.250	0.058		
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.004			

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$2	\$4	\$1
<i>Operation \$/Year (million)</i>	\$0	\$3	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	22	56	13
<i>Operation FTEs (Full-Time Equivalents)</i>	0	12	2

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.334	\$0.629	\$0.144
<i>Operation \$/Year (million)</i>	\$0.108	\$0.344	\$0.023

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 750 MW Integrated Gasification Combined Cycle

Resource Category: Coal

Region: Peace River

### Project Description

Integrated Gasification Combined Cycle (IGCC) plants are a newer generation of coal power generation technology. In an IGCC, the coal is first gasified to produce a synthetic gas (syngas). Syngas is burned in a combined cycle generator to produce electric

In British Columbia, policy action No. 20 of the 2007 Energy Plan stipulates that coal-fired generation must meet a zero greenhouse gas (GHG) emission standard "through a combination of „clean coal,, fired generation technology, carbon sequestration and offset for any residual GHG emission". While „Clean Coal" technology in the form of IGCC is now becoming available, technology that allows the carbon dioxide to be captured from the plant and stored through sequestration, allowing coal fired generation to have „near zero" GHG emissions is still evolving and is not presently viable on a commercial scale. According to EPRI (2007), coal-fired plants with 90% CO<sub>2</sub> emission capture and storage could be commercially available by 2022.

Cost estimates presented in the NETL report have been used in calculating the Unit Energy Cost. There is significant uncertainty around these estimates. A 582 MW IGCC currently being built by Missisipi Power Co. is estimated to cost more than twice the hypothetical plant analyzed in the NETL study. Similarly, Duke Energy's 618 MW IGCC plant at Edwardsport scheduled to be in service in 2012 has seen a 45% increase over the utility's original estimate.

### Technical Information

Assumes base load operation at 80% capacity factor.

Installed Capacity (MW)	745
Average Annual Energy (GWh/year)	3896
Dependable Capacity (MW)	556
Firm Energy (GWh/year)	3896
Average Heat Rate (GJ/GWh)	11080

### Financial Information (in Fiscal \$ 2013 )

Direct Capital Cost (\$1000s)*	\$1,704,290
Fixed Operating & Maintenance Cost (\$1000s/year)	\$28,059.9
Variable Operating & Maintenance Cost (\$/MWh)	\$14.6
Fixed Taxes (\$1000s)	\$1,150
Variable Taxes (\$1000s)	\$0
Unit Energy Cost at Point of Interconnection (\$/MWh)	\$88
Project Life (Years)	20
Project Lead Time (Years)	6

\* Direct Capital Cost excludes Interest During Construction (IDC) and Corporate Overhead (CO)

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>	1.0	178.4	444.6			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	198.1	50.9	247.6	127.4		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>	0.0			0.0	623.1	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *	0.0	0.0	623.1	0.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
<i>km</i>							

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: 750 MW Integrated Gasification Combined Cycle

Resource Category: Coal

Region: Peace River

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

<b>Marine</b>	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A				
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
<i>ha/class</i>	N/A					
<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>	93.0				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>	0.046	0.222			0.000
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
			0.034			

### Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$424	\$340	\$157
<i>Operation \$/Year (million)</i>	\$12	\$28	\$6

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	5,226	3,841	1,858
<i>Operation FTEs (Full-Time Equivalents)</i>	118	259	73

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$60.855	\$48.453	\$20.735
<i>Operation \$/Year (million)</i>	\$2.839	\$4.001	\$0.813

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

### Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-01

Resource Category: Transmission

Region: Central Interior

### Project Description

New 500 kV, 50% series compensated transmission circuit 5L8 between GMS and Williston.

### Technical Information

Transfer Capacity Increase (MW)	1470
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$388,277
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		738.1	595.6			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	1.4	4.3	42.5	1,285.5			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	64.1	208.9	274.8	643.3	142.6		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class*</i>	626.8	476.3	230.6			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	6.1	5.4	4.1	0.5	0.8	2.1
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
Affected Stream Length:	Length							
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
		<i>ha/class</i>				
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5		
	<i>ha/class</i>	N/A				
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf		
	<i>ha/class</i>	N/A				



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-01

Resource Category: Transmission

Region: Central Interior

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$90	\$118	\$40
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,113	1,464	475
<i>Operation FTEs (Full-Time Equivalents)</i>	19	15	7

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$13.576	\$16.277	\$5.303
<i>Operation \$/Year (million)</i>	\$6.019	\$0.125	\$0.082

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-02

Resource Category: Transmission

Region: Kelly Nicola

### Project Description

New 500 kV, 50% series compensated transmission circuit 5L14 between Williston and Kelly Lake.

