

Community–Based Biomass Power Call - RFQ

Proposal Preparation Workshop

Power Acquisitions

BC Hydro

July 2010

BChydro 

Time	Activity	Presenter
12:30-12:45 pm	Registration	
12:45-1:00	Welcome / Session Goals	James Grant
1:00-1:45	RFQ Process Overview	James Grant
1:45-2:00	Interconnections	Laila Bassim
2:00-2:30	Proposal Submission Requirements	James Grant
2:30-2:50	Q&A	All
2:50-3:00	Break	
3:00-3:30	Electricity Purchase Agreements- Overview	James Grant
3:30-4:30	Quantitative and Commercial Requirements	Mohsen Movahed
4:30-5:00	Q&A	All
5:00 pm	End of Session	

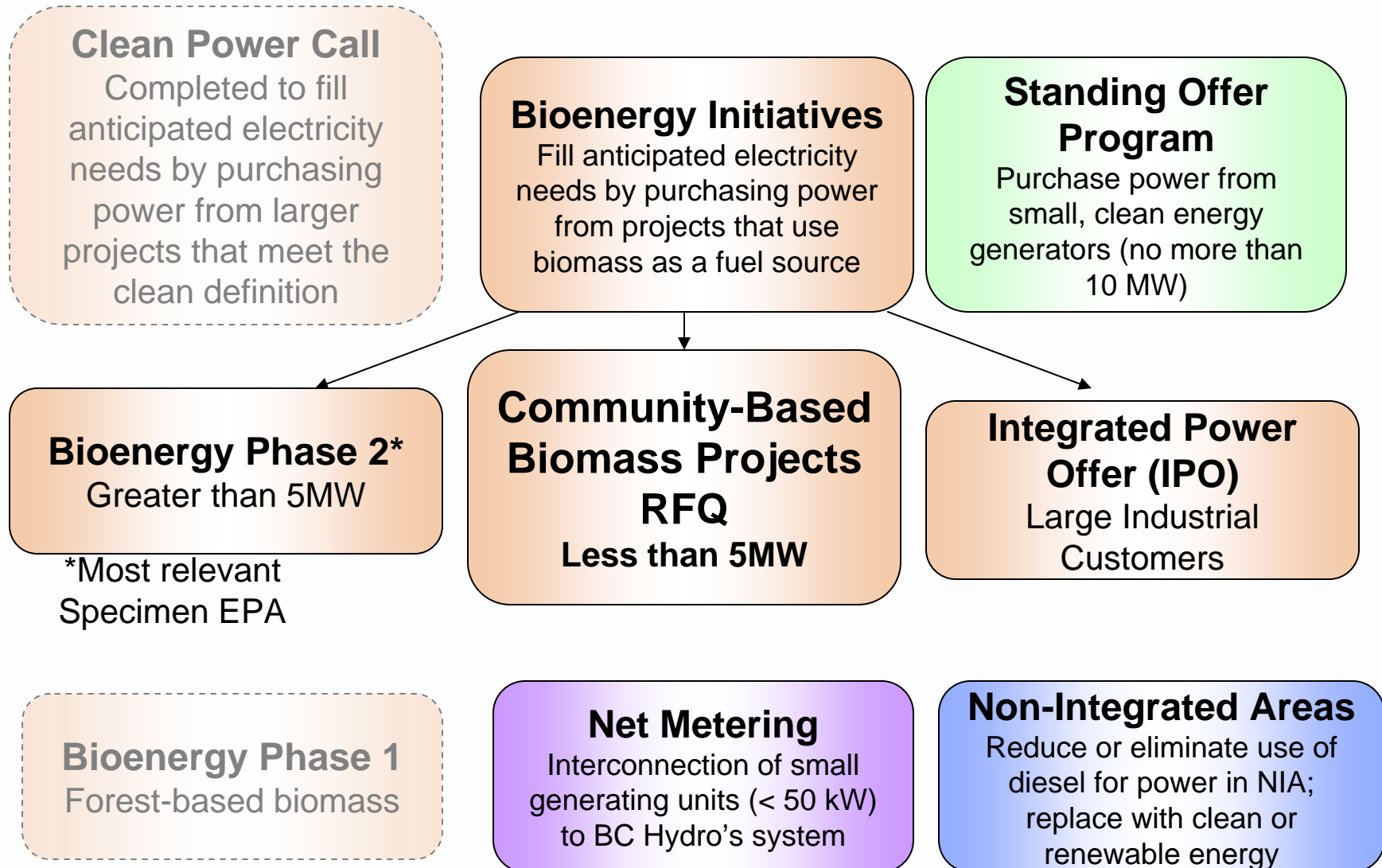
Overall Goal of Session:

- Provide attendees information that will help them in preparing their proposals and interconnection applications

We will do this by:

- Reviewing the Community-Based Biomass (CBB) Request for Qualifications (RFQ)
- Describing the overall RFQ objectives, design changes since draft and process
- Describing proposal guidelines, cost and financial inputs and the subsequent quantitative analysis
- Providing time for Q&As

- Attendees will gain a better understanding of the CBB RFQ; will be able to assess whether this RFQ is right for them
- Provide the key Action Items that Respondents will need to undertake in order to meet submission deadlines
- Understanding of key terms and conditions of Electricity Purchase Agreements



Seeking innovative, community-level solutions

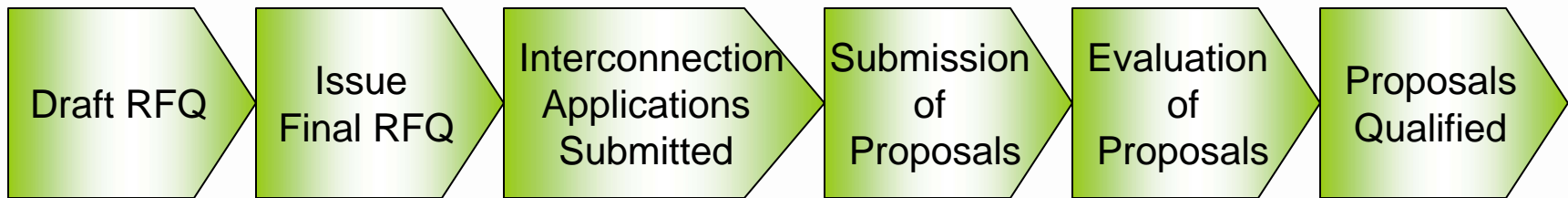
Cost competitive electricity for the integrated
electricity system

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Quantifiable local or regional benefits such as
improved reliability

