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1.1 Executive Summary

This report describes BC Hydro’s engagement activities carried out for the 2008 Long-Term Acquisition Plan (LTAP). This report also provides an overview of the engagement conducted for a number of 2008 LTAP application elements, including the 2008 Fort Nelson Resource Plan (2008 FNRP), the Clean Power Call (CPC), and Mica Unit 5 and Mica Unit 6. Engagement activities for these application elements were conducted separately from the 2008 LTAP engagement process.

Engagement activities for the 2008 LTAP occurred from July 2007 to June 2008 and included a Resource Options Update (ROU) component, an Intervenor workshop component and a public communication component.

The ROU component occurred in three stages, a scoping session to confirm the scope of the targeted update and methodology to undertake the work; resource specific engagement through one-on-one meetings, phone calls and group meetings to carry out the ROU work; and a results session to report on the findings.

Input received from participants during the ROU was used to confirm the scope and methodology of the update, to guide the update work, and to help ensure the accuracy and validity of resource data for each resource type examined. Participant feedback received indicated satisfaction with the process and outcome of the targeted ROU, along with an interest to fully update the resource options inventory and characteristics, and to include a broader range of stakeholders and First Nations within the process.

The 2008 LTAP Intervenor engagement was designed as a series of workshops and was based on Intervenor input at a preliminary session. This engagement included two workshops on the LTAP inputs and analysis, and one workshop to review the draft application. Participant feedback indicated Intervenors found the workshops valuable in gaining a better understanding of the LTAP drivers, processes, and portfolio results prior to regulatory filing. Areas for improvement were identified by participants, such as providing more detail regarding the portfolio analysis, demand-side management programs, and the load forecast; and providing more time to preview materials prior to workshops.
The review of the draft 2008 LTAP application resulted in five sets of written comments. These comments were considered, and adjustments made to the application based on these comments are outlined in Section 1.5.6 of this Appendix.

With respect to the public communication component, a BC Hydro 2008 LTAP website section was developed (www.bchydro.com/iep), which provided public access to relevant documents as materials became available during the ROU and Intervenor engagement components. An Energy Planning update newsletter was distributed to about 65 First Nations and 590 stakeholders who had either participated or expressed interest in the 2006 Integrated Electricity Plan (IEP)/LTAP, providing an update on the 2008 LTAP process, as well as identifying the new 2008 LTAP web pages added to the Integrated Electricity Planning website link for further information and comment/inquiry opportunities.

The 2008 FNRP engagement activities consisted of meetings with the Fort Nelson Town Council, the Prophet River First Nation and the Fort Nelson First Nation, along with an open house for the broader community. During the meetings and open house, held the last week in April 2008, the resource planning process was presented along with an overview of the analysis, key risks and the expected recommended approach based on the analysis.

General support for the 2008 FNRP was expressed during the engagement process. No specific concerns regarding the need for the Fort Nelson generation station upgrade (FNGU) or plans for more detailed studies of future supply options were identified at the community meetings or open house. An interest was expressed to ensure infrastructure, including reliable electricity supply, is available in a timely manner to accommodate any significant load growth in the area due to activities in the oil and gas industry.

The CPC engagement process included a series of dialogue sessions with Independent Power Producers (IPPs), First Nations and other interested parties, during the summer of 2007, to solicit input into the design of the call and how to address meeting system needs through future calls. BC Hydro received over 40 submissions with approximately 600 written comments on the draft Term Sheet documents, which were released in November 2007. Input received through stakeholder engagement will be used to inform the Power
Acquisitions Clean Power Team as they continue to design the call, the terms and the electricity purchase agreement.

For Mica Unit 5 and Mica Unit 6, a technical Core Committee was established in January 2008 with First Nations and stakeholders to identify the social, environmental and economic impacts and opportunities associated with Mica Unit 5 and Mica Unit 6, and to develop recommended mitigation and compensation measures to address those impacts.

The harmonized Provincial and Federal environmental assessment process will follow the timelines prescribed by the Provincial Environmental Assessment Office (EAO) process. The formal environmental review is expected to begin, at the earliest, in December 2008. BC Hydro's consultation with First Nations is consistent with the requirements of the EAO and is modelled on the consultation process completed for Revelstoke Unit 5. A range of other engagement and communication activities are being offered to ensure First Nations and stakeholder participation during the review of Mica Unit 5 and Mica Unit 6.

1.2 Introduction

This report presents the engagement activities for BC Hydro's 2008 LTAP. Engagement activities occurred from July 2007 through to June 2008.

Meeting notes, presentations and technical reports associated with the 2008 LTAP engagement activities are available at www.bchydro.com/iep. In accordance with the provisions of the Freedom of Information Protection and Privacy Act, participant names are not disclosed within this report or in associated public documentation, such as meeting notes.

A number of the 2008 LTAP application elements included engagement activities that were conducted separately from the 2008 LTAP engagement process and are described within this Appendix. These include the 2008 FNRP, the CPC, and Mica Unit 5 & Mica Unit 6.

Engagement undertaken for application elements related to the development of demand-side management programs are described in Appendix K.
1.3 2008 LTAP Engagement: Context and Components

This section describes the drivers of the 2008 LTAP engagement activities, the scope of the 2008 LTAP engagement activities and the 2008 LTAP engagement components.

1.3.1 Drivers of the 2008 LTAP Engagement Activities

A number of key drivers informed the development and scope of BC Hydro's 2008 LTAP First Nations and stakeholder engagement activities. These drivers included:

- previous experience with the 2006 IEP/LTAP,
- regulatory considerations,
- provincial energy policy, and
- scope of the 2008 LTAP work plan.

Previous experience with 2006 IEP/LTAP

The 2006 IEP/LTAP was the culmination of a planning process that included a substantial First Nations and stakeholder engagement component. Hundreds of British Columbians from around the province provided their input and comments through public information sessions, regional meetings, technical resource options workshops, First Nations meetings and information sessions, Provincial Integrated Electricity Plan Committee (PIEPC) meetings, the Integrated Electricity Planning website, and a toll-free information line. This engagement was documented and submitted as Appendix G of the 2006 IEP/LTAP filing.

One area of engagement that BC Hydro acknowledged needed to be improved was engagement with registered Intervenors. During the regulatory process, BC Hydro stated that it "plans on implementing a separate Intervenor engagement stream to allow for meaningful and timely input into the contents of future LTAPs and IEPs" (2006 IEP/LTAP BCUC IR 1.7.1).
Regulatory Considerations

The British Columbia Utilities Commission (BCUC) Decision on the 2006 IEP/LTAP approved the requested LTAP expenditures related to a number of demand and supply acquisition-related programs and projects. At the same time, the Decision also provided BC Hydro with directives and expectations that needed to be addressed in the 2008 LTAP. These directives and expectations are outlined in Appendix C of this report.

Provincial Energy Policy

Policies within the 2007 Energy Plan, for instance related to self-sufficiency, greenhouse gas (GHG) emissions, and conservation significantly impact the electricity sector. Examples of policies that will influence BC Hydro’s long-term energy planning include:

• ensure self-sufficiency to meet electricity needs, including insurance by 2016 (this has subsequently been legislated by Special Direction No. 10),

• ensure clean or renewable electricity generation continues to account for at least 90 per cent of total generation,

• ensure zero GHG emissions from coal thermal electricity facilities,

• ensure zero net GHG emissions for new thermal plants, and zero net GHG emissions for existing plants by 2016, and

• set a conservation target of acquiring 50 per cent of BC Hydro’s incremental resource needs through conservation by 2020.

BC Hydro addressed the BC Energy Plan policies in the 2008 LTAP. This indicated a narrower range of resource options, a need for enhanced conservation programs and a load resource balance that meets the intent of Special Direction 10. As a result, some of the questions traditionally considered by BC Hydro in its long-term energy planning have been narrowed or eliminated.
Scope of 2008 LTAP Work Plan

Figure 1 outlines the reduced scale of the 2008 LTAP work plan compared with the 2006 IEP/LTAP. This targeted update concentrated on reflecting the BCUC decision directives and the 2007 Energy Plan within a reduced timeframe.

Figure 1 2008 LTAP Work Plan Compared with the 2006 IEP/LTAP Work Plan

1.3.2 Scope of the 2008 LTAP Engagement

The 2008 LTAP engagement was developed with strong consideration given to the key drivers listed above. More specifically, the 2008 LTAP engagement is:

- of a reduced scope reflecting the reduced scale and timelines of the 2008 LTAP,
- focused on the key issues and developments from both the BCUC Decision on the 2006 IEP/LTAP and the BC Energy Plan, and
- primarily focused on registered Intervenors to address the commitment in the 2006 IEP/LTAP regulatory process to more effectively engage Intervenors in future processes.
1.3.3 Components of the 2008 LTAP Engagement

In consideration of the scope of the 2008 LTAP, the engagement undertaken consisted of three components: the ROU, Intervenor workshops and public communication. The following sections provide a description of these three components.

1.4 2008 LTAP Engagement: Resource Options Update

1.4.1 Objectives

The objectives of the ROU engagement were to:

- receive input from participants and ensure their understanding with respect to the proposed scope of updates to the resource options, and
- receive input from participants and ensure their understanding with respect to the resource options data.

1.4.2 Process

The ROU engagement process took place from July 2007 to December 2007 and included three phases.

1. Sessions to confirm the scope of the targeted ROU, outline a proposed methodology for updating each resource type considered, and solicit interest in participating in the data collection.

2. Resource specific engagement through one-on-one meetings, phone calls and group meetings to carry out the ROU work.

3. A final session to present the ROU results and provide additional opportunity to comment.

All session and meeting notes, along with associated materials (e.g., consultant reports) were posted on the BC hydro website for information purposes and to provide opportunity for additional comments.
1.4.3 Scoping Sessions

A general session was held on July 19, 2007, at the Fairmont Waterfront Hotel in Vancouver, to solicit input on a proposed targeted ROU scope and methodology and to solicit participation in the update work. A second session, to solicit input on a proposed ROU scope and methodology, was held on July 30 with customer Intervenor groups who could not make the July 19 session due to a conflict with a concurrently scheduled BC Hydro sponsored meeting.

1.4.3.1 General Scoping Session – July 19, 2007

Invitations to this scoping session were sent via email and fax to approximately 725 individuals and organizations. The invitation list was compiled from the following sources: 1) the participants list from the 2005 resource options technical workshops, 2) the IPPs database related to the Calls for Power, 3) registered Intervenors from the 2006 IEP/LTAP, and 4) contact list from the Aboriginal Relations and Negotiation department.

Approximately 80 people attended the session. Attendees primarily included representatives of IPPs and consulting companies, but also included municipalities, public interest and environmental groups and representatives of two First Nations.

This scoping session was divided into two parts. In the first part of this session, BC Hydro presented the LTAP context and the proposed scope of the targeted update (e.g., cost, potential, and/or technology) for each resource type considered. This was followed by breakout group discussions to introduce the technical leads for each resource type, to explore suggestions on data collection methodologies, and to identify people interested in participating in the update process. The resource types considered in this update were biomass, large hydro, wind, small hydro, natural gas, coal, and geothermal options.

July 19, 2007: Part 1 – Context & Scope Summary

The following table provides a summary of key discussion points raised during the first part of the session where the overall scope of the 2008 LTAP ROU was presented.
Table 1  ROU Session Summary: Context & Scope  
(July 19, 2007)

<table>
<thead>
<tr>
<th>Discussion Outcome</th>
<th>Number of Participants = 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics Covered</td>
<td></td>
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<tr>
<td>- context of update</td>
<td></td>
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<tr>
<td>- proposed scope of targeted update</td>
<td></td>
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<tr>
<td>- description of the next steps of the LTAP process</td>
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<tr>
<td>- introduction to break out groups</td>
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</tbody>
</table>

Summary

Questions addressed during this session related to the power acquisition process, government policy, general LTAP process and analysis, and the ROU scope.

It was clarified that capacity (Waneta and Jordan River pumped storage) and resource smart projects were included as part of the large hydro resource engagement stream. It was also clarified that the roles of the Canadian Entitlement and Burrard Thermal Generating Station are being considered by BC Hydro and will be included in the 2008 LTAP analysis. It was understood that DSM was being updated through a separate process which included a comprehensive engagement process; however there was a desire to have it more integrated with the ROU process. It was noted and an update of the DSM work was to be presented at the ROU results session in December.

It was clarified that this targeted update would consider commercial technologies. Near commercial technologies would be included in the next comprehensive update. Other scope related questions included whether other pumped storage would be included, and whether other large hydro would be considered. As a result of the input received here and other sessions, additional pumped storage, and additional potential future large hydro options (in addition to Site C) were added to the scope of the large hydro ROU.

It was clarified the fuel price risk would be examined by updating the natural gas price forecasts as part of the LTAP analysis. Greenhouse gas offset price forecasts would also be updated for the LTAP analysis. The expected timing of the call and the LTAP was questioned. Definitions of self-sufficiency and BC Hydro’s current clean/non-clean ratio were also clarified.

It was determined that consultants would be utilized for independent data review as needed to ensure reasonability of data.

There was a desire to include First Nations perspectives and opinions in this process. First Nations were included in the invitation list and a desire to have further engagement was noted.

There was no further comment on the overall scope of the targeted ROU. Participants were invited to comment further on the scope of the targeted ROU for the following two weeks.

July 19, 2007: Part 2 – Breakout Group Summary

The following tables provide a summary of key discussion points raised during the second part of the session where breakout groups considered specific resource types.

For all breakout groups, topics covered included:
• Proposed scope

• Previous methodology

• Proposed methodology

• Interest in participating in data collection and review

<table>
<thead>
<tr>
<th>Table 2</th>
<th>ROU Breakout Group Summary: Small &amp; Large Hydro (July 19, 2007)</th>
</tr>
</thead>
</table>

**Discussion Outcome**

During this discussion, questions were addressed that related to acquisition activities, government policy and scope and process of the ROU update. Participants expressed an interest to have input into the BC Clean definition. Interest was also expressed regarding the British Columbia Transmission Corporation (BCTC) expansion policy and impact on ROU in terms of identifying potential hydro sites. This issue was considered during the ROU for the small hydro resource.

A request for more investigation by BC Hydro of potential future large hydro projects led to a number of large hydro projects, in addition to Site C, being included in the scope of the ROU.

Interest was expressed in having a forum or website to share knowledge on topics such as capital cost, discount rates, benchmarking. The small and large hydro resource streams addressed capital costs, and benchmarking. Discount rates were outside the scope of the ROU.

There was interest in including broader First Nations perspectives on resource options and their characterization.

It was concluded that the proposed process of the update looked good so far. Eight participants expressed interest to continue the small hydro update work, and ten participants expressed interest in the large hydro update.

| Participants = 19 |
| Technical Lead Shane Grovue |
| Facilitator Randy Reimann |

<table>
<thead>
<tr>
<th>Table 3</th>
<th>ROU Breakout Group Summary: Biomass (July 19, 2007)</th>
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</table>

**Discussion Outcome**

Much of the discussion focused on the call acquisition processes, and issues raised included the timing of the bioenergy call in relation to the ROU and current cost barriers to biomass projects. Representatives from the BC Hydro Power Acquisitions department were available to respond to questions.

There was interest in the definitions of commercial and near commercial as related to what would be included in the ROU. It was confirmed that ecologo biomass is considered green. Also, confidentiality of information was confirmed.

Concern was raised regarding uncertainties and impacts on costs. These uncertainties included: estimating fuel (wood) costs (it was determined that a risk premium be identified and checked against the market); lack of ownership; confidentiality of information was confirmed.

| Participants = 25 |
| Technical Lead Allan Grant |
| Facilitator Jennifer Gin |
Discussion Outcome

relationships between IPPs and First Nations consultation requirements; and pine beetle kill and relationship to volumes of fibre and timing of access. It was confirmed that an update would be useful even considering the uncertainty over cost estimations.

All 25 participants expressed interest in the update work.

Table 4  ROU Breakout Group Summary: Wind (July 19, 2007)

Discussion Outcome

At this breakout session a methodology for updating information was confirmed, including having an independent consultant contracted (Garrad Hassan) to update the wind data work that had been completed in the 2005 ROR, and that the approach would add a new region to the wind potential.

Primary issues and concerns underscored during this session included the need to factor in rising costs of wind turbines and the fact that the F2006 Call results do not reflect the current reality, call related issues arose such as financing risk and it was emphasized that cost information for planning purposes is disconnected from the call. Suggestions were made to revisit the capacity factor from the 2005 ROR, to look at a realistic bottom range for the cost based on turbine supply costs, and articulate costs as a range. A request was made to look at the wind data in detail to establish a mutual, clear understanding of what is going into the ROU.

Fourteen people expressed interest in continued involvement of the update.