### Technical Information

Transfer Capacity Increase (MW)	2120
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$341,147
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>		436.4	1,148.3		
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>		0.1	5.8	1,578.9		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		12.9	4.4	802.4	765.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>			669.7	915.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	3.7	2.9	0.4	0.5		1.0
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-02

Resource Category: Transmission

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$79	\$104	\$35
<i>Operation \$/Year (million)</i>	\$2	\$1	\$1

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	978	1,286	418
<i>Operation FTEs (Full-Time Equivalents)</i>	16	13	6

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$11.928	\$14.301	\$4.660
<i>Operation \$/Year (million)</i>	\$5.289	\$0.110	\$0.072

\* Where Provincial Government Revenues is the sum of:

- (1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.
- (2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-03

Resource Category: Transmission

Region: Lower Mainland

### Project Description

New +/-500 kV HVDC bipole transmission circuit between Peace River and Lower Mainland - Phase 1.

### Technical Information

Transfer Capacity Increase (MW)	1000
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$1,482,882
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>	13.1	1,513.6	2,283.5			
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	4.9	11.7	134.7	3,658.9		
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	54.8	200.9	257.1	1,472.5	1,825.0	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class</i> *		1,011.8	1,354.4	1,444.0		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	23.9	17.8	6.4	2.7	0.7	10.4
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
	<i>ha/class</i>					
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5		
	<i>ha/class</i>	N/A				
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf		
	<i>ha/class</i>	N/A				

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-03

Resource Category: Transmission

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$345	\$452	\$153
<i>Operation \$/Year (million)</i>	\$7	\$4	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	4,252	5,591	1,815
<i>Operation FTEs (Full-Time Equivalents)</i>	71	57	28

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$51.847	\$62.164	\$20.254
<i>Operation \$/Year (million)</i>	\$22.989	\$0.477	\$0.312

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-04

Resource Category: Transmission

Region: Lower Mainland

### Project Description

New +/-500 kV HVDC bipole transmission circuit between Peace River and Lower Mainland - Phase 2.

### Technical Information

Transfer Capacity Increase (MW)	1000
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$246,783
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-04

Resource Category: Transmission

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$57	\$75	\$25
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	708	930	302
<i>Operation FTEs (Full-Time Equivalents)</i>	12	10	5

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.628	\$10.345	\$3.371
<i>Operation \$/Year (million)</i>	\$3.826	\$0.079	\$0.052

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-05

Resource Category: Transmission

Region: Central Interior

### Project Description

Series compensation upgrade at Kennedy from 50% to 65% on GMS to Williston 500 kV lines 5L1, 5L2, 5L3 and 5L7 with thermal upgrades to 3000A rating.

### Technical Information

This project will increase transfer capability of 360 MW between Central Interior and Kelly Nicola and 300 MW between Peace River and Central Interior.

Transfer Capacity Increase (MW)	360
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$59,511
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	3

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>				
	Remoteness - Linear Disturbance Density:	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-05

Resource Category: Transmission

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$18	\$3
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	210	34
<i>Operation FTEs (Full-Time Equivalents)</i>	3	2	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.020	\$2.424	\$0.384
<i>Operation \$/Year (million)</i>	\$0.923	\$0.019	\$0.013

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-06

Resource Category: Transmission

Region: Central Interior

### Project Description

Series compensation upgrade at McLeese from 50% to 65% on Williston to Kelly 500 kV lines 5L11, 5L12 and 5L13 with thermal upgrades to 3000A rating.

### Technical Information

This project will increase transfer capability of 390 MW between Central Interior and Kelly Nicola and 330 MW between Peace River and Central Interior.

