

---

---

**2012 Integrated Resource Plan**

---

---



---

---

**Chapter**

**1**

**Introduction and Context**

---

---

## Table of Contents

1.1	Introduction to and Structure of the Integrated Resource Plan .....	1-1
1.1.1	Requested Approval .....	1-2
1.1.2	Structure of IRP .....	1-3
1.2	Legal and Policy Context .....	1-6
1.2.1	Clean Energy Act .....	1-6
	1.2.1.1    IRP Form Requirements .....	1-6
	1.2.1.2    Section 2 British Columbia’s Energy Objectives .....	1-8
1.2.2	Electricity Self-Sufficiency Regulation and Average Water .....	1-13
1.2.3	LNG Strategy .....	1-14
1.2.4	Role of IRP in Future Filings with BCUC .....	1-15
1.2.5	BCUC 2008 LTAP Directives .....	1-15

## List of Tables

Table 1-1	Summary of IRP Response to <i>CEA</i> Objectives .....	1-9
Table 1-2	IRP Response to 2008 LTAP Directives .....	1-15

---

## 1.1 Introduction to and Structure of the Integrated Resource Plan

British Columbia Hydro and Power Authority (**BC Hydro**) submits this Integrated Resource Plan (**IRP**) to the British Columbia (**B.C.**) Minister of Energy and Mines (**Minister**) under section 3 of the B.C. *Clean Energy Act* (**CEA**). BC Hydro has an obligation to serve existing and future customers in its service area. The IRP presents a set of future actions to ensure that BC Hydro customers will continue to receive cost-effective, reliable electricity with manageable risks. In developing the IRP, BC Hydro sought and considered input from First Nations, the public and stakeholders, including many of its key customer organizations.

The key elements of the IRP include:

- (i) A finding that BC Hydro will likely need a significant amount of energy and capacity resources over the course of the 20-year IRP planning horizon to meet forecasted load growth. In addition to general residential and commercial customer load growth, BC Hydro may experience substantial increased load in the mining and oil and gas sectors, including liquefied natural gas (**LNG**). By Fiscal (**F**) 2021,<sup>1</sup> an additional 13,800 gigawatt hours per year (**GWh/year**) of firm energy and 2,700 megawatts (**MW**) of dependable capacity will be needed.<sup>2,3</sup> The BC Hydro integrated system energy and peak demand capacity loads are forecasted to grow at an average annual growth rate of 2.7 to 3.5 per cent (without and with Initial LNG) and 2.3 to 2.9 per cent (without and with Initial LNG) respectively for F2012 through to F2021. BC Hydro, like other electric utilities in the Pacific Northwest that have benefitted from a historically robust hydro system, has traditionally had greater energy than capacity needs.

---

<sup>1</sup> All year marks in the IRP are stated in fiscal years (F20xx) ending March 31, except where otherwise noted.

<sup>2</sup> Both figures are before savings projected in BC Hydro's current Demand-Side Measures plan.

<sup>3</sup> Both figures include two LNG projects: (1) Kitimat LNG, proposed by Apache Canada Ltd., EOG Resources Canada Inc. and Encana Corporation; and (2) Douglas Channel LNG, proposed by Douglas Channel Energy Partnership. The proponents of these two LNG projects have secured material regulatory approvals, including National Energy Board export licences; refer to section 2.2. Kitimat and Douglas Channel LNG are referred to as **Initial LNG** throughout the IRP.

1 Due to continued growth of winter peak loads and increased reliance on  
2 non-dispatchable and intermittent run-of-river and wind generation, BC Hydro's  
3 capacity needs are as significant as its energy needs. Traditional low-cost clean  
4 or renewable BC Hydro Heritage hydroelectric capacity options will be  
5 exhausted after Revelstoke Unit 6, with an earliest in-service date (**ISD**) of  
6 F2019 and BC Hydro needs to consider new capacity supply options such as  
7 natural gas-fired generation and pumped storage; and

- 8 (ii) A 10-year Action Plan that identifies the key actions that BC Hydro must make  
9 to secure resources. The Action Plan is the outcome of the IRP. The Action  
10 Plan provides BC Hydro's proposed plan to address the *CEA* legislative  
11 requirements, and aligns with B.C. Government policy as reflected in "British  
12 Columbia's energy objectives" set out in section 2 of *CEA*, the 2007 Energy  
13 Plan,<sup>4</sup> British Columbia's Natural Gas Strategy and Liquefied Natural Gas  
14 Strategy<sup>5</sup> (referred to as the **LNG Strategy**), the Climate Action Plan<sup>6</sup> and other  
15 documents referred to in the IRP. While Demand-Side Measures (**DSM**) and  
16 upgrades to BC Hydro's existing hydroelectric facilities are an integral part of  
17 the Action Plan to address customers' future electricity requirements, they are  
18 ultimately inadequate to meet all expected future load growth, and thus new  
19 clean or renewable resources, and potentially natural gas-fired generation, will  
20 be required.