Participants = 17
Technical Lead
Sol Friedman
Facilitator
Kenna Hoskins

Table 5  ROU Breakout Group Summary: Geothermal, Natural Gas-Fired Generation, Coal-Fired Generation (July 19, 2007)

Discussion Outcome

Geothermal

Discussion topics focussed on resource potential and costs. Questions raised included what projects would be included in the update, such as the potential for the Pebble Beach/North Meager creek, and whether the additional potential that has been identified as part of BCTC's transmission expansion policy would be included. A question was raised about verifying costs given the absence of existing geothermal projects in B.C., and whether costs included transmission. The participants recommended reviewing the status of the Pebble creek geothermal project, cost estimates for other potential geothermal projects and to review whether transmission cost is included in the final capital cost.

Based on input received, the final scope for the geothermal resource update included reviewing current activity at Meager Creek and other potential resource locations and update project costs. One participant expressed interest in participating in the geothermal update.

Participants = 14
Technical Lead
Sasi Sasitharan
Facilitator
Kristin Hanlon

Natural Gas-Fired Generation
During this discussion, questions were addressed that related to estimates of electrical interconnection costs, evaluation (or not) of upstream GHG emissions, gas price forecasts, assumptions on project locations, and use of Unit Energy Costs (UECs) in portfolio analysis.

It was clarified that transmission costs used to calculate the UEC included costs to get to the point of interconnection to the bulk transmission system. The costs of new transmission or transmission upgrades related to the bulk transmission system will be addressed during the portfolio analysis.

The use of the ROU information within the LTAP analysis was clarified. In addition, for the LTAP analysis, natural gas price forecasts will be updated and used, combined cycle gas turbines (CCGTs) will be modelled as a dispatchable resource, the value of firm energy will be calculated based on pricing tables, a comment was made that the 2X12 table does not provide an appropriate incentive for firm energy.

The general conclusion was that updating project data sheets should address most of the project specific issues, and broader portfolio evaluation issues would be addressed in later stages of consultation on LTAP portfolio analysis. Seven participants expressed interest in participating in the natural gas update.

**Coal-Fired Generation**

There was a general agreement that the technology is not yet viable and that Powertech Labs would be used to assess the status of the coal resource, in particular the requirements to achieve carbon capture and sequestration. It was clarified that coal bed methane was not included as a separate resource option as no projects have been identified.

No participants expressed interest in participating in the coal update work during the breakout session; however, the two participants were sent the draft report to review, and comments were provided.

<table>
<thead>
<tr>
<th>Discussion Outcome</th>
</tr>
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<tbody>
<tr>
<td>During this discussion, questions were addressed that related to estimates of electrical interconnection costs, evaluation (or not) of upstream GHG emissions, gas price forecasts, assumptions on project locations, and use of Unit Energy Costs (UECs) in portfolio analysis. It was clarified that transmission costs used to calculate the UEC included costs to get to the point of interconnection to the bulk transmission system. The costs of new transmission or transmission upgrades related to the bulk transmission system will be addressed during the portfolio analysis. The use of the ROU information within the LTAP analysis was clarified. In addition, for the LTAP analysis, natural gas price forecasts will be updated and used, combined cycle gas turbines (CCGTs) will be modelled as a dispatchable resource, the value of firm energy will be calculated based on pricing tables, a comment was made that the 2X12 table does not provide an appropriate incentive for firm energy. The general conclusion was that updating project data sheets should address most of the project specific issues, and broader portfolio evaluation issues would be addressed in later stages of consultation on LTAP portfolio analysis. Seven participants expressed interest in participating in the natural gas update. <strong>Coal-Fired Generation</strong> There was a general agreement that the technology is not yet viable and that Powertech Labs would be used to assess the status of the coal resource, in particular the requirements to achieve carbon capture and sequestration. It was clarified that coal bed methane was not included as a separate resource option as no projects have been identified. No participants expressed interest in participating in the coal update work during the breakout session; however, the two participants were sent the draft report to review, and comments were provided.</td>
</tr>
</tbody>
</table>

### 1.4.3.2 Intervenor Scoping Session – July 30, 2007

In addition to the July 19 general session - a second session - to solicit input on a proposed ROU scope and methodology, was held on July 30 with customer Intervenor groups who could not make the July 19 session due to a conflict with a concurrently scheduled BC Hydro sponsored meeting.

On July 30, 2007 BC Hydro met with members of two customer Intervenor groups – the Joint Industry Electrical Steering Committee (JIESC) and the Commercial Energy Consumers of B.C. (CEC) - to review the proposed scope and methodology of the ROU. The following table provides a summary of feedback raised on the ROU and LTAP generally, and how BC Hydro has addressed or incorporated the feedback received.
Table 6  ROU Session Summary: Overall Scope  
(July 30, 2007)

<table>
<thead>
<tr>
<th>Discussion Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics Covered</td>
</tr>
<tr>
<td>- context of ROU update</td>
</tr>
<tr>
<td>- proposed scope of ROU</td>
</tr>
<tr>
<td>- interest in participating in update process</td>
</tr>
<tr>
<td>Number of Participants = 3</td>
</tr>
</tbody>
</table>

Summary
During this discussion, issues were addressed that related to the LTAP regulatory schedule, the scope of the ROU and the portfolio analysis.

It was confirmed that the current timing of the LTAP was due to the need to adequately reflect the new energy plan, and address BCUC decisions. As well, there was agreement that LTAP update filings should not be substantive filings (with the exception being the 2008 LTAP). It was clarified that DSM information may not be available for the ROU results session; however, this information would be included in the LTAP filing.

It was confirmed that BC Hydro will examine pumped storage options.

Interests included the desire to address the following: how transmissions costs are factored into overall costs and the value of intermittent energy resources versus firm energy resources; using contract life versus economic life for costing IPP projects to address the issue of ownership; understanding what was included in the hydro bundles. It was raised that interest has been expressed by First Nations (through DSM engagement) about increasing their capacity and involvement in energy planning issues.

An interest was expressed in assessing the energy policy objectives of self-sufficiency plus insurance policy. An assessment of this scenario will be examined in the LTAP.

A suggestion was made to expand Table 10.1 in the 2006 IEP/LTAP, a table summarizing the ROU results, to include transmission and other costs that may only be captured during portfolio analysis. BC Hydro subsequently developed an expanded summary table that provides an indicative guide to what additional costs may be included in a portfolio analysis with each resource option.

Intervenors expressed possible interest in following the resource update work. BC Hydro subsequently sent the Intervenors the technical lead contact list.

1.4.4  Engagement by Resource Type – July to December 2007

The engagement process undertaken to update the resource option data varied by resource type, and depended on the update methodology agreed upon at the scoping session and considered levels of participant interest and complexity and breadth of update. The update process for each resource type varied from email correspondence to working group meetings. The following provides a summary of the process involved for each resource type.

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1.4.4.1 Small Hydro

Technical Lead
Shane Grovue (PowerTech)

Engagement Method
Working group meetings

INPUT TO UPDATE
Based on input from the July 19, 2007 scoping session, the update process included maintaining the methodology from 2005 ROR; reviewing existing water licenses and electricity purchase agreements; updating consulting work from 2005 ROR; and updating cost and potential resource availability.

An independent consultant, Keir Wood Leidal (KWL), was retained to update the small hydro work.

Small Hydro Meeting 1
On September 12, 2007, the small hydro working group met to review the proposed KWL methodology. Those who expressed interest at the scoping session were invited. Five people attended the meeting, including representatives from IPPs and consulting firms. Participants provided suggestions and comments, and overall supported the proposed scope of the study.

The participants recognized that the study was an inventory-level assessment.

Meeting notes are provided at www.bchydro.com/iep.

Small Hydro Meeting 2
On November 19, 2007, the small hydro working group was presented with preliminary results of the KWL study. Five people attended the meeting, including representatives from Independent Power Producers Association of British Columbia (IPPBC), IPPs and consulting firms. The majority of input received was related to recommendations for future study, such as identifying power project clusters to share access and transmission costs, and including storage in the analysis. There were also clarification questions related to results and methodology.

The final data was not substantially affected by comments from this portion of engagement, as the suggested changes to the analysis would require a level of study beyond the scope and schedule of the update. However, overall input from participants was valuable both in shaping the original scope and identifying improvements for future resource evaluations.

Meeting notes are provided at www.bchydro.com/iep.

Findings were presented at the ROU Results Session, held on December 4, 2007.

The final consultant report "Run of River Hydroelectric Resource Assessment for British Columbia (Kerr Wood Leidal)" is available at www.bchydro.com/iep.

1.4.4.2 Biomass

Technical Lead
Allan Grant (Powertech Labs)

Engagement Method
Working group meeting

INPUT TO UPDATE
The results of the July 19, 2007 scoping session indicated a need to address the characterization and cost of the woodwaste resource.

A biomass working group meeting was held on September 19, 2007, with 8 participants in attendance, including representatives from IPPs and industry. Those who expressed interest in the biomass resource update were invited to the engagement session. Most of the discussion focused on
woodwaste; however, biogas and municipal solid waste were also addressed.

Participants agreed to the following for the purposes of the ROU: it is acceptable to take the issue of fuel price risk off the table; there is a high degree of uncertainty around the potential supply of woodwaste in the province; and it is important to distinguish between three types of woodwaste (sawmill, roadside, and standing timber) as these resources have different potential and cost profiles.

Participants also had a concern about only using an update to the 2005 ROR data to represent current cost estimates, and provided suggestions for costing of each bundle. Ultimately, capacities and indicative pricing information for these bundles were extracted from the 2007 Request for Expression of Interest (RFEOI).

Attendees had no significant comments on the biogas datasheet.

Attendees suggested contacting the Greater Vancouver Regional District for more information on a request for proposals for municipal solid waste disposal.

The meeting notes are available at www.bchydro.com/iep.

Findings were presented at the ROU results session, held on December 4, 2007.
1.4.4.3  Wind

Technical Lead
Sol Friedman (BC Hydro)

Engagement Method
Email correspondence, telephone conversations, survey, and presentations

INPUT TO UPDATE
A total of 33 stakeholders, including 23 wind proponents comprised the 'wind interested parties' and participated in one or all of the stages of wind data collection and review.

A written survey was issued to the wind IPPs to gather input for the update. Conversations occurred with the chair of the IPPBC Wind Committee in regards to the wind resource update. The survey was released from Garrad Hassan and included a confidentiality agreement.

A total of six IPPs provided responses to the survey. One provided wind data and another provided a summary of wind data.

The draft Garrad Hassan results were circulated to the wind interested parties, including the Chair of the IPP Wind Committee. A presentation of the results occurred at the IPPBC Annual Conference in November 2007.

There were no comments on the Garrad Hassan wind data results circulated for review.

Findings were presented at the ROU Results Session, held on December 4, 2007.

The final consultant report "Assessment of the Energy Potential and Estimated Costs of Wind Energy in British Columbia (Garrad Hassan)" is available at www.bchydro.com/iep.

1.4.4.4  Geothermal

Technical Lead
Sasi Sasitharan (Powertech Labs)

Engagement Method
Email correspondence and telephone conversations

INPUT TO UPDATE
Current activities on South Meager Creek was reviewed via e-mail and telephone contact with permit holder Western GeoPower Corp. Gaea Energy Enterprise, the permit holder for Pebble creek was also contacted to obtained current activities at this location.

Findings were presented at the ROU Results Session.
1.4.4.5  **Coal-Fired Generation**

**Technical Lead**  
Sasi Sasitharan (Powertech Labs)

**Engagement Method**  
Email correspondence

**INPUT TO UPDATE**  
It was agreed at the July 19, 2007 scoping session that an assessment of the feasibility of carbon capture and storage in relation to the coal resource development in B.C. would be conducted through Powertech Labs.

The draft report was circulated to two industry stakeholders for their review.

Findings were presented at the ROU results session, held on December 4, 2007.

The final report "Technology Summary: Clean Coal Power Generation by C02 Sequestration (Powertech Labs Inc.)" is available at [www.bchydro.com/iep](http://www.bchydro.com/iep).

1.4.4.6  **Natural Gas-Fired Generation**

**Technical Lead**  
Graeme Simpson (BC Hydro)

**Engagement Method**  
Email correspondence

**INPUT TO UPDATE**  
Based on the scope and methodology confirmed at the July 19 scoping session, an independent consultant, AMEC, was contracted to update the technology and cost information of natural gas projects.

Update data sheets were prepared to be responsive to questions raised (e.g. specific interconnection costs have been identified for each project; gas price data has been updated). The draft data sheets were circulated to ten interested parties for review in November 2007, including representatives from Terasen Gas, TransAlta, IPPBC, industry groups, and a consulting company.

No significant data-related comments were received, and these updated sheets were included as final in the ROU.

Findings were presented at the ROU Results Session, held on December 4, 2007.

1.4.4.7 Large Hydro

Technical Lead
Alec Tsang (BC Hydro)

Engagement Method
Email correspondence, individual and working group meetings

INPUT TO UPDATE
As a result of the July 19, 2007, scoping session, the large hydro resource was divided into the following categories: Resource Smart projects, Mica and Revelstoke units, Jordan River pumped storage, Waneta Expansion Project and Site C.

As a result of the input received, future Potential large hydro projects, in addition to Site C, were included in the scope of the large hydro resource stream. In addition, as a result of the input received, an update of Vancouver Island and Lower Mainland pump storage potential was added.

The work of updating the datasheets related to Resource Smart projects, Mica and Revelstoke units, and Site C and other large hydro was undertaken.

Jordan River Pumped Storage
At the July 19, 2007, scoping session, BC Hydro confirmed its intent to review pumped storage at Jordan River. Two assessments were undertaken. A generic pumped storage option was reviewed by the BC Hydro Engineering department in fulfillment of the 2006 IEP/LTAP BCUC Directive 21 described in Appendix C of this application. As well, Powertech Labs undertook an additional assessment of a specific Jorvic Sewage Reclaim Pipeline (JSRP) pumped storage project at Jordan River submitted by Vanport Sterilizers (VPS).

Both assessments were emailed to the representative of VPS on November 9, 2007. On November 14, 2007, BC Hydro met with the VPS representative to review the assessments. Questions regarding the assessment were raised. Key findings concluded that a Jorvic project would be a net energy loss to the system, and therefore would not be desirable. Although the engineering assessment provided reasons why an ocean water pumped storage plant would not be considered feasible, interest was expressed by VPS to pursue an ocean hydro pumped storage plant. It was clarified that VPS could bid any projects it deemed viable into upcoming calls for power. It was also clarified that BC Hydro does not provide preferential treatment for any individual IPP. The assessments undertaken by Powertech Labs and BC Hydro Engineering were not modified as a result of this meeting.

Following the ROU Results session on December 4, VPS provided a submission that included an interest for the ROU to include, among other projects, an ocean hydro pumped storage plant at Jordan River. BC Hydro replied to this submission confirming satisfaction with the assessments undertaken to review the pumped storage options. BC Hydro reiterated that VPS is welcome to bid into upcoming calls. As well, upon request, VPS was provided with information as to who purchased the property adjacent to the Jordan River Forebay reservoir from BC Hydro so that a project could be pursued independently.

In January 2008, through email correspondence, VPS noted that it would no longer pursue the JSRP project, and expressed further interest in pursuing an ocean water pumped storage plant. Subsequent correspondence from BC Hydro reiterated that, at this time, BC Hydro is satisfied with the Jordan River pumped storage assessments and stated VPS is welcome to bid projects into the power acquisition processes, and provided the appropriate
BC Hydro’s engineering memo titled "Jordan River Pumped Storage", as well as the Powertech Labs report "VPS JSRP Assessment" are included in Appendix F of this application.

Waneta Expansion

Cost information was received from Columbia Power Corporation through email correspondence.

Findings were not presented at the ROU Results Session, as agreement had not been reached on final characterization of the resource.

Large Hydro Group Session

A large hydro working group meeting was held on November 28, 2007. Those who expressed interest in the large hydro resource update were invited to the large hydro engagement session. Six people attended this meeting and included representatives from Columbia Power Corporation, IPPs and public interest groups. The main inputs from the large hydro session are summarized in the following points:

The Unit Capacity Cost for the Upper Columbia projects differ from those found in the Alcan filing (earlier in the year) because they do not include transmission costs and they are based on a more recent capital cost estimate (October 2007). Bulk transmission costs will be addressed in the portfolio analysis.

The group expressed interest in the details, such as size and location, of the projects that comprise the Resource Smart bundle. The requested details will be provided in the ROU data sheets, which were not presented at this session.

The group inquired about the composition of the Other Pumped Storage Options, and it was confirmed details would be provided in the data sheet.

The questions and comments during the large hydro session were more of a clarification nature rather than having issue with the methodology or approach of the ROU. Therefore, the data was not affected as a result of the session.

Meeting notes are provided at www.bchydro.com/iep.

Findings were presented at the ROU Results Session, held on December 4, 2007.

