

BRITISH COLUMBIA UTILITIES COMMISSION
B.C. Sustainable Energy Association, *et al*, Information Request No. 2 to BC Hydro
July 22, 2005
BC Hydro 2005 Resource Expenditure and Acquisition Plan

2.1.0 Reference: Exhibit B-11; and Exhibit B-1, March 7, 2005, cover letter from Richard Stout, Chief Regulatory Officer, BC Hydro to BCUC

2.1.1 Please clarify whether BC Hydro seeks Commission approval of the F2006 Call.

2.1.2 If so, please provide the statutory reference(s).

2.2.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.3, A5

The evidence states:

Firm energy has been defined for the purposes of the F2006 Call to represent a volume of energy, with a contractually assured delivery, that an IPP must commit to providing over a specified period.

2.2.1 Was the definition of “firm energy” the subject of consultation with IPPs and others?

2.2.2 If so, please describe the results of such consultations.

2.3.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.3, A6

The evidence states:

Regarding the Green Attributes, bidders will be given the option of (a) keeping the Green Attributes for sale or use in other markets; or (b) assigning the Green Attributes to BC Hydro and, for such assignment, receiving a credit in the tender evaluation of \$3/MWh. Bidders that do not tender the Green Attributes of their projects to BC Hydro may still be considered BC Clean Electricity for evaluation purposes, provided their projects meet the BC Clean Electricity requirements, which are set out later in my testimony.

2.3.1 Please confirm that the \$3/MWh Green Attribute credit for evaluation purposes takes the form of a reduction of the bid price by \$3/MWh for evaluation purposes. If not, please explain.

2.3.2 Please confirm that where a bidder elects to assign the Green Attributes to BC Hydro and becomes a successful bidder the ensuing electricity purchase agreement is at the bid price, not at the price used for evaluation purposes.

2.3.3 Do the proposed F2006 Call rules provide that where the bidder elects to retain the Green Attributes rather than assigning them to BC Hydro the \$3/MWh Green Attribute credit for evaluation purposes does *not* apply?

- 2.3.4 If so, what is the rationale for not applying the \$3/MWh Green Attribute credit *for evaluation purposes* where the bidder elects to retain the Green Attributes rather than assigning them to BC Hydro?
- 2.3.5 Please confirm that Green Attributes include the absence of GHG emissions. If this is not so, please discuss who would own present or future credits that might arise from the absence of GHG emissions from a project.
- 2.3.6 Are there types of projects that might be bid into the F2006 Call that would involve less than BATEA concentrations of GHG emissions but for which the proponent would be unable or unwilling to obtain EcoLogo certification? If so,

2.4.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, page 3, lines 5-11; page 7, and lines 16-25

The evidence states:

BC Hydro is targeting to procure a minimum of 1,000 gigawatt hours per year (GWh/year) of electrical energy as follows:

- (a) minimum of 800 GWh/year of firm electrical energy supply and up to 800 GWh/year of associated non-firm electrical energy supply from projects 10 megawatts (MW) and larger (Large Projects) built and operated by independent power producers (IPPs); and
- (b) minimum of 200 GWh/year (based on a 50 MW portfolio at approximately 50% capacity factor) of electrical energy supply from projects 1 MW and larger, but less than 10 MW (Small Projects) built and operated by IPPs.

Firm energy supply has always been important to BC Hydro given its obligation to provide reliable electricity service to its customers. In its recent calls, BC Hydro has reflected the need for firm energy through various adjustments in the evaluation process and through prescribed EPA obligations. The requirement to deliver a specified minimum volume of energy (in the form of "firm" energy) over a specified period of time, together with contractual remedies for delivery shortfalls, enhances reliability and predictability of power supply to BC Hydro. With the increasing reliance on IPP supply, BC Hydro needs to ensure that the supply contracted under EPAs carries firm delivery commitments and that new supply does not detract from the value of the existing system.

- 2.4.1 What is the rationale for *not* setting a maximum amount for *firm* energy to be acquired from projects 10 MW and larger?
- 2.4.2 What is the rationale for *setting* a maximum amount for *non-firm* energy to be acquired from projects 10 MW and larger?
- 2.4.3 What is the rationale for *not* setting a maximum amount for energy to be acquired from projects of over 1 MW and under 10 MW?
- 2.4.4 Please discuss the qualitative issues that would arise for BC Hydro if there were an *increase* in the amount of non-firm energy to be acquired from projects 10 MW and larger

from the present proposed amount (a) to 1,600 GWh per year or (b) to 3,200 GWh per year. In particular, does BC Hydro take the position that such increases would adversely affect BC Hydro's or BC Transmission Corporation's operations? If so, to what extent has BC Hydro quantified such effects?

2.4.5 Would BC Hydro be averse to increasing the non-firm component of energy to be acquired from projects 10 MW or larger?

2.4.6 Please discuss the qualitative issues that would arise for BC Hydro in relation to allowing large bids with *no* firm energy component. In particular, does BC Hydro take the position that large, non-firm purchase agreements would adversely affect BC Hydro's or BC Transmission Corporation's operations? If so, to what extent has BC Hydro quantified such effects?

2.4.7 Please discuss any assumptions or plans that BC Hydro made about the amounts, attributes and timing of *future* calls for electricity that affected the amounts, attributes and timing of electricity sought in the *F2006* Call.

2.5.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, pp.3-4, A6

The evidence states:

...Bidders that elect to assign the Green Attributes to BC Hydro will retain the ability to apply for government programs such as the federal Renewable Power Production Incentive (RPPI) or Wind Power Production Incentive (WPPI). If the government program requires government ownership of the Green Attributes, BC Hydro will forfeit its rights to the Green Attributes and adjust the contracted power price downward by \$3/MWh (escalating at Consumer Price Index (CPI) from January 2006) in order to recoup the evaluation credit previously provided to the successful bidder.