Transfer Capacity Increase (MW)	390
---------------------------------	-----

### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$57,222
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	3

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>				
	Remoteness - Linear Disturbance Density:	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-06

Resource Category: Transmission

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$17	\$3
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	202	33
<i>Operation FTEs (Full-Time Equivalents)</i>	3	2	1

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.019	\$2.331	\$0.369
<i>Operation \$/Year (million)</i>	\$0.887	\$0.018	\$0.012

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-07

Resource Category: Transmission

Region: Central Interior

### Project Description

500 kV Shunt compensation: At Williston add one 300 MVAR SVC and two 250 MVAR switchable capacitor banks. At Kelly Lake add one 250 MVAR shunt capacitor bank.

### Technical Information

This project will increase transfer capability of 650 MW between Central Interior and Kelly Nicola and 580 MW between Peace River and Central Interior.

Transfer Capacity Increase (MW)	650
---------------------------------	-----

### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$65,129
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	4

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>				
	Remoteness - Linear Disturbance Density:	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-07

Resource Category: Transmission

Region: Central Interior

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$20	\$3
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	230	38
<i>Operation FTEs (Full-Time Equivalents)</i>	3	3	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.022	\$2.653	\$0.420
<i>Operation \$/Year (million)</i>	\$1.010	\$0.021	\$0.014

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-08

Resource Category: Transmission

Region: North Coast

### Project Description

New 500 kV circuit Williston-Glenannan-Telkwa-Skeena parallel to the existing 5L61 - 5L62 and 5L63 lines.

### Technical Information

Transfer Capacity Increase (MW)	970
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$1,031,557
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>	48.8	1,547.4	556.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	2.7	14.6	221.7	1,913.2			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	4.2	15.9	1,306.9	823.8	1.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
	<i>ha/class</i> *				2,152.2			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>	18.0	5.8	3.7	11.0	8.2	1.0	
	Reservoir Aquatic Area:	Area						
	<i>ha</i>							
Affected Stream Length:	Length							
<i>km</i>								

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m		
		<i>ha/class</i>					
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5			
	<i>ha/class</i>	N/A					
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf			
	<i>ha/class</i>	N/A					

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-08

Resource Category: Transmission

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$240	\$314	\$107
<i>Operation \$/Year (million)</i>	\$5	\$3	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	2,958	3,889	1,263
<i>Operation FTEs (Full-Time Equivalents)</i>	49	40	19

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$36.067	\$43.244	\$14.089
<i>Operation \$/Year (million)</i>	\$15.992	\$0.332	\$0.217

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-09

Resource Category: Transmission

Region: North Coast

### Project Description

Series compensation of the WSN-SKA 500 kV lines 5L61, 5L62 and 5L63 plus voltage support and transformation addition in the existing BC Hydro substations.

### Technical Information

Transfer Capacity Increase (MW)	580
---------------------------------	-----

### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$142,262
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	3

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
	<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
	<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>						
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
	Affected Stream Length:	Length					
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-09

Resource Category: Transmission

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$43	\$7
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

  

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	502	82
<i>Operation FTEs (Full-Time Equivalents)</i>	7	5	3

  

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.048	\$5.795	\$0.917
<i>Operation \$/Year (million)</i>	\$2.205	\$0.046	\$0.030

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-10

Resource Category: Transmission

Region: Selkirk

### Project Description

New 500 kV, 50% series compensated transmission circuit 5L97 between Selkirk and Vaseaux Lake.

### Technical Information

Transfer Capacity Increase (MW)	750
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$226,703
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>	50.1	305.1	427.0			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	2.1	4.0	105.6	670.4		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		2.1	30.6	121.6	627.9	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>		450.9	331.2			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	3.9	1.2	0.4	1.6	0.9	1.5
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-10

Resource Category: Transmission

Region: Selkirk

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
<i>Tonnes/GWh</i>						

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$53	\$69	\$23
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	650	855	278
<i>Operation FTEs (Full-Time Equivalents)</i>	11	9	4

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$7.926	\$9.504	\$3.096
<i>Operation \$/Year (million)</i>	\$3.514	\$0.073	\$0.048

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-11

Resource Category: Transmission

Region: Kelly Nicola

### Project Description

New 500 kV, 50% series compensated transmission circuit 5L99 between Vaseaux Lake and Nicola.

