BC HYDRO

2008 Residential Inclining Block Application

February 2008

BC hydro

FOR GENERATIONS

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February 26, 2008

Ms. Erica M. Hamilton
Commission Secretary
British Columbia Utilities Commission
Sixth Floor – 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

RE: British Columbia Utilities Commission (BCUC)
British Columbia Hydro and Power Authority (BC Hydro)
2008 Residential Inclining Block Rate Application

BC Hydro submits under cover of this letter its Residential Inclining Block (RIB) Rate Application, pursuant to sections 58 to 61 of the *Utilities Commission Act*. The proposed regulatory timetable for the initial steps in the review of this application is set out in section 1.6, and takes into account BC Hydro's other recent filings, namely the F2009/F2010 Revenue Requirements Application, and the Transmission Service Rate Re-pricing Application. BC Hydro notes that the RIB Rate Application does not seek any interim rate relief

For further information please contact the undersigned.

Yours sincerely,

Joanna Sofield
Chief Regulatory Officer

c. BC Hydro F07/F08 RRA Intervenors
BC Hydro 2007 RDA Intervenors

Enclosure

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2008 Residential Inclining Block Rate Application

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Chapter

1

Introduction

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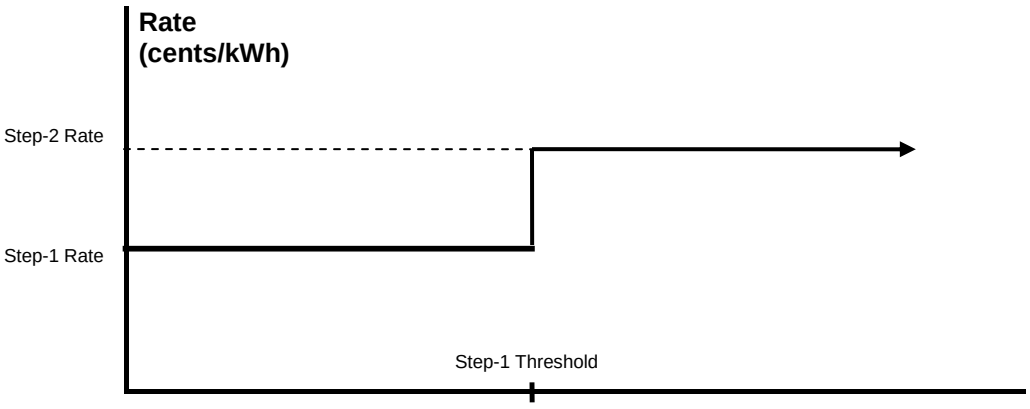
1.1 BC Hydro's Residential Inclining Block Rate Proposal

BC Hydro hereby applies under sections 58-61 of the *Utilities Commission Act,* R.S.B.C. 1996, c.473*,* as amended, for British Columbia Utilities Commission (**BCUC**) approval of a new, two-step, inclining block rate structure (the residential inclining block rate, or **RIB** rate) for its residential customers.

Under a two-step inclining block rate, customers pay a lower per-unit rate for electricity consumption below a certain kWh threshold, and a higher per-unit rate for electricity consumption above the kWh threshold. In this application BC Hydro uses the expression "Step-1 Rate" for the rate applicable to consumption below the threshold, and "Step-2 Rate" for the rate applicable to consumption above the threshold. The threshold is referred to as the Step-1 Threshold. The following Figure 1-1 provides a graphical representation of a generic RIB rate structure.

Figure 1-1 Illustration of a Generic RIB Rate Structure



BC Hydro's proposed RIB rate structure performs well against industry-standard rate design criteria, improves on the efficiency of the rate's price signal, and results in acceptable bill impacts for customers. Having been designed in such a manner, BC Hydro expects that its proposed RIB rate structure will achieve more conservation than a flat rate structure.

Currently, most BC Hydro residential customers pay a flat rate of 6.15 cents/kWh for all energy consumption within a bi-monthly billing period, in addition to a Basic Charge of 12.13 cents/day.[1] As a result of the BCUC's recent decision (2007 RDA Decision)[2] on BC Hydro's 2007 Rate Design Application (**2007 RDA**), the flat rate and Basic Charge for residential customers are scheduled to increase by 3.6 per cent in each of the next three years effective April 1, 2008, 2009 and 2010. However, the provincial government advised BC Hydro in February 2008 of its intention to extinguish the rate rebalancing aspects of the 2007 RDA Decision[3]. Consequently on February 20, 2008, BC Hydro filed the Application for Reconsideration of Orders G-111-07, G-130-07, and G-10-08 and Certain Direction in the 2007 RDA Phase 1 Decision.

BC Hydro has applied for across-the-board rate increases for all customer classes in the F2009/F2010 Revenue Requirements Application (**F09/F10 RRA**), in the amounts of 6.56 per cent, and 8.21 per cent, effective April 1, 2008, and April 1, 2009, respectively.[4]

Assuming the F09/F10 RRA is approved as filed, Table 1-1 and Table 1-2, respectively, show the proposed RIB rate structure with the F09/F10 RRA increase alone and with the F09/F10 RRA increase and rate rebalancing[5] combined. Under the proposed RIB rate, rates shown in Table 1-1 would be implemented if the rate rebalancing elements of the 2007 RDA Decision are extinguished and Table 1-2 reflects proposed RIB rates if the rate rebalancing is not extinguished. Following BCUC approval, the final RIB rates would be implemented on a mandatory basis for all BC Hydro residential customers, except for excluded customers who are described in section 1.3.

1 Effective April 1, 2008 BC Hydro's tariff will reflect the Basic Charge on a cents/day basis.

2 BCUC Order No. G-130-07, October 26, 2007.

3 See Appendix B of BC Hydro's Application for Reconsideration of Orders G-111-07, G-13-07, and G-10-08 and Certain Direction in the 2007 RDA Phase 1 Decision dated February 20, 2008.

4 BC Hydro F09/F10 RRA, February 20, 2008 – For convenience, all references in this application to proposed rate changes arising from the F09/F10 RRA are exclusive of proposed changes to the Deferral Account Rate Rider.

5 For the purposes of modelling the rate structure under a rate rebalancing scenario, BC Hydro has used the rate rebalancing amount of 3.6 per cent/year, as directed by the BCUC in its 2007 RDA Decision.

Table 1-1 Proposed RIB Rates[6] (Assuming F09/F10 RRA Increases Only and October 1, 2008 Implementation[7])

Residential Rates With Flat Rate Structure (in absence of this application):	**Current Rates**	**April 1 , 2008**	**October 1, 2008**	**April 1, 2009**
Basic Charge (cents/day)	12.13	12.93	12.93	13.99
Flat Rate (in cents/kWh for all kWhs consumed per bi-monthly billing period)	6.15	6.55	6.55	7.09
Residential Rates With Proposed BC Hydro RIB Rate Structure:				
Basic Charge (cents/day)			12.38	12.64
Step-1 Rate (in cents/kWh for all kWh consumed up to and including 1,600 kWh per bi-monthly billing period)			6.28	6.41
Step-2 Rate (in cents/kWh for all kWh consumed above 1,600 kWh per bi-monthly billing period)			6.98	8.53

6 Appendix A provides background on rate calculations and illustrates the October 1, 2008 and April 1, 2009 rate calculations behind Table 1-1.

7 October 1, 2008 is BC Hydro's preferred RIB rate implementation date - see section 1.7 for additional details.

Table 1-2 Proposed RIB Rates (Assuming F09/F10 RRA Increases, Rate Rebalancing Increases, and October 1, 2008 Implementation)

Residential Rates With Flat Rate Structure (in absence of this application):	**Current Rates**	**April 1, 2008**	**October 1, 2008**	**April 1, 2009**
Basic Charge (cents/day)	12.13	13.38	13.38	15.00
Flat Rate (in cents/kWh for all kWh consumed per bi-monthly billing period)	6.15	6.79	6.79	7.61
Residential Rates With Proposed BC Hydro RIB Rate Structure:				
Basic Charge (cents/day)			12.83	13.57
Step-1 Rate (in cents/kWh for all kWh consumed up to and including 1,600 kWh per bi-monthly billing period)			6.51	6.88
Step-2 Rate (in cents/kWh for all kWh consumed above 1,600 kWh per bi-monthly billing period)			7.23	9.16

In the BCUC's 2007 RDA Decision, the BCUC commended BC Hydro for its plan to introduce a new residential inclining block rate and directed BC Hydro to file its application by March 31, 2008.[8] As stated at page 110 of the 2007 RDA Decision, the BCUC suggested the following design parameters would be suitable (the BCUC Proposal):

[8] Page 110 of the 2007 RDA Decision.

- the size of the first block should be determined on the basis of the Heritage entitlement and for each residential customer it should be set at about 800 kWh per month;

- all energy consumed in excess of 800 kWh per month would be priced at the marginal cost of supply, as established by BC Hydro from time to time as the cost of Tier 2 power under Rate Schedule 1823, plus an allowance for distribution losses; [and]

- the proposal be revenue neutral.

BC Hydro's proposed design is consistent with the BCUC Proposal parameters regarding the size of the first block and revenue neutrality but proposes a different pricing mechanism. BC Hydro proposes to implement the RIB rate structure[9] by creating a Step-1 Threshold at 1,600 kWh per bi-monthly billing period. BC Hydro's proposed pricing mechanism has the Step-1 Rate being pre-set with the Step-2 Rate being calculated residually, whereas the BCUC's proposed pricing mechanism works the other way around. Under BC Hydro's preferred design, the Step-1 Rate and Basic Charge would increase annually by the projected rate of inflation consistent with the current revenue requirement for that year. The Step-2 Rate would collect the remaining residential class revenue requirement. To the extent that there is future rate rebalancing, BC Hydro proposes that it be applied to each of the Basic Charge, Step-1 Rate and Step-2 Rate. Finally, BC Hydro's proposed RIB rate design is revenue neutral on a forecast consumption basis at the residential class level, as is discussed further in section 4.3 and demonstrated in Appendix A.

BC Hydro believes that its proposed RIB rate structure better serves the conservation objective of the RIB rate under a wider range of scenarios regarding rate rebalancing, the timing and magnitude of revenue requirement increases, and the cost of new electricity supply.

[9] An electronic spreadsheet containing the RIB rate model will be made available at the time of the RIB rate technical workshop proposed in section 1.6.

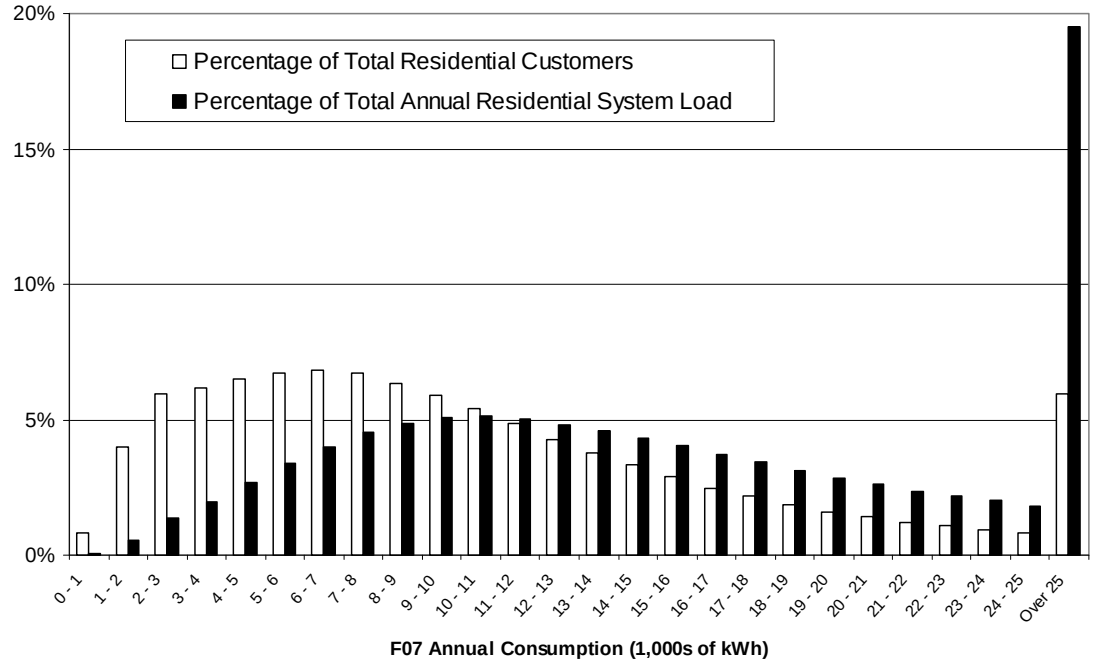
1.2 Context and Summary Justification

In this section of the application, BC Hydro describes the objectives of its proposal, why it believes its RIB rate proposal is the right rate structure for the residential class at this time, and why BC Hydro recommends it be approved by the BCUC.

1.2.1 Residential Customers' Energy Use

BC Hydro's proposed RIB rate will apply to approximately 1.5 million residential customers. The average annual consumption for the residential class is approximately 11,000 kWh per account. As Figure 1-2 below shows, residential load is not distributed evenly, with large customers using a greater proportion of load. The average annual consumption of the smallest 20 per cent of customers is approximately 2,800 kWh/year (about one-quarter of the average) and these customers collectively use approximately five per cent of total residential load. The largest 20 per cent of customers account for approximately 44 per cent of total residential load and on average have annual consumption of almost 25,000 kWh (about nine times the average for the smallest 20 per cent of consumers, and over twice the overall residential average).

Figure 1-2 Residential Consumption Distribution



1.2.2 Objectives and Timing of BC Hydro's RIB Rate Proposal

The over-arching objective of the RIB rate proposal in this application is to encourage additional electricity conservation. The conservation objective of this application was prescribed in the most recent provincial energy plan[10] as attached as Appendix B. Policy Actions No. 1 and No. 4 of the 2007 Energy Plan are particularly relevant:

- Policy Action No. 1: Set an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020.

- Policy Action No. 4: Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation.[11]

However, the 2007 Energy Plan is not the only policy driver of this application. The prospect of an application for approval of a RIB rate structure was foreseen in the early 1990s, at which time BC Hydro was directed by the BCUC to phase-out its earlier declining block rate structure in anticipation of increasing costs of new electricity supply.[12] The province's 2002 energy policy[13] required a stepped-rate structure for BC Hydro's industrial customers, but also indicated the possibility of similar rate structures for other customer classes.[14]

BC Hydro believes it is important to apply for restructured residential rates now in order to:

- start contributing to achievement of the 2007 Energy Plan's 2020 conservation goal;

- accelerate customer awareness of the increasing cost of electricity and the subsequent need for conservation;

- gain experience with residential customer demand response to rates in order to inform future rate design proposals; and

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10 *The BC Energy Plan - A Vision for Clean Energy Leadership,* February 27, 2007 (2007 Energy Plan).

11 2007 Energy Plan (in Appendix B) at page 39.

12 Page 16, BCUC Decision concerning BC Hydro's 1991 RDA (April 24, 1992).

13 *Energy For our Future - A Plan for B.C.*, November 25, 2002 (2002 Energy Plan).

14 On page 33 of the 2002 Energy Plan, Policy Action No. 21 states in part that "Stepped rates will be initially applied to large rate customers. They may be applied, at a later date, to other customer classes."

- capture opportunities to leverage non-rate demand side management (**DSM**) initiatives that complement rates and address barriers to conservation.

Finally, as noted earlier, the BCUC directed BC Hydro to file for approval of a RIB rate prior to March 31, 2008 in the 2007 RDA Decision.

1.2.3 An Inclining Block Rate Structure Serves the Conservation Objective

The desire to incorporate an incentive for conservation into its rates has prompted BC Hydro to apply for approval of a rate structure that sends a price signal to customers that better reflects the higher long-run cost of new electricity supply. In the current and foreseeable future, where the long-run cost of new electricity supply is substantially higher than the embedded cost of BC Hydro's existing assets, such a rate structure sends price signals that will encourage economically efficient electricity consumption choices and, thus, electricity conservation.

BC Hydro has assessed a generic inclining block rate structure against industry-standard rate design criteria, and concludes that it meets all of the rate design criteria well, or manageably well, and better than the current flat rate on the key rate design criterion of economic efficiency. This assessment is provided in Chapter 2. Further, the Step-2 Rate in the proposed RIB rate structure better reflects the higher cost of new electricity supply than a flat rate structure. Thus, compared to a flat rate, BC Hydro's RIB rate proposal is more likely to incent economically efficient choices and result in electricity conservation.

BC Hydro examined a variety of scenarios in order to estimate potential incremental conservation resulting from the proposed RIB rate structure. Given BC Hydro's history of low and stable rates, it is difficult to accurately estimate price elasticity, which informs estimates of conservation. However, under the range of scenarios examined by BC Hydro, the RIB rate structure is estimated to yield conservation of at least 200 GWh/year in F2010. This conservation is incremental to the conservation that could be achieved under a flat rate structure given the same average rate increases. By definition, any scenario with a higher average rate increase will provide more conservation for a given rate structure and price elasticity.

Further, conservation from rate structures will form part of BC Hydro's 2008 DSM Plan, the scope of which will be the subject of BC Hydro's next Long Term Acquisition Plan (**LTAP**).[15] The success of the non-rate components of the 2008 DSM Plan is enhanced if customers have price signals that make those components more compelling. Section 4.2 discusses BC Hydro's conservation estimates and underlying assumptions.

BC Hydro has conducted research into the default residential rate designs offered by 88 different utilities throughout North America, Europe and Asia. The research results, which are summarized in Appendix C, indicate that the majority of these utilities offer relatively simple rate structures that are easy to understand. Of the 24 utilities that use an inclining block rate structure, 13 (54 per cent) offer a simple two-step inclining block structure. Thus, the designs chosen by other utilities and regulators show the importance of simplicity in rate design as a contributing factor in building understanding and acceptance of a rate structure.

1.2.4 Design Parameters of BC Hydro's Proposed RIB Rate Structure

The essential design parameters of the proposed RIB rate structure are as follows:[16]

- the Step-1 Threshold is set at 1,600 kWh per bi-monthly billing period;
- the Step-1 Rate and the Basic Charge are increased annually to reflect the portion of revenue requirement increases equal to the projected rate of inflation;
- the Step-2 Rate is set annually by whatever further amount is necessary to allow the recovery of the residential class revenue requirement, less the amount of revenue generated by the Step-1 Rate and the Basic Charge;
- additional rate rebalancing would be applied to each of the Basic Charge, Step-1 Rate and Step-2 Rate to the extent required; and
- the structure is revenue neutral on a class basis at forecast consumption levels.

[15] The 2008 LTAP is expected to be filed with the BCUC in spring 2008.

[16] This is a generic description of the rate design application on an annual basis. If the rate is implemented on October 1, 2008, the detailed application of the design parameters will differ slightly as illustrated in Appendix A.

BC Hydro believes that its proposed design carefully balances several important interests:

1. It ensures that no residential customer will see a rate decrease, even in inflation-adjusted terms, thus avoiding any unintended disincentives to conservation due to a decline in the price of electricity.

2. It provides efficient price signals to more rather than fewer electricity consumers, which will encourage conservation.

3. The difference between the Step-1 Rate and the Step-2 Rate is sufficient to incent a demand response under a reasonably wide range of cost of service and revenue requirement scenarios.

4. The Step-2 Rate provides a better reflection of the long-run incremental costs of new supply than the otherwise applicable flat rate, while not exceeding a reasonable estimate of those costs.

5. The design shields the vast majority of BC Hydro's residential customers from incremental, unacceptably large bill impacts, again under a reasonably wide range of cost of service and revenue requirement scenarios. The bill impact issue is discussed further in section 1.2.5.

In Chapter 3, BC Hydro elaborates on how its RIB rate proposal achieves and balances these interests.

1.2.5 Bill Impacts

Rate restructuring inevitably means that some customers see larger bill increases and some see smaller bill increases than under the existing rate structure. If the elements of the BCUC's 2007 RDA Decision related to rate rebalancing are extinguished by the provincial government, BC Hydro anticipates that no residential customer would see bill impacts greater than ten per cent per year from rate restructuring under the proposed rate structure. For approximately 75 per cent of customers, the proposed RIB rate structure in this application results in bill impacts over the two-year period of the F09/F10 RRA that are less than the 15.3 per cent average increase they would experience as a result of the F09/F10 RRA in the absence of this application (and assuming an October 1 implementation).

It should be noted that bill impact estimates in this application are conservative as they assume no conservation action by customers. When customers respond to the rate and utilize Power Smart[17] programs, the resulting reduction in consumption will reduce the bill impacts described in this application. In this regard, BC Hydro's current and planned Power Smart programs will help customers reduce their consumption and help offset the impact of higher rates.

1.2.6 The RIB Rate Proposal Is A First Step

BC Hydro expects to return to the BCUC within the next three years with further residential rate proposals. Within that timeframe BC Hydro expects to have begun to implement Smart Metering Infrastructure (**SMI**) which will enable additional rate structures. As well, BC Hydro expects to know more about customer response to rates giving both BC Hydro and the BCUC substantially more information with which to make a more informed decision about next steps regarding the restructuring of residential rates. The proposed RIB rate structure should be considered as a first step on a path of residential rate restructuring, and one that does not preclude future development of residential rate structures. BC Hydro will continue to work with its external stakeholders to consider innovative rate designs with potential to contribute to BC Hydro's conservation objectives.

1.3 Applicability

BC Hydro proposes that its RIB rate structure will be mandatory for all residential customers, except as noted in this section.[18]

BC Hydro proposes that its proposed RIB rate structure not be applicable to residential customers in Rate Zone II nor to the customers in the Bella Bella Non-Integrated Area (**NIA**). Rate Zone II customers are already on an inclining block rate with the Step-2 Rate set to reflect the (typically) higher cost of supply in Rate Zone II communities. The BCUC exempted the Bella Bella NIA customers from an inclining block rate structure by Order No. G-171-07. Instead of being transferred to the proposed RIB rate, Bella Bella NIA customers would be

[17] Power Smart is the name for BC Hydro's DSM programs.

[18] As per the 2007 RDA Decision, all customers on RS 1111 will be transferred to RS 1101, and those on RS 1131 and RS 1133 will be transferred to RS 1121 effective April 1, 2008. Thus, RS 1101 and RS 1121 will be the default mandatory rate schedules that prescribe the RIB rate.

transferred to a proposed exempt residential rate - RS 1151 - which would have the same flat rate structure that Zone I residential customers are on today. The new exempt rate RS 1151 would be subject to the across-the-board rate changes resulting from revenue requirement and any rate rebalancing increases.

With regard to residential E-Plus customers, the rate structure proposed in this application is meant to be applicable only to the non-E-Plus account. The E-Plus account will continue to be billed as a flat rate with average residential class increases applied.

In this application, BC Hydro proposes that customers designated as farm accounts under the existing residential rate RS 1101 be transferred to the proposed exempt residential rate RS 1151. Conservation rates for farm customers will be reviewed when conservation rates for small commercial customer classes are reviewed.

In November 2006, selected residential customers began a year-long Conservation Research Initiative (**CRI Pilot**) to pilot time-of-use rates and smart meters under rate schedules RS 1141, RS 1142, RS 1143, RS 1144 and RS 1145. The CRI Pilot was extended one year, to the end of October 2008, with adjustments to peak hours and with the introduction of critical peak pricing and load control components. At present, there are approximately 1,700 BC Hydro customers enrolled in the CRI Pilot of which approximately 1,300 are on time-of-use rates and the balance on rate RS 1101 as a control group. The control group is proposed to be transferred temporarily to the proposed exempt residential rate RS 1151 until the end of the CRI Pilot. Should the CRI Pilot not be extended beyond October 2008, BC Hydro will transfer all customers to the new RS 1101 rate (the RIB rate proposed in this application).

Finally, the All-Purpose Multi-Residential rates RS 1131 and RS 1133 are to be transferred to the Multiple Residential Service rate RS 1121 effective April 1, 2008 in accordance with the 2007 RDA Decision. Under that rate, customers are charged the Basic Charge per single-family dwelling. In this application BC Hydro proposes that the RS 1121 be allotted a Step-1 Threshold proportional to the number of single-family dwellings for each account, as shown in draft tariff sheets in Appendix D.

1.4 Organization of Application

The application is organized as follows:

- Chapter 2 describes BC Hydro's rate design criteria and how a generic flat rate structure and a generic two-step inclining block structure perform against the rate design criteria;
- Chapter 3 describes BC Hydro's proposal and demonstrates that it is preferable to the BCUC's Proposal and plausible variations of a simple two-step rate; and
- Chapter 4 provides further information on the expected outcomes of putting the RIB rate structure in place, including anticipated customer bill impacts, estimated conservation resulting from implementing the RIB rate structure, and estimated financial outcomes.

1.5 Approvals Sought

The specific BCUC orders sought by BC Hydro in this application are shown in Appendix D. At this time, pending approval of any interim rate increase from the F09/F10 RRA and legislative changes regarding the 2007 RDA Decision, BC Hydro is seeking approval of the design principles by which the current flat rate structure would be adjusted at first instance to the proposed RIB rate, and annually thereafter. Thus, the tariff sheets included in Appendix D show per unit rates, for illustrative purposes only, that assume that the rate rebalancing elements of the 2007 RDA Decision have been extinguished; that the F2009 rate relief sought in the F09/F10 RRA has been granted; and that the RIB rate is implemented in October 2008.

1.6 Proposed Regulatory Process

BC Hydro filed its F09/F10 RRA on February 20, 2008 and its Transmission Service Rate (TSR) Re-pricing Application on February 22, 2008. BC Hydro suggests that it would be convenient, in light of these other significant rate applications, for the BCUC to issue a process order establishing the following coordinated process to keep the applications proceeding in a timely fashion:

1. F09/F10 RRA workshop: Thursday, March 6, 2008. (Please note that BC Hydro is holding a stakeholder workshop on inputs to its 2008 LTAP on Wednesday, March 5, 2008);
2. BCUC IRs on the F09/F10 RRA issued: Wednesday, March 12, 2008;
3. RIB/TSR Re-pricing workshop: Thursday, March 13, 2008;
4. BCUC IRs on the RIB rate application and the TSR Re-pricing application issued: Tuesday, March 18, 2008;
5. Registration of intervenors and interested parties for all three proceedings: Thursday, March 20, 2008;
6. Intervenor IRs on all three applications issued: Tuesday, March 25, 2008;
7. BC Hydro responses to all IRs on the RIB rate application and the TSR Re-pricing application: Friday, April 18, 2008; and
8. BC Hydro responses to all IRs on the F09/F10 RRA: Wednesday, April 23, 2008.

After the first round of IRs for each of the three applications, the BCUC, BC Hydro and intervenors will be in a better position to form views on how each of the applications ought to be finally resolved. Accordingly, BC Hydro proposes a procedural conference on Monday, April 28, 2008 to consider further process issues for all three applications, including consideration of which applications might be resolved through negotiated settlement or written process. BC Hydro notes the BCUC Order No. G-21-08 of February 25, 2008 setting out the regulatory timetable for the F09/F10 RRA which confirms the above dates in respect of that application.

1.7 Implementation and Timing

Implementation of the RIB rate structure requires design, testing and completion of changes to the residential billing system, implementation of changes to customer service business processes including required changes to BC Hydro bill formats, training of customer service staff, and development of communications materials to explain rate changes to customers.

Preparatory work will be done prior to receipt of BCUC approval of the rate structure with final billing system changes and testing requiring a minimum of 30 days.

As noted, BC Hydro is hopeful that its proposed RIB rate structure can be implemented on October 1, 2008 before the 2008/09 winter peak load season, and has modeled the proposed RIB rate, and the BCUC Proposal, on the basis of that start date. With 30 days required between a final decision and implementation, for reasons described in the previous paragraph, an October 1, 2008 implementation date implies a final BCUC decision on or before August 31, 2008. BC Hydro believes this to be a reasonable timeline given that the end of August is just over six months from the filing of this application. In this regard, BC Hydro notes the BCUC's practice directive issued pursuant to section 12 of the *Administrative Tribunals Act* contemplates an approximately six month process for applications that are not overly complex and yet which require an oral evidentiary phase.[19] BC Hydro also notes that the BCUC itself commented on the desirability of an expeditious implementation of the RIB rate.[20] Finally, while it is premature to comment on the specific process by which this application should be resolved, BC Hydro believes that either a written hearing process or a negotiated settlement could be desirable and achievable, and that either one could expedite the resolution of this application.

1.8 Contact Information

All communications regarding this application should be directed to:

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[19] BC Hydro takes no position now on whether an oral phase would be required to resolve this application.

[20] See the 2007 RDA Decision, page 110.

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Chapter

2

Residential Rate Design Criteria:
The Basic Rationale for a RIB Rate Structure

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2.1 Introduction

BC Hydro's proposed RIB rate is designed to encourage conservation via price signals that are more economically efficient than those under the status quo flat rate structure. BC Hydro's selection of a RIB rate design to achieve its conservation goals requires the consideration of a number of tradeoffs, as well as a comparative evaluation of alternate rate designs. This chapter describes the basic rate design criteria against which BC Hydro evaluated a flat rate design and a generic two-step rate design.

2.2 Rate Design Criteria

In its 2007 RDA, BC Hydro specified eight rate design criteria[21]

- recovery of the revenue requirement;
- fair apportionment of costs among customers;
- price signals that encourage efficient use and discourage inefficient use;
- customer understanding and acceptance;
- practical and cost effective to implement;
- rate and bill stability;
- provision of revenue stability; and
- avoidance of undue discrimination.

As explained in the 2007 RDA, BC Hydro believes that these are well-recognized and accepted rate design criteria that are consistent with the statutory test of being fair, just, and not unduly discriminatory. The BCUC reviewed and considered these criteria in the 2007 RDA Decision and determined the criteria to be appropriate. In the following section,

[21] Paraphrased from James C. Bonbright, *Principles of Public Utility Rates*, Columbia University Press, March 1988.

BC Hydro evaluates the performance of a generic flat rate structure and a generic two-step inclining block structure against the eight design criteria.

2.3 Evaluation of a Flat Rate Design

A flat rate refers to a simple structure with one volumetric (cents/kWh) charge for all usage. BC Hydro's current residential rates are flat rates with a fixed Basic Charge. The performance of the flat rate design with regard to the basic eight rate design criteria provides a benchmark against which to evaluate a generic two-step rate design.

The generic flat rate design performance results are presented in Table 2-1, below.

Table 2-1 Evaluation of Generic Flat Energy Block Structure against Design Criteria

Criteria	Performance	Remarks
Recovery of the revenue requirement	Good	The rates are designed to fully recover BC Hydro's revenue requirements.
Fair apportionment of costs among customers	Good but with some issues	Given metering limitations that prevent demand charges, a constant $/kWh rate provides a fair allocation of embedded costs among residential consumers.
Price signals that encourage efficient use and discourage inefficient use	Poor	A flat rate design sends neither an efficient short-run price signal based on market prices nor a long-run price signal based on longer run incremental costs. The poor performance of this rate from an efficiency perspective has become increasingly noticeable as the incremental costs of new supply continue to rise above the historical embedded cost of supply.
Customer understanding and acceptance	Good	The flat energy rate has been in place for many years and customers have a high degree of familiarity with it.
Practical and cost effective to implement	Good	Existing meters, billing system and business processes are already in place and can continue to be used for this rate.
Rate and bill stability	Good	Predictable bills and revenues within the year are driven primarily by seasonal usage patterns. Year to year bill changes are generally driven either by changes in a customer's usage or by changes to the class average rate.
Provision of revenue stability	Good	A flat rate produces stable revenues.
Avoidance of undue discrimination	Good	Applicable rates are solely based on electricity consumption, and remain constant regardless of consumption level under this rate structure.

As can be seen from Table 2-1, the existing rate structure, which has been used by BC Hydro since April 1994, performs well against seven of the eight rate design criteria. The existing rate structure provides for the collection of BC Hydro's revenue requirement; fairly apportions costs to consumers based on their overall usage (with some issues due to the inability to implement a demand charge for collecting kW-related costs); is easy to understand and implement; provides rate, bill and revenue stability; and does not unduly discriminate against individual groups of residential customers. The only area where the design performs poorly is that it does not send efficient pricing signals to consumers and reflects neither short-run nor long-run incremental costs of new electricity supply. Instead,

pricing is entirely based on embedded costs spread equally among all energy usage in the class. In light of BC Hydro's over-arching conservation objective, BC Hydro believes that this weakness, for the reasons described below, is a sufficient reason to reject the flat rate structure going into the future.

The key driver for residential rate restructuring is to better reflect higher incremental costs of new supply and in turn to incent electricity conservation. Nevertheless, it is desirable that rate design changes that promote conservation do not result in a rate structure that performs unacceptably with respect to other criteria. Therefore, the application focuses on rate designs which entail modifications to the existing rate design that result in better performance under the "efficient price signal" criterion without causing unacceptable deterioration in the performance under the other seven rate design criteria.

2.4 Evaluation of a Two-Step Rate Design

As opposed to a flat rate design, a two-step rate design is an obvious option, requiring minimal modifications in the rate structure. A generic form of a two-step inclining block structure is presented here and analyzed against the basic design criteria. This conceptual two-step inclining block structure has a lower Step-1 Rate for all electricity consumed below the Step-1 Threshold and a higher Step-2 Rate for all electricity consumed above the Step-1 Threshold. BC Hydro believes that, if properly designed, a two-step inclining block rate structure has the potential to satisfy all eight design criteria, as shown in Table 2-2 below.

Table 2-2 Evaluation of Generic Two-Step Inclining Block Rate Structure against Design Criteria

Criteria	Performance	Remarks
Recovery of the revenue requirement	Good	The rates are designed to fully recover BC Hydro's revenue requirements.
Fair apportionment of costs among customers	Good	Still reflective of embedded costs for Step-1 usage, but more reflective of incremental costs for Step-2 usage. The design reflects a blend of historical low cost power and the higher incremental costs of new resources. The design can be adjusted over time to ensure that the design effectively balances Step-1 and Step-2 pricing objectives.
Price signals that encourage efficient use and discourage inefficient use	Good	In general this design can be used to send an efficient pricing signal for Step-2 usage. It can also effectively balance the criteria to have both fair and efficient pricing.
Customer understanding and acceptance	Good but with some issues	Although the design is more complex than a flat rate, a simple two-step structure with a Step-2 Rate that is higher than a Step-1 Rate, is still relatively simple and sends a clear price signal to consumers. Could result in customer dissatisfaction for large users if Step-2 Rates become very high.
Practical and cost effective to implement	Good	Existing meters can be used for this rate; will require manageable changes to billing system and business processes.
Rate and bill stability	Good but with some issues	High Step-2 Rate increases could cause bill instability for large users. Higher bill impacts could be mitigated under this structure via rate design choices: by keeping Step-2 Rates at reasonably low levels; increasing Step-1 Rates to collect a portion of the class increase; or decreasing the size of the Step-1 Threshold so more customers get the higher Step-2 Rate.
Provision of revenue stability	Good but with some issues	Will increase variability in revenues, but can be controlled through design parameters/financial policies.
Avoidance of undue discrimination	Good	Rates continue to be reflective of costs and of electricity consumption.

Table 2-2 shows that, in theory, a two-step rate structure can be designed such that it provides good performance across all criteria. However, in practice, it may be impossible to satisfy one criterion without sacrificing some performance of another criterion. For example, the recovery of increased revenue requirements through the Step-2 Rate can cause customer bill impacts for the very largest customers that may be very high.

In summary, the above comparison between a generic flat rate and a generic two-step rate regarding their performance against the eight rate design criteria that BC Hydro is using to analyze rate design alternatives, supports further examination of the use of a two-step rate. Although the existing flat rate structure performs well on seven of the eight design criteria, it has a poor rating for sending a price signal that encourages efficient use and discourages inefficient use. The two-step rate structure performs well on this criterion of encouraging efficient use, within the boundaries of what BC Hydro considers are acceptable trade-offs. Given that BC Hydro's primary focus for redesigning the residential rate is to achieve conservation by encouraging customers to make economically efficient choices, the two-step rate design is a better alternative to meet this objective.

2.5 Other Residential Rate Restructuring Alternatives

In this application BC Hydro focuses its consideration on various alternative two-step RIB rate structures. The foregoing describes why a two-step RIB rate structure is a good alternative to the current flat rate structure, but does not demonstrate why a two-step RIB structure is preferable to other potential residential rate restructuring alternatives. Such alternatives include, for example, time-of-use rates, seasonal rates, regionally-differentiated rates, and critical peak pricing rates, among others. In light of the 2007 Energy Plan's reference to innovative rate structures,[22] it is important to observe, again, that this application is anticipated to be a first step toward the development of different residential rate options.

To that end, BC Hydro has implemented the CRI Pilot, which is now testing time-differentiated rates with volunteer customer participants, for a second year. Meanwhile, BC Hydro is actively pursuing its consideration of SMI which, when implemented, will allow for time-differentiated rates to be provided to all BC Hydro

[22] See Appendix B, 2007 Energy Plan, Policy Action No. 4, page 39.

customers. Until implementation of the SMI initiative, the provision of residential time-of-use rates is simply not possible. The same can be said of critical-peak rates.

With respect to regionally-differentiated rates, BC Hydro believes it would be inappropriate to move beyond stated government policy regarding the desirability of postage stamp rates across BC Hydro's Zone I and Zone II service territories.[23] On a more practical level, regionally differentiated rate structures would require more detailed, regionally-distinguished cost of service studies than BC Hydro currently has available and BC Hydro believes that it is important to move as quickly as possible to begin providing conservation price signals to its residential customers.

Seasonal rate structures are another potential alternative to the simple RIB rate designs assessed by BC Hydro in this application. BC Hydro believes that a seasonal rate structure would be impractical to implement in the immediate future due to current bi-monthly meter reading schedules. Therefore, implementation of seasonal rates, which by definition begin and end on specific calendar dates, would require significant billing pro-ration to estimate seasonal consumption and possibly more frequent meter reading which would involve increased costs. As well, seasonal rates are more complicated and difficult to understand than a simple two-step structure. BC Hydro would reconsider the use of seasonal rate structures in the future, once BC Hydro gains experience with a simple non-seasonal rate structure. In the future, advanced metering and billing software modifications would facilitate cost-effective and accurate consumption tracking during designated seasonal months, making the structure more practical to implement and easier for customers to understand.

Finally, it is significant in BC Hydro's view that the BCUC directed BC Hydro to apply for a simple two-step inclining block rate structure, before the end of March 2008. If BC Hydro believed that it could not do so, or if it believed that an alternative rate structure satisfied the basic design criteria as well as a simple two-step inclining block rate structure, it would have sought relief from that direction. BC Hydro has not done so because it shares the BCUC's view that an appropriate first step toward residential rate restructuring is a simple, easy to understand two-step inclining block rate design.

[23] See 2007 RDA Decision page 205.

2.6 Conclusion

This chapter has demonstrated that a two-step inclining block rate structure can satisfy the eight rate design criteria described by BC Hydro in its 2007 RDA and endorsed by the BCUC in its subsequent decision. In addition, the two-step inclining block rate better satisfies the efficient pricing design criterion than a flat rate structure, and therefore better enables BC Hydro to achieve its conservation objectives. It can do so sooner, with less likelihood of customer acceptance issues, and consistent with provincial energy policy.

The eight rate design criteria, while important, do not provide sufficient guidance to develop specific rate structures that can send efficient price signals to residential consumers to promote economic conservation, without causing undue bill impacts or other issues. Thus, the assessment of a properly-designed rate structure requires that alternative design elements within the two-step inclining block structure be evaluated, as summarized in Chapter 3.

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Chapter

3

Proposed RIB Rate Structure

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3.1 Introduction

This chapter sets out BC Hydro's analysis of and proposal for a RIB rate structure.

In section 3.2 BC Hydro describes the analytical tools it used, beyond the basic rate design criteria, to select its preferred RIB rate structure, including several proposed refinements – "tests" to the economic efficiency criteria and the bill stability criteria.

In section 3.3 BC Hydro compares its proposed RIB rate structure and the BCUC Proposal against the proposed economic efficiency tests, under a range of assumed class average rate increase and cost of new supply scenarios. It concludes that BC Hydro's proposed structure performs better than the BCUC Proposal.

In section 3.4, BC Hydro provides bill impact analyses of its preferred RIB rate structure, under two plausible class average rate increase scenarios, demonstrating that even under relatively higher assumed class average rate increases, BC Hydro's proposal meets the bill impact test.

In section 3.5 BC Hydro assesses its preferred RIB rate structure against two simple variations of it, one with a lower 1,000 kWh bi-monthly Step-1 Threshold and the other with a higher 2,200 kWh bi-monthly Step-1 Threshold. BC Hydro concludes that the 1,600 kWh Step-1 Threshold proposed first by the BCUC and now by BC Hydro in this application better serves the objectives of this application while still passing the bill impact test.

3.2 Beyond the Eight Basic Rate Design Criteria

3.2.1 Introduction

The basic eight rate design criteria described in section 2.2 are useful in BC Hydro's assessment of the current flat rate against a generic two-step rate, but by themselves do not assist in defining a more efficient rate structure, nor do they provide specific guidance on bill and rate stability issues. In addition, they do not account for the circumstances in which a new rate structure is introduced, and how a new rate structure ought to be assessed in light of those circumstances. Finally, they do not provide guidance in assessing a particular

inclining block rate structure. Thus, in this section of the application BC Hydro describes:

- the tests it established for the purpose of assessing the ability of the new RIB rate structure to better achieve the basic efficiency criteria (section 3.2.2);
- the more specific test it has established to assess whether bill impacts are acceptable (section 3.2.3);
- how the current uncertainty regarding future class average rate increases and long-run cost of new supply affects its consideration of alternative rate structures (section 3.2.4); and
- an approach to explaining and justifying its proposed RIB rate structure that highlights the fundamental difference between BC Hydro's proposal and the BCUC Proposal, namely whether the Step-1 Rate is pre-set, with the Step-2 Rate being calculated residually (the BC Hydro proposal), or the other way around (the BCUC Proposal) (section 3.2.5).

3.2.2 Tests to Assess the RIB Rate's Ability to Achieve the Basic Efficiency Criteria

The following tests are used to assess the performance of the proposed RIB rate structure against the economic efficiency criterion described in Chapter 2. They are described as "tests" because BC Hydro believes that to the extent possible any proposed RIB rate should satisfy each of them. The tests are qualified - "to the extent possible" - because achieving them all to the highest degree possible would be impossible. That is, any RIB rate proposal that seeks to satisfy as many of the tests as possible will require trade-offs between them. To the extent that these tests can all be satisfied by a specific RIB rate proposal, without undue trade-offs against each, BC Hydro believes that the RIB rate proposal will best satisfy the economic efficiency rate design criteria. Conversely, any proposed RIB rate that utterly fails on any one of the tests is not a rate structure that BC Hydro would readily endorse.

The "tests" are as follows:

- no customer should see a rate decrease, to avoid providing disincentives to conservation;

- as many customers as possible should see the Step-2 Rate, to maximize the number of customers that have incentives to conserve;

- the differential between the Step-1 Rate and Step-2 Rate should be sufficiently large to provide a meaningful incentive for conservation; and

- the Step-2 Rate should be more reflective of, while not exceeding, the full cost of new supply (plus fixed costs)[24], relative to the otherwise applicable flat rate, to incent more conservation than under a flat rate.

3.2.3 Bill Impact Considerations

Rate re-structuring necessarily results in bill impacts that from a customer perspective are either favourable, or adverse, in the sense that they either result in lower or higher annual bills than under the existing flat rate structure. The degree to which a new proposed rate structure limits adverse bill impacts while still meeting to the highest degree possible the other basic rate design criteria is an important factor to consider in the assessment of that rate structure.

Customer bills can be impacted by a combination of two causes. The first cause is a general rate increase due to an increase in BC Hydro's revenue requirement. The second cause is rate restructuring, such as this RIB rate proposal or a rate rebalancing (that is, bringing revenues from a customer class more in line with the costs to serve that class).

BC Hydro's customer bill impact test, the same test it proposed in the 2007 RDA, is based on two premises:

- customer bill impacts as a result of rate restructuring alone should ideally be no more than 10 per cent per year; and

- rate restructuring impacts are cumulatively additive to general rate increases (such as those applied for in the F09/F10 RRA).

[24] The "Energy Charges" under the residential rate structure provide for the recovery by BC Hydro of more than simply the cost of energy allocated to residential customers under cost of service studies, also providing for the recovery of fixed delivery and customer costs. Thus any comparison of the residential Step-2 Rate and the cost of new supply requires, in BC Hydro's view, an accounting for this element of the residential rate structure. See section 3.3.4 for further discussion on this topic.

Like the economic efficiency tests, the bill impact test advanced by BC Hydro in this application is not strictly a pass-fail test. Like all other design considerations, the results of a bill impact analysis must be assessed in light of other design criteria and considerations, even if the proposed rate structure causes more than an annual 10 per cent bill impact. For example, in the 2007 RDA BC Hydro posited a specific exception to the 10 per cent test, namely that greater than 10 per cent annual bill impacts would be acceptable if absolute dollar increases in bills were nominal. In this application BC Hydro also considers that under some larger class average rate increase scenarios (future revenue requirement rate increases and rate rebalancing rate increases) it would be acceptable if small percentages of BC Hydro's 1.5 million residential customers faced adverse bill impacts greater than 10 per cent annually. Such impacts would be acceptable because of the extremely wide distribution of residential consumption,[25] and because of the difficulty of otherwise achieving the objectives of any RIB rate proposal under some of those scenarios.

Finally, it is useful to consider what BC Hydro means by the word "acceptable". Ideally BC Hydro could achieve the objective of this application without causing any adverse bill impacts. However, that is simply not possible as any re-structuring must effectively redistribute costs among customers. Thus "acceptable" is a qualitative assessment of what is reasonable in the circumstances, and as guided by regulatory precedent. Regarding the latter, BC Hydro believes that the BCUC has generally accepted the 10 per cent bill impact test since BC Hydro's first rate design hearing in 1992.

3.2.4 Robustness of Rate Design Proposal in Light of Future Uncertainty

The previous paragraph alluded to scenarios of larger future class average rate increases. Such scenarios arise because in the medium to long term the size of such potential rate increases to BC Hydro's residential customers is unknown. Even in the near term there is some uncertainty: the F09/F10 RRA is subject to BCUC review, and government has announced its intention to extinguish the rate rebalancing aspects of the 2007 RDA Decision via legislation, and also specify the parameters for future treatment of rate rebalancing. This is significant for the purpose of assessing any proposed RIB rate structure because, as is demonstrated in sections 3.3 and 3.4 below, there is a direct relationship between the magnitude of future class average rate increases and i) the bill impacts that will arise from

[25] See Figure 1-2 and Table 4-1.

that proposed structure (particularly under BC Hydro's proposal); and ii) the performance of the proposed rate structure against the economic efficiency tests.

There is also considerable uncertainty regarding both the future long-run cost of new supply, and the proxy for that cost proposed by the BCUC for the Step-2 Rate, namely the RS 1823 Tier 2 Rate. Regarding the former, BC Hydro plans to conduct a further call for energy in F2009, which will likely yield a different levelized call price than the F2006 Call for Tender (**CFT**) price, used by BC Hydro as the best indicator of the long-run cost of new supply in British Columbia. The results of the future call are unknown at this time, and likely will not be known until the regulatory review of that process, including section 71 filings, are complete. Regarding the latter, BC Hydro has applied to the BCUC to increase the RS 1823 Tier 2 rate from 5.40 cent/kWh to 7.36 cents/kWh,[26] but the outcome of that application is at this time unknown. The uncertainty regarding the long-run cost of new supply, and its RS 1823 Tier 2 proxy, is not very relevant to the assessment of BC Hydro's proposed RIB rate structure. However, this uncertainty is very relevant to an assessment of the BCUC Proposal, which would specifically tie the Step-2 Rate to the RS 1823 Tier 2 Rate.

Given the foregoing, BC Hydro believes that a further important consideration in selecting a RIB rate proposal is the relative robustness of a particular RIB rate design to a reasonably wide range of class average rate increases and future call results. That is, a design which can better satisfy the efficiency criteria, and all the other rate design criteria, including bill stability and impacts, under a wider range of plausible scenarios, ought to be preferred to a design that satisfies those criteria under only a limited number of scenarios.

3.2.5 Choosing Between the BCUC Proposal and BC Hydro's Preferred RIB Rate Structure

The key design elements in any RIB rate proposal are the Step-1 Rate, the Step-2 Rate, and the Step-1 Threshold.[27] Selecting the combination of these elements that best satisfies the design criteria is both an empirical and iterative process. It is empirical because the combination of any set of design elements can only be assessed by modelling them. It is

[26] Transmission Service Rate (TSR) Re-pricing Application, February 22, 2008.

[27] There is a fourth design element, being the Basic Charge. Because the Basic Charge under BC Hydro's current residential rate structure collects only a small fraction of total residential customer revenue – about six per cent - how it is treated under different class average rate increase scenarios has little bearing on how the design otherwise performs.

iterative because only by adjusting each element in turn can the different set of elements be assessed. However, this process does not lend itself well to an obviously more logical starting point for the consideration of design alternatives. For example, it is not more logical to first establish the Step-1 Threshold and then pricing, than the other way around. Nor does the selection process lend itself to an explanation of why a particular design is the preferred alternative. An application that described every alternate combination of design elements would be unwieldy at best.

For these reasons BC Hydro's justification for its RIB rate structure begins with a comparison of BC Hydro's preferred RIB rate structure against the BCUC Proposal. This comparison is convenient because there is only one fundamental difference between BC Hydro's proposed RIB rate structure and the BCUC Proposal, namely whether to set the Step-1 Rate residually (that is, to collect the balance of the residential revenue requirement not recovered by the Step-2 Rate and the Basic Charge), or to set the Step-2 Rate residually.[28] The former is the BCUC Proposal, and the latter is BC Hydro's preferred approach. Under either approach, however, a relatively large (small) Step-2 Rate implies a relatively small (large) Step-1 Rate, with important implications for the performance of the proposed rate structures, including conservation incentives and bill impacts.

The following section describes the BCUC Proposal, BC Hydro's preferred RIB rate structure, and then compares the performance of both against the economic efficiency tests described above, in the face of a number of different class average rate increase and long-run cost of new supply scenarios. As will be seen, BC Hydro concludes that its RIB rate proposal satisfies those tests under far more scenarios than the BCUC Proposal. In light of this conclusion, there is no further analysis of the BCUC Proposal in this application subsequent to section 3.3.[29]

[28] Both the BCUC Proposal and BC Hydro's preferred RIB rate structure are based on a 1600 kWh bi-monthly Step-1 Threshold and the residual rate calculation is done on a revenue neutral basis. See Appendix A for more information on these topics.

[29] Sections 3.4 and 3.5 provide further justification of BC Hydro's proposed RIB rate structure without regard to the BCUC Proposal.

3.3 Comparison of the BCUC Proposal and BC Hydro's Proposed RIB Rate Structure (Economic Tests)

In this section BC Hydro assesses the BCUC Proposal and its own proposed RIB rate structure against the economic efficiency tests it proposes above, under five different residential class average rate increase scenarios and three RS 1823 Tier 2 Rate scenarios.

BC Hydro first provides further information on the BCUC Proposal and then on its proposed rate structure in the next sections. In section 3.3.3 BC Hydro provides further information on the different class average rate increase and cost of new supply scenarios. BC Hydro concludes with its assessment of the performance of the two RIB structures against the economic tests and in light of the different scenarios.

3.3.1 The BCUC Proposal

This section describes the BCUC Proposal: an inclining block rate with a Step-2 Rate tied to the RS 1823 Tier 2 rate and a residually set Step-1 Rate. Specifically, as stated by the BCUC at page 110 of the 2007 RDA Decision, the BCUC Proposal has the following design elements:

- the size of the first block should be determined on the basis of the Heritage entitlement and for each residential customer it should be set at about 800 kWh/month;
- all energy consumed in excess of 800 kWh/month would be priced at the marginal cost of supply, as established by BC Hydro from time to time as the cost of Tier 2 power under Rate Schedule 1823, plus an allowance for distribution losses; and
- the proposal be revenue neutral.

To establish the Step-2 Rate for the purpose of describing and analysing the BCUC Proposal it is necessary to establish what the Step-2 Rate might be under different assumptions of the RS 1823 Tier 2 Rate. For the purpose of analysing the BCUC Proposal BC Hydro has used the following RS 1823 Tier 2 Rate scenarios:

1. the current RS 1823 Tier 2 Rate of 5.40 cent/kWh, for three years;

2. the applied-for RS 1823 Tier 2 Rate of 7.36 cents/kWh, for three years; and

3. the applied-for RS 1823 Tier 2 Rate of 7.36 cents/kWh, for two years, and a hypothetical call for energy price of 10.0 cents/kWh in year three.

As the current and applied-for RS 1823 Tier 2 Rates are plant-gate prices, BC Hydro grossed-up all the prices to account for both distribution and transmission losses, at six per cent each, yielding Step-2 Rates of 6.07, 8.27 and 11.24 cents/kWh for the three scenarios, reflecting the fact that residential consumption occurs at the distribution level. BC Hydro believes its treatment to be consistent with the BCUC's design elements quoted above.

The BCUC Proposal specifies a "Heritage" Step-1 Threshold of 800 kWh/month. However, because the vast majority of BC Hydro's residential customers are billed on a bi-monthly basis, BC Hydro uses a 1,600 kWh/bi-monthly billing period to model the BCUC Proposal. [30] Again, BC Hydro believes this is consistent with the description of that proposal in the 2007 RDA Decision.

As previously noted, BC Hydro's preferred structure would have the Basic Charge change by the same annual percentage change as the Step-1 Rate. For ease of comparison, BC Hydro uses the same Basic Charge that results from its proposed structure for the purpose of modelling the BCUC Proposal.[31]

Under the BCUC Proposal the Step-1 Rate is calculated residually to allow recovery of the residential revenue requirement that is not recovered by the Step-2 Rate and the Basic Charge. Thus, the BCUC Proposal as modelled by BC Hydro is revenue neutral, on a

[30] In the application, BC Hydro refers to a bi-monthly billing period and a Step-1 Threshold of 1,600 kWh/bi-monthly billing period. This is a simplification for convenience because the number of days in a billing period can vary significantly. As shown in the illustrative tariff sheets attached to the application in Appendix D, the 1,600 kWh bi-monthly Step-1 Threshold will be pro-rated on a daily basis. For a given bill, the daily pro-rated Step-1 Threshold amount will be multiplied by the number of days in the billing period.

[31] BC Hydro does not believe this assumption has any material effect on the comparative assessment of its proposed RIB rate structure against the BCUC Proposal. See footnote 7 above.

forecast consumption basis. Section 4.3 provides a fuller discussion of the topic of revenue neutrality.

3.3.2 The BC Hydro Proposal

As noted previously, BC Hydro's proposal first sets the Step-1 Rate and Basic Charge, and then residually determines the Step-2 Rate. Like the BCUC Proposal, it is revenue neutral on a forecast consumption basis,[32] and has a 1,600 kWh bi-monthly Step-1 Threshold. Under BC Hydro's proposal, the pricing structure would be adjusted annually as follows:

1. increase the Step-1 Rate and the Basic Charge by the projected rate of inflation inherent in the revenue requirement applicable for the fiscal period beginning on April 1;

2. increase the Step-2 Rate so that it allows BC Hydro to recover the residual residential revenue requirement for the fiscal period beginning on April 1 that would not be recovered by the Basic Charge and Step-1 Rate, before any rate changes arising from rate rebalancing; and

3. further adjust each of the Step-1 Rate, the Basic Change, and the Step-2 Rate by the percent change to residential rates arising from any rate rebalancing effective that April 1.

In the case of implementation prior to the beginning of April 1, 2009 (BC Hydro believes October 1, 2008 is feasible and desirable – see section 1.7) a one-time variation to the foregoing would be would be necessary to account for the small impact of relatively higher winter usage on the partial year rate calculation. BC Hydro proposes that in such a circumstance the Step-1 Rate should be calculated on the basis of the rates in effect on March 31, 2008 (i.e., prior to any interim rate increase or changes to rates as a result of the 2007 RDA Decision).