The following is an attempt to describe the proposed process: A bidder claims Green Attributes. The bid is evaluated on the basis of the bid price less \$3/MWh. If the bid is successful, the bidder receives the bid price. The successful bidder is allowed to apply for a subsidy from a program such as RPPI or WPPI. The successful bidder makes an application to a subsidy program. If that application is rejected for some reason then the bidder continues to be paid at the bid price. If the subsidy application is approved and the program does *not* require the bidder/subsidy applicant to transfer the Green Attributes to the government sponsoring the subsidy program, then the bidder receives the bid price from Hydro and receives the subsidy from the subsidy program. If the subsidy program *does* require the bidder/subsidy applicant to transfer the Green Attributes to the government sponsoring the subsidy program, then BC Hydro returns the Green Attributes to the bidder and the bidder transfers the Green Attributes to the sponsoring government, the bidder receives the bid price less \$3/MWh from BC Hydro and the bidder receives the subsidy from the subsidy program.

2.5.1 Please confirm or clarify the anticipated process.

- 2.5.2 Where BC Hydro is deducting \$3/MWh from the bid price because the bidder has obtained a Green Attributes subsidy, and where the duration of the Green Attributes subsidy program is less than the duration of the electricity purchase agreement between the bidder and BC Hydro, does the electricity price revert to the bid price upon the expiry of the subsidy?
- 2.5.3 Is a bidder allowed to make its bid conditional on approval of an application by the bidder for a subsidy from a program such as RPPI or WPPI?
- 2.5.4 Does BC Hydro acknowledge that it would have to refrain from selling Green Attributes acquired pursuant to the F2006 Call in order to be in a position to allow successful bidders to obtain WPPI or RPPI subsidies (in the event that such programs require transfer of Green Attributes to the sponsoring government)?

2.6.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.5, A8

The evidence states:

As noted in the 2005 REAP, additional supply and demand uncertainties include future load growth, IPP attrition and energy savings from DSM initiatives.
[underline added]

2.6.1 Please explain what “IPP attrition” means.

2.7.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, pp.5-6, A8, A9

The evidence states:

...BC Hydro proposes to increase the size of the F2006 Call from a target maximum of 1,000 GWh/year to a target minimum of 1,000 GWh/year. [underline added]

And:

The demand/supply balance will be revisited prior to the tender evaluation and will be used as a criterion in selecting the optimal portfolio.

- 2.7.1 In addition to the demand/supply balance, what other criteria will be used in selecting the optimal size of the portfolio arising from the F2006 Call?
- 2.7.2 When, in relation to the public initiation of the F2006 Call, does BC Hydro anticipate the *evaluation* of the F2006 Call will occur?

2.8.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, page 3, lines 5-11; and page 7, lines 25-34

The evidence states:

... For the F2006 Call, BC Hydro is proposing to acquire monthly firm or hourly firm energy as tendered by bidders. Monthly firm energy provides a balance between the capability of various IPP resources and BC Hydro's system limitations. The hourly firm option is intended to incent bidders to provide a higher-value “capacity rich” product, if

available, by providing a \$3/MWh evaluation credit adjuster for such projects. The basis for the additional value provided by a project that provides firm energy on an hourly resolution is the levelized cost of Revelstoke Unit #5, inclusive of forgone system benefits to BC Hydro, a proxy for BC Hydro's cost of incremental intra-day system capacity. [p.7]

- 2.8.1 Please provide the calculation used to arrive at the \$3/MWh evaluation credit adjuster.
- 2.8.2 Please explain why the levelized cost of Revelstoke Unit #5 was used as the standard of comparison.
- 2.8.3 Has BC Hydro made other calculations to assess the value of hourly firm energy? If so, please provide them.
- 2.8.4 Are bidders allowed to split their bids between the hourly firm option and the monthly firm option? If not, why not?
- 2.8.5 Please summarize the feedback BC Hydro has received from IPPs by resource type regarding the effect of a monthly firm energy stipulation on their respective abilities to prepare a feasible bid.

2.9.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, A. 12, pp 7-8; A. 13, pp. 8-10; and page 17, lines 27-31; and Exhibit C, page 8, No. 6

The evidence states:

Energy Profile: Large Project bidders will tender a firm energy profile (monthly or hourly) to reflect their specific project characteristics. This will provide bidders with the opportunity to optimize the risk/reward balance for their projects in conjunction with the terms and conditions of the CFT and EPA, allowing for more competitive bids. [Hemmingsen, p.17]

...

Further, price premiums and discounts will also be applied based on the month of delivery, with larger premiums applied to higher demand months and larger discounts applied to lower demand months. [Hemmingsen, Ex. C, pdf p.66]

- 2.9.1 Please provide the schedule of premiums and discounts based on month of delivery.
- 2.9.2 Please provide the rationale for the amounts of the month-of-delivery premiums and discounts, including any relevant numeric calculations.
- 2.9.3 To what extent does BC Hydro consider that the month-of-delivery premiums and discounts reflect the values and costs to BC Hydro of having proportionately larger amounts of firm energy supplied to it by IPPs in the months with the largest gaps to be filled by "BC Hydro discretionary generation" (as per Figures 1 & 2 of Ms. Hemmingsen's testimony)? If the values and costs are not completely reflected, please discuss why not.
- 2.9.4 Apart from the seasonal constraints (detailed in A. 13), the \$3/MWh evaluation credit adjuster, and the month-of-delivery premiums and discounts, has BC Hydro considered

other constraints or credits associated with bidders' energy profiles in the development of the F2006 Call? If so, please list them and discuss the reasons why they were not factored into the Call.

2.10.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, page 10, Table 1

2.10.1 Please define "HLH" (high load hours) and "LLH" (low load hours) and discuss their significance with respect to the provision of electricity by BC Hydro.

2.10.2 Please discuss how BC Hydro arrived at the specific price premiums in Table 1, including any equations used to calculate the premiums.