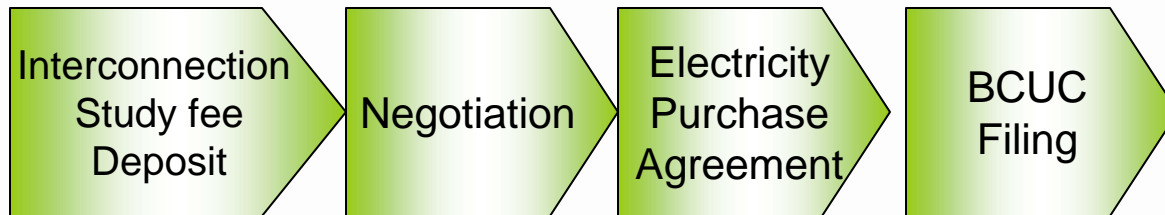
We are here

RFQ Process

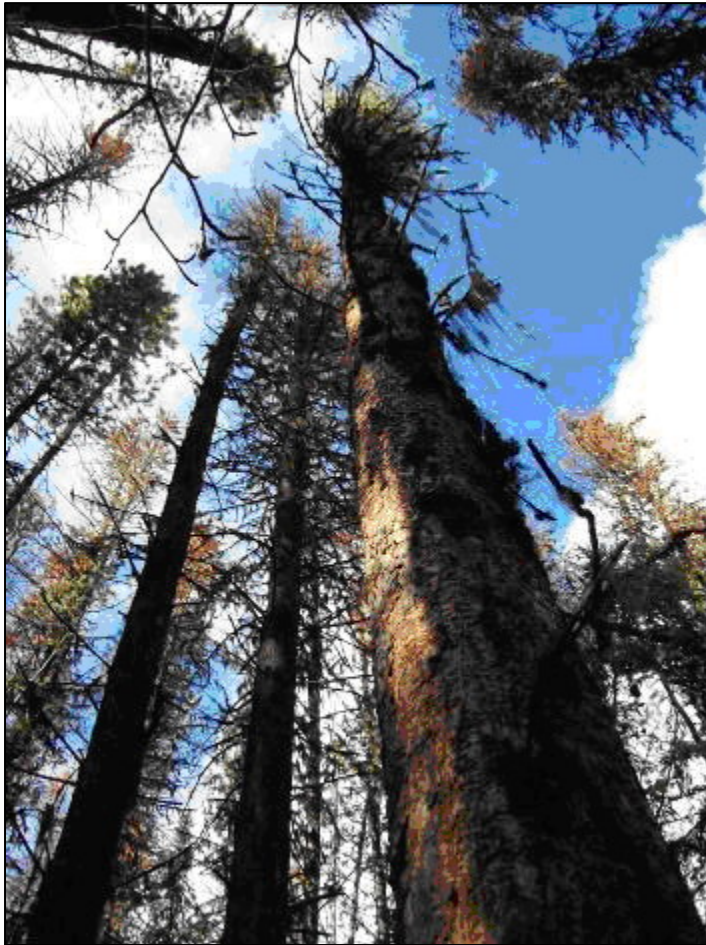


Summer/Fall 2010

Post RFQ Process



Fall 2010/Winter 2011



Community-Based Biomass Power Call: Overview

James Grant

1. Goals
2. Eligibility
3. Process
4. Evaluation Criteria

1. Help B.C. reach goal of becoming electricity self-sufficient by 2016, while securing cost-effective, clean or renewable, carbon-neutral energy for ratepayers
2. Fulfill objectives in the Clean Energy Act and the BC Bioenergy Strategy
3. Qualify at least two Proposals to engage in negotiations, which may result in Electricity Purchase Agreements being awarded
4. Conduct a fair and effective process
5. Reduce Project attrition and ensure a Projects' success



Eligibility Requirements:

- Biomass (Clean or Renewable Electricity)
- Must be registered in RFQ
- Between 50 kW and 5 MW
- Located in B.C.
- Point of Interconnection: (D-connected, and at customers' sites D- or T-connected)
- New or existing Projects
- Must be metered according to RFQ guidelines

Project Location:

- Projects must be located in British Columbia: (i) where BC Hydro can transmit energy to reach the Lower Mainland, but is not required to do so through another utility or out-of-province jurisdiction; or (ii) with a point of interconnection on the Distribution System in the Anahim Lake Service Area

- Recent addendum has introduced Anahim Lake Service Area to be eligible for inclusion in the CBB RFQ

Fuel Type

Qualify as clean biomass fuel under the BC Clean or Renewable Electricity Definitions applicable to biomass projects

BIOMASS ENERGY - means electricity generated from the combustion or gasification of organic materials. Biomass includes, but is not limited to:

- Clean wood biomass, meaning
 - wood residue within the meaning of the *Forest Act*,
 - wood debris from logging, construction, or demolition operations,
 - organic residues from pulp and paper production processes, and
 - timber, within the meaning of the *Forest Act* infested by the mountain pine beetle;
- Liquid fuels derived from biomass including bio-oil, ethanol, methanol, and bio-diesel;
- Dedicated energy crops; and
- Clean organically sourced material separated from municipal solid waste (MSW) and processed to serve as a combustion fuel.

www.empr.gov.bc.ca/EAED/AEPB/Documents/CleanEnergyJune.pdf

Project Size

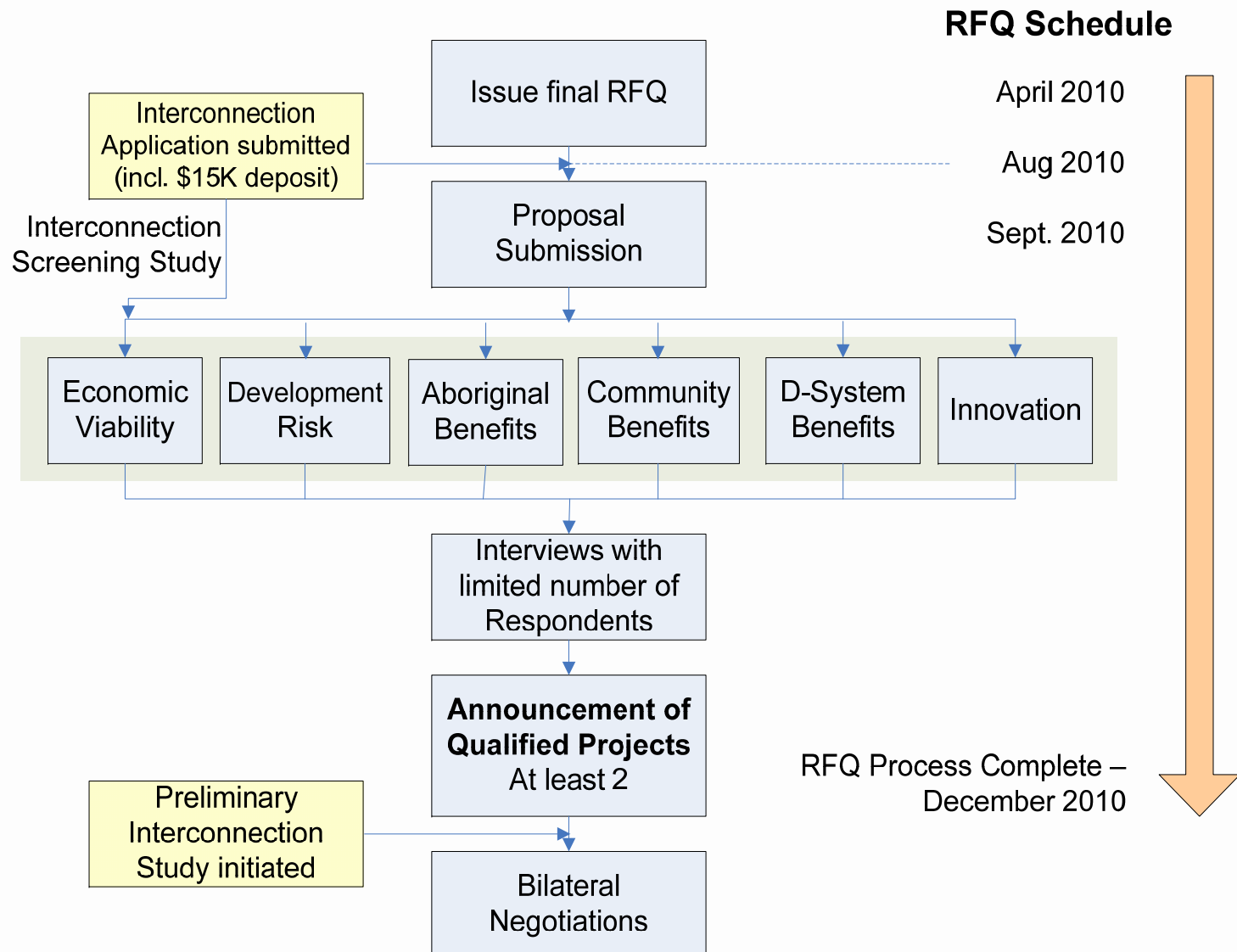
Must have an installed capacity larger than 50 kW, no greater than 5 MW

- Size allows connections to Distribution System (D-connected)
- Size reflects community-based focus of RFQ
- Smaller projects (< 50 kW) under Net Metering Program

Interconnections:

Point of Interconnection: Distribution System, or on an existing BC Hydro customer's site, which could be either D-connected or T-connected

Interconnection Conformity: Consistency between technical parameters of Proposal and interconnection application and study



Evaluation criteria categories:

Fundamental to Proposal:

Economic Viability	Development Risk
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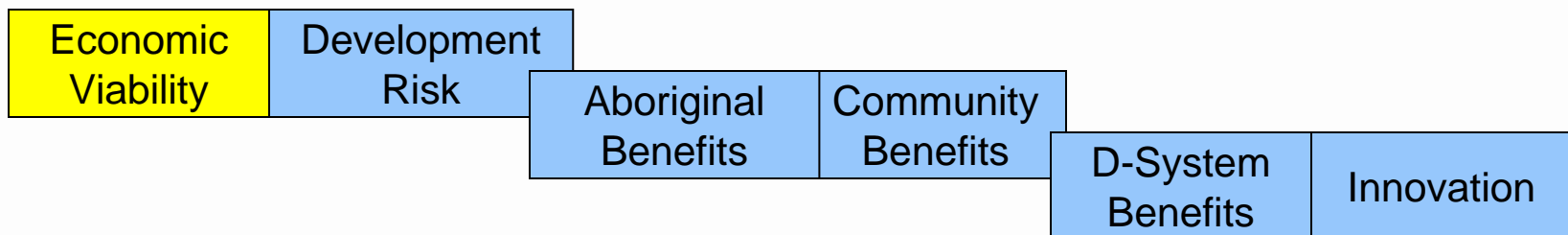
Strong Preference will be given to Proposals demonstrating:

Aboriginal Benefits	Community Benefits
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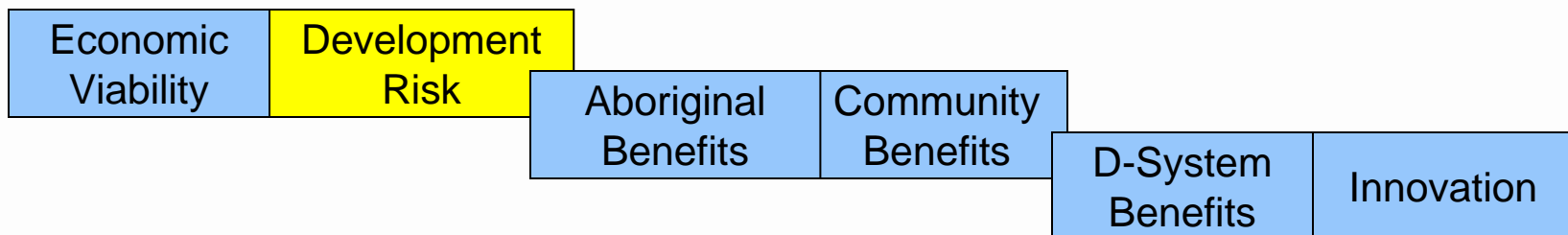
Additional consideration will be attributed to Proposals with:

D-System Benefits	Innovation
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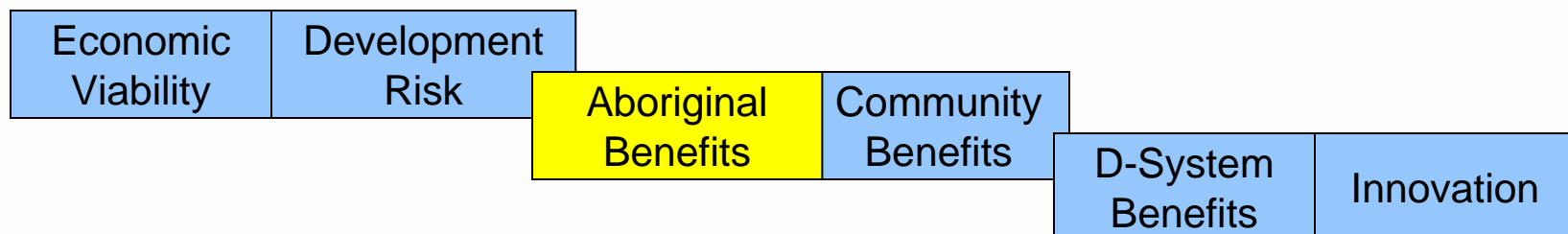
- Project costs;
- The Respondent's opportunity cost relative to its Project;
- Interconnection and Distribution/Transmission System impacts.



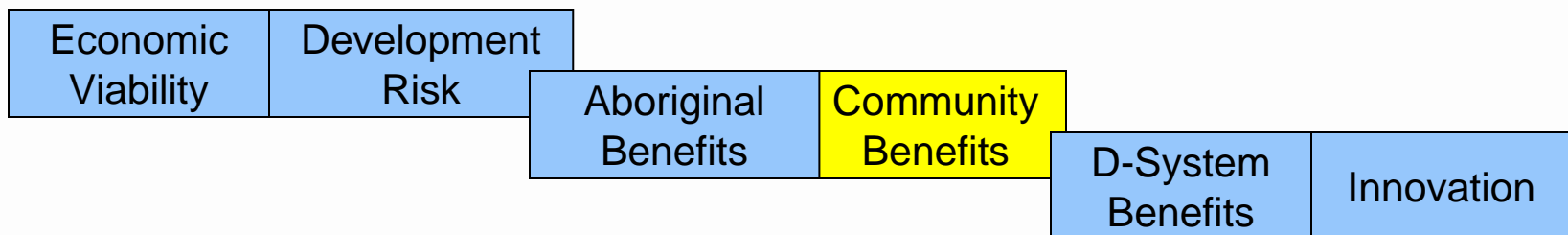
- A risk assessment that will include consideration of Project development and operating risks, including permitting, an understanding of First Nations consultation requirements, technological, constructability and schedule risks, and supply reliability and other operating availability and reliability risks;
- An assessment of probable fuel availability, with a desirability of minimizing adverse impacts on existing productive uses of biomass;
- Environmental impacts;
- Funding from alternative sources (e.g., Innovative Clean Energy (ICE) Fund, Sustainable Development Technology Canada).



- Benefits of the Project to Aboriginal Peoples as they relate to employment or business opportunities.

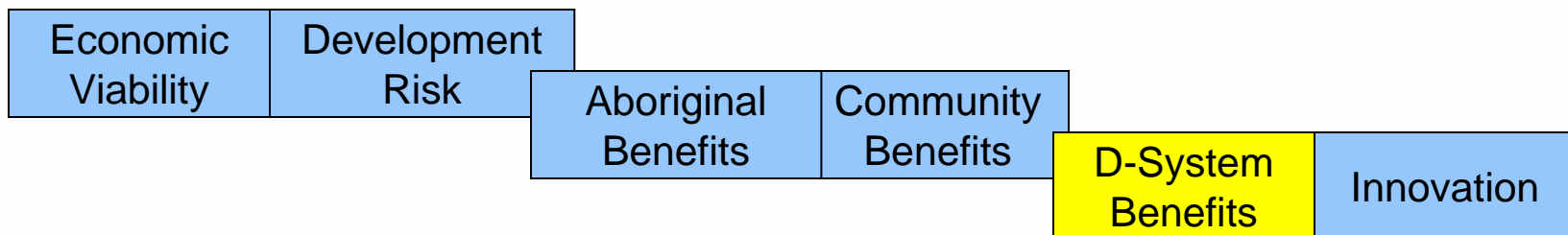


- Quantifiable economic near-term benefits to local community and potential for future long-term business and energy system growth
- Contribution to and coordination with a community's environmental programs
- Community or industrial use of waste heat (space and water heating, lumber drying, etc) and other by-products of electricity generation from biomass
- Environmental benefits

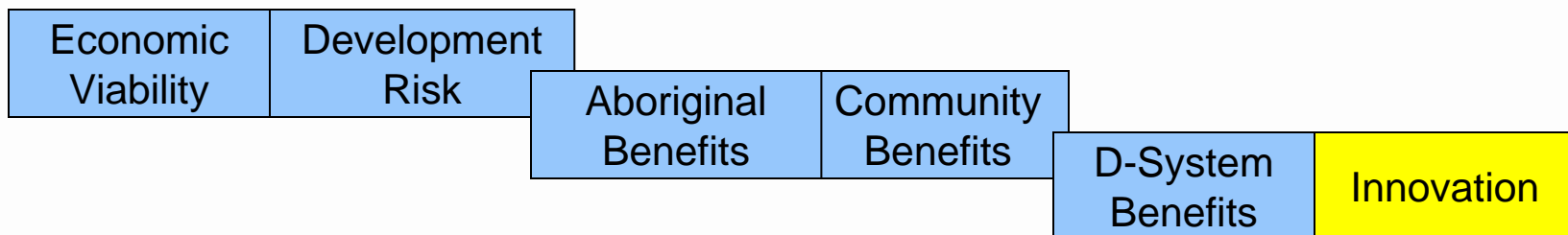
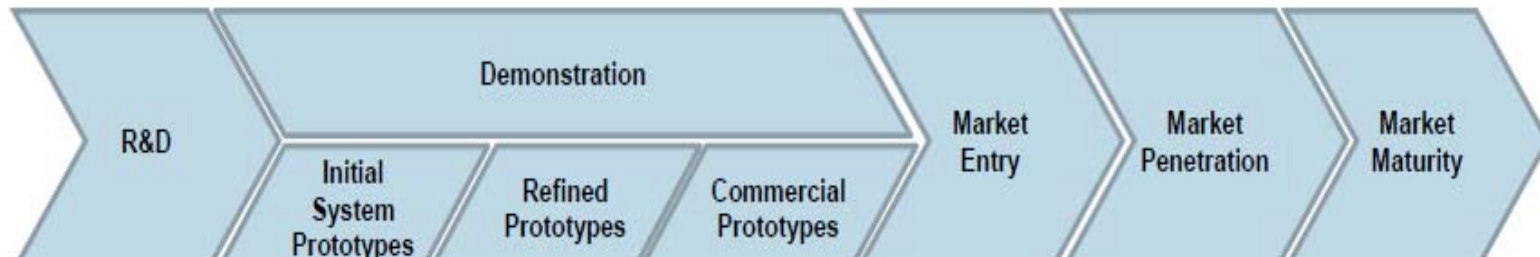


Distribution System Benefits include:

- Reliability / Islanding
- Capacity constraints
- Power quality



- Broader commercialization potential:
 - consideration of innovative technologies at the late demonstration or market development phase that have potential for wider application in British Columbia.