[32] See section 4.3 and Appendix A.

3.3.3 The Rate Increase and Cost of New Supply Scenarios

Appendix E contains tables that show the pricing (Step-1 Rate, Step-2 Rate and Basic Charge) that would result from BC Hydro's proposed RIB rate structure and from the BCUC Proposal, under different class average rate increase and cost of new supply scenarios.[33] These scenarios were developed to test the BCUC Proposal and the BC Hydro proposal against the economic tests. None represents a particular expectation by BC Hydro regarding what is expected to occur. BC Hydro refers to these tables, collectively, as the "Scenario Analyses". The pricing shown in the Scenario Analyses reflects the specific design elements of the two different rate structures as described above.

The cost of new supply scenarios shown in the Scenario Analyses were used to develop alternate Step-2 Rates under the BCUC Proposal, and are already described above.

The class average rate increase scenarios used in the Scenario Analyses are as follows:

A. revenue requirement increases equal to 5 per cent per year, for three years, with no rate rebalancing;

B. revenue requirement increases equal to those proposed in the F09/F10 RRA, plus a further 5 per cent in year three, with no rate rebalancing;

C. revenue requirement increases equal to those proposed in the F09/F10 RRA, plus a further 7.5 per cent in year three, with no rate rebalancing;

D. revenue requirement increases equal to those proposed in the F09/F10 RRA, plus a further 5 per cent in year three, with a further 3.6 per cent increase per year from rate rebalancing; and

E. revenue requirement increases equal to those proposed in the F09/F10 RRA, plus a further 7.5 per cent in year three, with a further 3.6 per cent increase per year from rate rebalancing.

[33] Tables 1-1 and 1-2 also show the rates that would result from BC Hydro's proposal under the scenarios that assume the currently applied-for F09/F10 RRA rate increases, with and without assumed rate rebalancing increases.

In BC Hydro's view these scenarios capture a wide but possible range of potential class average rate increases and RS 1823 Tier 2 rates that could unfold in the near to medium term. The 3.6 per cent annual rate rebalancing assumption is based on the 2007 RDA Decision and BC Hydro's January 30, 2008 compliance filing that followed. Although government has announced its intention to extinguish the rate rebalancing elements of the 2007 RDA Decision, it is currently uncertain when that will occur, or the degree to which future rate rebalancing will occur. Further, assuming a scenario that includes the rate rebalancing effects of the 2007 RDA Decision usefully serves to illustrate how the proposed rate structures fare under higher average rate increase scenarios.

The Scenario Analyses shown in Appendix E are all calculated on the basis of the following:

- an October 1 implementation, which BC Hydro believes is both desirable and achievable, as noted above in section 1.7;
- a projected inflation rate of 2.1 per cent, consistent with the F09/F10 RRA;
- the same BC Hydro load forecast used for the F09/F10 RRA; and
- recorded F2006 and F2007 residential billing data. [34]

Appendix A provides further information on the calculation of the pricing of the first two years of Scenario B1.

3.3.4 Comparison of the BCUC Proposal and BC Hydro's Preferred RIB Rate Structure (Economic Tests)

BC Hydro assesses its proposal and the BCUC Proposal against the economic efficiency tests proposed above. As can be seen from the Scenario Analyses, BC Hydro's proposal does not depend on the assumed RS 1823 Tier 2 Rate. As is discussed below, this difference between the two rate structures is a significant driver of their relative performance.

[34] Billing data from categories of accounts to which the RIB would not be applicable and accounts with less than 2 years of billing history were excluded.

No Rate Decreases

To meet this test at all, BC Hydro believes that the Step-1 Rate should be no less than the current flat rate in effect on March 31, 2008. Ideally, and as proposed by BC Hydro, on the assumption that revenue requirement increases will exceed general inflation in the near to medium term, the Step-1 Rate should increase by projected inflation, keeping it constant in real dollar terms. This is particularly important because under both the BCUC Proposal and BC Hydro's proposed RIB rate structure about 40 per cent of BC Hydro's residential customers consistently consume at a level below the Step-1 Threshold (see section 3.5.1). Minimizing the conservation disincentive for these customers requires, to the extent reasonably possible, that their rates do not decline, and preferably do not decline on an inflation-adjusted basis.

On this basis it is apparent from the Scenario Analyses that the BCUC Proposal only meets this test when the RS 1823 Tier 2 rate remains at the current 5.40 cents/kWh. However, under that RS 1823 Tier 2 rate scenario, the BCUC Proposal requires the Step-1 Rate to exceed the Step-2 Rate to allow recovery of the residual residential revenue requirement. Thus, the BCUC Proposal produces a declining block rate, utterly failing not only this particular economic efficiency test, but the basic efficiency rate design criteria that an inclining block rate is meant to address. Further, under higher Step-2 Rate assumptions, the BCUC Proposal results in the Step-1 Rate declining relative to the current flat rate. In contrast, the BC Hydro proposal does not in any circumstance result in rate decreases, in inflation-adjusted terms from the March 31, 2008 rates.[35]

As Many Customers As Possible Should See the Step-2 Rate

As implicitly noted above, a 1,600 kWh bi-monthly Step-1 Threshold will result in about 60 per cent of BC Hydro's residential customers seeing the Step-2 Rate in at least their high consumption billing periods. Thus this test is satisfied under either the BCUC Proposal or BC Hydro's proposal, and under any of the scenarios shown in the Scenario Analyses.

[35] An October 1, 2008 implementation date would result in a Step-1 Rate on October 1, 2008 being lower than the flat rate applicable on September 30. BC Hydro does not believe that this one-time transition issue should be a bar to an implementation date prior to the 2008/09 winter season.

The Difference Between the Step-1 Rate and Step-2 Rate Should Be Significant

The Scenario Analyses indicate that under most scenarios the BCUC Proposal results in a significant differential between the Step-1 Rate and the Step-2 Rate (except where the BCUC Proposal yields a declining block rate under the 5.40 cent/kWh RS 1823 Tier 2 Rate scenario). However, in most cases this comes at the expense of the Step-1 Rate being significantly below the current inflation-adjusted flat rate, and in many cases below even the unadjusted current flat rate. Even where there is a significant rate differential, the differential decreases over time as the Step-2 Rate stays unchanged and the class average rate increases are built into the Step-1 Rate. Finally, in no scenario does the BCUC Proposal yield a pricing structure in which the Step-2 Rate significantly exceeds the Step-1 Rate and the Step-1 Rate does not decline on an inflation-adjusted basis.

By contrast, the Scenario Analyses demonstrate that in virtually all scenarios BC Hydro's proposal yields a significant difference between the Step-1 Rate and the Step-2 Rate.

The Step-2 Rate Should Be More Reflective of, While Not Exceeding, the Full Cost of New Supply

The most current information BC Hydro has regarding the long run cost of new supply in British Columbia is from the F2006 CFT. Under the BCUC Proposal the F2006 CFT yields a Step-2 Rate that is 8.27 cents/kWh (7.36 cents/kWh grossed up for losses), as described above. Given that the current flat rate at 6.15 cents/kWh is lower than 8.27 cents/kWh, any Step-2 Rate that exceeds 6.15 cents is bound to satisfy the first arm of this test. BC Hydro's proposed RIB satisfies this test under all scenarios. Similarly the BCUC Proposal also satisfies this test under all scenarios but one, in this case the 5.40 cents/kWh RS 1823 Tier 2 Rate scenario, which yields a declining block structure.

The BCUC Proposal satisfies the second arm of this test of course because it starts with the premise that the Step-2 Rate should equal the RS 1823 Tier 2 Rate (adjusted for losses). Conversely, if the RS 1823 Tier 2 rate was an appropriate basis for limiting the Step-2 Rate, the Scenario Analyses indicate that BC Hydro's proposal would fail this test under those scenarios with higher class average rate increases and lower RS 1823 Tier 2 rates, as

BC Hydro's Step-2 Rate would exceed the RS 1823 Tier 2 Rate. However, BC Hydro does not believe the BCUC proposal is, in this regard, methodologically sound.

The reason is that there is a fundamental difference between the RS 1823 rate structure and any residential structure that does not provide for demand metering. That difference arises from the fact the under RS 1823 customers pay an additional demand charge that, relative to the Basic Charge under the residential rate structure, covers a significant portion of the fixed costs of the system allocated to the RS 1823 customer class. Put another way, the "energy charges" under the residential rate structure include more than simply the cost of energy allocated to residential customers, despite the name. In quantitative terms (first order approximation), and relying on the cost of service study filed in compliance with BCUC Order No. G-111-07, about 2.50 cents/kWh of the current residential rate of 6.15 cents/kWh covers the cost of energy allocated to residential customers, while under RS 1823 the current average energy rate of 2.77 cents/kWh covers very closely the cost of energy allocated to that class. Thus, a rate design that required the residential Step-2 Rate to be no higher than the RS 1823 Tier 2 Rate would require the latter to be grossed-up by three to four cents/kWh. Doing so would allow for a more appropriate comparison and linkage between the energy charges in the different rate structures. It would also result in all the Step-2 Rates arising from BC Hydro's proposal as shown in the Scenario Analyses being well within the upper bound of long-run cost of new supply scenarios.

3.3.5 Conclusions Regarding the BCUC Proposal and BC Hydro's Proposed RIB

The Scenario Analyses indicate conclusively that the BCUC Proposal does not perform well under any of the class average rate increase and cost of new supply scenarios against the proposed economic efficiency tests. By contrast, BC Hydro's proposal performs well under all of the scenarios against those tests.

In addition, and by reference to the basic eight rate design criteria, BC Hydro believes that the Scenario Analyses convincingly demonstrate that its proposal is less likely to lead to rate instability. Under the BCUC Proposal rates can vary dramatically from year to year, higher or lower, as a consequence of changing the RS 1823 Tier 2 rate. In contrast, BC Hydro's proposed RIB rate structure has rates that steadily increase over time.

Further, the BCUC Proposal is also more likely to lead to income instability for BC Hydro, given the greater likelihood of a rapid increase in the Step-2 Rate compared to the short run marginal cost of new supply than under BC Hydro's proposal.

3.4 Bill Impact Test (BC Hydro Proposed RIB Rate)

In this section BC Hydro assesses the performance of its proposed RIB rate structure against its bill impact test under two of the average rate increase scenarios shown in the Scenario Analyses. Under that test, BC Hydro considers a ten per cent bill impact per year arising solely from rate restructuring to be acceptable.

1. Scenario B1: BC Hydro's proposed F09/F10 RRA rate increases in year one and year two, with a further hypothetical 5 per cent revenue requirement increase in year three, with assumed rate rebalancing increases of zero per cent in each year (Table 3-1); and

2. Scenario D1: the same revenue requirement scenario as above, but with assumed rate rebalancing increases of 3.6 per cent each year (Table 3-2).

Under this revenue requirement scenario, customers whose annual rate increases were less than 17.2 per cent in year one; 19.0 per cent in year two; and 15.5 per cent in year three would fall outside BC Hydro's bill impact test.[36]

In each case the bill impact analysis is based on the same assumptions used for the corresponding Appendix E table, including an implementation date of October 1, 2008, except that only F2007 residential billing data has been used.[37]

It is apparent from the following tables that under a class average rate increase scenario that is based on the F09/F10 RRA and assumes no rate rebalancing (Scenario B1),

[36] Only those customers with bill increases of 17.2 per cent in year one, 39.5 per cent over two years, and 61.2 per cent over three years, on a cumulative basis, fall outside BC Hydro's bill impact test (calculated by multiplying the revenue requirement increase by the bill impact test). That is: 17.2 = 1.0656 X 1.10;
39.5 = 1.0656 X 1.10 X 1.0821 X 1.10;
61.2 = 1.0656 X 1.10 X 1.0821 X 1.10 X 1.05 X 1.10.

[37] For the F2009 bill impact calculations, F2007 billing data from the period October 1 to March 31 was used, given the proposed October 1, 2008 implementation date.

consistent with government's recent direction on this topic, no customers would fall outside BC Hydro's bill impact test.

However, under Scenario D1 in which residential rates also increase because of rate rebalancing, on a year-over-year basis, there would be a very small percentage of customers who would fail to meet BC Hydro's bill impact test (slightly more than one per cent and no more than about 15,700 customers in year two). However, such a class average rate increase scenario now seems very unlikely given government's intention to extinguish the rate rebalancing effects of the 2007 RDA Decision. Further, the bill impact analyses assume no demand response to the new rate structure, and therefore tend to overestimate the adverse bill impacts. Finally, and as noted above in section 3.2.3, BC Hydro also believes that the projected bill impacts are acceptable when the percentage of customers who do fall outside the 10 per cent test is very small, in light of the number of customers, their wide range of consumption, and the objective of the RIB proposal. Regardless, BC Hydro provides further customer consumption information in section 4.1.

For all these reasons BC Hydro believes that its RIB proposal passes the bill impact test.

Table 3-1 Scenario B1 Bill Impact Analysis

% Bill Increase	F2009		F2010		F2011	
	# of Customers	% of Customers	# of Customers	% of Customers	# of Customers	% of Customers
> 80						
70 - 80						
61.2 - 70						
					⇩Bill Impact Test 61.2% Cumulative 3 Years	
50 - 61.2					106	0.0%
45 - 50					3,550	0.3%
39.5 - 45					17,932	1.3%
			⇩Bill Impact Test 39.5% Cumulative 2 Years			
35 - 39.5			1,479	0.1%	45,088	3.3%
30 - 35			14,550	1.1%	85,589	6.2%
25 - 30			66,110	4.8%	112,156	8.1%
20 - 25			126,750	9.2%	128,073	9.3%
17.2 - 20			88,578	6.4%	74,946	5.4%
	⇩Bill Impact Test 17.2% Cumulative 1 Year					
14 - 17.2			110,861	8.0%	90,668	6.6%
12 - 14	3,606	0.3%	71,771	5.2%	59,720	4.3%
10 - 12	73,146	5.3%	74,442	5.4%	66,545	4.8%
8 - 10	166,841	12.1%	79,710	5.8%	83,080	6.0%
6 - 8	188,268	13.6%	95,300	6.9%	613,329	44.4%
4 - 6	184,824	13.4%	651,231	47.2%		
2 - 4	764,097	55.3%				
0 - 2						

Table 3-2 Scenario D1 Bill Impact Analysis

% Bill Increase	F2009		F2010		F2011	
	# of Customers	% of Customers	# of Customers	% of Customers	# of Customers	% of Customers
> 80						
70 - 80						
61.2 - 70					3,782	0.3%
					⇩Bill Impact Test 61.2% Cumulative 3 Years	
50 - 61.2					64,489	4.7%
45 - 50			1,316	0.10%	76,257	5.5%
39.5 - 45			14,400	1.04%	108,250	7.8%
			⇩Bill Impact Test 39.5% Cumulative 2 Years			
35 - 39.5			50,530	3.7%	102,559	7.4%
30 - 35			109,205	7.9%	120,067	8.7%
25 - 30			146,798	10.6%	128,754	9.3%
20 - 25			164,451	11.9%	165,403	12.0%
17.2 - 20	31	0.002%	97,785	7.1%	611,221	44.3%
	⇩Bill Impact Test 17.2% Cumulative 1 Year					
14 - 17.2	74,270	5.4%	133,273	9.7%		
12 - 14	160,879	11.7%	127,435	9.2%		
10 - 12	182,890	13.2%	535,589	38.8%		
8 - 10	179,871	13.0%				
6 - 8	213,368	15.5%				
4 - 6	569,473	41.2%				
2 - 4						
0 - 2						

3.5 Consideration of Different Step-1 Thresholds (BC Hydro Proposed RIB Rate)

3.5.1 Introduction

In this section BC Hydro considers the performance of two variations of its proposed RIB structure: one in which the bi-monthly Step-1 Threshold is 1,000 kWh, and another in which it is 2,200 kWh. These alternative rate structures are otherwise exactly the same as BC Hydro's proposed RIB rate structure. The pricing derivation and analysis which follow are modelled using the same assumptions used in the Scenario Analyses, and on the basis of the F09/F10 RRA plus five per cent in year three scenario, without rate rebalancing (Scenario B1). The alternate 1,000 kWh and 2,200 kWh Step-1 Thresholds are modelled because they form a sufficiently wide range of plausible Step-1 Thresholds.

Table 3-3 shows the pricing that results from the alternative 1,000 and 2,200 kWh bi-monthly Step-1 Thresholds. Table 3-4 shows the percentage of customers that see the

Step-2 Rate and the percentage of load that each of those categories of customers use. Tables 3-5 and 3-6 show the bill impacts of the alternatives.

In the discussion that follows these tables BC Hydro explains why it does not believe that either a 1,000 kWh or a 2,200 kWh Step-1 Threshold is preferable to its proposed 1,600 kWh Step-1 Threshold.

Table 3-3 Pricing of BC Hydro Proposed RIB Rate Under Alternate Step-1 Thresholds

BC Hydro Proposed Design Plus Two Alternative Step-1 Threshold Sizes:	Year 1			Year 2			Year 3		
	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)
BC Hydro Proposed RIB rate Design (Step-1 Threshold of 1,600 kWh/Bi-Monthly Billing Period)	12.38	6.28	6.98	12.64	6.41	8.53	12.91	6.55	9.35
BC Hydro Proposed RIB rate Design Variation No. 1 (Smaller Step-1 Threshold of 1,000 kWh/Bi-Monthly Billing Period	12.38	6.28	6.77	12.64	6.41	7.80	12.91	6.55	8.39
BC Hydro Proposed RIB rate Design Variation No. 2 (Larger Step-1 Threshold of 2,200 kWh/Bi-Monthly Billing Period)	12.38	6.28	7.27	12.64	6.41	9.56	12.91	6.55	10.71

Table 3-4 Percentage of Customers and Load Under Alternate Step-1 Thresholds for BC Hydro Proposed RIB Rate

Customers That See The Step-2 Rate:	BC Hydro Proposed Step-1 Threshold 1,600 kWh		Smaller Step-1 Threshold 1,000 kWh		Larger Step-1 Threshold 2,200 kWh	
	% of Customers	% of Load	% of Customers	% of Load	% of Customers	% of Load
Never	~ 38 %	~ 15 %	~ 20 %	~ 5 %	~ 54 %	~ 28 %
Sometimes	~ 37 %	~ 37 %	~ 29 %	~ 20 %	~ 35 %	~ 45 %
Always	~ 25 %	~ 48 %	~ 51 %	~ 75 %	~ 11 %	~ 27 %

Table 3-5 Bill Impacts Of BC Hydro Proposed RIB Rate Under Alternate 1,000 kWh Step-1 Threshold & Rate Increase of F09/F10 RRA in Years 1 & 2 Plus 5 per cent in Year 3

% Bill Increase	F2009		F2010		F2011	
	# of Customers	% of Customers	# of Customers	% of Customers	# of Customers	% of Customers
> 80						
70 - 80						
61.2 - 70						
					⇩Bill Impact Test 61.2% Cumulative 3 Years	
50 - 61.2						
45 - 50						
39.5 - 45						
			⇩Bill Impact Test 39.5% Cumulative 2 Years			
35 - 39.5					527	0.04%
30 - 35					41,409	3.0%
25 - 30			2,135	0.2%	201,337	14.6%
20 - 25			128,714	9.3%	266,850	19.3%
17.2 - 20			180,770	13.1%	139,195	10.1%
	⇩Bill Impact Test 17.2% Cumulative 1 Year					
14 - 17.2			227,791	16.5%	140,644	10.2%
12 - 14			129,788	9.4%	77,778	5.6%
10 - 12	4	0.0%	114,939	8.3%	73,496	5.3%
8 - 10	159,816	11.6%	102,393	7.4%	76,979	5.6%
6 - 8	399,457	28.9%	97,938	7.1%	362,567	26.3%
4 - 6	305,644	22.1%	396,314	28.7%		
2 - 4	515,861	37.4%				
0 - 2						

Table 3-6 Bill Impacts Of BC Hydro Proposed RIB Rate Under Alternate 2,200 kWh Step-1 Threshold & Rate Increase of F09/F10 RRA In Years 1 & 2 Plus 5 per cent in Year 3

% Bill Increase	F2009		F2010		F2011	
	# of Customers	% of Customers	# of Customers	% of Customers	# of Customers	% of Customers
> 80						
70 - 80					111	0.0%
61.2 - 70					2,862	0.2%
					⇩Bill Impact Test 61.2% Cumulative 3 Years	
50 - 61.2			660	0.0%	16,202	1.2%
45 - 50			2,838	0.2%	19,646	1.4%
39.5 - 45			8,369	0.6%	35,289	2.6%
			⇩Bill Impact Test 39.5% Cumulative 2 Years			
35 - 39.5			17,098	1.2%	40,384	2.9%
30 - 35			37,568	2.7%	53,933	3.91%
25 - 30			58,475	4.2%	63,127	4.6%
20 - 25			75,948	5.5%	73,426	5.3%
17.2 - 20	155	0.0%	49,515	3.6%	44,838	3.2%
	⇩Bill Impact Test 17.2% Cumulative 1 Year					
14 - 17.2	13,907	1.0%	63,730	4.6%	58,106	4.2%
12 - 14	46,815	3.4%	43,467	3.1%	41,281	3.0%
10 - 12	77,860	5.6%	47,806	3.5%	49,886	3.6%
8 - 10	92,608	6.7%	55,598	4.0%	65,930	4.8%
6 - 8	101,456	7.3%	73,252	5.3%	815,761	59.1%
4 - 6	113,521	8.2%	846,458	61.3%		
2 - 4	934,460	67.7%				
0 - 2						

3.5.2 BC Hydro's Proposed RIB Rate with a 1,000 kWh Step-1 Threshold

As can be seen from Tables 3-3 and 3-4, a smaller Step-1 Threshold than that proposed by BC Hydro, and inherent in the BCUC Proposal, can still yield an inclining block rate and a Step-1 Rate that does not decrease, even on an inflation-adjusted basis, and that results in more customers seeing the Step-2 Rate. Further, the smaller Step-1 Threshold yields a Step-2 Rate that is more reflective of the long-run cost of new supply than the otherwise applicable flat rate, while not exceeding it. Finally, there are no bill impact issues associated with the smaller Step-1 Threshold alternative.

Despite these advantages, BC Hydro does not believe the 1,000 kWh Step-1 Threshold is preferable to the 1,600 kWh Step-1 Threshold proposed by BC Hydro and the BCUC. First, the smaller Step-1 Threshold diminishes the differential between the Step-1 and

Step-2 Rates, thus spreading more of the class average rate increase to smaller consumption customers and, importantly, weakening the conservation signal. By contrast, BC Hydro's proposal yields a higher Step-2 Rate that provides a more economically efficient price signal that is more likely to incent conservation, while still passing the bill impact test.

3.5.3 BC Hydro's Proposed RIB with a 2,200 kWh Step-1 Threshold

Like the 1,000 and 1,600 kWh Step-1 Threshold designs, a 2,200 kWh Step-1 Threshold results in Step-1 Rates that do not in any circumstance decline in inflation-adjusted terms and that do not result in a declining block rate structure.

However, by reference again to Tables 3-3 and 3-4, it is apparent that a larger Step-1 Threshold has the opposite effect of a smaller Step-1 Threshold in comparison to the proposed 1,600 kWh Step-1 Threshold. That is, the differential between the Step-1 Rate and the Step-2 Rate is magnified, but at the expense of the number of customers and corresponding load that see the Step-2 Rate, which drops significantly. Further, and as one would expect given that a larger Step-1 Threshold puts relatively more of any incremental revenue requirement increases into the Step-2 Rate compared to a 1,600 kWh Step-1 Threshold, the larger Step-1 Threshold has the effect of causing about 12,000 customers to fail to meet the bill impact test in year two.

3.5.4 Other Considerations Regarding the Proposed 1,600 kWh Step-1 Threshold

As is implicit in the foregoing discussion, BC Hydro did not take the BCUC's proposed Step-1 Threshold as a given, with the other design parameters built-up around it. Instead BC Hydro tested, in an iterative and empirical way, alternative Step-1 Thresholds. BC Hydro concluded that the 1,600 kWh bi-monthly Step-1 Threshold initially proposed by the BCUC, and now by BC Hydro, allows for a balanced rate design, as described in the immediately previous sections.

However, BC Hydro believes that a further reason to favour a 1,600 kWh Step-1 Threshold is that it is close to the average residential customer consumption level.[38] BC Hydro believes

[38] The average bi-monthly consumption is about 1,800 kWh. When the largest five per cent of customers are removed, the average bi-monthly consumption of the remaining 95 per cent of customers is about 1,600 kWh.

this characteristic of the proposed Step-1 Threshold is likely to make intuitive sense to its customers, and therefore will foster customer understanding and acceptance of the proposed rate structure.

2008 Residential Inclining Block Rate Application

BC hydro

Chapter

4

Expected Outcomes of Proposed Residential Inclining Block Rate

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4.1 Customer Bill Impacts

4.1.1 Introduction

BC Hydro believes that its proposed RIB rate strikes an appropriate balance between the efficiency of its price signal and overall customer bill impacts. To elaborate further, BC Hydro's RIB rate design, in particular the choice of the Step-1 Threshold, and the determination of the Step-1 and Step-2 Rates, results in acceptable bill impacts for the majority of residential customers, while at the same time providing a visible and real price signal.

Sections 4.1.2 and 4.1.3 below provide further information on the bill impacts to customers of BC Hydro's RIB rate proposal. For the purposes of the discussion in this chapter the bill impacts reviewed are for the first two years of its implementation, covering the two-year RRA test period of F2009 and F2010. The analysis and discussion assume that the relief sought in that application is granted, that there are no rate rebalancing changes, and that the RIB rate structure is implemented on October 1, 2008. Thus the impacts described here are different from those discussed in section 3.4 which assessed the bill impacts of the BC Hydro RIB rate proposal against the customer bill impact test, under different rate increase scenarios over three years, so as to test the robustness of the rate design.

The customer bill impacts presented thus far in this application assume that customers make no changes to their electricity consumption levels upon the introduction of the RIB rate. However, the rationale for restructuring BC Hydro's residential rate is to employ price signals as part of an integrated strategy to encourage residential energy conservation. To this end, section 4.1.4 describes BC Hydro's approach to encouraging conservation via implementation of an integrated DSM plan and enhanced customer services. Conservation actions taken by customers will help to mitigate any bill impacts due to the introduction of the RIB rate.

4.1.2 The "Breakeven" Consumption Point

Under BC Hydro's proposed RIB rate design, approximately 75 per cent of residential customers (about 1.1 million) will face smaller overall bill increases with the RIB rate in place

than would have been the case if the F09/F10 RRA rate increases were applied to the existing flat rate structure. These customers consume up to approximately 14,500 kWh annually. Thus the 14,500 kWh/year consumption can be viewed as the "breakeven" point, below which a customer is better off under the proposed RIB rate than under the flat rate structure, for the same F09/F10 RRA rate increases.[39] This breakeven point arises from the specific design parameters of BC Hydro's proposed RIB rate, in particular the level of the Step-1 Threshold, and the Step-1 and Step-2 Rates.

For approximately half of these 1.1 million customers (which collectively use only 15 per cent of residential load), their bi-monthly consumption is small enough that they are unlikely to see the Step-2 Rate in any billing period. The remaining half of these customers will consume above the Step-1 Threshold in some billing periods, and hence will see the Step-2 Rate. However the bill impact of this higher priced consumption is more than offset by the consumption priced at the lower Step-1 Rate. As a result, these customers are expected to have lower bills than they would have otherwise received under the flat rate with the F09/F10 RRA increases.

Accordingly, BC Hydro's proposed RIB rate will allow the Step-2 Rate, which is more reflective of BC Hydro's long-run marginal cost of new electricity supply, to be seen at some time during the year by half of the 1.1 million customers, promoting energy conservation through the higher price signal. Yet at the same time their annual bill increases are mitigated, due to the design of the rate.

4.1.3 Bill Impacts for Customers Consuming >14,500 kWh/year

There are approximately 25 per cent of residential customers (about 334,000) with annual consumption above the breakeven point of 14,500 kWh/year. On average, these customers use approximately 22,000 kWh annually, twice that of the average residential customer. As

[39] The annual estimate of the breakeven consumption point is based on the bi-monthly breakeven calculation of approximately 2,400 kWh.

a result, they will pay the Step-2 Rate more frequently than those consuming less than 14,500 kWh/year (in fact, in every billing period), and will face larger bill increases than would have been the case under the flat rate structure, with the F09/F10 RRA annual rate increases applied.

BC Hydro's bill impact analysis indicates that these customers can expect to see the Step-2 Rate in all billing periods. If their consumption remains unchanged, these customers will face bill increases over the two years that range from approximately 15 to 38.5 per cent. On average, a customer would see an increase of approximately $345 over their current annual bill in F2010, assuming no change in consumption.

Table 4-1 below provides details of the average bill increases (in dollars) that these customers will face. For illustrative purposes the table compares the annual bill for customers in F2010 (the second year of the RIB implementation) to the annual bill under current rates (as of February 2008), assuming the same consumption level. Thus the bill increases also include the impact of the proposed general rate increases for F2009 and F2010.

Table 4-1 Bill Increases for Customers with Consumption > 14,500 kWh/year

Annual Consumption Range (kWh)	Approximate Number of Customers	Average Current Bill ($) 1	Average F2010 Bill ($) 2	Bill Increase ($) 3 = 2-1
14,500 – 16,000	62,100	981	1,146	165
16,000 – 17,500	50,300	1,074	1,273	199
17,500 – 19,000	40,400	1,166	1,400	234
19,000 – 20,500	32,400	1,261	1,528	267
20,500 – 22,000	26,300	1,350	1,655	305
22,000 – 23,500	21,700	1,442	1,782	340
23,500 – 25,000	17,700	1,535	1,910	375
> 25,000	82,900	2,263	2,921	658

With this RIB rate proposal and given the rate increases applied for in its F09/F10 RRA, BC Hydro is endeavouring to limit customer bill impacts by the end of the two year period to a maximum increase of 39.5 per cent,[40] as per the customer bill impact test described in section 3.2.3.

While no customers exceed the bill impact test under BC Hydro's RIB rate proposal, there is a small percentage of customers who will face over 30 per cent bill increases in that period. These are largely the same customers that are more severely impacted (by exceeding the bill impact test) in the case where rate rebalancing is assumed along with the F09/F10 RRA rate increases. (This situation is discussed in section 3.3.4). On average these 16,000 customers (approximately 1.2 per cent) use around 61,000 kWh annually, 5.5 times the average residential annual consumption.

Table 4-2 provides further details of consumption levels, number of customers and bill increases for those residential customers who would face over 30 per cent bill increases.

Table 4-2 Customers with Bill Impacts > 30 per cent by F2010

Annual Consumption Range (kWh)	Approximate Number of Customers	Average Current Bill ($) 1	Average F2010 Bill ($) 2	Bill Increase ($) 3=2-1
14,500 – 50,000	8,200	2,751	3,598	847
50,000 – 100,000	6,500	4,016	5,349	1,333
100,000 – 150,000	900	7,416	10,067	2,651
150,000 – 200,000	270	10,549	14,413	3,864
> 200,000	170	17,001	23,361	6,360

4.1.4 Bill Impact Mitigation

BC Hydro is mindful of its proposed RIB rate's bill impacts on large residential users in particular. It is important to note again that these bill impact levels assume that customers take no action to reduce their consumption. BC Hydro recognizes that while conservation

[40] The limit of 39.5 per cent is calculated by multiplying annual general rate increases (F09/F10 RRA increases) and the 10 per cent annual rate restructuring guideline as follows: 1.0656 x 1.10 x 1.0821 x 1.10 = 1.395.

can ease the bill impacts, it requires that customers either modify their behaviour or make investments. BC Hydro's integrated DSM Plan is intended to support customers in their conservation efforts.

BC Hydro is currently developing its new 2008 DSM Plan which will be included as part of its LTAP to be filed with the BCUC in spring 2008. This integrated DSM plan will include a wide range of activities that are designed to change decisions around electricity consumption. For example, restructured rates, programs delivering information and financial incentives to customers, public awareness and education activities to foster a conservation culture, technical and financial support for changes to codes and standards and enabling activities to support the energy efficiency industry in B.C. In addition, planned customer service enhancements, such as a new call centre conservation advisory service, will support residential customers in their conservation efforts.

Restructured rates, such as BC Hydro's proposed RIB rate, with more efficient price signals will encourage the adoption of conservation actions and encourage participation in Power Smart programs by improving the payback on conservation investments. Conversely, the presence of Power Smart programs and educational initiatives is expected to elevate customers' awareness and understanding of the RIB rate, and enhance their response to the price signal.

4.2 Estimated Energy Conservation Impact

4.2.1 Introduction

The proposed RIB rate restructuring is intended to send a clear price signal to encourage residential conservation. BC Hydro believes that its proposed RIB rate structure will meet this objective and will achieve more conservation than if a flat rate structure remains in place.

BC Hydro anticipates that residential customers will respond to the RIB rate's price signal through a variety of actions. Some conservation actions require limited or no customer investment while others will require customer investment that may be partially supported by BC Hydro's Power Smart program incentives.

BC Hydro believes that its analysis of the overall energy conservation effect of its proposed RIB rate demonstrates that this rate will produce a meaningful amount of conservation, sufficient to achieve the objective of this application. As described below, it is evident that a number of assumptions need to be made to estimate the amount of conservation, and for that reason a range is presented. In this RIB rate application BC Hydro does not consider it should attempt to provide any greater precision with respect to the conservation estimates, nor does it believe it needs to evaluate the conservation impact of every possible rate design alternative. BC Hydro's 2008 LTAP filing will present further evidence on how rate design in general will contribute to conservation as part of an integrated DSM plan, and BC Hydro believes that is the appropriate proceeding for the discussion to take place.

Forecasting BC Hydro's residential customer demand response to electricity price changes is especially challenging given BC Hydro's history of relatively low and stable electricity prices. Actual customer response to price increases is bound to vary from BC Hydro's estimates. However, implementing the RIB rate will provide BC Hydro, its customers, and the BCUC with valuable experience regarding actual demand response to conservation price signals. This experience will inform future elasticity assumptions and subsequent rate development.

4.2.2 Price Elasticity

To make overall conservation estimates of the residential customers' response to rate changes it is necessary to make assumptions about price elasticity (or elasticity of demand). Price elasticity measures customers' aggregated responsiveness of demand to changes in price.[41] For example, an elasticity assumption of -0.10 means that for each one per cent increase in real price, class usage declines by 0.10 per cent. There is considerable uncertainty with respect to elasticity assumptions and their application, and the resulting conservation estimates have to be viewed in that context. Those estimates are also impacted by the level and timing of actual rate increases, and the actual rate structures implemented.

Because of the uncertainty in relation to anticipated conservation, BC Hydro has chosen to present its conservation estimates as ranges, based on different price elasticity

[41] Price elasticity = (percentage change in quantity)/(percentage change in price)

assumptions. The range of elasticities used is based on reasonable assumptions, given the lack of experience and empirical evidence in this jurisdiction. Such assumptions come from published studies of measured price response results in other jurisdictions with relatively low rates and a winter system peak, similar to British Columbia.

4.2.3 Flat Rate and Inclining Block Rate Price Elasticities

Reductions in consumption generated by the RIB rate structure are driven by elasticities of demand which are different than those associated with the existing flat rate structure. It is reasonable to assume that an inclining block rate structure has a higher price elasticity than a flat rate structure because more of any rate increase is directed towards high-usage, more price-responsive customers. Price elasticity studies published in industry literature confirm that higher-usage customers are generally more price responsive than lower-usage customers.

Accordingly, the net conservation effect of the RIB rate structure is the difference between the estimated reduction in residential consumption with the RIB rate in place and the estimated reduction in consumption that would have occurred with the existing flat rate structure in place.

4.2.4 Estimated Uniform RIB Rate Elasticity Assumptions

In developing its net conservation estimates, BC Hydro assumes a uniform elasticity for all consumption under the RIB rate. This modeling method is referred to by BC Hydro as "Uniform RIB Rate Elasticity". The method also assumes:

- customers begin to respond to the RIB rate structure when the rate is implemented;
- elasticity of demand on the existing flat rate structure is estimated at -0.05 (that is, for each one per cent increase in real price, usage declines by 0.05 per cent); and
- elasticity of demand for the proposed RIB rate is estimated at between -0.075 and -0.15.

Based on this method and its underlying assumptions, BC Hydro estimates that the net conservation effect of the RIB rate structure by F2010 to be between 200 and 500 GWh/year.

4.2.5 Sensitivity of Elasticity Assumptions

As noted above in section 4.2.3 price elasticity studies confirm that higher-usage customers are generally more price responsive than lower-usage customers.

Thus an alternative approach to estimating the demand response to the proposed RIB rate is to reflect that greater price responsiveness of higher usage customers by applying a higher price elasticity to consumption over the Step-1 Threshold.

To explore this alternative method, BC Hydro has undertaken a sensitivity analysis that applies a higher elasticity to users with bi-monthly consumption above the Step-1 Threshold (using a range of elasticities between -0.075 and -0.15), and a lower elasticity of -0.05 to consumption below the Step-1 Threshold. BC Hydro refers to this method as “Non-uniform RIB Rate Elasticity”.

Based on this method and its underlying assumptions, BC Hydro estimates that the net conservation effect of the RIB rate structure by F2010 to be between 217 and 523 GWh/year.

A comparison of the results of the two methods indicates that the different methods of applying the elasticity assumptions, results in comparable estimates of RIB rate-induced conservation. BC Hydro believes that the choice of methodology is not the material cause of estimate differences. The main source of uncertainty regarding estimates of net energy conservation is the elasticity estimates themselves, as is indicated in Table 4-3 below, which shows the results of three sensitivity analyses using elasticity assumptions of -0.075, -0.10 and -0.15, for each of the elasticity application methods.

Table 4-3 Results of Elasticity Assumption Sensitivity Analysis

GWh/year	Method 1: Uniform RIB Elasticity -0.075	Method 2: Non-uniform RIB Elasticity -0.05/-0.075	Method 1: Uniform RIB Elasticity -0.10	Method 2: Non-uniform RIB Elasticity -0.05/-0.10	Method 1: Uniform RIB Elasticity -0.15	Method 2: Non-uniform RIB Elasticity -0.05/-0.15
F2010	204	217	303	319	500	523

4.2.6 Peak Load Conservation Impact

In conjunction with the conservation expected to be achieved with the RIB rate, BC Hydro also expects that there will be a corresponding reduction in the winter peak load. The behavioural and investment actions taken to conserve energy are expected to apply throughout the year, and therefore will reduce the demand during the winter peak periods.

BC Hydro has estimated the peak MW reduction due to the RIB rate by first allocating the annual GWh conservation (based on the residential class load profile) to the winter peak periods and then translating the resulting winter GWh reduction to a system MW reduction. The estimated reduced energy during peak periods for F2010 translates to between 46 MW and 109 MW, depending on the elasticity assumptions, under the Uniform RIB elasticity method.

4.3 Expected Financial Outcomes and Revenue Neutrality

4.3.1 Introduction

Revenue neutrality of the inclining block rate is one of the design elements of both BC Hydro's proposed RIB rate structure, and the BCUC Proposal, as introduced in section 1.1. BC Hydro understands "revenue neutrality" to mean, at a high level, and in the context of this application, that BC Hydro will be held substantially financially harmless from the introduction of the RIB rate structure and, in consequence, other customer classes will also be held harmless. The following sections address the degree to which BC Hydro's proposed RIB rate is in fact expected to be revenue neutral, and possible measures that could be employed to address outcomes that are not financially neutral. The discussion distinguishes between revenue neutrality on a forecast basis, for the purpose of setting the RIB pricing, and revenue neutrality on an actual, or after-the-fact basis.

4.3.2 Revenue Neutrality – Prospective (Forecast) Considerations

BC Hydro has designed its RIB rate to be revenue neutral on a forecast residential class consumption basis. In particular, the RIB rate pricing for a fiscal year (commencing on April 1) is calculated on the basis of the forecast revenue from the residential class for that year. Appendix A sets out the details of the rate calculation methodology. The Rate Scenarios shown in Appendix E were calculated in this way, where the residential revenue forecast (based on the residential load forecast, net of DSM) is the same forecast as is used in the F09/F10 RRA. Going forward, where the BCUC issues final revenue requirement orders in respect of a fiscal period, BC Hydro would use the underlying revenue and load forecasts from the BCUC orders to establish the annual Step-2 Rate.

Under this approach the proposed RIB rate would be revenue neutral, in the general sense of the expression used above, because it accounts for load and revenue forecasts net of demand response. It accounts for the expected response to the rate structure because BC Hydro's load forecast after DSM includes, as an implicit part of the DSM savings estimates, the impact of new rate structures.

Comparison to Revenue Neutrality of RS 1823 (Stepped Rates for Large Industrial Customers)

The approach to revenue neutrality for the RIB rate is different than that used to establish the pricing of RS 1823. The RS 1823 rate structure is designed to be revenue neutral on a customer-by-customer basis, based on historic consumption. It would only be revenue neutral on a class basis, in the sense described above, when the forecast load of each RS 1823 customer is equal to each customer's customer baseline load (**CBL**) - a measure of a customer's historical pre-RS 1823 load). In most circumstances, when the aggregate forecast RS 1823 load is less than the aggregate RS 1823 CBLs, BC Hydro forecasts less revenue from its RS 1823 customers than it otherwise would under the flat rate structure, and implicitly the difference is recovered across all customer classes.[42] Conversely, when the aggregate forecast RS 1823 load exceeds the aggregate RS 1823 CBLs, in most circumstances BC Hydro forecasts more revenue than under the equivalent flat rate

[42] For further information on this topic, please see BC Hydro's TSR Re-pricing Application, filed on February 22, 2008.

structure, and this gain is implicitly shared across all customer classes. Thus overall, the RS 1823 rate structure does not keep incremental costs or savings within the large industrial customer class, but rather causes them to be absorbed by all customer classes.

BC Hydro did not attempt to design a RIB rate structure that was revenue neutral to each customer in the same way the RS 1823 rate was designed because of the technical impossibility of establishing individual CBLs for residential customers. Thus, compared to the RS 1823 rate structure, the proposed RIB rate is better designed to keep BC Hydro and thus other customer classes financially whole.

Alternative Approach to Revenue Neutrality for the RIB Rate Calculation

BC Hydro is aware that its proposed pricing, and meaning of "revenue neutrality" in the context of its RIB rate design, keeps any incremental cost or savings arising from the rate structure strictly within the residential class.

One way to address this issue would be to add back in to the residential load forecast the estimated demand response to the RIB rate structure (i.e., the DSM savings netted off the gross load forecast would no longer contain a rate structure response element). Because the RIB rate pricing would now in effect assume no demand response from the rate, a forecast of the revenue variance could be calculated and carried forward in a regulatory account to be allocated, more or less, to all customer classers. Such an approach would have the appearance at least of fairness insofar as it would allow the residential class to "keep" some of the savings it earned, in the same way that RS 1823 customers can keep their "savings" when their consumption is less than their CBL.

However, BC Hydro does not favour such an approach, at this time. Attempting to capture these demand response savings from the RIB rate requires a robust way of estimating the demand response to rate structures alone, and distinguishing between residential customers' demand response to rates and their demand response to non-rate DSM activities. While BC Hydro feels confident that its proposed RIB rate structure will generate conservation, as described in section 4.2, it does not believe that it can estimate demand response to the RIB rate structure alone with sufficient accuracy and certainty to justify pricing adjustments.

4.3.3 Revenue Neutrality - After-the-Fact Considerations

Section 4.3.2 above considers the financial impacts of the proposed RIB rate structure from a forecast perspective. However, there are also significant after-the-fact considerations that arise from the inevitable differences between forecast load and revenue and actual load and revenue. If the RIB rate's marginal rate (the Step-2 Rate) is higher than the marginal short run cost of energy,[43] the utility will earn less (more) net income when the actual load is below (above) the forecast load.

Thus a RIB rate will likely introduce income volatility that BC Hydro has not experienced under the residential flat rate structure. This issue is addressed in the F09/F10 RRA, in which BC Hydro has requested an amendment to the Non-Heritage Deferral Account, to allow it to capture differences between forecast and actual cost of energy arising from the differences between forecast and actual load.[44]

[43] The marginal short-run cost of energy in the F09/F10 RRA cost of energy forecasts is the mid-Columbia market price, forecast to range between U.S. $30/MWh (LLH) and U.S. $83/MWh (HLH) over the two years. (Figure 3-1 of the F09/F10 RRA)

[44] Section 6.2.2 of the F09/F10 RRA.

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2008 Residential Inclining Block Rate Application

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APPENDIX A

RIB Rate Calculation Worksheets

RIB Rate Calculation Methodology and Revenue Neutrality

This appendix describes how prices under BC Hydro's proposed RIB rate structure were calculated and then demonstrates that these rates are revenue neutral on a forecast basis in F2009 and F2010. The rate calculation methodology uses a sub-set of the residential customer base[1] to calculate BC Hydro's proposed RIB rates. In the latter section of this appendix, revenue neutrality is demonstrated using the full customer base in the F09/F10 RRA load forecast.

For convenience, the description of the methodology is specific to the rates shown in Table 1-1; that is, they assume F09/F10 RRA rate increases, and an October 1, 2008 implementation. However, the underlying methodology is generic and meant to be applied annually to re-set the RIB pricing.

Rate Calculation Methodology

This section describes rate calculations under BC Hydro's proposed RIB rate structure with the Step-2 Rate set to recover the residual revenue requirement not collected by a preset Step-1 Rate and a preset Basic Charge, for a given Step-1 Threshold.

Rates are calculated using a historical sub-set of BC Hydro's residential customer class account records. Billing data from F2006 and F2007 is used as the starting point to calculate RIB rates for F2009 and F2010. The rate calculation is based on customer usage patterns over a two-year period. Accounts that lack two full years of billing data are excluded from the historical sub-set, as are farm and NIA customers.

Because the rates are designed to be revenue neutral with a flat rate structure, the absolute levels of customer accounts and sales do not affect the rate calculations. Rather, it is (1) the relationship between the number of accounts and sales (i.e. the average kWh usage per account) and (2) the split of usage between Step-1 and Step-2 that affect the rate calculations. For this reason, rate calculations require calibration of the historical sub-set data in order to match the forecast average usage per customer, but do not scale sales and accounts up to the absolute forecast levels in the F09/F10 RRA. Because the rate calculation uses a smaller number of accounts and kWh sales than BC Hydro's F09/F10 RRA load forecast, the revenues calculated will be lower than the revenues that BC Hydro shows for the residential class. However, this does not indicate a shortfall or that the RIB rates are too low. Rather, the lower

[1] For rate calculation purposes, customers designated as farms, those without two years of historical billing data, and NIA customers were excluded.

revenues are the result of the rate calculations being based on the historical sub-set data. When applied to the entire residential class forecast number of accounts, the calculated rates collect the F09/F10 RRA forecast revenue, as shown in the revenue neutrality section later in this appendix.

The rates are calculated using the following five steps:

(1) Determine the amount of total kWh expected to be consumed and billed at the Step-1 Rate and the Step-2 Rate

Two years of historic billing data (for F2006 and F2007) were used to determine the volume and percentage of load that would have been consumed under each of the Step-1 Rate and Step-2 Rate if the proposed RIB rate structure had been in place during that period.

First, total Step 1 kWh consumption at the Step-1 Rate was calculated by adding the following two items:

- for customers with consumption at or below the 1,600 kWh Step-1 Threshold level in a given bi-monthly billing period, all kWh consumed in that given billing period were totaled; and
- for customers consuming beyond the Step-1 Threshold level in a given bi-monthly billing period, their Step-1 consumption by definition was 1,600 kWh. Thus, the Step-1 kWh consumption of these customers is the number of customer billing periods where consumption exceeded the Step-1 Threshold multiplied by 1,600 kWh.

The total Step-1 kWh consumption, calculated above, was subtracted from the total kWh consumed by RIB rate customers to determine total Step-2 kWh consumption.

(2) Compute the revenue collected via the preset Step-1 Rate

Step-1 revenue equals the total Step1 kWh consumption multiplied by the Step-1 Rate. For the proposed RIB rate, the preset Step-1 Rate is the existing flat rate (6.15 cents/kWh) escalated in each year by the projected rate of inflation of 2.1 per cent.

(3) Compute the revenue collected via the preset Basic Charge

This revenue is the projected number of customer accounts multiplied by a preset Basic Charge multiplied by 365 days. For the proposed RIB rate, the preset Basic Charge is set at the existing

Basic Charge (12.13 cents/day) escalated each year by the projected rate of inflation of 2.1 per cent.

(4) Compute the residual revenue requirement to be collected via the Step-2 Rate

The residual revenue is the total forecast residential class revenue less the revenues collected via the Step-1 Rate and Basic Charge, as described in the two steps above. The total residential class revenue is the revenue that would have been collected under the flat rate structure, using the general rate increase assumptions in BC Hydro's F09/F10 RRA.

(5) Compute the Step-2 Rate

The Step-2 Rate is the residual revenue divided by the total Step-2 kWh consumption as determined in Step 1 above.

The following input data and assumptions were used in implementing the five steps above:

a) Historical billing data sales and accounts

Rate calculations are based on two years (F2006 and F2007) of historic billing data for customers on Rate Schedules 1101, 1111, 1121, 1131, 1133 and excludes farms, NIA customers and accounts with less than two years of history. Billing data was averaged for the two years, by customer account and billing period. For example, an account's April-May bi-monthly usage is equal to the average of the account's April-May 2006 and April-May 2007 bi-monthly usage.

Accounts on RS 1131 and 1133 are buildings with multiple residential units so their bills aggregate the consumption for multiple units. For rate calculation purposes, these accounts are divided into multiple smaller accounts so that each unit's average individual usage can be compared to the Step-1 Threshold. The division is based on the number of units served under each account.

b) Calibrating historical sales and accounts and forecasts for F2009 and F2010

The recorded historical sales, customer accounts, and consumption per customer in the F2006 and F2007 billing data differ from the projected residential sales, accounts, and usage per customer in BC Hydro's F09/F10 RRA Load Forecast (which includes F2008 as a base year).

- *Consumption Per Customer*. Based on the F09/F10 RRA load forecast, average sales per residential account in F2008 were expected to be lower than the actual average in

the historic billing data. Thus it is necessary to calibrate the historical kWh consumption per account data to match the F09/F10 RRA load forecast, as usage per customer affects the percentage of kWh priced at the Step-1 and Step-2 Rates. The data is calibrated to BC Hydro's F09/F10 RRA load forecast by multiplying the historic data by the ratio of the load forecast's F2008 average sales per account and the historic data's average sales per account. The consumption per customer data, first calibrated to F2008, is further calibrated from F2008 to F2009 and F2010 in the same manner.

- *Number of Accounts*. The number of accounts is also calibrated by the percentage customer growth rate assumed in the F09/F10 RRA load forecast.

c) Step-1 Threshold, Step-1 and Step-2 kWh

The Step-1 Threshold is presented in Table A-1, item D. The resulting Step-1 and Step-2 kWh are presented in Table A-1, items E and F respectively (shown both as GWh and as a percentage of total load).

d) Flat rate revenue calculation

For F2009 and F2010, the flat rate and Basic Charge are the existing flat rate and Basic Charge escalated by the proposed F09/F10 RRA rate increase. Each year's total residential revenue required is the year's sales and accounts priced at the year's flat rate and Basic Charge. The flat rate and Basic Charge amounts for F2009 and F2010 are presented in Table A-2, items G and H respectively, and the resulting revenue used for rate calculations are items I and J respectively.

e) Residual rate calculation

The Basic Charge and Step-1 Rates are presented in Table A-3, items L and M respectively, and the resulting RIB rate Basic Charge and Step-1 sales revenue are items N and P respectively. The resulting Step-2 Rate is presented in Table A-4, item Q.

f) Revenue neutrality under the calibrated, historical data sub-set

The revenue collected by the proposed RIB rate structure and the resulting rates is equal to the revenue that would have been collected in the absence of the RIB rate structure. This is the case because the proposed RIB structure's Step-2 Rate is designed to collect the revenue difference between total flat rate revenue and the revenue collected via the RIB's Basic Charge

and Step-1 Rate. Revenue neutrality for the calibrated sub-set of historical data is demonstrated in Table A-5 below.

Table A-1 Step 1 and Step-2 Load Under the RIB Rate

F09/F10 RRA Reference Load Forecast		F2009 (6 months commencing October 1, 2008	F2010 (12 months commencing April 1, 2009
Customer Accounts used for Rate Calculations [a]	A	1,454,296	1,478,769
# Days	B	183	365
Load Forecast used for Rate Calculations (GWh)	C	9,331	15,873
Step-1 Threshold (kWh Bi-monthly)	D	1,600	1,600
Step-1 Load (GWh)	E	5,480 58.7%	10,433 65.7%
Step-2 Load (GWh)	F	3,851 41.3%	5,440 34.3%

a . Customer Accounts equals the number of accounts containing 12 bi-monthly bills between April 2005 and March 2007 from RS 1101, 1111, 1121, 1131, 1133 excluding farms and BC Hydro's Non-Integrated customers. Includes allowance for aggregated accounts serving multiple units or residences.

Table A-2 Flat Rate Structure: Rate and Revenue Calculations

Residential Rates and Revenue With Flat Rate Structure (in Absence of this Application):		F2009 (6 months commencing October 1, 2008	F2010 (12 months commencing April 1, 2008
Flat Rate Basic Charge (cents/day) = current rate X (1 + RRA rate)	G	= 12.13 x (1 + 0.0656) **12.93 cents/day**	= 12.93 x (1 + 0.0821) **13.99 cents/day**
Flat Rate (in cents/kWh for all kWh consumed per bi-monthly Billing Period) = current rate X (1 + RRA rate)	H	= 6.15 x (1 + 0.0656) **6.55 cents/kWh**	= 6.55 x (1 + 0.0821) **7.09 cents/kWh**
Flat Rate Basic Charge Revenue ($ millions) = (Basic Charge Rate / 100) x # Customer Accounts x # Days / million = **G / 100 x A x B**	I	= (12.93 / 100) x 1,454,296 x 183 / 1,000,000 **34**	= (13.99 / 100) x 1,478,769 x 365 / 1,000,000 **76**
Energy Charge Revenue ($ millions) = (Energy Charge Rate / 100) x Total Load = **H x C / 100**	J**	= (6.55 / 100) x 9,331 **612**	= (7.09 / 100) x 15,873 **1,125**
Total Revenue - Flat Rate Structure ($ millions) = Flat Rate Basic Charge Revenue + Energy Charge Revenue **= I + J**	K	= 34 + 612 **646**	= 76 + 1,125 **1,201**

** due to rounding

Table A-3 RIB Rate Structure: Basic and Step-1 Rate and Revenue Calculations

Residential Rates and Revenue With Proposed BC Hydro RIB Rate Structure (Basic Charge and Step-1):		**F2009 (6 months commencing October 1, 2008**	**F2010 (12 months commencing April 1, 2009**
RIB Basic Charge (cents/day)			
= current rate X (1 + projected inflation rate)		= 12.13 cents/day x (1 + 0.021)	= 12.38 cents/day x (1 + 0.021)
	L	**= 12.38 cents/day**	**= 12.64 cents/day**
Step-1 Rate (in cents/kWh for all kWh consumed up to and including 1,600 kWh per bi-monthly Billing Period)			
= current rate X (1 + projected inflation rate)		= 6.15 cents/kWh x (1 + 0.021)	= 6.28 cents/kWh (1 + 0.021)
	M	**= 6.28 cents/kWh**	**= 6.41 cents/kWh**
RIB Basic Charge Revenue ($ millions)			
= (Basic Charge Rate / 100) x # Customer Accounts x # Days / million		= (12.38 / 100) x 1,454,296 x 183 / 1,000,000	= (12.64 / 100) x 1,478,769 x 365 / 1,000,000
= L / 100 x A x B	**N**	**33**	**68**
Step-1 Revenue ($ millions)			
= (Step-1 Rate / 100) x Step-1 Load		= (6.28 / 100) x 5,480	= (6.41 / 100) x 10,433
= M / 100 x E	**O**	**344**	**669**

Table A-4 RIB Rate Structure: Residual Revenue and Step-2 Rate Calculations

Residential Rates and Revenue With Proposed BC Hydro RIB Rate Structure (Step-2):		**F2009 (6 months commencing October 1, 2008**	**F2010 (12 months commencing April 1, 2009**
Residual Revenue ($ millions)			
= Total Revenue Flat Rate Structure - Basic Charge Revenue - Step-1 Revenue		= 646 - 33 + 344	= 68 + 669 + 464
= K - N - O	**P**	**269**	**464**
Step-2 Rate (in cents/kWh for all kWh consumed above 1,600 kWh per bi-monthly Billing Period)			
= Residual Revenue / Step-2 Load * 100		= (269 / 3,851) * 100	= (464 / 5,440) * 100
= P / F x 100	**Q**	**6.98 cents/kWh**	**8.53 cents/kWh**

Table A-5 Revenue Neutrality Under Calibrated Historical Data Sub-set

Residential Rate Structure Revenue:	**F2009 (6 months commencing October 1, 2008**	**F2010 (12 months commencing April 1, 2009**
Flat Rate Revenue ($ millions)		
= Flat Rate Basic Charge Revenue + Energy Charge Revenue	= 34 + 612	= 76 + 1,125
= I + J	**646**	**1,201**
RIB Revenue ($ millions)		
= RIB Basic Charge Revenue + Step-1 Revenue + Step-2 Rate x Step-2 Load	= 33 + 344 + ((6.98 * 3,851) / 100)	= 68 + 669 + ((8.53 x 5,440) / 100)
= N + O + (Q * F)	**646**	**1,201**

Revenue Neutrality Under the F09/F10 RRA Load Forecast

Using the rates calculated via the rate calculation methodology described above, this section of the appendix illustrates the RIB rate's revenue neutrality on a forecast basis using the F09/F10 RRA load forecast assumptions. This is done by comparing revenue calculated under the flat rate structure and the revenue calculated under the proposed RIB rate structure, assuming the F09/F10 RRA increases in both cases. The calculation of residential revenue only includes those customers that will be subject to the RIB rate. Several pieces of information are used to calculate the F2009 and F2010 revenues.