Pumped Storage

Since January 2008, pump storage potential for the Lower Mainland has been evaluated through ongoing emails and individual meetings with IPPs, to estimate project costs and capabilities. These findings were not available for the ROU Results Session; however, preliminary costs were included in the final ROU.

1.4.5 Results Session – December 4, 2007

On December 4, 2007, a session was held at the Pan Pacific Hotel in Vancouver to review the results of the targeted ROU. Sixty four people attended that session.

For each resource type, the methodology of the update was described, the process of updating the information, the results of the update and the key drivers of change. The resource types included: biomass, natural gas, coal, geothermal, wind, large hydro, small
hydro, DSM, and transmission. A summary table was presented, which included the resource characteristics, costs and adjusted cost estimates of each resource type considered.

Emergent themes arising from the session discussion included: adding capacity to the system, such as with geothermal and (Greater Vancouver Regional District) municipal solid waste potential, possible pumped storage at larger facilities (Mica and Revelstoke), and storage for small hydro; wanting more information on resource smart bundles; and an interest in the relationship between the UEC and power call prices. Subsequent to the session, BC Hydro provided the full list of Resource Smart bundles attached to the meeting notes.

Meeting notes are provided at www.bchydro.com/iep.

1.4.5.1 Feedback Regarding the 2008 LTAP ROU Results Session
A feedback form was distributed at the Results Session. Seven forms were returned. Two people rated the session as excellent, four people rated the session as good and one person rated the session as fair.

Verbatim overall comments were as follows:

- Excellent content and delivery.

- Presentations were well laid out and the appropriate information was given to the attendees.

- Well presented - each subject to the point and reasonably researched, some areas needed more data.
Verbatim comments regarding the most valuable part of today's session were:

- Understanding the ranking of resources.
- The summary table at the end.
- The biomass study.
- The coal study really needs data - it is time to move from hypothesis as in Alberta.

Verbatim suggestions for improvement on the session included:

- More interaction/breakout groups.
- More clear description of transmission system upgrade plans.
- Advance publishing the studies pertinent to the presentations to garner more input on the day and from those that cannot make the venue.

1.4.6 Input and Feedback

1.4.6.1 Input into the targeted ROU

Input received from interested parties during the targeted resource option update engagement process was used to confirm the scope and methodology of the update, to guide the update work, and to help ensure the accuracy and validity of resource data for each resource type examined.

Interested parties provided cost, potential and technology information for the update itself and/or acted as a sounding board for update results. In addition, examples of ways in which the ROU was modified based on stakeholder input included:

- Adding to the scope: large hydro (other than Site C), and additional pumped storage options.
- Modifying the methodology of the biomass work to reflect cost uncertainties.
• Modifying the summary table to be more reflective of total costs associated with
resources, such as a range of transmission costs likely to arise during portfolio analysis

1.4.6.2 Feedback Regarding the Overall ROU Process

A feedback form was distributed at the December 4, 2007 Results Session to solicit
feedback on the overall ROU engagement process. Eleven responses were received. Two
people rated the overall process as excellent, and seven people rated the overall process as
good.

Verbatim comments were as follows:

- It appears BC Hydro is listening.
- Information content excellent; well organized, logical, and clearly presented.
- It has a way to go but a good start, especially factual in the biomass sector.
- It was informative.

Verbatim comments regarding the most valuable part of the ROU were:

- The biomass study, we would like more information ASAP.
- This December 4 results session.
- It’s a good roadmap of all of BC Energy resources (with the following caveats:
  planning versus prospecting; unit energy costs versus bid prices).

Verbatim comments for improvements to the process were as follows:

- I think the process is proceeding well. Considering the scope, it obviously needs
  more time and more input to gestate.
- Involve others besides IPPs and Intervenors.
1.5 2008 LTAP Engagement: Intervenor Workshops

1.5.1 Objectives

The key objectives of the Intervenor sessions were to:

- Promote the understanding of key LTAP elements through the open sharing of information in advance of regulatory filing,

- Where appropriate, integrate and/or clarify Intervenors' concerns to expedite regulatory review;

- Continue to foster positive and constructive working relationships with Intervenors.

1.5.2 Process

Registered Intervenors from the 2006 IEP/LTAP BCUC hearing were invited to attend the 2008 LTAP Intervenor activities, which were held from November 2007 to May 2008. Upon request, interested First Nations and stakeholders who were not registered Intervenors from the 2006 IEP/LTAP hearing were also able to attend the LTAP activities. Information, including agenda, background material, and session dates, was posted on the BC Hydro website prior to each activity. The website also included a facility for online registration.

Four Intervenor activities were held; one session to review the context of the LTAP and to solicit input on the engagement process, two workshops to review inputs to the LTAP and analysis, and one workshop to review the draft application prior to filing. All activities were held in Vancouver, B.C., where most of the Intervenor organizations are based. Subsequent to each activity, presentation material and session notes were posted on the BC hydro website to provide additional opportunity for review and comment.

Representatives from the following organizations attended one or more Intervenor activities: BC Old Age Pensioners Organization, BC Sustainable Energy Association, BCTC, Burke Mountain Naturalists Society, Business Council of British Columbia, Columbia Power Corporation, CEC, Canadian Office and Professional Employees Union (COPE), Fraser...
Valley Regional District, Fortis BC, IPPBC, JIESC, Peace Valley Environmental Association, Sierra Club of Canada, Terasen Gas, Western Canada Wilderness Committee, along with various First Nations, IPPs and consulting firms.

1.5.3 Preliminary Session – November 14, 2007

The first Intervenor activity was held on November 14, 2007, at the Sutton Place Hotel, Vancouver, BC to provide an overview of the 2008 LTAP components and to solicit input on the engagement process. The following section provides a summary of some of the comments received. Meeting notes are provided at www.bchydro.com/iep.

<table>
<thead>
<tr>
<th>Table 7</th>
<th>Intervenor Preliminary Session: Process Overview &amp; Engagement Options (November 14, 2007)</th>
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</thead>
<tbody>
<tr>
<td>Discussion Outcome</td>
<td></td>
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<tr>
<td><strong>Number of Participants = 35</strong></td>
<td></td>
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</tbody>
</table>

1. LTAP Components

Participants were interested to see the cost effectiveness of various 2007 Energy Plan policy components tested by comparing against ‘unconstrained’ or ‘unrestricted’ portfolios. Examples include coal without GHG costs or sequestration and self-sufficiency requirements. It was clarified that BC Hydro would not test portfolios that do not meet legal requirements.

Participants provided comments on a number of economic variables which should be considered in the load forecast including uncertainties around the current changes impacting the pulp and paper industry, the elasticity of demand to rate changes, and the potential introduction of a carbon tax.

Participants expressed concern on the intermittency and potential high cost of run-of-river hydro and wind resources and a desire not to overlook other large hydro in addition to Site C. Participants were also interested in the specific resources included in the resource smart bundle and the transmission requirements for Mica units 5 and 6. Details of the Resource Smart bundles were appended to the meeting notes.

2. Engagement and Communication Options

With respect to the design of the engagement process, participants expressed a desire for two or three workshops to review inputs, analyses, and portfolio options as well as the ability to review the draft application. In terms of communication, participants preferred the ability to review information before each session and the ability to provide comments online. BC Hydro subsequently developed the Intervenor workshops based on this input.
1.5.4 Workshop #1 – March 5, 2008

The second Intervenor session (Workshop #1) was held on March 5, 2008, at the Sutton Place Hotel, Vancouver, B.C. During the workshop, participants were provided with information on the key 2008 LTAP inputs including updates for Site C and DSM resource options and an introduction to the risk framework used for the LTAP analyses. The following section summarizes some of the comments received. Meeting notes are provided at www.bchydro.com/iep.

<table>
<thead>
<tr>
<th>Table 8</th>
<th>Intervenor Workshop #1: Inputs &amp; Risk Framework (March 5, 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Outcome</td>
<td></td>
</tr>
<tr>
<td>Number of Participants = 30</td>
<td></td>
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</tbody>
</table>

1. Overall LTAP Context and Workshop Components

During this presentation, workshop participants expressed interest in the state of the load forecast and how recent economic developments and advancement of new technology such as electric cars can impact future load growth in the Province. Risk and uncertainties associated with future developments in major industrial sectors were also discussed in relation to long-term resource planning.

2. Resource Options Update - Site C

Most of the discussions following this presentation were related to the cost for the Site C project. Participants were interested in how recent changes by government such as the water rental rate increase and the introduction of deemed equity in the Heritage Special Direction No. HC2 would impact costs. Other issues such as project life, depreciation, and other large hydro options were discussed.

3. Resource Options Update - Demand-Side Management

Considerable discussions were generated from this presentation including discussions on the rationale for including specific initiatives such as rate structures, codes and standards, and voltage optimization as part of the DSM program. Participants were interested in the low cost and high volume of the DSM programs as compared to information from the ROU and the impact of the current DSM on the supply-demand gap.

4. Electricity and Gas Price Forecast

Several participants acknowledged the substantial technical analysis supporting the forecast. Participants were interested in the details of how scenarios were developed and how the price forecast is or is not reflective of the electricity demand patterns in the province.

The support consultant report, Global Energy Report: Natural Gas Price Forecasts for BC Hydro was distributed via email and made available at www.bchydro.com/iep.

5. Greenhouse Gas Offset Price Forecast

Much of the interest for participants was related to the GHG offset system to be adopted by the province. Many questions were raised during the presentation on anticipated Provincial policy on how a cap and trade system would work or what would qualify to be used as offsets.
The supporting consultant report, Natsource Report: 2007 GHG Offset Forecast was distributed via email and made available on the BC Hydro [www.bchydro.com/iep](http://www.bchydro.com/iep).

6. Risk Framework – An Introduction

Much of the discussion regarding the risk framework centred on the construction, components and interpretation of the probability tree. Participants were interested in how trade or market impacts were incorporated, how high risk/low probability scenarios can be isolated for analysis, and a desire for testing unconstrained portfolios.

1.5.5 Workshop #2 – April 25, 2008

The third Intervenor session (Workshop #2) was held on April 25, 2008, at the Sutton Place Hotel, Vancouver, B.C. During the workshop, participants were provided with updates on legislation and regulations associated with the implementation of the B.C. Government's 2007 Energy Plan, the current load forecast, load resource gap, and additional discussion on the risk framework and how it would be applied in portfolio analyses. The following section summarizes some of the comments received. Meeting notes are provided at [www.bchydro.com/iep](http://www.bchydro.com/iep).

<table>
<thead>
<tr>
<th>Table 9</th>
<th>Intervenor Workshop #2: Review Inputs, Risk Assessment &amp; Mitigation (April 25, 2008)</th>
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<tbody>
<tr>
<td>Discussion Outcome</td>
<td></td>
</tr>
<tr>
<td>Number of Participants = 43</td>
<td></td>
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</tbody>
</table>

1. Legislative Context

This segment provided a summary of the legislation and regulations through which the B.C. Government is implementing the 2007 Energy Plan, including Special Direction No. 10 on self-sufficiency, Bill 15 (Utilities Commission Amendment Act), and Bill 31 (Greenhouse Gas Reduction Statues Amendment Act). In response to a question whether Bill 31 addresses what constitutes an offset, it was clarified that offsets were addressed in Bill 18 (Greenhouse Gas Reduction Cap and Trade Act) although the specifics have been left to future regulations.

2. Load Forecast

During this presentation, participants were interested in understanding how the various evolving environmental initiatives and industrial developments would impact the load forecast. Discussions were held regarding the impacts of the carbon tax, potential fuel switching, and long-term electricity rates. Much discussion also took place regarding the effects of the pine beetle infestation on long-term supply of fibre in the province. One participant commented that the allowable cut could take a big jump in 10 years when the young growth matures.

3. Price Forecast Update

Much of the discussion was centred on the use of the price forecast. Impacts of transmission constraints, GHG adders, and full cycle cost versus variable costs were discussed. There were also
## Discussion Outcome

interests on how the average price forecast was weighted in terms of on-peak and off-peak prices.

### 4. Load Resource Gap

Most questions following this presentation were directed at clarifying the resource assumptions used in determining the load resource gap including the application of critical water on heritage hydro and whether resources like additional Mica units were assumed. One participant commented that risks are not symmetrical and the risk outcome between a long and short portfolio can be significant.

### 5. Risk Framework

Several participants raised concern on the risk of DSM and the need to have contingency plans to address under performance of DSM and hence a larger gap. One participant disagreed with BC Hydro's assessment that no clear co-relationship can be established between load growth and DSM savings and suggested looking at California for some indication. A number of participants commented that it would be beneficial to also incorporate capacity reliability into the risk framework. It was clarified that capacity risks would be addressed through contingency resource plans in scenarios where the timing of resources are delayed.

### 6. Portfolio Analysis

During this presentation, examples were presented on how the risk framework was applied in the selection of specific portfolios for each scenario. Participants were generally interested in understanding the logic behind each portfolio selection. One participant commented that DSM might have considerable flexibility as a contingency resource.

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### 1.5.6 Workshop #3 – June 3, 2008

The final Intervenor session (Workshop #3) was held on June 3, 2008, at the British Columbia Utilities Commission's hearing room, in Vancouver, B.C. During the workshop, participants were provided with the opportunity to discuss and comment on the draft application prior to regulatory filing. The workshop presentation is provided as Sub-Appendix Q-B. Workshop registrants received the draft application for review on May 29, 2008, and were asked to submit any written comments to BC Hydro for consideration by June 6, 2008.

Written comments regarding the 2008 LTAP draft application were received from the following organizations: CEC, EarthFirst Canada, JIESC, NaiKun and VPS. The following provides a summary of the adjustments made to the 2008 LTAP in response to the comments received. Please note that the following includes excerpts from the written comments submitted.
Written Comments – Commercial Energy Consumers (CEC)
Comment: The load forecast anticipates some significant flattening of industrial load particularly based on the ongoing outlook for the forest industry. However there may likely be much more to come in the next 20 years, which is not anticipated.
Adjustment: Included clarifying text in Section 2.2.1 that addresses future industrial load trends.

Comment: There is nothing in the forecast for load and peak reductions coming from the Smart Metering Initiative (SMI), which is now a firm legislative commitment for BC Hydro...
Adjustment: Included clarifying text regarding SMI in Section 6.2.1.2 (footnote).

Comment: There is little included in the forecasts for the potential sources new electric load from such developments as electric hybrid and or electric plug in vehicles...
Adjustment: Included clarifying text in Section 2.2.1.

Comment: The Clean Power Call shows $2 million of expenditure but once launched out of this process may result in substantial commitments to future costs. It may be prudent to reflect this fuller view of the reality (the future cost commitments).
Adjustment: Included a range of cost estimates for potential Clean Power Call commitments in Section 6.2.6.4.

Comment: BC Hydro’s risk framework appears to revolve around ‘demand uncertainty’ and ‘deliverability risk’, particularly for DSM…. There are other very important risks to be managed and balanced…. There are ‘environmental risks’ related to supply that are very different from conservation.
Adjustment: Expanded risk description in Sections 5.5.3 and 5.5.5.

Written Comments – EarthFirst Canada
Comment: Recommendations regarding the transfer of environmental attributes as part of the Clean Power Call.
Adjustment: Included clarifying text in Section 6.2.6.3.

Written Comments – Joint Industry Electricity Steering Committee (JIESC)
Comment: Whenever a $/MWh is provided, state whether the cost is in levelized, nominal or real dollars.
Adjustment: Included clarifying text in Section 3.3.1, and Table 3-21.

Comment: Provide a detailed explanation for activities, costs and deliverables where approval of a deferral account is being requested, e.g., Mica 5&6, Site C.
Adjustment: More detailed explanations provided in Section 6.2.4 and Section 6.2.5.
Comment: Clarify whether the 70/30 debt-equity and Tier 3 water rentals have been reflected in the cost of BCH resources.

**Adjustment:** Included clarifying text in Section 6.2.4.2 (footnote).

Comment: Clarify the projection of trade income and the expectations vs. both the transfer price to Powerex and the incremental cost of Green/Clean energy.

**Adjustment:** Included clarifying text in Section 5.9.4.

Comment: Electric vehicles and the Hydrogen Highway have not been addressed in this LTAP.

**Adjustment:** Included clarifying text in Section 2.2.3.

Comment: Peak demand is growing more rapidly than energy use and an explanation would be helpful.

**Adjustment:** Included clarifying text in Section 2.2.3.

Comment: For the ROR, a range and average cost, all nominal would be helpful in understanding future prices.

**Adjustment:** Included a range of costs within Appendix F-11.

Comment: Set out what is treated as DSM and what is not. Where consumption changes are treated differently, such as in the cost of DSM, make the treatment clear.

**Adjustment:** Detailed description is found in Section 3.2.

Comment: Incorporate a discussion of SMI cost and relationship to DSM.