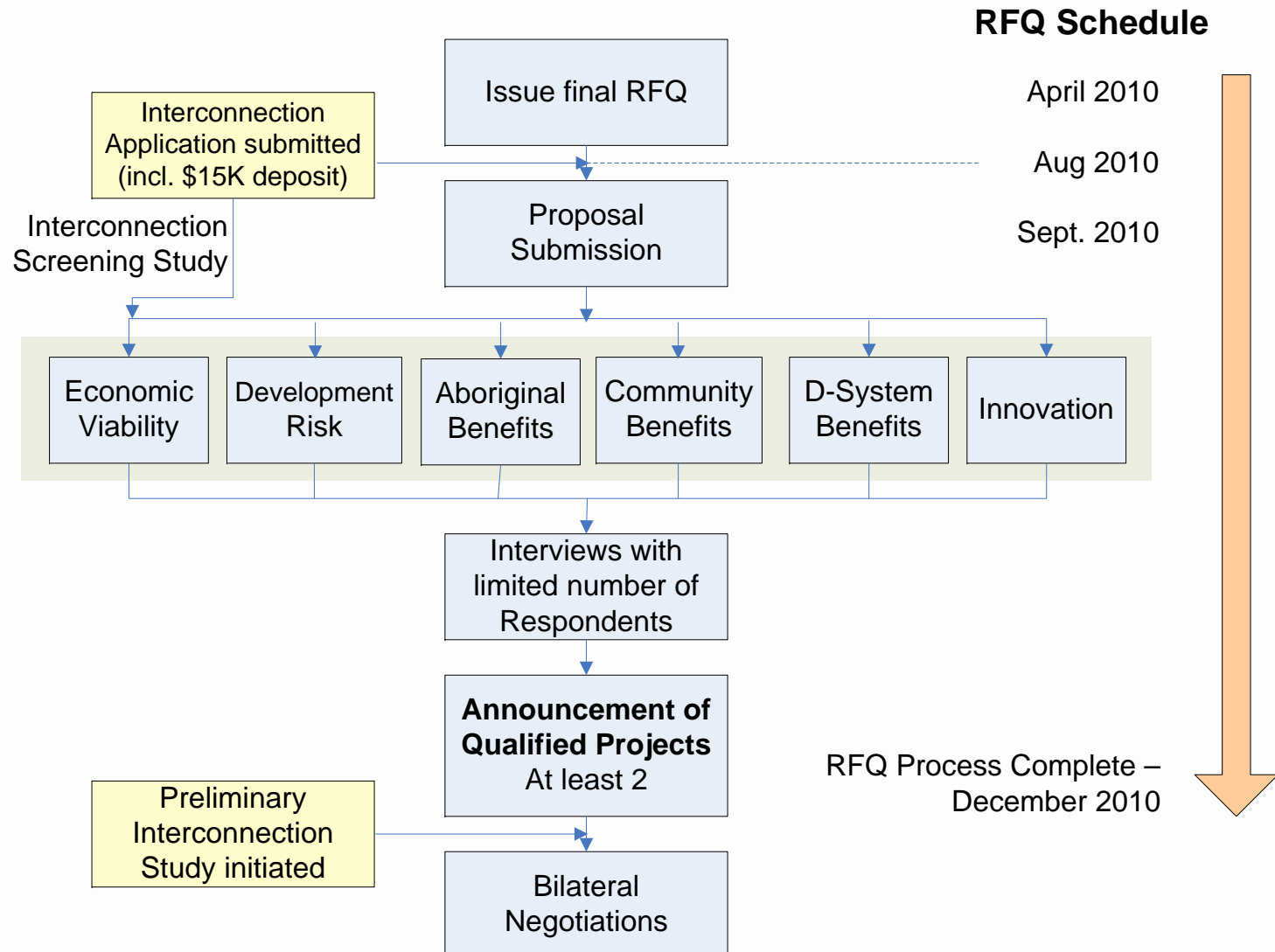


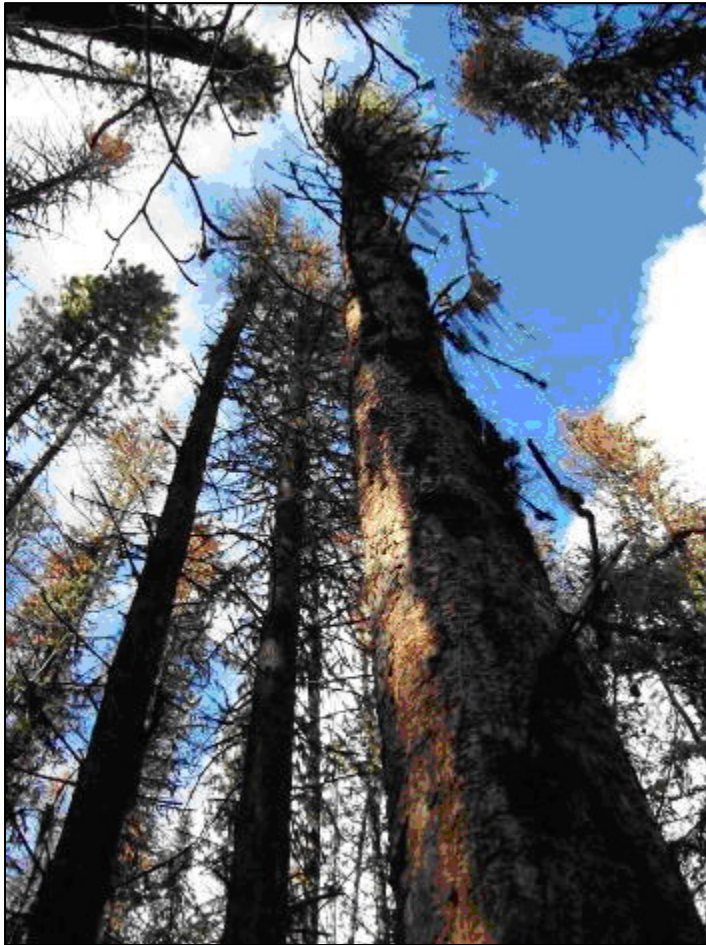
- If applicable, Project alignment to Anahim Lake Service Area technical needs in order to displace current diesel generation (see Schedule 7 – Anahim Lake Technical Information), and Community Electricity Plan (CEP) objectives (see Schedule 8 – Anahim Lake CEP).

Schedule 7 Anahim Lake Technical Information

Schedule 8 Anahim Lake Community Electricity Plan

– *Schedule 8 – Anahim Lake CEP posted July 6, 2010.*





Community-Based Biomass Power Call: Interconnections

Laila Bassim
Specialist Engineer
Interconnections

- Process
- Timelines
- Application & Cost of Study
- Interconnection Studies
- Contacts
- Summary

All Projects participating in this RFQ:

- Will be studied on a stand-alone basis, under the same system conditions.
- Respondents submitting Proposals, including Respondents with existing interconnection agreements for existing generation, will still be required to file an Interconnection Application for the new generation by the applicable deadline.
- The cost of the Preliminary Interconnection study for a Qualified Proposal, and any subsequent studies necessary to complete the Project's interconnection until the commercial operation date is achieved, will be borne by the Respondent.

Respondents submit initial Preliminary Interconnection Study (PIS) application, including site plan and Single Line Diagram, to BC Hydro for a Preliminary Interconnection Study (PIS)

July 30, 2010

Respondents submit completed PIS application and \$15,000* deposit to BC Hydro by 4:00 pm PST (Refundable if project is not qualified)

August 30, 2010

-- After selection of qualified proposals --

For qualified projects submit a signed completed Preliminary Interconnection Study Agreement with another \$15,000* to BC Hydro