### Technical Information

Transfer Capacity Increase (MW)	750
---------------------------------	-----

### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$196,323
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
	<i>ha/class</i>	22.7	459.2	186.2			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>	0.1	0.7	66.2	601.1		
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>		32.9	70.1	55.4	509.8	
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>		95.8	572.4			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
	<i>ha</i>	1.7	1.2	0.5	0.5		
	Reservoir Aquatic Area:	Area					
	<i>ha</i>						
Affected Stream Length:	Length						
<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
	<i>ha/class</i>	N/A			
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-11

Resource Category: Transmission

Region: Kelly Nicola

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$46	\$60	\$20
<i>Operation \$/Year (million)</i>	\$1	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	563	740	240
<i>Operation FTEs (Full-Time Equivalents)</i>	9	8	4

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$6.864	\$8.230	\$2.681
<i>Operation \$/Year (million)</i>	\$3.044	\$0.063	\$0.041

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-12

Resource Category: Transmission

Region: Revelstoke Ashton Creek

### Project Description

50% series compensation of the 500 kV lines 5L91 and 5L98.

### Technical Information

This project will increase transfer capability of 133 MW between Selkirk and Kelly Nicola and 147 MW between Selkirk and Revelstoke Ashton Creek.

Transfer Capacity Increase (MW)	147
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$61,800
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	3

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
	<i>ha/class</i>					
Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
	<i>ha/class</i>					
High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
	<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
	<i>ha/class*</i>						
Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
	<i>ha</i>						
Reservoir Aquatic Area:	Area						
	<i>ha</i>						
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
	<i>ha/class</i>				
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5	
	<i>ha/class</i>	N/A			
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf	
	<i>ha/class</i>	N/A			

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-12

Resource Category: Transmission

Region: Revelstoke Ashton Creek

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$19	\$3
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	218	36
<i>Operation FTEs (Full-Time Equivalents)</i>	3	2	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.021	\$2.517	\$0.398
<i>Operation \$/Year (million)</i>	\$0.958	\$0.020	\$0.013

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Pre-feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-13

Resource Category: Transmission

Region: Mica

### Project Description

50% series compensaton of 500 kV lines 5L71 and 5L72.

### Technical Information

Transfer Capacity Increase (MW)	950
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$45,986
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-13

Resource Category: Transmission

Region: Mica

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$14	\$2
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	162	27
<i>Operation FTEs (Full-Time Equivalents)</i>	2	2	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.015	\$1.873	\$0.296
<i>Operation \$/Year (million)</i>	\$0.713	\$0.015	\$0.010

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Low

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-14

Resource Category: Transmission

Region: Kelly Nicola

### Project Description

50% series compensaton of 500 kV lines 5L76, 5L79, and 5L96.

### Technical Information

Transfer Capacity Increase (MW)	112
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$60,343
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	4

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-14

Resource Category: Transmission

Region: Kelly Nicola

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$18	\$3
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	213	35
<i>Operation FTEs (Full-Time Equivalents)</i>	3	2	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.020	\$2.458	\$0.389
<i>Operation \$/Year (million)</i>	\$0.935	\$0.019	\$0.013

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-15

Resource Category: Transmission

Region: Lower Mainland

### Project Description

New 500 kV, 50% series compensated transmission circuit 5L83 between Nicola and Meridian.

### Technical Information

Transfer Capacity Increase (MW)	1550
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$609,154
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-15

Resource Category: Transmission

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$142	\$186	\$63
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,747	2,297	746
<i>Operation FTEs (Full-Time Equivalents)</i>	29	23	11

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$21.298	\$25.536	\$8.320
<i>Operation \$/Year (million)</i>	\$9.443	\$0.196	\$0.128

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

<b>Level of Study</b>	Feasibility
<b>Resource Type Uncertainty</b>	Low
<b>Cost Uncertainty</b>	Low

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-16

Resource Category: Transmission

Region: Lower Mainland

### Project Description

New 500 kV, 50% series compensated transmission circuit 5L46 between Kelly Lake and Cheekye.