2.10.3 Please provide a table or tables detailing when HLH and LLH occur, annually, monthly or daily, as the case may be.

2.11.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.11, A14; and Testimony of Mary Hemmingsen, Appendix E, Energy Plan, p.28

The evidence states:

BC Hydro recognizes that it is incumbent on the utility to demonstrate that any new resource options are "cost-effective". Cost-effectiveness does not refer only to least cost but also encompasses factors such as reliability, security of supply, price risk, project timing and the financial capability and experience of the bidder. [underline added]

The B.C. Energy Plan states:

Policy Action #9 (new): Electricity distributors will acquire new supply on a least-cost basis, with regulatory oversight by the BC Utilities Commission. [underline added]

2.11.1 Please discuss how BC Hydro's understanding of the terms "cost-effective" and "least cost" relates to the term "least-cost" in the *Energy Plan*.

2.12.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, page 18, A. 21

2.12.1 Has BC Hydro considered the cost and feasibility of meeting all incremental electricity needs with "BC Clean Electricity"? If so, please discuss the conclusions.

2.13.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.25, A27

The evidence states:

Q27. Should BC Hydro expressly address the risk allocation for future regulatory compliance costs for GHG emission offsets in its F2006 Call bid evaluation?

A. Yes. It would be imprudent for BC Hydro not to do so, for the reasons set out in the Direct Testimony of Tim Lesiuk and Richard Rosenzweig.

2.13.1 Please confirm that "risk allocation" here refers to allocation of financial risk between BC Hydro and a successful bidder.

2.13.2 Please discuss the overlaps and differences between:

- (a) allocation of GHG emissions liability risk between BC Hydro and a successful bidder,
- (b) incorporation of the GHG emissions liability risk of individual tenders into the evaluation of individual tenders as one component of the proposed F2006 Call process,
- (c) use of GHG emissions liability risk as a criterion in the creation of an optimal portfolio, as a component of the F2006 Call process, and
- (d) imposition of GHG emissions offset responsibilities within the electricity purchase agreement.

2.13.3 The question (Q27) refers to the “F2006 Call bid evaluation.” [underline added] Please comment on whether there are only two ways in which the answers to questions Q27 to Q31 relate to *bid evaluation*, as distinct from allocation of risk between BC Hydro and a successful bidder:

- (a) The EPA requirement that F2006 projects comply with otherwise applicable GHG emissions regulatory regimes regardless of COD imposes an additional potential financial cost that would be borne more heavily by projects with relatively high GHG-intensity.
- (b) By offering to take GHG emissions liability risk (at prices set out in Hemmingsen Evidence, Exhibit B, p.12), BC Hydro indirectly encourages bidders not to underestimate GHG emissions liability in establishing their respective bid prices, a factor that is proportionately more significant for projects that are relatively GHG-intensive.

2.13.4 Does BC Hydro acknowledge that there is a public interest in new electrical generation being *less*-GHG-intensive rather than *more*-GHG-intensive, *in addition to* the differences in associated financial risk?

2.14.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.25, A27

The evidence states:

...Unless this risk variation for future GHG compliance costs is reflected in the CFT process, BC Hydro could end up selecting a F2006 Call portfolio that is not cost effective on a risk-adjusted basis.

2.14.1 What methodology does BC Hydro use to determine the most cost-effective portfolio on a risk-adjusted basis?

2.15.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.25, A28

The evidence states:

Q28. How will projects that are in service prior to Kyoto Protocol implementation be treated in the F2006 Call?

A. All EPAs awarded under the terms of the F2006 Call will require the successful bidder to comply with all Canadian federal, provincial and municipal regulatory regimes for GHG emissions regardless of whether or not the regimes are otherwise applicable to the projects, based on the timing of COD or any other date stipulated in the regulations. ...

2.15.1 Please clarify this requirement. Does this mean that, where a GHG regulatory regime would apply to a F2006 Call project but for the project's COD or a related date, the EPA will require the successful bidder to ensure, as a matter of contract, that the project complies with the equivalent of the provisions of the GHG regulatory regime?

2.16.0 References: Exhibit B-11, BC Hydro F2006 Call Evidence, Testimony of Mary Hemmingsen, p.22, A26; Testimony of Mary Hemmingsen, Appendix B, Tender Evaluation Criteria and Methodology – Key Elements, p.12, “Preliminary GHG Bid Adjuster Look-up Table”

Ms. Hemmingsen explains “why treatment of GHG emission offset risk in the F2006 Call is important for managing BC Hydro's exposure to financial and development risks” as follows:

As mentioned above, even at the low end of a range of reasonable estimates of potential GHG regulatory compliance costs, the costs of complying with future GHG regulations could be substantial. The potential magnitude of compliance costs in moving from the low end of the range of cost estimates to the high end, raises concerns about the impact on the financial integrity of the entity required to shoulder the risk – whether it is an IPP, a utility or ratepayers. For thermal technologies, compliance with GHG regulations is likely to become a material component of the total cost of energy. (p.26)

The witness then lists four approaches: (1) do nothing (rejected), (2) automatic bidder responsibility, (3) automatic Hydro responsibility, and (4) bidder's option between bidder responsibility and Hydro responsibility (the proposed approach). The evidence states:

GHG Emission Offsets – With respect to meeting GHG regulatory requirements, bidders will have the option of (1) retaining all GHG liabilities including GHG emission offset obligations or (2) transferring their GHG emission offset obligations to BC Hydro, but retaining all other GHG liabilities. If the GHG offset risk is transferred to BC Hydro, evaluation adjusters will be applied to the bid prices based on the tendered EPA term and the GHG intensity of the projects (see Exhibit B for details). The bid price adjustment reflects BC Hydro's estimate of the potential future cost of GHG offset obligations.

The “Preliminary GHG Bid Adjuster Look-up Table” is at p.12 of Appendix B of Ms. Hemmingsen's evidence, within Exhibit B-11.