### 21 1.1.1 Requested Approval

22 BC Hydro requests that the B.C. Lieutenant Governor in Council approve the IRP  
23 pursuant to subsection 4(1)(a) of the *CEA*. BC Hydro also recommends that the  
24 Lieutenant Governor in Council not initiate any export-related process outlined in  
25 subsection 4(1)(b) of the *CEA* at this time on the basis of BC Hydro's assessment

<sup>4</sup> *The BC Energy Plan: A Vision for Clean Energy Leadership*, [www.energyplan.gov.bc.ca](http://www.energyplan.gov.bc.ca).

<sup>5</sup> B.C. Ministry of Energy and Mines, *British Columbia's Natural Gas Strategy: Fuelling B.C.'s Economy for the Next Decade and Beyond*, February 3, 2012, [www.gov.bc.ca/ener/popt/down/natural\\_gas\\_strategy.pdf](http://www.gov.bc.ca/ener/popt/down/natural_gas_strategy.pdf); and *Liquefied Natural Gas: A Strategy for B.C.'s Newest Industry*, February 3, 2012, [www.gov.bc.ca/popt/down/liquefied\\_natural\\_gas\\_strategy.pdf](http://www.gov.bc.ca/popt/down/liquefied_natural_gas_strategy.pdf).

<sup>6</sup> [www.gov.bc.ca/premier/attachments/climate\\_action\\_plan.pdf](http://www.gov.bc.ca/premier/attachments/climate_action_plan.pdf).

1 that the potential export market does not warrant the development of new, additional  
2 clean or renewable resources for the foreseeable future.

### 3 **1.1.2 Structure of IRP**

4 The IRP consists of nine chapters as well as an Executive Summary and a series of  
5 technical appendices. The order of the chapters generally follows the stages of IRP  
6 development:

- 7 • Remainder of Chapter 1 – section [1.2](#) sets out the legal and policy context  
8 framing the IRP;
- 9 • Chapter 2 – The IRP process begins by identifying and quantifying customers’  
10 expected demand needs and the expected output of existing resources to  
11 identify the Load/Resource Balance (**LRB**; also referred to as the ‘gap’) going  
12 forward. Chapter 2 contains BC Hydro’s resource needs assessment, including  
13 BC Hydro’s most recent load forecast, the status of existing, committed and  
14 planned generation resources, and a determination of the LRB for the 20-year  
15 IRP planning horizon. As noted in Chapter 2, the need for capacity has become  
16 a key reliability issue in the next 10 years;
- 17 • Chapter 3 – Next, and in line with good utility practice, BC Hydro considered a  
18 wide variety of resource options. Chapter 3 profiles the DSM, generation and  
19 transmission resource options for addressing future energy and capacity gaps;
- 20 • Chapter 4 – Chapter 4 provides BC Hydro’s assessment of the planning  
21 environment, including market price forecasts. Informing BC Hydro’s analysis  
22 are decreases in projected market prices for natural gas, greenhouse gas  
23 (**GHG**) offsets and Renewable Energy Credits (**RECs**) resulting in decreasing  
24 market electricity prices. With the increasing role of natural gas-fired generation  
25 in the region in which BC Hydro operates, defined by the member utilities in the

1 Western Electricity Coordinating Council (**WECC**),<sup>7</sup> natural gas prices are  
2 becoming a critical determinant in establishing WECC market electricity prices.  
3 BC Hydro expects that the recent innovations that have unlocked the economic  
4 extraction of North America's 'shale gas' reserves will serve to both keep the  
5 market price of natural gas below \$5 per million British Thermal Units (**MMBtu**)  
6 at the Henry Hub early into the next decade and will reduce the degree of gas  
7 price volatility that has been experienced over the past 10 years. Another  
8 critical uncertainty is the prospect for future U.S. GHG policies. There has been  
9 a loss of momentum in U.S. federal and state efforts to develop GHG  
10 compliance requirements.