Table A-6 shows the customer account and load assumptions from the F09/F10 RRA:

- The F09/F10 RRA load forecast is used as a starting point and is adjusted to remove the accounts and load associated with residential customers who are exempt from the RIB rate. The same customers are exempt as described earlier in the rate calculation methodology.
- The next calculation categorizes the amount of load that is expected to be consumed and priced at the Step-1 and Step-2 levels. The percentage splits for each step were calculated in Table A-1.
- The load used in the revenue neutrality illustration in Table A-7 below differs from the load used above in the rate calculation methodology, in Table A-2, because the number of customer accounts differs.

Table A-6 Calculation of Customer Accounts and Load Forecast

F09/F10 RRA Reference Load Forecast			F2009 (6 months commencing October 1, 2008)	F2010 (12 months commencing April 1, 2009)
Customer Accounts				
Average Accounts			1,587,322	1,607,283
Less: Exempt Customer Accounts			(24,029)	(24,437)
Total Customer Accounts	**A**		1,563,293	1,582,846
# Days	**B**		182	365
Load Forecast (GWh)				
Load Forecast			10,335	17,701
Less: Exempt Customer Load			(363)	(593)
Total Load	**C**		9,972	17,108
Step-1 Load %	**D**		58.7%	65.7%
Step-2 Load %	**E**		41.3%	34.3%
Step-1 Load (GWh)	**F**	**[C x D]**	5,854	11,240
Step-2 Load (GWh)	**G**	**[C x E]**	4,118	5,868

Table A-7 shows the revenue neutrality calculation:

- Based on the F09/F10 RRA load forecast, total revenue to be collected from the residential class in F2009 and F2010 is determined, using the same assumptions applied to a flat uniform rate as to the RIB rates;

- Under the flat rate, the Basic Charge is determined by multiplying the total number of customers (net of exempt customer accounts) by the number of days in the year by the Basic Charge for all customers. The energy charge is calculated by multiplying the load forecast (net of exempt customer load) by the energy charge.
- Under the RIB rate, the Basic Charge is determined by multiplying the total number of customers (net of exempt customer accounts) by the number of days in the year by the Basic Charge for all customers. The Step-1 revenue is calculated based on multiplying the Step-1 load by the Step-1 rate. The Step-2 revenue is calculated by multiplying the Step-2 load by the Step-2 rate.

All the revenue amounts are converted to millions of dollars and are based on a half year of revenue for F2009 and a full year for F2010.

Table A-7 Calculation of Revenue under the Flat Rate and under the RIB rate

Residential Revenue Calculation Under Flat Rate Structure With F09/F10 RRA Increase Only	**F2009 (6 months commencing October 1, 2008)**	**F2010 (12 months commencing April 1, 2009)**
Basic Charge Revenue ($ millions) = Basic Charge Rate x # Customer Accounts x # Days/ 100 / 1,000,000 = **O x A x B / 100 / 1,000,0000 = H**	= 12.93 x 1,563,293 x 182 / 100 / 1,000,000 37	= 13.99 x 1,582,846 x 365 / 100 / 1,000,000 81
Energy Charge Revenue ($ millions) = Energy Charge Rate x Total Load / 100 = **P x C / 100 = I**	= 6.55 x 9,972 / 100 653	= 7.09 x 17,108 / 100 1,213
Total Revenue - Flat Rate Structure ($ millions) = Basic Charge Revenue + Energy Charge Revenue **= H + I = J**	= 37 + 653 **690**	= 81 + 1,213 **1,294**
Residential Revenue With Proposed BC Hydro RIB Rate Structure:	**F2009 (6 months commencing October 1, 2008)**	**F2010 (12 months commencing April 1, 2009)**
Basic Charge Revenue ($ millions) = Basic Charge Rate x # Customer Accounts x # Days / 100 / 1,000,000 **= Q x A x B / 100 / 1,000,000 = K**	= 12.38 x 1,563,293 x 182 / 100 / 1,000,000 35	= 12.64 x 1,582,846 x 365 / 100 / 1,000,000 73
Step-1 Revenue ($ millions) = Step-1 Rate x Step-1 Load / 100 **= R x F / 100 = L**	= 6.28 x 5,854 / 100 368	= 6.41 x 11,240 / 100 720
Step-2 Revenue ($ millions) = Step-2 Rate x Step-2 Load / 100 **= S x G / 100 = M**	= 6.98 x 4,118 / 100 287	= 8.53 x 5,868 / 100 501
Total Revenue - Proposed BC Hydro RIB Rate Structure ($ millions) = Basic Charge Revenue + Step-1 Revenue + Step-2 Revenue **= K + L + M = N**	= 35 + 368 + 287 **690**	= 73 + 720 + 501 **1,294**

As Table A-7 demonstrates, revenues under both the flat rate and the RIB rate are the same, demonstrating revenue neutrality and consistency with the F09/F10 RRA revenue forecasts for residential customers.

Table A-8 reconciles F09/F10 RRA revenue with RIB revenue in Table A-7

- The revenue in Table A-7 at Line N is different from the F09/F10 RRA Residential Revenue Forecast, in Table A-8 below at Line A, due to the removal of exempt customer accounts and load that are not subject to the RIB rate. Table A-8 reconciles F2010 revenue associated with the F09/F10 RRA Residential Revenue Forecast to the RIB revenue of $1,294 million calculated in Table A-7 above at Line N.

Table A-8 Reconciliation of RIB revenue to the F09/F10 RR Application

	F09/F10 RRA Application Residential Revenue Forecast F2010 ($)	Load F2010 (GWh)	Average Rate (cents/kWh)
A. With RDA, no RRA rate increase (Schedule 14, RRA)	1,199.1	17,701	6.77
B. With RRA rate increase, no RDA (A x 1.0656 x 1.0821/1.0355)	1,335.3	17,701	7.54
C. RIB Revenue (Table A-7 - rate increase, no RDA)	1,294.0	17,108	7.56
D. Exempt Revenue (B - C)	41.3	593	6.96

2008 Residential Inclining Block Rate Application

BC hydro

APPENDIX B

2007 Energy Plan

The BC Energy Plan

A Vision for Clean Energy Leadership







BRITISH COLUMBIA
The Best Place on Earth

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MESSAGE FROM THE PREMIER

The BC Energy Plan: A Vision for Clean Energy Leadership is British Columbia's plan to make our province energy self-sufficient while taking responsibility for our natural environment and climate. The world has turned its attention to the critical issue of global warming. This plan sets ambitious targets. We will pursue them relentlessly as we build a brighter future for B.C.

The BC Energy Plan sets out a strategy for reducing our greenhouse gas emissions and commits to unprecedented investments in alternative technology based on the work that was undertaken by the Alternative Energy Task Force. Most importantly, this plan outlines the steps that all of us – including industry, environmental agencies, communities and citizens – must take to reach these goals for conservation, energy efficiency and clean energy so we can arrest the growth of greenhouse gases and reduce human impacts on the climate.

As stewards of this province, we have a responsibility to manage our natural resources in a way that ensures they both meet our needs today and the needs of our children and grandchildren. We will all have to think and act differently as we develop innovative and sustainable solutions to secure a clean and reliable energy supply for all British Columbians.

Our plan will make B.C. energy self-sufficient by 2016. To do this, we must maximize our conservation efforts. Conservation will reduce pressure on our energy supply and result in real savings for those who use less energy. Individual actions that reduce our own everyday energy consumption will make the difference between success and failure. For industry, conservation can lead to an effective, productive and significant competitive advantage. For communities, it can lead to healthier neighbourhoods and lifestyles for all of us.

We are looking at how we can use clean alternative energy sources, including bioenergy, geothermal, fuel cells, water-powered electricity, solar and wind to meet our province's energy needs. With each of these new options comes the opportunity for new job creation in areas such as research, development, and production of innovative energy and conservation solutions. The combination of renewable alternative energy sources and conservation will allow us to pursue our potential to become a net exporter of clean, renewable energy to our Pacific neighbours.

Just as the government's energy vision of 40 years ago led to massive benefits for our province, so will our decisions today. **The BC Energy Plan** will ensure a secure, reliable, and affordable energy supply for all British Columbians for years to come.

Premier Gordon Campbell

MESSAGE FROM THE MINISTER

The BC Energy Plan: A Vision for Clean Energy Leadership is a made-in-B.C. solution to the common global challenge of ensuring a secure, reliable supply of affordable energy in an environmentally responsible way. In the next decade government will balance the opportunities and increased prosperity available from our natural resources while leading the world in sustainable environmental management.

This energy plan puts us in a leadership role that will see the province move to eliminating or offsetting greenhouse gas emissions for all new projects in the growing electricity sector, end flaring from oil and gas producing wells, and put in place a plan to make B.C. electricity self-sufficient by 2016.

In developing this plan, the government met with key stakeholders, environmental non-government organizations, First Nations, industry representatives and others. In all, more than 100 meetings were held with a wide range of parties to gather ideas and feedback on new policy actions and strategies now contained in **The BC Energy Plan**.

By building on the strong successes of Energy Plan 2002, this energy plan will provide secure, affordable energy for British Columbia. Today, we reaffirm our commitment to public ownership of our BC Hydro assets while broadening our supply of available energy.

We look towards British Columbia's leading edge industries to help develop new, greener generation technologies with the support of the new **Innovative Clean Energy Fund**. We're planning for tomorrow, today. Our energy industry creates jobs for British Columbians, supports important services for our families, and will play an important role in the decade of economic growth and environmental sustainability that lies ahead.

The Ministry of Energy, Mines and Petroleum Resources is responding to challenges and opportunities by delivering innovative, sustainable ways to develop British Columbia's energy resources.

Honourable Richard Neufeld
Minister of Energy, Mines and Petroleum Resources

British Columbia's current electricity supply resources are 90 per cent clean and new electricity generation plants will have zero net greenhouse gas emissions.

In 2002, the Government of British Columbia launched an ambitious plan to invigorate the province's energy sector. Energy for Our Future: A Plan for BC was built around four cornerstones: low electricity rates and public ownership of BC Hydro; secure, reliable supply; more private sector opportunities; and environmental responsibility with no nuclear power sources. Today, our challenges include a growing energy demand, higher prices, climate change and the need for environmental sustainability. The BC Energy Plan: A Vision for Clean Energy Leadership builds on the successes of the government's 2002 plan and moves forward with new policies to meet the challenges and opportunities ahead.

Environmental Leadership

The BC Energy Plan puts British Columbia at the forefront of environmental and economic leadership by focusing on our key natural strengths and our competitive advantages of clean and renewable sources of energy. The plan further strengthens our environmental leadership through the following key policy actions:

- **Zero greenhouse gas emissions from coal fired electricity generation.**
- **All new electricity generation projects will have zero net greenhouse gas emissions.**
- **Zero net greenhouse gas emissions from existing thermal generation power plants by 2016.**
- **Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.**
- **No nuclear power.**
- **Best coalbed gas practices in North America.**
- **Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.**

A Strong Commitment to Energy Conservation and Efficiency

Conservation is integral to meeting British Columbia's future energy needs. The BC Energy Plan sets ambitious conservation targets to reduce the growth in electricity used within the province. British Columbia will:

- **Set an ambitious target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020.**
- **Implement energy efficient building standards by 2010.**

Current per household electricity consumption for BC Hydro customers is about 10,000 Kwh per year. Achieving this conservation target will see electricity use per household decline to approximately 9,000 Kwh per year by 2020.

Energy Security

The Government of British Columbia is taking action to ensure that the energy needs of British Columbians continue to be met now and into the future. As part of ensuring our energy security, The BC Energy Plan sets the following key policy actions:

- **Maintain public ownership of BC Hydro and the BC Transmission Corporation.**
- **Maintain our competitive electricity rate advantage.**
- **Achieve electricity self-sufficiency by 2016.**
- **Make small power part of the solution through a set purchase price for electricity generated from projects up to 10 megawatts.**
- **Explore value-added opportunities in the oil and gas industry by examining the viability of a new petroleum refinery and petrochemical industry.**
- **Be among the most competitive oil and gas jurisdictions in North America.**
- **BC Hydro and the Province will enter into initial discussions with First Nations, the Province of Alberta and communities to discuss Site C to ensure that communications regarding the potential project and the processes being followed are well known.**

Investing in Innovation

British Columbia has a proven track record in bringing ideas and innovation to the energy sector. From our leadership and experience in harnessing our hydro resources to produce electricity, to our groundbreaking work in hydrogen and fuel cell technology, British Columbia has always met its future energy challenges by developing new, improved and sustainable solutions. To support future innovation and to help bridge the gap experienced in bringing innovations through the pre-commercial stage to market, government will:

- **Establish an Innovative Clean Energy Fund of $25 million.**
- **Implement the BC Bioenergy Strategy to take full advantage of B.C.'s abundant sources of renewable energy.**
- **Generate electricity from mountain pine beetle wood by turning wood waste into energy.**

Ambitious Energy Conservation and Efficiency Targets

The more energy that is conserved, the fewer new sources of supply we will require in the future. That is why British Columbia is setting new conservation targets to reduce growth in electricity demand.

Inefficient use of energy leads to higher costs and many environmental and security of supply problems.

Conservation Target

The BC Energy Plan sets an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020. This will require building on the "culture of conservation" that British Columbians have embraced in recent years.

The plan confirms action on the part of government to complement these conservation targets by working closely with BC Hydro and other utilities to research, develop, and implement best practices in conservation and energy efficiency and to increase public awareness. In addition, the plan supports utilities in British Columbia and the BC Utilities Commission pursuing all cost effective and competitive demand side management programs. Utilities are also encouraged to explore and develop rate designs to encourage efficiency, conservation and the development of renewable energy.

Future energy efficiency and conservation initiatives will include:

- Continuing to remove barriers that prevent customers from reducing their consumption.
- Building upon efforts to educate customers about the choices they can make today with respect to the amount of electricity they consume.
- Exploring new rate structures to identify opportunities to use rates as a mechanism to motivate customers either to use less electricity or use less at specific times.
- Employing new rate structures to help customers implement new energy efficient products and technologies and provide them with useful information about their electricity consumption to allow them to make informed choices.
- Advancing ongoing efforts to develop energy-efficient products and practices through regulations, codes and standards.

POLICY ACTIONS

COMMITMENT TO CONSERVATION

- **Set an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020.**
- **Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia.**
- **Encourage utilities to pursue cost effective and competitive demand side management opportunities.**
- **Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation.**

The average household uses about 10,000 kilowatt-hours of electricity per year.

Implement Energy Efficiency Standards for Buildings by 2010

British Columbia implemented *Energy Efficient Buildings: A Plan for BC* in 2005 to address specific barriers to energy efficiency in our building stock through a number of voluntary policy and market measures. This plan has seen a variety of successes including smart metering pilot projects, energy performance measurement and labelling, and increased use of Energy Star appliances. In 2005, B.C. received a two year, $11 million federal contribution from the Climate Change Opportunities Envelope to support implementation of this plan.

Working together industry, local governments, other stakeholders and the provincial government will determine and implement cost effective energy efficiency standards for new buildings by 2010. Regulated standards for buildings are a central component of energy efficiency programs in leading jurisdictions throughout the world.

The BC Energy Plan supports reducing consumption by raising awareness and enhancing the efforts of utilities, local governments and building industry partners in British Columbia toward conservation and energy efficiency.

Aggressive Public Sector Building Plan

The design and retrofit of buildings and their surrounding landscapes offer us an important means to achieve our goal of making the government of British Columbia carbon neutral by 2010, and promoting Pacific Green universities, colleges, hospitals, schools, prisons, ferries, ports and airports.

British Columbia communities are already recognized leaders in innovative design practices. We know how to build smarter, faster and smaller. We know how to increase densities, reduce building costs and create new positive benefits for our environment. We know how to improve air quality, reduce energy consumption and make wise use of other resources, and how to make our landscapes and buildings healthy places for living, working and learning. We know how to make it affordable.

Government will set the following ambitious goals for all publicly funded buildings and landscapes and ask the Climate Action Team to determine the most credible, aggressive and economically viable options for achieving them:

- Require integrated environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.
- Supply green, healthy workspaces for all public service employees.
- Capture the productivity benefits for people who live and work in publicly funded buildings such as reduced illnesses, less absenteeism, and a better learning environment.
- Aim not only for the lowest impact, but also for restoration of the ecological features of the surrounding landscapes.

Gigawatt = 1,000,000 kilowatts
Kilowatt = amount of power to light ten 100-watt incandescent light bulbs.

ENERGY CONSERVATION AND EFFICIENCY

Community Action on Energy Efficiency

British Columbia is working in partnership with local governments to encourage energy conservation at the community level through the Community Action on Energy Efficiency Program. The program promotes energy efficiency and community energy planning projects, providing direct policy and technical support to local governments through a partnership with the Fraser Basin Council. A total of 29 communities are participating in the program and this plan calls for an increase in the level of participation and expansion of the program to include transportation actions. The Community Action on Energy Efficiency Program is a collaboration among the provincial ministries of Energy, Mines and Petroleum Resources, Environment, and Community Services, Natural Resources Canada, the Fraser Basin Council, Community Energy Association, BC Hydro, FortisBC, Terasen Gas, and the Union of BC Municipalities.

Leading the Way to a Future with Green Buildings and Green Cities

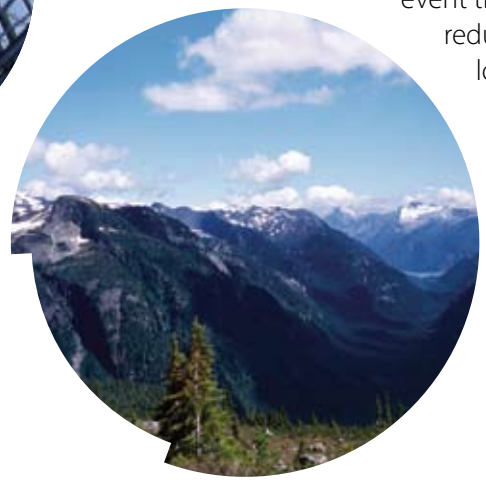
British Columbia has taken a leadership role in the development of green buildings. Through the Green Buildings BC Program, the province is working to reduce the environmental impact of government buildings by increasing energy and water efficiency and reducing greenhouse gas emissions. Through this program, and the Energy Efficient Buildings Strategy that establishes energy efficiency targets for all types of buildings, the province is inviting businesses, local governments and all British Columbians to do their part to increase energy efficiency and reduce greenhouse gas emissions.

The Green Cities Project sets a number of strategies to make our communities greener, healthier and more vibrant places to live. British Columbia communities are already recognized leaders in innovative sustainability practices, and the Green Cities Project will provide them with additional resources to improve air quality, reduce energy consumption and encourage British Columbians to get out and enjoy the outdoors. With the Green Cities Project, the provincial government will:

- Provide $10 million a year over four years for the new LocalMotion Fund, which will cost share capital projects on a 50/50 basis with municipal governments to build bike paths, walkways, greenways and improve accessibility for people with disabilities.
- Establish a new Green City Awards program to encourage the development and exchange of best practices by communities, with the awards presented annually at the Union of British Columbia Municipalities convention.
- Set new financial incentives to help local governments shift to hybrid vehicle fleets and help retrofit diesel vehicles.
- Commit to making new investments in expanded rapid transit, support for fuel cell vehicles and other innovations.

Industrial Energy Efficiency Program

Government will establish an Industrial Energy Efficiency Program for British Columbia to address challenges and issues faced by the B.C. industrial sector and support the Canada wide industrial energy efficiency initiatives. The program will encourage industry driven investments in energy efficient technologies and processes; reduce emissions and greenhouse gases; promote self generation of power; and reduce funding barriers that discourage energy efficiency in the industrial sector. Some specific strategies include developing a results based pilot program with industry to improve energy efficiency and reduce overall power consumption and promote the generation of renewable energy within the industrial sector.



The 2010 Olympic and Paralympics Games: Sustainability in Action

In 2010 Vancouver and Whistler will host the Winter Olympic and Paralympic Games. The 2010 Olympic Games are the first that have been organized based on the principles of sustainability.

All new buildings for the Olympics will be designed and built to conserve both water and materials, minimize waste, maximize air quality, protect surrounding areas and continue to provide environmental and community benefits over their lifetimes. Existing venues will be upgraded to showcase energy conservation and efficiency and demonstrate the use of alternative heating/cooling technologies. Wherever possible, renewable energy sources such as wind, solar, micro hydro, and geothermal energy will be used to power and heat all Games facilities.

Transportation for the 2010 Games will be based on public transit. This system – which will tie event tickets to transit use – will help reduce traffic congestion, minimize local air pollution and limit greenhouse gas emissions.

POLICY ACTIONS

BUILDING STANDARDS, COMMUNITY ACTION AND INDUSTRIAL EFFICIENCY

- **Implement Energy Efficiency Standards for Buildings by 2010.**
- **Undertake a pilot project for energy performance labelling of homes and buildings in coordination with local and federal governments, First Nations and industry associations.**
- **New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.**
- **Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia's industrial sector.**
- **Increase the participation of local governments in the Community Action on Energy Efficiency Program and expand the First Nations and Remote Community Clean Energy Program.**

British Columbia benefits from the public ownership of BC Hydro and the BC Transmission Corporation.

POLICY ACTIONS

SELF-SUFFICIENCY BY 2016

- **Ensure self-sufficiency to meet electricity needs, including "insurance."**
- **Establish a standing offer for clean electricity projects up to 10 megawatts.**
- **The BC Transmission Corporation is to ensure that British Columbia's transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand.**
- **Ensure adequate transmission system capacity by developing and implementing a transmission congestion relief policy.**
- **Ensure that the province remains consistent with North American transmission reliability standards.**

Electricity Security

Electricity, while often taken for granted, is the lifeblood of our modern economy and key to our entire way of life. Fortunately, British Columbia has been blessed with an abundant supply of clean, affordable and renewable electricity. But today, as British Columbia's population has grown, so too has our demand for electricity. We are now dependent on other jurisdictions for up to 10 per cent of our electricity supply. BC Hydro estimates demand for electricity to grow by up to 45 per cent over the next 20 years.

We must address this ever increasing demand to maintain our secure supply of electricity and the competitive advantage in electricity rates that all British Columbians have enjoyed for the last 20 years. There are no simple solutions or answers. We have an obligation to future generations to chart a course that will ensure a secure, environmentally and socially responsible electricity supply.

To close this electricity gap, and for our province to become electricity self-sufficient, will require an innovative electricity industry and the real commitment of all British Columbians to conservation and energy efficiency.

The New Relationship and Electricity

The Government of British Columbia is working with First Nations to restore, revitalize and strengthen First Nations communities. The goal is to build strong and healthy relationships with First Nations people guided by the principles of trust and collaboration. First Nations share many of the concerns of other British Columbians in how the development of energy resources may impact as well as benefit their communities. In addition, First Nations have concerns with regard to the recognition and respect of Aboriginal rights and title.

By focusing on building partnerships between First Nations, industry and government, tangible social and economic benefits will flow to First Nations communities across the province and assist in eliminating the gap between First Nations people and other British Columbians.

Government is working every day to ensure that energy resource management includes First Nations' interests, knowledge and values. By continuing to engage First Nations in energy related issues, we have the opportunity to share information and look for opportunities to facilitate First Nations' employment and participation in the electricity sectors to ensure that First Nations people benefit from the continued growth and development of British Columbia's resources. The BC Energy Plan provides British Columbia with a blueprint for facing the many energy challenges and opportunities that lay ahead. It provides an opportunity to build on First Nations success stories such as:

- First Nations involvement in independent power projects, such as the Squamish First Nation's participation in the Furry Creek and Ashlu hydro projects.

- Almost $4 million will flow to approximately 10 First Nations communities across British Columbia to support the implementation of Community Energy Action Plans as part of the First Nation and Remote Community Clean Energy Program.
- The China Creek independent power project was developed by the Hupacasath First Nation on Vancouver Island.

Achieve Electricity Self-Sufficiency by 2016

Achieving electricity self-sufficiency is fundamental to our future energy security and will allow our province to achieve a reliable, clean and affordable supply of electricity. It also represents a lasting legacy for future generations of British Columbians. That's why government has committed that British Columbia will be electricity self-sufficient within the decade ahead.

Through **The BC Energy Plan**, government will set policies to guide BC Hydro in producing and acquiring enough electricity in advance of future need. However, electricity generation and transmission infrastructure require long lead times. This means that over the next two decades, BC Hydro must acquire an additional supply of "insurance power" beyond the projected increases in demand to minimize the risk and implications of having to rely on electricity imports.

Small Power Standing Offer

Achieving electricity self-sufficiency in British Columbia will require a range of new power sources to be brought on line. To help make this happen, this policy will direct BC Hydro to establish a Standing Offer Program with no quota to encourage small and clean electricity producers. Under the Standing Offer Program, BC Hydro will purchase directly from suppliers at a set price.

Eligible projects must be less than 10 megawatts in size and be clean electricity or high efficiency electricity cogeneration. The price offered in the standing offer contract would be based on the prices paid in the most recent BC Hydro energy call. This will provide small electricity suppliers with more certainty, bring small power projects into the system more quickly, and help achieve government's goal of maintaining a secure electricity supply. As well, BC Hydro will offer the same price to those in BC Hydro's Net Metering Program who have a surplus of generation at the end of the year.

Ensuring a Reliable Transmission Network

An important part of meeting the goal of self-sufficiency is ensuring a reliable transmission infrastructure is in place as additional power is brought on line. Transmission is a critical part of the solution as often new clean sources of electricity are located away from where the demand is. In addition, transmission investment is required to support economic growth in the province and must be planned and started in anticipation of future electricity needs given the long lead times required for transmission development. New and upgraded transmission infrastructure will be required to avoid congestion and to efficiently move the electricity across the entire power grid. Because our transmission system is part of a much larger, interconnected grid, we need to work with other jurisdictions to maximize the benefit of interconnection, remain consistent with evolving North American reliability standards, and ensure British Columbia's infrastructure remains capable of meeting customer needs.

BC HYDRO'S NET METERING PROGRAM: PEOPLE PRODUCING POWER

BC Hydro's Net Metering Program was established as a result of Energy Plan 2002. It is designed for customers with small generating facilities, who may sometimes generate more electricity than they require for their own use. A net metering customer's electricity meter will run backwards when they produce more electricity than they consume and run forward when they produce less than they consume.

The customer is only billed for their "net consumption"; the total amount of electricity used minus the total produced.

Net metering allows customers to lower their environmental impact and take responsibility for their own power production. It helps to move the province towards electricity self-sufficiency and expands clean electricity generation, making B.C.'s electricity supply more environmentally sustainable.

In order for British Columbia to ensure the development of a secure and reliable supply of electricity, **The BC Energy Plan** provides policy direction to the BC Transmission Corporation to ensure that our transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand. This will include ensuring there is adequate transmission capacity, ongoing investments in technology and infrastructure and remaining consistent with evolving North American reliability standards.

BC Transmission Corporation Innovation and Technology

As the manager of a complex and high-value transmission grid, BC Transmission Corporation is introducing technology innovations that provide improvements to the performance of the system and allow for a greater utilization of existing assets, ensuring B.C. continues to benefit from one of the most advanced energy networks in the world. BC Transmission Corporation's innovation program focuses on increasing the power transfer capability of existing assets, extending the life of assets and improving system reliability and security. Initiatives include:

- System Control Centre Modernization Project: This project is consolidating system operations into a new control center and backup site and upgrading operating technologies with a modern management system that includes enhancements to existing applications to ensure the electric grid is operating reliably and efficiently. The backup site will take over complete operation of the electric grid if the main site is unavailable.
- Real-Time Phasors: British Columbia is among the first North American jurisdictions to incorporate phasor measurement into control centre operations. Phasors are highly accurate voltage, current and phase angle "snapshots" of the real-time state of the transmission system that enable system operators to monitor system conditions and identify any impending problems.
- Real-Time Rating: This is a temperature monitoring system which enables the operation of two 500 kilovolt submarine cable circuits at maximum capacity without overloading. The resulting increase in capacity is estimated to be up to 10 per cent, saving millions of dollars.
- Electronic Temperature Monitor Upgrades for Station Transformers: In this program, existing mechanical temperature monitors will be replaced with newer, more accurate electronic monitors on station transformers that allow transformers to operate to maximum capacity without overheating. In addition to improving performance, BC Transmission Corporation will realize reduced maintenance costs as the monitors are "self-checking."
- Life Extension of Transmission Towers: BC Transmission Corporation maintains over 22,000 steel lattice towers and is applying a special composite corrosion protection coating to some existing steel towers to extend their life by about 25 years.

Public Ownership

Public Ownership of BC Hydro and the BC Transmission Corporation

BC Hydro and the BC Transmission Corporation are publicly-owned crown corporations and will remain that way now and into the future. BC Hydro is responsible for generating, purchasing and distributing electricity. The BC Transmission Corporation operates, maintains, and plans BC Hydro's transmission assets and is responsible for providing fair, open access to the power grid for all customers. Both crowns are subject to the review and approvals of the independent regulator, the BC Utilities Commission.

BC Hydro owns the heritage assets, which include historic electricity facilities such as those on the Peace and Columbia Rivers that provide a secure, reliable supply of low-cost power for British Columbians. These heritage assets require maintenance and upgrades over time to ensure they continue to operate reliably and efficiently. Potential improvements to these assets, such as capacity additions at the Mica and Revelstoke generating stations, can make important contributions for the benefit of British Columbians.

Confirming the Heritage Contract in Perpetuity

Under the 2002 Energy Plan, a legislated heritage contract was established for an initial term of 10 years to ensure BC Hydro customers benefit from its existing low-cost resources. With The BC Energy Plan, government confirms the heritage contract in perpetuity to ensure ratepayers will continue to receive the benefits of this low-cost electricity for generations to come.

British Columbia's Leadership in Clean Energy

The BC Energy Plan will continue to ensure British Columbia has an environmentally and socially responsible electricity supply with a focus on conservation and energy efficiency.

British Columbia is already a world leader in the use of clean and renewable electricity, due in part to the foresight of previous generations who built our province's hydroelectric dams. These dams - now British Columbians' 'heritage assets' - today help us to enjoy 90 per cent clean electricity, one of the highest levels in North America.

All New Electricity Generation Projects Will Have Zero Net Greenhouse Gas Emissions

The B.C. government is a leader in North America when it comes to environmental standards. While British Columbia is a province rich in energy resources such as hydro electricity, natural gas and coal, the use of these resources needs to be balanced through effective use, preserving our environmental standards, while upholding our quality of life for generations to come. The government has made a commitment that all new electricity generation projects developed in British Columbia and connected to the grid will have zero net greenhouse gas emissions. In addition, any new electricity generated from coal must meet the more stringent standard of zero greenhouse gas emissions.

POLICY ACTIONS

PUBLIC OWNERSHIP

- **Continue public ownership of BC Hydro and its heritage assets, and the BC Transmission Corporation.**
- **Establish the existing heritage contract in perpetuity.**
- **Invest in upgrading and maintaining the heritage asset power plants and the transmission lines to retain the ongoing competitive advantage these assets provide to the province.**

POLICY ACTIONS

REDUCING GREENHOUSE GAS EMISSIONS FROM ELECTRICITY

- **All new electricity generation projects will have zero net greenhouse gas emissions.**
- **Zero net greenhouse gas emissions from existing thermal generation power plants by 2016.**
- **Require zero greenhouse gas emissions from any coal thermal electricity facilities.**
- **Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.**
- **Government supports BC Hydro's proposal to replace the firm energy supply from the Burrard Thermal plant with other resources. BC Hydro may choose to retain Burrard for capacity purposes after 2014.**
- **No nuclear power.**

Zero Net Greenhouse Gas Emissions from Existing Thermal Generation Power Plants by 2016

Setting a requirement for zero net emissions over this time period encourages power producers to invest in new or upgraded technology. For existing plants the government will set policy around reaching zero net emissions through carbon offsets from other activities in British Columbia. It clearly signals the government's intention to continue to have one of the lowest greenhouse gas emission electricity sectors in the world.

Ensure Clean or Renewable Electricity Generation Continues to Account For at Least 90 per cent of Total Generation

Currently in B.C., 90 per cent of electricity is from clean or renewable resources. The BC Energy Plan commits to maintaining this high standard which places us among the top jurisdictions in the world. Clean or renewable resources include sources of energy that are constantly renewed by natural processes, such as water power, solar energy, wind energy, tidal energy, geothermal energy, wood residue energy, and energy from organic municipal waste.

Zero Greenhouse Gas Emissions from Coal

The government is committed to ensuring that British Columbia's electricity sector remains one of the cleanest in the world and will allow coal as a resource for electricity generation when it can reach zero greenhouse gas emissions. Clean-coal technology with carbon sequestration is expected to become commercially available in the next decade. Therefore, the province will require zero greenhouse gas emissions from any coal thermal electricity facilities which can be met through capture and sequestration technology. British Columbia is the first Canadian jurisdiction to commit to using only clean coal technology for any electricity generated from coal.

Burrard Thermal Generating Station

A decision regarding the Burrard Thermal Natural Gas Generating Station is another action that is related to environmentally responsible electricity generation in British Columbia.

Even though it could generate electricity from Burrard Thermal, BC Hydro imports power primarily because the plant is outdated, inefficient and costly to run. However, Burrard Thermal still provides significant benefits to BC Hydro as it acts as a "battery" close to the Lower Mainland, and provides extra capacity or "reliability insurance" for the province's electricity supply. It also provides transmission system benefits that would otherwise have to be supplied through the addition of new equipment at Lower Mainland sub-stations.

By 2014, BC Hydro plans to have firm electricity to replace what would have been produced at the plant. Government supports BC Hydro's proposal to replace the firm energy supply from Burrard Thermal with other resources by 2014. However, BC Hydro may choose to retain the plant for "reliability insurance" should the need arise.

No Nuclear Power

As first outlined in Energy Plan 2002, government will not allow production of nuclear power in British Columbia.

Benefits to British Columbians

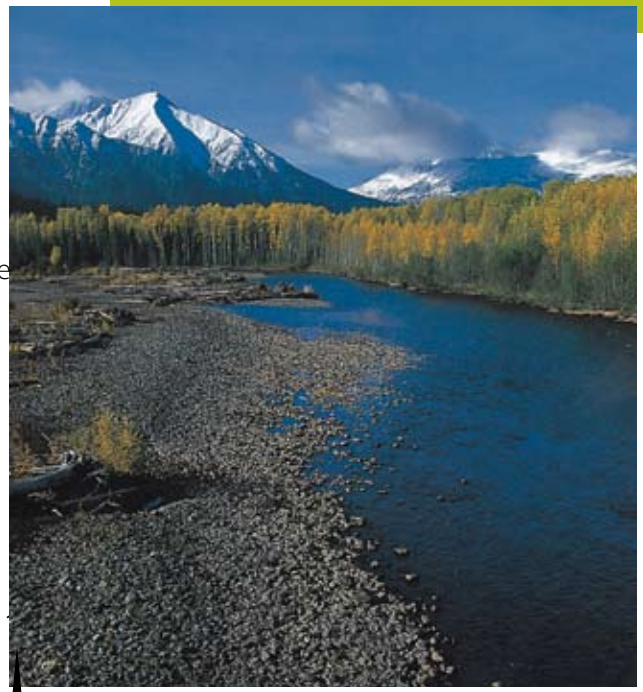
Clean or renewable electricity comes from sources that replenish over a reasonable time or have minimal environmental impacts. Today, demand for economically viable, clean, renewable and alternative energy is growing along with the world's population and economies. Consumers are looking for power that is not only affordable but creates minimal environmental impacts. Fortunately, British Columbia has abundant hydroelectric resources, and plenty of other potential energy sources.

Maintain our Electricity Competitive Advantage

British Columbians require a secure, reliable supply of competitively priced electricity now and in the future. Competitively priced power is also an incentive for investors to locate in British Columbia. It provides an advantage over other jurisdictions and helps sustain economic growth. We are fortunate that historic investments in hydroelectric assets provide electricity that is readily available, reliable, clean and inexpensive. By ensuring public ownership of BC Hydro, the heritage assets and the BC Transmission Corporation and confirming the heritage contract in perpetuity, we will ensure that ratepayers continue to receive the benefits of this low cost generation. Due to load growth and aging infrastructure, new investments will be required. Investments in maintenance and in some cases expansions can be a cost effective way to meet growth and reduce future rate increases.

CARBON OFFSETS AND HOW THEY REDUCE EMISSIONS

A carbon offset is an action taken directly, outside of normal operations, which results in reduced greenhouse gas emissions or removal of greenhouse gases from the atmosphere. Here's how it works: if a project adds greenhouse gases to the atmosphere, it can effectively subtract them by purchasing carbon offsets which are reductions from another activity. Government regulations to reduce greenhouse gases, including offsets, demonstrate leadership on climate change and support a move to clean and renewable energy.



ELECTRICITY

25

Government will establish a $25 million ***Innovative Clean Energy Fund.***

POLICY ACTIONS

BENEFITS TO BRITISH COLUMBIANS

- **Review BC Utilities Commissions' role in considering social and environmental costs and benefits.**
- **Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources.**
- **Work with BC Hydro and parties involved to continue to improve the procurement process for electricity.**
- **Pursue Government and BC Hydro's planned Remote Community Electrification Program to expand or take over electricity service to remote communities in British Columbia.**
- **Ensure BC Hydro considers alternative electricity sources and energy efficiency measures in its energy planning for remote communities.**

British Columbia must look for new, innovative ways to stay competitive. New technologies must be identified and nurtured, from both new and existing industries. By diversifying and strengthening our energy sector through the development of new and alternative energy sources, we can help ensure the province's economy remains vibrant for years to come.

Ensure Electricity is Secured at Competitive Prices

One practical way to keep rates down is to ensure utilities have effective processes for securing competitively priced power. As part of The BC Energy Plan, government will work with BC Hydro and parties involved to continue to improve the Call for Tender process for acquiring new generation. Fair treatment of both buyers and sellers of electricity will facilitate a robust and competitive procurement process. Government and BC Hydro will also look for ways to further recognize the value of intermittent resources, such as run-of- river and wind, in the acquisition process – which means that BC Hydro will examine ways to value separate projects together to increase the amount of firm energy calculated from the resources.

Rates Kept Low Through Powerex Trading of Electricity

Profits from electricity trade also contribute to keeping our electricity rates competitive. BC Hydro, through its subsidiary, Powerex, buys and sells electricity when it is advantageous to British Columbia's ratepayers. Government will continue to support capitalizing on electricity trading opportunities and will continue to allocate trade revenue to BC Hydro ratepayers to keep electricity rates low for all British Columbians.

BC Utilities Commissions' Role in Social and Environmental Costs and Benefits

The BC Energy Plan clarifies that social, economic and environmental costs are important for ensuring a suitable electricity supply in British Columbia. Government will review the BC Utilities Commissions' role in considering social, environmental and economic costs and benefits, and will determine how best to ensure these are appropriately considered within the regulatory framework.

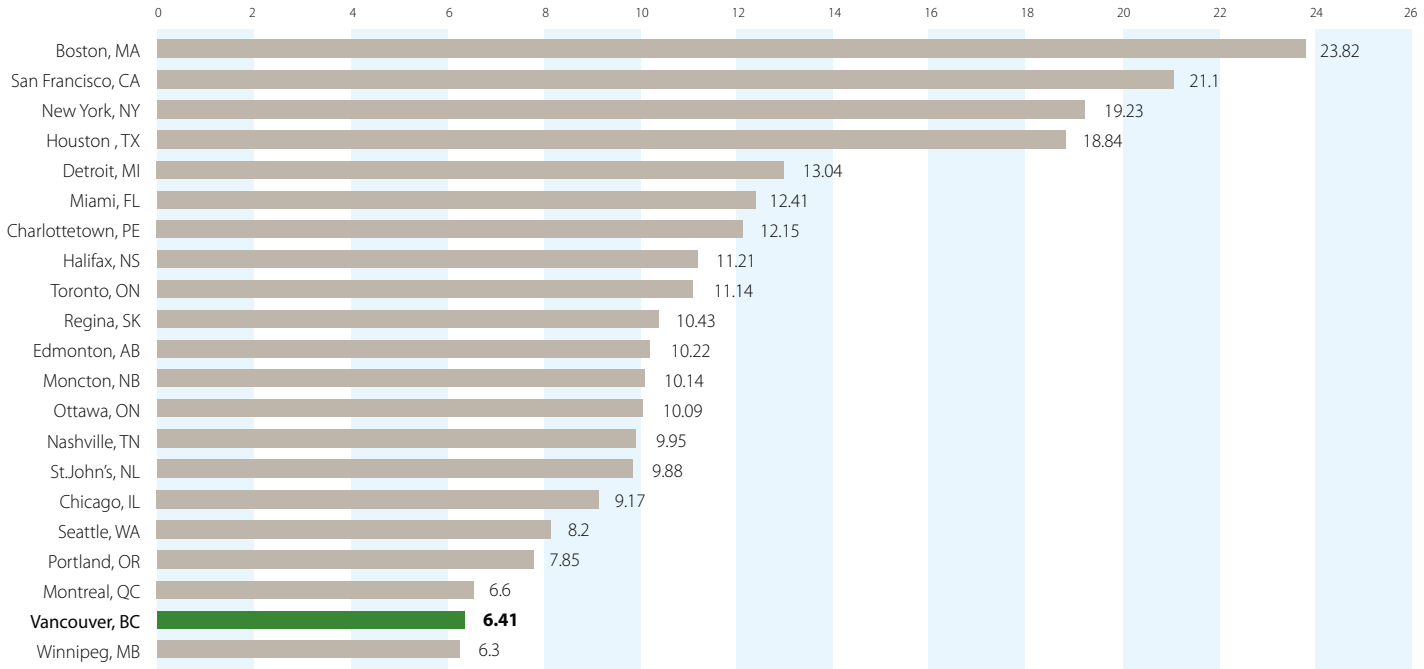
Bring Clean Power to Communities

British Columbia's electricity industry supports thousands of well-paying jobs, helps drive the economy and provides revenues to sustain public services. British Columbia's electricity industry already fosters economic development by implementing cost effective and reliable energy solutions in communities around the province. However, British Columbia covers almost one million square kilometres and electrification does not extend to all parts of our vast province.

Government and BC Hydro have established First Nation and remote community energy programs to implement alternative energy, energy efficiency, conservation and skills training solutions in a number of communities. The program focuses on expanding electrification services to as many as 50 remote and First Nations communities in British Columbia, enabling them to share in the benefits of a stable and secure supply of electricity. Government will put the policy framework in place and BC Hydro will implement the program over the next 10 years. The **Innovative Clean Energy Fund** can also support technological advancements to address the issue of providing a clean and secure supply of electricity to remote communities.

2006 Average Residential Electricity Price

Price (Canadian cents per kilowatt hour)



Source: Hydro Quebec comparison of Electricity Prices in Major North American Cities, April 2006

BRINGING CLEAN POWER TO ATLIN

Electricity in the remote community of Atlin in northwestern British Columbia is currently supplied by diesel generators. The First Nations and Remote Community Clean Energy Program is bringing clean power to Atlin.

The Taku Land Corporation, solely owned by the Taku River Tlingit First Nation will construct a two megawatt run-of-river hydroelectric project on Pine Creek, generating local economic benefits and providing clean power for Atlin. The Taku Land Corporation has entered into a 25 year Electricity Purchase Agreement with BC Hydro to supply electricity from the project to Atlin's grid. Over the course of the agreement, this will reduce greenhouse gas emissions by up to 150,000 tonnes as the town's diesel generators stand by.

The province is contributing $1.4 million to this $10 million project. This is the first payment from a $3.9 million federal contribution to British Columbia's First Nations and Remote Community Clean Energy Program. Criteria for federal funding included demonstrating greenhouse gas emissions reductions, cost-effectiveness, and partnerships with communities and industry.

Government will work with other agencies to maximize opportunities to develop, deploy and export British Columbia clean and alternative energy technologies.

POLICY ACTIONS

INVESTING IN INNOVATION

- **Establish the Innovative Clean Energy Fund to support the development of clean power and energy efficiency technologies in the electricity, alternative energy, transportation and oil and gas sectors.**
- **Implement a provincial Bioenergy Strategy which will build upon British Columbia's natural bioenergy resource advantages.**
- **Issue an expression of interest followed by a call for proposals for electricity from sawmill residues, logging debris and beetle-killed timber to help mitigate impacts from the provincial mountain pine beetle infestation.**

Innovative Clean Energy Fund

British Columbia's increasing energy requirements and our ambitious greenhouse gas emission reduction and clean energy targets require greater investment and innovation in the area of alternative energy by both the public and private sector.

To lead this effort, the government will establish an Innovative Clean Energy Fund of $25 million to help promising clean power technology projects succeed. The fund will be established through a small charge on energy utilities. The Minister of Energy, Mines and Petroleum Resources will consult with the energy utilities on the implementation of this charge.

Proponents of projects that will be supported through the fund will be encouraged to seek additional contributions from other sources. Government's new Innovative Clean Energy Fund will help make British Columbia a world leader in alternative energy and power technology. It will solve some of B.C.'s pressing energy challenges, protect our environment, help grow the economy, position the province as the place international customers turn to for key energy and environmental solutions, and assist B.C. based companies to showcase their products to world wide markets.

Following the advice of the Premier's Technology Council and the Alternative Energy and Power Technology Task Force, the fund will focus strictly on projects that:

- Address specific British Columbia energy and environmental problems that have been identified by government.
- Showcase B.C. technologies that have a strong potential for international market demand in other jurisdictions because they solve problems that exist both in B.C. and other jurisdictions.
- Support pre-commercial energy technology that is new, or commercial technologies not currently used in British Columbia.
- Demonstrate commercial success for new energy technologies.

Some problems that the fund could focus on include:

- Developing reliable power solutions for remote communities-particularly helping First Nations communities reduce their reliance on diesel generation for electricity.
- Advance conservation technologies to commercial application.
- Finding ways to convert vehicles to cleaner alternative fuels.
- Increasing the efficiency of power transmission through future grid technologies.
- Expanding the opportunities to generate power using alternative fuels (e.g.mountain pine beetle wood).

The British Columbia Bioenergy Strategy: Growing Our Natural Energy Advantage

Currently, British Columbia is leading Canada in the use of biomass for energy. The province has 50 per cent of Canada's biomass electricity generating capacity. In 2005, British Columbia's forest industry self-generated the equivalent of $150 million in electricity and roughly $1.5 billion in the form of heat energy. The use of biomass has displaced some natural gas consumption in the pulp and paper sector. The British Columbia wood pellet industry also enjoys a one-sixth share of the growing European Union market for bioenergy feedstock. The province will shortly release a bioenergy strategy that will build upon British Columbia's natural bioenergy resource advantages, industry capabilities and academic strength to establish British Columbia as a world leader in bioenergy development.

British Columbia's plan is to lead the bioeconomy in Western Canada with a strong and sustainable bioenergy sector. This vision is built on two guiding principles:

- Competitive, diversified forest and agriculture sectors.
- Strengthening regions and communities.

The provincial Bioenergy Strategy is aimed at:

- Enhancing British Columbia's ability to become electricity self-sufficient.
- Fostering the development of a sustainable bioenergy sector.
- Creating new jobs.
- Supporting improvements in air quality.
- Promoting opportunities to create power from mountain pine beetle-impacted timber.
- Positioning British Columbia for world leadership in the development and commercial adoption of wood energy technology.
- Advancing innovative solutions to agricultural and other waste management challenges.
- Encouraging diversification in the forestry and agriculture industries.
- Producing liquid biofuels to meet Renewable Fuel Standards and displace conventional fossil fuels.

Generating Electricity from Mountain Pine Beetle Wood: Turning Wood Waste into Energy

British Columbia is experiencing an unprecedented mountain pine beetle infestation that has affected several million hectares of trees throughout the province. This infestation is having a significant impact on forestry-based communities and industries, and heightens forest fire risk. There is a great opportunity to convert the affected timber to bioenergy, such as wood pellets and wood-fired electricity generation and cogeneration.

Through **The BC Energy Plan**, BC Hydro will issue a call for proposals for electricity from sawmill residues, logging debris and beetle-killed timber to help mitigate impacts from the provincial mountain pine beetle infestation.

MOUNTAIN PINE BEETLE INFESTATION: TURNING WOOD WASTE INTO ENERGY

British Columbia is experiencing an unprecedented mountain pine beetle infestation that has affected several million hectares of trees throughout the province. This infestation is having a significant economic impact on B.C.'s forestry industry and the many communities it helps to support and sustain. The forest fire risk to these communities has also risen as a result of their proximity to large stands of "beetle-killed" wood.

B.C. has developed a bioenergy strategy to promote new sources of sustainable and renewable energy in order to take advantage of the vast amounts of pine beetle-infested timber and other biomass resources. In the future, bioenergy will help meet our electricity needs, supplement conventional natural gas and petroleum supplies, maximize job and economic opportunities, and protect our health and environment.

The production of wood pellets is already a mature industry in British Columbia. Industry has produced over 500,000 tonnes of pellets and exported about 90 per cent of this product overseas in 2005, primarily to the European thermal power industry. Through **The BC Energy Plan**, BC Hydro will issue a call for proposals for further electricity generation from wood residue and mountain pine beetle-infested timber.

GOVERNMENT TO USE HYBRID VEHICLES ONLY

The provincial government is continuing the effort to reduce greenhouse gas emissions and overall energy consumption.

As part of this effort, government has more than tripled the size of its hybrid fleet since 2005 to become one of the leaders in public sector use of hybrid cars.

Hybrids emit much less pollution than conventional gas and diesel powered vehicles and thus help to reduce greenhouse gases in our environment. They can also be more cost-effective as fuel savings offset the higher initial cost.

As of 2007, all new cars purchased or leased by the B.C. government are to be hybrid vehicles. The province also has new financial incentives to help local governments shift to hybrid vehicle fleets and help retrofit diesel vehicles.

Addressing Greenhouse Gas Emissions from Transportation

The BC Energy Plan: A Vision for Clean Energy Leadership takes a first step to incorporate transportation issues into provincial energy policy. Transportation is a major contributor to climate change and air quality problems. It presents other issues such as traffic congestion that slows the movement of goods and people. The fuel we use to travel around the province accounts for about 40 per cent of British Columbia's greenhouse gas emissions. Every time we drive or take a vehicle that runs on fossil fuels, we add to the problem, whether it's a train, boat, plane or automobile. Cars and trucks are the biggest source of greenhouse gas emissions and contribute to reduced air quality in urban areas.

The government is committed to reducing greenhouse gas emissions from the transportation sector and has committed to adopting California's tailpipe emission standards from greenhouse gas emissions and champion the national adoption of these standards.

British Columbians want a range of energy options for use at home, on the road and in day-to-day life. Most people use gasoline or diesel to keep their vehicles moving, but there are other options that improve our air quality and reduce greenhouse gas emissions.

Natural gas burns cleaner than either gasoline or propane, resulting in less air pollution. Fuel cell vehicles are propelled by electric motors powered by fuel cells, devices that produce electricity from hydrogen without combustion.

GO GREEN

Cars that run on blends of renewable biofuels like ethanol and biodiesel emit lower levels of greenhouse gases and air pollutants. Electricity can provide an alternative to gasoline vehicles when used in hybrids and electric cars.

By working with businesses, educational institutions, non-profit organizations and governments, new and emerging transportation technologies can be deployed more rapidly at home and around the world. British Columbia will focus on research and development, demonstration projects, and marketing strategies to promote British Columbia's technologies to the world.

Implementing a Five Per Cent Renewable Fuel Standard for Diesel and Gasoline

The BC Energy Plan demonstrates British Columbia's commitment to environmental sustainability and economic growth by taking a lead role in promoting innovation in the transportation sector to reduce greenhouse gas emissions, improve air quality and help improve British Columbians' health and quality of life in the future. The plan will implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry. It will further support the federal action of increasing the ethanol content of gasoline to five per cent by 2010. The plan will also see the adoption of quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions. These renewable fuel standards are a major component and first step towards government's goal of reducing the carbon intensity of all passenger vehicles by 10 per cent by 2020.

Government will implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.

A Commitment to Extend British Columbia's Ground-breaking Hydrogen Highway

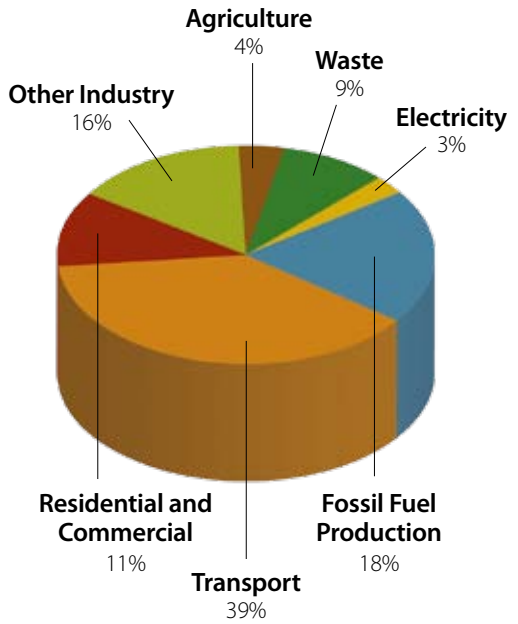
British Columbia is a world leader in transportation applications of the Hydrogen Highway, including the design, construction and safe operation of advanced hydrogen vehicle fuelling station technology. The Hydrogen Highway is a large scale, coordinated demonstration and deployment program for hydrogen and fuel cell technologies.