2.16.1 Does BC Hydro commit to backstopping any GHG emission offset obligations unmet by a successful bidder that has chosen to retain all GHG emission offset obligations and is later unable or unwilling to meet such liabilities and obligations in whole or in part?

2.16.2 What is the net present value in \$/MWh of a commitment by BC Hydro to backstop GHG emission offset obligations retained by a successful bidder?

2.16.3 What are all of the reasons, if any, why the F2006 Call should not require a bidder that elects to retain GHG emission offset obligations to specify in its bid the financial amount the bidder has allocated to risk of GHG emission offset liability?

2.16.4 What are BC Hydro's views regarding the addition of a requirement that a bidder that elects to retain GHG emission offset obligations must commit in its bid that it will not publicly or privately oppose proposed GHG emission offset requirements that would cost an amount less than or equal to the applicable GHG Bid Evaluation Adjusters?

2.17.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.22, A26

The evidence states:

Providing bidders with an option for handling GHG emission offsets allows them to choose the most economic alternative and thereby tender more cost-effective prices to BC Hydro.

2.17.1 Will there be a tendency for a bidder of a project with a relatively high GHG intensity to elect to retain GHG emission offset obligations, to set a bid price based on lower estimates of GHG emission offset liabilities than the corresponding figures contained in the GHG Bid Adjuster Look-up Table, and, if it becomes a successful bidder, then to argue in the regulatory arena that it cannot afford to be subjected to GHG emission offset obligations that would cost it as much as the amounts in the GHG Bid Adjuster Look-up Table?

2.17.2 Does BC Hydro expect bid prices regarding GHG-intensive projects to be lower if bidders are allowed to retain GHG emission offset obligations than such bid prices would be if bidders were required to transfer GHG emission offset obligations in exchange for the prices set out in the GHG Bid Adjuster Look-up Table?

2.17.3 What is the net present value in \$/MWh to BC Hydro of the F2006 Call *requiring* bidders to transfer GHG offset obligations to BC Hydro in exchange for prices set out in the GHG Bid Adjuster Look-up Table?

2.17.4 When BC Hydro uses the phrase "the most economic alternative" in the above-quoted passage is it referring to the alternative that maximizes well-being across the whole economy?

2.18.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.29, A33

2.18.1 When, in relation to the date of the Commission's decision regarding this 2005 REAP, does BC Hydro anticipate initiating the F2006 Call?

2.19.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.31, A35, and Exhibit B, p.8, Levelized Bid Pricing

The evidence states:

Phase 2 involves calculating the levelized bid price for those tenders passing Phase 1.

And:

Levelized Pricing

The CFT will permit bidders to quote an

EPA term from 15 to 40 years and also stepped pricing in two portions of that term. The CFT will restrict the differential between the stepped prices. BC Hydro will levelize pricing in all tenders as a first step in adjusting bid prices for comparability.

- 2.19.1 Please provide the formula and definitions of terms for the levelizing of bid prices.
- 2.19.2 What discount (or equivalent) rate is used in the levelizing of bid prices?
- 2.19.3 How does the calculation of the levelized bid price handle fuel price uncertainty for those projects which rely on fuel?
- 2.19.4 More generally, does BC Hydro propose to use the same discount rate in calculations aimed at comparing the Net Present Value of tenders with different fuel price risks?

2.20.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.31, A35

The evidence states:

Phase 3 involves adjusting the levelized bid prices to represent the delivered cost of a common electrical product to a common delivery point. In the case of Small Projects, the common product is non-green energy, risk-adjusted for any GHG emission offset risk borne by BC Hydro. In the case of Large Projects, the common product is non-green monthly-firm energy, risk-adjusted for any GHG emission offset risk borne by BC Hydro. ...

- 2.20.1 Please confirm that the phrase “the common product is non-green energy” means that for comparison between bids the prices are adjusted to the equivalent of a price for non-green energy; and the phrase does not imply that the Call is limited to non-green energy.

2.21.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.31, A35

The evidence states:

In the case of both streams, the common delivery point is the Lower Mainland. ...

- 2.21.1 Please provide the rationale for using the Lower Mainland as a common delivery point for bid price comparison purposes.
- 2.21.2 Does use of the Lower Mainland as a common delivery point for bid price comparison purposes imply that all of the firm energy resulting from the F2006 Call will be delivered to, or through, the Lower Mainland?
- 2.21.3 Please discuss the feasibility of evaluating the bids on the basis of delivery to nearest relevant load centre in the BC Hydro service area, such as: Vancouver Island; Lower Mainland; Skeena-Prince Rupert; Central BC; North-Eastern BC; and South-Eastern BC.
- 2.21.4 Please discuss what cost issues this would raise for BC Hydro.

2.21.5 Is the condition of a Lower Mainland delivery point intended to capture all transmission costs relevant to proposals bid into the F2006 Call, including charges by the BC Transmission Corporation? If not, please discuss the allocation of transmission costs and charges between BC Hydro and BC Transmission Corporation.

2.22.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.31, A35

The evidence states:

Phase 4 involves, for each stream, the identification of the optimal portfolio of one or more tenders that have passed Phases 1, 2 and 3 above, having regard first to both price factors and then to non-price factors.

2.22.1 Is BC Hydro seeking approval from the Commission in this 2005 REAP application for any characteristics of the optimal portfolio for the Small Projects stream or the Large Projects stream?

2.22.2 If so, what are the characteristics for which approval is sought?

2.23.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.32, A37

The evidence states:

Furthermore, bid prices of all successful and unsuccessful tenders will be published on our website after EPA award(s), as well as any non-price factors that may have been used in determining the optimal portfolios.

2.23.1 Please clarify that the website on which the reference information will be published will be available to the public and not merely to registered bidders.