- 11 • Chapters 5 and 6 – The resource options described in Chapter 3 are evaluated  
12 for their ability to meet the electricity needs of customers by determining  
13 comparative reliability, cost, risks, environmental attributes and economic  
14 development attributes of various portfolios of new and existing resources  
15 against varying potential futures over the 20-year IRP planning horizon. This  
16 kind of analysis is consistent with the British Columbia Utilities Commission's  
17 (**BCUC**) *Resource Planning Guidelines*<sup>8</sup> and is considered a best practice for  
18 IRP analysis. Chapter 5 describes the IRP uncertainty and portfolio  
19 performance assessment processes, while Chapter 6 presents the IRP analysis  
20 results, including the identification of a series of conclusions that support the  
21 recommended actions provided in Chapter 9. While a rigorous evaluation of  
22 portfolio cost performance across a range of risks and uncertainties lends  
23 critical insights into decision-making, it cannot account for or quantify every  
24 consideration. BC Hydro emphasizes that a portfolio 'scoring approach' does  
25 not replace prudent utility judgment or the need to consider qualitative factors;

---

<sup>7</sup> The WECC territory is composed of two Canadian provinces – B.C. and Alberta; parts of 14 western United States (**U.S.**) states (California, Nevada, Arizona, Utah, Idaho, Oregon, Washington state, Wyoming, most of Montana, Colorado and New Mexico, and a part of South Dakota, Nebraska and Texas); and the northern portion of Baja California, Mexico.

<sup>8</sup> Available at [www.bcuc.com/Documents/Guidelines/RP\\_Guidelines.12-2003.pdf](http://www.bcuc.com/Documents/Guidelines/RP_Guidelines.12-2003.pdf).

- 
- 1 • Chapter 7 – Export potential assessment is a new addition to BC Hydro IRP  
2 development. Chapter 7 sets out the expected export demand during the  
3 10-year Action Plan period, and BC Hydro’s conclusion that aside from  
4 monitoring, the potential export market does not warrant the development of  
5 new, additional clean or renewable resources for the foreseeable future;
  - 6 • Chapter 8 – First Nations, the public and stakeholders were involved in IRP  
7 development. Refer to Chapter 8 for a description of BC Hydro’s IRP-related  
8 consultation program to date;
  - 9 • Chapter 9 – The 10-year Action Plan is the final step in IRP development.  
10 Chapter 9 is BC Hydro’s Action Plan, consisting of specific implementation  
11 actions, costs of pursuing such actions and a discussion of resource risks. The  
12 Action Plan does not, by itself, commit BC Hydro to any specific projects  
13 identified over the planning horizon. Specific projects, such as DSM  
14 conservation programs, transmission lines, generation facilities or new power  
15 acquisition processes, have additional engagement, consultation and approval  
16 requirements. It is also important to recognize that while the Action Plan sets  
17 out steps with respect to pursuing specific projects, the resources identified in  
18 the portfolio analysis underpinning the proposed power acquisition process in  
19 the Action Plan are proxy resources and act as guides for resource  
20 procurement and not as a commitment. Resources evaluated as part of the  
21 proposed power acquisition process may vary from the proxy resources  
22 identified in the IRP with respect to resource type, timing, size, cost and  
23 location. Evaluations will be conducted at the time of acquiring any such power  
24 acquisition resource to justify the resource.

25 The IRP appendices, included as separate volumes, are comprised of a several  
26 significant studies conducted to support the IRP, including the 2011 Load Forecast,  
27 the Resource Options Report (**ROR**), the Electricity Price Forecast for the WECC

1 region, the DSM Plan and the Consultation Report. A glossary defining key terms  
2 and referencing abbreviations used in the IRP is also attached as Appendix 1A.