**Adjustment:** Included clarifying text regarding SMI in Section 6.2.1.2 (footnote).

**Written Comments – Naikun**

Comment: Interested in maintaining environmental attributes as part of the Clean Power Call.

**Adjustment:** Included clarifying text in Section 6.2.6.3.

**Written Comments – VPS**

Comment: Our primary concern is that the document offers very little in response to our proposed range of pumped storage hydroelectric plants … specifically, Appendix F-4… neglects any discussion of our proposal to re-develop the abandoned Old Jordan Forebay…

**Adjustment:** Included additional information on Jordan River pumped storage in Appendix F-4.
1.5.7 Feedback Regarding the Intervenor Workshops

A feedback form was distributed during Workshop #2 (April 25, 2008) to solicit comments on the Intervenor engagement process including: an overall ranking of the process; what participants found most valuable about the process; and suggestions on how the process could be improved. Twenty-seven feedback forms were returned. The summary results and verbatim comments are presented below.

1.5.7.1 Overall Rating

Respondents were asked to rate, "Overall based on my experience with the 2008 LTAP Intervenor workshops, I found them valuable and would participate in future workshops on this topic." A scale of "1 to 10" was used, where “1” is strongly disagree and “10” strongly agree.

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Number of Responses</th>
<th>Percentage</th>
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<tr>
<td>Rated “9-10”</td>
<td>10</td>
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<td>Rated “7-8”</td>
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<td>48%</td>
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<td>Rated “2”</td>
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<td>4%</td>
</tr>
<tr>
<td>Non-Responses</td>
<td>1</td>
<td>4%</td>
</tr>
</tbody>
</table>

*Ratings are based on participants' experience with all or some of the following: Preliminary Session, Workshop #1 and Workshop #2.

1.5.7.2 Overall Rating of "7 or less" – Verbatim Comments

Respondents were asked to explain if they selected an overall rating of “7 or less”:

- The analysis is unfortunately limited by government policy. This raises concerns about the validity of the analysis and the risks.
- Depends on whether the application matches the workshop.
- Level of detail info provided.
I will participate in future workshops. The materials are high level and more details are always appreciated.

Learned enough on overall direction of this workshop.

Useful presentation materials. Appreciate the regulatory framework provided at the start. Availability of presentation materials before/after is appreciated.

1.5.7.3 Most Valuable Aspect – Verbatim Comments

Respondents were asked to identify from their perspective, "What was the most valuable part of the 2008 LTAP Intervenor sessions? Verbatim responses from the survey are provided below and have been grouped into the following categories:

- Access to Information & Improved Understanding,
- Outlining Changes from Previous Plan & Effect of Government Policy,
- Load Forecast,
- Load Resource Gap,
- Portfolio Analysis & Risk Framework,
- Thermal Generation, and
- DSM & Price of Power

Most Valuable Aspect: Access to Information & Improved Understanding

- Obtain current BC Hydro status on LTAP.
- Ability to get informal information and Q&A on the materials before the formal BCUC review.
- The workshop sessions increase the understanding of the process within BC Hydro and allows for feedback.
• The ability to follow the thought process, behind BC Hydro development of the LTAP.

• Information about future needs and how BC Hydro arrives at their figures is presented in accessible manner.

• Presentations by a team lead were very helpful in understanding LTAP process and findings. Thank you for providing the opportunity to participate.

• Questions and answers.

• Gathering stakeholders – hearing perspectives.

• People contact.

• Meeting other people in audience.

**Most Valuable Aspect: Outlining Changes from Previous Plan & Effect of Government Policy**

• Understanding changes from prior plans.

• Can clearly see through analysis presented effect of recent government policies.

**Most Valuable Aspect: Load Forecast**

• Discussion of the load forecast – inputs/results.

• Discussion of price and load forecasts.

• Learning about the drop in the forecasted load.

• Load forecast validations and generation load grid and regulatory charges.

• Developing insight into how models and forecasts were generated.

• Gaining understanding of BC Hydro’s load forecasts and evaluation process for supply side and demand-side resources.
Understanding how electricity resource planning in the province will affect natural gas resource planning.

*Most Valuable Aspect: Load Resource Gap*

- Seeing what the gap is, and what hydro plans to do about it.
- Resource gap

*Most Valuable Aspect: Portfolio Analysis & Risk Framework*

- Portfolio analysis.
- Understanding of analysis methodologies.
- Quantifying the resource gap, portfolio analysis and risk analysis. The probability tree and risk analysis was GREAT!
- Understanding the methodologies behind the different scenarios pertaining to risk frameworks, etc.

*Most Valuable Aspect: Thermal Generation*

- Information on thermal generation and status.

*Most Valuable Aspect: DSM & Price of Power*

- Learning price of power not factor in forecasting success (or not) of DSM.

**1.5.7.4 Areas for Improvement – Verbatim Comments**

Respondents were asked, "Do you have any suggestions as to how the 2008 LTAP Intervenor engagement process could be improved?" Verbatim responses from the survey are provided below and have been grouped into the following categories:

- No Improvement Needed,
- Venue Improvements,
- More Notice for Announcements/Reading Materials,
- Opportunity to Comment on Background Materials,
- Encourage NGO Participation,
- Schedule Annual Resource Planning Workshop,
- Assessment of Planning Aspects & Modelling Approach,
- Portfolio Analysis - Step-by-Step Review of a Sample, and
- Portfolio Analysis - More Details and Analysis Required

**Areas for Improvement: No Improvement Needed**

- I think it's already pretty good.

**Areas for Improvement: Venue Improvements**

- Do not do them on Fridays, means I have to travel on the weekend.
- The room for this workshop was not very appropriate for the occasion. The room for the last workshop in March was much better.
- I wish BCH would choose hotels that are themselves Power Smart. I get annoyed looking up at all the incandescents while hearing BCH talk about creating a “conservation culture”.

**Areas for Improvement: More Notice for Announcements/Reading Materials**

- A little more lead time for announcement and email information (natural gas data).

**Areas for Improvement: Opportunity to Comment on Background Materials**
• Recommend BC Hydro provide windows of opportunity to comment on background documents used in BC Hydro planning activities. Not to revise them, but rather to allow comments on record in relation to underlying assumptions.

**Areas for Improvement: Encourage NGO Participation**

• Do encourage NGO [non-governmental organization] participation – B.C. residents need to understand more about these issues.

**Areas for Improvement: Schedule Annual Resource Planning Workshop**

• I think an annual resource planning workshop should be planned for a regular date each year – regardless of whether there is an LTAP or not. Resource planning is such a key driver of many energy related decisions it should be done regularly.

**Areas for Improvement: Assessment of Planning Aspects & Modelling Approach**

• More time spent reflecting on weaknesses of models/forecast. There are problems with the approach taken but little/no time spent on formalizing that in the slides.

• Assessment of areas in the planning, which might benefit from further examination, and the priority of those areas in contributing to understanding.

**Areas for Improvement: Portfolio Analysis – Step-by-Step Review of a Sample**

• A sample portfolio analysis that goes step-by-step through the process for one particular portfolio sharing the assumptions, the analytical steps and the results. BC Hydro has done something like this in its Revenue Requirement Application and Residential Inclining Block Application by providing an excel model that enables participates to run sensitivities.

**Areas for Improvement: Portfolio Analysis – More Details and Analysis Required**

• More specific data and numbers (load forecast, etc.)
- DSM details – more can be added. How they are estimated. What are the different levels and their examination?

- The LTAP process is lacking in:
  
  o Analysis of the impact of coal, nuclear and large hydro (B.C. and market area) or early 500 MW, CCGT in the Peace River.
  
  o Analysis of options and costs of government policy (and risk).
  
  o To quote a government representative: “There will be huge profits from the sale of green electricity to the US.”
  
  o Analysis of price risk for IPP supply with no competition.

1.6 2008 LTAP Engagement: Public Communication

1.6.1 Objectives

Objectives of the public communication component of the LTAP engagement were to:

- inform the broader audience about the 2008 LTAP,

- provide some continuity between the 2008 LTAP and the 2006 IEP/LTAP, and

- provide an opportunity for feedback or questions related to the 2008 LTAP.

1.6.2 Process

With respect to the public communication component, a BC Hydro 2008 LTAP website section was developed (www.bchydro.com/iep), which provided public access to relevant documents as materials became available during the ROU and Intervenor engagement components. An Energy Planning email address was created as an avenue for people to comment and to pose questions directly to the Energy Planning department staff. To provide continuity between the 2008 LTAP and the 2006 IEP/LTAP, an Energy Planning update
newsletter was distributed to First Nations and stakeholders who had either participated or expressed interest in the 2006 IEP/LTAP, providing an update on the 2008 LTAP process.

1.6.3 Website

A 2008 LTAP section was developed on BC Hydro’s Integrated Electricity Planning website (www.bchydro.com/iep). As materials became available during the ROU and Intervenor engagement components, they were uploaded to provide public viewing and access to relevant documents. Materials included items related to specific ROU and Intervenor engagement activities such as agendas, presentations, and meeting notes; and associated consultant reports produced to support the 2008 LTAP inputs and analysis.

1.6.4 Email Address

An Energy Planning email address was provided at public sessions and on the website as an avenue for people to comment and to pose questions directly to the Energy Planning department staff. The number of enquiries received through the Energy Planning email address indicates that this was a valuable communications tool. Subject matter of the email enquiries received was diverse, ranging from straightforward information requests about sessions/workshops, presentations and reports to more involved discussions on the 2008 LTAP analysis.

1.6.5 Newsletter

In March 2008, an Energy Planning update newsletter was distributed to First Nations and stakeholders who had either participated or expressed interest in the 2006 IEP/LTAP, with the objective of providing an update on the 2008 LTAP process and making the connection to the 2006 IEP/LTAP, as well as identifying the new 2008 LTAP web pages added to the Integrated Electricity Planning website for further information and comment/inquiry opportunities. The newsletter was distributed to 594 stakeholder contacts and 67 First Nations contacts. The distribution list was developed from the 2006 IEP/LTAP contact list of individuals who participated or expressed interest in the 2006 IEP/LTAP process. A copy of the newsletter is provided as Sub-Appendix Q-A.
1.7 2008 Fort Nelson Resource Plan Engagement

This section describes the First Nations and stakeholder engagement activities undertaken for the 2008 FNRP.

1.7.1 Objectives

The objectives of the 2008 FNRP First Nations and stakeholder engagement process were to:

- Inform First Nations and stakeholders of the 2008 FNRP,
- Identify issues and concerns and respond to inquiries associated with the 2008 FNRP, and
- Identify people who would like to stay informed of future Fort Nelson energy planning engagement activities.

1.7.2 Process

To achieve the above objectives, the 2008 FNRP engagement process consisted of the following:

- An announcement of the 2008 FNRP and community meetings
- Meeting with the Fort Nelson Town Council and the Chamber of Commerce
- Meeting with the Prophet River and the Fort Nelson First Nations, and
- Hosting an open house for the broader Fort Nelson community.

1.7.3 Activities

The 2008 FNRP includes two components; the need for advancement of the FNGU, and the need for more detailed studies of future supply options to meet possible future load scenarios. All engagement and communication activities regarding the 2008 FNRP included these two components.
On March 26, 2008 a Community Bulletin announcing the 2008 FNRP was distributed to the Fort Nelson Town Council, the Fort Nelson Chamber of Commerce, the Prophet River First Nation and the Fort Nelson First Nation. Along with the community bulletin was an invitation to meet with BC Hydro to discuss the 2008 FNRP. Through telephone discussions, meetings with all groups were confirmed for the week of April 28, 2008. The Town Council and Chamber of Commerce opted for holding a joint meeting.

On April 11, 2008, a News Release publicly announced the 2008 FNRP and invited people to attend an open house on April 30, 2008. On April 16, an invitation to attend the BC Hydro community open house was sent, along with the Media Release, to the following community groups: Industrial businesses, commercial businesses, Fort Nelson Library, Tourism, Muskwa-Kechika Management Area, Rotary Club, and the Alaska Highway Management Committee. Additional First Nations groups who received the Media Release and invitation to the open house included the Kaska Dene and the Treaty 8 Tribal Association. Please find the News Release attached as Sub-Appendix Q-C of this report.

During the week of April 21, 2008, an invitation to attend the BC Hydro community open house was also sent to the organizations that had provided a submission in response to BC Hydro’s RFEOI. Please refer to http://www.bchydro.com/info/ipp/ipp53053.html for more information on the RFEOI.

The Fort Nelson News printed an article on the 2008 FNRP prior to the community open house on April 16, 2008. In the weeks leading up to the open house, a newspaper advertisement was printed in the weekly Fort Nelson News on April 16, 23, and 30, 2008. A radio advertisement ran two times a day from April 25 to April 29. The Fort Nelson News article and the newspaper and radio advertisements are attached as Sub-Appendices Q-D, Q-E and Q-F of this report.

1.7.3.1 Community Meetings and Open House

- For the meetings and open house, the following information was reviewed with the attendees: the 2008 FNRP context, a summary of analysis and BC Hydro's approach to the 2008 LTAP filing. This was followed by a question and answer period. Feedback forms were made available for people to provide written comments.
A 2008 FNRP Fact Sheet was developed and distributed during the meetings and open house. The Fact Sheet was also made available at a Trade Fair, sponsored by the Chamber of Commerce and held in Fort Nelson, during the weekend of May 4/5, 2008.

The following provides a summary of the meetings and open house held in Fort Nelson:

**Meeting with the Town Council and Chamber of Commerce**

On April 30, 2008 BC Hydro representatives met with 7 members of the Town Council (which includes regional district staff) and the Chamber of Commerce at the Bear Pit in the Town Hall of Fort Nelson.

Generally the discussion focused on two areas. Members were interested in the ability to provide electrification to surrounding communities which do not currently have access to power. It was clarified that providing remote communities access is outside the scope of the mandate of the 2008 FNRP, however, and pointed to other areas of BC Hydro that deal with this issue.

In addition, people were interested in the potentially very significant load growth in the Horn River Basin due to oil and gas industrial activities and how this growth would impact municipal and regional infrastructure along with power supply needs. It was confirmed that the resource plan addresses future resource supply needs by including more detailed studies on supply options; however, the commitment of new load would be needed before any plan could be enacted. It was confirmed that BC Hydro would participate in a planning symposium in September to discuss potential load growth in the area.

The meeting ended with the Council being appreciative of Hydro’s planning efforts.

Four feedback forms providing written comments were received from this meeting. Comments expressed the following points: that it looks like the FNGU should be fast tracked, and that there is concern new supply may be needed before 2012. All members expressed interest in staying informed of the progression of the FNGU and outcome of the more detailed studies of future supply options.
Fort Nelson Community Open House

On April 30, 2008 BC Hydro hosted a community open house from 7 p.m. to 9 p.m. in the Aspen Room of the Woodlands Inn in Fort Nelson. Five people attended, including two IPPs, a regional district staff member, and two members of the general public.

Much of the discussion addressed questions related to potential IPP development (particularly wind), and the implications of accelerated oil and gas industrial growth and the potential need for a new transmission line over the longer term. It was clarified that, in terms of a call for power, BC Hydro would first examine the cost of doubling the capability of its existing plant and may use that estimate as a reference price to ensure any future call for power would be cost effective. It was also clarified that wind projects face challenges due to their inability to provide dependable capacity, which is needed in the Fort Nelson area. Significant increases in load would support the possible option of a transmission line connection to BC Hydro’s interconnected system.

A couple of questions were raised regarding the FNGU. It was clarified that an increase of approximately 10 MW of output would be achieved with no increase in fuel consumption, and also that BC Hydro is looking into what permit amendments might be required with this project.

One feedback form providing written comments was received from this open house. Comments expressed the following points: the FNGU is a great idea, biomass opportunities would be welcome, and the presenters were knowledgeable people.

Prophet River First Nation

On May 1, 2008 BC Hydro met with 2 members of the Prophet River First Nation at the band office located approximately 100 km outside of Fort Nelson. The community members present were responsible for the oil and gas and community development initiatives for the Prophet River First Nation.
Much of the discussion addressed issues related to the need for reliable service at Prophet River, the cost of service and original agreement with BC Hydro, potential donation and scholarship opportunities, and questions regarding a recent referrals request for studies associated with BC Hydro's Site C project. BC Hydro confirmed it would look for the original memorandum of understanding with Prophet River in regards to the Fort Nelson generating station. No concerns were raised regarding the FNGU or studies of future supply options at this meeting.

**Fort Nelson First Nation**

As requested by the Fort Nelson First Nation Chief, BC Hydro scheduled a meeting on May 1, 2008, with the Lands and Resources Director of the Fort Nelson First Nation Land and Resources Department. Due to unforeseen circumstances this meeting was cancelled by the Director. Presentation materials were left at the Lands and Resource Department for review.