2.23.2 For bid prices of unsuccessful tenders, what, if any, details of the bid and bidder will be provided?

2.24.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p.33, A38

The evidence states:

The F2006 Call expands BC Hydro's previous practice of obtaining input on CFT elements from potential bidders [and (?)] to explicitly seek input from First Nations, stakeholders and customers.

2.24.1 Can the above sentence be better understood by the inclusion of the word "and" as indicated?

2.24.2 If not, please elaborate on the meaning of the sentence.

2.24.3 Does BC Hydro plan further consultation with First Nations pertaining to the F2006 Call, in addition to BC Hydro's practices regarding dialogue with, and input from, First Nations discussed in A38?

2.25.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit A, p.3

The evidence states:

With respect to projects under 1 MW, BC Hydro is currently exploring alternative processes that would accommodate such projects in a cost-effective manner.

2.25.1 Please describe the alternative processes with respect to projects under 1 MW that BC Hydro is currently exploring.

2.26.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit A, p.6

The evidence states:

BC Hydro requires all bidders to have, at the time of tender submission, a completed preliminary interconnection study. ...

Currently, preliminary interconnection studies remain valid for several months.

2.26.1 Please discuss the extent to which this requirement would discourage would-be bidders whose proposals might be cost-effective.

2.26.2 Will preliminary connection studies for projects bid into the F206 Call remain valid until electricity purchase agreements are completed?

2.27.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit A, p.7

The evidence states:

BC Hydro will assess tendered projects to determine whether the projects pose unacceptable risk with respect to project completion by the guaranteed COD or operation in accordance with the terms of the EPA. The assessment will take into account factors such as site control and tenure, permitting status, GHG mitigation plans, progress toward other project milestones, fuel supply arrangements and availability, and an assessment of the expected useful life of the proposed project.

2.27.1 What information regarding “GHG mitigation plans” will bidders be required to provide?

2.27.2 What information regarding “fuel supply arrangements and availability” will bidders be required to provide?

2.28.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.2, column 2

The evidence states:

Awarded EPAs will be filed with the Commission as “energy supply contracts”, with a full, reasoned report on the evaluation process and outcome.

2.28.1 Please confirm that BC Hydro anticipates filing any electricity purchase agreements resulting from the F2006 Call with the Commission pursuant to s.71 of the *Utilities Commission Act*.

2.28.2 Will the electricity purchase agreement specify that it is conditional upon Commission acceptance of the EPA for filing pursuant to s.71 of the *Act*?

2.28.3 Will the electricity purchase agreement address the apportionment of risk of (a) a request for review and reconsideration of a Commission decision accepting an EPA for filing, and (b) an application for leave to appeal such a decision to the Court of Appeal pursuant to s.101 of the *Utilities Commission Act*?

2.29.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.2, Determination of Optimal Portfolio

2.29.1 Will the determination of the optimal portfolio be done separately for the Small Projects stream and for the Large Projects stream?

2.30.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.2, Determination of Optimal Portfolio

The evidence states:

2. All criteria will be applied with a view to determining the portfolio which best serves the interests of BC Hydro and its ratepayers, while respecting the regulatory need for prudence and respect for the public interest.

2.30.1 Does this wording imply acknowledgement by BC Hydro that the criteria for determining the portfolio of projects from the F2006 Call include the public interest, as well as, and not necessarily synonymous with, BC Hydro ratepayer interests?

2.31.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.5, No. 2(4) Determination of optimal portfolio

The evidence states:

BC Hydro’s evaluation team will determine the optimal portfolio of tenders by applying

price and non-price criteria, including, but not necessarily limited to: ...

- [the] target minimum aggregate portfolio of 800 GWh/y firm energy and up to 800 GWh/y non-firm energy, subject to assessment of system needs for greater or lesser energy,

2.31.1 Please discuss what criteria will be used to determine “system needs for greater or lesser energy.”

2.32.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, pages 2 and 4, Small Project Evaluation – General Approach: Rationale; and Large Project Evaluation – General Approach: Rationale:

The evidence states:

Awarded EPAs will be filed with the Commission as “energy supply contracts”, with a full, reasoned report on the evaluation process and outcome.

2.32.1 Apart from this review of the 2005 REAP and any review of F2006 Call EPAs filed pursuant to s.71 of the *Utilities Commission Act*, does BC Hydro contemplate any other regulatory review of the make-up of the optimal Large Project and Small Project portfolios?

2.33.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.8, Adjusted Bid Prices

The evidence states:

Adjusted Bid Prices

Certain specified quantitative adjustments will be made to levelized bid prices to reflect values of specific tender attributes.

2.33.1 Please list and describe the quantitative adjustments that will be made to levelized bid prices.

2.34.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.8, Green Credit for Green Attributes

The evidence states:

Green Credit for Green Attributes

The green credit is applicable to both streams. Projects that can achieve Ecologo^m certification can elect to tender Green Attributes to BC Hydro, in which case a credit of \$3/MWh will be applied for evaluation purposes.

2.34.1 Is the \$3/MWh Green Credit for Green Attributes a levelized price?

2.34.2 Please describe BC Hydro's "Green Power Certificates" program. How does the program work? What prices does it charge? How are the prices determined? Does BC Hydro purchase power from Green Power Generators on a capacity basis (per MW) or on an energy basis (per GWh)? How much is the premium that BC Hydro pays for Green Power Generation to supply the Green Power Certificate program? How many Certificates have been issued? For how long is a Certificate valid? Are Certificates explicitly linked to a specific generation facility?

2.34.3 Does BC Hydro intend to sell Green Attributes acquired through the F2006 Call through the Green Power Certificate program, or otherwise?

2.35.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.9, GHG Adjustment

The evidence states:

GHG Adjustment

This adjustment will apply to both streams. Bidders may assume all GHG liability, or alternatively, may elect that BC Hydro assume specified GHG liability in respect of offset purchases required by law and regulation, subject to a specified GHG intensity for the relevant project, as specified in the tender.