### Technical Information

Transfer Capacity Increase (MW)	1384
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$656,700
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369				
		<i>ha/class</i>		382.6	562.8			
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2			
	<i>ha/class</i>	8.1	14.4	175.9	746.9			
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80		
	<i>ha/class</i>	14.1	65.4	28.2	633.1	204.5		
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38			
		<i>ha/class*</i>	206.9	621.3	117.2			
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6	
		<i>ha</i>	10.5	7.9	8.9	12.5	6.6	1.3
	Reservoir Aquatic Area:	Area						
		<i>ha</i>						
Affected Stream Length:	Length							
	<i>km</i>							

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m	
		<i>ha/class</i>				
Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5		
	<i>ha/class</i>	N/A				
Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf		
	<i>ha/class</i>	N/A				

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-16

Resource Category: Transmission

Region: Lower Mainland

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$153	\$200	\$68
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,883	2,476	804
<i>Operation FTEs (Full-Time Equivalents)</i>	31	25	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22.961	\$27.529	\$8.969
<i>Operation \$/Year (million)</i>	\$10.181	\$0.211	\$0.138

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	High
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-17

Resource Category: Transmission

Region: Lower Mainland

### Project Description

500 kV and 230 kV shunt compensation: At Meridian 230 kV add two 110 MVar capacitor banks. At Nicola 500 kV add one 250 MVar capacitor bank.

### Technical Information

Transfer Capacity Increase (MW)	570
---------------------------------	-----

### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$10,092
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	3

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>				
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
		<i>ha/class</i>				
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
		<i>ha/class</i>				

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-17

Resource Category: Transmission

Region: Lower Mainland

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$3	\$0
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	36	6
<i>Operation FTEs (Full-Time Equivalents)</i>	0	0	0

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.003	\$0.411	\$0.065
<i>Operation \$/Year (million)</i>	\$0.156	\$0.003	\$0.002

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Pre-feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-18

Resource Category: Transmission

Region: Vancouver Island

### Project Description

New 230 kV transmission circuit 2L124 between Arnott and Vancouver Island terminal.

### Technical Information

Transfer Capacity Increase (MW)	600
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$230,136
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	6

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-18

Resource Category: Transmission

Region: Vancouver Island

<b>Atmosphere</b>	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
		Fine Particulates				
		PM 2.5	PM 10	PM Total		
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$54	\$70	\$24
<i>Operation \$/Year (million)</i>	\$1	\$1	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	660	868	282
<i>Operation FTEs (Full-Time Equivalents)</i>	11	9	4

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$8.048	\$9.646	\$3.143
<i>Operation \$/Year (million)</i>	\$3.568	\$0.074	\$0.048

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Feasibility
Resource Type Uncertainty	Low
Cost Uncertainty	Medium

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-19

Resource Category: Transmission

Region: Selkirk

### Project Description

50% Series compensation of 500 kV line 5L92 SEL-CBK.

### Technical Information

Transfer Capacity Increase (MW)	150
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$31,212
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	3

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-19

Resource Category: Transmission

Region: Selkirk

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
		<i>Tonnes/GWh</i>				
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
		<i>Tonnes/GWh</i>				
			Fine Particulates			
			PM 2.5	PM 10	PM Total	
	<i>Tonnes/GWh</i>					

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0	\$10	\$2
<i>Operation \$/Year (million)</i>	\$0	\$0	\$0

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	0	110	18
<i>Operation FTEs (Full-Time Equivalents)</i>	1	1	1

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$0.010	\$1.271	\$0.201
<i>Operation \$/Year (million)</i>	\$0.484	\$0.010	\$0.007

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Low
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-20

Resource Category: Transmission

Region: Selkirk

### Project Description

A new 500 kV line between SEL and CBK. To define this line, information from Section 5 Inquiry for a new 500 kV line from SEL to Alberta border (287 km , TTC = 1550 MW) is utilized. The new CBK - SEL 500 kV line will be 180 km long.

### Technical Information

Transfer Capacity Increase (MW)	1550
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$651,132
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369		
		<i>ha/class</i>	112.2	282.6	468.8	
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2	
		<i>ha/class</i>	8.7	10.2	186.2	658.5
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80
		<i>ha/class</i>	10.2	126.5	18.9	38.1

Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>		60.0	798.1		
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>	8.3	3.8	1.0	1.1	
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
	Affected Stream Length:	Length					
		<i>km</i>					

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-20

Resource Category: Transmission

Region: Selkirk

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$152	\$198	\$67
<i>Operation \$/Year (million)</i>	\$3	\$2	\$1

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	1,867	2,455	797
<i>Operation FTEs (Full-Time Equivalents)</i>	31	25	12

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$22.766	\$27.296	\$8.893
<i>Operation \$/Year (million)</i>	\$10.094	\$0.209	\$0.137

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High

# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-21

Resource Category: Transmission

Region: North Coast

### Project Description

A new 449 km long +/-500 kV HVDC bipole transmission circuit between WSN and SKA.