Early 2011

* A cheque payable to BC Hydro

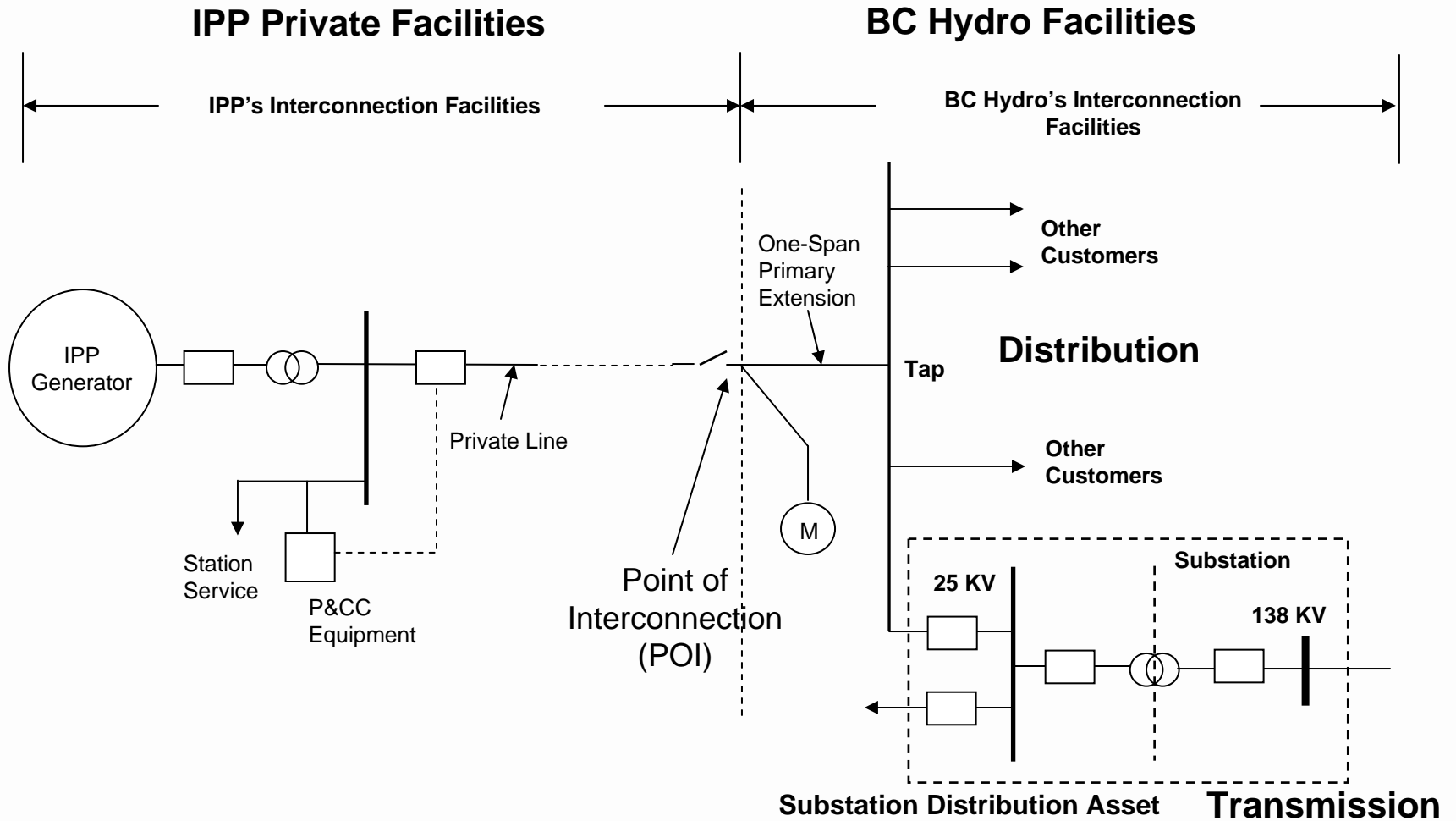
The application:

- The application form is posted on BCH web site
- Read the instruction carefully and fill all the shaded cells applicable to your project.
- Attach a Site Location Plan drawing and a Single Line Diagram
- Optional: attach any other information that is relevant to the interconnection studies.
- Please do not delete any sheets that are not applicable to your project.
- Electronic and signed hard copies of the application are required.

- The screening process is to provide a preliminary assessment of the interconnection feasibility, and to provide a high level assessment of the minimum technical requirements and cost range (level) of potential network upgrades needed to accommodate the interconnection of the generator.

- By July 30, 2010, for each project, an application including Site Plan and Single Line Diagram, signed by a professional engineer must be submitted to BC Hydro.
- BC Hydro will review completeness of Application and issue a deficiency list, if required, until application is completed.
- By August 30, 2010, for each project, a completed application signed by a professional engineer, and a deposit of \$15,000 must be submitted to BC Hydro for each project.
- Electronic and signed hard copies of the application are required for both dates.
- For qualified projects a signed completed preliminary Interconnection Study Agreement with another \$15,000* must be submitted to BC Hydro.

A Typical Distribution Generator Interconnection



- The studies on the distribution include all or some of the following:
 - Feeder studies to identify constraints, needs and alternatives for:
 - » feeder thermal and voltage limits,
 - » fault levels,
 - » protection coordination,
 - » recloser control,
 - » location of capacitor bank and voltage regulator,
 - » primary service
 - Prepare interconnection cost estimates

The study on the transmission will consist of:

- A short circuit analysis and a power flow analysis. The study shall state the assumptions, upon which it is based, state the results of the analysis and provide the requirements or potential impediments to provide the interconnection.
- A preliminary indication of the cost and length of time that would be necessary to correct any problems identified in that analysis and implement the interconnection.
- The study will provide a list of facilities (SDA assets and T assets) that are required and the interconnection cost estimates.

Laila Bassim

laila.bassim@bchydro.com

604-623-3755

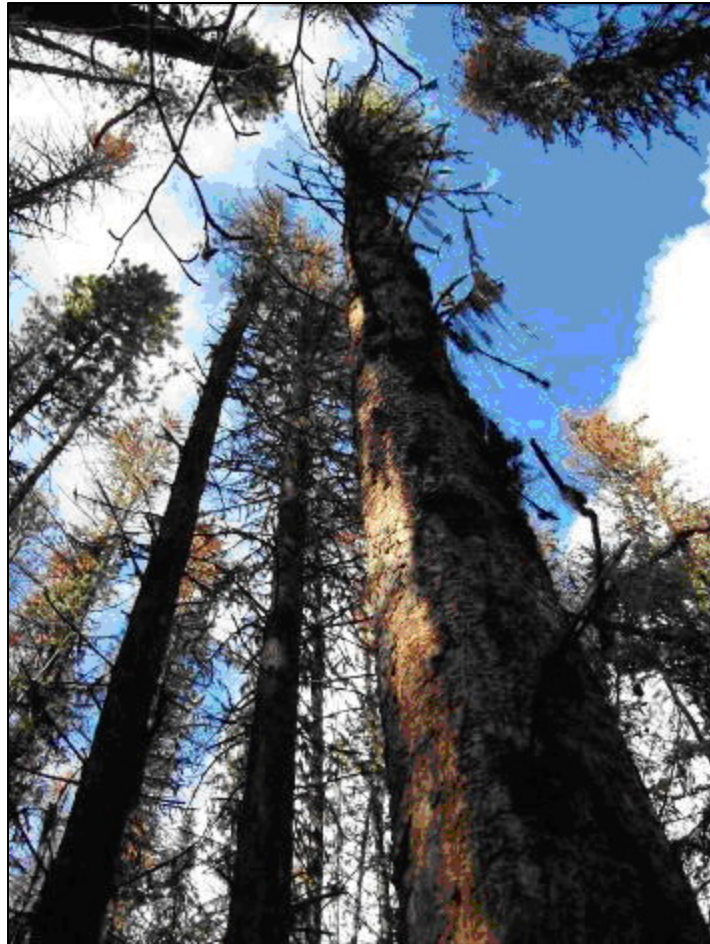
Interconnections, BC Hydro
333 Dunsmuir Street, 10th Floor
Vancouver, BC V6B 5R3

For more information go to:

http://www.bchydro.com/planning_regulatory/acquiring_power/generator_interconnections.html

- Interconnections' role is to facilitate and assist Respondents to CBB RFQ until the RFQ is complete
- Timelines, Timelines, and Timelines
- Completed Application
- Good luck

Questions



Community-Based Biomass Power Call: Proposal Submission Requirements

James Grant

- BC Hydro expects a large number of Proposals
- Make every effort to comply with RFQ requirements and Proposal submission guidelines and submit a complete, clear Proposal – see RFQ Proposal Checklist

Each Proposal must have a completed Interconnection Study Application:

- Must address all proposed Project configurations
- Must be materially consistent with Proposal

- **Do not miss key dates:**

- File Interconnection Study application with BC Hydro

- Initial Interconnection application July 30, 2010

- Completed Interconnection application August 30, 2010

Interconnection Study Deposit of \$15,000 payable to BC Hydro

- Submit Proposal September 15, 2010

Proposal Fee \$5,000 payable to BC Hydro

* For Anahim Lake Respondents refer to Addendum 1 on Interconnection Application dates

Four main sections:

Section 1 - Commercial & Quantitative Evaluation Data

- Download “Attachment 1 - Commercial and Quantitative Evaluation Data” from the RFQ Website and complete and submit it as an attachment to the Proposal as a separate MS Word document.