2.36.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit B, p.12 (pdf p.58), Preliminary GHG Bid Adjuster Look-up Table; Testimony of Tim Lesiuk, p.8 (pdf p.257) Table 2

2.36.1 Please confirm that Table 2, p.8, of the Tim Lesiuk Testimony is the same as the Preliminary GHG Bid Adjuster Look-up Table, p.12, Exhibit B, Mary Hemmingsen Testimony.

2.36.2 The Preliminary GHG Bid Adjuster Look-up Table specifies that data is in 2006 dollars. For what year are the dollar figures in Table 2 of the Tim Lesiuk Testimony?

2.37.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, page 3, lines 5-8; page 20, A. 26; and Exhibit C, page 11-12, No. 9

The evidence states:

BC Hydro is targeting to procure a minimum of 1,000 gigawatt hours per year (GWh/year) of electrical energy as follows:

(a) minimum of 800 GWh/year of firm electrical energy supply and up to 800 GWh/year of associated non-firm electrical energy supply from projects 10 megawatts (MW) and larger (Large Projects) built and operated by independent power producers (IPPs); [Hemmingsen, p.3, pdf p.4]

...

With respect to Large Projects, nonfirm energy will be subject to stepped discounts as volume increases. [Hemmingsen, p.20, pdf p.21]

...

The discount [Tier 1: for volumes of electricity up to the equivalent of 100% of firm energy volume] will be the same for all successful bidders and the amount to be applied is expected to range from \$8/MWh to \$12/MWh. [Hemmingsen, Ex. C, p.12, pdf p.70]

Tier 2:

- Volume in excess of Tier 1
- Price is lesser of 70% of average LLH Mid C (less transmission charges to the border) or the applicable LLH Tier 1 price. [Hemmingsen, Ex. C, p.12, pdf p.70]

2.37.1 Please confirm that the rates referred to in Exhibit C No. 9 do not include month-of-delivery adjustments. If they do not, please discuss why not.

2.37.2 Please provide the rationale for using Mica #5 as the basis of the \$8-12/MWh discount price rate for non-firm Tier 1 electricity, and please provide the calculation used.

2.37.3 Does the \$8-12/MWh Tier 1 discount price rate reflect a calculation of the value to BC Hydro of non-firm electricity delivered to BC Hydro during months when there is a large “gap to be filled with BC Hydro Discretionary Generation”? If not, please discuss how this value might be reflected in the discount price rate.

2.37.4 Please discuss other ways BC Hydro might use to assign monetary value to non-firm generation.

2.37.5 Could the purchase of Tier 2 energy result in BC Hydro exceeding the specified maximum 800 GWh/year amount of non-firm electricity to be acquired? Please explain.

2.37.6 Why is the average LLC Mid C used as a basis for valuing Tier 2 energy?

2.37.7 How did BC Hydro arrive at 70% of average LLC Mid C as the Tier 2 discount price rate?

2.37.8 Would it be feasible for BC Hydro to incorporate a cost factor to the Tier 2 rate to reflect the value to BC Hydro of energy delivered to it during months when there is a large “gap to be filled with BC Hydro Discretionary Generation”? Please discuss.

2.38.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, page 3, lines 5-8; and Exhibit C, page 6-7, No. 5

The evidence states:

BC Hydro is targeting to procure a minimum of 1,000 gigawatt hours per year (GWh/year) of electrical energy as follows:

(a) minimum of 800 GWh/year of firm electrical energy supply and up to 800

GWh/year of associated non-firm electrical energy supply [Hemmingsen, p.3, pdf p.4] ...

Provided that the bidder has not elected the “split bid” option, BC Hydro will purchase the entire output from a contracted project up to 120% of the maximum project capacity of the successful bidder’s plant sized at COD. If the bidder elected the “split bid” option, BC Hydro will purchase all energy up to the Split Bid Threshold Level. [Hemmingsen, Ex. C, p.6, pdf p.64]

2.38.1 The commitment to purchase up to 120% of maximum project capacity or “all energy to the Split Bid Threshold Level” appears potentially to be in conflict with the specified maximum 800 GWh/year amount of non-firm electricity to be acquired. Please clarify the relationship between these conditions.

2.38.2 Please confirm that the purchase commitment to large projects in Exhibit C No. 5 refers to non-firm, as well as firm, energy output.

2.39.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit C, page 14, No. 11

The evidence states:

Mark to market LDs based on a comparison of the adjusted bid price to the average monthly Mid-C price (capped at \$100/MWh, escalating at CPI) plus transmission charges from Mid-C to the border.

2.39.1 Please confirm that the “mark to market” liquidated damages would be, for each MWh of shortfall in a month or hour (depending on the relevant terms), the difference in price between the adjusted bid price and the relevant Mid-C price (capped).

2.39.2 Has BC Hydro calculated actual costs to itself of the failure of a successful bidder delivering hourly or monthly firm electricity? If so, please provide and discuss the calculations, including factors taken into account and the reliability of the calculations.

2.39.3 What is the rationale for using Mid-C as the notional point of delivery rather than the Lower Mainland?

2.39.4 Would it be feasible to allow successful bidders to provide purchased electricity to BC Hydro in lieu of liquidated damages? If not, please discuss the reasons.

2.40.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit C, p.20-21 (pdf p.78-79), GHG Requirements

The evidence states:

GHG Requirements

BC Hydro will offer a tender option for bidders to (a) assume responsibility for any and all future GHG regulatory

and legal requirements and bidding in a contract price that internalizes GHG risk into their bid prices or (b) have BC Hydro assume responsibility for one type of future GHG regulatory risk (the regulatory requirement to purchase offsets), with the understanding that BC Hydro would apply an evaluation adjuster to the bid price based on the tendered GHG intensity of the projects.