BC Hydro held a second meeting in Vancouver, B.C., with the Lands and Resources Director. Discussion at this meeting was focussed on clarifying the resource plan content. No concerns were identified at this meeting regarding the FNGU. Interest was expressed regarding resource supply options under future load scenarios, such as the possibility for wind and biomass projects. The need for more geographic information system (GIS) mapping of traditional use information for Fort Nelson First Nation lands was discussed by the Land and Resources Director.

**1.8 Clean Power Call Engagement**

The CPC engagement process built upon the previous engagement efforts of the F2006 Open Call for Power. During summer 2006, BC Hydro engaged IPPs in a series of dialogue sessions to solicit input into the design of the call, including improvements to the acquisition process and enhanced contractual terms and conditions. On June 6, 2007, BC Hydro hosted an information session titled "Understanding BC Hydro's System Needs Information", 
which detailed BC Hydro’s system needs, long- and short-term system planning and system constraints. Input was sought from IPPs, First Nations and stakeholders on how to meet system needs through future calls.

In addition, BC Hydro sought input on the proposed terms of the CPC from potential developers, First Nations, government, other stakeholders and interested parties and the BCUC. The draft Term Sheet documents for the CPC were released on November 14, 2007. To improve understanding of the draft documents and to encourage discussion on the terms and facilitate informed feedback, BC Hydro held an information session on the proposed design of the call in Vancouver on November 27, 2007. This session was followed by a First Nations only information session on December 6 to discuss issues that are specific to First Nations. Following these sessions, BC Hydro received over 40 submissions with approximately 600 written comments on the draft Term Sheet documents. Input received through stakeholder engagement will be used to inform the Power Acquisitions Clean Power Team as they continue to design the CPC and the terms and electricity purchase agreement.

1.9 Mica Unit 5 & Mica Unit 6 Engagement

1.9.1 Core Committee Engagement

Engagement via a Core Committee commenced on January 21 and 22, 2008 with First Nations and stakeholders who expressed interest in participating at a technical level. The Core Committee consists of interested stakeholders including regulatory agencies and First Nations that are potentially impacted by the proposed project. The Core Committee is asked to identify and review potential incremental social, environmental and economic impacts and opportunities associated with Mica Unit 5 and Mica Unit 6, in an effort to recommend mitigation and compensation measures to address potential impacts. Additionally, the Core Committee is expected to review the Columbia River Water Use Plan and recommend revisions, if needed, to address incremental project impacts related to operational changes.
1.9.2 First Nation Consultation

BC Hydro Aboriginal Relations and Negotiations (AR&N) invited and offered capacity funding to 33 Aboriginal groups (i.e., First Nations and Tribal Councils) to participate in the Core Committee process, and to engage in consultations with respect to the project. AR&N is currently working with those First Nations that have expressed interest to provide project information, determine First Nation consultation expectations, understand First Nation interests in relation to the proposed project, and provide capacity funding to facilitate ongoing participation in the technical and procedural activities of the environmental assessment process.

1.9.3 Formal Public Consultation Process

The harmonized Provincial and Federal environmental assessment process follows the timelines prescribed by the EAO process. The process was initiated on March 4, 2008. The formal environmental review is 180 days that is expected to begin in December 2008 at the earliest, after the submission of the application. The formal review will include a public comment period of 45 days to allow First Nations, the public and Government agencies to review the EAO Application and provide their comments to the EAO. BC Hydro’s consultation with First Nations is consistent with the requirements of the EAO and is modelled on the consultation process completed for Revelstoke Unit 5.

1.9.4 Other Communication

First Nations and stakeholders will continue to be notified of all public involvement events and received copies of all updates sent out as part of broad communications activities. A range of other activities are being offered to ensure First Nations and stakeholder participation during the review of Mica Unit 5 and Mica Unit 6. This included e-mail, face-to-face meetings, presentation to organizations and municipal councils, an Open House, phone calls and development of a Project web site that provided pre-reading materials and minutes of Core Committee and Subcommittee meetings, and other documentation prepared on behalf of the Committees.
1.10 Sub-Appendix Q-A: Energy Planning Update Newsletter

As an individual who participated, or expressed interest, in BC Hydro’s energy planning work for the 2006 Integrated Electricity Plan (IEP), we would like to provide you with an update on the 2008 Long-Term Acquisition Plan (LTAP).

Currently, BC Hydro’s 2006 LTAP is in place and translates the 2006 IEP analysis into a series of actions that sets the course for the first ten years (F2006 to F2015) of the 20-year 2006 IEP horizon.

The purpose of the 2008 LTAP is to update the 2006 LTAP. This 2008 LTAP update is distinctive in that it reflects the 2007 provincial Energy Plan. Although addressing the 2007 Energy Plan expands the scope of the LTAP update, it also focuses the nature of the update on what needs to be done to implement the 2007 Energy Plan. The 2008 LTAP update work is in progress and is anticipated to be completed, and filed with the British Columbia Utilities Commission, in the spring of 2008.

With the 2008 LTAP underway, we have recently updated the Integrated Electricity Planning information on bchydro.com. Please see the information below to learn more about the LTAP process and its related engagement activities.

Sincerely,
Randy Reimann
2008 LTAP Project Manager

More information

- Overview of the 2008 LTAP
- Understanding the Process
- Resource Options Update
- Intervenor Workshops

Questions

If you have feedback on the content of this update, please Contact Us.
1.11 Sub-Appendix Q-B: Intervenor Workshop #3 Presentation

Slide 1

2008 Long-Term Acquisition Plan

Intervenor Workshop #3
2008 LTAP Draft Application

June 3, 2008

Slide 2

AGENDA

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<tr>
<th>Time</th>
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<tr>
<td>8:00</td>
<td>Registration</td>
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<tr>
<td>9:00</td>
<td>Introduction</td>
</tr>
<tr>
<td>9:15</td>
<td>Analysis &amp; Requests</td>
</tr>
<tr>
<td></td>
<td>• Risk Framework &amp; Modelling Intro</td>
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<tr>
<td></td>
<td>• Burrard</td>
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<td></td>
<td>• DSM</td>
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<tr>
<td></td>
<td>• Site C</td>
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<tr>
<td></td>
<td>• Contingency Resource Plan</td>
</tr>
<tr>
<td></td>
<td>• Contingency Contingency Plan</td>
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<tr>
<td>12:15</td>
<td>Lunch</td>
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<td>12:45</td>
<td>Analysis &amp; Requests - continued</td>
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<td></td>
<td>Implementation</td>
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<td></td>
<td>• DSM</td>
</tr>
<tr>
<td></td>
<td>• Burrard</td>
</tr>
<tr>
<td></td>
<td>• Mica Unit 5/Mica Unit 6</td>
</tr>
<tr>
<td></td>
<td>• Site C</td>
</tr>
<tr>
<td></td>
<td>• Acquisitions</td>
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<td>1:10</td>
<td>Fort Nelson Resource Plan</td>
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<td>2:00</td>
<td>Next Steps/Regulatory Process</td>
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Slide 3

Introduction

Cam Matheson

APPENDIX Q to BC Hydro’s 2008 LTAP

Slide 4

Introduction / Overview

2008 LTAP Process

Step 1 - Establish Objectives

Step 2 - Load Resource Balance

Step 3 - Resource Options Inventory

Step 4 - Develop & Evaluate Portfolios

Step 5 - Portfolio Trade-Off Analysis

Step 6 - Long-Term Acquisition Plan

Attributes

Load Forecast

Update

Key Risks and Uncertainties

Update

Load Forecast Key Risks and Uncertainties

Limited Update

Update (REVIEW TODAY)

No Update

Update (REVIEW TODAY)

No Update

Limited Update

No Update

Limited Update

APPENDIX Q to BC Hydro’s 2008 LTAP

Page 51 of 109
Orders Sought

◆ BCUC determines that the 2008 LTAP is in the public interest
◆ Endorsement of:
  ■ the Clean Power Call pre-attrition target of 5,000 GWh/yr and that energy to be purchased pursuant to the Clean Power Call must qualify as “clean or renewable”
  ■ BC Hydro relying on Burrard for planning purposes for 900 MW of dependable capacity and 3,000 GWh/yr of firm energy
◆ Approves the submission of the 2008 LTAP CRPs for inclusion in BC Hydro's NITS update
◆ BCUC determines that expenditures of $552.2 million are in the public interest
Slide 7

<table>
<thead>
<tr>
<th>Activity</th>
<th>Requested Expenditures ($M)</th>
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<tbody>
<tr>
<td>DSM Plan for F09 to F11</td>
<td>$418.0</td>
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<tr>
<td>Definition phase for capacity related DSM</td>
<td>$0.6</td>
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<tr>
<td>Sustaining Capital for Burrard</td>
<td>$1.6</td>
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<td>Definition phase for Mica Units 5 &amp; 6</td>
<td>$30.0</td>
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<tr>
<td>Site C Stage 2 Definition and Consultation work</td>
<td>$41.0</td>
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<tr>
<td>Clean Power Call Definition and Implementation</td>
<td>$2.0</td>
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<td>Fort Nelson Upgrade</td>
<td>$59.0</td>
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</table>

Slide 8

Analysis & Requests:
Risk Framework & Modelling Intro

Randy Reimann
Basil Stumborg
Slide 9

Introduction

◆ Goal of the 2008 LTAP
  - Identify best combination of supply-side and demand-side resources
    - Subject to 2007 Energy Plan, related legislation, and special directions
◆ Key Issues:
  - The future role of the Burrard Generating Station (BGS);
  - Amount of Demand Side Management (DSM);
  - Timing and nature of Calls for Energy;
  - The value of maintaining Site C as an option.
  - Contingency Plans (Resources and Transmission)
◆ This portion of today:
  - Risk Framework
  - Portfolio Modeling Overview
  - Analysis, Conclusions and Requests for key issues

Slide 10

Risk Framework and Portfolio Analysis

**LTAP Actions**
- DSM Plan
- Calls – Size and Type
- Burrard – Future Role
- Mica/Revelstoke
- Site C
- Contingency Resource Plans
- Transmission Contingency Plans

**Supported by Analysis**
- Process for comparing risks
- Identify Key Risks
- Scenarios
- Scenario Runs/Portfolios
- PV Costs
- Likelihood of resources being needed, their cost effectiveness
- Ability to meet reliability requirements
- Uncertainties/Risks
- Policy Requirements
- Resource Options
Risk Framework

- Four Key Elements:
  - Characterizing of uncertainty
    - either stochastic modelling or subjective assessments;
  - Combining uncertainty measures with portfolio analysis;
  - Qualitative Assessment; and
  - Providing mitigation for risks that need to be managed.

Risk Framework - Definitions

- Uncertainty
  - Unknown outcomes

- Risk
  - Uncertain outcomes that can be adverse to BCH and its customers

- Stochastic Modeling
  - Based on data from historic record
  - Includes load growth, market prices,

- Subjective assessment
  - When historic record can’t be relied upon
    - Quantitative or qualitative
Risk Framework – Probability Assessments

- **Probability Tree**
  - Combines probability assessments from stochastic modelling and from more subjective assessments
  - Provides a range of scenarios of what the future might look like
  - Used to frame comparisons for key issues

<table>
<thead>
<tr>
<th>Size of Gap</th>
<th>Cost of Thermal Generation</th>
<th>Relative Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Low</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Mid</td>
<td>6.6%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.3%</td>
</tr>
<tr>
<td>Mid</td>
<td>LowGas-LowGHG</td>
<td>0.6%</td>
</tr>
<tr>
<td></td>
<td>MidGas-MidGHG</td>
<td>24.0%</td>
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<td>HighGas-MidGHG</td>
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<td>HighGas-HighGHG</td>
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<tr>
<td>Large</td>
<td>Low</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Mid</td>
<td>6.6%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Slide 14

**Gap Uncertainty**

- Uncertainty around The Gap
  - Uncertain load growth
  - Uncertain DSM performance
  - Uncertain performance of IPP EPA’s
- Putting this together gives a range of Net Demand
  - For a fixed supply, gives a range of outcomes for The Gap

**Table 5-1 Representing Uncertainty Regarding Net Demand**

<table>
<thead>
<tr>
<th>Net Demand Scenarios</th>
<th>Low Net Demand</th>
<th>Mid Net Demand</th>
<th>High Net Demand</th>
</tr>
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<tbody>
<tr>
<td>Relative Likelihood</td>
<td>20%</td>
<td>60%</td>
<td>20%</td>
</tr>
<tr>
<td>GWh (F2020)</td>
<td>55,000</td>
<td>59,800</td>
<td>65,500</td>
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</table>
Uncertainty Regarding Thermal Costs

- Thermal Cost Uncertainty
  - Uncertain Natural Gas Cost Forecasts
  - Uncertainty Around GHG Offset Costs
  - Putting these together gives a range of costs for thermal operations

Table 5-2 Cost of Thermal Operations (Three-point Distribution)

<table>
<thead>
<tr>
<th>Cost of Thermal Operations Scenarios</th>
<th>Low (Low Gas, Low GHG)</th>
<th>Mid (Mid Gas, Mid GHG)</th>
<th>High (High Gas, High GHG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Likelihood</td>
<td>1%</td>
<td>66%</td>
<td>33%</td>
</tr>
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</table>

Uncertainty Regarding Thermal Costs – cont’d

- Thermal Cost Uncertainty
  - Pulling apart GHG and Natural Gas prices gives a five point distribution
  - Use where separating out these effects was important

Table 5-3 Cost of Thermal Operations (Five-point Distribution)

<table>
<thead>
<tr>
<th>Cost of Thermal Operations Scenarios</th>
<th>Low (Low Gas, Low GHG)</th>
<th>Mid (Mid Gas, Mid GHG)</th>
<th>Mid Gas, High GHG</th>
<th>High Gas, Mid GHG</th>
<th>High (High Gas, High GHG)</th>
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<tbody>
<tr>
<td>Relative Likelihood</td>
<td>1%</td>
<td>32%</td>
<td>13%</td>
<td>38%</td>
<td>16%</td>
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</table>
Base 11 Scenarios
- Combining Net Demand (The Gap) with Cost of Thermal Generation
- Yields discrete scenarios
- Each scenario has a relative likelihood

Figure 5-1 Eleven Branch Probability Tree

Slide 18

Base 11 Scenarios – cont’d
- How were these used?
  - For each scenario, resources used to fill the gap
  - Resources used, costs and other impacts can be analyzed
  - Policy options, resources constraints can then be tested

Table 5-5 Portfolio Results associated with the Base 11 Scenarios

<table>
<thead>
<tr>
<th>Base 11 Scenarios</th>
<th>Net Demand</th>
<th>Cost of Thermal Generation</th>
<th>Relative Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>1%</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Mid</td>
<td>10%</td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>33%</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>LowGas-LowGHG</td>
<td>1%</td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td>MidGas-MidGHG</td>
<td>17%</td>
<td>24.8%</td>
</tr>
<tr>
<td></td>
<td>HighGas-MidGHG</td>
<td>39%</td>
<td>10.7%</td>
</tr>
<tr>
<td></td>
<td>HighGas-HighGHG</td>
<td>13%</td>
<td>13.0%</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>99%</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Mid</td>
<td>62%</td>
<td>6.5%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>33%</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

How were these used?
- For each scenario, resources used to fill the gap
- Resources used, costs and other impacts can be analyzed
- Policy options, resources constraints can then be tested
Base 9 Scenarios

- A simplified tree was used when:
  - "cost of thermal" distinctions were not important
  - Site C analyses, capacity projects on the Columbia

(Portion of) Table 5-31 Portfolios with Mica/Revelstoke
Unit Selections identified

Base 5 Scenarios

- Used when:
  - Focus was on just most likely (mid-gap) scenarios
  - Used to manage modeling resources
  - Used mostly for sensitivity analyses
    - Incremental revenues from "green credits" (RPS sales),
    - exchange rates; and
    - discount rates.