Section 2 - The Respondent

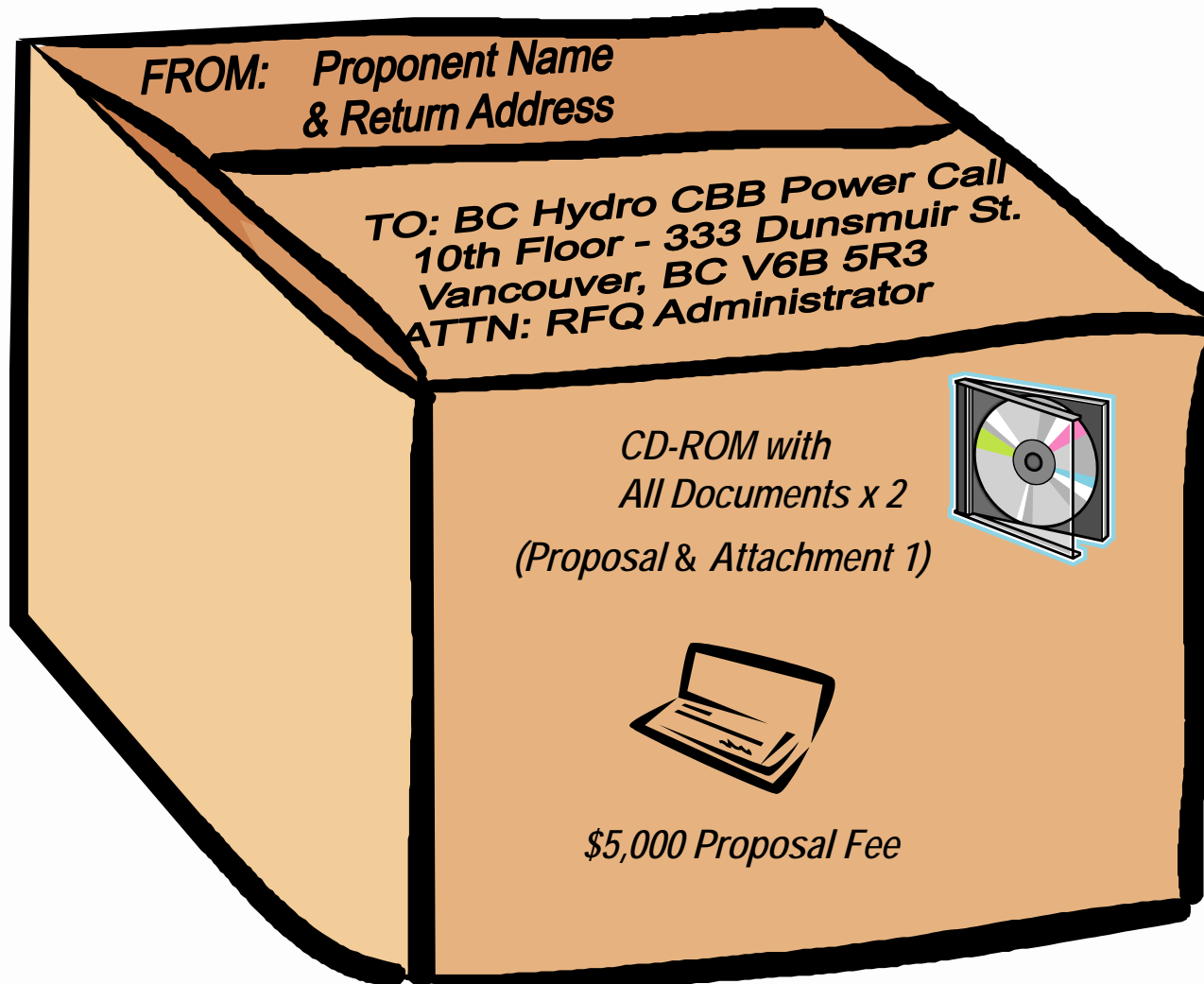
- Respondent Information

Section 3 - The Project

- Project Details

Section 4 - Supplementary Information

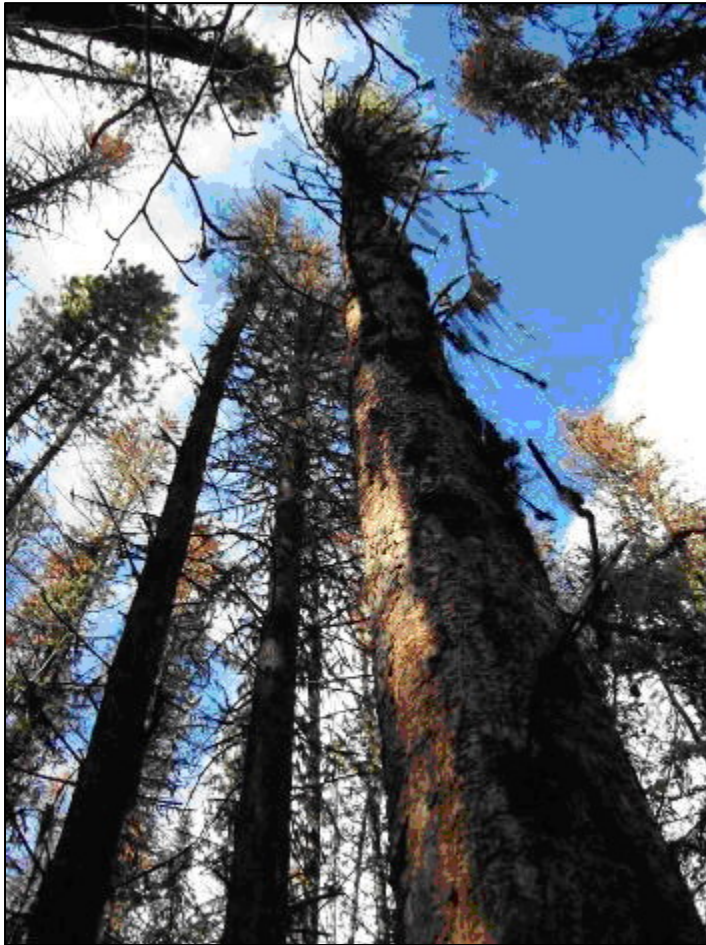
Required by RFQ Deadline:



Update, if required:

- Disclosure Statement
- Confidentiality & Compliance Agreement

Questions



Community-Based Biomass Power Call: EPA Terms

James Grant

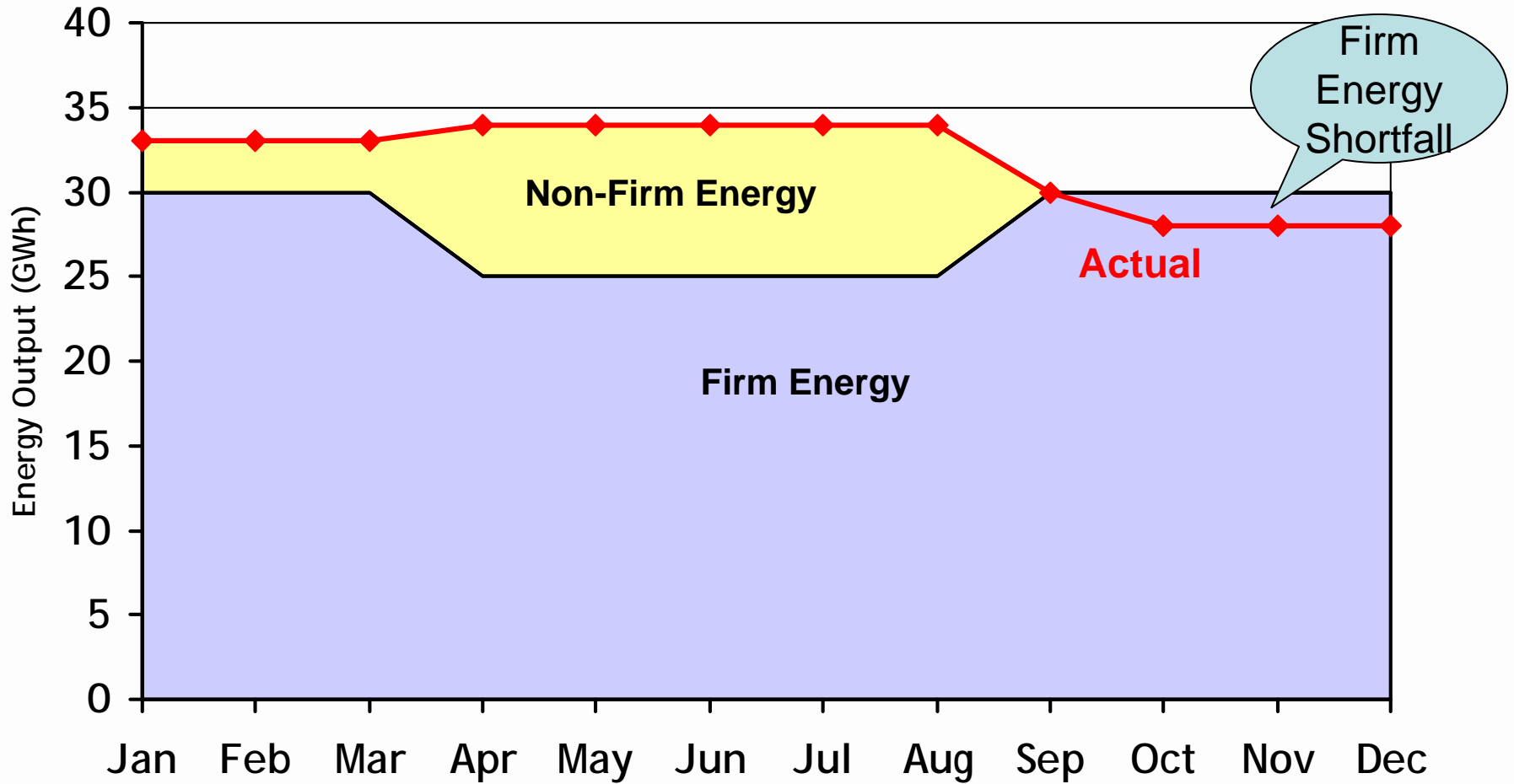
- Electricity Purchase Agreement overview
 - Discuss some specifics (e.g. firm vs non-firm products, Liquidated Damages, Performance Security, other terms and conditions)
- Q&A