## 3 **1.2 Legal and Policy Context**

4 This section discusses the regulatory requirements that shaped this IRP.

### 5 **1.2.1 Clean Energy Act**

#### 6 **1.2.1.1 IRP Form Requirements**

7 BC Hydro has met all of the section 3 CEA form requirements:

- 8 • “Consistent with good utility practice”. The IRP is an electric utility long-term  
9 resource plan balancing considerations of cost, risks, environmental and  
10 economic development attributes while meeting reliability criteria. The term  
11 “good utility practice” in this context means any of the practices, methods and  
12 acts engaged in by a significant portion of the electric utility industry in the  
13 WECC in the development of long-term resource plans. As part of the  
14 development of the IRP, BC Hydro examined the long-term resource plans of a  
15 number of electric utilities operating in the WECC, including PacifiCorp,  
16 Portland General Electric and Puget Sound Energy, and BC Hydro is of the  
17 view that the IRP is consistent with the long-term resource plan development  
18 practices of those electric utilities, taking into account the differing legal, policy  
19 and other regimes. A common feature of long-term resource plans and thus of  
20 good utility practice is maintaining reliability of supply. There are two other good  
21 utility practice objectives which are traded off in IRPs - minimizing the economic  
22 cost of delivering electricity services and minimizing the environmental impacts  
23 of electricity supply and use. BC Hydro’s IRP is also guided by the BCUC  
24 *Resource Planning Guidelines*;
- 25 • “A description of [BC Hydro’s] forecasts”. BC Hydro’s assessment of its  
26 resource needs in Chapter 2 contains a description of the most recent, 20-year  
27 2011 Load Forecast;

- 
- 1 • “A description of what [BC Hydro] plans to do to achieve electricity  
2 self-sufficiency ... including plans respecting the implementation of [DSM]; the  
3 construction or extension of facilities; the acquisition of electricity from other  
4 persons; and the use of rates to encourage [among other things] energy  
5 conservation or efficiency and the reduction of the energy demand [BC Hydro]  
6 must serve”. The Action Plan is a plan of how BC Hydro intends to  
7 cost-effectively meet the load/resource gap through DSM, upgrades to existing  
8 BC Hydro facilities such as Revelstoke Generating Station, development of Site  
9 C and a targeted power acquisition process. BC Hydro proposes a flexible and  
10 staged approach to cost-effectively address the self-sufficiency requirement  
11 given large new load growth uncertainty. There are expected to be short to  
12 mid-term energy and capacity load/resource balance gaps - in energy from  
13 F2017 to F2022, and in capacity from F2016 to F2022 – for which BC Hydro  
14 proposes a mix of B.C.-based resources and increased market reliance.  
15 BC Hydro is proposing such a course only to meet these short to mid-term gaps  
16 to cost-effectively maintain flexibility to respond to load growth uncertainty, the  
17 level of DSM achieved savings and the process required to develop and secure  
18 B.C.-based resources;
- 19 • “A description of the consultation carried out by [BC Hydro] respecting the  
20 development of the [IRP]”. This information is contained in Chapter 8. Under  
21 subsection 3(4) of *CEA*, BC Hydro is required to carry out any consultations  
22 required by a Ministerial regulation. To date, no such regulation has been  
23 enacted. As part of the IRP process BC Hydro solicited input from First Nations,  
24 various stakeholder groups and individuals to ensure BC Hydro understands  
25 and considers the perspectives and feedback from our external constituents. In  
26 respect of First Nations, and for the reasons set out in Chapter 8, BC Hydro  
27 determined that there is a legal duty to consult with First Nations regarding this  
28 IRP and that the duty is at the low end of the *Haida v. British Columbia (Minister*

1 of Forests)<sup>9</sup> (*Haida*) spectrum because the IRP itself has low to non-existent  
2 impacts as no specific projects, acquisition processes or programs are being  
3 directly implemented through the IRP itself. As set out in Chapter 9, many of the  
4 recommended projects, acquisition processes and programs require  
5 subsequent approvals prior to implementation. The IRP is not a substitute for  
6 these subsequent approval processes;

- 7 • “A description of expected export demand ..., the potential for British Columbia  
8 to meet that demand, the actions [BC Hydro] has taken to seek suitable  
9 opportunities for the export of electricity from clean or renewable resources,  
10 and the extent to which [BC Hydro] has arranged for contracts for the export of  
11 electricity and the transmission or other services necessary to facilitate those  
12 exports”. As stated above, in Chapter 7 BC Hydro concludes that aside from  
13 monitoring, there are no actions BC Hydro should be taking because there are  
14 no suitable market opportunities that warrant the development of new,  
15 additional clean or renewable resources for the purpose of exporting electricity.  
16 Powerex Corp. (**Powerex**) will monitor export market developments as part of  
17 its ordinary course of business. Accordingly, BC Hydro is not proposing any  
18 projects or contracts needed to pursue export opportunities as part of the  
19 10-year Action Plan;
- 20 • “A description of [BC Hydro’s] infrastructure and capacity needs for electricity  
21 transmission for the period ending 30 years after the date the [IRP] is  
22 submitted”. Refer to section 6.9 and Appendix 6F.