APPENDIX Q to BC Hydro's 2008 LTAP

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Base Plan and Contingency Plans

- **Base Plan**
  - Informed by probability tree, probability weighted costs
  - Driven by more likely scenarios

- **Contingency Plans**
  - Informed by judgment and probability tree’s less likely branches
  - E.g. - Large gap scenario

<table>
<thead>
<tr>
<th>Size of Gap</th>
<th>Cost of Thermal Generation</th>
<th>Relative Likelihood</th>
<th>Thermal</th>
<th>Renewable</th>
<th>MCA</th>
<th>RCV/MAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>5.5%</td>
<td>$7,809</td>
<td>243</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High</td>
<td>5.5%</td>
<td>$11,577</td>
<td>337</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LowGas</td>
<td>0%</td>
<td>$11,577</td>
<td>337</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MidGas</td>
<td>20%</td>
<td>$11,577</td>
<td>1002</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MidGas</td>
<td>30%</td>
<td>$11,577</td>
<td>1260</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>HighGas</td>
<td>30%</td>
<td>$11,577</td>
<td>1260</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>HighGas</td>
<td>50%</td>
<td>$11,577</td>
<td>2030</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>HighGas</td>
<td>70%</td>
<td>$11,577</td>
<td>2030</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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Portfolio Analysis

Randy Reimann
Slide 23

Portfolio Analysis - Topics

- Renewable Energy Credits
- Gas Modeling
- Burrard
- DSM
- Acquisitions
- Mica / Revelstoke Next Units
- Site C
- Base Resource Plan
- Contingency Resource Plans
- Transmission Contingency Plans

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Renewable Energy Credits Modeled in LTAP

![Renewable Energy Credits Graph](image)

- BC Hydro Low Scenario
- BC Hydro Mid Scenario
- BC Hydro High Scenario
- Global Energy High Range
- Global Energy Low Range
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Natural Gas Generation

- Burrard
  - Allowed a range of dispatch, but plant generally does not run
  - Reflects current role as a backup source to non-firm Heritage Hydro or market purchases

- New gas generation committed and operated to:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Firm</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>Operating</td>
<td></td>
</tr>
<tr>
<td>SCGTs:</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>CCGTs:</td>
<td>70%</td>
<td>70%</td>
</tr>
</tbody>
</table>

- Reflects new unit construction commitments would be based on an expectation of operation
- Considers impact of divergent GHG offset policies and carbon taxes across neighbouring jurisdictions may not persist

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Burrard

- Burrard’s historical role
  - Including current operation and contribution to dependable capacity and firm energy;

- AMEC technical studies
  - Undertaken on Burrard’s health
  - Implications on BC Hydro’s ability to rely upon and operate the plant

- RWDI environmental and social license study
  - Undertaken on BC Hydro’s ability to operate Burrard

- Analysis of the impacts of maintaining Burrard
  - In current configuration with varying levels of energy contribution; and

- Rebuilding Burrard
  - Technical, environmental and social considerations
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**Burrard**

Figure 5-7 Burrard Actual Annual Generation

![Graph showing annual generation from 1961 to 2006]

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**Burrard**

Figure 5-8 Burrard Capability Study Annual Generation over 60-year period of record

![Graph showing annual generation from 1940 to 2000]

APPENDIX Q to BC Hydro's 2008 LTAP
Table 5-6: Annual OMA and Capital Funding for Alternative Burrard Operating Scenarios ($M/yr)

<table>
<thead>
<tr>
<th>Period</th>
<th>Scenario 1 (900 MW/600 GWh)</th>
<th>Scenario 2 (900 MW/3000 GWh)</th>
<th>Scenario 3 (900 MW/6000 GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Capital</td>
<td>OMA</td>
<td>Capital</td>
</tr>
<tr>
<td>Average 2009-2015</td>
<td>26</td>
<td>15</td>
<td>31</td>
</tr>
<tr>
<td>Average 2016-2028</td>
<td>6</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Average 20 yrs</td>
<td>13</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Levelized 20 yrs</td>
<td>16</td>
<td>14</td>
<td>19</td>
</tr>
</tbody>
</table>

Figure 5-9: Effect of Incremental RPS sales on the PV of the Burrard Firm
Figure 5-11 Comparison of the Annual Cost of the Burrard Options by Capacity Factor (high gas forecast)

<table>
<thead>
<tr>
<th>Capacity Factor (%)</th>
<th>CCGT</th>
<th>Existing</th>
<th>SCGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$0</td>
<td>$200</td>
<td>$400</td>
</tr>
<tr>
<td>10</td>
<td>$200</td>
<td>$400</td>
<td>$600</td>
</tr>
<tr>
<td>20</td>
<td>$400</td>
<td>$600</td>
<td>$800</td>
</tr>
<tr>
<td>30</td>
<td>$600</td>
<td>$800</td>
<td>$1,000</td>
</tr>
<tr>
<td>40</td>
<td>$800</td>
<td>$1,000</td>
<td>$1,200</td>
</tr>
<tr>
<td>50</td>
<td>$1,000</td>
<td>$1,200</td>
<td>$1,400</td>
</tr>
<tr>
<td>60</td>
<td>$1,200</td>
<td>$1,400</td>
<td>$1,600</td>
</tr>
<tr>
<td>70</td>
<td>$1,400</td>
<td>$1,600</td>
<td>$1,800</td>
</tr>
<tr>
<td>80</td>
<td>$1,600</td>
<td>$1,800</td>
<td>$2,000</td>
</tr>
<tr>
<td>90</td>
<td>$1,800</td>
<td>$2,000</td>
<td>$2,200</td>
</tr>
<tr>
<td>100</td>
<td>$2,000</td>
<td>$2,200</td>
<td>$2,400</td>
</tr>
</tbody>
</table>

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Burrard Options

- Demolish: Infeasible
- Maintain 900 MW / 600 GWh: Feasible – Risk: Low
- Maintain 900 MW / 3000 GWh: Feasible – Risk: Low – Mod
- Maintain 900 MW / 6000 GWh: Feasible – Risk: High
- Rebuild SCGT: Feasible – Risk: Mod – High
- Rebuild ½ CCGT or full CCGT: Infeasible
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**Burrard Conclusion**

1. Reduce planned firm energy commitment to 3,000 GWh to reflect the actual firm energy contribution to the BC Hydro system, reduce social license risk and to meet the intent of SD 10;
2. Funding and implementing the refurbishment plan as proposed by AMEC for the 900 MW / 3000 GWh reliance on Burrard; and
3. Delaying any potential plans to rebuild the plant that may raise either social license or permitting issues until ILM Upgrade Project is in place;

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**DSM**

- **DSM Option A:**
  - By 2020, expected energy savings of 10,900 GWh per year with associated capacity savings of 1,900 MW, both including transmission and distribution loss savings;

- **DSM Option B:**
  - By 2020, expected energy savings of 12,900 GWh per year with associated capacity savings of 2,200 MW both including transmission and distribution loss savings.
DSM

1. Impact of alternative DSM volumes on the load/resource balance;
2. Economic analysis of the two DSM options; and
3. Deliverability risk of the DSM savings.

---

### DSM Volume

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Gap with DSM Option A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak (MW)</td>
<td>382</td>
<td>356</td>
<td>358</td>
<td>37</td>
<td>115</td>
</tr>
<tr>
<td>Energy (GWh/y)</td>
<td>339</td>
<td>-352</td>
<td>-905</td>
<td>-1,315</td>
<td>-3,258</td>
</tr>
<tr>
<td>Mid Gap with DSM Option B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak (MW)</td>
<td>527</td>
<td>546</td>
<td>588</td>
<td>209</td>
<td>388</td>
</tr>
<tr>
<td>Energy (GWh/y)</td>
<td>927</td>
<td>502</td>
<td>187</td>
<td>56</td>
<td>-1,837</td>
</tr>
</tbody>
</table>

---

APPENDIX Q to BC Hydro's 2008 LTAP
DSM Volume

Figure 5-12  Electricity Trade Volumes with DSM Option B and Low Load Growth

DSM Economic Analysis

Table 5-15  Relative Value of DSM Option A as compared to No DSM

<table>
<thead>
<tr>
<th>Gap</th>
<th>Cost of Thermal</th>
<th>A-No DSM Total Resource Cost ($M)</th>
<th>B-No PV Cost of Scenario ($M)</th>
<th>C-No PV Supply Savings ($M)</th>
<th>D-A-No PV DSM Cost Acquired ($M)</th>
<th>E-A-No PV DSM Cost ($M/MWh)</th>
<th>F-Cost of Thermal Side Savings ($M/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Gas</td>
<td>0.1%</td>
<td>4,078</td>
<td>-</td>
<td>8,794</td>
<td>108,339</td>
<td>38</td>
</tr>
<tr>
<td>Low</td>
<td>GHG</td>
<td>0.5%</td>
<td>4,078</td>
<td>-</td>
<td>8,794</td>
<td>108,339</td>
<td>38</td>
</tr>
<tr>
<td>High</td>
<td>Gas</td>
<td>3.3%</td>
<td>4,078</td>
<td>-</td>
<td>11,186</td>
<td>108,339</td>
<td>41</td>
</tr>
<tr>
<td>High</td>
<td>GHG</td>
<td>6.6%</td>
<td>4,078</td>
<td>-</td>
<td>11,186</td>
<td>108,339</td>
<td>41</td>
</tr>
<tr>
<td>Low</td>
<td>Weighted</td>
<td>Low</td>
<td>3,394</td>
<td>8,706</td>
<td>74,848</td>
<td>45</td>
<td>116</td>
</tr>
<tr>
<td>Low</td>
<td>Weighted</td>
<td>Mid</td>
<td>3,394</td>
<td>8,706</td>
<td>74,848</td>
<td>45</td>
<td>116</td>
</tr>
<tr>
<td>High</td>
<td>Weighted</td>
<td>High</td>
<td>3,394</td>
<td>8,706</td>
<td>74,848</td>
<td>45</td>
<td>116</td>
</tr>
</tbody>
</table>

Weighted Present Value: 3,772 ($2,821) 11,597 92,992 41 125

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**DSM Economic Analysis**

**Figure 5-12** Cost of DSM Option A versus Supply Side

![graph showing cost comparison between DSM Option A and supply side for different levels of demand: low/low, mid/mid, high/high, low/low, mid/mid, high/high, low/low, mid/mid, high/high.]

- **Levelized $/MWh**
- **Supply Saving**
- **DSM Cost**

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**DSM Economic Analysis**

**Figure 5-13** Cost of Incremental Savings from DSM Option B and displaced Electricity Supply

![graph showing cost comparison between incremental savings from DSM Option B and displaced electricity supply for different levels of demand: low/low, mid/mid, high/high, low/low, mid/mid, high/high, low/low, mid/mid, high/high.]

- **Levelized $/MWh**
- **Supply Saving**
- **DSM Cost**

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DSM – Deliverability Risk

Includes consideration of:

- The expected variability of the resource;
- The degree of reliance upon the resource (e.g. how much of the gap is met by the resource); and
- The proven success of similar programs either here or in other jurisdictions.

Application of the Risk Framework to DSM was a first-time effort that involved eliciting probability assessments regarding DSM tools that were new to BC Hydro DSM planning, such as codes and standards and conservation rate structures, and programs that involved higher levels of effort than previous years.

As such, the Risk Framework has not yet identified and captured all drivers of DSM performance risk and correlations between drivers.

### Table 5-17 Low, Mid, and High Ranges for DSM Energy Savings

<table>
<thead>
<tr>
<th>DSM Option</th>
<th>GWh/y savings, 2020 Low</th>
<th>GWh/y savings, 2020 Mid</th>
<th>GWh/y savings, 2020 High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>(1,700)</td>
<td>10,200</td>
<td>1,800</td>
</tr>
<tr>
<td>Option B</td>
<td>(2,100)</td>
<td>12,000</td>
<td>2,300</td>
</tr>
</tbody>
</table>
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DSM - Conclusions

- Based upon:
  - DSM’s low cost,
  - The uncertainties and costs of supply side options, and
- In consideration of:
  - The degree of reliance upon DSM programs;
- BC Hydro concludes that DSM Option A should be the extent of the reliance on DSM savings at this point in time.

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Acquisitions (Calls for Power)

Key considerations:
1. Size of the gap, including DSM and past acquisition process delivery risk;
2. Natural gas prices;
3. Possible future impacts of GHG legislation or carbon taxes; and
4. Costs of the available clean supply sources.
## Acquisitions

### Table 5-18

Mid Gap Load/Resource Gap with Existing and Committed Resources plus Scenario A DSM

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak (MW)</td>
<td>382</td>
<td>356</td>
<td>358</td>
<td>37</td>
<td>115</td>
</tr>
<tr>
<td>Energy (GWh/y)</td>
<td>339</td>
<td>-352</td>
<td>-905</td>
<td>-1,315</td>
<td>-3,258</td>
</tr>
</tbody>
</table>

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**Table 5-21** Results of the 11 Base Scenarios showing amount of Thermal and Clean Resources

<table>
<thead>
<tr>
<th>Base 11 Scenarios</th>
<th>Dependable Capacity</th>
<th>Firm Energy</th>
<th>Dependable Capacity</th>
<th>Firm Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thermal</td>
<td>Clean</td>
<td>GWh</td>
<td>Thermal</td>
</tr>
<tr>
<td>Gap</td>
<td>Cost of Thermal</td>
<td>GHG Likelihood</td>
<td>Thermal MW</td>
<td>Clean MW</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>0.1%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
<td>3.3%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>0.5%</td>
<td>137</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>0.1%</td>
<td>479</td>
<td>137</td>
</tr>
<tr>
<td>Low</td>
<td>Hi</td>
<td>24.8%</td>
<td>479</td>
<td>188</td>
</tr>
<tr>
<td>Low</td>
<td>Mid</td>
<td>11.7%</td>
<td>479</td>
<td>318</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>0.1%</td>
<td>577</td>
<td>418</td>
</tr>
<tr>
<td>Low</td>
<td>Mid</td>
<td>6.6%</td>
<td>577</td>
<td>418</td>
</tr>
<tr>
<td>Mid</td>
<td>Mid</td>
<td>11.7%</td>
<td>479</td>
<td>318</td>
</tr>
<tr>
<td>Low</td>
<td>Mid</td>
<td>6.6%</td>
<td>577</td>
<td>418</td>
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<td>High</td>
<td>High</td>
<td>3.3%</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Low</td>
<td>Low</td>
<td>0.1%</td>
<td>577</td>
<td>418</td>
</tr>
<tr>
<td>Low</td>
<td>Mid</td>
<td>6.6%</td>
<td>577</td>
<td>418</td>
</tr>
</tbody>
</table>

### Slide 47

**Table 5-22** Present Value of Costs of the Base 11 Scenarios including RPS Sales

<table>
<thead>
<tr>
<th>Base 11 Scenarios</th>
<th>Present Value of Portfolios including Scenarios of RPS Sales Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weighted Present Value</td>
</tr>
<tr>
<td></td>
<td>11,857</td>
</tr>
</tbody>
</table>

**Note:** Present value of action cost, for generations, dependable power at low cost, for generations, revenue at low cost, for generations.
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## Acquisitions – Commitment Analysis

### Table 5-23 Assumed Resources in Clean Call Block and Open Call Block

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Dependable Capacity (MW)</th>
<th>Firm Energy (GWh)</th>
<th>Total (MW)</th>
<th>Energy (GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thermal</td>
<td>Clean</td>
<td>Thermal</td>
<td>Clean</td>
</tr>
<tr>
<td>Clean Call Block</td>
<td>0</td>
<td>319</td>
<td>0</td>
<td>3940</td>
</tr>
<tr>
<td>Open Call Block</td>
<td>479</td>
<td>188</td>
<td>2939</td>
<td>1637</td>
</tr>
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</table>

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## Acquisitions

### Table 5-24 Results of the Commitment Analysis for the Clean Call Block showing the amount of Thermal and Clean Resources

<table>
<thead>
<tr>
<th>Clean Call Block</th>
<th>Cost of Thermal 2012-2016</th>
<th>Dependable Capacity</th>
<th>Firm Energy</th>
<th>Total Cost 2017-2017</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Thermal Clean</td>
<td>Clean</td>
<td>Thermal Clean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermal GWh</td>
<td>Clean GWh</td>
<td>Thermal GWh</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Low</td>
<td>0.1%</td>
<td>319</td>
<td>3,940</td>
<td>0.1%</td>
</tr>
<tr>
<td>Low Mid</td>
<td>2.2%</td>
<td>319</td>
<td>3,940</td>
<td>2.2%</td>
</tr>
<tr>
<td>Low High</td>
<td>3.3%</td>
<td>319</td>
<td>3,940</td>
<td>3.3%</td>
</tr>
<tr>
<td>Mid Low</td>
<td>0.5%</td>
<td>319</td>
<td>3,940</td>
<td>0.5%</td>
</tr>
<tr>
<td>Mid Mid</td>
<td>2.4%</td>
<td>319</td>
<td>3,940</td>
<td>2.4%</td>
</tr>
<tr>
<td>Mid High</td>
<td>10.7%</td>
<td>319</td>
<td>3,940</td>
<td>10.7%</td>
</tr>
<tr>
<td>High Mid</td>
<td>31.0%</td>
<td>319</td>
<td>3,940</td>
<td>31.0%</td>
</tr>
<tr>
<td>High High</td>
<td>13.0%</td>
<td>319</td>
<td>3,940</td>
<td>13.0%</td>
</tr>
</tbody>
</table>
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### Acquisitions

#### Table 5-25 Results of the Commitment Analysis for the Open Call Block showing the amount of Thermal and Clean Resources

<table>
<thead>
<tr>
<th>Gap</th>
<th>Cost of Thermal</th>
<th>2012-2016</th>
<th>2012-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dependable</td>
<td>Firm Energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capacity</td>
<td>Energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermal</td>
<td>Clean</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>1.1%</td>
<td>189</td>
</tr>
<tr>
<td>Mid</td>
<td>Mid</td>
<td>2.5%</td>
<td>249</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>6.6%</td>
<td>396</td>
</tr>
</tbody>
</table>