- Electricity Purchase Agreements (EPAs)
 - Specimen EPAs
 - Firm Energy Pricing
 - Non-Firm Energy Pricing
 - Energy Allocation
 - Liquidated Damages
 - Performance Security
- Key Messages



- Standing Offer Program
 - Non-firm energy Specimen EPA
- Bioenergy Phase 2 (and Clean Power Call)
 - Firm energy EPA
- Specimen EPAs set out BC Hydro's preferred terms & conditions for certain projects
 - Firm Energy/Non-Firm Energy
 - Monthly Firm Energy
 - Liquidated Damages
 - Interconnection costs and Securities

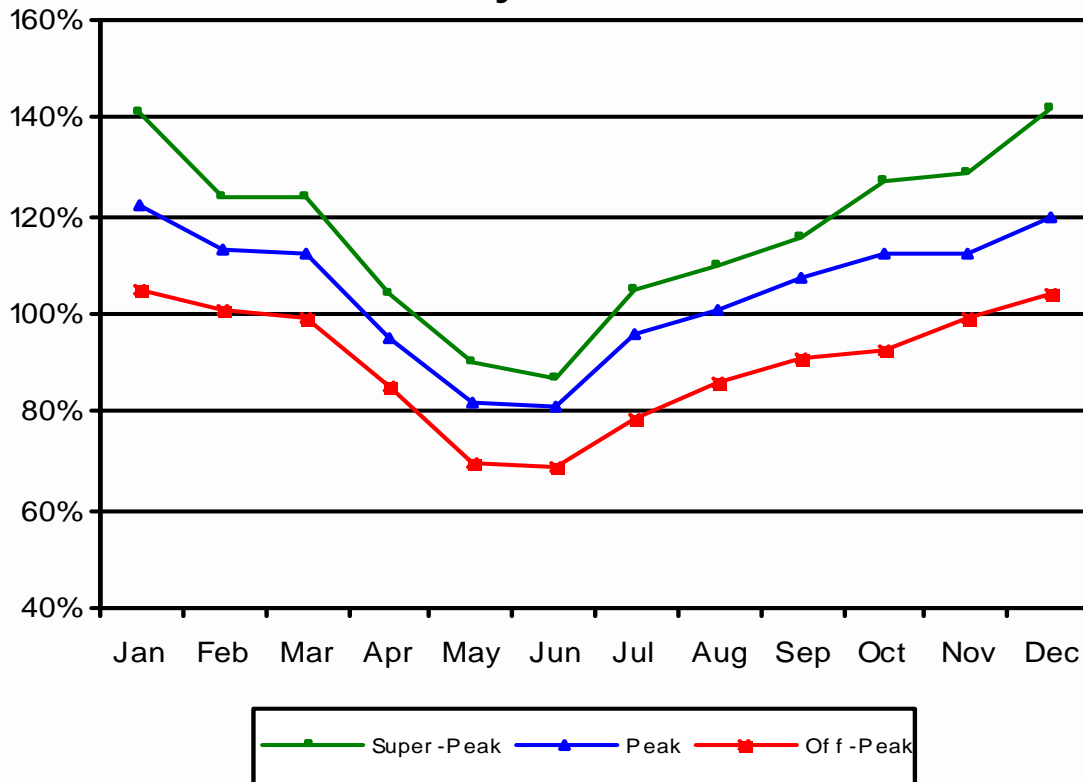
Energy Classification for Firm Energy EPA



- If using a Firm Energy Price - Proponent submits an indicative price for energy (at COD) for Firm Energy
- Firm Energy Price is the offered firm energy price, escalated by a percentage of CPI (contract specific), and adjusted by a time of delivery factor

- Price Escalation
 - Post-COD: Firm Energy Price to be escalated by a percentage of BC CPI
- Time of Delivery Factors
 - 3 x 12 table
 - Value of energy to BC Hydro during the peak, super-peak and off-peak periods for each of the 12 months

Delivery Time Curves



Delivery Time Table

	Super Peak	Peak	Off Peak
Jan	141%	122%	105%
Feb	124%	113%	101%
Mar	124%	112%	99%
Apr	104%	95%	85%
May	90%	82%	70%
Jun	87%	81%	69%
Jul	105%	96%	79%
Aug	110%	101%	86%
Sep	116%	107%	91%
Oct	127%	112%	93%
Nov	129%	112%	99%
Dec	142%	120%	104%

Non-firm energy pricing options

- From prior EPAs
 - Fixed Price Option A
 - Market Price Option B

- Firm and non-firm energy is calculated on an hourly or monthly basis
- Firm energy is the lesser of metered energy and firm energy commitment
- Non-firm energy is the difference between metered energy and firm energy when metered energy is greater than firm energy commitment
- Delivery shortfall occurs when metered energy is less than firm energy commitment

- Liquidated Damages (LDs) are incurred for delivery shortfall of contractual firm energy
- No LDs payable for the first year of operation
- LD amount = LD factor x firm energy delivery shortfall
 - where the LD factor is the greater of:
 - (1) market price less adjusted firm energy price, and
 - (2) \$5.20/MWh (Jan 1, 2010)
- Annual LD limit = 2 x performance security amount

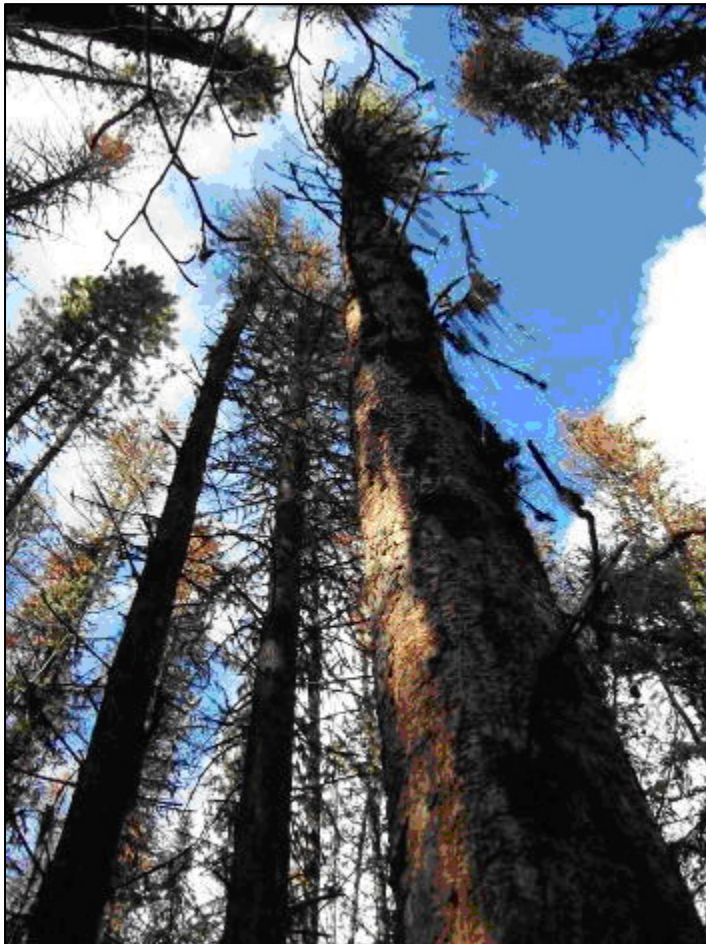
Project Stage	Description	Rate (\$/MWh in 2010\$)
1	EPA signing to Prior to Material Permits Expiry Date	\$2.60
2	From Material Permits Expiry Date to end of EPA Year 1	\$8.30
3	EPA Year 1 to end of EPA Year 6	\$6.20
4	For each 5-year period after EPA Year 6 ¹	\$4.10 - \$6.20
	1 Dependent on Average Annual Firm Energy	