### 23 **1.2.1.2 Section 2 British Columbia’s Energy Objectives**

24 Section 3 of *CEA* also provides that BC Hydro is to describe “what it (BC Hydro)  
25 plans to do to achieve electricity self-sufficiency and to respond to British Columbia’s  
26 other energy objectives” set out in section 2 of *CEA*. Leaving aside the

---

<sup>9</sup> 2004 SCC 73, paragraph 39: “the scope of the duty to consult is proportionate to a preliminary assessment of the case supporting the existence of the right or title, and to the seriousness of the potentially adverse effect upon the right or title claimed”.

1 2(a) self-sufficiency objective, which is unique because there is a legal requirement  
 2 contained in subsection 6(2) of *CEA* that BC Hydro “must achieve self-sufficiency”,  
 3 for purposes of the IRP, BC Hydro groups the remaining 15 British Columbia energy  
 4 objectives into four categories - Ratepayer Impact, Economic Development,  
 5 Clean/Renewable/DSM and GHG Impacts, and Export. [Table 1-1](#) sets out how the  
 6 IRP responds to these four categories (refer to section 9.6 for a more detailed  
 7 summary of the IRP’s responses to the *CEA* objectives). Overall, BC Hydro is of the  
 8 view that the IRP represents the right balance of proposed cost-effective resource  
 9 additions to meet customer reliability needs while taking into consideration First  
 10 Nation and stakeholder input, addressing environmental concerns and following  
 11 legislated and government policy parameters.

12 **Table 1-1 Summary of IRP Response to *CEA***  
 13 **Objectives**

<b>CEA British Columbia’s Energy Objective</b>	<b>IRP Response</b>
<b>Ratepayer Impact</b>	Three of British Columbia’s energy objectives fall within in the ‘Ratepayer Impact’ category – 2(f), 2(e), 2(m)
2(f): “to ensure [BC Hydro’s] rates remain among the most competitive of rates charged by public utilities in North America”	BC Hydro places priority on this objective given that BC Hydro has a service obligation pursuant to section 28 of the <i>Utilities Commission Act (UCA)</i> , the fact that the IRP is designed to address customer electricity demand and because of BC Hydro’s relationship with its customers. BC Hydro considers that the proposed Action Plan (in Chapter 9) is the most cost-effective way to meet the projected load/resource gap, and therefore the optimal way to ensure that BC Hydro’s rates remain competitive. Refer to Chapter 6, where BC Hydro emphasizes: (1) the lowest Unit Energy Costs ( <b>UECs</b> ) or Unit Capacity Costs ( <b>UCCs</b> ) when examining potential resources; and (2) portfolios with the lowest Present Value ( <b>PV</b> ) costs

<b>CEA British Columbia’s Energy Objective</b>	<b>IRP Response</b>
<p>2(e): “ensure that [BC Hydro’s] ratepayers receive the benefits of the heritage assets...” and 2(m): “to maximize the value ... of British Columbia’s generation and transmission assets for the benefit of British Columbia”</p>	<p>The Action Plan outlines how BC Hydro is pursuing cost-effective upgrades at its existing generation facilities and what transmission projects it is pursuing. In addition, the impact of intermittent resources are included within the evaluation of alternatives in Chapter 6 to ensure that the value of the Heritage Assets is both maximized and remains with BC Hydro’s customers</p>
<p><b>Economic Development</b></p>	<p>Two of British Columbia’s energy objectives fall within the ‘Economic Development’ category – 2(k) and 2(l)</p>
<p>2(k): “encourage economic development and the creation and retention of jobs”</p>	<p>The Action Plan aligns with the section 2(k) objective by both maintaining the most cost-effective supply of electricity for its customers (including commercial and industrial entities) as well as through pursuit of DSM, upgrades at existing BC Hydro facilities, transmission, Site C and a power acquisition process, all of which have direct and indirect economic benefits</p>
<p>2(l): “foster the development of First Nation and rural communities through the use and development of clean or renewable resources”</p>	<p>Through the IRP consultation, BC Hydro sought input from First Nations on the topic of clean or renewable energy development in First Nations communities. Chapter 3 provides BC Hydro’s resource option assessment, including how to access the information in Geographic Information System (<b>GIS</b>) format, which is a tool that can inform clean or renewable energy development. The Action Plan aligns with the section 2(l) objective through the power acquisition process, which may provide opportunities for First Nations and rural communities, including an action around assessing whether additional or expanded smaller-scale acquisitions are required. Outside of the IRP, BC Hydro is continuing with its Remote Community Electrification Program to help remote communities receive electricity service from BC Hydro</p>