Vancouver's Powertech Labs established the world's first fast-fill, high pressure hydrogen fuelling station. The station anchors the Hydrogen Highway, which runs from Victoria through Surrey to Vancouver, North Vancouver, Squamish, and Whistler. Additional hydrogen fuelling stations are now in operation in Victoria and at the University of British Columbia.

The goal is to demonstrate and deploy various technologies and to one day see hydrogen filling stations around the province, serving drivers of consumer and commercial cars, trucks, and buses.

The unifying vision of the province's hydrogen and fuel cell strategy is to promote fuel cells and hydrogen technologies as a means of moving towards a sustainable energy future, increasing energy efficiency and reducing air pollutants and greenhouse gases. The Hydrogen Highway is targeted for full implementation by 2010. Canadian hydrogen and fuel cell companies have invested over $1 billion over the last five years, most of that in B.C. A federal-provincial partnership will be investing $89 million for fuelling stations and the world's first fleet of 20 fuel cell buses.

British Columbia will continue to be a leader in the new hydrogen economy by taking actions such as a fuel cell bus fleet deployment, developing a regulatory framework for micro-hydrogen applications, collaborating with neighbouring jurisdictions on hydrogen, and, in the long term, establishing a regulatory framework for hydrogen production, vehicles and fuelling stations.



B.C. Greenhouse Gas Emissions by Sector

(Based on 2004 data)
Source: Ministry of Environment

Cars and trucks are the biggest source of greenhouse gas emissions and reduce the quality of air in urban areas.

POLICY ACTIONS

ADDRESSING GREENHOUSE GAS EMISSIONS FROM TRANSPORTATION AND INCREASING INNOVATION

- **Implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.**
- **Support the federal action of increasing the ethanol content of gasoline to five per cent by 2010 and adopt quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions.**
- **Develop a leading hydrogen economy by continuing to support the Hydrogen and Fuel Cell Strategy for British Columbia.**
- **Establish a new, harmonized regulatory framework by 2010 for hydrogen by working with governments, industry and hydrogen alliances.**

Vehicles that run on electricity, hydrogen and blends of renewable biofuels like ethanol and biodiesel emit lower levels of greenhouse gases and air pollutants.

LOCALMOTION FUND: REDUCING AIR POLLUTION IN YOUR COMMUNITY

The province has committed $40 million over four years to help build cycling and pedestrian pathways, improve safety and accessibility, and support children's activity programs in playgrounds.

This fund will help local government shift to hybrid vehicle fleets and help retrofit diesel vehicles which will help reduce air pollution and ensure vibrant and environmentally sustainable communities. This investment will also include expansion of rapid transit and support fuel cell vehicles.

Promote Energy Efficiency and Alternative Energy

It is important for British Columbians to understand the appropriate uses of different forms of energy and utilize the right fuel, for the right activity at the right time. There is the potential to promote energy efficiency and alternative energy supplemented by natural gas. Combinations of alternative energy sources with natural gas include solar thermal and geothermal. Working with municipalities, utilities and other stakeholders the provincial government will promote energy efficiency and alternative energy systems, such as solar thermal and geothermal throughout the province.

Environmental Leadership in Action

The BC Energy Plan: A Vision for Clean Energy Leadership complements other related cross-government initiatives that include supporting transportation demand management, reducing traffic congestion and better integrating land use and transportation planning. These plans include actions across a broad range of activities. Some key initiatives and recent announcements include:

- Extending the tax break on hybrid vehicle purchases beyond the current March 2008 deadline.
- Government to purchase hybrid vehicles exclusively.
- Reducing diesel emissions through new financial incentives to help municipalities shift to hybrid vehicle fleets and retrofit diesel vehicles with cleaner technologies.
- Green Ports:
  - Working with ports and the shipping sector to reduce emissions from their activities and marine vessels.
  - The Port of Vancouver has established idle reduction zones and has reduced truck emissions with its container reservation system which has reduced average wait times from two hours to approximately 20 minutes.
  - The port is also evaluating port-side electrification which would see vessels using shore-side electrical power while berthed rather than diesel power.
- Improving upon the monitoring and reporting of air quality information.
- Highway Infrastructure and Rapid Transit Infrastructure funding including the Gateway Program, the Border Infrastructure Program, high occupancy vehicle lanes, construction of the Rapid Transit Canada Line linking Richmond, the Vancouver International Airport and Vancouver, and the Rapid Transit Evergreen Line linking Burnaby to Coquitlam.
- Expanding the AirCare on the Road Program to the Lower Fraser Valley and other communities.
- Implementing the LocalMotion Program for capital projects to improve physical fitness and safety, reduce air pollution and meet the diverse needs of British Columbians.

A Choice of Electricity Options

The range of supply options, both large and small, for British Columbia include:

Bioenergy: Bioenergy is derived from organic biomass sources such as wood residue, agricultural waste, municipal solid waste and other biomass and may be considered a carbon-neutral form of energy, because the carbon dioxide released by the biomass when converted to energy is equivalent to the amount absorbed during its lifetime.

A number of bioenergy facilities operate in British Columbia today. Many of these are "cogeneration" plants that create both electricity and heat for on-site use and in some cases, sell surplus electricity to BC Hydro.

Reliability[1]: FIRM
Estimated Cost[5]: $75 – $91

Coal Thermal Power: The BC Energy Plan establishes a zero emission standard for greenhouse gas emissions from coal-fired plants. This will require proponents of new coal facilities to employ clean coal technology with carbon capture and sequestration to ensure there are no greenhouse gas emissions.

Reliability[1]: FIRM
Estimated Cost[5 6]: $67– $82

Geothermal: Geothermal power is electricity generated from the earth. Geothermal power production involves tapping into pockets of superheated water and steam deep underground, bringing them to the surface and using the heat to produce steam to drive a turbine and produce electricity. British Columbia has potential high temperature (the water is heated to more than 200 degrees Celsius) geothermal resources in the coastal mountains and lower temperature resources in the interior, in northeast British Columbia and in a belt down the Rocky Mountains. Geothermal energy's two main advantages are its consistent supply, and the fact that it is a clean, renewable source of energy.

Reliability[1]: FIRM
Estimated Cost[2]: $44 - $60

Hydrogen and Fuel Cell Technology:
British Columbia companies are recognized globally for being leaders in hydrogen and fuel cell technology for mobile, stationary and micro applications. For example, BC Transit's fuel cell buses are planned for deployment in Whistler in 2009.

Reliability[1]: FIRM
Estimated Cost[2]: n/a

[1] Reliability refers to energy that can be depended on to be available whenever required
[2] Source: BC Hydro's 2006 IEP Volume 1 of 2 page 5-6
[3] Based on a 500 MW super ciritcal pulverized coal combustion unit. The BC Energy Plan requires coal power to meet zero GHG emissions
[4] Based on a 250 MW combined cycle gas turbine plant. The BC Energy Plan requires coal power to meet zero GHG emissions
[5] Source: BC Hydro's F2006 Open Call for Power Report
[6] These costs do not reflect the costs of zero GHG emissions for coal thermal power

GOVERNMENT'S COMMITMENT TO THE ENVIRONMENT – THE ENVIRONMENTAL ASSESSMENT PROCESS

The environmental assessment process in British Columbia is an integrated review process for major projects that looks at potential environmental, community and First Nation, health and safety, and socioeconomic impacts. Through the environmental assessment process, the potential effects of a project are identified and evaluated early, resulting in improved project design and helping to avoid costly mistakes for proponents, governments, local communities and the environment.

An assessment is begun when a proposed project that meets certain criteria under the ***Environmental Assessment Act*** makes an application for an environmental assessment certificate. Each assessment will usually include an opportunity for all interested parties to identify issues and provide input; technical studies of the relevant environmental, social, economic, heritage and/or health effects of the proposed project; identification of ways to prevent or minimize undesirable effects and enhance desirable effects; and consideration of the input of all interested parties in compiling the assessment findings and making decisions about project acceptability. The review is concluded when a decision is made to issue or not issue an environmental assessment certificate. Industrial, mining, energy, water management, waste disposal, food processing, transportation and tourist destination resort projects are generally subject to an environmental assessment.

ELECTRICITY CHOICES

WHAT IS THE DIFFERENCE BETWEEN FIRM AND INTERMITTENT ELECTRICITY?

Firm electricity refers to electricity that is available at all times even in adverse conditions. The main sources of reliable electricity in British Columbia include large hydroelectric dams, and natural gas. This differs from intermittent electricity, which is limited or is not available at all times. An example of intermittent electricity would be wind which only produces power when the wind is blowing.

Large Hydroelectric Dams: The chief advantage of a hydro system is that it provides a reliable supply with both dependable capacity and energy, and a renewable and clean source of energy. Hydropower produces essentially no carbon dioxide.

Site C is one of many resource options that can help meet BC Hydro's customers' electricity needs. No preferred option has been selected at this time; however; it is recognized that the Province will need to examine opportunities for some large projects to meet growing demand.

As part of **The BC Energy Plan**, BC Hydro and the Province will enter into initial discussions with First Nations, the Province of Alberta and communities to discuss Site C to ensure that communications regarding the potential project and the processes being followed are well known. The purpose of this step is to engage the various parties up front to obtain input for the proposed engagement process. The decision-making process on Site C includes public consultation, environmental impact assessments, obtaining a Certificate of Public Convenience and Necessity, obtaining an Environmental Assessment Certificate and necessary environmental approvals, and approval by Cabinet.

Reliability[1]: FIRM
Estimated Cost[2]: $43 - $62

Natural Gas: Natural gas is converted into electricity through the use of gas fired turbines in medium to large generating stations; particularly high efficiencies can be achieved through combining gas turbines with steam turbines in the combined cycle and through reciprocating engines and mini and macro turbines. Combined cycle power generation using natural gas is the cleanest source of power available using fossil fuels. Natural gas provides a reliable supply with both dependable capacity and firm energy.

Reliability[1]: FIRM
Estimated Cost[2 6]: $48 - $100

Small Hydro: This includes run-of-river and micro Hydro. These generate electricity without altering seasonal flow characteristics. Water is diverted from a natural watercourse through an intake channel and pipeline to a powerhouse where a turbine and generator convert the kinetic energy in the moving water to electrical energy.

Twenty-nine electricity purchase agreements were awarded to small waterpower producers by BC Hydro in 2006. These projects will generate approximately 2,851 gigawatt hours of electricity annually (equivalent to electricity consumed by 285,000 homes in British Columbia). There are also 32 existing small hydro projects in British Columbia that generate 3,500 gigawatt hours (equivalent to electricity consumed by 350,000 homes in British Columbia).

Reliability[1]: INTERMITTENT
Estimated Cost[3]: $60 – $95

Solar: With financial support from the Ministry of Energy, Mines and Petroleum Resources, the "Solar for Schools" program has brought clean solar photovoltaic electricity to schools in Vernon, Fort Nelson, and Greater Victoria.

The BC Sustainable Energy Association is leading a project which targets installing solar water heaters on 100,000 rooftops across British Columbia.

Reliability[1]: INTERMITTENT
Estimated Cost[2]: $700 - $1700

Tidal Energy: A small demonstration project has been installed at Race Rocks located west-southwest of Victoria. The Lester B. Pearson College of the Pacific, the provincial and federal government, and industry have partnered to install and test a tidal energy demonstration turbine at Race Rocks. The project will generate about 77,000 kilowatt hours on an annual basis (equivalent to electricity consumed by approximately eight homes).

Reliability[1]: INTERMITTENT
Estimated Cost[2]: $100 - $360

Wind: British Columbia has abundant, widely distributed wind energy resources in three areas: the Peace region in the Northeast; Northern Vancouver Island; and the North Coast. Wind is a clean and renewable source that does not produce air or water pollution, greenhouse gases, solid or toxic wastes.

Three wind generation projects have been offered power purchase contracts in BC Hydro's 2006 Open Call for Power. These three projects will have a combined annual output of 979 gigawatt hours of electricity (equivalent to electricity consumed by 97,900 homes).

Reliability[1]: INTERMITTENT
Estimated Cost[5]: $71 – $74

[1] Reliability refers to energy that can be depended on to be available whenever required
[2] Source: BC Hydro's 2006 IEP Volume 1 of 2 page 5-6
[3] Based on a 500 MW super ciritcal pulverized coal combustion unit. The BC Energy Plan requires coal power to meet zero GHG emissions
[4] Based on a 250 MW combined cycle gas turbine plant.
[5] Source: BC Hydro's F2006 Open Call for Power Report
[6] These costs do not reflect the costs of zero net GHG emissions for natural gas

RACE ROCKS TIDAL ENERGY PROJECT

Announced in early 2005, this demonstration project between the provincial and federal governments, industry, and Pearson College is producing zero emission tidal power at the Race Rocks Marine Reserve on southern Vancouver Island. Using a current-driven turbine submerged below the ocean surface, the project is producing about 77,000 kilowatt hours of electricity per year, enough to meet the needs of approximately eight households. The knowledge gained about tidal energy will help our province remain at the forefront of clean energy generation technology.

Table 1: Summary of Resource Options

Description	Estimated Cost [1] $ /megawatt hour	Reliable[2]	Greenhouse gas emissions[3] tonnes per gigawatt hour
Energy conservation/ efficiency	32 – 76	Yes	0
Large hydroelectric	43 – 62	Yes	0
Natural gas	48 – 100[8]	Yes	0 – 350[4 8]
Coal	67 – 82[9 10]	Yes	0 – 855[5 9]
Biomass	75 – 91[10]	Yes	0 – 500[6]
Geothermal	44 – 60	Yes	0 – 10
Wind	71 – 74[10]	Depends on the availability and speed of wind	0
Run-of-river small hydro	60 – 95[10]	Depends on the flow of water, which varies throughout the year	0
Ocean (wave and tidal)	100 – 360[7]	Future supply option which has great potential for British Columbia	0
Solar	700 – 1700[7]	Depends on location, cloud cover, season, and time of day	0

[1] Source: BC Hydro's 2006 Integrated Electricity Plan Volume 1 of 2, page 5-6
[2] Reliability refers to energy that can be depended on to be available whenever required
[3] Source: BC Hydro's 2006 Integrated Electricity Plan, Volume 2 of 2, Appendix F page 5-14 and Table 10-2
[4] Based on a 250 MW combined cycle gas turbine plant
[5] Based on a 500 MW supercritical pulverized coal combustion unit
[6] GHG are 0 for wood residue and landfill gas. GHG is 500 tonnes per gigawatt hour for municipal solid waste
[7] Source: BC Hydro's 2004 Integrated Electricity Plan, page 69
[8] The BC Energy Plan requires natural gas plants to offset to zero net greenhouse gas emissions. These costs do not reflect the costs of zero net GHG emissions
[9] The BC Energy Plan requires zero greenhouse gas emissions from any coal thermal electricity facilities The costs do not include the costs of requiring zero emissions from coal thermal power
[10] Source: BC Hydro's F2006 Open Call for Power Report

The majority of B.C.'s electricity requirements over the next 10 years can be achieved through increased conservation by all British Columbians and new electricity from independent power producers.

British Columbia's Strength in Electricity Diversity

British Columbia is truly fortunate to have a wide variety of future supply options available to meet our growing demand for energy. A cost effective way to meet that demand is to conserve energy and be more energy efficient. However, British Columbia will still need to bring new power on line to meet demand growth in the years ahead. In order to ensure we have this critical resource available to British Columbians when they need it, government will be looking to secure a range of made-in-B.C. power to serve British Columbians in the years ahead.

Government's goal is to encourage a diverse mix of resources that represent a variety of technologies. Some resource technologies, such as large and small hydro, thermal power, wind and geothermal provide well-established, commercially available sources of electricity. Other emerging technologies that are not yet widely used include large ocean wave and tidal power, solar, hydrogen and advanced coal technologies.

2004 Total Electricity Production by Source (% of total)

	Other Renewables	Hydro Electric	Nuclear	Waste and Biomass	Natural Gas	Diesel Oil	Coal	TOTAL
British Columbia	**0.0**	**92.8**	**0.0**	**1.0**	**6.0**	**0.2**	**0.0**	**100**
Alberta	2.3	4.4	0.0	0.0	12.0	2.6	78.7	100
Australia	0.3	6.9	0.0	0.6	12.3	0.70	79.2	100
California	10.7	17.0	14.5	0.0	37.7	0.0	20.1	100
Denmark	16.3	0.1	0.0	8.8	24.7	4.0	46.1	100
Finland	0.4	17.6	26.5	12.4	14.9	0.7	27.5	100
France	0.2	11.3	78.3	1.0	3.2	1.0	5.0	100
Germany	4.2	4.5	27.1	2.6	10.0	1.6	50.0	100
Japan	0.4	9.5	26.1	1.9	22.6	12.3	27.2	100
Norway	0.3	98.8	0.0	0.5	0.3	0.0	0.1	100
Ontario	1.8	24.8	49.7	0.0	5.2	0.5	18.0	100
Oregon	2.3	64.4	0.0	0.0	26.3	0.1	6.9	100
Quebec	0.7	94.5	3.2	0.0	0.1	1.5	0.0	100
United Kingdom	0.5	1.9	20.2	2.1	40.3	1.2	33.8	100
Washington	2.3	70.0	8.8	0.0	8.6	0.1	10.2	100

SHARING SOLUTIONS ON ELECTRICITY

The BC Energy Plan has a goal that most of B.C.'s electricity requirements over the next 10 years can be achieved through increased conservation and energy efficiency by all British Columbians, coupled with generation by independent power producers. However, these new projects take time to plan and implement. In addition, many of these sources provide limited amounts of firm supply. The province will also need to consider options for new, large scale sources to meet forecasted demand growth in the next 10 to 20 years. Large scale options could include Site C, large biomass facilities, clean coal or natural gas plants. As with all large scale undertakings, these kinds of projects will require years of lead time to allow for careful planning, analysis, consultation and construction.

Perhaps the biggest challenge facing British Columbians is simply to begin choosing our electricity future together. Demand for electricity is projected to grow by up to 45 per cent over the next 20 years. To meet this projected growth we will need to conserve more, and obtain more electricity from small power producers and large projects. Given the critical importance of public participation and stakeholder involvement in addressing the challenges and choices of meeting our future electricity needs, government and BC Hydro will seek and share solutions.

Rapid expansion of our energy sector means a growing number of permanent, well-paying employment opportunities are available.

Taking Action to Meet the Demand for Workers

The energy sector has been a major contributor to British Columbia's record economic performance since 2001. The BC Energy Plan focuses on four under-represented groups that offer excellent employment potential: Aboriginal people, immigrants, women and youth.

At the same time, the energy sector must overcome a variety of skills training and labour challenges to ensure future growth.

These challenges include:

- An aging workforce that upon retirement will leave a gap in experience and expertise.
- Competition for talent from other jurisdictions.
- Skills shortages among present and future workers.
- Labour market information gaps due to a lack of in-depth study.
- The need to coordinate immigration efforts with the federal government.
- The need for greater involvement of under-represented energy sector workers such as Aboriginal people, immigrants, women, and youth.
- A highly mobile workforce that moves with the opportunities.
- The need to improve productivity and enhance competitiveness.

Innovative, practical and timely skills training, and labour management is required to ensure the energy sector continues to thrive. As part of The BC Energy Plan, government will work collaboratively with industry, communities, Aboriginal people, education facilities, the federal government and others to define the projected demand for workers and take active measures to meet those demands.

Attract Highly Skilled Workers

Demographics show that those born at the height of the baby boom are retired or nearing retirement, leaving behind a growing gap in skills and expertise. Since this phenomenon is taking place in most western nations, attracting and retaining skilled staff is highly competitive.

To ensure continued energy sector growth, we need to attract workers from outside the province, particularly for the electricity, oil and gas, and heavy construction industries where the shortage is most keenly felt. At this time, a significant increase in annual net migration of workers from other provinces and from outside Canada is needed to complement the existing workforce.

Government and its partners are developing targeted plans to attract the necessary workers. These plans will include marketing and promoting energy sector jobs as a career choice.

Develop a Robust Talent Pool of Workers

It is vital to provide the initial training to build a job-ready talent pool in British Columbia, as well as the ongoing training employees need to adapt to changing energy sector technologies, products and requirements. We can ensure a thriving pool of talent in British Columbia by retraining skilled employees who are without work due to downturns in other industries. Displaced workers from other sectors and jurisdictions may require some retraining and new employees may need considerable skills development.

Another way to help ensure there are enough skilled energy sector workers in the years ahead is to educate and inform young people today. By letting high school students know about the opportunities, they can consider their options and make the appropriate training and career choices. Government will work to enhance information relating to energy sector activities in British Columbia's school curriculum in the years ahead.

Retain Skilled Workers

Around the world, energy facility construction and operations are booming, creating fierce, global competition for skilled workers. While British Columbia has much to offer, it is critical that our jurisdiction presents a superior opportunity to these highly skilled and mobile workers. That is why we need to ensure our workplaces are safe, fair and healthy and our communities continue to offer an unparalleled lifestyle with high quality health care and education, affordable housing, and readily available recreation opportunities in outstanding natural settings.

Inform British Columbians

To be effective in filling energy sector jobs with skilled workers, British Columbians need to be informed and educated about the outstanding opportunities available. As part of The BC Energy Plan, a comprehensive public awareness and education campaign based on sound labour market analysis will reach out to potential energy sector workers. This process will recognize and address both the potential challenges such as shift work and remote locations as well as the opportunities, such as obtaining highly marketable skills and earning excellent compensation.

Be Among the Most Competitive Oil and Gas Jurisdictions in North America

Since 2001, British Columbia's oil and gas sector has grown to become a major force in our provincial economy, employing tens of thousands of British Columbians and helping to fuel the province's strong economic performance. In fact, investment in the oil and gas sector was $4.6 billion in 2005. The oil and gas industry contributes approximately $1.95 billion annually or seven per cent of the province's annual revenues.

The BC Energy Plan is designed to take B.C.'s oil and gas sector to the next level to enhance a sustainable, thriving and vibrant oil and gas sector in British Columbia. With a healthy, competitive oil and gas sector comes the opportunity to create jobs and build vibrant communities with increased infrastructure and services, such as schools and hospitals. Of particular importance is an expanding British Columbia-based service sector.

There is a lively debate about the peak of the world's oil and gas production and the impacts on economies, businesses and consumers. A number of countries, such as the UK, Norway and the USA, are experiencing declining fossil fuel production from conventional sources. Energy prices, especially oil prices have increased and are more volatile than in the past. As a result, the way energy is produced and consumed will change, particularly in developed countries.

The plan is aimed at enhancing the development of conventional resources and stimulating activity in relatively undeveloped areas such as the interior basins – particularly the Nechako Basin. It will also foster the development of unconventional resources such as as tight gas, shale gas, and coalbed gas. The plan will further efforts to work with the federal government, communities and First Nations to advance offshore opportunities.

The challenge for British Columbia in the future will be to continue to find the right balance of economic, environmental and social priorities to allow the oil and gas sector to succeed, while protecting our environment and improving our quality of life.

The New Relationship and Oil and Gas

Working together with local communities and First Nations, the provincial government will continue to share in the many benefits and opportunities created through the development of British Columbia's oil and gas resources.

Government is working to ensure that oil and gas resource management includes First Nations' interests, knowledge and values. Government has recently concluded consultation agreements for oil and gas resource development with First Nations in Northeast British Columbia. These agreements increase clarity in the process and will go a long way to enhancing our engagement with these First Nations.

Government will continue to pursue opportunities to share information and look for opportunities to facilitate First Nations' employment and participation in the oil and gas industry to ensure that Aboriginal people benefit from the continued growth and development of British Columbia's resources.

POLICY ACTIONS

ENVIRONMENTALLY RESPONSIBLE OIL AND GAS DEVELOPMENT

- **Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.**
- **Establish policies and measures to reduce air emissions in coordination with the Ministry of Environment.**
- **Best coalbed gas practices in North America. Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.**
- **Enhance the Oil and Gas Environmental Stewardship Program, ensuring sound environmental, land and resource management.**

The BC Energy Plan adopts a triple bottom line approach to competitiveness, with an attractive investment climate, environmentally sustainable development of B.C.'s abundant resources, and by benefiting communities and First Nations.

While striving to be among the most competitive oil and gas jurisdictions in North America, the province will focus on maintaining and enhancing its strong competitive environment for the oil and gas industry. This encompasses the following components:

- A competitive investment climate.
- An abundant resource endowment.
- Environmental responsibility.
- Social responsibility.

Leading in Environmentally and Socially Responsible Oil and Gas Development

The BC Energy Plan emphasizes conservation, energy efficiency, and the environmental and socially responsible management of the province's energy resources. It outlines government's efforts to meet this objective by working collaboratively with involved and interested parties, including affected communities, landowners, environmental groups, First Nations, the regulator (the Oil and Gas Commission), industry groups and others. Policy actions will support ways to address air emissions, impacts on land and wildlife habitat, and water quality.

The oil and gas sector in British Columbia accounts for approximately 18 per cent of greenhouse gas air emissions in the province. The main sources of air emissions from the oil and gas sector are flaring, fugitive gases, gas processing and compressor stations. While these air emissions have long been part of the oil and gas sector, they have also been a source of major concern for oil and gas communities.

Eliminate Flaring from Oil and Gas Producing Wells and Production Facilities By 2016

Through The BC Energy Plan, government has committed to eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011. In addition, government will adopt policies to reduce natural gas flaring and venting at test sites and pipelines, and encourage compressor station efficiency to cut back emissions. Government will also explore opportunities and new technologies for safe, underground disposal of carbon dioxide or sequestration from oil and gas facilities. Sequestration is considered a cost effective mitigation strategy in reducing carbon dioxide emissions.

Enhance Carbon Dioxide Sequestration in British Columbia

British Columbia is a member of the Plains CO2 Reduction (PCOR) Partnership composed of nearly 50 private and public sector groups from nine states and three Canadian provinces that is assessing the technical and economic feasibility of capturing and storing carbon dioxide emissions from stationary sources in western sedimentary basins.

B.C. is also a member of the West Coast Regional Carbon Sequestration Partnership, made up of west coast state and provincial government ministries and agencies. This partnership has been formed to pursue carbon sequestration opportunities and technologies.

To facilitate and foster innovation in sequestration, government will develop market oriented requirements with a graduated schedule. In consultation with stakeholders, a timetable will be developed along with increasing requirements for sequestration.

BRITISH COLUMBIA COMPANIES RECOGNIZED AS WORLD ENERGY TECHNOLOGY INNOVATORS

The leadership of British Columbian companies can be seen in all areas of the energy sector through innovative, industry leading technologies.

Production of a new generation of chemical injection pump for use in the oil and gas industry is beginning. The pumps, developed and built in British Columbia, are the first solar powered precision injection pumps available to the industry. They will reduce emissions by replacing traditional gas powered injection systems for pipelines.

Other solar technologies developed in British Columbia provide modular power supplies in remote locations all over the globe for marine signals, aviation lights and road signs.

Roads in B.C. and around the world are hosting demonstrations of fuel cell vehicles built with British Columbia technology. Thanks to the first high pressure hydrogen fuelling station in the world, compatible fuel cell vehicles in B.C. can carry more fuel and travel farther than ever before.

The Innovative Clean Energy Fund will help to build B.C.'s technology cluster and keep us at the forefront of energy technology development.

Government will work to improve oil and gas tenure policies as well as develop new guidelines to determine areas that require special consideration prior to tenure approval.

POLICY ACTIONS

OFFSHORE OIL AND GAS DEVELOPMENT

- **Continue to work to lift the federal moratorium on offshore exploration and development and reiterate the intention to simultaneously lift the provincial moratorium.**
- **Work with the federal government to ensure that offshore oil and gas resources are developed in a scientifically sound and environmentally responsible way.**
- **Participate in marine and environmental planning to effectively manage marine areas and offshore oil and gas basins.**
- **Develop and implement a comprehensive community engagement program to establish a framework for a benefits sharing agreement resulting from offshore oil and gas development for communities, including First Nations.**

Environmental Stewardship Program

In 2004, the Ministry of Energy, Mines and Petroleum Resources initiated the Oil and Gas Environmental Stewardship Program having two components: the Environmental Policy Program and the Environmental Resource Information Project. The Environmental Policy Program identifies and mitigates environmental issues in the petroleum sector focusing on policy development in areas such as environmental waste management, habitat enhancement, planning initiatives, wildlife studies for oil and gas priority areas and government best management practices. Some key program achievements include the completion of guidelines for regulatory dispersion modeling, research leading to the development of soil quality guidelines for soluble barium, a key to northern grasses and their restorative properties for remediated well sites, and moose and caribou inventories in Northeast British Columbia.

The Environmental Resource Information Project is dedicated to increasing opportunities for oil and gas development, through the collection of necessary environmental baseline information. These projects are delivered in partnership with other agencies, industry, communities and First Nations.

The BC Energy Plan enhances the important Oil and Gas Environmental Stewardship Program. This will improve existing efforts to manage waste and preserve habitat, and will establish baseline data as well as development and risk mitigation plans for environmentally sensitive areas. Barriers need to be identified and steps taken for remediation, progressive reclamation, and waste management.

Best Coalbed Gas Practices in North America

Government will continue to encourage coalbed gas development with the intent of demonstrating that British Columbia is a leading socially and environmentally responsible coalbed gas developing jurisdiction. Coalbed gas, also known as coalbed methane, is natural gas found in coal seams. It is one of the cleanest burning of all fossil fuels. Proponents wanting to develop coalbed gas must adopt the following best practices:

- Fully engage local communities and First Nations in all stages of development.
- Use the most advanced technology and practices that are commercially viable to minimize land and aesthetic disturbances.
- Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.
- Meet any other conditions the Oil and Gas Commission may apply.
- Demonstrate the company's previous experience with coalbed gas development, and information must be made publicly available as to how the company plans to meet and be accountable for these best practices.

Ensuring Offshore Oil and Gas Resources are Developed in a Scientifically Sound and Environmentally Responsible Way

The BC Energy Plan includes actions related to the province's offshore oil and gas resources. Since 1972, Canada and British Columbia have each had a moratorium in place on offshore oil and gas exploration and development. With advanced technology and

British Columbia's oil and gas industry supports thousands of well-paying jobs, helps drive the economy and provides revenues to sustain public services.

positive experiences in other jurisdictions, a compelling case exists for assessing British Columbia's offshore resource potential.

Government will work with coastal communities, First Nations, the federal government, environmental organizations, and others to ascertain the benefits and address the concerns associated with offshore oil and gas development.

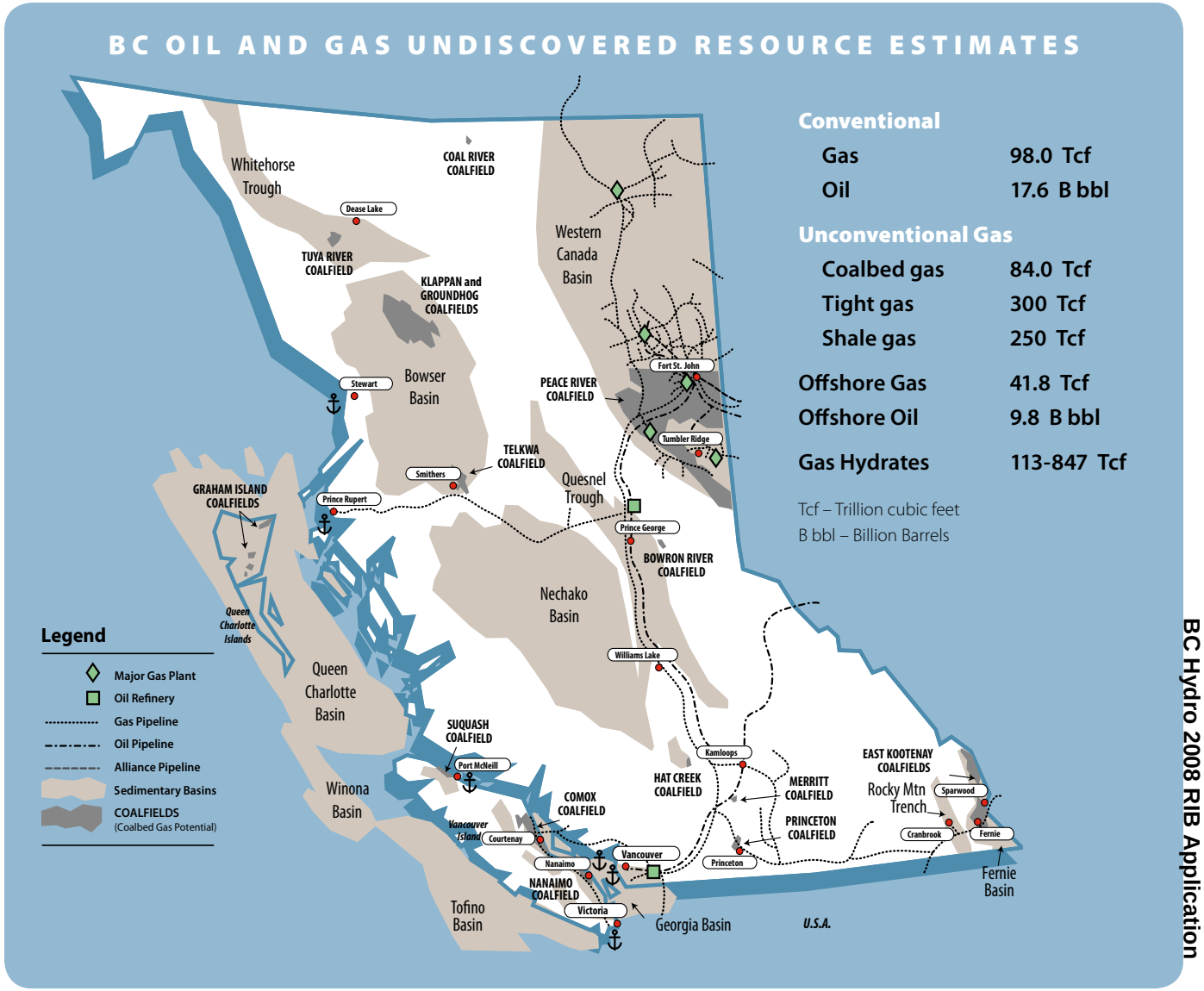
Maintaining B.C.'s Competitive Advantage as an Oil and Gas Jurisdiction

British Columbia's oil and gas industry is thriving thanks to high resource potential, industry and service sector expertise, and a competitive investment climate that includes a streamlined regulatory environment. To attract additional investment in British Columbia's oil and gas industry, we need to compete aggressively with other jurisdictions that may offer lower taxes or other investment incentives.

Another key way to be more competitive is by spurring activity in underdeveloped areas while heightening activity in the northeast, where our natural gas industry thrives. The province will work with industry to develop new policies and technologies for enhanced resource recovery making, it more cost-effective to develop British Columbia's resources.

By increasing our competitiveness, British Columbians can continue to benefit from well-paying jobs, high quality social infrastructure and a thriving economy.

BC OIL AND GAS UNDISCOVERED RESOURCE ESTIMATES



British Columbia's Enormous Natural Gas Potential

The oil and gas sector will continue to play an important role in British Columbia's future energy security. Our province has enormous natural gas resource potential and opportunities for significant growth. The BC Energy Plan facilitates the development of B.C.'s resources.

British Columbia has numerous sedimentary basins, which contain petroleum and natural gas resources. In north-eastern British Columbia, the Western Canada Sedimentary Basin is the focus of our thriving natural gas industry. The potential resources in the central and northern interior of the province, the Nechako and Bowser Basins and Whitehorse Trough, have gone untapped.

The delayed evaluation and potential development of these areas is largely due to geological and physical obstructions that make it difficult to explore in the area. Volcanic rocks that overlay the sedimentary package combined with complex basin structures, have hindered development.

The BC Energy Plan is aimed at enhancing the development of conventional resources and stimulating activity in undeveloped areas such as the interior basins – particularly the Nechako Basin. It will also foster the development of unconventional resources and take a more stringent approach on coalbed gas to meet higher environmental standards.

Attracting Investment and Developing our Oil and Gas Resources

The BC Energy Plan promotes competitiveness by setting out a number of important regulatory and fiscal measures including: monitoring British Columbia's competitive ranking, considering a Net Profit Royalty Program, promoting a B.C. service sector, harmonizing and streamlining regulations, and developing a Petroleum Registry to examine royalty and tenure incentives, and undertaking geoscience programs.

Establishment of a Petroleum Registry

The establishment of a petroleum registry that functions as a central database will improve the quality and management of key volumetric, royalty and infrastructure information associated with British Columbia's oil and gas industry and promote competition while providing transparency around oil and gas activity.

NEEMAC: SUCCESS THROUGH COMMUNICATION

As energy, mining and petroleum resource development increases in northeast B.C., so too does the need for input from local governments, First Nations, community groups, landowners and other key stakeholders. In 2006, the Northeast Energy and Mines Advisory Committee (NEEMAC) was created to provide an inclusive forum for representative organizations to build relationships with each other, industry and government to provide input on Ministry policy, and recommend innovative solutions to stakeholder concerns.

Since its creation, NEEMAC has identified and explored priority concerns, and is beginning to find balanced solutions related to environmental, surface disturbance, access and landowner rights issues. The Ministry is committed to implementing recommendations that represent the broad interests of community, industry and government and expects that the committee will continue to provide advice on energy, mining and petroleum development issues in support of The BC Energy Plan.

An opportunity to increase competitiveness exists in British Columbia's Interior Basins – namely the Nechako, Bowser and Whitehorse Basins – where considerable resource potential is known to exist.

Increasing Access

In addition to regulatory and fiscal mechanisms, the plan addresses the need for improving access to resources. Pipelines and road infrastructure are critical factors in development and competitiveness. The BC Energy Plan calls for new investment in public roads and other infrastructure. It will see government establish a clear, structured infrastructure royalty program, combining road and pipeline initiatives and increasing development in under-explored areas that have little or no existing infrastructure.

Developing Conventional and Unconventional Oil and Gas Resources

To support investment in exploration, The BC Energy Plan calls for partnerships in research and development to establish reliable regional data, as well as royalty and tenure incentives. The goal is to attract investment, create well-paying jobs, boost the regional economy and produce economic benefits for all British Columbians. We can be more competitive by spurring activity in underdeveloped areas while heightening activity in the northeast where our natural gas industry thrives. The plan advocates working with industry to develop new policies and technology to enhance resource recovery, including oil in British Columbia.

Improve Regulations and Research

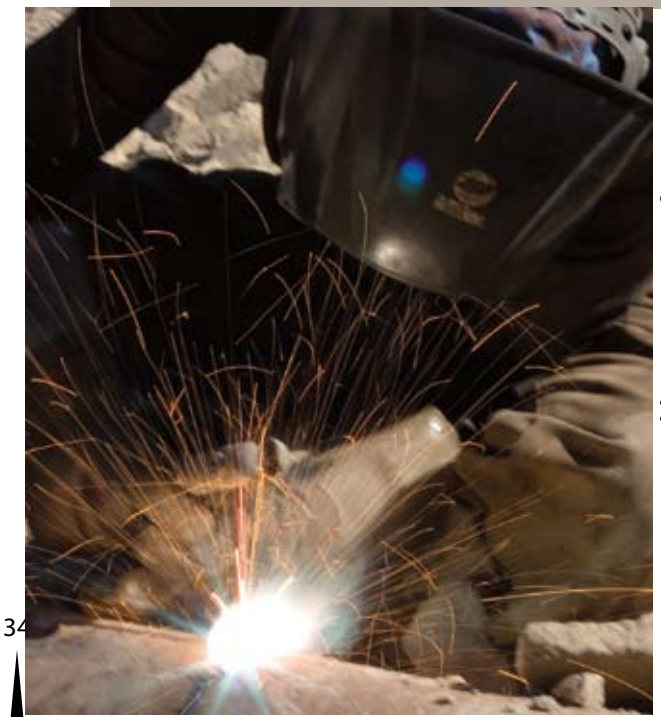
The province remains committed to continuous improvement in the regulatory regime and environmental management of conventional and unconventional oil and gas resources. The opportunities for enhancing exploration and production of tight gas, shale gas, and coalbed gas will also be assessed and supported by geoscience research and programs. The BC Energy Plan calls for collaboration with other government ministries, agencies, industry, communities and First Nations to develop the oil and gas resources in British Columbia.

Focus on Innovation and Technology Development

The BC Energy Plan also calls for supporting the development of new oil and gas technologies. This plan will lead British Columbia to become an internationally recognized centre for technological advancements and commercialization, particularly in environmental management, flaring, carbon sequestration and hydrogeology. The service sector has noted it can play an important role in developing and commercializing new technologies; however, the issue for companies is accessing the necessary funds.

THE HUB OF B.C.'S OIL AND GAS SECTOR

Oil and gas is benefiting all British Columbians - not just those living in major centres. Nowhere is this more apparent than in booming Fort St. John, which has rapidly become the oil and gas hub of the province. Since 2001, more than 1,400 people have moved to the community, an increase of 6.3 per cent and two per cent faster growth than the provincial average. Construction permits are way up - from $48.7 million in 2004, to $50.6 million in 2005, to over $123 million in 2006. In the past five years, over 1,000 new companies have been incorporated in Fort St. John, as young families, experienced professionals, skilled trades-people and many others move here from across the country.



POLICY ACTIONS

BE AMONG THE MOST COMPETITIVE OIL AND GAS JURISDICTIONS IN NORTH AMERICA

- **Pursue regulatory and fiscal competitiveness in support of being among the most competitive oil and gas jurisdictions in North America.**
- **Enhance infrastructure to support the development of oil and gas in British Columbia and address impediments to economic development such as transportation and labour shortages.**
- **Encourage the development of conventional and unconventional resources.**
- **Support the growth of British Columbia's oil and gas service sector.**
- **Promote exploration and development of the Interior basins with a priority focus on the Nechako Basin.**
- **Encourage the development of new technologies.**
- **Add value to British Columbia's oil and gas industry by assessing and promoting the development of additional gas processing facilities in the province.**

Technology Transfer Incentive Program

A new Oil and Gas Technology Transfer Incentive Program will be considered to encourage the research, development and use of innovative technologies to increase recoveries from existing reserves and encourage responsible development of new oil and gas reserves. The program could recover program costs over time through increased royalties generated by expanded development and production of British Columbia's petroleum resources.

Scientific Research and Experimental Development

The BC Energy Plan supports the British Columbia Scientific Research and Experimental Development Program, which provides financial support for research and development leading to new or improved products and processes. Through credits or refunds, the expanded program could cover project costs directly related to commercially applicable research, and development or demonstration of new or improved technologies conducted in British Columbia that facilitate expanded oil and gas production.

Research and Development

The BC Energy Plan calls for using new or existing research and development programs for the oil and gas sector. Government will develop a program targeting areas in which British Columbia has an advantage such as well completion technology and hydrogeology.

A program to encourage oil and gas innovation and research in British Columbia's post-secondary institutions will be explored. These opportunities will be explored in partnership with the Petroleum Technology Alliance Canada and as part of the April 2006 Memorandum of Understanding between British Columbia and Alberta on Energy Research, Technology Development and Innovation.

Together with the Oil and Gas Centre of Excellence in Fort St. John, an oil and gas technology incubator, a site which provides innovators with space to build prototypes and carry out testing as well as providing business infrastructure and assistance accessing additional support will be established, allowing entrepreneurs to develop and test new innovations and commercialize new, innovative technologies and processes.

Nechako Initiative

The BC Energy Plan calls for government to partner with industry, the federal government, and Geoscience BC to undertake comprehensive research in the Nechako Basin and establish new data of the resource potential. It will include active engagement of communities and the development and implementation of a comprehensive pre-tenure engagement initiative for First Nations in the region. Specific tenures and royalties will be explored to encourage investment, as well as a comprehensive Environmental Information Program to identify baseline information needs in the area through consultations with government, industry, communities and First Nations.

By increasing our oil and gas industry's competitiveness, British Columbians can continue to benefit from well-paying jobs, high quality social infrastructure and a thriving economy.

Value-Added Opportunities

To improve competitiveness, The BC Energy Plan calls for a review of value-added opportunities in British Columbia. This will include a thorough assessment of the potential for processing facilities and petroleum refineries as well as petrochemical industry opportunities. The Ministry of Energy, Mines and Petroleum Resources will conduct an analysis to identify and address barriers and explore incentives required to encourage investment in gas processing in British Columbia. A working group of industry and government will develop business cases and report to the Minister by January 2008 with recommendations on the viability of a new petroleum refinery and petrochemical industry and measures, if any, to encourage investment.

Oil and Gas Service Sector

British Columbia's oil and gas service sector can also help establish our province as one of the most competitive jurisdictions in North America. The service sector has grown over the past four years and with increased activity, additional summer drilling, and the security of supply, opportunities for local companies will continue. Government can help maximize the benefits derived from the service sector by:

- Promoting British Columbia's service sector to the oil and gas industry through participation at trade shows and providing information to the business community.
- Identifying areas where British Columbian companies can play a larger role, expand into other provinces, and through procurement strategies.

The government also supports the Oil and Gas Centre of Excellence at the Fort St. John Northern Lights College campus, which will provide oil and gas, related vocational, trades, career and technical programs.

Improving Oil and Gas Tenures

Government will work to improve oil and gas tenure issuance policies as well as develop new guidelines to determine areas that require special consideration prior to tenure approval by the end of 2007. This will provide clear parameters for industry regarding areas where special or enhanced management practices are required. These measures will strike the important balance between providing industry with clarity and access to resources and the desire of local government, communities, landowners, stakeholders and First Nations for input into the oil and gas development process.

Create Opportunities for Communities and First Nations

Benefits for British Columbians from the Oil and Gas Sector

The oil and gas sector offers enormous benefits to all British Columbians through enhanced energy security, tens of thousands of good, well-paying jobs and tax revenues used to help fund our hospitals and schools. However, the day-to-day impact of the sector has largely been felt on communities and First Nations in British Columbia's northeast. Community organizations, First Nations, and landowners have communicated a desire for greater input into the pace and scope of oil and gas development in British Columbia.

Together with the Oil and Gas Centre of Excellence in Fort St. John, an oil and gas technology incubator will be established, allowing entrepreneurs to develop and test new innovations.

POLICY ACTIONS

WORKING WITH COMMUNITIES AND FIRST NATIONS

- **Provide information about local oil and gas activities to local governments, First Nations, education and health service providers to inform and support the development of necessary social infrastructure.**
- **Work with First Nations to identify opportunities to participate in and benefit from oil and gas development.**
- **Support First Nations in providing cross-cultural training to agencies and industry.**
- **Improve working relationships among industry and local communities and landowners by clarifying and simplifying processes, enhancing dispute resolution methods, and offering more support and information.**
- **Examine oil and gas tenure policies and develop guidelines to determine areas that require special consideration prior to tenure approval.**

Through The BC Energy Plan, government intends to develop stronger relationships with those affected by oil and gas development, including communities and First Nations. The aim is to work cooperatively to maximize benefits and minimize impacts. The plan supports improved working relationships among industry, local communities and landowners by increased and improved communication to clarify and simplify processes, enhancing dispute resolution methods, and offering more support and information.

The government will also continue to improve communications with local governments and agencies. Specifically, The BC Energy Plan calls for efforts to provide information about increased local oil and gas activities to local governments, education and health service providers to improve their ability to make timely decisions on infrastructure, such as schools, housing, and health and recreational facilities. By providing local communities and service providers with regular reports of trends and industry activities, they can more effectively plan for growth in required services and infrastructure.

Building Better Relationships with Landowners

The BC Energy Plan: A Vision for Clean Energy Leadership also supports improved working relationships between industry, local communities and landowners and First Nations. Landowners will be notified in a more timely way of sales of oil and gas rights on private land. Plain language information materials, including standardized lease agreements will be made available to help landowners deal with subsurface tenures and activity. There will be a review of the dispute resolution process between landowners and industry by the end of 2007. The existing setback requirements, the allowed distance of a well site from a residence, school or other public place, will also be examined. These measures seek to strike the important balance between providing industry with clarity and access to resources and the desire of local government, communities, landowners, stakeholders and First Nations for input into oil and gas development.

Working in Partnership with First Nations and Communities

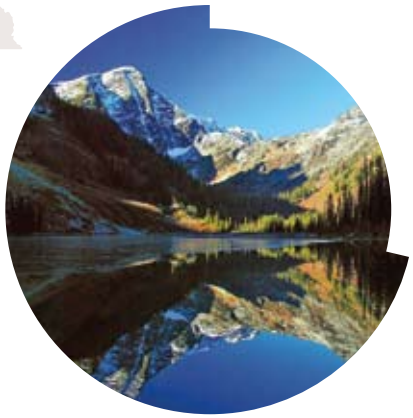
Government will work with First Nations communities to identify opportunities to benefit from oil and gas development. By developing a greater ability to participate in and benefit from oil and gas development, First Nations can play a much more active role in the industry. The BC Energy Plan also supports increasing First Nations role in the development of cross-cultural training initiatives for agencies and industry.

Conclusion

The BC Energy Plan: A Vision for Clean Energy Leadership sets the standard for proactively addressing the opportunities and challenges that lie ahead in meeting the energy needs for all the citizens of the province, now and in the future. Appendix A provides a detailed listing of the policy actions of the plan.

The BC Energy Plan will attract new investments, help develop and commercialize new technology, build partnerships with First Nations, and ensures a strong environmental focus.

British Columbia has a proud history of innovation that has resulted in 90 per cent of our power generation coming from clean sources. This plan builds on that foundation and ensures B.C. will be at the forefront of environmental and economic leadership for years to come.



APPENDIX A The BC Energy Plan: Summary of Policy Actions

ENERGY CONSERVATION AND EFFICIENCY

1. Set an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020.
2. Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia.
3. Encourage utilities to pursue cost effective and competitive demand side management opportunities.
4. Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation.
5. Implement Energy Efficiency Standards for Buildings by 2010.
6. Undertake a pilot project for energy performance labeling of homes and buildings in coordination with local and federal governments, First Nations, and industry associations.
7. New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.
8. Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia's industrial sector.
9. Increase the participation of local governments in the Community Action on Energy Efficiency Program and expand the First Nations and Remote Community Clean Energy Program.

ELECTRICITY

10. Ensure self-sufficiency to meet electricity needs, including "insurance" by 2016.
11. Establish a standing offer for clean electricity projects up to 10 megawatts.
12. The BC Transmission Corporation is to ensure that British Columbia's transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand.
13. Ensure adequate transmission system capacity by developing and implementing a transmission congestion relief policy.
14. Ensure that the province remains consistent with North American transmission reliability standards.
15. Continue public ownership of BC Hydro and its heritage assets, and the BC Transmission Corporation.
16. Establish the existing heritage contract in perpetuity.
17. Invest in upgrading and maintaining the heritage asset power plants and the transmission lines to retain the ongoing competitive advantage these assets provide to the province.
18. All new electricity generation projects will have zero net greenhouse gas emissions.
19. Zero net greenhouse gas emissions from existing thermal generation power plants by 2016.
20. Require zero greenhouse gas emissions from any coal thermal electricity facilities.
21. Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.
22. Government supports BC Hydro's proposal to replace the firm energy supply from the Burrard Thermal plant with other resources. BC Hydro may choose to retain Burrard for capacity purposes after 2014.
23. No nuclear power.
24. Review BC Utilities Commissions' role in considering social and environmental costs and benefits.
25. Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources.
26. Work with BC Hydro and parties involved to continue to improve the procurement process for electricity.
27. Pursue Government and BC Hydro's planned Remote Community Electrification Program to expand or take over electricity service to remote communities in British Columbia.
28. Ensure BC Hydro considers alternative electricity sources and energy efficiency measures in its energy planning for remote communities.

ALTERNATIVE ENERGY

29. Establish the **Innovative Clean Energy Fund** to support the development of clean power and energy efficiency technologies in the electricity, alternative energy, transportation and oil and gas sectors.
30. Implement a provincial Bioenergy Strategy which will build upon British Columbia's natural bioenergy resource advantages.
31. Issue an expression of interest followed by a call for proposals for electricity from sawmill residues, logging debris and beetle-killed timber to help mitigate impacts from the provincial mountain pine beetle infestation.
32. Implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.
33. Support the federal action of increasing the ethanol content of gasoline to five per cent by 2010 and adopt quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions.
34. Develop a leading hydrogen economy by continuing to support the Hydrogen and Fuel Cell Strategy for British Columbia.
35. Establish a new, harmonized regulatory framework by 2010 for hydrogen by working with governments, industry and hydrogen alliances.

OIL AND GAS

36. Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.
37. Establish policies and measures to reduce air emissions in coordination with the Ministry of Environment.
38. Best coalbed gas practices in North America. Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.
39. Enhance the Oil and Gas Environmental Stewardship Program, ensuring sound environmental, land and resource management.
40. Continue to work to lift the federal moratorium on offshore exploration and development and reiterate the intention to simultaneously lift the provincial moratorium.
41. Work with the federal government to ensure that offshore oil and gas resources are developed in a scientifically sound and environmentally responsible way.
42. Participate in marine and environmental planning to effectively manage marine areas and offshore oil and gas basins.
43. Develop and implement a comprehensive community engagement program to establish a framework for a benefits sharing agreement resulting from offshore oil and gas development for communities, including First Nations.
44. Pursue regulatory and fiscal competitiveness in support of being among the most competitive oil and gas jurisdictions in North America.
45. Enhance infrastructure to support the development of oil and gas in British Columbia and address impediments to economic development such as transportation and labour shortages.
46. Encourage the development of conventional and unconventional resources.
47. Support the growth of British Columbia's oil and gas service sector.
48. Promote exploration and development of the Interior basins with a priority focus on the Nechako Basin.
49. Encourage the development of new technologies.
50. Add value to British Columbia's oil and gas industry by assessing and promoting the development of additional gas processing facilities in the province.
51. Provide information about local oil and gas activities to local governments, education and health service providers to inform and support the development of necessary social infrastructure.
52. Work with First Nations to identify opportunities to participate in and benefit from oil and gas development.
53. Support First Nations in providing cross-cultural training to agencies and industry.
54. Improve working relationships among industry and local communities and landowners by clarifying and simplifying processes, enhancing dispute resolution methods, and offering more support and information.
55. Examine oil and gas tenure policies and develop guidelines to determine areas that require special consideration prior to tenure approval.

Energy in Action

POWERSMART
BC Hydro offers a variety of incentives to adopt energy saving technologies. Incentives such as rebates on efficient lighting or windows encourages British Columbians to improve the energy efficiency of their homes and businesses.

PROVINCIAL SALES TAX EXEMPTIONS
Tax breaks are offered for a wide variety of energy efficient items, making it easier to conserve energy. Tax concessions are in place for alternative fuel and hybrid vehicles as well as some alternative fuels. Bicycles and some bicycle parts are exempt from provincial sales tax, as are a variety of materials, such as Energy Star® qualified windows, that can make homes more energy efficient.

NET METERING
The Net Metering program offered by BC Hydro for customers with small generating facilities, allows customers to lower their environmental impact and take responsibility for their own power production. The customer is only billed for their "net consumption"; the total amount of electricity used minus the total produced. Net Metering helps to move the province towards electricity self sufficiency and expands clean electricity generation.

POWERING THE ECONOMY
The Oil and Gas sector invested $4.6 billion in B.C. in 2005 and contributed more to the provincial treasury than any other resource in 2005/06. In 2006 1,416 oil and gas wells were drilled in the province and between 2002 and 2005, summer drilling increased 242 per cent.

FRIDGE BUY-BACK PROGRAM
This program offers customers $30 in cash and no-cost pickup and disposal of an old, inefficient second fridge. If all second operating fridges in B.C. were recycled, we would save enough energy to power all the homes in the city of Chilliwack for an entire year.

LIGHTING REBATES
This program offers instant rebate coupons for the retail purchase of Energy Star® light fixtures and Energy Star® CFLs (Compact Fluorescent Lights).

WINDOWS REBATE
The Windows Rebate Program offers rebates for the installation of Energy Star® windows in new, renovated or upgraded single-family homes, duplexes, townhouses or apartments.