### Technical Information

Transfer Capacity Increase (MW)	2000
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### Financial Information (in Fiscal \$ 2013 )

Total Capital Cost (\$1000s)	\$1,091,606
Fixed Operating & Maintenance Cost (\$1000s/year)	
Project Life (Years)	
Project Lead Time (Years)	8

### Environmental Information

Land	Net Primary Productivity: gC/m <sup>2</sup> /year	Low 0 to <69	Medium 69 to <369	High >369			
		<i>ha/class</i>					
	Remoteness - Linear Disturbance Density <sup>2</sup> :	Wilderness <0.2	Remote 0.2 to <0.66	Rural 0.66 to 2.2	Urban >2.2		
		<i>ha/class</i>					
	High Priority Species Count (percentile):	0 to <20	20 to <40	40 to <60	60 to <80	>=80	
		<i>ha/class</i>					
Freshwater	Priority Fish Species: no. of priority species / watershed	None 0	Low 1 to 12	Moderate 13 to 23	High 24 to 38		
		<i>ha/class*</i>					
	Riparian Area Stream Order:	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
		<i>ha</i>					
	Reservoir Aquatic Area:	Area					
		<i>ha</i>					
Affected Stream Length:	Length						
	<i>km</i>						

\* The Priority Fish Species indicator calculates the total resource option footprint (in hectares) that falls within watersheds with none, low, moderate or high numbers of priority fish species.

Marine	Bathymetry (depth):	Photic 0 < 20m	Shallow 20 < 200m	Deep 200 < 1000m	Abyssal >=1000 m
		<i>ha/class</i>			
	Valued Ecological Features: no. of valued ecological features	None 0	Low 1 to 2	Medium 3 to 5	High >5
		<i>ha/class</i>	N/A		
	Key Commercial Bottom Fishing Areas: no. of bottom fisheries (bf)	0 bf	1 bf	2 to 3 bf	>3 bf
		<i>ha/class</i>	N/A		



# RESOURCE OPTIONS DATABASE 2013 Resource Options Report Update Appendix 3

## Project: TO-21

Resource Category: Transmission

Region: North Coast

Atmosphere	Greenhouse Gas Emissions:	Carbon Dioxide Equivalents (CO <sub>2</sub> e)				
	<i>Tonnes/GWh</i>					
	Air Contaminant Emissions:	Sulphur Dioxide	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic	Mercury
	<i>Tonnes/GWh</i>					
		Fine Particulates				
	<i>Tonnes/GWh</i>	PM 2.5	PM 10	PM Total		

## Economic Development Information

Provincial GDP	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$254	\$333	\$113
<i>Operation \$/Year (million)</i>	\$6	\$3	\$2

Employment	Direct	Indirect	Induced
<i>Construction Person-Years</i>	3,130	4,116	1,336
<i>Operation FTEs (Full-Time Equivalents)</i>	52	42	21

Provincial Government Revenues*	Direct	Indirect	Induced
<i>Construction \$ (million)</i>	\$38.167	\$45.761	\$14.910
<i>Operation \$/Year (million)</i>	\$16.923	\$0.351	\$0.230

\* Where Provincial Government Revenues is the sum of:

(1) From BC Stats: Government tax revenue estimates generated by the model include income taxes as well as commodity taxes. Provincial and federal tax revenues include federal and provincial personal and corporation income taxes. Also included are HST and other commodity taxes (taxes on products) such as the carbon tax, gas taxes, liquor and lottery taxes and profits, air transportation taxes, duties and excise taxes. Municipal commodity tax revenues are primarily related to accommodation taxes. Property taxes are included in taxes on factors of production.

(2) From BC Hydro: water rentals + grants in lieu (these only affect direct impacts and show up under operations as annual revenues).

## Data Confidence

Level of Study	Survey
Resource Type Uncertainty	Medium
Cost Uncertainty	High