<b>CEA British Columbia’s Energy Objective</b>	<b>IRP Response</b>
<b><i>Clean/Renewable/DSM and GHG Impacts</i></b>	Eight of British Columbia’s energy objectives fall within the ‘Clean/Renewable and GHG Impact’ category – 2(b), 2(c), 2(d), 2(g), 2(h), 2(i), 2(j), 2(o)
2(g) sets out the binding GHG reduction targets described in the B.C. Greenhouse Gas Reduction Targets Act; 2(i) provides: “to encourage communities to reduce [GHG] emissions...”; and 2(h) states: “to encourage the switching from one kind of energy source or use to another that decreases [GHG] emissions in British Columbia”	<p>Overall, the Action Plan is the least GHG intensive BC Hydro has identified as being cost-effective. In the IRP BC Hydro generally uses the BCUC’s definition of ‘cost-effectiveness’, which in addition to low cost includes schedule/deliverability risk, reliability, timing, location and environmental impacts. The Action Plan puts first priority on capturing all achievable, cost-effective DSM. The proposed targeted power acquisition process for energy resources would be restricted to “clean or renewable resources” as that term is defined in section 1 of CEA.</p> <p>Electrification is a form of fuel switching; it is the process of switching specific end uses in the residential, commercial, transportation and industrial sectors from utilization of fossil-based fuels to using clean or renewable electricity. BC Hydro examined various electrification (GHG reduction) scenarios for the impact on incremental demand and undertook studies to understand how electrification could contribute to the provincial GHG targets. Refer to the analysis in section 6.7. As part of gas development in the province, BC Hydro is assessing the ability to electrify the Fort Nelson/Horn River Basin region. BC Hydro will continue to work with the Provincial Government to assess where electrification should be most effectively applied and how electrification costs should be managed</p>

CEA British Columbia’s Energy Objective	IRP Response
<p>2(b) “to take [DSM], including the objective of [BC Hydro] reducing its expected increase in demand for electricity by the year 2020 by at least 66%”</p>	<p>The term “demand-side measure” (referred to as DSM in this IRP) is broadly defined in section 1 of CEA to include both rates and programs, among other measures. BC Hydro responded to the 2(b) objective by targeting all cost-effective and achievable DSM. The proposed DSM target has increased from the last long-term planning target established by BC Hydro in the 2008 Long-Term Acquisition Plan (<b>LTAP</b>) Evidentiary Update. BC Hydro is recommending targeting 9,800 GWh/year of DSM energy savings by F2021, which equates to approximately 78 per cent of BC Hydro’s forecasted energy load increase by F2021 excluding Initial LNG and 58 per cent of BC Hydro’s forecasted energy load increase by F2021 including Initial LNG</p>
<p>2(c) “to generate at least 93% of the electricity in British Columbia from clean or renewable resources and build the infrastructure necessary to transmit that electricity”</p>	<p>Currently, BC Hydro’s system is at approximately 94 per cent clean or renewable. BC Hydro responded to the 2(c) objective by examining portfolios in Chapter 6 that meet the 93 per cent objective and recommending actions that support meeting this objective.</p>
<p>2(j) “to reduce waste by encouraging the use of waste heat, biogas and biomass”; 2(d): “to use and foster the development in British Columbia of innovative technologies that support [DSM] and the use of clean or renewable resources” and 2(o): “to achieve British Columbia’s energy objectives without the use of nuclear power”</p>	<p>With respect to 2(j), BC Hydro recently completed its Bioenergy Phase 2 Call Request for Proposals (<b>RFP</b>). In addition, to meet the recommended acquisition volumes set out in the Action Plan, BC Hydro will consider the renewal or extension of existing Electricity Purchase Agreements (<b>EPAs</b>) with bioenergy resources.</p> <p>Concerning 2(d), BC Hydro’s DSM Implementation Plan (Appendix 9A) contains a Technology Innovation supporting initiative. The Standing Offer Program (<b>SOP</b>) rules are set so that “completed prototype generation technologies” as well as “commercial operation generation technologies” are now eligible. Future clean or renewable resource potential such as pumped storage and geothermal will continue to be explored and considered to meet energy and capacity shortfalls. In addition, the BCUC recently approved a re-pricing proposal for BC Hydro’s Net Metering tariff. With respect to 2(o), nuclear power will not form part of the next power acquisition process</p>