PRODUCT INCENTIVE PROGRAM
The Product Incentive Program provides financial incentives to organizations which replace inefficient products with energy efficient technologies or add on products to existing systems to make them more efficient.

HIGH-PERFORMANCE BUILDING PROGRAM FOR LARGE COMMERCIAL BUILDINGS
Financial incentives, resources, and technical assistance are available to help qualified projects identify energy saving strategies early in the design process; evaluate alternative design options and make a business case for the high-performance design; and, offset the incremental costs, if any, of the energy-efficient measures in the high-performance design.

HIGH-PERFORMANCE BUILDING PROGRAM FOR SMALL TO MEDIUM COMMERCIAL BUILDINGS
Incentives and tools are offered to help owners and their design teams create and install more effective and energy-efficient lighting in new commercial development projects.

NEW HOME PROGRAM
Builders and developers are encouraged to build energy efficient homes by offering financial incentives and Power Smart branding for homes that achieve energy efficient ratings.

ANALYZE MY HOME
BC Hydro offers an online tool that provides a free, personalized breakdown of a customer's home energy use and recommendations on where improvements can be made to lower consumption.

CONSERVATION RESEARCH INITIATIVE
A 12-month study in six communities that examines how adjusting the price of electricity at different times of day influences energy use by residential customers, and how individual British Columbians can make a difference in conserving power in their homes and help meet the growing demand for electricity in B.C.

THE GREEN BUILDINGS PROGRAM
Provides tools and resources to support school districts, universities, colleges, and health authorities to improve the energy efficiency of their buildings across the province.

ATTRACTING WORKERS
The Ministry of Energy, Mines and Petroleum Resources hosts job fairs across B.C. to attract workers to the highly lucrative oil and gas sector. Job fairs were held in 14 communities in 2005 and 16 communities in 2006 attracting thousands of people and resulting in hundreds of job offers. Centre of Excellence Government is partnering with industry and the Northern Lights College in Fort St. John to build a centre for oil and gas excellence, more than doubling the number of students training for jobs in the oil and gas industry.

CENTRE OF EXCELLENCE
Government is partnering with industry and the Northern Lights College in Fort St. John to build a centre for oil and gas excellence, more than doubling the number of students training for jobs in the oil and gas industry.

100,000 SOLAR ROOFS FOR B.C.
The Ministers of Environment, and Energy, Mines and Petroleum Resources are sponsoring the development of a plan that will see the aggressive adoption of solar technology in B.C. The goal of the project is to see the installation of solar roofs and walls for hot water heating and photovoltaic electricity generation on 100,000 buildings around B.C.

PARTNERING FOR SUCCESS
Since 2003, the Province of B.C. has partnered in the construction of $158 million in new oil and gas road and pipeline infrastructure. The Sierra Yoyo Desan Road public private partnership improved the road allowing year round drilling activity in the Greater Sierra natural gas play. The project was recognized with the Gold Award for Innovation and Excellence from the Canadian Council for Public Private Partnerships in 2004.

ENERGY EFFICIENT BUILDINGS: A PLAN FOR BC
This strategy will lower energy costs for new and existing buildings by $127 million in 2010 and $474 million in 2020, and reduce greenhouse gas emissions by 2.3 million tonnes in 2020. The Province is implementing ten policy and market measures in partnership with the building industry, energy consumer groups, utilities, non-governmental organizations, and the federal government.

BRITISH COLUMBIA
The Best Place on Earth

Ministry of
Energy, Mines and
Petroleum Resources

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The BC Energy Plan
A Vision for Clean Energy Leadership

ENERGY CONSERVATION AND EFFICIENCY POLICIES

1. **Set an ambitious conservation target, to acquire 50 per cent of BC Hydro's incremental resource needs through conservation by 2020.**

   Government has set a goal to reduce the growth in electricity demand so that, by 2020, 10,000 GWh of currently forecast needs will be met through demand reduction measures. This may include energy efficiency, conservation, and other demand side solutions like load displacement, fuel switching (e.g. solar hot water heating) and small distributed generation (e.g. net metering.) To put this goal in context, it represents about 20 per cent of the 52,000 GWh of electricity BC Hydro required in 2006 to meet the needs of British Columbians.

   This conservation target will be accomplished through BC Hydro aggressively pursuing and then exceeding its existing target to meet one-third of its forecast increase in requirements through demand reduction. In addition, new government policies and programs will support BC Hydro and other electricity and natural gas utilities in further reducing demand growth. This may involve clarifying the criteria the British Columbia Utilities Commission uses in its oversight of utility rates and other utility efforts designed to promote conservation.

2. **Ensure a coordinated approach to conservation and efficiency is actively pursued in British Columbia.**

   British Columbia's energy utilities, the Province, the federal government, the private sector, industry associations, non-profit organizations, local governments and First Nations are delivering a wide range of energy efficiency and conservation initiatives, including:

   - **Community Action on Energy Efficiency**
     http://www.bcclimateexchange.ca/index.php?p=caee
   - **Energy Savings Plan**
     http://www.saveenergynow.ca/
   - **Built Green BC**
     http://www.chbabc.org/content.php?id=504
   - **BOMA Green Buildings Foundation**
     http://www.greenbuildingsfoundation.org/
   - **Canada Green Building Council**
     http://www.greenbuildingsfoundation.org/
   - **First Nation and Remote Community Clean Energy Program**
     http://www.empr.gov.bc.ca/AlternativeEnergy/Alt_Energy_Home.htm
   - **BC Hydro's Power Smart**
     http://www.bchydro.com/powersmart/
   - **Terasen Gas**
     http://www.terasengas.com/Promotions/Current+Promotions/RewardingRebates.htm
   - **FortisBC's PowerSense program**
     http://www.fortisbc.com/energy_efficiency/energy_efficiency_programs.html

- **Green Buildings BC**
  http://www.greenbuildingsbc.com/
- **Lighthouse Sustainable Building Centre**
  http://www.sustainablebuildingcentre.com/new_ici_murb_construction_initiative
- **ecoEnergy Efficiency Initiative (Natural Resources Canada Office of Energy Efficiency)**
  http://www.ecoenergy.gc.ca/

There is currently limited coordination of these numerous initiatives. If BC is to achieve its energy efficiency/clean energy goals, these programs and initiatives must work together in a coordinated and complementary manner. For example, some programs, such as targeting household space and water heating, may not be justified on the basis of either electricity savings or gas savings alone. However, a coordinated effort may be cost-effective.

The Ministry of Energy, Mines and Petroleum Resources will take the lead in working with key players to ensure that initiatives are coordinated, and that opportunities for joint initiatives are not missed.

3. Encourage utilities to pursue cost effective and competitive demand side management opportunities.

Energy efficiency is a critical piece of all BC utility resource plans. Through demand side management (DSM) actions, energy utilities play a vital role in promoting energy conservation with investments in energy efficient technologies and building designs along with capacity building measures with communities, trade allies, industry associations and consumer organizations.

Under the 2002 Energy Plan, the *Utilities Commission Act* was amended to ensure that utilities specifically considered demand reduction measures as a part of long term resource plans. Under this Energy Plan, utilities in BC are to pursue all cost-effective investments in demand side management. Cost-effective demand-side investments are those that are equal to or lower in cost than supply side resources. Utilities are also encouraged to develop a diversified portfolio of programs to ensure all ratepayers can benefit from these programs. In particular, program development should consider how to make DSM programs accessible to residential ratepayers across all income levels.

The Ministry of Energy, Mines and Petroleum Resources will monitor utilities' progress on energy efficiency and assess whether there are barriers to the implementation of reasonable and cost-effective programs. If required, the Ministry may consider and propose as needed regulatory measures. (e.g. directions to the Commission under the *Utilities Commission Act*) As well, the Ministry will assess whether additional measures are needed to ensure appropriate incentives are in place to encourage investor owned utilities to identify and pursue cost-effective DSM programs and to facilitate and promote better cooperation and coordination among energy utilities regulated by the BCUC.

4. Explore with B.C. utilities new rate structures that encourage energy efficiency and conservation.

A key demand side management tool is pricing structures to either discourage consumption overall, or shift demand to less costly periods. The 2002 Energy Plan directed BC Hydro to develop stepped rates for industrial customers to ensure rates reflected the marginal cost of new supply and to encourage energy efficiency. These stepped rates came into effect on April 1, 2006.

The BC Energy Plan, all utilities are encouraged to explore, develop and propose to the Commission additional innovative rate designs that encourage efficiency, conservation and the development of clean or renewable energy. These include stepped rates for other rate classes, interruptible/curtailable rates, critical period rates, clean electricity supply rates, tariffs focused on promoting energy efficient new construction and others. A part of this work should include consideration of the benefits of 'smart' or advanced metering technology, which offer potential for much greater consumption information and control being available to the consumer.

The Ministry of Energy, Mines and Petroleum Resources will monitor and assess progress on the development and implementation of price structures and advanced metering to encourage energy efficiency and conservation, and may propose additional regulatory measures (e.g. Special Directions) if required.

5. Implement Energy Efficiency Standards for Buildings by 2010.

Government will work with industry, local governments and other stakeholders to prepare and implement cost-effective energy efficiency standards for buildings. Provincial energy efficiency building standards are needed to achieve energy efficiency and conservation targets and to support the goal of self sufficiency, including commitments under BC Hydro's current Integrated Electricity Plan. Regulated standards for buildings are a central component of energy efficiency programs in leading jurisdictions throughout the world. Performance-based standards can effectively build upon the uptake of energy efficiency measures currently applied voluntarily by developers and supported by partnerships between government and industry associations.

The Ministry of Energy, Mines and Petroleum Resources will work closely with the Buildings Policy Branch of the provincial Office of Housing and Construction Standards to develop recommendations by the end of 2007 on specific energy efficiency standards for houses and buildings and the mechanisms for implementation. These may include incentives, voluntary targets and/or regulated requirements. With active participation of industry, utilities and other stakeholders, the goal is to introduce building standards no later than 2010, provided they are cost-effective to administer and implement.

6. **Undertake a pilot project for energy performance labelling of homes and buildings in coordination with local and federal governments, First Nations, and industry associations.**

   Energy performance labelling supports increased energy efficiency by making the efficiency of buildings observable, in much the same way that the Energy Star and EnerGuide labels provide information for consumers on appliance energy use. Labelling also supports other policies and programs, such as energy-efficient mortgages, promotion of energy efficiency by realtors and property inspectors, and new utility incentives to promote energy efficiency upgrades of houses and buildings.

   The Ministry of Energy, Mines and Petroleum Resources will work with utility, federal and local government and industry partners, to implement an expanded "Energy Savings Plan" pilot project that would evaluate the potential for widespread energy performance labelling of homes and buildings.

7. **New provincial public sector buildings will be required to integrate environmental design to achieve the highest standards for greenhouse gas emission reductions, water conservation and other building performance results such as a certified standard.**

   Buildings have many environmental impacts, including energy demand, water consumption, waste water production, the embodied energy of building materials, solid waste production, and in some cases, disposal of toxic materials. Buildings have impacts beyond their physical boundaries - orientation and height can impact on neighboring buildings by shading key solar resources, occupants' impact on transportation systems, and greenfield construction can impact on food production.

   The Climate Action Team will define a number of "indicators of integrated environmental design" (e.g., greenhouse gas, energy, water, building materials and transportation footprint). The indicators will be calculated on a regular basis by conducting audits of all existing, publicly funded buildings of a minimum size, and for all new construction projects. These include provincial government, school district, health authority, BC Housing, crown corporation and local government buildings with funding from the Province.

   After completing the audits, prior to 2010, the Climate Action Team will establish targets for new integrated environmental design standards that will apply to all buildings that receive new funds from the Province, supporting the goal of the government of B.C. being carbon neutral by 2010. Reporting will be completed annually, including audits of all new buildings and "recommissioning" on a regular basis (e.g., every five years). Industry driven certification systems will be considered as a means of evaluating environmental performance.

For energy use, a carbon neutral target may require an aggressive deployment of advanced building designs that includes, but is not limited to:

- maximization of advantageous passive solar energy gains and daylighting,
- incorporation of high-performance windows,
- maximization of heat recovery from exhaust ventilation air, grey water and cooling equipment,
- use of the highest efficiency heating and cooling equipment and passive ventilation systems, and
- integration of smart building controls that promote energy and water conservation.

In addition, any greenhouse gas emissions created from the use of purchased energy supplies could be offset through leadership on transportation systems connected with buildings - supporting low- or zero-carbon employee transportation choices and/or locating buildings near amenities and workplace destinations to minimize the need for work-related vehicle travel.

The Province is already a leader in North America on low carbon building designs. For example, the BC Cancer Research Agency uses 50 per cent less energy than the model energy code for buildings. Taylor Park Elementary School in Burnaby uses 41.5 per cent less energy and 50 per cent of the site is landscaped with native vegetation requiring little or no irrigation. The 48,600 square foot Nicola Valley Institute of Technology in Merritt uses 35 per cent less energy with an efficient envelope, solar control, thermal mass and natural ventilation. A comprehensive post occupancy evaluation was conducted after this building had been occupied, involving interviews with the building designers and operators, a site visit, analysis of energy and water consumption data, and a satisfaction survey.

8. Develop an Industrial Energy Efficiency Program for British Columbia to address specific challenges faced by British Columbia's industrial sector.

Government will establish an Industrial Energy Efficiency Program for British Columbia to address challenges and issues faced by the BC industrial sector and support the Canada wide industrial energy efficiency initiatives led by the Council of Energy Ministers. The program will encourage industry driven investments in energy efficient technologies and processes; reduce emissions and greenhouse gases; promote self generation of power; and reduce funding barriers that prohibit energy efficiency in the industrial sector. Some specific strategies include developing a results-based pilot program with industry to improve energy efficiency and reduce overall power consumption and promote the generation of renewable energy within the industrial sector.

9. Increase the participation of local governments in the Community Action on Energy Efficiency Program and expand the First Nations and Remote Community Clean Energy Program.

The Community Action on Energy Efficiency (CAEE) program provides financial and research support to BC local governments to advance the energy conservation and efficiency through local government policies and public outreach.

In 2007, a total of 29 communities in all regions of the province are participating. Each community has signed on to one or more of the Provincial targets for new and existing (public and private sector) buildings outlined in "Energy Efficiency Buildings: A Plan for BC", including residential, commercial, institutional and industrial buildings.

Phase 1 of CAEE was a jointly managed pilot project with Natural Resources Canada in 2004 and 2005 that engaged two local governments and a remote community. Support was provided towards human resources to advance energy efficiency objectives, including "one-stop-shop" information services.

Under Phase 2 of CAEE (early 2006) 15 communities were provided with $10,000 to implement energy efficiency policies. The Fraser Basin Council has provided policy research support to local governments that want to pioneer innovative energy efficiency initiatives through land use planning, development controls and educational/voluntary measures. In addition, Phase 2 of CAEE also provides funding for the "Energy Savings Plan", an education, labelling and incentive initiative that targets consumers and industry with the support of participating local governments.

Under Phase 3 of CAEE, announced on October 25, 2006, a total of $450,500 was directed to support new energy efficiency and community energy planning projects in sixteen communities throughout British Columbia. Each community will develop an energy efficiency program unique to its own needs and policies. These programs could address a range of leadership, voluntary and policy measures such as:

- Establishing energy commitments in the official community plan,
- Completing integrated energy, air quality and greenhouse gas action plans,
- Considering energy efficiency guidelines for building developers,
- Providing information to community residents, and
- Introducing green building policies.

The Province is also providing technical support to a number of CAEE communities through the "Green Buildings BC" initiative.

The First Nation and Remote Community Clean Energy Program was announced by MEMPR on November 23, 2006 in the northern community of Atlin, near the Yukon border. The program included pilot projects with ten communities to implement alternative and renewable energy supplies and energy efficiency measures. These include hydropower, wind, solar photovoltaics, energy efficiency and conservation measures.

The BC Energy Plan
A Vision for Clean Energy Leadership

ENERGY CONSERVATION AND EFFICIENCY POLICIES

Many remote communities rely on expensive diesel electricity supplies. In partnership with BC Hydro's Remote Community Electrification program, efforts have been made to improve the reliability and affordability of electricity systems, while maximizing energy conservation, efficiency and clean electricity supply options. The federal government contributed $3.863 million to support the program, along with significant financial support from communities and development partners.

The BC Energy Plan includes an expansion to additional local governments and remote and First Nation communities, with an aim to have 50 local governments and additional First Nations and remote communities in BC participating in CAEE by 2010, and 50 per cent of local governments and remote communities by 2016 (about 90 local governments and 30 remote communities).

The following communities are participating in CAEE and the First Nation and Remote Community Clean Energy Program:

City of Abbotsford
Atlin - Taku River Tlingit First Nation
Municipality of Bowen Island
City of Burnaby
City of Campbell River
Regional District of Central Kootenay
Capital Regional District
District of Central Saanich
City of Dawson Creek
Douglas First Nation
City of Fort St John
Hartley Bay - Gitga'at First Nation
District of Houston
Hupacasath First Nation
City of Kamloops
Village of Kaslo
City of Kelowna
Kitamaat Village - Haisla First Nation
Klemtu - Kitasoo-Xaixais First Nation
Kyuquot/Checklesaht First Nation
City of Merritt
Regional District of Nanaimo
City of New Westminster
City of North Vancouver
Town of Oliver
City of Port Moody
City of Quesnel
District of Saanich
Salt Spring Island Trust
Town of Smithers
District of Squamish
City of Surrey
Treaty 8 Tribal Association
City of Vancouver
District of Vanderhoof
City of Victoria

10. Ensure self-sufficiency to meet electricity needs, including "insurance".

The Province wants to ensure that British Columbia has the reliable made-in-BC supply it needs to meet the growing demand for electricity, and that new resource acquisition is planned in a way that recognizes the long lead time and implementation risks associated with new power projects, and the challenges of forecasting future needs. In particular, for BC Hydro, the Province wants to ensure that BC Hydro has enough BC-based power at all times, even in low water years, to meet its customers' electricity needs. Therefore, after implementing all cost-effective energy conservation opportunities, BC Hydro will acquire sufficient BC-based resources by 2016 so that BC Hydro can meet its customers' needs even under critical water conditions. By 2026, BC Hydro will acquire 3,000 gigawatt hours of supply on top of their firm energy requirements (the energy required to meet customer needs under critical water conditions) and capacity resources needed to effectively integrate this energy in a cost-effective manner. The Province recognises the ongoing importance of trade for maximising the value of BC Hydro's heritage resources and for optimising its system, and this activity will continue. The British Columbia Utilities Commission will continue to have responsibility for regulating BC Hydro, within the context of the self-sufficiency requirement.

11. Establish a standing offer for clean electricity projects up to 10 megawatts.

The Province wants to facilitate the development of distributed clean electricity generating projects in British Columbia to support its goal of self-sufficiency and help promote B.C. innovation. The Province is concerned about the size of the administrative burden for small project proponents to bid on BC Hydro calls. For this reason, this policy directs BC Hydro to develop a program, in consultation with stakeholders, to purchase, continuously or in regular offer windows, electricity from projects with a capacity of 10 MW or less. The Standing Offer will allow small projects to sell power to BC Hydro at a fixed price and with standard contract terms and conditions. A Standing Offer Program would be in addition to planned Calls for Power from larger projects. The Program design will be subject to the review and approval of the BCUC.

The Province has established the following general principles to guide the design of the Program:

- Simplify the process, contract terms and conditions for small power projects in BC;
- Competitive pricing for these projects relative to other supply sources; and
- Ensure cost-effectiveness, transparency, and fairness of the Program.

Some specific design guidelines are as follows:

- Except for local safety and security reasons, there should be no quota initially for the Standing Offer program.
- The product should be contractually non-firm energy.
- Proponents should not be required to pay a deposit for the Standing Offer program, although BC Hydro may establish other eligibility and security requirements, subject to approval from the BCUC. BC Hydro may also limit the maximum length of time a proponent has between receiving a contract and commercial operating date (COD).
- Transmission or distribution connected projects of 10 MW or less, and either clean, renewable or co-generation with an overall efficiency (heat and electricity production) in excess of 80 per cent will be eligible for the program.
- BC Hydro will absorb transmission / distribution network upgrade costs for individual projects subject to a cap established in consultation with stakeholders and approval from the BCUC, after which project proponents may be required to pay for additional network upgrade costs.

- The price should be transparent, simple, and based on the most recent call results and updated regularly, but not more than annually.
- BC Hydro will retain any rights and incentives associated with the green attributes, as well as any credits associated with greenhouse gas emissions (GHG). The clean or alternative electricity acquired will contribute to maintaining the Province's standard of having 90 per cent of BC's electricity generated being clean or renewable.

In addition, to ensure even treatment of new supply acquired through BC Hydro's net metering program and the Standing Offer approach, Government will issue a direction to the Commission that BC Hydro makes appropriate changes to its net metering program. This will ensure the price paid for net annual surpluses of generation 'purchased' by BC Hydro is generally consistent with the prices paid in the Standing Offer program.

12. The BC Transmission Corporation is to ensure that British Columbia's transmission technology and infrastructure remains at the leading edge and has the capacity to deliver power efficiently and reliably to meet growing demand.

The BC Transmission Corporation's investments in advanced control and monitoring technologies increase the capacity of existing assets by enabling more precise operation of the transmission system. By taking a broader and more progressive approach to transmission planning, BCTC will also be able to ensure that new transmission infrastructure will be in place to reliably meet the province's future electricity needs.

Since its inception, BCTC has planned system upgrades and new transmission projects in response to a customer's request. Transmission projects, however, require longer lead and construction times than generation or load build. The experience of other jurisdictions with this type of planning approach is that transmission capacity is often not in place when it is needed.

To prevent this situation from occurring in British Columbia, BCTC will move beyond this contract driven approach to an approach that builds infrastructure in advance of need. The BC Transmission Corporation will study and propose, where appropriate, system upgrades or expansions based, in part, on its own assessment of future market needs. Three types of transmission projects will benefit from this approach:

- a planned system upgrade for a Network Customer already identified in the BCTC Capital Plan that can be beneficially advanced in time;
- a system upgrade required for a customer that can beneficially be made larger than the immediate requirement; and
- a project that BCTC identifies as having future benefits, but which has not been triggered by a customer request.

BCTC will identify this third type of project through an annual project review designed to identify possible projects that would be viable as a BCTC led investment.

BCTC will only proceed with an upgrade or expansion project after completion of a strong business case that identifies the costs and benefits of the proposed project, completion of thorough stakeholder and First Nation consultations, and receiving all necessary regulatory approvals.

13. Ensure adequate transmission system capacity by developing and implementing a transmission congestion relief policy.

The congestion-relief policy will support the priorities of energy security and self-sufficiency by ensuring full and adequate transmission infrastructure is available at all times, and across all regions, of BC's electricity grid.

By implementing a congestion-relief planning regime, and by designating specifically-defined infrastructure projects as congestion-alleviating, Government will ensure that BC's transmission system is developed in a timely manner, is able to support optimum energy security and economic growth, and BC Hydro achieves electricity self-sufficiency. Specifically-defined infrastructure projects will ensure a transmission system robust enough to support the most efficient use of generation resources from a province-wide perspective.

Government will work with BCTC to create and implement the congestion-relief policy. This policy will guide transmission system planning on the basis of cost-effectively removing existing system congestion and constraints, and maintaining that state. This will be accomplished through specifically-defined transmission infrastructure upgrades or expansions, planned from the perspective of meeting and maintaining an un-congested system. This stands in contrast to the current regime of project planning based on specific customer-driven requirements, or opportunities identified through BCTC's current Expansion Policy. The policy will define the specific approach to identifying congestion-relieving priority projects.

Other jurisdictions have employed similar policies designed to get congestion out of a system. For example, Alberta has policies requiring zero congestion and transmission solutions. The United States has passed legislation (*as part of the Energy Policy Act*), to permit the Federal Energy Regulatory Commission to solve persistent and damaging congestion.

14. Ensure that the province remains consistent with North American transmission reliability standards.

Government will commit to ensure that industry developed reliability standards are introduced in British Columbia, cost-effectively and in a manner that respects BC's regulatory sovereignty.

The analysis of recent large-scale electricity blackouts has confirmed the value of common and mandatory reliability standards for the electricity industry. New North American standards are emerging from the North American Electric Reliability Council, an industry body made up of technical experts from Canada and the United States. British Columbia will follow the industry practice of making these common standards mandatory for users, owners, and operators of the bulk power transmission system in BC. Consultations with industry will be undertaken to discuss the options for BC to implement these standards.

The BC Utilities Commission will determine, set and enforce reliability standards in the province, and can approve variances if it determines that a variance is appropriate. This approach is consistent with steps taken by other Canadian jurisdictions.

15. Continue public ownership of BC Hydro and its heritage assets, and the BC Transmission Corporation.

The BC Energy Plan upholds and confirms the 2002 Energy Plan's fundamental principle of public ownership of BC Hydro, its heritage assets, and the BCTC.

Under the 2002 Energy Plan, the government passed the *BC Hydro Public Power Legacy and Heritage Contract Act* to ensure continued public ownership of BC Hydro and its heritage assets, including BC Hydro's generation, distribution and transmission systems. While BC Hydro retains ownership of the transmission system, the *Transmission Corporation Act* dealt with the transfer of transmission operation, management and planning responsibility to BCTC. The *Transmission Corporation Act* included the stipulation that BCTC must be 100 per cent owned by government and cannot be sold.

These protections remain in place to continue to ensure public ownership of these corporations and assets.

16. Establish the existing heritage contract in perpetuity.

The 2002 Energy Plan recognized that BC Hydro's heritage assets represent valuable provincial assets yielding a substantial return for BC Hydro ratepayers in the form of low cost electricity generation. Energy Plan 2002 included policy actions to secure that benefit.

The *BC Hydro Public Power Legacy and Heritage Contract Act* provided enabling legislation to allow Government to require a "Heritage Contract" ensuring the electricity generated by the heritage assets continues to be available to BC Hydro ratepayers based on cost of service. The Heritage Contract ensures BC Hydro ratepayers receive heritage power that are based on costs of generation, not market prices. The Heritage Contract was implemented by the Heritage Contract Special Direction #2.

The Heritage Contract includes a provision stating the Contract may be terminated with 5 years notice if notice is given any time after April 1, 2009. While no official 'end date' to the Heritage Contract exists, the language of the contract implies the potential for termination and thus creates uncertainty. Government will re-affirm and strengthen its commitment to the Heritage Contract though amendments addressing this uncertainty.

17. Invest in upgrading and maintaining the heritage asset power plants and transmission lines to retain the ongoing competitive advantage these assets provide to the province.

Thanks to the valuable investment made in heritage assets by previous generations of British Columbians, BC Hydro ratepayers today reap substantial benefits from this low cost, reliable, flexible electricity system.

As with Energy Plan 2002, BC Hydro will continue to pursue efficiency improvements and upgrades to its existing assets under its 'Resource Smart' program. In addition, BC Transmission Corporation will continue to plan for enhancements required to support the transmission system. The British Columbia Utilities Commission will continue to oversee the resource plans of these utilities and approve the projects it deems to be cost effective and in the public interest.

18. All new electricity generation projects will have zero net greenhouse gas emissions.

Currently, electricity accounts for only a small portion (around 3 per cent in 2004) of the province's overall GHG emissions. This Energy Plan maintains the low greenhouse gas intensity of the electricity sector.

In The BC Energy Plan, government commits that all new natural gas or oil fired electricity generation projects developed in BC and connected to the integrated grid will have zero net GHG emissions. This means that the proponents of these generation projects would have to invest in other initiatives that would completely offset the GHG emissions generated by these projects, unless the technology was available to eliminate or capture and store the emissions from the plant.

The cost of this measure will depend on the province's offset policy, which will be developed over the next several months. The Ministry of Environment, in consultation with MEMPR, will be responsible for leading the development of the offset policy, as well as all necessary regulatory and legislative changes. The policy may include the option of contributing to the Innovative Clean Energy Fund as an alternative to investing in offset projects.

19. Zero net greenhouse gas emissions from existing thermal generation power plants by 2016.

To ensure consistent treatment between new and existing generation projects, while allowing time to plan for this change, The BC Energy Plan commits that by 2016, all existing natural gas and oil fired electricity generating facilities in the integrated grid will need to completely offset their GHG emissions.

20. Require zero greenhouse gas emissions from any coal thermal electricity facilities.

The BC Energy Plan stipulates that coal-fired generation must meet a zero emission standard, through a combination of "clean coal" fired generation technology, carbon sequestration and offsets for any residual GHG emissions. Through technology that allows the carbon dioxide to be captured from the plant and "stored", coal fired generation can have 'near zero' GHG emissions. There is considerable investment, both nationally and internationally, in the development of this technology, which many believe will be commercially available in the next decade.

21. Ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation.

Currently in BC, about 90 per cent of electricity is from clean or renewable resources. Under The BC Energy Plan, Government commits to maintain this high standard – which places us among the top jurisdictions in the world. Government will issue guidelines to define what sources qualify as clean or renewable, and will provide additional policy guidance and directions, as needed, to ensure BC continues to meet this standard.

22. Government supports BC Hydro's proposal to replace the firm energy supply from the Burrard Thermal plant with other resources. BC Hydro may retain Burrard for capacity purposes after 2014.

As a part of it Integrated Electricity Plan, BC Hydro has a plan to replace the firm energy from Burrard Thermal by 2014. The proposed approach by BC Hydro is consistent with Government's desire to see Burrard Thermal phased out. The government recognizes that the value of the capacity and voltage support provided by Burrard Thermal may warrant continuing to keep Burrard Thermal available if needed for peaks in demand (for example, resulting from cold winter weather, Christmas lighting, to deal with other resources being unexpectedly unavailable, etc.). These may continue to be appropriate longer term roles for Burrard if that Burrard Thermal continues to be a cost effective voltage support and capacity resource.

23. No nuclear power.

British Columbia's 2002 Energy Plan had environmental responsibility and no nuclear power sources as one its cornerstones. The BC Energy Plan continues the Province's commitment that nuclear power is not a part of BC's energy future. The financial and environmental problems experienced in other jurisdictions that have invested in nuclear power continue to make it a risky proposition. The government rejects nuclear power as a strategy to meet British Columbia's future energy needs.

24. Review BC Utilities Commission's role in considering social and environmental costs and benefits.

The BC Energy Plan explicitly recognizes that low costs means more than least financial costs. Environmental, social and economic development objectives of the province are also values that need to be considered in determining whether utilities' plans and programs serve the public interest. Some stakeholders argue that the BC Utilities Commission does not take full consideration of this broader perspective when regulating utilities. Others argue that environmental, social and environmental policy properly rests with the province, and not the regulator.

A policy action of The BC Energy Plan is to review the BC Utilities Commission's role in considering social, environmental and economic costs and benefits as a part of its regulatory framework.

25. Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources.

BC Hydro, with stakeholder input, will develop an approach to allow for the recognition of any additional value associated with intermittent clean or renewable energy projects including portfolio benefits, for the purposes of evaluating these generators' capacity and firm energy output in its energy calls and acquisition processes. Intermittent resources are those for which the 'fuel' supply to the generator (e.g. the wind or the water flow) is not always available and cannot be 'ordered' when needed.

BC has substantial potential to develop green resources such as wind and small-hydro, and doing so is an objective of The BC Energy Plan. The intermittent, seasonal and non-dispatchable nature of these resources tends to make their output less valuable compared to the output from coal, natural gas, or biomass-fired plants that can generate on a consistent basis or can be dispatched or displaced based on short-term demand and market conditions. Wind and run of river small-hydro generators also provide a less valuable product individually than do large hydro facilities with storage, since these large hydro facilities combine flexibility benefits with the "firmness" attributes of thermal generation resources. Finally, there are challenges to manage and integrate intermittent resources into the electricity delivery system that can require study (and related costs) and potentially additional infrastructure costs.

However, when the combined output from a portfolio of clean or renewable resources is considered, there may be advantages associated with the diversification of these resources that could increase the value of their combined output relative to when their outputs are considered individually. For example, the overall firmness (predictability) of a diverse portfolio of intermittent resources may be higher than the firmness of individual resources within the portfolio, especially if the output of the resource portfolio is composed of different types of resources and/or resources from different regions. When intermittent generators are viewed in this aggregated way, their value may be higher. Any net increase in value should be reflected in the choices made by BC Hydro when determining which resources are required to meet its needs, and in determining how to value these resources.

This policy is in no way intended to give preference to intermittent resources or establish a pre-defined target for intermittent energy. It is simply intended to ensure a level playing field among different resource types in order to reduce the overall cost to ratepayers of meeting growing demands and standards for clean or renewable electricity.

26. Work with BC Hydro and parties involved to continue to improve the procurement process for electricity.

BC Hydro's energy procurement plays a critical role in the reaching Government's self-sufficiency objective, as well as meeting the Government's objects for competitive rates, clean or renewable electricity, the development of a vibrant and competitive IPP sector and other fiscal and provincial policy objectives. As such, it is important that all parties – IPPs, BC Hydro, BC Hydro's customers who pay the costs through their rates, and the BC Utilities Commission – are satisfied that the approach used by BC Hydro, and the terms and conditions in BC Hydro's power purchase contracts, meet the objectives set out in this policy.

BC Hydro's efforts to design call processes must take into account the diversity of potential resource types available in British Columbia (small, large, firm intermittent, conventional and alternative) and the multiple issues that are related to or can affect policy objectives. These include penalties for non-performance, risk allocation, pricing, contract length and renewability provisions.

In addition, not all projects will necessarily fit into a call for power type process. BC Hydro needs the flexibility to utilize different procurement approaches so that it is able to acquire new supply in the most appropriate manner. However, given a call process is a transparent, competitive process, the prices, terms and conditions of these call processes serve as a useful guide to BC Hydro in its acquisition of resources through the standing offer and net metering, bilaterally negotiated contracts, request for proposals and other processes.

Under the current regulatory process, the Commission is able to evaluate BC Hydro's procurement approach before the fact under its general authority, and it can reject BC Hydro's tender results and/or contract terms after the fact in approving contracts under Section 71 of the *Utilities Commission Act*.

To ensure the procurement processes are consistent with provincial energy policy, the Ministry of Energy, Mines and Petroleum Resources (MEMPR) will continue to participate in the discussions regarding the design of BC Hydro's procurement processes, and will be able to respond more promptly to any policy issues that arise. In addition, MEMPR will consider if regulatory or other changes are advisable.

MEMPR's engagement will add certainty and stability to BC Hydro's call processes by ensuring they are consistent with energy policy objectives. The goal is to establish a transparent and well-understood regulatory regime for reviewing BC Hydro's procurement processes, both before and after the fact.

27. Pursue BC Hydro's planned Remote Community Electrification Program to expand or take over electricity service to remote communities in British Columbia.

There are approximately 50 permanent remote communities in BC that are self-reliant or reliant on a third party for electric power; the vast majority of these are First Nations communities. For many of these communities, electricity service is characterized by sub-standard reliability, provided by ageing assets that are poorly maintained and highly inefficient, and creates significant environmental risks related to diesel emissions and fuel handling.

Over the next 10 years, BC Hydro will pursue its remote community electrification program (RCE) to expand its service to remote communities that meet specific criteria and that are seeking service from BC Hydro. Service to these communities will be provided under BC Hydro's Zone 2 tariff. (The Zone 2 tariff is used to service BC Hydro's existing Non-Integrated Areas.) Costs will be recovered from currently-responsible agencies - such as the Department of Indian and Northern Affairs - and BC Hydro ratepayers.

28. Ensure BC Hydro considers alternative electricity sources and energy efficiency measures in its energy planning for remote communities.

Remote communities and Non-Integrated Areas tend to rely on diesel generation for electricity supply with high operating costs. Given the environmental and economic issues associated with this type of generation, the business and social case for pursing clean electricity and energy efficiency solutions in remote communities is much stronger than in other areas of the Province. These solutions should not be overlooked when considering service options for remote communities.

BC Hydro will work with the Ministry of Energy, Mines and Petroleum Resources (MEMPR) to develop community energy plans (CEP) prior to extending service to remote communities under its Remote Community Electrification program. In addition, BC Hydro will develop community energy plans when it is considering renewal or replacement of diesel generators in Non-Integrated Areas, or in other circumstances where unique opportunities are evident. CEPs will consider all cost-effective solutions to meet the electricity needs of the remote community, including energy efficiency, alternative energy solutions and integration with the main grid. In addition, the CEPs will seek to integrate with plans for skills training and local economic development opportunities.

29. Establish the Innovative Clean Energy Fund to support development of clean power and energy efficiency technologies in the electricity, alternative energy, transportation, and oil and gas sectors.

Government support for the advancement of energy technologies through the pre-commercial development stage can play a critical role in their early and successful uptake by the marketplace. British Columbia will take a leadership role in advancing innovation in its energy technology sectors, both conventional and emergent, through the establishment of an Innovative Clean Energy Fund.

The Fund will be administered by the Ministry of Energy, Mines and Petroleum Resources with the input and advice of an industry-government advisory body.

Projects supported by the Fund will:

- Address specific British Columbia energy and environmental problems that have been identified by government
- Showcase BC technologies that have a strong potential for international market demand in other jurisdictions because they solve problems that exist both in BC and other jurisdictions
- Support pre-commercial energy technology that is new, or commercial technologies not currently used in British Columbia
- Demonstrate commercial success for new energy technologies.

The development process of new technology evolves through many different phases, and the type of support needed in each phase varies significantly. For example, emerging technologies in the basic research, development and demonstration phases (e.g., fuel cells and wave / tidal energy) may need partnerships among industry, academia and government to help fund the necessary work to carry them to commercialization. Other examples include technologies that are already commercial but require more widespread adoption (e.g., wind energy). These technologies may require other types of assistance, such as the dissemination of information and technology transfer, or government taking leadership in applying the technologies in government operations. Lastly, those technologies with developed markets (e.g., fossil fuels and hydropower) may require sustained private sector investment in order to support local manufacturing and maintain employment levels.

Examples of energy resources, technologies and systems that may be considered under the Fund include:

- Renewable resources (e.g., biomass; ocean/hydro, solar, wind, geothermal)
- Improvements in the development and use of non-renewable resources (i.e., conventional and unconventional oil and natural gas)
- Energy carriers and storage (e.g., hydrogen, fuel cells)
- Gasification
- Carbon capture and sequestration
- Emissions management
- Energy systems integration
- Power measurement and management
- Energy efficiency and conservation
- Transportation (e.g., engine, vehicle and alternative fuel technologies)
- Fuels (e.g., biodiesel and ethanol)
- Waste energy capture and utilization

30. Implement a provincial Bioenergy Strategy which will build upon British Columbia's natural bioenergy resource advantages.

British Columbia is blessed with significant biomass resources such as woody debris, agricultural crop residues, animal manure and organic municipal wastes that can be used to produce heat, electricity, liquid fuels and other forms of energy. These resources are renewable, well-distributed throughout the province, and suitable for either large-scale or smaller, community-based energy production opportunities. Wood pellet production, wood-fired electricity generation and cogeneration are already well established in British Columbia, with wood gasification, liquid biofuel production and other bioenergy/biorefining technology also well positioned to play a significant role in British Columbia's energy future.

The provincial Bioenergy Strategy, which builds upon The BC Energy Plan and other provincial initiatives, will help advance British Columbia's bioenergy development opportunities in the near- mid- and long-term, while also promoting diversity and competitiveness in the province's forestry and agriculture sectors, and strengthening regions and communities throughout the province.

31. Issue an expression of interest followed by a call for proposals for electricity from sawmill residues, logging debris and beetle-killed timber to help mitigate impacts from the provincial mountain pine beetle infestation.

British Columbia has an abundance of underutilized wood residues, in the form of sawmill residues, logging debris and a growing supply of timber killed by the Mountain Pine Beetle (MPB) that will become less usable for conventional forest products over time. While British Columbia currently leads the nation in wood energy production and consumption, with about 50 per cent of Canada's biomass electricity generating capacity, it is estimated that about 1.2 million bone-dry tonnes (BDt) of mill residues per year are incinerated in beehive burners in the province with no energy recovery and adverse impacts on local air quality. There are about seven million BDt per year of logging residues in the Central Interior, and recent estimates indicate that the Mountain Pine Beetle infestation has already killed over one-third of the merchantable pine volume in the province. It is further estimated that 80 per cent of the merchantable pine will be dead by 2013, with the bulk of that damage (75 per cent) occurring before 2010. Estimates of non- recoverable losses vary between 200 and 500 million cubic meters, which equates to roughly 400 million to 1 billion BDt. These resources, and abundant wood residues in other regions throughout the province, present a significant opportunity for increased bioenergy production in British Columbia.

In order to encourage greater development and use of "home-grown," wood-fired electricity in the province, and to help address the MPB emergency and capture value from the affected timber, the government will instruct BC Hydro to issue an expression of interest followed by a call for proposals for electricity generated from wood residue and MPB timber. The terms of the call will be developed by BC Hydro in consultation with the Ministry of Energy, Mines and Petroleum Resources and the Ministry of Forests and Range, with input from the forest and energy sectors.

32. Implement a five per cent average renewable fuel standard for diesel by 2010 to help reduce emissions and advance the domestic renewable fuel industry.

In Spring 2006, the federal government announced its intention to proceed with a two percent national average renewable fuel standard (RFS) in Canada's diesel fuel no later than 2012. British Columbia will move beyond the federal RFS by adopting a five per cent biodiesel requirement in provincial diesel fuel supplies by 2010.

33. Support the federal action of increasing the ethanol content of gasoline to five per cent by 2010, and adopt quality parameters for all renewable fuels and fuel blends that are appropriate for Canadian weather conditions in cooperation with North American jurisdictions.

In Spring 2006, the federal government announced its intention to proceed with a five per cent average national renewable fuel standard (RFS) in Canada's gasoline by 2010, and a two per cent national average RFS for Canada's diesel fuel no later than 2012. British Columbia is supportive of the national RFS to help reduce transportation-related air emissions and advance the renewable fuel industry in Canada, and will move beyond the federal RFS by adopting a five per cent biodiesel requirement in provincial diesel fuel supplies by 2010.

The Council of Energy Ministers (CEM) Renewable Fuels Working Group was established in September 2000 to advance the development and use of renewable fuels in Canada. This group, comprised of federal, provincial and territorial government officials, works together and in consultation with industry and other stakeholders to:

- Address issues such as closing information gaps and phasing out inter-provincial trade barriers;
- Coordinate existing and future programs to avoid inefficiencies;
- collectively address competitiveness issues with the United States and other jurisdictions;
- Encourage cooperation and economies of scale for next-generation technology commercialization; and
- Facilitate policy work among jurisdictions.

British Columbia will continue to represent its interests at the CEM Working Group and help to implement the federal RFS in British Columbia by 2010.

Critical to the reliability and acceptance of renewable fuels in Canada is the adoption of fuel quality parameters for renewable fuels and fuel blends. Currently, requirements for biofuels to respect recognized product quality standards are not mandated; however, generally accepted production and procurement standards exist. Two standards generally accepted in North America are:

- ASTM D6751 - the American standard that covers pure biodiesel (B100), for blending with petrodiesel in levels up to 20 per cent by volume; and
- CGSB for B1 to B5 - the Canadian General Standards Board set a biodiesel standard for biodiesel blends between one and five per cent.

Adherence to regulated quality parameters will provide both consumers and petroleum companies with the confidence required to purchase and distribute biofuels. This is especially important for biodiesel and biodiesel blends. In the case of biodiesel, there are several technical requirements that must be addressed in blending, transport, and distribution in order to provide a fuel with uncompromised integrity.

34. Develop a leading hydrogen economy by continuing to support the Hydrogen and Fuel Cell Strategy for British Columbia.

British Columbia is a leader in hydrogen and fuel cell technologies – with the largest cluster of companies in Canada. The sector employs around 1,200 people in British Columbia. In 2003, Premier Gordon Campbell announced "Our goal is to develop the hydrogen and fuel cell sector to make British Columbia the world's leading hydrogen economy by 2020". The primary vehicle to achieve this goal is the British Columbia Hydrogen and Fuel Cell Strategy. The Strategy is an industry initiative, which seeks to accelerate the demonstration, deployment and commercialization of hydrogen and fuel cell technologies. The unifying vision of the strategy is the Hydrogen Highway initiative. In March 2005, British Columbia provided a $2 million grant to industry, which is administered by Hydrogen and Fuel Cells Canada. More than $110 million in investment activity in hydrogen and fuel cells in British Columbia has been announced since the award of this grant, including more than $30 million in federal funding.

35. Establish a new, harmonized regulatory framework by 2010 for hydrogen by working with governments, industry and hydrogen alliances.

Hydrogen technology has the potential to offer tremendous economic and environmental benefits for British Columbia. British Columbian companies have established a global market presence and Canadian hydrogen demonstration projects are being watched by international observers and consortiums. The "Hydrogen Highway" will be showcased during the upcoming 2010 Olympic and Paralympic Winter Games.

British Columbia is recognized as a North American expert in hydrogen regulatory frameworks. Regulatory reform leadership is needed to remove trade barriers and offer industry transparency. A new, harmonized regulatory framework will be developed to promote the emerging hydrogen economy and enable British Columbia's industry to maintain its competitive edge in the global market. Key actions to establish a regulatory framework for hydrogen include:

- Determine how existing and future regulations apply for hydrogen products;
- Determine appropriate codes and standards;
- Link legislative areas across different jurisdictions; and
- Hold stakeholder workshops.

The Province will work with Canadian jurisdictions and international participants (e.g., International Standards Organization, International Electro-Technical Commission and the UN / Global Technical Regulations) towards a harmonized framework.

Electricity Labour Strategy

There is fierce competition for talent among the utility companies in British Columbia. Key jobs that are mission critical and hard to recruit include: power line technicians, finance managers, electrical engineers, front line supervisors, operator technicians. The electricity sector is notably impacted by the number of retiring long-serving employees with early retirement options imbedded in their pension plans. This coupled with the decline in university programs dedicated to power/electricity have caused a vacuum of new graduates with the necessary skills for these highly specialized roles. British Columbia (and the Territories) will be facing the largest skilled labour shortage within the next three to eight years.

Actions:

The Ministry will support the BC Working Group of the Electricity Sector Council to develop an education program targeted at Grades 10-12 that highlights career choices available in the electricity sector.

The Ministry will designate a labour liaison to work with industry and the Crowns to implement policy actions in the Labour Strategy.

Crowns and industry will keep government apprised of large project proposals that have significant labour impacts and implications on the ability to deliver on related business lines.

The Ministry will monitor compensation issues, as they arise with the Crowns, and facilitate discussion with the Public Sector Employers' Council (PSEC) as necessary.

The Ministry will work with the Provincial Nominee Program (PNP) to have Economic Development facilitate an international recruitment mission to attract to critical roles identified, such as:

- Electrical Engineers
- Power Line Technicians
- Technicians/Technologists
- Front Line Supervisors
- Back Office Professionals

The Ministry will work with Crowns and industry to identify initiatives designed to increase labour availability in the sector, i.e:

- Indian and Northern Affairs Canada's Aboriginal Workforce Participation Initiative (AWPI)
- HRDSC Innovation Fund
- Service Canada Labour Market Partnership Agreement (LMPA)

Government will advocate on behalf of Crowns and industry for a dedicated power engineering option at UBC and other institutions offering electrical engineering programs.

Government will consider in-house training, such as those programs offered at BC Hydro, for accreditation and certification through recognized education institutions.

Government will work with Crowns and industry to monitor apprenticeship completion rates in the electricity related programs.

Crowns and industry will adopt a best practice of supply chain management, encouraging small employers and contractors to deliver apprenticeship training by through shared resource development.

The Ministry will review the Red Seal program for potential barriers to labour accessibility.

Alternative and Renewable Energy Labour Strategy

This emerging energy sector provides an opportunity for British Columbia to be proactive in developing human resources in time to meet the upcoming demand. Requisite requirements for most of the occupations include some degree of electrical/mechanical and/or engineering competence. Occupations associated with these sectors include: business development specialists, engineers, designers, installers, operators and mechanics.

Actions:

Government will support renewable and alternative energy and energy efficiency associations in promoting careers in new and developing industries through government information campaigns, trade missions, etc.

Government will work in partnership with industry associations to promote the BC advantage: like BC's potential for Hydrogen, Ocean Renewable and Bioenergy.

The Ministry will build on the dialogue that began in April, 2006 with Alberta to enact the MOU on Energy Research, Technology Development and Innovation to promote efficiencies in research and development and look for economies.

The Ministry will host information sessions for the renewable and alternative industry reps in BC to meet with the Electricity Sector Council of Canada (the Sector Council responsible for their representation nationally).

The Ministry will work with the Ministry of Economic Development to determine a critical occupational shortages list, particularly in the areas of energy efficient building design trades people.

The Ministry will continue to sponsor an annual sustainable energy forum to share information between energy industry and stakeholders regarding current and future initiatives.

Government will work with industry and associations to identify suitable occupations for cross-over of Mountain Pine Beetle affected workers.

Government, in partnership with the Aboriginal Workforce Participation Initiative, other Aboriginal groups and IPPs, will work to identify potential sources of labour in Aboriginal communities.

The Ministry as needed will review dated legislation such as the *Boiler Act*, in light of technological advances, to allow for more effective deployment of human resources.

Government will work with industry to identify trades training requirements for alternative sectors, leading to ITA designations and Red Seals, where appropriate, for example:

- Work with the Wood Pellet Manufacturing Association to develop training curriculum.
- Work with industry associations to develop new energy efficiency and conservation training, for example, Thermal Energy Comfort Association of BC, Canadian Home Builders Association of BC, to address consumer complaints regarding service standards.
- The Ministry will bring key parties together, including associations, employers, entrepreneurs and workers as required, to promote alternative and renewable energy sector networks across BC.

To stimulate job creation and skills training opportunities, government will examine the viability of a clean electricity procurement policy and continue to implement energy efficiency targets in its building stock.

The Ministry will create an inventory of training available in BC for renewable and alternative energy occupations.

Government will partner with Malaspina College to support the creation of a Green Building and Renewable Energy Technologist program.

The Ministry will work with AVED and Douglas College to expand the Building Environment Systems program.

Government will offer co-operative education placements for students who take programs related to energy, i.e. alternative, renewable or energy efficiency/power engineering.

Government will encourage energy education in public primary and secondary schools in energy supply/demand and efficiency and support the Ministry of Education in its curriculum review of the K-12 programs encapsulating energy and recommend additional sources of material.

The Ministry will engage university educators in BC to advance awareness of the variety of renewable/alternative energy and energy efficiency/conservation curriculum readily available for new teachers.

The Ministry will look for strategic opportunities to fund projects or programs that meet mutual interests and provide for economy of scale through the Collaboration in Energy Research, Technology Development and Innovation MOU with Alberta, that ultimately lead to job creation in renewable energy and energy efficiency technology in BC.

Government will partner with industry to target key strategic value positions (e.g. power engineers and other highly qualified personnel) that could shift at retirement into the renewable/alternative energy and energy efficiency/conservation sector.

The Ministry will actively seek leveraged funding opportunities for three new university chairs in Power Engineering, Ocean Renewable Energy Research and Development, Advanced Bioenergy Technologies.

Oil and Gas Labour Strategy

This sector has seen unprecedented growth in the number of oil and gas workers employed in British Columbia. Accurate labour market information specific to BC has proved problematic however, a recently completed survey of the major exploration and production companies based in Alberta, with operations in BC, suggests that the occupations most in demand for this type of work include: operators, engineers, geosciences professionals, speciality business service professionals, technicians and technologists. Due to the high volume of service sector work associated with oil and gas production, many trades jobs are also in demand.

Actions:

Establish the Centre of Excellence as a province-wide advisory body to provide strategic direction for oil and gas education, training and research and act as a hub for coordinating cross jurisdictional discussions on innovative industry models and responses to specific short and long-term labour market demands.

The Province will continue to support and develop joint solutions with the government of Alberta in an effort to harmonize policies and regulations to ease cross-migration burdens and assist in creating a more agile workforce.

The Province will support the devolution of the LMDA from the federal government to the provincial government and advocate for a sector study to be undertaken annually on behalf of the oil and gas sector in BC.

The Province will partner with industry, educational partners and the sector council to develop and deliver promotional materials for educators and citizens of BC to increase awareness of opportunities in the energy sector.

The Province will partner with the Aboriginal Workforce Participation Initiative (AWPI) and its partners to ensure that labour market information flows between the sector and constituents in Aboriginal communities. In addition, the Province will identify gaps in labour market support for Aboriginal people and work with the AWPI to form partnerships to address solutions.

The Ministry will work in partnership with other ministries and organizations to explore options for utilizing labour pools impacted by Mountain Pine Beetle infestation.

The Province, in partnership with other governments, sector councils and industry will develop a foreign worker recruitment strategy for the oil and gas sector in BC.

To create more awareness of career opportunities in the oil and gas sector and to encourage more British Columbians to pursue a career in the oil and gas industry, the Ministry will work in partnership to ensure a comprehensive marketing and promotional campaign is developed to advertise the long term career benefits, transferability of skills and current opportunities in the oil and gas sector for the general public. The Ministry will continue to sponsor regional job fairs in partnership with industry.

The Province will work to harmonize efforts between Alberta and BC to ensure industry understands talent pool composition in order to maximize effectiveness.

The Province will work with the various education partners to develop a targeted campaign that caters to K-12 in the BC school system. Information guides for career counsellors in the schools, colleges and universities will be produced in tandem.

Work with partners to encourage expatriates and skilled workers to locate in BC.

The Province will partner with the Aboriginal Workforce Participation Initiative and its partners to assist employers to access the potential workforce in Aboriginal communities.

Funding agreements will be sought between ministries to development communication tools to allow workers to access employers/employment opportunities.

Establish the Centre of Excellence to provide province-wide planning and coordination for oil and gas education, training and research.

Increase apprenticeship and trades training in general, and expand programs to address specific skills shortages as they are identified.

Better inform entry-level recruits about the industry's viable, long-term career paths including the high level of transferability of skills to other industry by building on existing web-based curriculum maps and information that show the skills required for each job, where to acquire those skills and the resources available.

Develop and implement a workforce literacy initiative focussed on resource extraction and processing sectors to improve basic literacy skills on the job.

Partner with industry, associations and service providers to promote initiatives and programs that provide a safe work environment for oil and gas workers.

Bring together industry and education and training providers to share research and training (including business development and management skills).

Government will work to strengthen arrangements among industry, educators and Aboriginal organizations for increased investment in skills development and employment access for Aboriginal people.

The Province will establish working relationships with the Aboriginal Workforce Participation Initiative and the Aboriginal Human Resources Development Agencies in order to identify training and development needs and to assist medium to large sector employers to prepare their workplace for Aboriginal workers.

Partner with the ITA, Northern Lights College and Aboriginal groups to seek effective deployment of mobilized training on reserve and in remote areas.

To maximize the available Aboriginal workforce, utilize benchmark labour market information to create culturally appropriate training ladders for upgrading and skills development.

Develop targeted programs for women that increase their participation in training and development in the sector.

Develop a 'Women In Trades' initiative, with a focus on engaging young women in high school.

Develop and implement a mentoring program focussed on women who have been out of the labour force for more than five years.

The Province will explore the social, physical and cultural infrastructure requirements that keep employees in regions and will form partnerships to affect improvements.

Government will partner to ensure ongoing improvement efforts to provide a safe work environment for all oil and gas workers.

The Province will seek out local service providers to establish holistic support mechanism for new recruits in the communities, including Aboriginal workers, new immigrants, youth and women.

The Province, in partnership with the organizations like the BC Housing Commission and local governments, will continue to work to develop integrated solutions to the housing challenges in N.E. BC.

The Province will work in partnership with local service providers and stakeholder groups to promote diversity and create welcoming communities.

Government will partner with industry to ensure training is available using up to date equipment that utilizes leading edge technology.

The Ministry will offer support to the Province in its research and development of skills training tax credits and flexible retirement policies with an emphasis on older worker retention.

36. Eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by half (50 per cent) by 2011.

Reducing flaring is an issue for many jurisdictions and the World Bank is leading a Global Gas Flaring Reduction Partnership.

The province has set a goal of reducing routine flaring at producing wells and production facilities by 50 per cent in five years and eliminating all routine associated gas flaring in 10 years. Routine associated gas flaring is considered gas that meets an economic threshold for conservation. Operators will be required to perform an economic analysis of all sources of continuous solution gas flaring and subsequently tie in any gas that shows a net present value greater than zero.

Currently, the Province does not receive a royalty for gas that is flared, consequently incentives designed to reduce flaring will be considered.

Reduce routine flaring at producing wells and production facilities.

The primary purpose of flaring is to act as a safety device to protect vessels or pipes from over-pressuring due to unplanned upsets and maintenance. This acts just like the spout on a tea-kettle when it starts whistling as the water in it starts boiling. A small amount of gas is continuously burned, like a pilot light, so that in the event of over-pressure, it is always ready to flare gas.

In British Columbia, the total amount of flared gas for 2004 was approximately 250 million cubic metres (m^3) broken down by the following categories:

Source	Amount of Gas Flared, million m^3
Gas Plant	35.0
Well Testing	72.4
Under-balanced Drilling	89.0
Associated Gas	37.9
Gas Gathering	14.0
Total	248.3

Of the associated gas, about two thirds is continuous (i.e. not upset or emergency) flaring. Although well test flaring is necessary, there is some work that can be done to help standardize allowed flare volumes and durations which may result in some improvements. There may be limited opportunities to reduce flaring during under-balanced drilling. Flaring at gas plants occurs as a result of process upsets, emergencies and plant maintenance. In Alberta, the regulator has implemented some requirements for planned shut downs and identification of causes of recurring upset flaring. There may also be scope to reduce flaring at gas plants in British Columbia, working with operators and the federal regulator, the National Energy Board, which regulates many of the gas plants in British Columbia.

Reduce the flaring and venting of natural gas at test sites, well sites and on pipelines, and eliminate the growth of fugitive gases.

The Ministry will work with industry to develop policies and strategies to reduce the flaring of natural gas at test sites, well sites and on pipelines, and eliminate the growth of fugitive gases and venting. Similar tools as those to reduce routine flaring will be pursued.

37. Establish policies and measures to reduce air emissions in coordination with the Ministry of Environment.

Fossil fuel industries in British Columbia account for approximately 18 per cent of greenhouse gas air emissions in the province. Environment Canada data suggests that the main sources of air emissions from the oil and gas sector are: flaring, fugitive gases, gas processing and compressor stations. In the late 1990's, the amount of gas flared declined as a result of new practices. With increased drilling activity, the amount of gas flared has stabilized. There are also limited unexploited cogeneration opportunities at compressor stations to capture waste heat and generate electricity or use the heat in other applications. Actions to reduce flaring, fugitive gases, increase compressor station efficiency and acid gas reinjection and sequestration are expected to reduce emissions to below 2000 levels.

Development of policies and measures to augment anticipated federal government policies will be part of this initiative.

Develop policy guidelines and identify regions in British Columbia which are suitable for the underground disposal of acid gas.

Disposal of acid gas to underground formations is sometimes a cost effective alternative to sulphur recovery and reduces flaring and emissions.

The Ministry will develop a policy for acid gas disposal based on the underground storage legislation, which has provisions for assigning long-term responsibility through tenuring and licensing arrangements. Currently, acid gas (primarily hydrogen sulphide and carbon dioxide) is being disposed of in depleted gas reservoirs without clearly assigning long term responsibility through tenuring and licensing arrangements.

The Ministry will conduct an assessment of suitable regions in BC for acid gas injection and identify opportunities to facilitate industry activities. Legislation and regulations from other jurisdictions will be reviewed and an appropriate framework will be proposed by 2008/09 or sooner.

Explore opportunities and new technologies to develop underground disposal of carbon dioxide (sequestration or carbon capture and storage).

Geological carbon sequestration involves disposing of carbon dioxide safely and permanently in carefully selected underground locations. There are opportunities to dispose of carbon dioxide into depleted gas reservoirs or specific formations with saline water, or to use the carbon dioxide to enhance oil recovery.

Currently there are more than 50 sites in western Canada for reinjection and permanent storage. For example, the Weyburn project takes carbon dioxide from the US and transports it for use in enhanced oil recovery in Saskatchewan. There may be opportunities for enhanced oil and gas recovery in BC, albeit somewhat limited.

The Ministry will explore with industry the opportunity to dispose of carbon dioxide from major facilities such as processing plants. Geological and hydrogeological mapping and monitoring will be conducted in key areas of interest for acid gas injection through 2009/2010.

Working with International Partners on Carbon Capture

British Columbia is a member of the Plains CO_2 Reduction (PCOR) Partnership composed of nearly 50 private and public sector groups from nine states and three Canadian provinces that is assessing the technical and economic feasibility of capturing and storing carbon dioxide emissions from stationary sources. The province is also a member of the West Coast Carbon Sequestration Partnership, consisting of west coast state and provincial government ministries and agencies that were formed to pursue carbon sequestration opportunities and technologies on the west coast.

As part of The BC Energy Plan the provincial government supports involvement in these partnerships and calls for the development of market oriented requirements with a graduated schedule to foster innovation in sequestration. In consultation with stakeholders, a timetable will be developed along with increasing requirements for sequestration.

Please visit: http://www.em.gov.bc.ca/subwebs/oilandgas/petroleum_geology/carbon.htm for more information.

Create policy to help improve compressor station efficiency and reduce emissions.

The Ministry will develop policies to reduce emissions at compressor stations, improve their efficiency and where possible, capture otherwise wasted heat and transform it into useable energy. In addition, results-based regulations will encourage innovation, new technologies and best practices that are key to an expanding and sustainable oil and gas industry.

The Ministry will work with industry and regulators to pursue the possibility of accelerated introduction of more efficient compressor in BC. One of the tools to be explored is linking the Motor Fuel Tax levied on compressor stations to their efficiency.

38. Best coalbed gas practices in North America. Companies will not be allowed to surface discharge produced water. Any re-injected produced water must be injected well below any domestic water aquifer.

BC will require proponents to follow Best Practices in all stages of coalbed gas development, including:

- Fully engaging communities and First Nations;
- Using the most advanced technology and practices that are commercially viable;
- No surface discharge of CBG produced water; and
- Any re-injected coalbed gas produced water must be well below aquifers.

As a result, the Code of Practice for the Discharge of Produced Water from Coalbed Gas Operations will be reviewed and updated where appropriate.

For more information on the Code of Practices: http://www.env.gov.bc.ca/epd/coalbed_code/pdfs/coalbed_reg.pdf

Conduct scientific and geological research and provide results to potential investors, communities and First Nations to further the exploration and development of coalbed gas.

The Ministry in coordination with the Ministry of Environment will undertake a program to gather scientific and geological data in areas of interest for CBG development. Specifically, numerous issues relating to groundwater have arisen in CBG developments in other jurisdictions and have become a public concern in BC. The existing surface water sampling program will be expanded to include work on groundwater and to conduct hydrogeological studies in coal basins. Research findings will be shared with industry, well owners and local communities including First Nations. Baseline surface hydrology and subsurface hydrogeological studies and monitoring will be conducted in key areas of interest for CBG development, when and where appropriate, including Hudson Hope, Telkwa and other sites, through 2009/2010.

Study and monitoring results will be made available publicly to all interested parties including local communities, First Nations, well owners and industry through 2009/10.

For additional information on coalbed gas see:
http://www.em.gov.bc.ca/dl/Coalbedgas/CoalbedGas_Doc_web.pdf

39. Enhance the Oil and Gas Environmental Stewardship Program, ensuring sound environmental, land and resource management.

A comprehensive review of the oil and gas environmental stewardship program will enhance programs including waste management, habitat enhancement, baseline data collection, planning initiatives such as land use planning and general development plans, programs for environmentally sensitive areas, infrastructure corridors, and remediation and progressive reclamation.

In 2004, the Ministry initiated the Oil and Gas Environmental Stewardship Program having two components: the Environmental Policy Program and the Environmental Resource Information Project. The Environmental Policy Program identifies and mitigates environmental issues in the petroleum sector focusing on policy development in areas such as environmental waste management, habitat enhancement, planning initiatives, wildlife studies for oil and gas priority areas and government best management practices. Some key program achievements include the completion of guidelines for regulatory dispersion modeling, research leading to the development of soil quality guidelines for soluble barium, a key to northern grasses and their restorative properties for remediated well sites, and moose and caribou inventories in Northeast British Columbia.

The Environmental Resource Information Project is dedicated to increasing opportunities for oil and gas development, through the collection of necessary environmental baseline information. These projects are delivered in partnership with other agencies, industry, communities and First Nations.

40. Continue to work to lift the federal moratorium on offshore exploration and development and reiterate the intention to simultaneously lift the provincial moratorium.

In response to provincial requests to lift the federal moratorium, Natural Resource Canada (NRCan) launched a three-part review in 2003. The science component concluded there was no scientific reason to maintain the moratorium (a similar conclusion was reached by the Province's Science Panel in 2002). To date, Canada has not formally responded to the review reports.

The Province re-affirms its commitment to offshore oil and gas exploration and development, its request to Canada to lift the federal moratorium and reiterates that the provincial moratorium will be lifted at the same time.

41. Work with the federal government to ensure that offshore oil and gas resources are developed in a scientifically sound and environmentally responsible way.

While many coastal residents have expressed concern about the prospect of offshore oil and gas activity, some are supportive, provided development is undertaken in an environmentally sound manner, and their communities share in the benefits. A number of First Nations have indicated they might consider offshore activity if they have a role in the management and regulation of activity.

The major tenure holders have stated that before investing in exploration activities, key issues must be addressed: clarification of the fiscal and regulatory regime, identification of "go" and "no go" areas, confirmation of existing tenures, and resolution of First Nation issues.

As a result, the Ministry has focused on the following key areas:

- Engaging First Nations, coastal communities and other key stakeholders who have an interest in how offshore oil and gas development might affect them;
- Developing options for BC's position on management/regulatory and fiscal regimes; and
- Co-ordinating a federal-provincial approach to science.

Considerable progress has been achieved. The Ministry has provided some coastal communities, First Nations and stakeholders with funding for educational activities, and involved First Nation and local government leaders in offshore fact finding tours. The Ministry has also entered into an MOU with the Union of BC Municipalities (UBCM) that establishes an Offshore Oil and Gas Working Group.

The BC Energy Plan reflects government's support for the lifting of the offshore exploration moratorium if it can be done in an environmentally safe and scientifically sound manner. If the moratorium were lifted, before any exploration took place, a framework would be developed through public consultation which would guide all offshore oil and gas activities. Specific issues that would need to be addressed include:

- Comprehensive assessment of offshore developments;
- Adoption of best practices, including "zero discharge" to the marine waters; and
- Negotiation of a collective First Nations representation for all management or regulatory processes.

42. Participate in marine and environmental planning to effectively manage marine areas and offshore oil and gas basins.

British Columbia will continue to participate in oceans strategy and marine planning initiatives including Oceans Strategy, Marine Planning, Marine Protected Areas Strategy and National Marine Conservation Area planning to promote environmental management and economic development objectives in marine areas and offshore oil and gas basins.

43. Develop and implement a comprehensive community engagement program to establish a framework for a benefits sharing agreement resulting from offshore oil and gas development for communities, including First Nations.

Offshore, as a "greenfield" project, represents a unique opportunity to demonstrate the province's commitment to coastal communities, the New Relationship and economic opportunities for First Nations. An early commitment to benefit sharing provides coastal communities and coastal First Nations with a clear interest in future exploration and development, while representation of First Nations in the regulatory processes would be a step in addressing concerns about environmental risks.

44. Pursue regulatory and fiscal competitiveness in support of being among the most competitive oil and gas jurisdiction in North America.

To be the most competitive jurisdiction in North America, new policies and reporting accountabilities will be created, building on the Oil and Gas Development Strategies (OGDS). The Ministry will identify and implement opportunities to reduce costs and increase efficiencies.

Monitor British Columbia's competitive ranking as an oil and gas jurisdiction and publish results.

Every three years the Progress Board or another independent agency will publish a report on the competitiveness of the oil and gas sector in BC. The Progress Board has developed the "North Star" index for the province. A similar index with performance indicators for the oil and gas sector will be created. A first report is expected by the end of 2008/09.

- The BC Progress Board issues an annual benchmarking report comparing British Columbia with other provinces on measures of economy, innovation, education, environment, health and society. Twenty additional performance indicators shed further light on BC's economic and social performance, along with recommendations to reach the Progress Board's 2010 North Star leadership benchmarks.

Further information on the BC Progress board can be found at: http://www.bcprogressboard.com/index.php

Implement a net profit royalty program to stimulate development of natural gas and oil resources.

The Ministry is currently developing a net profit royalty program to stimulate development of natural gas and oil resources by sharing the capital risk of successful developments, recognizing the long-lead times associated with these developments, while maintaining the province's royalty share. The net profit royalty program will be an important tool for government to create incentives for industry activity in under-explored areas of the province such as the Nechako Basin.

- In 2007/08, a net profit royalty program will be available for approved proposals. Projects that qualify for the net profit program are not eligible for any other royalty credit programs. Royalty rates begin at a nominal rate at the beginning of the undertaking and escalate during the project ending at a rate significantly higher than the current rate. The average royalty rate over the life of the project is similar to other programs.

Efficient regulations and cross-ministry harmonization.

The Best Practices Working Group—an industry and inter-agency working group—is a key interface to identify and implement initiatives to reduce costs and improve efficiencies. The Ministry and the Best Practices Working Group will create an annual work plan for initiatives aimed at reducing government and industry costs and improving efficiencies.

Work with industry, the federal government and other provinces to improve regulatory efficiency and reduce federal/provincial overlap.

The Province will work with industry, other provinces and the federal government to improve regulatory efficiency and reduce overlap. There are already harmonization agreements with the federal government, for example under the *Environmental Assessment Act* and *Species at Risk Act* that could serve as a model.

Pursue the development of a Petroleum Registry in coordination with the Ministry of Small Business and Revenue.

The Ministry will evaluate and develop a business case for setting up a BC-specific registry, including negotiating with stakeholders, industry, the Ministry of Small Business and Revenue, the Oil and Gas Commission and other users on the appropriate cost allocation.

A Petroleum Registry that functions as a central database will improve the quality and management of key volumetric, royalty and infrastructure information associated with British Columbia's oil and gas industry. A Registry would make regulatory compliance easier, reduce costs, reduce the amount of paper generated, and provide users with online access to information. It makes it possible for data to be uploaded directly from industry systems and allows stakeholders to submit and edit their data online. This data can be used for a variety of purposes and would be linked with well spacing since it provides information on pools, fields and pipelines. The registry would provide one reporting format to be integrated with other agencies, allowing for quicker delivery of detailed information. .

- In Alberta, the Petroleum Registry has provided the following benefits to industry, the regulator and the Department of Energy:
    - A more accurate royalty administration system;
    - Fewer amendments, reworks, and reconciliation;
    - Better, more reliable, more accessible information,;
    - Standardization and improved effectiveness of input, reporting, and analytic processes.

More information can be found at: http://www.petroleumregistry.gov.ab.ca/

45. Enhance infrastructure to support the development of oil and gas in British Columbia and address impediments to economic development such as transportation and labour shortages.

Under the OGDS III and IV, the Ministry contributes, through a royalty credit-based funding arrangement, to the construction of more and better resource roads, and on a more limited basis, to small-scale natural gas pipelines. The Ministry will identify new infrastructure opportunities for both resource and public road infrastructure. The Province would continue to partner in these infrastructure opportunities through innovative business arrangements such as public private partnerships (P3s) and differential royalty arrangements.

There are areas in northeast British Columbia that have not been explored and developed (sometimes referred to as "white spaces"). Industry has noted two primary impediments: lack of geoscience knowledge and lack of access.

The Ministry will develop actions to address these impediments, such as building on the Pipeline Pilot Program to encourage companies to drill in new or under-drilled areas so as to ensure good stewardship of evaluate the full resource potential.

Northeast British Columbia offers a number of under-explored and under-drilled areas that may be capable of producing oil or gas. However, these potential operating areas lack the necessary infrastructure, in the form of pipelines and processing facilities, to economically extract and transport product to market.

A number of oil and gas producers and pipeline mid-streamers operating in BC have indicated that limited or non-existent pipeline infrastructure is a key barrier to their investment in under-developed oil and gas areas in northeast BC.

Develop a multi-year infrastructure-based royalty program that introduces an integrated approach to the development of resource roads, pipelines and processing facilities. This approach to oil and gas infrastructure will further stimulate development in emerging and under-explored areas of northeast British Columbia.

The existing royalty credit program for resource roads was launched in 2004 and has since been renewed, through new instalments of road-based royalty credits, in each successive year thereafter. The pipeline royalty credit program was implemented on a pilot basis late in 2005 and yield successful results through 2006.

A multi-year infrastructure royalty program, that integrates roads, pipelines and facilities as an infrastructure bundle, will be developed so as to offer oil and gas partners longer term partnership arrangements with the Province, an improved operating chance on measures of risk and return and therefore, even greater confidence to push out the Province's oil and gas frontier. This integrated (resource roads, pipelines and facilities) infrastructure program will revolve a finite pool of infrastructure-based royalty credits through the best candidate oil and gas infrastructure projects. Royalty credits would be advanced into a completed project as it meets requirements to receive the Province's contribution, as credits are subsequently recovered by the Province, through new oil and gas royalties these same royalty credits would be re-advanced to support new infrastructure partnerships. On this basis the Province would invest and re-invest, through a capped but revolving infrastructure fund, in high quality oil and gas infrastructure projects.

A pipeline and facilities royalty credit could incent entry into under-developed areas, both by large companies who traditionally have been reluctant to absorb the full risk of pioneering under-developed areas, and by small producers whose capital resources are typically insufficient to finance large-scale resource development. There may also be cases to stimulate development in under-developed areas through partnerships involving producers, pipeline operators (mid-streamers) and the Province through the royalty credit that is transferable, on a one-time basis, between a mid-stream operator and an oil and gas producer.

Invest in resource-based and public road infrastructure and explore new infrastructure opportunities in northeast British Columbia.

Over the past three years, significant new investment in oil and gas infrastructure has proven to be an important lever in further developing the Province's oil and gas resource and establishing a competitive presence in North American natural gas markets. Building and maintaining high grade, all-season resource roads has demonstrably lengthened the drilling season, opened up new areas to development, and aligned operating costs in BC with other competing jurisdictions. Increased investment in high-grade resource roads, with connections to connecting public roads and highways has also created safer working and living places for industry, contractors and communities.

The Province will continue to invest in the public road infrastructure throughout northeast BC. The Ministry will explore new infrastructure opportunities for public road infrastructure, and continue to partner in the construction of producer built roads, pipeline and facilities infrastructure.

46. Encourage the development of conventional and unconventional resources.

The northeast region of the Province (194,000 square kilometres) has been a focus of petroleum exploration and development since 1952. About 17,000 wells have been drilled to date.

The table below shows the estimated undiscovered resource potential for all of the province, in trillion cubic feet (Tcf) for natural gas, and billion barrels of oil (Bbbl) and the known reserves for northeast BC. BC is primarily a gas producing jurisdiction with raw gas production of about 1.1 Tcf in 2005, has produced about 17.5 Tcf, with remaining reserves of 12.9 Tcf.

	Natural Gas Tcf	Tight Gas Tcf	Shale Gas Tcf	Coalbed Gas, Tcf	Oil Bbbl
RESOURCE POTENTIAL • Conventional	98.0				17.6
• Unconventional		300	250	84	
• Offshore	41.8				9.8
RESERVES • Northeast BC Reserves (Dec 31, 2005)	12.9				0.131
• Northeast BC Produced (up to Dec 31, 2005)	17.5				0.67

Declining conventional resources in North America has lead to a shift in some of the focus of oil and gas producers to unconventional gas—tight gas, shale gas and coalbed gas (CBG). The Western Canada Sedimentary Basin is rich with these emerging resources. The distribution of these unconventional resources, and the total amounts of economically producible or marketable resources are critical to attracting investment, planning for sustainable development and community involvement.

Tight gas is likely to hold the highest potential for remaining technically recoverable natural gas resources in the northeast. Tight gas is now being specifically targeted in pervasive, regional resource play developments, like those focused on the Greater Sierra near Fort Nelson and at Cutbank Ridge, west of Dawson Creek. In 2003 the Ministry of Energy and Mines released an Exploration Assessment of Tight Gas Plays in northeast BC and determined that the in-place tight gas resource base could be about 300 Tcf.

About 25 per cent of BC's 2005 production is estimated to come from tight gas formations. Further research is needed to identify areas of potential growth. Shale gas is just starting to be evaluated and developed in British Columbia.

With commercial success of several shale gas plays in the United States, British Columbia's shales are now being recognized as potential reservoirs estimated to have the capacity to hold about 250 Tcf gas-in-place. Though recoverable volumes will be considerably less, shale gas remains a significant untapped resource. Recent studies by the Ministry on Devonian and Triassic formations in northeast British Columbia, show shale gas potential throughout very large areas.

Undertake assessments and support geoscience evaluations to further the development of shale and tight gas.

While the amount of in-place shale and tight gas in BC is substantial, there are a number of obstacles that may impede development such as technology gaps to extract natural gas, the need for more geoscience, and a lack of knowledge amongst communities, landowners and First Nations on the impacts of developing these unconventional resources.

The Ministry will work with the Petroleum Technology Alliance of Canada (PTAC) and other agencies to address specific technical and community issues to identify areas of potential growth.

Develop policies and new technologies for Enhanced Resource Recovery.

Even with the increased price of crude oil, British Columbia has seen little interest from industry in increasing oil production from existing facilities or exploring and developing oil reserves. The Ministry will identify barriers to enhanced resource recovery.

By partnering with PTAC and other agencies, the Ministry will work with industry to support and develop policies to promote enhanced resource recovery (ERR). In addition, results-based regulations will be introduced in 2008 encouraging industry to implement new leading edge technologies. Results-based regulations will eliminate prescriptive methods that create disincentives to technical development. Through new compliance tools, the Oil and Gas Commission will be able to regulate industry without limiting the introduction of innovation, new technologies and best practices that are key to an expanding and sustainable oil and gas industry.

Enhance marketing efforts with major oil and gas companies in conjunction with the Ministry of Economic Development to increase knowledge of and investment in British Columbia's oil and gas sector.

While there is substantial investment in the oil and gas sector, many oil and gas companies do not have holdings and are not active in BC. To encourage investment, the Ministry will work with the Ministry of Economic Development's market representatives in Calgary, Houston, Asia Pacific and London and federal counterparts (e.g. Canadian consulates) to promote BC's potential resources and the advantages of investing in BC.

A comprehensive marketing plan will be implemented to encourage investment from companies that do not currently have holdings in BC.

47. Support the growth of British Columbia's oil and gas service sector.

The British Columbia based service sector has grown over the past four years and exhibits the

potential for further growth. In 2003, the Minister of Energy, Mines and Petroleum Resources established a Service Sector Strategy Committee with representation from the Northern Society of Oilfield Contractors and Service Firms, the Northeast Aboriginal Business Centre, the Canadian Association of Petroleum Producers and member firms, Treaty 8, the Fort Nelson Chamber of Commerce, the Oil and Gas Commission and the Ministry.

Increased activity in the traditional winter drilling season, together with the emergence summer drilling, has created a more stable, secure, near to year-round operating platform for oil and gas producers enabling them to make multi-year commitments to the service industry and promote local companies.

The Ministry will participate in trade shows and work with the Service Sector Committee to introduce and market BC service sector companies to the oil and gas industry. Companies will both sponsor and participate in these marketing initiatives. The Ministry will continue to actively support the development of the Oil and Gas Centre of Excellence.

Continue to promote awareness of British Columbia-based service sector companies in the interest of the BC sector securing a representative market share of oil and gas activity in the province.

The Ministry will undertake a study in 2007 that updates previous analysis that describes the market share of BC service sector companies. This study will establish a benchmark and identify specific business segments where BC companies can play a larger role. Thereafter, this study will be updated every two years with new data, benchmarks and trend analysis.

In addition, the Ministry and the Service Sector Committee will work to promote BC service sector companies through informing, educating and connecting the business community to expanding and emerging oil and gas both within and outside British Columbia.

Continue to support initiatives that enhance the competitiveness of British Columbia's oil and gas service sector and support the drive toward companies in the service sector capturing representative market share of activity within the province.

The Ministry of Small Business and Revenue is developing a small business strategy and intends to implement this strategy starting in 2007. The Ministry of Energy, Mines and Petroleum Resources will work with the Ministries of Small Business and Revenue and Finance to improve small business competitiveness and specifically pursue a greater share of the oil and gas service sector for BC based businesses.

48. Promote exploration and development of the Interior basins with a priority focus on the Nechako Basin.

The Whitehorse, Bowser and Nechako Basins of north central and interior British Columbia remain largely unexplored as a result of insufficient infrastructure and lack of geological information.

In relation to the Whitehorse and Bowser Basins, the Nechako is less remote; has more favourable geography and infrastructure; more is known about the potential for oil and gas; and is the geographic area most affected by the Mountain Pine Beetle.

While recognizing the potential for oil and gas development throughout the other Interior Basins in the longer term, the Nechako Basin has the most immediate potential to engage industry, First Nations and the local communities.

The Nechako Initiative aspires to provide multiple benefits including:

- Expansion of B.C.'s oil and gas activities;
- Economic diversification and job creation in areas severely affected by the Mountain Pine Beetle; and
- Innovative economic opportunities for First Nations and local communities.

Strategic components of the Initiative include:

- Geoscience information collection and analysis;
- Fostering First Nations relationships and opportunities;
- Community and stakeholder engagement;
- Environmental management;
- Industry promotion;
- Infrastructure development; and
- Policy considerations such as tenure and royalties.

GeoScience BC has received $5 million from the Province specifically targeted for the Nechako Basin. Collaborative programs will leverage additional funds and enhance the knowledge base to stimulate industry investment.

The "New Relationship" has created an opportunity for the Ministry to work with First Nations early in the planning process. Oil and gas exploration is a new industry to local communities and there is a need to communicate basic information about the industry well in advance of any proposed development, for First Nations to meaningfully engage in the process. An early, broad-based capacity development plan is needed to enable effective First Nations engagement by both the Ministry and industry.

Undertake geoscience activity in the Nechako Basin to establish new data of the

resource potential for oil and gas development.

The Ministry, in collaboration with the federal government, other agencies, and industry, will expand its geoscience work to stimulate industry exploration and development of oil and gas resources in the Nechako Basin.

The Nechako Basin is a 70,000 square kilometre area in the central interior of the province. The boundaries of the Nechako Basin are generally considered to be the Skeena Arch in the north, Highway 97 to the east, and the Chilcotin and Camelsfoot Ranges to the south.

The Nechako Basin has promising geologic formations including up to 4,000 meters of sedimentary rocks in smaller sub-basins and the presence of rocks that suggest the potential for oil and gas. There are minor hydrocarbon shows.

To date the area is largely unexplored. Seismic testing was undertaken in the 1980s and only twelve exploration wells have been drilled over the past 75 years with no resulting discoveries.

In conjunction with work being conducted elsewhere in the Interior Basins, geoscience work is being conducted in the Nechako Basin including:

- A review of known data and interpretation of subsurface data;
- A pilot project to re-process old seismic data; and
- Completion of a second field season of geoscience work including source bed analysis of subsurface rocks; a regional heat flow study and a detailed description of subsurface samples. The results will refine the search for hydrocarbons.

The Ministry will continue to develop partnerships, including the federal government, to undertake an extensive seismic program in the Nechako Basin to provide industry with data on the potential resource.

More information on GeoScience BC can be found at:

http://www.geosciencebc.com/

Develop tenures and royalties specific to the Nechako Basin to encourage development and investment.

The traditional means of awarding tenure may not be appropriate for exploration and development in the Interior Basins. More innovative tenure mechanisms and royalty regimes appropriate for these unexplored basins may be considered.

Develop and implement a comprehensive First Nations pre-tenure engagement

program in the Nechako Basin to develop First Nations capacity and knowledge of the oil and gas industry.

Focussing on First Nation's rights and interests, the Ministry will undertake a comprehensive information sharing program with local First Nations to gather their interests and exchange information on the oil and gas industry and the area's potential for development.

Develop and implement a comprehensive First Nations engagement process in the Nechako Basin to develop options for implementing the New Relationship.

The Ministry will undertake a comprehensive engagement process that includes information sharing and pre-tenure consultation with First Nations in the Nechako Basin area. This process will establish a forum to share information on the oil and gas industry and the areas potential for development, while exploring First Nations interests in this region. This process will include developing a potential benefit sharing model that includes economic opportunities.

Develop and implement a comprehensive community engagement program in the Nechako Basin to establish a framework for a benefits sharing agreement.

The Ministry will initiate a community engagement program on oil and gas development in the Nechako Basin. Also, the Ministry will develop, in cooperation with local communities, a benefits sharing framework and an environmental stewardship program.

Develop a comprehensive Environmental Information Program to identify baseline information needs in the Nechako Basin through consultations with government, industry, communities and First Nations.

The need for an environmental information program will be assessed by 2007/08. Data gap analysis will be completed by 2008/09 including a searchable, web accessible database.

49. Encourage the development of new technologies.

British Columbia has the opportunity for technological advancements and commercialization, particularly in environmental management, flaring, carbon sequestration and hydrogeology. The service sector has noted that it can play an important role in developing and commercializing new technologies, however, access to funds is an issue. Royalty credits is one option that is currently not available to the service sector and under this objective, the Ministry will assess the possibility of providing a company with transferability of royalty credits as a funding mechanism.

Establish a technology transfer incentive program.

The province will establish a technology transfer incentive program similar to the Saskatchewan Petroleum Research Incentive model but focusing on different technologies. This program, possibly funded by royalty credits, will encourage the research, development and use of innovative technologies to increase recoveries from existing reserves and encourage responsible development of new oil and gas reserves. The program should be designed to fully recover program costs, over time, through increased royalties generated by expanded development and production of BC's petroleum resources. An additional objective is to transfer the technology developed so there is a greater awareness and use of new technology in BC, particularly technology that leads to the reduction of environmental impacts of oil and gas production.

The BC Scientific Research and Experimental Development Program provides financial support to corporations for research and development that leads to new or improved products and processes. The Ministry, in consultation with the Ministry of Small Business and Revenue, will explore the expansion of the program to cover an individual's project costs directly related to commercially applicable research, development or demonstration for new or improved technologies conducted in British Columbia that facilitate expanded oil and gas production through credits or refunds. Work will also proceed in collaboration with PTAC.

Explore and establish other research and development programs for the oil and gas industry.

The Province will develop a program targeting specific areas where BC has demonstrated strengths.

The Province will work with the Fort St. John Centre of Excellence and other partners to establish an oil and gas technology incubator, encouraging entrepreneurs to develop and commercialize new and innovative technologies and processes. Workshops, information provision and expansion of existing events (e.g., tradeshows and oil and gas conferences) will be held to assist innovators.

The Province will develop a program to encourage oil and gas innovation and research in British Columbia's post-secondary institutions.

The Province will promote investment in research and development opportunities with the PTAC and the new MOU between BC and Alberta on Energy Research, Technology Development and Innovation.

50. Add value to British Columbia's oil and gas industry by assessing and promoting the development of additional gas processing facilities in the province.

The goal is to develop a strategy promoting gas processing facilities in British Columbia. With a number of proposals for new pipelines carrying crude to the coast, landing condensate, and liquefied natural gas regassification terminals, there may be an opportunity to create an integrated petroleum refining and petrochemical industry, providing jobs and investment on the north coast.

Conduct an analysis into the potential for processing facilities to be located in British Columbia.

The Ministry will identify and analyze constraints, in the form of scale or nature of oil and gas processing facilities, that limit development and enhanced stewardship of BC's oil and gas resource.

Determine the viability of establishing a new petroleum refinery and petrochemical industry in British Columbia.

British Columbia is a small crude oil producer in Canada. With approximately 17 million barrels of crude oil production per year (2.8 billion litres), BC provides 1.8 per cent of total Canadian crude oil production. About half of BC's crude oil production is processed at the two refineries—Chevron in North Burnaby and Husky in Prince George, and the rest is processed in Alberta. Small quantities are exported to the US.

There are numerous proposals for condensate and crude oil pipelines, and importing liquefied natural gas for regasification. The Province will establish an industry/government working group to develop business cases and promote opportunities for new refining and petrochemical investment in BC. The working group will report to the Minister within six months with recommendations on the viability of a new petroleum refinery and petrochemical industry and measures, if any, to encourage investment.

51. Provide information about local oil and gas activities to local governments, education and health service providers to inform and support the development of necessary social infrastructure.

Provide local communities and service providers with regular reports of trends and industry activities so that they can more effectively plan for growth in required services and infrastructure.

Work with local communities, ministries and industry to address housing demands.

Ministry of Energy, Mines and Petroleum Resources, in partnership with the Ministry of Forest and Range's Housing Policy Branch, will actively work with and assist communities wishing to implement recommendations of the 2006 Housing Report.

52. Work with First Nations to identify opportunities to participate in and benefit from oil and gas development.

Access to land to explore and develop oil and gas resources is a fundamental requirement as noted by the Progress Board and the Competition Council. First Nations have been increasingly concerned about the incremental approach to resource development, particularly gas well authorizations used by the Oil and Gas Commission. They want to participate in the new wealth being generated by industry within their asserted Traditional Territories.

The "New Relationship" is an opportunity for First Nations to participate in, and benefit from, the development of resources surrounding their communities.

Increase First Nations capacity to participate in, and benefit from oil and gas development.

The Ministry and the Oil and Gas Commission will continue to facilitate and assist in developing First Nations' capacity to engage in the oil and gas sector and work to improve relationships between industry, First Nations, the Oil and Gas Commission and the Ministry.

The Ministry will also facilitate and support opportunities for First Nations training, education (see also The BC Energy Plan Labour Strategy) and private-First Nations' partnerships.

53. Support First Nations in providing cross-cultural training to agencies and industry.

The Ministry will work with First Nations to develop and provide cross-cultural training to agencies and industry.

54. Improve working relationships among industry and local communities and landowners by clarifying and simplifying processes, enhancing dispute resolution methods, and offering more support and information.

In oil and gas development on private land, landowners negotiate land leases with industry. The acts governing oil and gas, minerals, coal and geothermal resources all have provisions for entry on private land by the subsurface resource title holder. These provisions provide rights to the surface landowners beyond those which would be afforded by Common Law.

Improve landowner notification and awareness of sales of oil and gas rights on private land.

The Ministry, in partnership with its established consultation mechanisms, will develop a process to better inform landowners in advance of sales of oil and gas rights on private land.

The Ministry has established several consultation mechanism (i.e., the Northeast Energy Mines Advisory Committee, the Provincial Forum, etc.) to provide advice on oil and gas policy issues. These processes involve participants from First Nations, local government, rural landowners, business and community groups, ranchers, agriculture and wildlife interests among others.

Enhanced web design and information improving landowner's access to online information about existing and proposed oil and gas tenures to better inform landowners of sales of oil and gas rights on private land will be in place in 2007/08.

Improve private landowners' knowledge of subsurface resource titles and lease

arrangements for land used for oil and gas development.

The Ministry will develop an educational package to assist landowners in dealing with subsurface resource titles The Ministry will consult with stakeholders, local landowners, organizations and industry to re-assess the current guidelines and methodologies to determine lease payments to landowners for land used for oil and gas development. Other actions include: development of standardized lease arrangements including an amount (up to $5,000) as assistance to develop a lease arrangement with an oil and gas company, and a publicly accessible registry of lease arrangements to improve transparency.

Assess and improve the process of dispute resolution between landowners and the industry.

The Ministry, in partnership with industry, the Oil and Gas Commission and the Mediation and Arbitration Board will assess processes to resolve disputes between landowners and the industry. Depending on the results of this assessment, landowner organizations will be engaged to develop new processes.

Review current setback regulations.

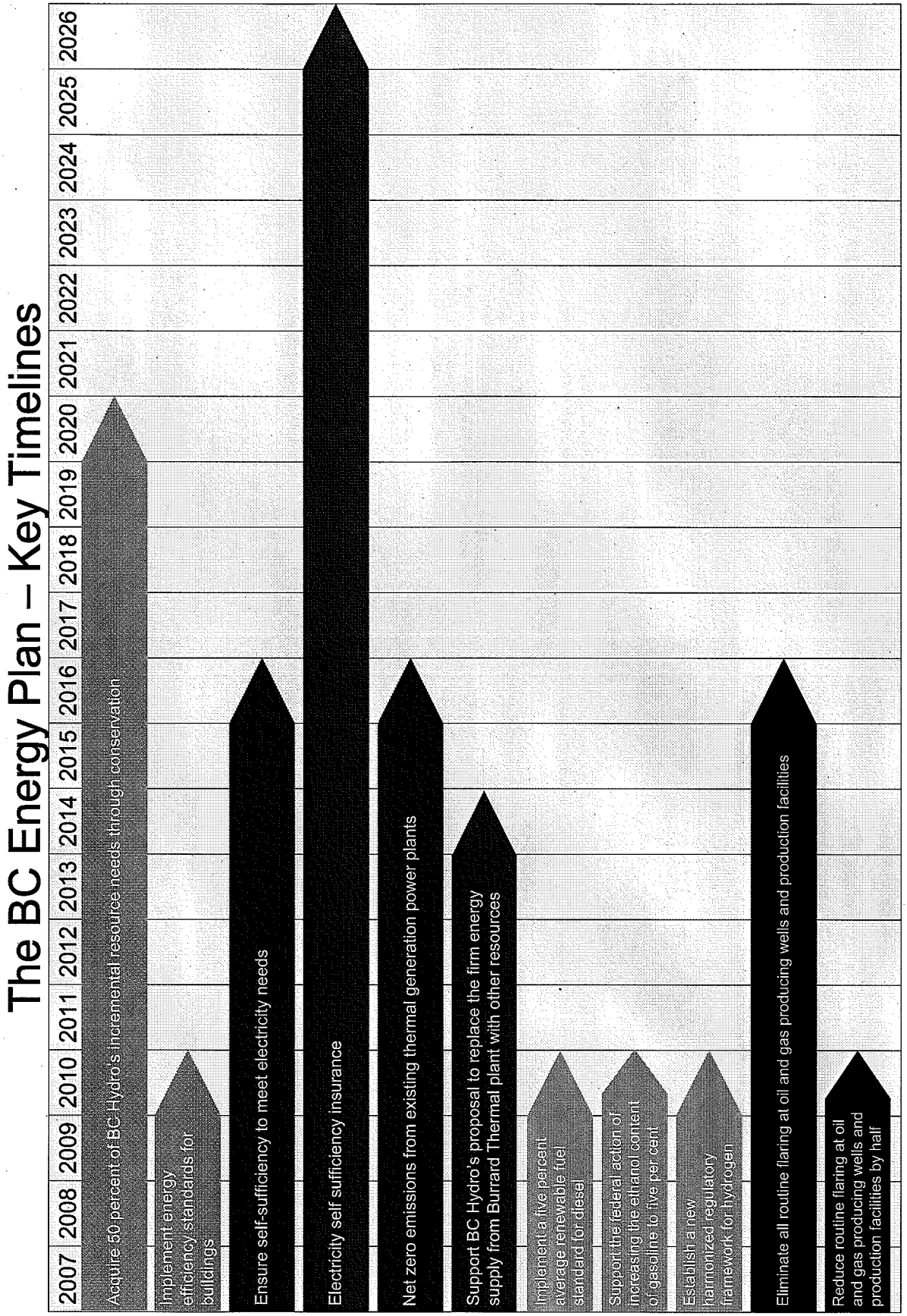
The Ministry will engage with local communities, landowners, First Nations, industry and the Oil and Gas Commission in reviewing requirements for setback distances between wells and occupied building structures based upon scientific studies, public health and safety, and economic and social considerations.

55. Examine oil and gas tenure policies and develop guidelines to determine areas that require special consideration prior to tenure approval.

Develop clear and consistent guidelines to determine areas which are off-limits for oil and gas tenures or where special management practices are required.

The Ministry will work with local governments, communities, landowners, stakeholders and First Nations to develop guidelines to determine which areas require special consideration for oil and gas tenures.

Notice of special areas will be posted on line and identified on the Petroleum Titles Online maps.


The BC Energy Plan – Key Timelines
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Acquire 50 percent of BC Hydro's incremental resource needs through conservation
Implement energy efficiency standards for buildings
Ensure self-sufficiency to meet electricity needs
Electricity self sufficiency insurance
Net zero emissions from existing thermal generation power plants
Support BC Hydro's proposal to replace the firm energy supply from Burrard Thermal plant with other resources
Implement a five percent average renewable fuel standard for diesel
Support the federal action of increasing the ethanol content of gasoline to five per cent
Establish a new harmonized regulatory framework for hydrogen
Eliminate all routine flaring at oil and gas producing wells and production facilities
Reduce routine flaring at oil and gas producing wells and production facilities by half

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APPENDIX C

Utility Survey Results

1.0 Residential Rate Structure Review

This appendix summarizes the commonly used rate structures of a default residential tariff. The summary is based on a review of the tariffs offered by a sample of 88 utilities in North America, Europe and Asia. This sample contains large utilities, has good Canadian representation, and spans winter and summer-peaking regions. The review leads BC Hydro to conclude that a year-round two-step tariff is common among Canadian and non-Canadian utilities that use an inclining block structure, thus supporting the adoption of BC Hydro's preferred RIB rate design as a first step in re-designing residential tariffs in British Columbia.

Table C-1 reports the number of utilities included in the tariff review that use a particular tariff structure, which may be an inclining block, declining block, flat, or time-of-use (TOU) structure.

The following observations emerge from this table:

- Three (18 per cent) of the 17 Canadian utilities have inclining block tariffs,[1] three (17 per cent) have declining block tariffs, 11 (65 per cent) have flat rate tariffs, and none use TOU pricing for a default tariff;

- Eighteen (30 per cent) of the 61 U.S. utilities have inclining block tariffs year round, five (8 per cent) have summer inclining block but winter declining block tariffs, two (3 per cent) have inclining block summer and flat winter tariffs, three (5 per cent) have flat summer and declining block winter tariffs, two (3 per cent) have declining block tariffs year round, and 31 (51 per cent) have flat rate tariffs. None uses TOU pricing for a default tariff;

- One (12.5 per cent) of the 8 European utilities has an inclining block tariff, one (12.5 per cent) has a declining block tariff, five (62.5 per cent) have flat rate tariffs, and one (12.5 per cent) has a TOU tariff;

- Both Asian utilities (100 per cent) (Hong Kong and Japan) have inclining block tariffs; and

- Overall, 47 (53 per cent) of the 88 utilities have flat rate tariffs, 24 (27 per cent) have inclining block tariffs, six (7 per cent) have declining block tariffs, five (6 per cent) have

[1] Toronto Hydro was chosen as a representative electricity distribution utility (EDU) in Ontario because all EDUs regulated by the Ontario Energy Board (OEB) offer seasonal inclining block tariffs that reflect the provincial rates set by the OEB for generation energy. As of January 2008, these generation energy rates are 5 cents/kWh for winter consumption up to 1,000 kWh/month during November - April, and 5.9 cents/kWh for consumption above the 1,000 kWh/month threshold. The summer threshold is 600 kWh/month.

summer inclining but winter declining block tariffs, two (2 per cent) have inclining block summer but flat winter tariffs, three (3 per cent) have flat summer but declining block winter tariffs, and one (1 per cent) has TOU tariffs.

The above observations show that:

(a) simplicity is a common feature of a default tariff, as suggested by the flat rate tariffs' popularity; and

(b) after the flat rate structure, the inclining block is the second most commonly used rate structure.

Table C-1 Number of Utilities Offering a Particular Default Residential Tariff

Tariff Structure	Canada	US	Europe	Asia	Total
Inclining block year round	3	18	1	2	24
Summer inclining block but winter declining block	0	5	0	0	5
Inclining summer flat winter	0	2	0	0	2
Flat summer declining winter	0	3	0	0	3
Declining block year round	3	2	1	0	6
Flat rate year around	11	31	5	0	47
TOU	0	0	1	0	1
Total	**17**	**61**	**8**	**2**	**88**

Table C-2 presents the number of utilities offering year-round inclining block tariffs with a particular number of steps, which may range from two to six. Of the 24 utilities shown in Table C-1, 13 (54 per cent) utilities have tariffs with two steps, six (25 per cent) have inclining blocks with three steps, and five (21 per cent) have inclining blocks with four or more steps. However, all three Canadian utilities have two-step inclining block tariffs.[2]

[2] Hydro Quebec has a $/kW-month charge for very large customers (e.g., apartment buildings) with winter (December - March) demand of over 50 kW.

Table C-2 Number of Utilities Offering Year-Round Inclining Block Tariffs by Number of Steps

Number of steps	Canada	US	Europe	Asia	Total
2	3	10	0	0	13
3	0	5	0	1	6
4	0	0	0	1	1
5	0	3	0	0	3
6	0	0	1	0	1
Total	**3**	**18**	**1**	**2**	**24**

Table C-3 below delineates the 24 year-round inclining block tariffs in Table 1-1 in this appendix by season (e.g. summer versus winter), location (e.g. coast versus inland), end-use (e.g. non-electric versus electric heating), and dwelling type (e.g. single versus multi-family).[3] It shows that two (67 per cent) of the three Canadian utilities using an inclining block structure have simple tariffs, with rates and thresholds that do not vary by season, location, end-use, or dwelling type.[4] The simple two-step tariffs are also popular among the European and Asian utilities. In the U.S., five of the 18 utilities have the simple two-step tariffs.

Table C-3 Number of Utilities Offering Year-Round Inclining Block Tariffs by Usage Attribute

Rate and threshold that vary by usage attribute	Canada	US	Europe	Asia	Total
(1) None	2	5	1	2	10
(2) Season only	1	6	0	0	7
(3) Location only	0	0	0	0	0
(4) End-use only	0	1	0	0	1
(5) Dwelling type only	0	1	0	0	1
Combination of two or more of (2) to (5) above	0	5	0	0	5
Total	**3**	**18**	**1**	**2**	**24**

The following tables provide further information used to create the foregoing tables

[3] The summer-only inclining block tariffs, by default, vary by season.

[4] The lone exception is Toronto Hydro whose seasonal component is regulated by the OEB.

Table C-4 Default Tariffs Offered by Utilities in Canada (Year-Round Inclining Block)

Utility	Province	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Hydro Quebec[a]	Quebec	2				
2. Toronto Hydro[b]	Ontario	2	X			
3. Yukon Energy	Yukon	2				

Notes: a See footnote 2.
b See footnote 1.

Table C-5 Default Tariffs Offered by Utilities in Canada (Year-Round Declining Block)

Utility	Province	Attributes				
		# of steps	Season	Location	End-use	Dwelling type
1. Manitoba Hydro	Manitoba	2				
2. Maritime Electric	PEI	2				
3. New Brunswick Power	New Brunswick	2				

Table C-6 Default Tariffs Offered by Utilities in Canada (Year-Round Flat)

Utility	Province	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. ATCO Electric	Alberta	NA				
2. Direct Energy	Canada	NA				
3. EPCOR	Alberta	NA	X	X		
4. Fortis BC	BC	NA				
5. Hydro One[a]	Ontario	NA	X			
6. Newfoundland and Labrador Hydro	Newfoundland	NA				
7. Newfoundland Power	Newfoundland	NA				
8. Northland Utilities (ATCO)	Northwest Territories	NA				
9. Nova Scotia Power	Nova Scotia	NA				
10. Sask Power	Saskatchewan	NA		X		
11. Saskatoon Power and Light	Saskatchewan	NA				

Note (a) Hydro One's Standard Supply Service's (UR2) monthly energy charge is a monthly weighted average of hourly spot market prices.

Table C-7 Default Tariffs Offered by Utilities in U.S. (Year-Round Inclining Block)

Utility	State	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. AEP (Indiana Michigan Power Co.)	MI	2			X	
2. Arizona Public Service (APS)	AZ	3	X			
3. Avista Utilities	WA	3				
4. City of Seattle	WA	2	X	X		
5. Consumers Energy Company	MI	2	X		X	
6. Duke Energy Corp.	NC	2	X			
7. Florida Power and Light	FL	2				
8. Georgia Power	GA	3	X			
9. Jersey Central Power and Light	NJ	2	X			
10. PacificPower	OR	3				
11. PECO Energy	PA	2	X		X	
12. PG&E	CA	5	X	X	X	X
13. Progress Energy (Florida)	FL	2				
14. Public Service Electricity and Gas Co.	NJ	2	X			
15. Puget Sound Energy	WA	2				
16. SCE	CA	5				X
17. SDG&E	CA	5	X	X	X	X
18. SMUD	CA	3	X			

Table C-8 Default Tariffs Offered by Utilities in U.S. (Inclining Block Summer and Declining Block Winter)

Utility	State	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Alabama Power Company	AL	2	X			
2. Consolidated Edison	NY	2	X			
3. Dominion Virginia	VA	2	X			
4. Duke Energy Corp.	OH	2	X			
5. Long Island Power Authority	NY	2	X		X (3-step)	

Table C-9 Default Tariffs Offered by Utilities in U.S. (Inclining Block Summer and Flat Winter)

Utility	State	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Idaho Power	ID	2	X			
2. United Illuminating	CT	2	X			

Table C-10 Default Tariffs Offered by Utilities in U.S. (Flat Summer and Declining Winter)

Utility	State	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Ameren Union Electric	MO	2	X			
2. Commonwealth Edison	IL	2	X			
3. Kansas City Power and Light	MO	3	X		X	

Table C-11 Default Tariffs Offered by Utilities in U.S. (Year-Round Declining Block)

Utility	State	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Indianapolis Power and Light	IN	2			X	
2. MDU Resources Group Inc.	WY	2				

Table C-12 Default Tariffs Offered by Utilities in U.S. (Year-Round Flat)

Utility	State	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Alaska Electric Power and Light	AK	NA				
2. Alaska Power	AK	NA		X		
3. Allegheny Power	PA	NA				
4. Anchorage Municipal Light and Power	AK	NA				
5. Baltimore Gas & Electricity	MD	NA				
6. Bangor Hydro	ME	NA				
7. Carolina Power and Light Co.	NC	NA				
8. Cheyenne Light Fuel and Power Co.	WY	NA				
9. Chugach Electric	AK	NA				
10. Connecticut Light and Power	CT	NA				
11. Detroit Edison	MI	NA				
12. Duquesne Light	PA	NA				
13. El Paso Electric	TX	NA				
14. Flathead Electric Coop	MT	NA				
15. Gulf Power	FL	NA				
16. Idaho Falls Power	ID	NA				
17. Inland Power & Light	WA	NA				
18. Jacksonville Electric Authority	FL	NA				
19. Los Angeles DWP	CA	NA				
20. Massachusetts Electric Co.	MA	NA				
21. Mission Valley Power	MT	NA				
22. Montana-Dakota Utilities	MT	NA				
23. Northern States Power	MN	NA				
24. Northwestern Energy	MT	NA				
25. NSTAR	MA	NA				
26. Rocky Mountain Power	ID	NA				
27. Rocky Mountain Power	WY	NA				
28. Salmon River Electric Coop	ID	NA				
29. Wisconsin Electric Power Co.	WI	NA				
30. Wisconsin Public Service	WI	NA				
31. Xcel Energy	CO	NA				

Table C-13 Default Tariffs Offered by Utilities in Europe and Asia (Year-Round Inclining Block)

Utility	Country	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Enel (SPA)	Italy	6				
2. China Power and Light	Hong Kong, China	4				
3. Tokyo Electric Power Co.	Japan	3				

Table C-14 Default Tariffs Offered by Utilities in Europe and Asia (Year-Round Declining Block)

Utility	Country	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. London Energy	UK	2				

Table C-15 Default Tariffs Offered by Utilities in Europe and Asia (Year-Round Flat)

Utility	Country	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Electricidade de Portugal	Portugal	NA				
2. Electricite de France	France	NA				
3. EnviaM	Germany	NA				
4. Hafslund	Norway	NA				
5. Mosenersgobyte (Moscow Energy)	Russia	NA		X		X

Table C-16 Default Tariffs Offered by Utilities in Europe and Asia (Seasonal)

Utility	Country	Attributes				
		Number of steps	Season	Location	End-use	Dwelling type
1. Bewag	Germany	NA	X			

2008 Residential Inclining Block Rate Application

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APPENDIX D

Draft BCUC Order and Draft Tariff Sheets

BRITISH COLUMBIA UTILITIES COMMISSION

ORDER NUMBER G-

SIXTH FLOOR, 900 HOWE STREET, BOX 250
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web site: http://www.bcuc.com

TELEPHONE: (604) 660-4700
BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

IN THE MATTER OF
the *Utilities Commission Act*, R.S.B.C. 1996, Chapter 473

and

An Application by British Columbia Hydro and Power Authority (BC Hydro)_
For Approval of a Residential Inclining Block Rate Structure

BEFORE: _____, Commissioner _____, 2008

DRAFT
O R D E R

WHEREAS:

A. BC Hydro filed on February 26, 2008 pursuant to sections 58-61 of the *Utilities Commission Act* (the Act) an application for approval of a two-step residential inclining block (RIB) rate structure for its customers, to be effective October 1 2008, or as soon thereafter as practicable;

B. Under the proposed RIB rate structure most of BC Hydro's residential customers would, in addition to a daily Basic Charge, pay a lower Step-1 Rate for all electricity consumption up to 1600 kWh per bi-monthly Billing Period, and pay a higher Step-2 Rate for all consumption in excess of 1600 kWh per bi-monthly Billing Period;

C. Further, under the proposed RIB structure, the Step-1 Rate and the Basic Charge would increase annually on April 1 by the projected inflation rate inherent in the revenue requirement for the fiscal year beginning on that April 1; the Step-2 Rate would be increased to allow the recovery by BC Hydro of the residual

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residential revenue requirement, on a revenue neutral basis; and any changes to rates arising from rate re-balancing directions of the Commission would be applied equally to each of the Step-1 Rate, the Step-2 Rate and the Basic Charge;

D. BC Hydro proposed that if the proposed RIB were to be implemented prior to April 1, 2009, the initial pricing of the Step-1 Rate and the Basic Charge would be calculated by increasing by 2.1 per cent the Basic Charge and the Step 1 Rate in place on March 31, 2008, with the Step-2 Rate being calculated residually on the basis of any across-the-board interim rate increase allowed by the Commission effective April 1, 2008, again on a revenue neutral basis;

E. ADD PROCESS RECITALS

F. The Commission has considered the evidence and submissions regarding BC Hydro's proposed RIB rate structure and concludes that it would result in rates that are fair, just and not unduly discriminatory.

NOW THEREFORE the Commission orders as follows:

1. BC Hydro's proposed RIB rate structure is approved, as applied for, effective October 1, 2008.

2. For greater certainty, Rate Schedules 1101 and 1121 shall be amended and filed with the Commission on or before September 30, 2008 to show a Step-1 Rate of 6.28 cents/kWh; a Basic Charge of 12.38 cents/day; a Step-1 Threshold of 1600 kWh per bi-monthly Billing Period; and a Step-2 Rate of 6.98 cents/kWh.

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BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

3. New Rate Schedules 1151 and 1161, for those customers on exempt residential service, will be filed with the Commission on or before September 30, 2008 showing a flat rate of 6.55 cents/kWh and a Basic Charge of 12.93 cents/day.

4. On or before February 28, 2009 BC Hydro shall file Rate Schedules 1101, 1121, 1151 and 1161 that are to be effective April 1, 2009, reflecting the Commission's acceptance of BC Hydro's proposed RIB rate structure, the revenue requirement then applicable to the fiscal year beginning April 1 2009, and any rate rebalancing rate changes effective April 1, 2009.