2.40.1 Is BC Hydro operating on the understanding that the requirements for GHG offsets applicable to Large Final Emitters will be applied at the facility level, as opposed to the utility level?

2.41.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit C, p.21 (pdf p.79), GHG Requirements

The evidence states:

All bidders will be required to provide any GHG mitigation plans (as may be required by permitting authorities) as part of the project risk assessment process.

2.41.1 Please confirm that “project risk assessment process” refers to a stage in the evaluation of the F2006 Call bids.

2.41.2 At the time that proposals are being bid into the F2006 Call and before EPAs have been entered, would there be any GHG mitigation plans “required by permitting authorities”?

2.42.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit C, p.22 (pdf p.80), GHG Requirements, Rationale

The evidence states:

The EPA will provide BC Hydro with the tools to monitor the successful bidder GHG compliance, remedy defaults at the successful bidder’s cost and terminate contracts where GHG compliance is not adequate. The suspension and termination provisions will

ensure that bidders and their lenders understand the importance BC Hydro places on this issue and should encourage bidders and their lenders to price the GHG risk appropriately.

2.42.1 Is it a feasible alternative for BC Hydro to signal the importance it places on GHG offsets compliance by BC Hydro taking the GHG emissions offset liability risk itself?

2.43.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, Exhibit D, Letter of December 22, 2004, from Alcan to BC Hydro, (pdf p.83)

2.43.1 Does Alcan's notice of recall of the Long Term Electricity Purchase Agreement (LTEPA) effective 2010 prevent BC Hydro from purchasing electricity from Alcan on some basis other than LTEPA?

2.44.0 Reference: Exhibit B-11, Testimony of Richard Rosenzweig, p.1 (pdf p.137)

At various locations throughout Exhibit B-11 there is reference to 2015 being the year for which the pricing of GHG compliance instruments is estimated.

2.44.1 What is the rationale for the choice of 2015 as the year for which GHG offsets pricing is estimated?

2.45.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig; and Appendix B to Testimony of Richard Rosenzweig

2.45.1 Does the term "greenhouse gas (GHG) compliance instrument[s]" mean Kyoto compliant instruments, i.e. instruments which conform with the standards of the Kyoto Protocol and the Framework Convention on Climate Change? If not, please discuss the relationship between GHG compliance instruments and Kyoto compliant instruments.

2.46.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig; and Appendix B to Testimony of Richard Rosenzweig, page 1

The evidence states:

For the longer-term post 2020 commentary in this paper, we review economic models that assume that the international community will agree to stabilize concentrations of GHGs in the atmosphere at a 550 parts per million volume (ppmv) level.

2.46.1 Please confirm that the 550 ppmv concentration cited refers to carbon dioxide equivalents (CO₂e). If it does not, please explain what GHGs are referred to and their relative proportions.

2.46.2 Please discuss, and quantify if possible, the sensitivity of the price forecasts for GHG compliant instruments to assumed target concentrations of GHG that are higher or lower than the assumed 550 ppmv amount, such as 450 ppmv and 750 ppmv.

2.47.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig; and Appendix B to Testimony of Richard Rosenzweig, page 3:

The evidence states:

Concentrations of GHG emissions are driven by four variables. These are:

- (1) population growth;
- (2) per capita economic growth;
- (3) reliance on increased energy use to support economic growth (energy intensity); and
- (4) the dominance of fossil fuels in providing this energy (carbon intensity).

2.47.1 Please confirm that, in this context, “GHG” refers to carbon dioxide only. If not, please explain.

2.48.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig; and Appendix B to Testimony of Richard Rosenzweig, page 4:

The evidence concludes:

Simply put, population and economic growth will lead to rising emissions unless fundamental transformation of the energy system is achieved through technological breakthroughs.

2.48.1 Please comment on the nature and plausibility of technological breakthroughs that might be required to reverse the trend of rising emissions.

2.48.2 Does the conclusion cited assume that people and societies will not implement substantial behavioral changes to limit GHG emissions in response to a growing awareness of the relationship between human-caused GHG emissions and global climate change? Please discuss.

2.49.0 Reference: Exhibit B-11, Direct Testimony of Doug Russell, page 3, A.5:

The evidence states:

Climate change is the fluctuation in temperature, precipitation and all other aspects of the Earth’s climate due to the natural greenhouse cycle and human induced greenhouse effect through the release of GHG emissions. [emphasis added]

2.49.1 Please confirm that the Intergovernmental Panel on Climate Change has concluded that most of the observed global warming over the past fifty years is attributable to human activities.

2.49.2 Please confirm that the Intergovernmental Panel on Climate Change is a highly regarded international organization whose scientific findings on climate change are widely considered to be highly credible and authoritative.

2.50.0 Reference: Exhibit B-11, Testimony of Doug Russell, p.6 (pdf p.167)

The evidence here and in a variety of other locations provides numbers concerning Canada’s GHG emissions, commitments and targets.

2.50.1 Please provide a graph of Canadian GHG emissions in Mt CO₂e by Year, showing the 1990 benchmark, the 2002 estimate, the 2008-2012 Kyoto Protocol commitment, the 270 Mt GHG reduction target in the 2005 Climate Change Plan, and any other relevant data points.

2.51.0 Reference: Exhibit B-11, Testimony of Doug Russell, p.6 (pdf p.167)

The evidence states:

The third key component of the 2005 Climate Change Plan is the proposed Large Final Emitters (LFE) regulatory system. LFEs are companies in the electricity generation, oil and gas, mining, pulp and paper, chemical, iron and steel, smelting, cement, and glass sectors. They are responsible for just under 50% of total GHG emissions in Canada. BC Hydro will be a LFE company. [underline added]

2.51.1 What is the definition of a Large Final Emitter company?

2.51.2 How is it known that BC Hydro will be a Large Final Emitter company?

2.51.3 What factors will determine whether a successful bidder in the Large Project stream will be an LFE company?

2.51.4 Is it likely that a successful bidder in the Small Project stream will be an LFE company? Why? Is there, or is there going to be, a defined cutoff between Large Final Emitters and small companies in the same field (e.g., electricity generation)?