#### Table 5-29 Difference in PV of Costs including RPS Sales of Clean Call Block minus the Open Call Block

<table>
<thead>
<tr>
<th>Gap</th>
<th>Cost of Thermal</th>
<th>Present Value of Portfolios including Scenarios of RPS Sales Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>0.1%</td>
</tr>
<tr>
<td>Small</td>
<td>Mid</td>
<td>0.5%</td>
</tr>
<tr>
<td>Mid</td>
<td>Mid</td>
<td>6.6%</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>10.7%</td>
</tr>
<tr>
<td>Mid</td>
<td>Mid</td>
<td>31.0%</td>
</tr>
<tr>
<td>Large</td>
<td>Mid</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Weighted Present Value: (204) (252) (280) (307)

---

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### Acquisitions

#### Table 5-29 Difference in PV of Costs including RPS Sales of Clean Call Block minus the Open Call Block

<table>
<thead>
<tr>
<th>Gap</th>
<th>Cost of Thermal</th>
<th>Present Value of Portfolios including Scenarios of RPS Sales Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>0.1%</td>
</tr>
<tr>
<td>Small</td>
<td>Mid</td>
<td>0.5%</td>
</tr>
<tr>
<td>Mid</td>
<td>Mid</td>
<td>6.6%</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>10.7%</td>
</tr>
<tr>
<td>Mid</td>
<td>Mid</td>
<td>31.0%</td>
</tr>
<tr>
<td>Large</td>
<td>Mid</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Weighted Present Value: (204) (252) (280) (307)

---

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**Acquisitions**

Table 5-30 Minimum Clean or Renewable Generation in Portfolios

<table>
<thead>
<tr>
<th>Base 11 Scenarios</th>
<th>Cost of Thermal</th>
<th>Minimum Clean or Renewable Percentage based on Generation in Portfolio (2012-2027)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>GHG</td>
<td>Likelihood</td>
</tr>
<tr>
<td>Small</td>
<td>Low Low</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Mid Mid</td>
<td>6.3%</td>
</tr>
<tr>
<td></td>
<td>High High</td>
<td>3.3%</td>
</tr>
<tr>
<td>Mid</td>
<td>Low Low</td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td>Mid Mid</td>
<td>24.9%</td>
</tr>
<tr>
<td></td>
<td>Mid High</td>
<td>10.5%</td>
</tr>
<tr>
<td></td>
<td>High Mid</td>
<td>31.0%</td>
</tr>
<tr>
<td></td>
<td>High High</td>
<td>13.5%</td>
</tr>
<tr>
<td>Large</td>
<td>Low Low</td>
<td>0.1%</td>
</tr>
<tr>
<td></td>
<td>Mid Mid</td>
<td>6.6%</td>
</tr>
<tr>
<td></td>
<td>High High</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Cost of Thermal:

- **Minimum Clean or Renewable Percentage based on Generation in Portfolio (2012-2027)**

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**Acquisitions - Conclusion**

- It is BC Hydro’s conclusion that given the gap uncertainties, that an acquisition of additional resources is warranted.
- Given the uncertainties surrounding GHG regulation and natural gas costs, that BC Hydro should avoid these risks, and target cost-effective clean or renewable resources.
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### Mica / Revelstoke

**Table 5-31** Portfolios with Mica/Revelstoke Unit Selections identified

<table>
<thead>
<tr>
<th>Net Demand</th>
<th>Base 9 Portfolios</th>
<th>Site C as an option</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cost of Thermal Generation</strong></td>
<td><strong>Relative Likelihood</strong></td>
</tr>
<tr>
<td>Small</td>
<td>6.60%</td>
<td>$7,124</td>
</tr>
<tr>
<td>Medium</td>
<td>3.30%</td>
<td>$6,952</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>32.85%</td>
<td>$11,026</td>
</tr>
<tr>
<td>Medium</td>
<td>25.45%</td>
<td>$11,859</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>15.10%</td>
<td>$17,069</td>
</tr>
<tr>
<td>Medium</td>
<td>12.05%</td>
<td>$17,766</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Site C

**Table 5-32** Portfolio Comparison between Site C not an option and Site C as an Option ($150M Risk Reserve cases)

<table>
<thead>
<tr>
<th>Site C Project</th>
<th>Net Demand</th>
<th>Site C as an option</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cost of Thermal Generation</strong></td>
<td><strong>Relative Likelihood</strong></td>
</tr>
<tr>
<td>Small</td>
<td>6.60%</td>
<td>$7,700</td>
</tr>
<tr>
<td>Medium</td>
<td>3.30%</td>
<td>$7,525</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>52.60%</td>
<td>$11,026</td>
</tr>
<tr>
<td>Medium</td>
<td>49.60%</td>
<td>$11,799</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>0.15%</td>
<td>$17,692</td>
</tr>
<tr>
<td>Medium</td>
<td>0.15%</td>
<td>$17,766</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>0.65%</td>
<td>$17,520</td>
</tr>
<tr>
<td>Medium</td>
<td>3.30%</td>
<td>$17,655</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APPENDIX Q to BC Hydro’s 2008 LTAP**

---

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**Site C**

Table 5-33 Portfolio Results with Site C as an Option for varying Risk Reserves

<table>
<thead>
<tr>
<th>Gap</th>
<th>Thermal</th>
<th>Year</th>
<th>PV</th>
<th>Year</th>
<th>PV</th>
<th>Year</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>-</td>
<td>6,544</td>
<td>2026</td>
<td>6,574</td>
<td>2027</td>
<td>6,583</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-</td>
<td>11,318</td>
<td>2024</td>
<td>11,552</td>
<td>2025</td>
<td>11,642</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2019</td>
<td>17,480</td>
<td>2021</td>
<td>17,437</td>
<td>2022</td>
<td>17,802</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2019</td>
<td>17,743</td>
<td>2021</td>
<td>17,897</td>
<td>2022</td>
<td>18,026</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>2021</td>
<td>17,285</td>
<td>2021</td>
<td>17,437</td>
<td>2021</td>
<td>17,802</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>2021</td>
<td>17,480</td>
<td>2021</td>
<td>17,597</td>
<td>2022</td>
<td>17,662</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2019</td>
<td>11,399</td>
<td>2021</td>
<td>11,554</td>
<td>2022</td>
<td>11,642</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>2021</td>
<td>11,138</td>
<td>2023</td>
<td>11,414</td>
<td>2024</td>
<td>11,483</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-</td>
<td>11,318</td>
<td>2023</td>
<td>11,414</td>
<td>2024</td>
<td>11,483</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>-</td>
<td>17,480</td>
<td>2025</td>
<td>17,597</td>
<td>2026</td>
<td>17,662</td>
<td></td>
</tr>
</tbody>
</table>

PVYear

$1,050M Risk Reserve

$450M Risk Reserve

No Risk Reserve

---

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**Base Resource Plan**

Figure 6-1

Capacity Load / Resource Balance - Base

Fiscal Year

(year ending March 31)

Operating Planning

APPENDIX Q to BC Hydro's 2008 LTAP

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**Base Resource Plan**

**Figure 6-2** Energy Load / Resource Balance - Base

<table>
<thead>
<tr>
<th>Fiscal Year (year ending March 31)</th>
<th>2007 Load Forecast Range</th>
<th>Existing and Committed Resources</th>
<th>Clean Power Call</th>
<th>Future Resources</th>
</tr>
</thead>
</table>
| Total Energy Load / Resource Balance - Base
| 2007 Load Forecast Range | Existing and Committed Resources | Clean Power Call | Future Resources |
| 2007 High Load Forecast after DSM | 2007 High Load Forecast after DSM |

**Contingency Resource Plan**

**Table 6-13 BRP Actions to Manage Risks**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential High Gas Prices</td>
<td>Significant DSM program Target clean resources in next calls</td>
<td>Avoids further exposure to gas prices by reducing need for calls and ensures calls avoid gas projects</td>
</tr>
<tr>
<td>GHG Offset Requirements and Costs</td>
<td>Significant DSM program Target clean resources in next calls</td>
<td>Avoids further exposure to GHG offset policies and prices by reducing need for calls and ensuring calls avoid gas projects</td>
</tr>
<tr>
<td>Burrard incapable or not permitted to operate</td>
<td>Limit Burrard energy reliance to 3000 GWh</td>
<td>Burrard capacity is required and by lowering energy reliance 1) reduces risk of technical or social license issues reducing plant availability, 2) is in line with Government Energy Plan and 3) reduces the impact if something goes wrong</td>
</tr>
<tr>
<td>ILM Timing Construction results in LMVI shortages</td>
<td>Maximise Burrard for 900 MW of capacity and return CE as a contingency resource Investigate the potential for cost effective DSM capacity programs or curtailable load</td>
<td>Provides maximum available capacity in the LMVI region without targeting further and potentially expensive capacity additions</td>
</tr>
</tbody>
</table>
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### Contingency Resource Plan

**Table 6-14 CRP Shortfall Risks**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Rationale</th>
<th>Capacity Reduction</th>
<th>Energy Shortfall Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F2017</td>
<td>F2028</td>
</tr>
<tr>
<td>Load Forecast Uncertainty</td>
<td>Peak load and energy requirements can increase as a result of either sustained growth or low temperatures on winter peak.</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>DSM Deliverability Risk#2</td>
<td>DSM programs as modelled have a significant range of deliverability where the variability is driven by implementations of codes and standards, customer response to rate design and rate increases. Capacity related to DSM energy savings was separately addressed as shown in section 5.7 or Appendix F-17.</td>
<td>230</td>
<td>180</td>
</tr>
<tr>
<td>Buried Unit Catastrophic Failure</td>
<td>Given the condition of the units, some units could suffer catastrophic failures, notwithstanding the planned refurbishment work and procurement of critical spares to reduce down-time.</td>
<td>150</td>
<td>n/a</td>
</tr>
<tr>
<td>Dales Capacity Reduction</td>
<td>Based upon less Bioenergy projects being successful.</td>
<td>50</td>
<td>n/a</td>
</tr>
<tr>
<td>Total Reduction:</td>
<td></td>
<td>930</td>
<td>1,150</td>
</tr>
</tbody>
</table>

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### Contingency Resource Plan

**Table 6-15 CRP#1**

<table>
<thead>
<tr>
<th>Unit</th>
<th>BRP</th>
<th>CRP #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mica 5</td>
<td>Not Required</td>
<td>F2014</td>
</tr>
<tr>
<td>Mica 6</td>
<td>Not Required</td>
<td>F2016</td>
</tr>
</tbody>
</table>
### Table 6-16 Energy Contingencies

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short lead time acquisition processes</td>
<td>BC Hydro would seek to undertake shorter lead-time acquisition processes that could include pre-qualification of bidders and pre-established acquisition rules.</td>
</tr>
<tr>
<td>DSM Program Adjustment</td>
<td>The DSM programs identified have an ability to adjust the timing and rate of delivery of energy savings.</td>
</tr>
<tr>
<td>Market Reliance</td>
<td>In the case of a short term shortfall of energy, BC Hydro would ultimately resort to market energy acquisitions.</td>
</tr>
</tbody>
</table>

### Table 6-17 CRP#2

<table>
<thead>
<tr>
<th>Unit</th>
<th>BRP</th>
<th>CRP #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site C</td>
<td>Not required</td>
<td>F2020</td>
</tr>
<tr>
<td>Mica 5</td>
<td>Not Required</td>
<td>F2014</td>
</tr>
<tr>
<td>Mica 6</td>
<td>Not Required</td>
<td>F2016</td>
</tr>
</tbody>
</table>
# Transmission Contingency Plan

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>11/12</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
<th>15/16</th>
<th>16/17</th>
<th>17/18</th>
<th>18/19</th>
<th>19/20</th>
<th>20/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 High Load Forecast LM/VI before DSM</td>
<td>8515</td>
<td>8643</td>
<td>8760</td>
<td>8869</td>
<td>9126</td>
<td>9243</td>
<td>9423</td>
<td>9597</td>
<td>9775</td>
<td></td>
</tr>
<tr>
<td>DSM Savings</td>
<td>183</td>
<td>321</td>
<td>429</td>
<td>527</td>
<td>666</td>
<td>867</td>
<td>1110</td>
<td>1215</td>
<td>1292</td>
<td></td>
</tr>
<tr>
<td>Net Peak Load Forecast</td>
<td>8702</td>
<td>8722</td>
<td>8794</td>
<td>8996</td>
<td>9162</td>
<td>9276</td>
<td>9432</td>
<td>9597</td>
<td>9775</td>
<td></td>
</tr>
<tr>
<td>LM/VI Dependable Capacity (excluding Burrard)</td>
<td>1522</td>
<td>1673</td>
<td>2036</td>
<td>2158</td>
<td>2175</td>
<td>2226</td>
<td>2226</td>
<td>2226</td>
<td>2226</td>
<td>2226</td>
</tr>
<tr>
<td>Capacity Available (in MW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Under System Normal</td>
<td>5232</td>
<td>5367</td>
<td>5573</td>
<td>5529</td>
<td>5684</td>
<td>5696</td>
<td>5734</td>
<td>5761</td>
<td>5761</td>
<td>5761</td>
</tr>
<tr>
<td>- Under N-1 Contingency</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
<td>8200</td>
</tr>
<tr>
<td>Burrard Capacity Requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Under N-1 Contingency</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
<td>480</td>
</tr>
<tr>
<td>CE Capacity Requirement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Under System Normal</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

### Break
Overview of DSM Options in the Portfolio Analysis

- Two DSM Resource Options (A & B)
- Cost Effective Resource Options
- Uncertainty
- DSM Option A selected
Overview of Proposed DSM Plan

**Codes and Standards**
- 23 changes to Provincial and Federal regulations across building codes and equipment regulations

**Rate Structures**
- Two-step incline block rate structures for all major rate classes

**DSM Programs**
- 21 programs across 3 sectors

**Supporting Initiatives**

---

### Codes and Standards

<table>
<thead>
<tr>
<th>Category</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic equipment</td>
<td>Standby power, set-top boxes, external power supplies, battery chargers</td>
</tr>
<tr>
<td>Incandescent lighting</td>
<td></td>
</tr>
<tr>
<td>Other residential</td>
<td>Windows, ceiling fans, furnace blower motors, torchieres, hot tubs, small motors, room air-conditioners</td>
</tr>
<tr>
<td>Building code</td>
<td></td>
</tr>
<tr>
<td>Appliances</td>
<td>Clothes washers, refrigerators, freezers, dishwashers</td>
</tr>
<tr>
<td>Large motors</td>
<td></td>
</tr>
<tr>
<td>Commercial equipment</td>
<td>High intensity discharge lamps and ballasts, packaged terminal air-conditioners, ice-cube makers, large air-conditioners, commercial clothes washers</td>
</tr>
</tbody>
</table>

---

APPENDIX Q to BC Hydro’s 2008 LTAP

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Overview of Proposed DSM Plan

Rate Structures

<table>
<thead>
<tr>
<th>Sector</th>
<th>Rate Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Residential (application filed with BCUC February 2008)</td>
</tr>
<tr>
<td>Commercial</td>
<td>Small general service (&lt;35 kW)</td>
</tr>
<tr>
<td></td>
<td>Large general service (&gt;35 kW)</td>
</tr>
<tr>
<td>Industrial</td>
<td>Large general service (&gt;35 kW)</td>
</tr>
<tr>
<td></td>
<td>Transmission (existing)</td>
</tr>
</tbody>
</table>

Overview of Proposed DSM Plan

Programs

<table>
<thead>
<tr>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour</td>
<td>Power Smart Partner</td>
<td>Mechanical Pulping</td>
</tr>
<tr>
<td>Voltage Optimization</td>
<td>Product Incentive</td>
<td>Power Smart Partner – Transmission</td>
</tr>
<tr>
<td>Lighting</td>
<td>High Performance Building</td>
<td>Power Smart Partner – Distribution</td>
</tr>
<tr>
<td>Sustainable Community</td>
<td>Voltage Optimization</td>
<td>New Plant Design</td>
</tr>
<tr>
<td>Refrigerator Buy-Back</td>
<td>Sustainable Community</td>
<td>Load Displacement</td>
</tr>
<tr>
<td>Renovation Rebate</td>
<td>Load Displacement</td>
<td>Sector Enabling Activities</td>
</tr>
<tr>
<td>New Home</td>
<td>Sector Enabling Activities</td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appliance and Electronics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Displacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector Enabling Activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Overview of Proposed DSM Plan