¹Firm Energy amount is the average annual amount over the previous 5 years

Performance Security rates for Project stages 1 and 2 are not escalated whereas for stages 3 and 4 are escalated using BC CPI

- Seller
 - Failure to obtain material permits
 - Prolonged force majeure
 - Bankruptcy, insolvency or material default by the other party
- BC Hydro
 - Similar to Seller's rights, plus
 - COD delay
 - Failure to maintain performance and interconnection security
 - Failure to meet interconnection requirements

- References for EPA Calculations (from Bioenergy 2)
 - Firm and non-firm energy prices (Appendix 3 of EPA)
 - Liquidated damages for Delivery Shortfalls (Section 13 of EPA)
 - Energy Allocation (Appendix 3 of EPA)
 - Performance Security (Section 14 of EPA and Appendix 1 of EPA)
- Resources on BC Hydro Acquiring Power Website
 - Sample Calculations
 - Computation Models
 - Specimen EPAs for other power acquisitions processes



Community-Based Biomass Power Call: Quantitative and Commercial Requirements

Mohsen Movahed

- The purpose of the quantitative evaluation is to assess the cost effectiveness of the projects independent of the non-price evaluation criteria.
- The quantitative evaluation is divided into two parts:
 - Part 1: assess the economic viability of a project from the IPP's perspective by calculating the project's financial indices using the indicative energy price
 - Part 2: assess the reasonableness of indicative energy price from BC Hydro's perspective by calculating the levelized price as well as Adjusted levelized price
- BC Hydro will select projects for bilateral negotiation based on the quantitative evaluation and consideration of the non-price evaluation criteria

- BC Hydro will use the technical, financial, and commercial data provided for each project to calculate the project cash flow over the proposed contract term
- Elements of the project cash flow will include revenue from energy and non-energy sales, fixed and variable operating and maintenance costs, fuel cost, debt repayment and taxes
- Once the project cash flow is established, BC Hydro will be able to determine the project's Return on Equity (ROE), and payback period
- Alternatively, an energy price can be calculated assuming an ROE

- Proponents can propose Firm and associated Non-Firm, or 100% Non-Firm energy
- Pricing of energy for evaluation purposes:
 - Firm Energy and associated Non-Firm Energy
 - indicative energy price for firm energy (Adjusted Firm Energy Price will be calculated and used for evaluation)
 - BC Hydro long term market price forecast for non-firm energy
 - 100% Non-Firm Energy
 - indicative energy price for all energy delivered (will be compared with Standing Offer Program prices)

- Two steps to calculating an Adjusted Firm Energy Price
 - Price Levelization
 - Adjustment of levelized price to account for all transmission-related attributes (including interconnection costs)
- Price Levelization
 - Provides a method for comparing energy prices for projects with different commercial operation dates, and contract durations
 - Levelized plant gate price (expressed in January 2010 dollars) is calculated by dividing the Present Value of the firm energy cost (based on the indicative price) by the Present Value of the energy flow
- Adjustment for transmission-related attributes
 - Accounts for the additional cost to be incurred by BC Hydro in transmitting energy from the plant gate to the Lower Mainland on a standalone basis

- Network Upgrade (NU) cost represents the required cost to upgrade the network to accommodate the delivered capacity and energy of each project to the BC Hydro system
- Cost of Incremental Firm Transmission (CIFT) represents the estimated cost for upgrading the bulk transmission system to transmit energy from the various regions to the Lower Mainland
- Energy Losses represent the % adjustment in energy delivery from the project through the BC Hydro system to the Lower Mainland

Assumptions	Proposal 1	Proposal 2
Indicative Price @ COD	\$91.9/MWh	\$93.8/MWh
COD	January 2012	August 2013
Capacity	3 MW	4.5 MW
Annual Firm Energy	20 GWh	30 GWh
Contract Term	20 Yrs	15 Yrs
Network Upgrade	\$2.0 Million	\$1.3 Million
Location	Vancouver Island	Central Interior

- All of the numbers are in January 2010\$/MWh:

Levelized firm energy Price	88.13	88.13
NU Adjuster	7.23	3.72
CIFT Adjuster	0.00	2.70
Loss Adjuster	- 0.20	2.23
Adjusted Firm Energy Price	95.17	96.77

- Each Proposal submission for the CBB RFQ must include the completion of Attachment 1--Commercial and Quantitative Evaluation Data
- Attachment 1 provides a brief description for each item requested
- In completing the attachment, select values where drop-down menus are available, otherwise enter data in the requested format or units
- BCH will use the information provided in Attachment 1 in its Quantitative Evaluation. In addition, BCH may conduct sensitivity analysis using scenarios and/or assumptions not provided by the Proponent

- Some of the items in Attachment 1 have been highlighted below to provide respondents with further clarification in completing the requested data

Item #7: “Asset Life: Indicate the expected life of the plant which could be the contract term with BC Hydro”

- Asset Life is the expected life of the plant and would be used to establish the contract term with BC Hydro unless the proponent elects not to link asset life to the contract term. In such a situation, the proponent could elect any contract term (in whole years)

Item #8: “Product: Select “Firm Energy”, “Non-Firm Energy” or “Other”.

- If the proposed product is 100% firm energy or predominantly firm with associated non-firm energy, select “Firm Energy” and if the proposed product is 100% non-firm energy, select “Non-Firm Energy”.

Item #9: “Indicative Electricity Price: Enter the indicative electricity price needed from BC Hydro....”

- The indicative electricity price is the nominal price at the expected COD assuming escalation at 100% of CPI. Should a project be accepted for bilateral negotiation, the escalation rate could be modified by mutual agreement.

Item #11: "Total Yearly Energy: Includes firm and non-firm energy"

Item #15: "Expected Firm Energy Profile: Provide the expected monthly energy profile if 'Firm Energy' was selected in item #8"

- The total annual energy in item #11 must be equal or greater than the sum of the expected monthly firm energy deliveries in item #15
- Providing the monthly firm energy profile is mandatory for projects with "Firm energy" product

Product	Correlation between items #11 and #15
Firm with associated Non-Firm Energy	The entry for item #11 must be equal or greater than the sum of twelve entries for item #15. The difference between the total annual energy in item #11 and the sum of the 12 monthly firm energy deliveries in item #15 is assumed to be non-firm energy
Non-Firm Energy	No entries for item #15. Expected non-firm energy for the year is entered in item #11

Item #14: “Overall Efficiency: If ‘Cogeneration’ was selected in item #3, indicate the ratio of energy output (heat & electricity) to the energy input from the fuel to the plant”

Item #12: “Heat Rate: Indicate the required fuel (GJ) to deliver one GWh of electrical energy at the point of interconnection to the BC Hydro grid”

Item #13: “Average Thermal Extraction (e.g. steam): If ‘Cogeneration’ was selected in item #3”

- If the project is a cogeneration facility, enter the overall efficiency inclusive of electricity and heat/steam output for item #14. This entry will be used to calculate the total fuel required to operate the plant. Please ensure the entry in item #14 does not conflict with the entries in items #12 and #13

Item #18: "Fixed Operation and Maintenance (O&M) Costs and Escalation Percentage: Provide the yearly fixed"

Item #19: "Variable O&M Costs and Escalation Percentage: Provide the variable O&M costs in"

- Either a portion or the entire fixed and variable operating and maintenance costs can be escalated annually using the CPI for British Columbia

Item #20 - #22: The fuel costs and the non-electricity revenues can be escalated annually by escalation rates (%) other than CPI

- The reasonableness of the proposals will be assessed from both BC Hydro and the respondent's perspectives.
- Either a firm or non-firm product is accepted in this RFQ. However, the firm product is a more valuable product to BC Hydro.
- Adjusted firm energy price will be used in the quantitative evaluation of firm energy projects.
- Standing Offer Program (SOP) will be the main benchmark for 100% non-firm energy proposals.
- In addition to the quantitative evaluation, selection of projects for bilateral negotiations will include consideration of non-price factors.

Questions

Thank You

www.bchydro.com/bioenergycallcbb

bioenergy.call@bchydro.com