DATED at the City of Vancouver, in the Province of British Columbia, this day of _____ 2008.

BY ORDER

Draft BC Hydro Tariff Pages – October 1, 2008

The attached draft tariff sheets show the proposed tariff pages that would be effective October 1, 2008 that arise from this application, based on an assumption that the BCUC has allowed an interim across-the-board rate increase of 6.56 per cent as requested in BC Hydro's F09/F10 RRA and that the rate rebalancing effects of the 2007 RDA have been suspended.

BC Hydro
Rate Schedules
Effective: 01 October 2008
Draft

SCHEDULE 1101, 1121 – RESIDENTIAL SERVICE

Availability: For Residential Service. Service is normally single phase, 60 hertz at the secondary potential available. In BC Hydro's discretion, service may be three phase 120/208 or 240 volts.

Applicable in: Rate Zone I.

Rate:

1. Schedule 1101 - Residential Service

Basic Charge 12.38~~56~~¢ per day
~~All kW.h @ 6.37¢ per kW.h~~
Energy Charge
A. For Customers billed monthly
Step 1 – First 800 kW.h per month @ 6.28 cents/kW.h
Step 2 – Additional kW.h per month @ 6.98 cents/kW.h

B. For Customers billed bi-monthly
Step 1 – First 1600 kW.h per two months @ 6.28 cents/kW.h
Step 2– Additional kW.h per two months @ 6.98 cents/kW.h

2. Schedule 1121 - Multiple Residential Service

Basic Charge 12.38~~56~~¢ per Single-Family Dwelling per day
~~All kW.h @ 6.37¢ per kW.h.~~
Energy Charge – Per Single Family Dwelling
A. For Customers billed monthly
Step 1 – First 800 kW.h per month @ 6.28 cents/kW.h
Step 2 – Additional kW.h per month @ 6.98 cents/kW.h

B. For Customers billed bi-monthly
Step 1 – First 1600 kW.h per two months @ 6.28 cents/kW.h
Step 2 – Additional kW.h per two months @ 6.98 cents/kW.h

Minimum Charge: Schedule 1101 - The Basic Charge.

Schedule 1121 - The Basic Charge per Single-Family Dwelling.

BC Hydro
Rate Schedules
Effective: 01 October 2008
Draft

Special Conditions:

1. The maximum capacity of all heating elements energized at any one time in any water heater served under this schedule shall not exceed the greater of 1,500 watts or 45 watts per litre (200 watts per imperial gallon) of tank capacity, except with the written permission of BC Hydro.

2. Schedule 1121 applies if a Premises contains more than two Single-Family Dwellings.

Discount for Ownership of Transformers:

A discount of 25¢ per month per kW of maximum demand shall be applied to Schedule 1121 if a Customer supplies the transformation from a primary potential to a secondary potential. BC Hydro will install a demand meter in addition to a kilowatt hour meter. BC Hydro will install its meters at the secondary potential. The Billing Code for Schedule 1121 Customers eligible for the Discount for Ownership of Transformers shall be Schedule 1122.

Rate Rider:

The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.

BC Hydro
Rate Schedules
Effective: 01 October 2008
Draft

SCHEDULE 1151, 1161 - EXEMPT RESIDENTIAL SERVICE

Availability: For residential service and uses exempted from rate schedules 1101 and 1121, including:

1. Use upon farms as referenced in the definition of Residential Service.
2. Residential service Customers in Rate Zone IB.
3. Customers enrolled in BC Hydro's Conservation Research Initiative (CRI) Pilot program as of October 1, 2008 and who, immediately prior to this Rate Schedule becoming effective, were receiving service as part of the Control Group under Rate Schedule 1101. A Customer who ceases to be enrolled in the CRI Pilot program shall revert to service under Rate Schedule 1101.

Service is normally single phase, 60 hertz at the secondary potential available. In BC Hydro's discretion, service may be three phase 120/208 or 240 volts.

Applicable in: Rate Zone I and Rate Zone IB

Rate:

1. Schedule 1151 – Residential Service

   Basic Charge 12.93¢ per day
   All kW.h @ 6.55¢ per kW.h

2. Schedule 1161 – Multiple Residential Service

   Basic Charge 12.93¢ per day per Single-Family Dwelling per day
   All kW.h @ 6.55¢ per kW.h

Minimum Charge: Schedule 1151 - The Basic Charge.

Schedule 1161 – The Basic Charge per Single-Family Dwelling

Special Conditions` The maximum capacity of all heating elements energized at any one time in any water heater served under this schedule shall not exceed the greater of 1,500 watts or 45 watts per litre (200 watts per imperial gallon) of tank capacity, except with the written permission of BC Hydro.

Discount for Ownership of Transformers: A discount of 25¢ per month per kW of maximum demand shall be applied to Schedule 1161 if a Customer supplies the transformation from a primary potential to a secondary potential. BC Hydro will install a demand meter in addition to a kilowatt hour meter. BC Hydro will install its meters at the secondary potential. The Billing Code for Schedule 1161 Customers eligible for the Discount for Ownership of Transformers shall be Schedule 1162.

Rate Rider: The Deferral Account Rate Rider as set out in Rate Schedule 1901 applies to all charges payable under this Rate Schedule, before taxes and levies.

2008 Residential Inclining Block Rate Application

BC hydro

APPENDIX E

Residential Class Average Rate Increase Sensitivity Analysis

Scenario A: 15.7 Per Cent Average Residential Class Rate Increase Over 3 Years
5.0 Per Cent Per Year

BC Hydro Design vs BCUC Proposed Design:	Year 1			Year 2			Year 3			Comments
	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	
A1) BC Hydro Proposed RIB Design	12.38	6.28	6.73	12.64	6.41	7.56	12.91	6.55	8.33	Structure remains an inclining block in all years. Step-1 Rate remains stable in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) and does not decline in real terms from Step-1 Rate in previous year. Step-2 Rate better reflects, but does not exceed, the full cost of new electricity supply (plus fixed costs).
A2) BCUC Proposed Design: RS 1823 Tier 2 Price = 5.40 cents/kWh (February 2008) (Grossed Up = 6.07 cents/kWh)	12.38	6.75	6.07	12.64	7.19	6.07	12.91	7.72	6.07	Structure does not remain an inclining block in all years (is a declining block structure).
A3) BCUC Proposed Design: RS 1823 Tier 2 Price = 7.36 cents/kWh (Proposed April 2008) (Grossed Up = 8.27 cents/kWh)	12.38	5.20	8.27	12.64	6.04	8.27	12.91	6.58	8.27	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year.
A4) BCUC Proposed Design: Year 3 RS 1823 Tier 2 Price = 10.0 cents/kWh (Future Call) (Grossed Up = 11.24 cents/kWh)	12.38	5.20	8.27	12.64	6.04	8.27	12.91	5.03	11.24	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year.

Notes:

* In BC Hydro Proposed RIB Design, 2.1% increase (inflation) is directed into Step-1 Rate & Basic Charge.

* In BCUC Proposed Designs, 2.1% increase (inflation) is directed into Basic Charge.

Scenario B: 21.1 Per Cent Average Residential Class Rate Increase Over 3 Years
RRA Only (6.56 Per Cent Year 1, 8.21 Per Cent Year 2, 5 Per Cent Year 3)

BC Hydro Design vs BCUC Proposed Design:	Year 1			Year 2			Year 3			Comments
	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	
B1) BC Hydro Proposed RIB Design	12.38	6.28	6.98	12.64	6.41	8.53	12.91	6.55	9.35	Structure remains an inclining block in all years. Step-1 Rate remains stable in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) and does not decline in real terms from Step-1 Rate in previous year. Step-2 Rate better reflects, but does not exceed, the full cost of new electricity supply (plus fixed costs).
B2) BCUC Proposed Design: RS 1823 Tier 2 Price = 5.40 cents/kWh (February 2008) (Grossed Up = 6.07 cents/kWh)	12.38	6.92	6.07	12.64	7.69	6.07	12.91	8.25	6.07	Structure does not remain an inclining block in all years (is a declining block structure).
B3) BCUC Proposed Design: RS 1823 Tier 2 Price = 7.36 cents/kWh (Proposed April 2008) (Grossed Up = 8.27 cents/kWh)	12.38	5.37	8.27	12.64	6.55	8.27	12.91	7.11	8.27	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year. Structure does not maintain a sufficiently large differential between Step-2 Rate and Step-1 Rate in all years.
B4) BCUC Proposed Design: Year 3 RS 1823 Tier 2 Price = 10.0 cents/kWh (Future Call) (Grossed Up = 11.24 cents/kWh)	12.38	5.37	8.27	12.64	6.55	8.27	12.91	5.56	11.24	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year.

Notes:

* In BC Hydro Proposed RIB Design, 2.1% increase (inflation) is directed into Step-1 Rate & Basic Charge.

* In BCUC Proposed Designs, 2.1% increase (inflation) is directed into Basic Charge.

Scenario C: 24.0 Per Cent Average Residential Class Rate Increase Over 3 Years
RRA Only (6.56 Per Cent Year 1, 8.21 Per Cent Year 2, 7.5 Per Cent Year 3)

BC Hydro Design vs BCUC Proposed Design:	Year 1			Year 2			Year 3			Comments
	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	
C1) BC Hydro Proposed RIB Design	12.38	6.28	6.98	12.64	6.41	8.53	12.91	6.55	9.90	Structure remains an inclining block in all years. Step-1 Rate remains stable in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) and does not decline in real terms from Step-1 Rate in previous year. Step-2 Rate better reflects, but does not exceed, the full cost of new electricity supply (plus fixed costs).
C2) BCUC Proposed Design: RS 1823 Tier 2 Price = 5.40 cents/kWh (February 2008) (Grossed Up = 6.07 cents/kWh)	12.38	6.92	6.07	12.64	7.69	6.07	12.91	8.54	6.07	Structure does not remain an inclining block in all years (is a declining block structure).
C3) BCUC Proposed Design: RS 1823 Tier 2 Price = 7.36 cents/kWh (Proposed April 2008) (Grossed Up = 8.27 cents/kWh)	12.38	5.37	8.27	12.64	6.55	8.27	12.91	7.40	8.27	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year. Structure does not maintain a sufficiently large differential between Step-2 Rate and Step-1 Rate in all years.
C4) BCUC Proposed Design: Year 3 RS 1823 Tier 2 Price = 10.0 cents/kWh (Future Call) (Grossed Up = 11.24 cents/kWh)	12.38	5.37	8.27	12.64	6.55	8.27	12.91	5.85	11.24	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year.

Notes:

* In BC Hydro Proposed RIB Design, 2.1% increase (inflation) is directed into Step-1 Rate & Basic Charge.

* In BCUC Proposed Designs, 2.1% increase (inflation) is directed into Basic Charge.

Scenario D: 34.6 Per Cent Average Residential Class Rate Increase Over 3 Years
RRA (6.56 Per Cent Year 1, 8.21 Per Cent Year 2, 5 Per Cent Year 3) Plus RDA Rate Rebalancing Each Year

BC Hydro Design vs BCUC Proposed Design:	Year 1			Year 2			Year 3			Comments
	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	
D1) BC Hydro Proposed RIB Design	12.83	6.51	7.23	13.57	6.88	9.16	14.36	7.28	10.40	Structure remains an inclining block in all years. Step-1 Rate remains stable in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) and does not decline in real terms from Step-1 Rate in previous year. Step-2 Rate better reflects, but does not exceed, the full cost of new electricity supply (plus fixed costs).
D2) BCUC Proposed Design: RS 1823 Tier 2 Price = 5.40 cents/kWh (February 2008) (Grossed Up = 6.07 cents/kWh)	12.83	7.32	6.07	13.57	8.49	6.07	14.36	9.53	6.07	Structure does not remain an inclining block in all years (is a declining block structure).
D3) BCUC Proposed Design: RS 1823 Tier 2 Price = 7.36 cents/kWh (Proposed April 2008) (Grossed Up = 8.27 cents/kWh)	12.83	5.78	8.27	13.57	7.34	8.27	14.36	8.39	8.27	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year. Structure does not maintain a sufficiently large differential between Step-2 Rate and Step-1 Rate in all years.
D4) BCUC Proposed Design: Year 3 RS 1823 Tier 2 Price = 10.0 cents/kWh (Future Call) (Grossed Up = 11.24 cents/kWh)	12.83	5.78	8.27	13.57	7.34	8.27	14.36	6.84	11.24	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year.

Notes:

* In BC Hydro Proposed RIB Design, Basic Charge and Step-1 Rate increased by 2.1% (projected rate of inflation) and by 3.6% (RDA rate rebalancing).

* In BCUC Proposed Designs, 2.1% increase (project rate of inflation) and 3.6% RDA rate rebalancing are directed into Basic Charge.

Scenario E: 37.8 Per Cent Average Residential Class Rate Increase Over 3 Years
RRA (6.56 Per Cent Year 1, 8.21 Per Cent Year 2, 7.5 Per Cent Year 3) Plus RDA Rate Rebalancing Each Year

BC Hydro Design vs BCUC Proposed Design:	Year 1			Year 2			Year 3			Comments
	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	Basic Charge (cents per day)	Step-1 Rate (cents per kWh)	Step-2 Rate (cents per kWh)	
E1) BC Hydro Proposed RIB Design	12.83	6.51	7.23	13.57	6.88	9.16	14.36	7.28	11.01	Structure remains an inclining block in all years. Step-1 Rate remains stable in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) and does not decline in real terms from Step-1 Rate in previous year. Step-2 Rate better reflects, but does not exceed, the full cost of new electricity supply (plus fixed costs).
E2) BCUC Proposed Design: RS 1823 Tier 2 Price = 5.40 cents/kWh (Feb 2008) (Grossed Up = 6.07 cents/kWh)	12.83	7.32	6.07	13.57	8.49	6.07	14.36	9.85	6.07	Structure does not remain an inclining block in all years (is a declining block structure).
E3) BCUC Proposed Design: RS 1823 Tier 2 Price = 7.36 cents/kWh (Proposed April 2008) (Grossed Up = 8.27 cents/kWh)	12.83	5.78	8.27	13.57	7.34	8.27	14.36	8.71	8.27	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year. Structure does not remain an inclining block in all years (is a declining block structure in Year 3). Structure does not maintain a sufficiently large differential between Step-2 Rate and Step-1 Rate in all years.
E4) BCUC Proposed Design: Year 3 RS 1823 Tier 2 Price = 10.0 cents/kWh (Future Call) (Grossed Up = 11.24 cents/kWh)	12.83	5.78	8.27	13.57	7.34	8.27	14.36	7.16	11.24	In 1 or more years, Step-1 Rate decreases in real dollar terms compared to 6.15 cents/kWh (rate in place in Feb 2008 at time of filing) or declines in real terms from Step-1 Rate in previous year.

Notes:

* In BC Hydro Proposed RIB Design, Basic Charge and Step-1 Rate increased by 2.1% (projected rate of inflation) and by 3.6% (RDA rate rebalancing).

* In BCUC Proposed Designs, 2.1% increase (inflation) and 3.6% RDA rate rebalancing are directed into Basic Charge.

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APPENDIX F

Summary of Stakeholder Engagement & Customer Research

1.0 Introduction

Within a relatively short timeframe, BC Hydro considered and evaluated alternatives and designed its proposed RIB rate structure. During this period, BC Hydro provided periodic updates of the issues and challenges inherent in designing an inclining block rate to the Rates Working Group[1] (RWG) and sought their feedback. BC Hydro also sought the feedback of the BC Old Age Pensioners Association (BCOAPO), a significant customer intervenor group that is not available to participate on the RWG, through separate meetings. BC Hydro also completed qualitative customer focus group research. The input and feedback gathered from stakeholders and customers was helpful in informing and validating design choices around the RIB rate and planning for customer communications and implementation.

2.0 Stakeholder Engagement – Rates Working Group

The mandate of the RWG, which had its first meeting in May 2007, is to provide "input and advice on how BC Hydro can design and implement rates that provide a price signal to encourage economically efficient and cost effective conservation, and efficient use of electricity, while ensuring that rates are fair and simple to understand."[2] At the July 2007 meeting, BC Hydro indicated its intent to consider an inclining block rate as an initial step in using rates to encourage conservation and requested the RWG's feedback on:

- the suitability of an inclining block rate as an initial conservation rate;
- what other rate structures, if any, the RWG believed would be more effective as an initial conservation rate; and
- if an inclining block rate was selected by BC Hydro as an initial residential conservation rate, how could it best be designed in order to increase its conservation effectiveness.

The RWG identified various rate structures with potential as an initial conservation rate for residential customers, including an inclining block rate, and prepared a preliminary summary of advantages and disadvantages. Initial feedback provided by the RWG included:

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1 The RWG is a sub-committee of the Electricity Conservation and Efficiency Advisory Committee (EC&E). The RWG members and the organizations or constituents that they represent are included in the RWG Terms of Reference at Attachment 1 to this appendix.

2 The RWG Terms of Reference are at Attachment 1.

- in principle, members were supportive of BC Hydro moving quickly to establish an initial conservation/efficiency based rate for residential customers;

- members were concerned that an inclining block rate may not be the most effective conservation and efficiency rate;

- members believed that a rate structure based on a 'flat rate with dividend' might offer more potential as an initial conservation rate (at its simplest, this rate structure would involve setting a price significantly higher than the current price, such as at the marginal cost of supply, but then providing customers the ability to earn a 'dividend' or 'rebate' based on the customer taking pre-defined conservation or efficiency measures); and

- greater analysis and due diligence would be required prior to making a final decision regarding the best rate to use as an initial conservation rate.

The RWG was working to finalize their recommendations to BC Hydro when the BCUC released its 2007 RDA Decision including the direction for BC Hydro to file a residential inclining block rate by March 31, 2008. As a result, the RWG concluded that it would document their emerging conclusions on a 'flat rate with dividend' rate structure and then turn the RWG's attention to rate structures for the longer-term. Nevertheless, as BC Hydro provided RIB rate design updates, the RWG provided BC Hydro with specific feedback on design and implementation issues. RWG feedback at the December 2007 and January 2008 meetings included:

- it would be better to set the block size so that the most customers will be impacted;

- the Step-1 Rate should be set higher than the current flat rate;

- although BC Hydro needs to be sensitive to low-income customers, the role of providing financial assistance, if any, lies with government rather than with the utility; and

- it would be a difficult education process regarding rates and that communication and messaging will be important.

The RWG advised BC Hydro to plan communications carefully so that the public understands the RIB rate and the actions they can take to conserve. Specific proposals were: use actual dollar figures in any communication; provide information on no/low cost actions and behavioural changes that people can make to conserve; provide simple scenarios that identify the electricity bill impacts as a result of the RIB rate structure and 'what if' examples if customers utilize Power Smart programs and take conservation actions.

3.0 Customer Focus Group Research

BC Hydro undertook qualitative research regarding rates in May 2007 and November 2007. This research was intended to understand customer attitudes towards various rate structures, rate increases, and communication messaging that could be most effective in building a conservation culture.

The research provided directional indication that customers tend to be supportive of an inclining block rate structure where higher users pay more. The research also indicates that customers generally recognize that price signals, as long as they are supported by strong messaging and Power Smart programs, could be effective in realizing conservation, although in the absence of such support, the rate might fail, result in a backlash, or both.

The reports are included at the end of this appendix at Attachments 2 and 3.

Final Rates Working Group
Terms of Reference

INTRODUCTION

BC Hydro is committed to mutually beneficial, respectful, and transparent engagement with First Nations, British Columbia communities and stakeholders. The purpose of these Terms of Reference (TOR) is to ensure that the members of BC Hydro's Rates Working Group have a clear understanding of the Working Group's objectives and what is expected of its members. These TOR are intended to provide assurance that First Nations, community and stakeholder values will be integrated into BC Hydro's electricity rates planning while supporting the smooth functioning of the Rates Working Group.

Context

1. The Provincial Energy Plan provides the energy policy direction for British Columbia and guidance for BC Hydro's planning and operations. The Energy Plan's vision for clean energy leadership is a made in BC solution to the global challenge of ensuring secure reliable supply of affordable energy in an environmentally responsible way. The actions contained within this plan seek to deliver social, environmental, and economic benefits throughout B.C. by conserving energy and improving the energy efficiency of homes and buildings. BC Hydro will play a key role in implementing the details of the Provincial Energy Plan.
2. The British Columbia Utilities Commission is a regulatory agency of the Provincial Government, operating under, and administering, the Utilities Commission Act ("UCA"). The Commission's mission is to ensure that ratepayers receive safe, reliable, and non-discriminatory energy services at fair rates from the utilities it regulates, and that shareholders of those utilities are afforded a reasonable opportunity to earn a fair return on their invested capital.
3. In March 2006 BC Hydro presented its 2006 Integrated Electricity Plan (IEP) to the BC Utilities Commission. The 2006 IEP provided an analysis of challenges and choices fundamental to securing British Columbia's electricity future by looking at two critical questions:
   a) What are the resources BC Hydro will need to meet its share of British Columbians' electricity demands and
   b) when will BC Hydro need them?
4. BC Hydro's current load forecast indicates that BC's electricity requirements will grow between 25 and 45 percent over the next 20 years. As part of its responsibility to ensure the province's electricity supply needs for the future are met, BC Hydro is looking at a variety of options to fill our future needs and the supply gap that is emerging ahead. Filling the emerging electricity gap will be met in three fundamental ways: conserving more, buying more from independent power producers and building more.
5. For a number of reasons BC Hydro believes the first priority for managing the future supply gap that has been identified should be achieving cost and economically effective conservation. Central to this is helping industrial, commercial and residential customers become more efficient and wise in their use of electricity. BC Hydro believes the development and implementation of its initiatives to assist customers with electricity conservation are likely to be more effective if they are informed by input from First Nations, British Columbia communities, and stakeholders. BC Hydro further believes such input is best achieved through the establishment of a formal Rates Working Group that is informed and is able to interact with BC Hydro on an ongoing basis.
6. BC Hydro is aligned to play a leadership role in delivering the Provincial Energy Plan and will work with government, customers, industry and the public to achieve the objectives the company sets out. As such, BC Hydro has agreed to establish a Rates Working Group to provide advice and input into

the Long Term Rate Strategy, 20 year Demand Side Management Plan, Conservation Research Initiative and Advanced Metering Infrastructure, all of which involve rates that need to be designed to meet the objectives of the Provincial Energy Plan.

WORKING GROUP OBJECTIVES

7. The objectives of the Rates Working Group are to:

   a) Build awareness and understanding of different rate options, their potential impact and how each rate option could contribute to reducing the electricity gap through encouraging conservation and shifting patterns of energy use.

   b) Provide input and advice on the design and implementation of rates that will be supported by BC Hydro's customers.

   c) Identify any challenges or unforeseen opportunities in Utilipoint's 'pricing portfolio'.

   d) Review customer research on possible rate options and the acceptable rate/pace of change, and advise on how new rate structures could be implemented.

   e) Provide input and advice on how to improve BC Hydro's approach to moving from the existing tariff to the implementation of a conservation based tariff.

   f) Provide recommendations for best methods of communicating potential changes to First Nations and Stakeholders.

   g) Provide input and advice on the best methods of communicating potential rate changes to First Nations and Stakeholders

.

   h) Review and provide recommendations and advice in regards to the evaluation results of any potential rate trials.

MANDATE

8. The over-arching mandate of the Rates Working Group is that given the growing gap between electricity supply and demand in B.C., the group will provide input and advice on how BC Hydro can design and implement rates that provide a price signal to encourage economically efficient and cost effective conservation, and efficient use of electricity, while ensuring that rates are fair and simple to understand.

9. The mandate for the first year of the Working Group's operation is:

   a) To provide advice, input, and generate innovative concepts and approaches to support the development of BC Hydro's Long Term Rate Strategy, 20 year Demand Side Management Plan, Conservation Research Initiative and Advanced Metering Infrastructure initiatives.

   b) To provide a forum for identifying and responding to key issues associated with BC Hydro's tariff. In developing recommendations, the Rates Working Group shall do so in a manner that recognizes BC Hydro operates within a context of provincial energy policy, the regulatory mandate of the British Columbia Utilities Commission, international treaties, customer expectations, unresolved Aboriginal land claims, environmental issues and business and other requirements.

   c) To provide advice on how to structure meaningful opportunities for other stakeholder and First Nations input on BC Hydro's rates and electricity conservation and efficiency programs, and to assist BC Hydro in designing its ongoing approach to creating those opportunities for input.

10. Input and advice from the Rates Working Group to BC Hydro will be recorded in the meeting notes and in the Annual Consultative Report of the Electricity Conservation and Efficiency Advisory Committee.

OPERATIONS

11. The Rates Working Group shall also be responsible for working with the Facilitator to prepare information to be included in the Annual Consultative Report as outlined in the Electricity Conservation and Efficiency Advisory Committee Terms of Reference and forward this documentation to BC Hydro's Project Team(s) involved with rates initiatives.

12. On or before March, 31st of each year, BC Hydro and the Rates Working Group shall review the Mandate and determine if there are changes to the Mandate that both parties believe would be beneficial for the ensuing year.

13. While the role of the Rates Working Group is purely "advisory" (i.e. the Working Group has no authority to make decisions that are binding on BC Hydro):

   a) BC Hydro will work with the Rates Working Group to ensure that the interests and concerns in relation to rates identified by the Working Group are clearly understood and considered in the design and implementation of BC Hydro's Long Term Rate Strategy, 20 year Demand Side Management Plan, Conservation Research Initiative and Advanced Metering Infrastructure initiatives;

   b) For each recommendation made by the Rates Working Group, BC Hydro will advise the members how it deals with that recommendation (i.e. if the recommendation is accepted in whole, in part, or with modifications, and the specific steps taken by BC Hydro on the basis of that recommendation); and

   c) Where the BC Hydro decides not to act on part or all of a recommendation, or decides to modify a recommendation, it shall provide the Working Group with a rationale for its decision.

14. The Rates Working Group shall work with the Facilitator to prepare and sign off on documentation that will be provided to the Electricity Conservation and Efficiency Advisory Committee for the purpose of forming part of their annual consultative report. The following information should be included:
    a) the overall Rates Working Group process, including the Rates Working Group's mandate, objectives and operations;
    b) the rate options considered and an evaluation of the potential impacts identified for each, including suggestions around the design and implementation of rates that would be supported by BC Hydro's customers;
    c) recommendations on the best methods of communicating potential changes to First Nations and Stakeholders;
    d) areas of agreement and disagreement;
    e) assessment of the effectiveness of the Rates Working Group in influencing the design and implementation of BC Hydro rates initiatives;
    f) Rates Working Group members' assessment of their experience as members and how well the interests of their organizations were addressed;
    g) suggestions or recommendations to BC Hydro on appropriate changes to any similar future stakeholder involvement processes; and
    h) other aspects of the process the Rates Working Group wishes to address.
15. In addition to informing the Electricity Conservation and Efficiency Advisory Committee, the Working Group will elect a representative to present the information to BC Hydro's project teams involved with the Long Term Rate Strategy, 20 year Demand Side Management Plan, Conservation Research Initiative and Advanced Metering Infrastructure initiatives.

DECISION-MAKING

16. The Rates Working Group shall function as a consensus based organization:
    a) Consensus shall be defined as no substantial disagreement on an issue/matter by any member; however;
    b) Consensus may include agreement on a document that describes different points of view on an issue/matter;
    c) Consensus shall be determined by the Facilitator asking if any member substantially disagrees with a proposed decision or recommendation on a matter; and
    d) BC Hydro representatives appointed to the Rates Working Group shall not participate in any determination of whether a consensus exists on a proposed recommendation in relation to a substantive issue/matter related to the Mandate.
17. All recommendations in relation to substantive issues/matters related to the Mandate, including periodic revisions to these Terms of Reference shall be made by consensus.

18. In the event of an impasse in relation to a substantive issue/matter:
    a) the Facilitator shall assist Rates Working Group members in identifying a mutually acceptable resolution to the impasse using interest based approaches/techniques the Facilitator considers most appropriate in the circumstances – these may include:
        i) Assisting Rates Working Group Members to clearly define the issue(s) and areas of disagreement;
        ii) Assisting Rates Working Group Members to identify their interests with respect to the subject under discussion;
        iii) Utilizing brainstorming sessions and other techniques determined appropriate by the Facilitator to identify options that can address the interests identified;
        iv) Assisting the Rates Working Group Members to develop criteria for evaluating options, where appropriate; and
        v) Facilitating the evaluation of options and the selection of the preferred option; and
    b) If the impasse remains, the Facilitator shall record the specific issue in dispute and the differing views with respect to that issue (without attribution to individual Members unless they ask to be specifically identified);

19. The Rates Working Group shall strive to deal with all administrative and procedural issues/matters by consensus.

20. In the event of an impasse in relation to a substantive administrative and procedural issue/matter:
    a) The Facilitator will make a specific recommendation to the Rates Working Group on how the issue/matter should dealt with from a best practices perspective; and
    b) If the impasse remains, the issue will be dealt with in a manner determined most appropriate by the Facilitator.

RATES WORKING GROUP STRUCTURE

Members

21. The Rates Working Group shall consist of:
    a) Fifteen individuals drawn from the Energy Conservation and Efficiency Advisory Committee, other Stakeholder Engagement initiatives and the general public.
    b) One representative from BC Hydro.

22. All decisions on membership, including reappointments, new appointments, and term of appointments shall be made by BC Hydro.

23. The initial membership of the Rates Working Group shall be as listed in Appendix 1 of these ToR (the ("Initial Appointments").

24. The term of all Initial Appointments shall be
    a) one year effective as of April 15, 2007, plus either
    b) an additional one or two years determined on a lottery basis.

25. Upon the expiry of the Initial Appointments:

    a) BC Hydro shall consider reappointments and determine new appointments in a manner that draws a balance between continuity of Rates Working Group membership and creating opportunities for new members; and

    b) The term of all reappointments and new appointments shall be two years.

26. BC Hydro may cancel membership of an individual at any time on the basis of poor attendance or failure to conduct oneself in accordance with the "Responsibilities of Members" as set out below.

27. There shall be no provision for alternate members.

Observers and Guests

28. Upon request, and where agreed to by the Rates Working Group, First Nations representatives, community representatives, and other stakeholders may attend selected meetings as observers ("Observers"):

    a) The dates of meetings open to Observers will be established by the Rates Working Group;

    b) and made available in advance;

    c) Observers will not sit at the main table;

    d) Except where requested and/or agreed to by the Rates Working Group, Observers will not make presentations or participate in discussion; and

    e) Observers will not participate in any decision making.

29. Where determined appropriate, the Rates Working Group may invite experts or other individuals to attend meetings to provide technical presentations or respond to questions on a subject relevant to the considerations of the Working Group ("Guests") – Guests will not participate in decision-making.

ANNUAL WORK PLAN

30. On or before March, 31st of each year, BC Hydro and the Working Group shall develop a mutually acceptable work plan for the following year. This work plan shall:

    a) Identify the key tasks to be undertaken by the Working Group for the upcoming year, required actions, information and sequence of steps to undertake those tasks and assignment of responsibility for each of those steps; and

    b) Establish a meeting schedule for the year.

RESPONSIBILITIES OF MEMBERS

31. Rates Working Group members are expected to:

    a) conduct themselves and discuss issues in a manner that is constructive, interest based, and respectful of others;

    b) strive for consensus;

    c) attend and actively participate in all meetings;

    d) review all provided materials in advance of meetings;

    e) review draft notes of each meeting they participate in and suggest any modifications or additions they deem necessary to ensure the accuracy of the notes;

    f) acquaint themselves with the discussion and outcomes at any meetings they are unable to attend;

    g) keep their constituents informed on progress of the Rates Working Group; and

    h) work with the Facilitator to ensure that the results of the Rates Working Group is an accurate representation of the members' experience and views that will be incorporated into the Electricity Conservation and Efficiency Advisory Committee's Annual Consultative Report.

PROCESS MANAGEMENT

Facilitator

32. BC Hydro may appoint a Facilitator or engage the services of an independent Facilitator mutually acceptable to the Working Group.

33. The Facilitator shall be responsible for:

    a) aiding the Rates Working Group in achieving its Mandate;

    b) ensuring that all parties are heard and assisting parties in resolving differences in a manner that is fair and without unnecessary delay or expense;

    c) ensuring all discussions take place in a manner consistent with Section 30(a);

    d) being and remaining impartial, according equal attention and courtesy to all persons involved;

    e) facilitating all meetings of the Rates Working Group and, upon request, facilitating any sub-groups;

    f) working with the BC Hydro Project Team(s) and Rates Working Group members to create an agenda for each meeting;

    g) working with BC Hydro Project Team(s) to ensure the draft meeting notes accurately reflect the Rates Working Group's discussions and decisions when they are distributed to the Rates Working Group members for review; and

    h) working with the Rates Working Group members to produce documentation that will be provided to BC Hydro's Project Team(s) and the Electricity Conservation and Efficiency Advisory Committee for their Annual Consultative Report.

BC Hydro Project Team

34. BC Hydro shall establish a Project Team(s) to support the work of the Rates Working Group.

35. The Project Team(s) shall be responsible for:

    a) Providing relevant background material to Rates Working Group members, for their review and consideration, in advance of each meeting;

    b) Seeking input from Rates Working Group members on the tasks and activities identified in BC Hydro's Long Term Rate Strategy, 20 year Demand Side Management Plan, Conservation Research Initiative and Advanced Metering Infrastructure initiatives;

    c) Reviewing the Rates Working Group's recommendations;

    d) Providing a rationale for how each recommendation provided by the Rates Working Group has been addressed (i.e. if the recommendation is accepted in whole, in part, or with modifications, and the specific steps taken by BC Hydro on the basis of that recommendation);

    e) Incorporating recommendations received by the Rates Working Group into BC Hydro's current planning process and or plans where appropriate as determined above;

    f) Coordinating all communications on Rates Working Group activities to internal and external audiences; and

    g) Providing all logistics support to the Rates Working Group as necessary.

Stakeholder Engagement Advisor

36. BC Hydro shall designate a Stakeholder Engagement Advisor who will be the primary contact person for all Rates Working Group Members.

37. The Stakeholder Engagement Advisor shall be responsible for:

    a) arranging for facilitation services;

    b) preparing and distributing materials for the Rates Working Group meetings;

    c) arranging the logistics of all meetings;

    d) preparing and distributing meeting notes of Rates Working Group meetings, workshops or other meetings; (Meeting notes are expected to summarize discussions and record agreements, decisions, and any areas of disagreements. All such draft notes will be distributed directly to each Rates Working Group Member for review and comment.);

    e) assisting with preparation and presentation of the documentation to be provided to the Rates Working Group and BC Hydro Project Team(s);

    f) administering participant resources;

    g) developing and maintaining communication links with interested parties;

    h) maintaining a database of interested parties who are to receive newsletters and other materials about the Rates Working Group;

    i) producing and issuing all communications materials about the Rates Working Group; and

    j) ensuring that all draft newsletters and other public or communications materials about the Rates Working Group are reviewed with the Working Group before issuing them.

MEETINGS

38. Meetings of the Rates Working Group shall be conducted in accordance with an agenda approved by the Working Group at the outset of the meeting – to expedite this, the Facilitator shall distribute in advance of each meeting a draft/proposed agenda based on the Work Plan, discussion/direction at the prior Rates Working Group meeting, and input form the BC Hydro Project Team

39. Except where otherwise agreed by the Rates Working Group, meetings shall be attended only by Members, Observers, Guests, and the BC Hydro Project Team.

40. Meetings of the Rates Working Group shall be recorded in meeting summaries that briefly summarize the matters discussed and any recommendations made. Unless specifically requested by them, meeting summaries shall not attribute specific points of view to individual Members.

PUBLIC COMMUNICATION

41. The following will be made publicly available by being posted on the BC Hydro website:

    a) The Rates Working Group Terms of Reference;
    b) The agenda for each meeting;
    c) The summary notes once approved by the Rates Working Group;
    d) Newsletters, press releases and/or media updates; and
    e) Other work or material produced by the Rates Working Group that the members agree should be made public.

42. BC Hydro may periodically prepare and distribute newsletters, press releases and/or media updates describing the Rates Working Group and its progress - such material will not be distributed prior to being reviewed by the Rates Working Group.

43. While Rates Working Group Members may speak to their constituents, stakeholders, the public, and media regarding the Rates Working Group and its work, they will do so in a manner consistent with the following:

    a) they will seek to express their points of view as interests rather than positions;
    b) they will make it clear they are expressing the views of their organization and/or their personal views and are not speaking on behalf of the Rates Working Group;
    c) they will not speak to the views of other Members or attribute specific positions, suggestions, comments, etc. to them; and
    d) they will not characterize and report, information, data, or other documents they or others have provided to the Rates Working Group as being sanctioned or endorsed by the Rates Working Group unless specifically agreed to by the Rates Working Group.

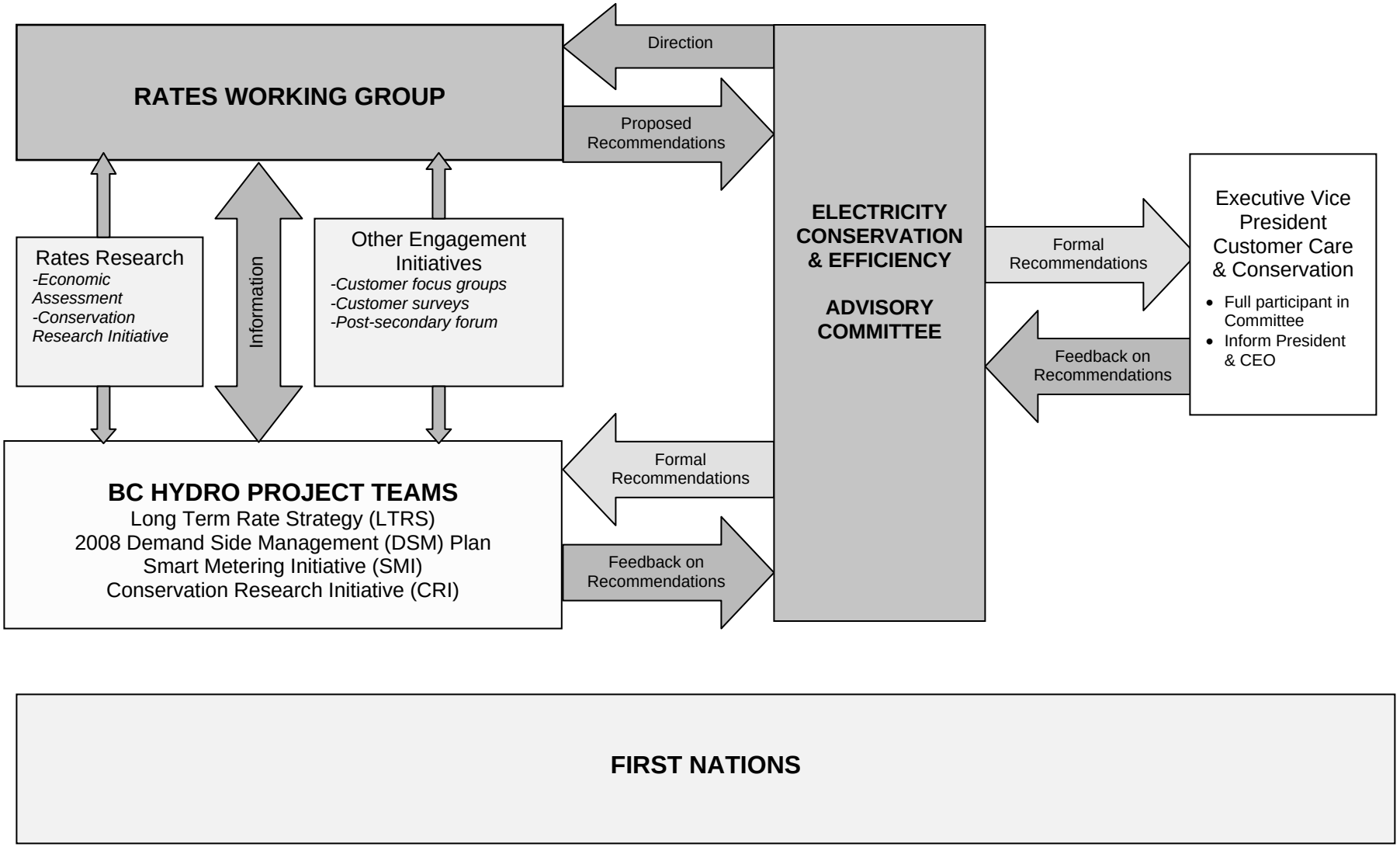
44. The Rates Working Group may periodically select a spokesperson, to speak publicly for the Rates Working Group.

APPENDIX 1

Rates Working Group Membership:

Ludo Bertsch	Energy Solutions Vancouver Island Society
John Cockburn	Chief Standards & Labelling, Natural Resources Canada
David Craig	President, Consolidated Mgmt Consultants representing Commercial Energy Consumers of B.C.
Dennis Fitzgerald	Catalyst Paper
Iris A. Frank	Ucluelet First Nation
Tom Hackney	Sierra Club of Canada - BC Chapter
Daniel Johnston (Facilitator)	Hope Johnston and Associates
Sue Kent	Independent
John Newcomb	Independent
David Perttula	Terasen Gas
Dan Potts	Joint Industry Electricity Steering Committee (JIESC)
Jim Quail	Public Interest Advocacy Group
Nic Rivers	Simon Fraser University
Dan Smith	Hamatla Treaty Society
Michelle Taschereau	Brite-Lite Vancouver Inc.
Robert Wickson	BC Chamber of Commerce

Appendix 2: Information flow between the Electricity Conservation & Efficiency Advisory Committee, Rates Working Group and BC Hydro



Research Findings

Rate Strategy Qualitative Research

November 16, 2007

Proprietary Warning

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f: (613) 230-9048

Montreal
1080 Beaver Hall Hill
Suite 400
Montreal, Quebec
H2Z 1S8

t: (514) 288-0037
f: (514) 288-0138

Vancouver
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www.harrisdecima.com

Introduction

We are pleased to present the following report summarizing the results of our recent wave of qualitative research investigating public opinion around BC Hydro's (BCH) long term rate strategy. This report represents the findings of four focus groups.

This phase of research was the second wave of a research project investigating perceptions around the possible ways in which BC Hydro could use rates as part of a strategy to modulate demand and promote conservation.

The research explored perceptions of what people felt would be fair, appropriate and efficient ways to establish price signals in a desire to promote conservation.

Step based pricing alternatives were introduced to participants to test the level of fairness of each. Further, we explored how people reacted to different messaging as to the rationales for using different signals.

A total of four super-groups (more than double the size of traditional focus groups) were held in Victoria (November 5, 2007) and Vancouver (November 6, 2007). The first group in each city was conducted with a mix of old age pensioners and low income respondents. The second group was conducted with a mix of BC Hydro's key target segments, drawn from the segmentation work conducted as part of Power Smarts year end user study: Stumbling Proponents, Devoted Conservationists, Comfort Seekers, Humble Practitioners, Tuned out and Carefree and Entrenched Libertarians.

Harris/Decima employed a unique interactive feedback technology known as the Perception Analyzer™ that optimizes the traditional focus group approach. Each group participant was given a hand-held dial that relayed his or her responses via radio frequency to an interface connected to a PC.

By using the Perception Analyzer™, we were able to accommodate 25 to 35 participants in each session. Conducting groups of this size improves the reliability of results, without compromising the qualitative benefits.

Each session was 2 hours long, allowing ample time to review and respond to a variety of stimuli and to evaluate a series of key communications messages.

Key Findings

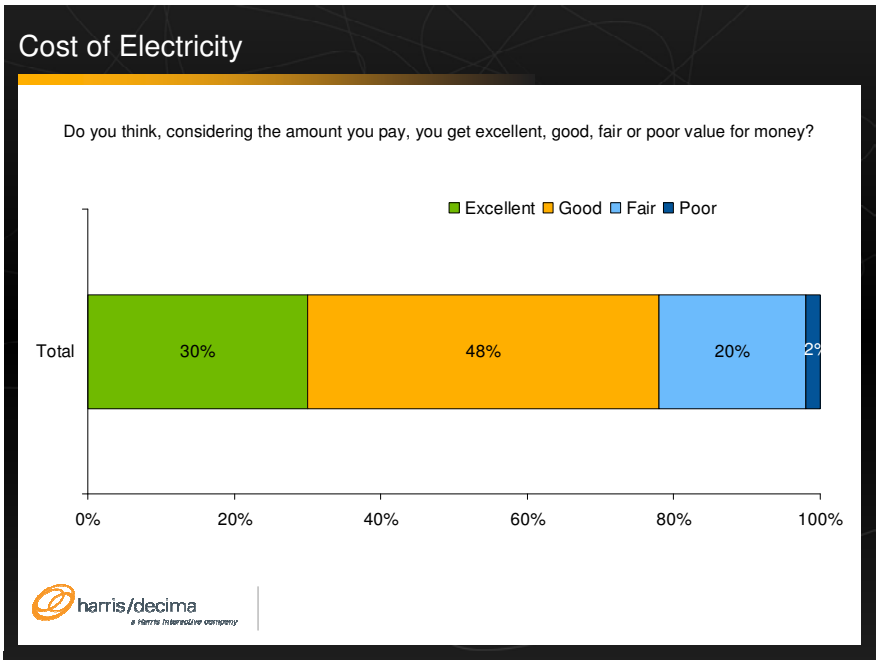
Current Electricity Usage and Pricing

The focus groups began with a general discussion to establish levels of knowledge and perceptions of the pricing of electricity. Participants were asked to discuss the cost of electricity they use in their household; the level of value for money as well as their perception of electricity waste.

1. **Most people have no more than a general sense of how much they pay for electricity.** A minority know in precise detail, often those who maintained detailed monthly budget recording within their household. At the other end of the spectrum, in each group there were a significant number of people who were renters who said that their electricity was included in the price of their accommodation and they were therefore completely unaware of the price of electricity.

   "I try to be mindful and I have a general sense of it, but (I'm) not fussed to the penny."

2. Most people feel that they are getting good value for money from BC Hydro when they consider the cost and the benefits. When probed to explain how they arrive at that feeling, the most common response was that the power was almost always there when they needed it – in effect commenting favorably on the general reliability of the power supply.



After discussion some people commented that they had trouble really being sure about whether they were getting value for money, since they weren't sure how electricity prices in BC compared to prices elsewhere. However, whenever this comment was heard, it was often followed by a comment by others, to the effect that comparing jurisdictions were not always a fair or reasonable way of assessing value.

"When someone's out of service, we get help pretty quickly. Reliability is part of the value."

3. **Most participants said that they waste electricity, and believe they could conserve more.** Almost all participants said they were guilty of doing things such as leaving lights on, keeping electronics plugged in and computers turned on when they aren't in use, and allowing heat to escape from their houses.

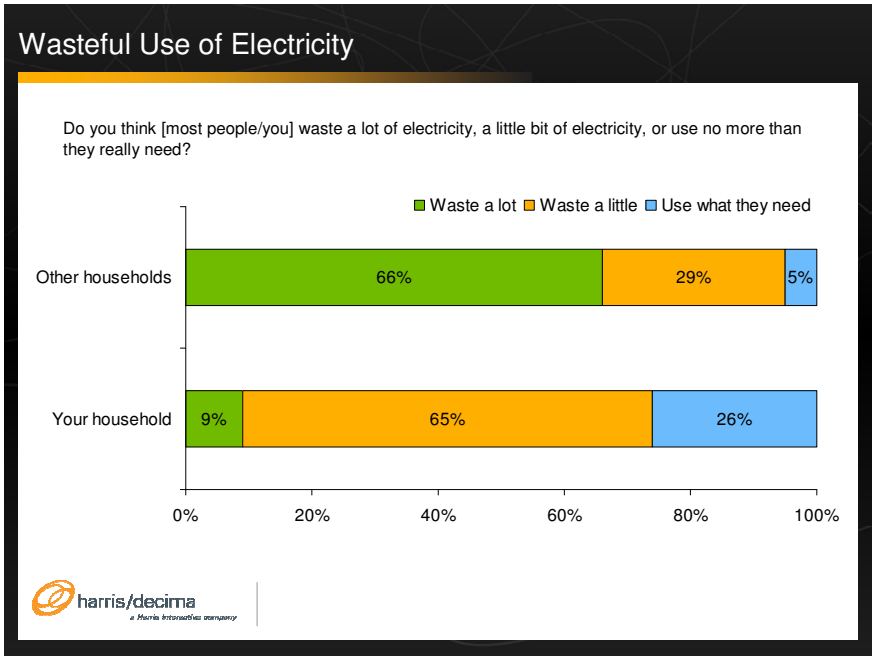
What is interesting, and has been evident in the quantitative research we have done on this subject as well, is that many people who see themselves as wasting electricity, also believe that they have become better conservers over time. Many feel that while they do waste some energy, they also do quite a bit to conserve and tried to be more conscious of their electricity use by such things as turning the lights off when they don't need them and being more careful about how they use major appliances.

Typically, many of those whose electricity costs were included in their rent acknowledged that they were not so conditioned to avoid waste. Some noted that the building managers really controlled how much heating and cooling energy was wasted, and in some cases wasted a lot rather than invest in efficiency upgrades. Some also noted that there can be a tendency to feel there is little point in trying to conserve if you feel that many of your apartment neighbors are clearly not doing the same thing.

"I just don't think about it, I am one of those people that waste a lot of power, I never think about it (probably because) it's included my rent. "

4. **Having for the most part characterized themselves as moderate energy wasters, participants were generally convinced that most other people wasted a lot of electricity.** When talking about "others", participants found it easy to come up with a relatively comprehensive list of the things they saw that they felt were wasteful. This list included:

- Business using excessive lighting, either in the form of office building lights being on at all times, or extensive use of fluorescent billboards and signage.
- People leaving lights on, using appliances excessively.
- The use of electronics including computers, cell phones, etc.
- People using more heating or cooling energy than they need.

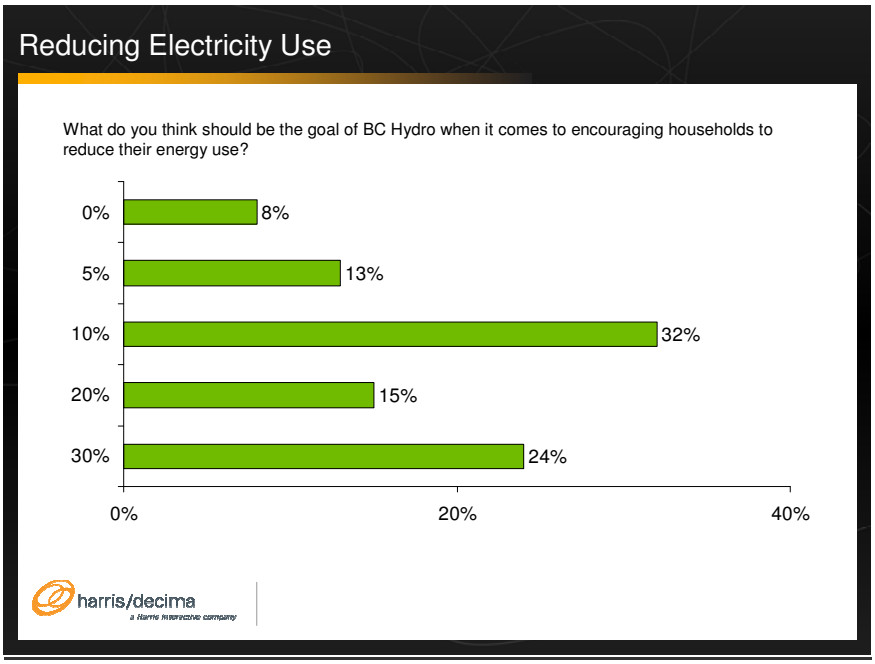


5. **Most respondents are fully convinced that wasting electricity carries a cost that is significant for the province, and for society as a whole.** The most prominent problems in the minds of the participants were environmental in nature, followed by economic and reliability costs. Many volunteered that if demand escalates unnecessarily this will lead to a requirement for BC Hydro to build additional generating capacity, such as a major new dam, and that this would involve additional pressure on the environment. Others noted that energy often requires the burning of fossil fuels.

Another common comment was about the fact that excessive demand would lead inevitably to greater pressures on reliability, more brownouts and outages. Finally, there is a sense that energy may be cheap, but it isn't free, and that waste of this resource on such a grand scale, cannot help but carry huge economic costs over time as well.

6. Participants were virtually unanimously of the view that BC Hydro should invest considerable effort in promoting conservation of electricity. This was felt to be something very much in the public interest, and therefore something that a public sector corporation like BC Hydro should do. Most felt that BC Hydro has been doing this for sometime, and indicated a view that the company was making useful efforts and achieving progress. However, they were quick to assert that more needed to be done, as much electricity was still being wasted.

7. Generally, people felt that it was reasonable for BC Hydro to encourage people to reduce their electricity use by 10% or more. Most felt that they could find that kind of reduction, or more, personally. At the same time, it was at this point in the discussion that it became clear that this idea has both a broad consensus about the goal and a "devil in the details" set of challenges.



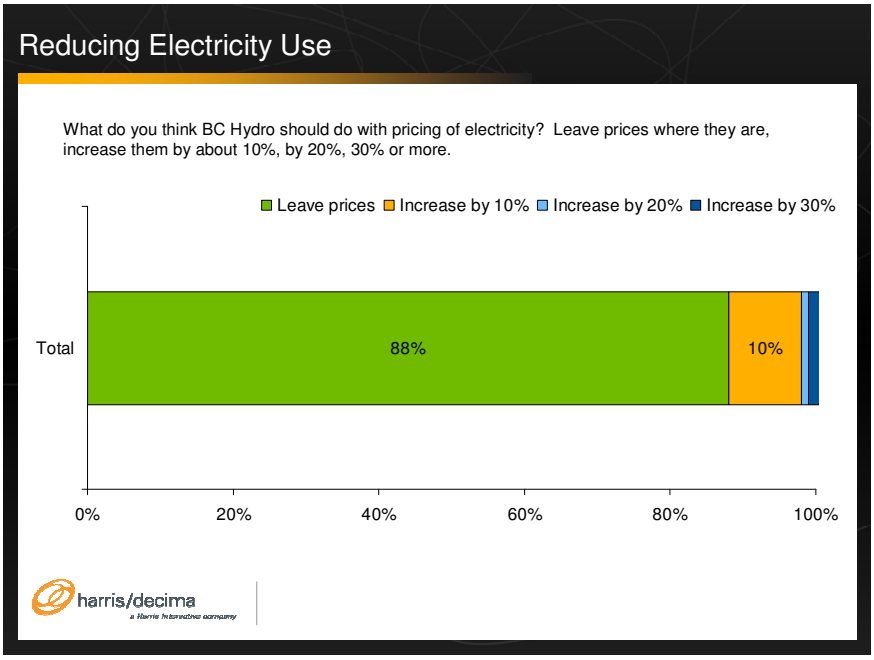
Spontaneously, people would raise concerns about the fact that some people would be more able and others less able to meet some type of general goal. There was a considerable amount of concern expressed about people on low or fixed incomes, or seniors living in rental accommodation where they can not control the energy use, or require extra energy to support medical equipment that is vital and unique to their situation.

Fundamentally, what the groups were signaling was a strong perception that when it comes to policies regarding energy use “one size doesn’t fit all”. Circumstances and that acting in the public interest meant being able to take this factor into account and avoid penalizing the wrong people or creating undue hardship.

Using Pricing to Promote Conservation

1. **There is a general view that the price of electricity is so low that it may not cause wasteful behavior, but doesn't prevent it in any meaningful way.**

2. **However, most people instinctively resist the idea of using price increases to promote conservation.** Participants felt there were a number of other things that could and should be done to moderate consumption of electricity before employing price increases. The most important of these was public education. As much as people were convinced that BC Hydro had been doing a lot in this area, they were convinced that a lot more could be accomplished in this area yet.