CEA British Columbia’s Energy Objective	IRP Response
<i>Exports</i>	Two of British Columbia’s energy objectives fall within the ‘Exports’ category – 2(n) and 2(p)
2(n) “ to be a net exporter of electricity from clean or renewable resources...”; and 2(p) “to ensure the [BCUC] ... continues to regulate [BC Hydro] with respect to domestic rates but not with respect to expenditures for export, except as provided by [CEA]”	As set out in Chapter 7, BC Hydro’s assessment concludes that there are no suitable market opportunities that warrant the development of new, additional clean or renewable resources for the purpose of exporting electricity for the foreseeable future. As a result, BC Hydro is not proposing to pursue projects or contracts specifically to serve the export market as part of the 10-year Action Plan

1 **1.2.2 Electricity Self-Sufficiency Regulation and Average Water**

2 Section 6 of *CEA* requires BC Hydro to achieve electricity self-sufficiency by holding  
 3 by 2016 the rights to enough electricity generated in B.C. to meet BC Hydro’s  
 4 “electricity supply obligations”. The Electricity Self-Sufficiency Regulation requires  
 5 BC Hydro to achieve self-sufficiency by 2016 assuming that the Heritage  
 6 hydroelectric assets are capable of producing no more than what they can produce  
 7 under “average water conditions”. Until February 3, 2012, the Electricity  
 8 Self-Sufficiency Regulation required BC Hydro to plan for self-sufficiency based on  
 9 what BC Hydro’s Heritage resources are capable of generating in the lowest water  
 10 inflows on record, known as “critical water conditions”. Given that 80 per cent of  
 11 BC Hydro’s energy is generated at hydroelectric facilities, the change in planning for  
 12 critical water conditions to average water conditions has the effect of reducing the  
 13 need for firm energy in F2017 by about 4,100 GWh/year.

14 Recent amendments to Special Direction No. 10 (**SD 10**) to the BCUC are also  
 15 relevant to the IRP. Section 1 of SD 10 provides that the BCUC, in adjudicating  
 16 BC Hydro applications, must use the new planning criterion of average water.  
 17 Heritage hydroelectric capability for purposes of SD 10 is defined in subsection 1(2)  
 18 as 48,200 GWh/year.<sup>10</sup> Section 2 of SD 10 removes the 3,000 GWh/year “insurance”  
 19 requirements through the repealing of subsection 3(e) of SD 10. Bill 30 (*Energy and*

<sup>10</sup> This compares to SD 10’s previous definition of such capability at critical water of 42,600 GWh/year.

1 *Mines Statutes Amendment Act*, 2012) was introduced in March 2012. Section 2 of  
2 Bill 30 will repeal the 3,000 GWh/year insurance requirement that is currently in  
3 subsection 6(2) of *CEA*.

4 Refer to Chapter 2, where the LRBs are presented based on average water with no  
5 insurance.

### 6 **1.2.3 LNG Strategy**

7 The LNG Strategy details the B.C. Government's commitment to LNG exports and  
8 outlines the priorities that are to guide development of this new industry:

- 9 • To remain competitive in a global LNG industry;
- 10 • To maintain leadership on climate change and clean/renewable energy. The  
11 Initial LNG projects would be the first LNG facilities in the world to use clean or  
12 renewable electricity to drive the liquefaction process; and
- 13 • To keep BC Hydro's rates affordable. LNG developers are to contribute to  
14 incremental transmission infrastructure development and to resource  
15 acquisitions required across the BC Hydro system arising from the incremental  
16 load attributable to serve each facility.

17 As described in Chapter 2, Initial LNG loads are included in the 2011 Load Forecast.  
18 To reflect the large size and nature of the Initial LNG load (i.e., proceed or do not  
19 proceed), BC Hydro has prepared two mid Load Forecasts in the 2011 Load  
20 Forecast: a mid Load Forecast with Initial LNG and a mid Load Forecast without  
21 Initial LNG. Serving these two LNG projects will require upgrades to an existing  
22 500 kilovolt (**kV**) transmission line. BC Hydro has adequate firm energy to meet the  
23 requirements of these two LNG projects. If these projects emerge, serving these two  
24 projects advances the need for firm energy from BC Hydro's next power acquisition  
25 process to F2017 from F2022. BC Hydro is also monitoring a number of other  
26 proposed LNG projects; however for the purposes of the IRP, these projects are  
27 treated as incremental load scenarios to the Load Forecast.