2.51.5 In the ongoing development of the LFE regulatory system has there been discussion of 'contracting out,' i.e., where an LFE company contracts with another company for the provision of goods or services such that the GHG emissions associated with the production of the goods or services are emitted by the other company?

2.51.6 If so, is it contemplated that an LFE company would be allowed to *transfer* its own GHG emissions responsibilities to another company by contract?

2.51.7 Is it contemplated that an LFE company would be allowed to *receive* GHG emissions responsibilities *from* another company by contract?

2.51.8 Please confirm that the LFE regulatory system that is now being developed includes the concept that a facility that emits GHG in concentrations *less* than those of the BATEA reference would receive a marketable *credit*.

2.52.0 Reference: Exhibit B-11, Direct Testimony of Doug Russell, page 8, A.11:

The evidence states:

For existing power plants, it is likely that both coal and natural gas will face the same emissions intensity target.

2.52.1 Please explain and characterize "emissions intensity target."

2.52.2 What is the expected numeric value of the target?

2.53.0 Reference: Exhibit B-11, Direct Testimony of Doug Russell, page 9, A.12; and Direct Testimony of Mary Hemmingsen, page 25, A.28, lines 32-35:

The evidence states:

New generation facilities will be required to meet Best Available Technology Economically Available standards. previous discussion papers on the LFE system suggested that the standard for new power generation facilities be set at 370 tonnes of CO₂ equivalent per gigawatt hour (t/GWh), roughly that of a new combined cycle gas turbine power plant.

Currently it is anticipated that the federal requirement will be tied to “Best Available Technology Economically Achievable” (currently anticipated to be set at 85% to 100% of the GHG emissions of a combined cycle generation turbine (CCGT) facility) standard.

2.53.1 Are 370 tonnes of CO₂ equivalent per GWh the same as 85% to 100% of GHG emissions of a CCGT?

2.53.2 If not, please discuss the differences between the two citations regarding BATEA.

2.54.0 Reference: Exhibit B-11, Direct Testimony of Tim Lesiuk, page 5, footnote 1; Table 1; and unlabeled table on page 6:

The footnote on p.5 states:

All price estimates were calculated by Natsource in the year 2001 \$US, and then converted from \$US to \$CDN using an exchange rate of \$1 US = \$1.244 CDN. Natsource took the exchange rate from www.x-rates.com on 8 June 2005.

The footnote for Table 1 on p.6 states:

All price quotes in \$CDN, per tonne CO₂e.

The unnamed table on p.6 is described as “Canadian \$ per tonne CO₂e”.

2.54.1 Are the figures in the unnamed table on p.6 in 2005 Cdn dollars, or in nominal Cdn dollars?

2.54.2 If the dollars cited are nominal dollars, please indicate the inflation rate assumed.

2.55.0 Reference: Exhibit B-11, Direct Testimony of Tim Lesiuk, page 7, A. 10:

Mr. Lesiuk gives two reasons for selecting “the low end of Natsource’s Scenario 3 (the moderate scenario)” as the basis for determining “a reasonable range for projected GHG compliance costs.” The evidence states:

...First, I looked to U.S. utilities and the GHG value range they have incorporated into their resource planning. The low range of Natsource’s Scenario 3 falls within and is consistent with U.S. electric utilities’ GHG value range as identified in the Direct Testimony of Richard Rosenzweig at pages 9-11.

Second, I believe that BC Hydro, with its in-house experience in commodity trades, will be able to select a lower than average price forecast upon which to base the GHG evaluation adjustment because it will have the capacity to effectively hedge the long-term risks posed by the long-term EPAs contemplated in the F2006 Call. ...

- 2.55.1 Since the Rosenzweig Testimony presents a range of values, why does BC Hydro select “the low end” of the range instead of some measure of the middle of the range?
- 2.55.2 Does BC Hydro currently purchase or trade GHG compliance instruments?
- 2.55.3 Does BC Hydro currently have a portfolio of GHG compliance instruments?
- 2.55.4 If BC Hydro currently owns GHG compliance instruments, please list them and their attributes (including amounts and costs).
- 2.55.5 Would BC Hydro commit to, or is it committed to, purchase only Kyoto compliant GHG instruments? If not, please explain.
- 2.55.6 Please explain how BC Hydro would use hedging to reduce long-terms risks associated with GHG emissions.
- 2.55.7 How has BC Hydro quantified the expected value of its hedging ability in relation to GHG compliance instruments?

2.56.0 Reference: Exhibit B-11, Testimony of Tim Lesiuk, pp.7-8 (pdf pp.256-257)

The evidence states:

All projects contracted as part of the F2006 Call will be required to meet the federal "Best Available Technology Economically Achievable" (BATEA) standard once the regulation has been established for the Electricity Sector by Environment Canada. BATEA is described further in the Direct Testimony of Doug Russell at page 9.

- 2.56.1 To clarify, is it more accurate to state that projects will be required to purchase Kyoto compliant offsets to the extent that they exceed the federal standard for GHG emissions?

2.57.0 Reference: Exhibit B-11, Testimony of Tim Lesiuk, Table 2, p.7 (pdf p.256)

The evidence states:

BC Hydro created a levelized GHG compliance adjustment matrix based on compliance and transaction cost values and generated a table of GHG evaluation adjustment figures based on the generating facility's emission profile and anticipated regulatory scenarios as described in the Report.

- 2.57.1 Please provide the compliance values, transaction cost values, formulas and definitions concerning how BC Hydro went from the low end of the Scenario 3 forecast price for 2015

at CDN \$25.00/tCO₂e (reference: Testimony of Tim Lesiuk, p.6, Table 1) to the values in Table 2, p.7.

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