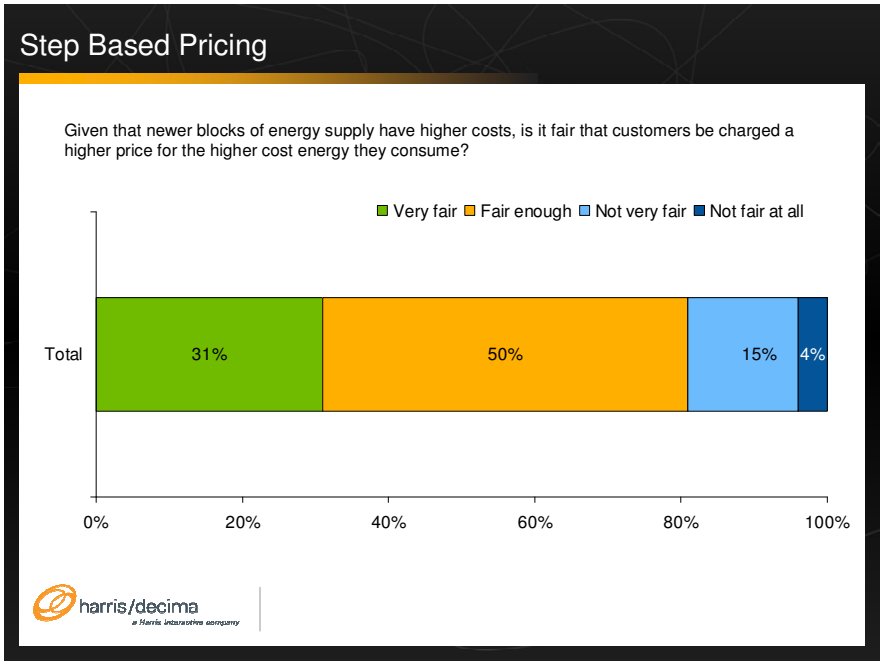
3. **The consensus was that the average household could find ways to save between 15% and 25% of their current consumption levels.** Most people reasoned that low cost wasn't the reason why the energy was being wasted and that increased cost therefore (within limits) wouldn't change that behaviour. As well, there was a concern that using price to dampen consumption might have the most punitive effect on those who were both poor and had already taken as many steps as possible to conserve, an outcome they considered would be both ineffective and unfair.

4. After extensive probing it became clear that most people would reduce their energy consumption if prices went up, but that the price increase might have to be as much as 30% to effect a broad change. At this threshold, the level of concern about the potential hardship caused to some segments of society grows markedly.

In the end, it was apparent that there would be an acceptance of the idea of using prices as one tool to effect conservation, provided that a much more significant emphasis was placed on promoting public understanding and take-up of energy efficiency solutions, and contingent upon any price strategy being handled in a way that was fair to those who had already become conservers and sensitive to the potential hardship caused to older and poorer members of society.

Step Based Pricing

1. **While there is instinctive resistance to the idea of a price increase, there is broad consensus that there is merit in the principle that those who use more electricity than the norm, could reasonably be asked to pay a higher price.** The idea that there are some people who waste electricity has broad buy in and thus, the essential concept of step based pricing embodies a principle that most people consider fair.

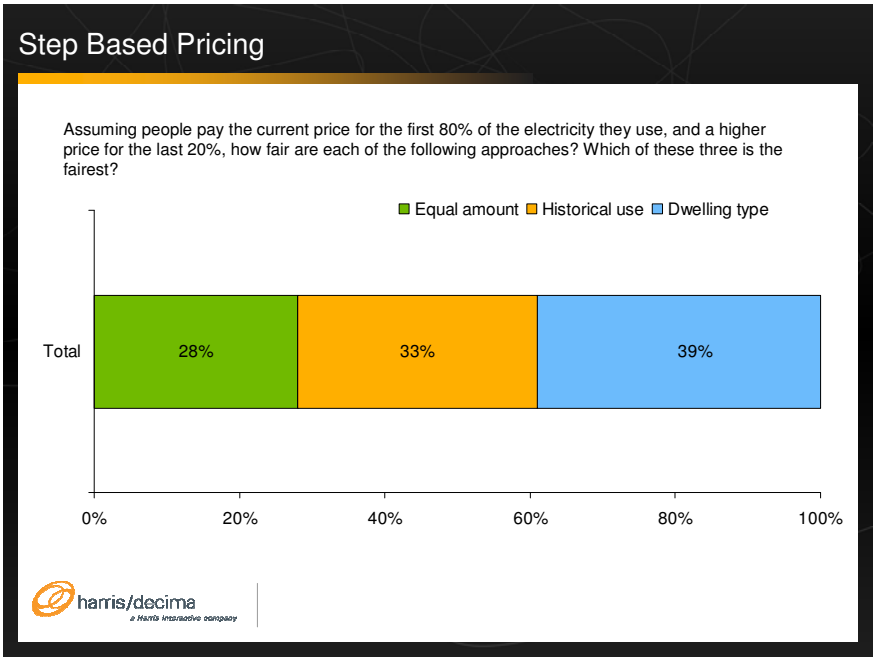


2. Having said that, the complexity of designing a step based pricing structure that would be productive and would be considered fair is a significant challenge.

   Three ways in which to approach the step rate were presented with the assumption that people would pay the current price for the first 80% of their electricity use, and a higher price for the last 20%. The probing centered first on how to establish the initial block size. Three approaches were explored:

   - An equal allocation for every customer
   - An allocation based on a percentage of the customer's historical use at that location
   - An allocation that varies by dwelling type

3. At first blush, many people felt that an equal allocation for every customer seemed fair, however the more they discussed the idea, the more the consensus became that it would not be particularly fair. There was a sense that it did not distinguish between those who were already conserving and those who were wasting a huge amount of energy, and that it did not take into account the fact that different people had different energy needs, irrespective of whether they were wasting or conserving. Examples of concerns associated with an equal block for all included the situation of older people who might need energy intense medical equipment, people who lived in an older home, or people who were plugging in a hybrid car.



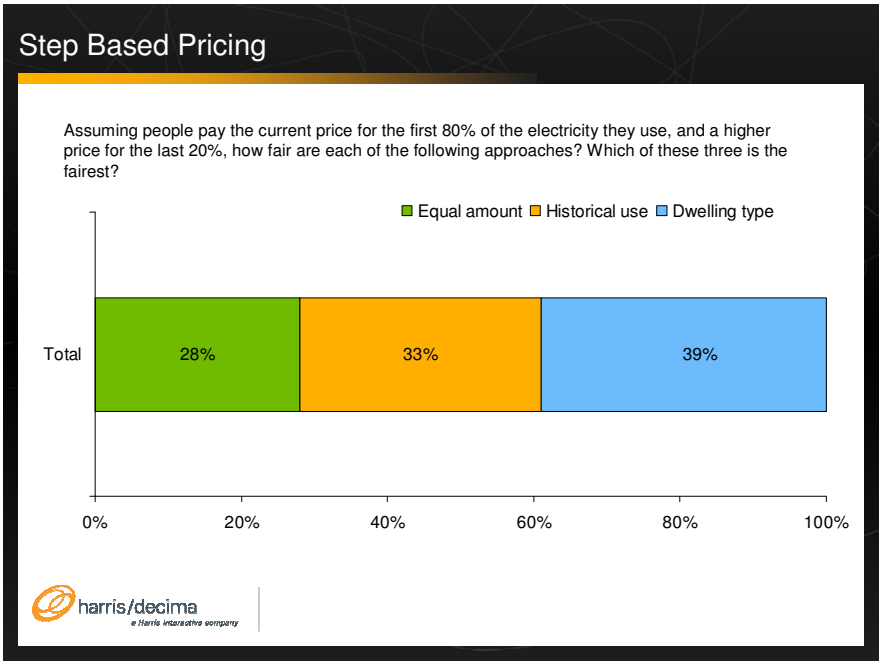
4. **Most people felt that setting the initial allocation based on a customer's historical use at that location was fair.** However, once again, discussion of the idea saw people move towards the view that the idea has several important inherent challenges. First, consumers instinctively don't want to be held accountable for the energy consumption behavior of other people, including the prior residents of their dwelling. Second, there was a concern that this approach would essentially reward energy "hogs" with a high allocation and thus penalize energy savers with a low allocation. This latter point was buttressed with the view that this was not only unfair, but counterproductive, since conservers probably can do little more to save electricity while those who are wasting a lot could in theory do a lot more.

5. Allocation based on dwelling type was seen as somewhat fair, since there was a consensus that a larger home required more energy. Again, though, this idea became more controversial and less accepted the more participants discussed its application in detail. The concerns with this approach included:

   a. A feeling that the number of occupants in a dwelling was relevant to electricity needs, not just the number of square feet.

   b. A concern that the nature of an individual's electricity needs was germane to the question of fairness and did not necessarily vary depending on their dwelling type. The examples raised included: resident of an apartment building or condo where the electricity use is controlled or affected by others; an individual who worked from home and therefore used the electricity at their residence that others might use in the workplace (with no extra personal cost); or the older person living in a small apartment but needing energy for medical equipment needs such as powering wheelchairs.

In essence, participants felt that there were some merits associated with each of the allocation approaches tested, but considerable drawbacks with each one as well.



6. The majority of people agreed that the primary type of heat for the household should be taken into account for the allocations. It was not controversial that those who used electricity as a fuel for heat should have that fact taken into account in setting their allocation.

7. Participants were also asked their views about whether it made more sense to them to see the step set at a lower or higher threshold, with correspondingly lower and higher pricing for the second block. Most preferred setting the initial allocation block higher and the set price for the second block higher as well. The most compelling argument that participants made in this regard was that setting a 10% conservation threshold was reasonable and attainable for many households and that therefore people would take it more seriously than a target of 30% (if the step was set at 70% of consumption) which many might see as unattainable and therefore not something they should really bother with. Inherent in this comment is the reality that for many people the desire to conserve is really less about economics and more about doing the right thing.

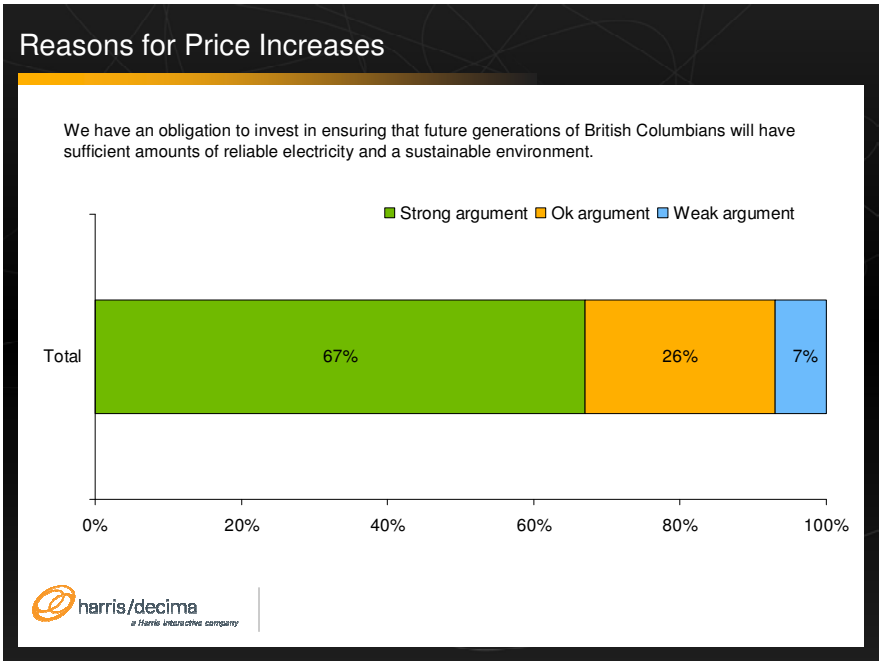
8. All agreed that it was fair to have very high volume electricity consumers pay a third tier price for extraordinarily high volume usage.

Related Messaging

The groups were also exposed to an array of messages that might be useful in building consensus around the need for prices to increase.

The results showed the following:

1. **The single most powerful argument as to why prices should be increased had to do with the responsibility people felt they had to future generations** in terms of ensuring reliable electricity and a cleaner environment.

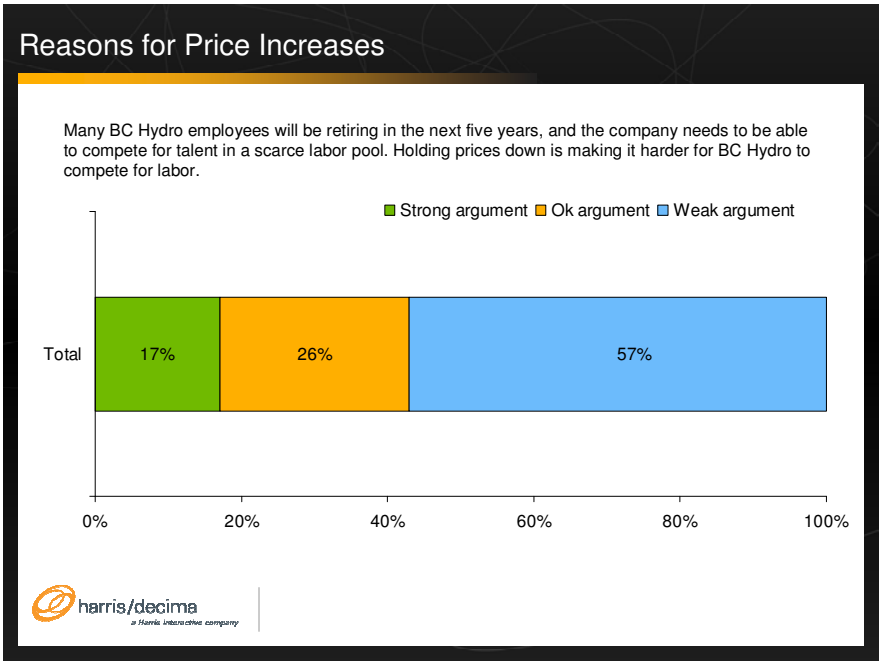


2. There was support for the idea of using the funds from price increases to refurbish generating assets, however in each group some people were inclined to wonder why this had not been built into budgets in the past, and whether this reflected poor planning on the part of those in charge.

3. Comparing the relatively lower price of electricity in BC to the prices charged in other jurisdictions is generally not a strong argument for raising prices. Most feel that no two jurisdictions are exactly the same and that BC can and should set prices based on its unique features, circumstances and needs.

4. Letting people know that prices have failed to keep pace with inflation over time is somewhat effective, in that it provides consumers with an understanding of why prices might need to rise to ensure continued normal course investments in generating assets.

5. Explaining the need for price increases by tying them to BC Hydro's need to be a competitive employer in a scarce labor market, or to ensure adequate safety for employees and customers was not effective. People felt that these were matters that should be dealt with through sound management, and not through increasing prices to consumers.



6. The idea of raising money with a price increase in order to invest in more environmentally sustainable kinds of electricity generation was met with a fairly positive response. Participants often qualified their response by wondering if they could trust that the money raised would be put towards conservation educational programs and green energy generation projects rather than a new dam, or the profit line of an independent power provider. In essence, this message triggered recall of debates about the merits and possibility of a new dam, and the emerging role of the private sector in what has traditionally been exclusively public sector services. Some wondered whether a price increase was a lead up to BCH becoming a private entity.

Conclusions

Energy costs are not necessarily a top of mind or a daily preoccupation for residential customers. There is a feeling that electricity is priced in a way that represents good value.

Most people believe it is important that greater efforts are made to conserve electricity, and they believe that considerable room exists to improve, on their part and on the part of others. There is very strong support for programs to promote consumer awareness and take-up of conservation measures. There is a profound consensus that wasting electricity is harmful to the environment and that failing to do more is being indifferent to the legacy we leave for future generations.

The idea of using price increases as a way to help promote electricity conservation is somewhat challenging. While people accept that penalties should be in place for wasteful consumption, they would much prefer that rewards be used. In an ideal world, they would have those who are highly wasteful pay a lot more, those who consume normal amounts see no price increase, and those who are actively conserving receive a financial benefit.

Part of the resistance to price increases is built on a belief that a lot more can be accomplished through public education and moral suasion: that those who are wasting electricity are unlikely to be moved by smallish price increases, but more likely to respond to a sense of obligation, peer or social pressure.

Another significant point of resistance to using price to promote conservation is a concern about the potential to cause hardship by reducing access to a vital or essential service.

The idea of using step based pricing strategy has the potential to be accepted; however, it would present several important communications challenges. The challenge of setting the allocation in a fair way is far from trivial and every idea tested was found lacking in some respect. The central issue is that there are a vast number of variables that people believe should be taken into account in setting an individual's "goal" for energy consumption, and that to take all of those variables into account would render the idea unworkable, while to leave any of them aside would be to accept that there will be unfairness.

Ultimately, it may be necessary to position step based pricing as fairer than a simple price increase and to provide assurances that hardships will be avoided.

In terms of how best to communicate the need for electricity prices to rise, it was clear that the most potent rationales have to do with the need to ensure environmentally sustainable, reliable electricity for future generations. This would be done both by using education programs and "conservation reward" pricing, and by ensuring that price increases would help fund these programs and the investment in lengthening the life of existing assets as well as new green sources of electricity. In this context, it is important to signal assurances that the price increases are not associated with the introduction of "for profit" players in the electricity generation business.

Discussion Guide

1. Introduction and Warm-Up (5 Minutes)

The moderator will take a few minutes to outline a few ground rules: want to ensure that people share their views openly, let everyone participate, want people to talk about their views, not "other people's views", ensure that we don't want people to "debate" each other – everyone's views are valid, there are no right or wrong answers. The moderator will also point out that there is a one-way mirror, observers in the back, and audio and videotaping.

You may have noticed that you were given a dial to use as part of this discussion.

- We will be using these dials for evaluation purposes over the course of our discussion. Please treat these dials with care. They relay information via radio frequency to equipment that is being run by my colleague in the back room.
- Keep your dial in front of you and try not to move it around too much or bring it too close to other dials in the room. When the dials get too close together, the radio frequencies can cancel each other out.
- Also, it would be great if you could turn off your cell phones and pagers as they can interfere with the dial frequency.
- The way this is going to work is we will be starting off using the dials to answer a series of questions. We'll read the question, ask you to register your answer by turning the dial to the appropriate answer category, I'll ask my colleague to tally the responses and we'll move onto the next question.
- Afterward we will have a discussion about how you reacted using the dials as reference points.

Using dials:

- Please indicate the start time for this group.
- Please indicate your gender (Male, Female).
- How old are you? (30 and under, 31-49, 50 or older)
- How would you describe your household income – above average, below average or average?
- Do you own or rent?
- Over the past year, would you say you are satisfied or dissatisfied with the overall service you have received from BC Hydro?
- What is the primary source of heating for your home?

2. Establishing Views on Current Usage and Pricing (15 Minutes)

I want to start with some questions about electricity and the cost of electricity you use in your household and your everyday life.

- Would you say you know exactly, roughly, only vaguely, or don't really know how much you pay for the electricity that you use?
- Do you think considering the amount that you pay, you get excellent, good, fair or poor value for money?
- Do you think electricity is too expensive, too cheap, or priced just about right?

(Pause to discuss the responses and rationale for each)

- Do you think most people waste a lot of electricity, a little bit of electricity, or use no more than they really need?
- How about you and your household?
- Does wasteful use of electricity cause serious problems, slight problems, or is it the kind of thing that doesn't really cause problems, since we have so much?

(Pause to discuss the previous responses and to explore what are the problems caused by wasteful use of electricity)

3. Using Pricing to Promote Conversation (20 Minutes)

Let's imagine that the typical household uses 10,000 Gigawatt hours of electricity in a year.

- How much can a typical household realistically reduce its use, in percentage terms?
- What do you think should be the goal of BC Hydro when it comes to encouraging households to reduce their energy use? (0%, 5%, 10%, 15%, 20%, more than 20%)
- If the average household pays about $50 for electricity a month, by how many dollars would that price have to go up, before you would consciously reduce your electricity use in order to avoid paying more?
- If the monthly cost rose by $10 would you be more likely to reduce your use of electricity or to keep on using the same amount and pay the extra $10. How about $20, $30, $40?
- What do you think BC Hydro should do with pricing of electricity? Leave prices where they are, increase them by about 10%, by 20%, 30% or more.
- What level of increase would be so great that it would cause too much harm?

(Pause, discuss these results and what they mean)

4. Price Related Messaging (5 minutes to gather data, discussion follows item 5)

If BC Hydro's plan for the future of electricity for the province included increasing prices, how good a reason are each of the following as to why prices should be increased - strong argument, ok argument, weak argument?

- Increasing price is the best way to ensure people don't waste electricity.
- The province as a whole is using more and more power and the costs of new generating capacity should be passed on to users.
- Increasing prices helps raise money that can be invested in new, green or sustainable energy sources like wind, solar, biomass and tidal.
- BC is facing a widening gap in the amount of electricity that we supply and what is being used by residents and the economy. Raising prices can help reduce wasteful use and raise money to invest in new power.
- Raising electricity prices will help ensure that future generations of British Columbians will have sufficient amounts of reliable electricity. This is our responsibility to them, just as those who came before us made necessary investments and changes in their time.
- Increased electricity prices will pay for necessary upgrades to the aging power facilities that BC Hydro has, ensuring they are efficient and last for the long term. The largest facilities are approaching 35-45 years old and the mechanical and electrical equipment is nearing the end of its design life.
- BC Hydro's current price for electricity is one of the lowest you'll find anywhere; keeping prices this low almost encourages people to waste electricity.
- BC Hydro's current price for electricity is one of the lowest you'll find anywhere; prices probably should have risen a long time ago.
- Electricity prices in many parts of North America have increased by 20 percent in the last 10 years, while in BC they have risen by about 6 percent. It's reasonable to expect BC prices to go up as well.
- The safety of our facilities, the public and employees require continuous and growing investments, a price increase is needed to help fund safety measures.
- Many BC Hydro employees will be retiring in the next five years, and the company needs to be able to compete for talent in a scarce labor pool. Holding prices down is making it harder for BC Hydro to compete for labor.
- Even if rates went up by10%, BC Hydro customers would continue to enjoy the third lowest rates in North America.

Let's discuss these results and what they mean. (May be also useful to drive towards a ranking solution of best five arguments)

5. Step Based Pricing (30 Minutes)

Let's imagine that BC Hydro wanted to increase prices for electricity in an effort to promote conservation, in other words that the company wasn't trying to raise more revenue, but only get people to use less.

One way to do this would be to say that if people reduced their electricity use they wouldn't pay any more, and their cost would only go up if they failed to find ways to conserve. To do this properly, it's important to have a fair way of establishing what the level of lower priced energy should be for each customer

I want to show you some ways this could be done, and ask you to say whether you think each one is a fair way to do this or not. (FAIR/UNFAIR)

1. Given that newer blocks of energy supply have higher costs, is it fair that customers be charged a higher price for the higher cost energy they consume?

2. Assuming people pay the current price for the first 80% of the electricity they use, and a higher price for the last 20%, how fair are each of the following approaches…very fair, fair enough, not very fair, or not fair at all.

    a. Equal amount allocation – everyone gets the same volume allocation

    b. An allocation based on a % of the customer's historical use at that location

    c. An allocation that is different by dwelling type – (a house would get a different allocation than an apartment)

    d. Which of these three is the fairest?

    For the customer who has already taken measures to conserve, is it fair that they receive an allocation the same as those who have not conserved, or should their prior conservation somehow be taken into account.

    Is it fair to have different allocations based on the primary type of heat for the household – electric vs. natural gas. This would take into account that in some areas there is no choice but to use electricity and also that those homes that use electricity for heat are not penalized.

3. Which is the fairest way to encourage conservation: to set the initial allocation lower, and the price for the second block lower, or to set the initial block higher and the price for the second block higher; in the first instance, more people would be exposed to paying a higher price for a second block, in the second fewer people would pay a higher price for a second block, but those who did would pay a higher price.

4. Assuming there are some very high volume consuming customers should there be a high third tier for high volume usage, is that a fair way to promote conservation.

Let's discuss these results and what they mean.

Thank you very much for your participation today, your input has been most helpful, and I hope that you found the experience interesting.

BC Hydro Long Term Rate Strategy

Qualitative Research Findings

Prepared for BC Hydro
May 31, 2007

Proprietary Caveat

Any material or information provided by BC Hydro and all data collected by Decima will be treated as confidential by Decima and will be stored securely while on Decima's premise.

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Decima Research

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Executive Summary

This report represents the culmination of twelve mini groups and two supergroups the week of May 21, 2007 across British Columbia. The mini groups allow for deeper insights; while the supergroups were conducted using real time feedback technology, the Perception Analyzer™.

The discussion groups took place in Vancouver, Kamloops, Parksville and Prince George among members of BC Hydro's target audiences: consumers and small/medium businesses. The consumer groups were recruited based on BC Hydro's psychographic segmentation.

The purpose of the research was to investigate use and conservation behaviour, reaction to potential pricing strategies and the effectiveness of a variety of communications materials promoting energy conservation.

The findings of our research suggest that:

- Customers generally have a relatively weak understanding of the current state of electricity demand and supply, for many the consumption of electricity is something which is seen as low cost and taken more or less for granted. While awareness of the self-sufficiency gap has increased, it remains the case that many customers are not aware that BC imports electricity.

- Irrespective of how well or poorly people understand the state of generating capacity and demand in the province, there is broad acceptance of the notion that looking forward economic and population growth will require new measures to ensure that the province has enough electricity to meet its needs. Virtually everyone agrees enthusiastically that one way to tackle this challenge must be to promote conservation.

- When customers are asked what could be done to reduce energy consumption or promote conservation, pricing comes up spontaneously as an option BC Hydro could employ. It is not usually the first suggestion but follows public education and incentive/reward programs. The consensus

appears to be that both public education and changing pricing approaches are necessary, neither would be sufficient or satisfactory on its own.

- Both residential and SMB customers believe there is merit in the idea of using pricing strategies to promote conservation, but they had different reactions to the ideas as tested.

  Residential customers were generally willing to accept changes that might make it more expensive to use a lot of electricity, or conversely ideas that might save them money if they chose to do more to conserve. SMB customers were fairly opposed to any alternative that might cost them more or impose a discipline on their businesses that might compromise their competitiveness.

- The residential groups provided these insights into the four rate options:

  Flat Rate: Most were doubtful that simply increasing the price of electricity on a flat rate basis would do much to achieve a reduction in energy consumption. There was a feeling that the do not feel the incremental cost increases would prompt any real change in behaviour.

  Step Rate: The idea of having a base price for a "normal" level of consumption and a higher rate beyond that level makes intuitive sense to many respondents. In fact, is the alternative that most closely resembles the approach participants would outline spontaneously. There was a feeling that this idea would get their attention and would catalyze a change in behaviour.

  Time of Use Rate: Participants struggle to support this approach to setting rates. This is largely because many don't at this point understand the relationship between peak demand and the requirement to build out generating capacity around peak demand. As a consequence, people have trouble connecting the idea of reducing peak use with the principle of conservation. There is a tendency to think that shifting time of use will not really result in what they consider "conservation"; consequently, they foresee cost and inconvenience without the desired benefit.

Peak Buy Back Rate: This approach generally met with favourable reception. The concept of rewarding good behaviour is more enthusiastically accepted than the approach of penalizing poor behaviour.

- The optimal approach from the standpoint of customer reaction in these tests would probably be a blend of Step Rate and Peak Buy Back Rate. The Peak Buy Back Rate offers a reward for good behaviour, while the penalty of overuse in the Step Rate option is a more lasting way to instill long-term conservation habits. **There seemed to be a consensus that neither a penalty nor a reward in isolation would be the best approach, the ideal approach would combine both tools.**

- **Where advocacy efforts to promote behaviour change are concerned, the consensus was that communications should focus on offering tangible tips on how to reduce energy use, and avoid anything that might seem to be a "scare tactic".** Communication efforts that combine humour and those that offer actionable advice on how to meaningfully contribute to energy conservation goals tested most favourably.

In summary, the results of this qualitative research pointed up the fact that using price signals to alter behaviour will likely be necessary to cause a reduction in electricity consumption, however unless it is paired with an aggressive education effort, it might fail, or result in a backlash, or both. Too many people appear not to have a strong understanding of the things they can do to reduce their consumption, and might as a result only end up paying more to use the same amount of electricity.

In the SMB market, there are considerable risks associated with using penalties to condition behaviour. A rewards-focussed approach would be easier to implement and to win support for on a sustained basis, and it might also work better because it would cause individual businesses to look for ways to reduce their operating costs.

Introduction

Decima Research is pleased to present the following report summarizing the results of qualitative research conducted on behalf of BC Hydro. We're pleased to be working with BC Hydro as the company pursues an agenda to promote conservation as a central element of a long term sustainability and self-sufficiency initiative.

As part of that investigation, Decima was asked to conduct public opinion research that would help provide initial direction on the issues at stake. The specific objectives of the research program were to explore:

- Consumption behaviour and how these behaviours interact or don't with concerns about environmental sustainability of current lifestyles;
- Linkages between cost of electricity and consumption patterns;
- Feedback to the most plausible new rate designs;
- Impacts of proposed rate designs on customer satisfaction based on price, simplicity vs. complexity, mandatory vs. optional rates, fairness, and bill stability;
- Price responsiveness of customers and the elasticity among different market segments;
- Potential motivators and barriers to conservation;
- Responsiveness to time-based pricing and load control options;
- The value of providing different types of advocacy and information, including energy usage information, or other DSM related tools;
- Insight into the way in which different approaches are likely to impact on customer satisfaction rates for BC Hydro; and,
- The types of information/education and communication channels required to maximize customer education, acceptance and response to new rate structures.

To that end, we conducted a series of twelve mini groups (4-6 participants) and two supergroups (15-25 participants) across the province in Vancouver, Kamloops, Parksville and Prince George. We conducted mini groups because they allow for deeper insights; while the supergroups allowed us to use our proprietary real time feedback technology, the Perception Analyzer™.

The discussion groups were conducted among residents of BC and small/medium businesses (SMBs). The residential groups were recruited according to psychographic segmentation as described by BC Hydro; the screening criteria of which can be found in the Appendix. The business groups were conducted among small/medium business owners/operators or the person in the business that makes decisions about utilities including electricity supply.

The following table outlines the locations, dates, and audiences for the discussion groups:

Mini Groups		
Vancouver May 22, 2007	12:00 pm 5:00 pm 6:30 pm	Small/medium businesses Stumbling Proponents and Comfort Seekers Devoted Conservationists and Humble Practitioners
Kamloops May 23, 2007	12:00 pm 5:00 pm 6:30 pm	Small/medium businesses Stumbling Proponents and Comfort Seekers Entrenched Libertarians and Tuned Out & Carefree
Parksville May 23, 2007	12:00 pm 5:00 pm 6:30 pm	Small/medium businesses Stumbling Proponents and Comfort Seekers Devoted Conservationists and Humble Practitioners
Prince George May 23, 2007	12:00 pm 5:00 pm 6:30 pm	Small/medium businesses Stumbling Proponents and Comfort Seekers Devoted Conservationists and Humble Practitioners
Supergroups		
Vancouver May 24, 2007	5:00 pm 7:00 pm	Devoted Conservationists / Humble Practitioners / Stumbling Proponents Entrenched Libertarians / Comfort Seekers / Tuned Out and Carefree

Decima Research designed and directed all elements of this phase including design, recruitment and incentives, moderation, Perception Analyzer™ equipment and technician, analysis and reporting. Any questions regarding this report can be directed to Bruce Anderson, banderson@decima.com, or Bob Murphy, bmurphy@decima.com.

Key Findings

Energy Use and Conservation Behaviour

The groups began with a general discussion about energy use and current conservation behaviour. This warm-up provided useful context for the remainder of the discussion; and the lens through which participants analyzed the pricing alternatives and communication options.

Energy Use at a Personal and Business Level

- **Energy costs are not top of mind or a daily preoccupation for most customers.** Some residential customers tend to take a cursory look at their bill to confirm it's not unusually high, and some report that electricity costs are hidden in rent payments and strata fees. However, very few have become highly familiar with the system used to price electricity and the fluctuations they could expect based on their usage patterns.

- **Most residential and small/medium business customers perceive that the cost of electricity in British Columbia is low.** The majority of participants feel that they do not pay very much for electricity, particularly as compared to other regions. Many participants could cite anecdotal experience where family or friends or contacts are paying more for electricity in other jurisdictions – in Canada and around the world.

> ***"I've heard our electricity is cheap. When thinking of general household expenses and compared to things like gas, (electricity) is not a huge part of my budget."***
>
> ***"We have cheap electricity. I know a family in Alberta and they pay a lot more."***
>
> ***"I have family in Germany and New Zealand and they both pay a lot more than I do."***

- **Most doubt that they are over-consuming electricity compared to other households or businesses of a similar size and structure.** There is acceptance of the idea that everyone can do more to conserve, but also an instinct to believe that others are more likely to be wasting more electricity.

- **Most feel that they are making some effort to use electricity wisely.** The most common conservation efforts revolve around lighting: turning off unnecessary lights and switching from incandescent and halogen to CFL and LED lighting where possible. Other efforts include using appliances (dryers, dishwashers and ovens) less frequently, switching to more energy efficient appliances and machinery, and unplugging electronics when not in use.

- **The overwhelming majority of participants would welcome more information to help them make the right choices and control their energy usage.** People feel that BC Hydro and by extension the BC Government has an important role to play in educating the public about efficient energy consumption and conservation behaviour. Most participants felt that any rate increase must be coupled with a public education campaign to be effective at promoting conservation.

- **More respondents indicate that the motivation to conserve is rooted in the idea of "doing the right thing" than associated with saving money.** People believe that it is important to conserve and use resources wisely, and to pass on a healthy environment to future generations. They also tend to think that because the price of electricity is so low, for a price increase to work on its own to achieve conservation, the increase would have to be extreme in nature. They also consider that an extreme price increase would be unlikely and also potentially unsustainable from a public support standpoint.

  "I don't see much difference in my bills – I could do whatever I want and the bill will stay the same. For me it's more about the larger concern for the environment."

- **This is not to say that price is not an important secondary factor.** Few, if any, participants said that price does not matter at all. In fact, it is particularly relevant for the SMB participants. **Unlike residential consumers, it is important to recognize that SMB customers are quite resistant to price**

hikes that might make the cost of doing their business rise. Anything that compromises the bottom line is important.

- **Some hesitate to commit to the idea of further reducing consumption even though they embrace the goal for the province as a whole.** Some are hard pressed to think of additional measures they could take to reduce electricity consumption; and others because they value personal convenience. Some acknowledge that there are additional actions they could take, but wonder how meaningful these would be.

  "I think I could turn off the computer. I work at home though, so it is on all the time. There is a certain trade-off between convenience and saving."

  "I'm not willing to change my lifestyle to conserve. I think I am doing all I can right now and certainly don't want to sacrifice or do without at the expense of saving a few dollars."

- **SMBs are unwilling to change their consumption if they feel doing so might come at the expense of their businesses.** Some argued that it was hard enough to tune their business so that it met the tests of a competitive market, without also having to alter the way it is run to protect from a financial penalty for energy consumption.

- **When asked who is most to blame, there is some finger pointing that takes place.** Residential customers are quick to blame industry and suggest that the "heavy lifting" for increased conservation must come first from industry. The SMB participants, on the other hand, suggest that it is people in general that have to change, and since companies are but a gathering of people, significant efforts should be focussed at the individual level. Both groups do point to major industry as a segment that by the nature and size can have a large impact on energy conservation.

Reducing Energy Consumption in the Community at Large

The overwhelming majority of participants – both residential and SMB customers – feel it is important that the provincial government and BC Hydro find ways to reduce consumption of electricity.

When asked to suggest potential initiatives BC Hydro could pursue to reduce consumption, two ideas are spontaneously raised:

- Communications and public education about the need for conservation and the ways in which people can accomplish energy savings easily.

- Increasing the price of electricity.

There was a view that because energy costs are relatively low, it would take a possibly unrealistic increase in price to effect change, if price were the only tool employed. The feeling was that the only approach that would be likely to work must include a balance of pricing signals, an appeal to the moral obligation of the community, and tips on how to accomplish conservation.

> ***"They should play a role in making us more aware of what's going on. They need to supply people with the tools to be good citizens. We need the information and reasoning why."***

> ***"If I were to see more of the environmental impact of higher electricity use, then that would make me feel it's more urgent."***

> ***"If it was more expensive, I think people would do more to conserve."***

Pricing Alternatives

This segment of the groups agenda began with a brief explanation of the provincial energy conservation mandate:

The provincial government's mandate, highlighted in its 2007 Energy Plan, is to gain 50% of additional energy resources through conservation – BC Hydro has been given a mandate to restore the province to a situation of self-sufficiency in electricity and to do so in part by promoting conservation and smarter energy use.

Following this explanation, participants were presented with examples of how BC Hydro could change the way it prices electricity in the future to help meet its mandate. The pricing alternatives presented were as follows:

Flat Rate	A single price for every kilowatt hour of energy consumed. This is the current pricing approach.
Step Rate	One price for the first X hours, and then a higher price for additional electricity use.
Time of Use Rate	A higher price is charged for using electricity during the times when demand is highest.
Peak Buy Back Rate	Customers that agree to reduce energy use during peak demand periods are rewarded.

While there is a general consensus among residential and SMB customer segments relative to the need to conserve and the tactics employed to reduce consumption, there was some divergence of opinion among these groups on pricing alternatives.

Residential Groups

Broadly speaking, residential customers are amenable to the idea of price increases, think any increases should be gradual, but do not feel that all alternatives tested are equally appealing.

Flat Rate **- Reaction to a flat rate pricing system was neutral to negative.** This reaction was due to a feeling that this approach would create too little incentive to use less, or disincentive to use more.

Some also argued that a flat rate is regressive because only those in a lower economic situation would likely feel any real pressure to change their behaviour, given the relatively low cost of electricity.

Step Rate **- Most feel this approach would get their attention, and could trigger a change in their behaviour.**

Participants feel that the fairest way to set the step would be to do it based on individual household usage, rather than averaging across a segment.

Also, setting the step threshold at 80% of current/prior consumption met with some opposition, believing that a 10% reduction was more reasonable and plausible.

Time of Use Rate **– In general reaction to this approach was mixed to negative**. Opposition is tied to these two factors:

1. A lack of understanding of the role that peak demand plays in setting the framework for electricity policy and capacity build-out. Without this understanding it is difficult for people to make the connection between shifting time of use and reducing the overall demand, or the concept of conservation.

2. A concern that this rate might create undue inconvenience. People were inclined to try to find ways to use less energy, but would prefer to start looking first for solutions that are least inconvenient for them, and also to have the

ability to choose the ways that they conserve, rather than have those choices "dictated" by pricing policy.

This last point may be particularly important. It stems from the fact that for people who are motivated to conserve out of a sense of moral obligation, there is a risk that if BC Hydro uses pricing signals that are seen as heavy handed, that the instinct to "do the right thing" will dissipate. If a time of use price approach is necessary, then it will be necessary to help people become familiar with the reasons why reducing peak demand is critical to achieving the overall goals of conservation.

Peak Buy Back Rate **– This alternative met with the most positive response of any of the options tested.** The concept of rewarding rather than penalizing behaviour is appealing. Most did feel this would encourage them to change their behaviour, though some worried this option will simply shift energy use, and therefore wondered how well it would contribute to the goal of conservation.

In sum, residential consumers find most palatable a blend of the step rates and the peak buy back. They like combining the incentive reward for good behaviour, and that aspect makes the idea of the penalty for overuse in the step rate option a more powerful and palatable way to re-condition behaviour.

A handful of participants in each market expressed some scepticism around BC Hydro's motivation for contemplating an increase in rates. They argue that the approach has more to do with increasing revenues, and suggested that if capacity is an issue, BC Hydro should pursue alternative power generation options rather than putting the onus on consumers to conserve.

SMB Customers

SMBs respondents across the province voiced consistent concerns about rate alternatives. Broad concerns about any pricing strategy touched on the following areas:

1. **Fairness** – Any rate option would potentially create winners and losers within a business marketplace. More see this as a threat to their competitiveness rather than an opportunity to improve their competitiveness.

2. **Financial benefit** - It is difficult for SMB respondents to understand how much money can actually be saved, and as such the upside is not highly motivating. Some sensed that any benefits would only accrue to their landlords.

3. **Incompatibility with business operations** – Some feel they have little room to change the way they conduct their business and therefore little ability to respond to price signals.

In Vancouver the SMB's interviewed were more agreeable to the general concept of using pricing to help meet conservation goals. However, in other markets, SMB's were more likely to offer resistance to all of the potential new pricing models. They argued that in the face of constant pressures and ever-shrinking margins, even slight increases to their energy bill could harm their operations.

By and large, the regional SMB preference would be a system that comes closest to offering an incentive for reduced use, but only with current base levels. They clearly prefer a reward system to encourage energy conservation as opposed to a penalty system and are against an increase of any kind.

Communicating About Conservation

Participants were shown a variety of communications materials geared towards energy conservation and asked to comment on messaging, tone, design, and medium.

BC Hydro examples were fairly well received, with most participants saying that the designs employed were appealing and the content was relevant. While some urged that the content should be developed to "the lowest common denominator", others felt a need for more specialized information, as opposed to generic "common knowledge" hints and tips.

The television commercials from different jurisdictions were met with varied response. The general consensus was that communications efforts should focus mainly on tangible tips on how to reduce energy use.

The most popular of these communication efforts were those that used humour and those that offered actionable advice on how to meaningfully contribute to energy conservation goals.

Conclusions

Energy costs are not top of mind or a daily preoccupation for residential or business customers. In general, most think that they use the same or less than households or businesses of a similar size and feel that the cost of electricity in BC is low.

There is a consensus that it would be useful to promote conservation of electricity, and making people aware of the facts of a self-sufficiency gap is very helpful in galvanizing this view.

Public education and pricing are both considered important tools that BC Hydro should employ to reduce energy consumption. SMB participants are more resistant to ideas that could impose additional costs on their business.

Reactions to different pricing models can be summed up as follows:

- Flat Rate: Skepticism about whether this approach would change behaviour and some concern that it might penalize those of lesser means.

- Step Rate: Most feel it would get their attention and would cause them to change their behaviour. A preference to have the step set at 90% of their past consumption.

- Time of Use Rate: Confusion about whether shifting time of use would really contribute to the goal of conservation, and worry about the inconvenience this might impose.

- Peak Buy Back Rate: Favourable reception, based on a preference for rewarding good behaviour over penalizing excessive consumption.

Where moral suasion is concerned, the general consensus was that communication should focus largely on helping people understand how they can contribute easily to achieving the conservation goals.

Appendix A
Discussion Guide: Mini-Groups

1. Introduction and Warm-Up (5)

The moderator will take a few minutes to outline a few ground rules: want to ensure that people share their views openly, let everyone participate, want people to talk about their views, not "other people's views", ensure that we don't want people to "debate" each other – everyone's views are valid, there are no right or wrong answers. The moderator will also point out that there is a one-way mirror, observers in the back, and audio and videotaping.

2. Household Energy Use (15)

Let's begin by talking about how you use electricity in your household / business or organization.

- How familiar are you with the amount of money you pay for the electricity you use?
- Do you consider that you pay a lot for electricity, a little, or somewhere in between?
- Do you make a conscious effort to use electricity wisely?
- If so, why (probe: is it to save money or for other reasons)
- If not, why not?

3. Energy Use and Conservation (15)

- Do you think you use more or less than the average for a household / business your size?
- What are the things that you do that you think waste the most amount of electricity?
- What are the things that you do that save the most electricity?

- How much money do you think you could save in a year, if you used electricity very wisely?

- Is that amount of money a meaningful incentive for you to try to reduce your electricity use?

4. Behaviour and Consumption (15)

- Do you think it's important that people / businesses try to use less electricity?

- Do you think it's important that the BC Government and BC Hydro find ways to reduce the consumption of electricity?

- Why is it important…what are the reasons why it is necessary or beneficial to do so?

- What are the best ways to cause this to happen?

Probe: Change pricing approaches
Increase pricing
Educate people about how they can save electricity
Provide incentives to reduce electricity
Limit the ways and times in which people can use electricity
Smart metering

5. Rate Alternatives (30)

The provincial government's mandate highlighted in the 2007 Energy Plan is to gain 50% of additional energy resources through conservation - BC Hydro has been given a mandate to restore the province to a situation of self-sufficiency in electricity and to do so in part by promoting conservation and smarter energy use.

- Do you think that this should be done by increasing prices for use of electricity, increasing prices when people use more than a certain amount of energy, or should prices be left where they are and other methods should be used to achieve the goals.

I'd like to show you some examples of how BC Hydro could change the way it prices electricity in the future. In each case, I'd like you to say how well you think it would work to achieve the goals, whether it would work to affect your

household behaviour / behaviour in your organization, and whether you support or oppose this approach being taken.

DISTRIBUTE PRICING DECK TO WALK PARTICIPANTS THROUGH PRICING OPTIONS.

- ***How well do you think this approach would work to achieve the goals?***
- ***How well do you think this approach would affect your behaviour, and if so how much and in what ways?***
- ***Do you support or oppose this approach being taken?***
- ***FOR THOSE THAT SAY THEY ALREADY CONSERVE A LOT: Given that your household/business already does so much to conserve to date; how do you feel about a rate restructure that may potentially increase your energy costs in an effort to encourage conservation across a larger market.***

6. Conclusion (15)

Let's wrap up our discussion.

- What do you think about the idea of BC Hydro trying to promote conservation and a change in how people use electricity?
- What do you think about the idea of changing pricing as a way to accomplish that goal?
- What do you is the best approach of the ones discussed today? Are there other ideas that you would prefer to see taken?

IF TIME PERMITS, PASS COMMUNICATION MATERIALS TO THE GROUP AND PROBE AT A HIGH LEVEL WITH QUESTIONS BELOW.

- *What is the central message or theme that you take away from these materials?*
- *Do you find these materials and messages relevant? Why or why not?*
- *Do these materials raise your consciousness about the importance of energy conservation?*

Appendix B
Discussion Guide: Supergroups

~~1.~~ Introduction and Warm-Up (5)

The moderator will take a few minutes to outline a few ground rules: want to ensure that people share their views openly, let everyone participate, want people to talk about their views, not "other people's views", ensure that we don't want people to "debate" each other – everyone's views are valid, there are no right or wrong answers. The moderator will also point out that there is a one-way mirror, observers in the back, and audio and videotaping.

You may have noticed that you were given a dial to use as part of this discussion.

- We will be using these dials for evaluation purposes over the course of our discussion. Please treat these dials with care. They relay information via radio frequency to equipment that is being run by my colleague, Stephanie, in the back room.

- Keep your dial in front of you and try not to move it around too much or bring it too close to other dials in the room. When the dials get too close together, the radio frequencies can cancel each other out.

- Also, it would be great if you could turn off your cell phones and pagers as they can interfere with the dial frequency.

- The way this is going to work is we will be starting off using the dials to answer a series of questions. We'll read the question, ask you to register your answer by turning the dial to the appropriate answer category, I'll ask my colleague to tally the responses and we'll move onto the next question.

- After the initial series of questions we will be reviewing some ideas and communications materials, and we'll use the dials in a way that helps you explain to us what you think is effective or not..

- Afterward we will have a discussion about how you reacted using the dials as reference points.

- Finally, we'll use the dials to answer a series of finishing questions.

2. Benchmark questions **(10)**

If there are no further questions, we'll go ahead and get started with the initial questions. Could everyone please pick up their dial? We'll start off with some general demographic questions.

- Please indicate the start time for this group (5:00 pm, 7:00 pm).
- Please indicate the number/letter displayed on your name badge.
- Please indicate your gender (Male, Female).
- How old are you? (30 and under, 31-49, 50 or older)
- Is your highest level of education high school or below, some university or university graduate/post graduate?
- How would you describe your household income – above average, below average or average?
- Do you own or rent? (Own, Rent)

- Over the past year, would you say you are satisfied or dissatisfied with the overall service you have received from BC Hydro?

Would you say you are very satisfied, satisfied, dissatisfied, or very dissatisfied with BC Hydro when it comes to each of the following?

  - Value for money
  - Acting in the best interests of British Columbians
  - Their effort to plan for the future energy requirements of BC

- How familiar are you with the amount of money you pay for the electricity you use – very familiar, somewhat familiar, not very familiar or not at all familiar?

- Do you consider that you pay a lot for electricity, a little, or somewhere in between?

- Do you think you use more, the same amount, or less electricity than an average household your size?

- Do you use more electricity than you need to (A lot, a little, no)

- Do you make a conscious effort to limit how much electricity you use? (Yes regularly, yes occasionally, no)

- Do you think you could do a lot more, a little more or no more to limit how much electricity you use? (A lot, a little, no)

- How much more could each of the following electricity user groups do to limit how much electricity they use: (A lot, a little, no more):

  - Residential consumers
  - Small and medium business users
  - Large institutional, commercial and industrial users

- Which one of these electricity user groups should bear the most responsibility for limiting how much electricity they use:

  - Residential consumers
  - Small and medium business users
  - Large institutional, commercial and industrial users
  - All equally

How important are the following reasons for you to control your use of electricity, in other words to use no more electricity than you need to…(a big motivator, somewhat motivating, not all that motivating)

- Because when you save electricity you save money
- Because the province currently imports electricity to meet the demand
- Because using less electricity helps conserve the environment
- Because its important that our culture become less wasteful generally
- Because I personally feel a need to do more to limit my impact on the environment

- To the best of your knowledge, does BC generate more than enough, enough or not enough electricity to meet the demands of BC consumers and businesses?

- Does BC sell electricity to other jurisdictions? (Yes, No)

- Does BC buy electricity from other jurisdictions? (Yes, No)

- Is the electricity BC Hydro generates today a clean energy? (Yes, No)

- Can you store electricity once it is generated? (Yes, No)

- Do you think it's important that the BC Government and BC Hydro find ways to reduce the consumption of electricity? (Crucial, good idea, not that important)

In order to ensure our future supply of electricity in the province, how much do you think BC Hydro should focus on the following approaches: (a great deal, some, not at all):

- Invest in new and alternative sources of energy
- Buy power from other jurisdictions
- Take action to make consumers and businesses conserve electricity

And which one of these three approaches, should they rely on most

- Invest in new and alternative sources of energy
- Buy power from other jurisdictions
- Take action to make consumers and businesses conserve electricity

If they were to take action to ensure wise electricity use in the household, how much do you think BC Hydro should rely on the following approaches: (a great deal, some, not at all)

- Change pricing so that those who use less save more money
- Change pricing so that those who use more than they need pay more money
- Offer benefits to people who are willing to avoid using electricity at specific times
- Educate people with tips and examples of how to avoid wasting electricity
- Show exactly how conserving electricity helps the environment
- Promote the idea of a less wasteful society including how to use electricity
- Show people how small changes in household behaviour can add up to a big change in the environment over time
- Educate people to appreciate how conserving electricity today will ensure we'll have enough to meet the needs of future generations

- Let's imagine that your household pays an average of $600 a year for electricity. How much money would you need to save in order to be highly motivated to save electricity? ($ per year range)

    - Nothing ($0) – I'm already highly motivated
    - $1 to under $50
    - $50 to under $100
    - $100 to under $200

- How much would you need to see your electricity bill go up before you would become highly motivated to save electricity ($ per year range)

  - Go up $50
  - Go up $100
  - Go up $200 or more
  -

3. Pricing Options (45)

- How familiar are you with the provincial government's 2007 Energy Plan? (Very, Somewhat, Not very, Not at all)

'Electricity Facts"

- Electricity use in the province is split more or less equally between three user groups – residential consumers, small and medium business users, and large institutional, commercial and industrial users
- BC Hydro is not currently producing enough electricity to meet the province's annual needs
- BC Hydro is a "Net Importer" of electricity, buying more electricity than it sells
- BC's Energy Plan foresees continued growth in demand for electricity.

- The provincial government's 2007 Energy Plan mandates BC Hydro to try to meet 50% of the growth in demand through conservation.

For each of the following, please tell me whether you strongly agree, agree, disagree, or strongly disagree. (Strongly agree, Agree, Disagree, Strongly disagree)

- There's information here that comes as a surprise
- There's new and important information here that has me thinking harder about my role in conservation and smarter energy use

Qualitative Breakout Discussion

- Which of these facts that make up the Electricity Facts story had the most influence on you?

I'd like to show you some examples of how BC Hydro could change the way it prices electricity for residential consumers in the future. In each case, I'd like you to say how well you think it would work to achieve the goals and whether you support or oppose this approach.

For each pricing option, please use your dials to answer these questions:

- How well do you think this approach would work to achieve the conservation goals – very well, well, not well?
- Do you support or oppose this approach – strongly support, support, oppose, strongly oppose?

Discussion After all Four Rated:

(To be informed by dial ratings)

- What are your impressions of this idea?
- How do you think would it affect you?
- How would it affect consumption of electricity by other people?
- What about in your home?
- Why do you support or oppose this approach?
- How could it be improved?

4. Communications Approaches (45)

We're going to take some time now to look at some communications efforts that organizations around the world have created around this issue of conservation. Before we do that, I'd like to talk about your views on conservation.

I'd like to show you some examples of things others are doing to promote energy conservation. We'll be using our dials to evaluate each one and we'll also be discussing your views.

Moderator to show websites, video clips, radio clips, and other communications materials. Respondents will initially be asked to give each a rating using their dial and a discussion will follow.

For each one:

- How well do you think this approach would work to achieve the goals – very well, well, not well?
- Do you support or oppose this approach – strongly support, support, oppose, strongly oppose?

Discussion After All Four Shown:

(To be informed by dial ratings)

- What are your impressions of this, what did you like? Dislike?
- Would you notice this, would it stand out for you?
- Are the visuals appealing and relevant to you?

- Would it affect the way you think about energy conservation?
- How could it be improved?

5. Wrap-up Questions **(15)**

I'd like to do walk through a final series of questions with the dials.

If BC Hydro used the pricing ideas we've tested as a way to promote conservation, would this leave you feeling very satisfied, satisfied, dissatisfied, or very dissatisfied, with BC Hydro when it comes to each of the following?

- Value for money
- Acting in the best interests of British Columbians
- Their effort to plan for the future energy requirements of BC

How about if BC Hydro used communications and education approaches. would this leave you feeling very satisfied, satisfied, dissatisfied, or very dissatisfied, with BC Hydro when it comes to each of the following?

- Value for money
- Acting in the best interests of British Columbians
- Their effort to plan for the future energy requirements of BC

If they were to take action to ensure wise electricity use in the household, how much do you think BC Hydro should rely on the following approaches: (a great deal, some, not at all)

- Change pricing so that those who use less save more money
- Change pricing so that those who use more than they need pay more money
- Offer benefits to people who are willing to avoid using electricity at specific times
- Educate people with tips and examples of how to avoid wasting electricity
- Show exactly how conserving electricity helps the environment
- Promote the idea of a less wasteful society including how to use electricity
- Show people how small changes in household behaviour can add up to a big change in the environment over time
- Educate people to appreciate how conserving electricity today will ensure we'll have enough to meet the needs of future generations.

Appendix C
Recruitment Questions

Devoted Conservationists and ***Humble Practitioners***

- By making my home more energy efficient, I am helping to do my part for the environment
- I am an active energy conserver who looks for opportunities to save energy in everything I do.
- I am knowledgeable about ways to save electricity around my home
- I regularly recycle newspaper, metals, plastics or glass

Stumbling Proponents, ***Comfort Seekers***

- Everyone has a moral obligation to do the best they can to conserve energy
- I find it hard to break my habits in terms of the amount of electricity I consume.
- I am not that knowledgeable about ways to save electricity around my home
- I am willing to pay more for products that are environmentally friendly

Entrenched Libertarians

- I'm knowledgeable about how to conserve electricity
- I don't think that I have a moral obligation to use less electricity, its a choice I can make or not

Tuned-Out and Carefree

- Conserving energy is worthwhile, but its not something I spend much time thinking about
- The cost of electricity is not something that worries me much, its pretty affordable