**1.2.4 Role of IRP in Future Filings with BCUC**

The UCA provides that the BCUC must “consider and be guided” by the IRP in adjudicating BC Hydro’s applications for Certificate of Public Convenience and Necessity (**CPCN**), expenditure requests under section 44.2 of the *UCA* for upgrades to existing facilities and DSM, and EPA filings under section 71. Thus, the IRP will be used as support and context for future BC Hydro filings with the BCUC.

The BCUC also maintains jurisdiction to separately approve the Contingency Resource Plans (**CRPs**)<sup>11</sup> forming part of BC Hydro’s Action Plan. CRPs are BC Hydro’s alternative portfolios of resources to mitigate major risks inherent with the actions selected in the Action Plan, such as managing supply shortfall risks if the load forecast is higher than anticipated or DSM does not deliver the projected energy and/or capacity savings. The CRPs ensure that there are adequate transmission resources to deliver these contingency resources.

**1.2.5 BCUC 2008 LTAP Directives**

In its decision concerning BC Hydro’s 2008 LTAP, the BCUC made a number of directives. By letter dated November 1, 2010, BC Hydro advised the BCUC that it would be addressing a number of these directives in the IRP, as follows:

**Table 1-2 IRP Response to 2008 LTAP Directives**

<b>2008 LTAP Directive</b>	<b>IRP Response</b>
4 – Self-Sufficiency: “In its next LTAP, BC Hydro is requested to pay particular attention to the phasing in of the steps it deems necessary in order to meet the two aspects of self-sufficiency specified by SD 10. Particular regard should be given to achieving the requirements in a manner that meets the requirement of having the capability “within the Province,” while avoiding any undue burden on its ratepayers”	The phasing in of steps to achieve self-sufficiency by 2016 and each year after as mandated by subsection 6(2) of the <i>CEA</i> is set out in the Action Plan

<sup>11</sup> Pursuant to BCUC Directive 3 (page 109) of BCUC Order No. G-58-05 concerning the Open Access Transmission Tariff.

2008 LTAP Directive	IRP Response
<p>6 – Load Forecast: “The Commission Panel accepts BC Hydro’s 2008 Load Forecast Update for the purposes of its review of the 2008 LTAP. The Commission Panel also notes that BC Hydro agrees with IPPBC that there is some potential for double counting of DSM in the forecasting coefficients and requires BC Hydro to address this in its next LTAP”</p>	<p>In the 2011 Load Forecast (Chapter 2, Appendix 2A), BC Hydro addressed the issue by correcting identified areas of overlap or documenting outstanding information gaps still to be resolved</p>
<p>11 – DSM: “The Commission Panel requires BC Hydro to address in its next LTAP a methodology for comparing risk-weighted UECs of demand side measures and of physical supply-side resources”</p>	<p>BC Hydro has built uncertainty into an incremental comparison of DSM and supply-side resources to address these concerns. However, comparing risk-weighted UECs of DSM and supply-side options exactly in the manner suggested by the BCUC is not possible. Refer to Chapter 6</p>
<p>13 – DSM: “Inasmuch as BC Hydro has effectively chosen to truncate its DSM programs in F2020 by letting the impact of those programs progressively decay, the Commission Panel finds that BC Hydro’s DSM Plan is deficient”</p>	<p>Refer to Appendix 9A, DSM Implementation Plan</p>

1 In addition, there is one outstanding 2006 Integrated Electricity Plan (IEP)/LTAP  
 2 BCUC directive that is addressed in the IRP. With respect to the issue of potential  
 3 effects of climate change on hydroelectric resources, the BCUC made the following  
 4 directive:

5 The Commission Panel concludes that BC Hydro should  
 6 continue to assess the potential effects of climate change on its  
 7 hydroelectric resources and that in addition to the activities it is  
 8 currently involved in, BC Hydro should conduct statistical  
 9 analyses of snow pack, annual precipitation and stream flows,  
 10 freshet timing and other relevant variables and survey the  
 11 relevant literature on an ongoing basis for relevant regional  
 12 trends, with a view to assessing the impact on stream flows and  
 13 on its major reservoirs. The Commission Panel directs  
 14 BC Hydro to file a report with the Commission in its next IEP,  
 15 identifying significant trends in the literature and summarizing  
 16 the results of its statistical analyses of historical streamflows.

17 Refer to section 2.3.1.6 and Appendix 2C of the IRP for the discussion of a climate  
 18 change adaptation strategy framework to address the potential impacts of climate  
 19 change on BC Hydro’s operations and long-term planning.