#### Supporting Initiatives

<table>
<thead>
<tr>
<th>Supporting Initiative</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes and Standards Support</td>
<td>Funding and technical assistance Research on new opportunities Industry and stakeholder support Training and education support</td>
</tr>
<tr>
<td>Public Awareness and Education</td>
<td>Advertising School education Internet Showcasing public figures as advocates for conservation</td>
</tr>
<tr>
<td>Community Engagement</td>
<td>Partnering with non-government organizations Codes and standards at local government level Support for incorporating energy strategies into community plans Event sponsorships Public outreach Community specialists</td>
</tr>
<tr>
<td>Technology Innovation</td>
<td>Technology identification introduction and demonstration Support for technology commercialization and adoption</td>
</tr>
<tr>
<td>Indirect and Portfolio Enabling Activities</td>
<td>Support and administration Strategy and policy Processes and documentation DSM-related training and education</td>
</tr>
<tr>
<td>Information Technology</td>
<td>For internal cost tracking and reporting</td>
</tr>
</tbody>
</table>

#### Planned Energy Savings in F2020 (GWh/yr)

<table>
<thead>
<tr>
<th></th>
<th>Codes and Standards</th>
<th>Rate Structures</th>
<th>Programs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>2,760</td>
<td>980</td>
<td>1,070</td>
<td>4,810</td>
</tr>
<tr>
<td>Commercial</td>
<td>500</td>
<td>390</td>
<td>1,480</td>
<td>2,370</td>
</tr>
<tr>
<td>Industrial</td>
<td>110</td>
<td>730</td>
<td>2,550</td>
<td>3,430</td>
</tr>
<tr>
<td>Total</td>
<td>3,370</td>
<td>2,060</td>
<td>5,150</td>
<td>10,610</td>
</tr>
</tbody>
</table>
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Risk Management

- Individual components undergo more detailed design
- Tracked against milestones and energy savings
- Flexibility to adjust individual components
- Flexibility to adjust mix of components over time

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Burrard

Randy Reimann
Burrard – Implementation

- Determination of $1.6 million are in the public interest
- BC Hydro requests that the BCUC endorse BC Hydro’s plan
  - 900 MW of dependable capacity and 3,000 GWh/year of firm energy.
- The plan reflects a commitment and requirement to:
  - Undertake the inspection work
  - Fund the additional capital investments and OMA expenditures identified in Scenario 2 of the AMEC Burrard Current Configuration Study
  - Average over 2009 – 2015 (timing to be confirmed)
    - $31M/yr capital
    - $18M/yr OMA

Burrard – Implementation - Need

<table>
<thead>
<tr>
<th>System Condition</th>
<th>Burrard Reliance (MW)</th>
<th>CE Reliance (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Plan Normal</td>
<td>640</td>
<td>0</td>
</tr>
<tr>
<td>Base Plan N-1 T Contingency after 1 hr</td>
<td>900</td>
<td>115</td>
</tr>
<tr>
<td>CRP* Normal</td>
<td>750</td>
<td>400</td>
</tr>
<tr>
<td>CRP* N-1 T Contingency after 1 hr</td>
<td>750</td>
<td>640</td>
</tr>
</tbody>
</table>
Burrard – Implementation – Time Line

- **F2009**
  - Develop project plan to undertake detailed inspections including tendering and retaining consultants;

- **F2010-F2012**
  - Undertake detailed unit inspections at the rate of two per year. Order of inspections to begin with older and worse condition Units 1-3. Units 4-6 would follow. This work would include taking key measurements for any critical spares identified in the inspection.

- **F2010-F2012**
  - Procure critical spares immediately as identified in the detailed inspections. Non-critical items would be reflected in capital plans.

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*Mica Unit 5 and Unit 6*

*Ken McKenzie*
Slide 80

**Mica Unit 5 / Mica Unit 6 – Implementation**

- BC Hydro is requesting a determination that expenditures of $30 million in F2009, F2010, F2011 to complete the Definition phase work for Mica Unit 5 and Mica Unit 6 are in the public interest.

- Completing the Definition phase for both Mica Units at the same time is also in the public interest.

- Stakeholder Engagement process and economic assessment confirmed optimal development sequence of Mica Unit 5, followed by Mica Unit 6, followed by Revelstoke Unit 6.

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**Mica Unit 5 / Mica Unit 6 – Implementation**

- To retain Contingency Resource Plan date of F2014 for Mica Unit 5, BC Hydro will undertake to complete in the Definition Phase:
  - Stakeholder Engagement (Regulatory agencies, First Nations, Local Government and stakeholders)
  - First Nations consultation
  - Environmental Regulatory approval (Environmental Assessment Certificates, Federal)
  - Technical design work
  - Award turbine and generator contract – complete turbine modal test
  - Application to BCUC for a Determinations for implementation
  - Implementation phase project plan

- The Mica units provide:
  - Very long term (50+ years) dependable capacity (465 / 460 MW)
  - Dependable capacity can be sustained over daily 16 HLH
  - UCCs delivered to the Lower Mainland: $34 / kW-yr to $49 / kW-yr

**Table 6-6 Direct and Loaded Capital Cost Estimates for the Mica Units ($2008)**

<table>
<thead>
<tr>
<th></th>
<th>Expected Direct Cost (SM)</th>
<th>Expected Loaded Cost (SM)</th>
<th>High Case Loaded Cost and deferred ISD (SM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mica Unit 5</td>
<td>$316</td>
<td>$420</td>
<td>$560</td>
</tr>
<tr>
<td>Mica Unit 6</td>
<td>$316</td>
<td>$420</td>
<td>$700</td>
</tr>
</tbody>
</table>
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Mica Unit 5 / Mica Unit 6 – Timeline

Table 6-7 Mica Units Definition Phase Timeline

<table>
<thead>
<tr>
<th>Activity</th>
<th>Target Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition Phase starts</td>
<td>May, 2008</td>
</tr>
<tr>
<td>Phased Turbine tender award</td>
<td>May, 2009</td>
</tr>
<tr>
<td>Expected issuance of EAC</td>
<td>February, 2010</td>
</tr>
<tr>
<td>Expected Determination issuance by BCUC</td>
<td>February, 2010</td>
</tr>
<tr>
<td>Definition phase ends</td>
<td>June, 2010</td>
</tr>
<tr>
<td>Mica Unit 5 Implementation Phase begins</td>
<td>June, 2010</td>
</tr>
<tr>
<td>Turbine model tests complete</td>
<td>August, 2010</td>
</tr>
<tr>
<td>Mica Unit 5 In-Service</td>
<td>October, 2013</td>
</tr>
</tbody>
</table>

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Implementation:
Site C

Mike Savident
Site C: Background

- BC Hydro is requesting a determination that Site C Stage 2 expenditures are in the public interest
  - Stage 2 is Project Definition and Consultation
  - Stage 2 expenditures forecast to be $41 million
- Stage 2 work will preserve Site C as an available supply option for 2019

- BC Energy Plan mandated BC Hydro and the Province to enter into consultation with First Nations, the province of Alberta, and communities
- LTAP Portfolio analysis shows Site C offers economic benefits to ratepayers in a range of scenarios

Site C: Staged Process

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Site C: Project Definition

- Engineering Field Investigations and Studies
  - Updating decades-old studies including:
    - Flood and earthquake design criteria
    - Foundation conditions
    - Peace river thermal regime and total gas pressure
    - Others
  - Will inform consultation process and may be required if project moves into environmental assessment
  - Will be used to confirm design criteria and inform project costs

- Commercial Analysis
  - Update interim project cost estimate
  - Investigate potential procurement options

Site C: Environmental & Social Issues

- Environmental and Socio-Economic Studies and Field Research
  - Prepare information baseline of current conditions in preparation for assessing project effects
  - Have planned for more than fifty studies over the next two years

- Technical Advisory Committees
  - Preparation for potential entry into federal / provincial environmental regulatory process
  - Participation from province, federal government, First Nations, local government, and local experts where applicable
  - Topics: Fish, Wildlife, Land Use, GHG, Recreation / Tourism, Heritage, Community Services & Infrastructure
Site C: Consultation

- Stakeholder and public consultation
  - Opened consultation office in Fort St. John (January ‘08)
  - Pre-consultation process (Dec ‘07 – Feb ‘08)
  - First round of project definition consultation (May ‘08 – Jun ‘08)
  - Second round of consultation planned for Fall 2008

- First Nations consultation
  - Parallel, separate process from public consultation

- Inter-provincial consultation with Alberta and NWT

Site C: Stage 2 Deliverables

- Project Definition Report (Stage 2 Report)
  - Updated project definition
  - Report on results of public consultation
  - Updated project cost estimate

- Recommendation to BC provincial government

- Provincial government will decide whether or not to proceed to Stage 3
- Stage 3 would include the formal regulatory process and environmental assessment
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Clean Power Call – Order Sought

- Expenditures of $2.0 million in F2009 and F2010 to complete the Definition phase work and implement the Clean Power Call are in the public interest.

- Request that BCUC endorse the following:
  - proposed target of 5,000 GWh/year of firm energy,
  - that the energy to be purchased must qualify as “clean or renewable” in accordance with the B.C. government’s Clean or Renewable Electricity Guidelines, and
  - the eligibility requirements for the Call.
Clean Power Call – Structured RFP

- RFP establishes BC Hydro’s preferred terms and conditions
- RFP provides flexibility to explore variations or alternatives that add value to ratepayers
- Proponents may submit modifications to the specimen EPA
- BC Hydro can initiate discussions and negotiations with selected proponents after proposal submission
- RFP approach reduces risk of legal claims

Clean Power Call – Key Eligibility Criteria

- Project Size – minimum of 25 GWh/year of energy
- Project Location – must be located in B.C.
- Project Type – new generation
- Interconnection – must have interconnection point on integrated system and follow BCTC’s OATT
- Biomass – forest-based biomass not eligible
- Existing Contracts – must be terminated shortly after call issued
- System Freshet Limitation – No greater than 25% of firm energy during May 1 to July 31 period
BC Hydro will determine the most cost-effective portfolio based on a comparison of adjusted bid prices and potential consideration of several non-price factors.

The bid price adjustments currently contemplated are as follows:

- Hourly Firm: ~$4/MWh deduction for flat energy profile
- Wind Integration: $10/MWh adder for wind projects
- Interconnection/Transmission: adder for project specific costs borne by BC Hydro for interconnection, network upgrades and transmission losses

**Clean Power Call – Key Terms and Conditions**

- **Product** – seasonal or hourly firm energy
- **Term** – 15 to 40 years
- **COD** – November 1, 2010 to November 1, 2016
- **Environmental Attributes** – All transferred to BC Hydro
Bioenergy Call

Bioenergy Call - Phase I
- A flexible RFP for projects viable now and do not require new tenure from Ministry of Forests and Range (MoFR).
  - Issued February 6, 2008; submission deadline is June 10
  - Targeting 1,000 GWh/year of new firm energy

Bioenergy Call - Phase II
- For projects that require more time and/or new forest tenure (presently being completed by MoFR)
  - Launched by July 2008 after inventory and forest tenure analysis is complete
  - Targeting 1,000 GWh/year of new firm energy

---

Fort Nelson Resource Plan

John Rich
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Fort Nelson Resource Plan

Outline

◆ Fort Nelson Resource Plan
  ▪ Overview of Fort Nelson Area
  ▪ Existing and Future Supply/Demand
  ▪ Supply Options
  ▪ Initial Assessment
◆ Resource Plan
  ▪ Proposed Approach and Schedule
◆ Next Steps
◆ Questions

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Fort Nelson Resource Plan

Overview of Fort Nelson Area

Pre-1991  Diesel generating station
1991  Transmission line to Alberta
1999  Fort Nelson 47 MW (nominal) gas-fired generating station
       Forecasted minimal load growth
2000  Decommissioned diesel generating station
       Firm back-up supply from Alberta
2007/8  Load in the Fort Nelson area increased by more than 50% (now about 40 MW)
**Slide 100**

### Fort Nelson Resource Plan

#### Supply/Demand Balance

<table>
<thead>
<tr>
<th>Current</th>
<th>Supply Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>◆ 50% load growth in less than 2 years&lt;br&gt;◆ Gap between supply &amp; expected load&lt;br&gt;◆ Reliability deteriorated</td>
<td>Modest new supply needed to meet actual and expected growth</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Future</th>
<th>Supply Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>◆ Potential significant load growth (as much as 200% above forecasted)&lt;br&gt;◆ Industry-related growth and fuel-switching</td>
<td>Significant future load growth will require major new resources</td>
</tr>
</tbody>
</table>

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### Fort Nelson Resource Plan

#### Reference Demand Forecast and Possible Load Growth Scenarios

![Graph showing reference demand forecast and load growth scenarios](image)

- **FNG 40MW (dependable)**

**APPENDIX Q to BC Hydro’s 2008 LTAP**

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**Fort Nelson Resource Plan**

**Resource Options**

- **Local Generation**
  - FNG Upgrade project
  - Further expansion of FNG
  - IPP – Acquisition of clean or renewable or gas-fired generation

- **Transmission**
  - Connection from Fort Nelson to BC Hydro grid (Peace region)
  - Increased supply from Alberta (A1 and A2 reinforcement options identified for analysis)

- **Load**
  - Demand-Side Management

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**Fort Nelson Resource Plan**

**Local Generation - FNG Upgrade Project**

- Convert the existing simple cycle gas-fired unit into a combined cycle facility without expanding the existing footprint
- Estimated cost ~ $59 million
- Planned ISD: March 2012

**EFFICIENCY & POWER OUTPUT IMPROVEMENTS**

- Increase power output by about 8MW to 12MW (nominal)
- More MWh produced for the same natural gas consumption
- Add voltage support to the region

**ENVIRONMENTAL IMPROVEMENTS**

- Reduce effluent production by 50 – 75%
- Reduce GHG per MWh by roughly 20%
- Potentially reduce raw water usage by 60 – 80%
Fort Nelson Resource Plan

Local Generation - Fort Nelson Generation Expansion

- Double size of existing FNG (after upgrade project) by adding second CCGT.
- Economies of scale relative to greenfield CCGT.

Local Generation - IPP Acquisition

- Clean or Renewable Generation Procurement
  - Request for Expression of Interest (RFEOI) for Clean or Renewable Projects was undertaken in October 2007
  - 6 Biomass, 2 Run-of-river, 6 Wind power, 2 Additional
  - Clean/renewable supply unlikely to meet load – some potential for biomass although with high cost/fuel supply risk
- Gas Generation Procurement
  - Greenfield CCGT – assumed characteristics same as FNG expansion.

Approach

- Bundle supply options into “portfolios”
- Assess each portfolio against the forecasted load and each of the three scenarios (low, medium and high)
- Reliability and cost criteria were primary considerations
- Key input assumptions same as 2008 LTAP (GHG, gas/electricity prices)
- Other considerations identified for further assessment (e.g. consistency with BC Energy Plan)
- Economic and risk analysis on a range of uncertainties
  - Upgrade project capital cost
  - GHG costs
  - Gas/electricity prices
  - Expected local generation dispatch
  - Marginal versus system losses
  - Load growth above scenarios
  - Double circuited transmission line from Alta (Rainbow) to Fort Nelson
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Fort Nelson Resource Plan

Portfolio Cost-Effectiveness as a Function of Load (Illustration)

- New transmission line to BC Hydro grid
- Upgrade of AB transmission supply
- FNG Upgrade
- Fort Nelson generating station
- New local generation
- Backup supply from Alberta

Calendar Year

MW

Reference Forecast
High Scenario
Medium Scenario
Low Scenario

Fort Nelson generating station
+ Backup supply from Alberta

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Fort Nelson Resource Plan

Preliminary Results – PV Analysis

Portfolio

PV of Costs - Weighted Average Price Forecast, Mid GHG Offset Cost

A0 = AESO Committed Trans
A1 = AESO Upgrade 1
A2 = AESO Upgrade 2
FNGUBM = FNGU + 10 MW Biomass
FBM = FNG + 10 MW Biomass
B1 = New BCTC 230 kV to GMS
Link = GHG Linked Markets Scenario (Mid)
FNG = Existing FNG SCGT
FNGU = FNG Upgrade to CCGT
FNGUCC = FNGU + 60 MW CCGT

APPENDIX Q to BC Hydro's 2008 LTAP
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Fort Nelson Resource Plan

Initial Indications

- New supply required just to meet expected load forecast
- All supply options will require significant investment and lead time
- RFEOI indicates clean or renewable supply alone cannot meet future load
- FNG Upgrade project and Alberta transmission reinforcement (A1) appear to be cost-effective building blocks across all load growth scenarios
- More detailed study of other options, combined with increased certainty of future load increases needed to determine next best supply option

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Fort Nelson Resource Plan

Next Steps

- Advance FNG Upgrade project
  - Evidentiary update to be filed in August 2008
  - Seek regulatory approvals
  - First Nations and Stakeholder Engagement to be completed
- Initiate more detailed studies of:
  - Transmission reinforcements to support increased supply from Alberta
  - Expansion of Fort Nelson generating station (~ double the size) and new gas generation
  - Integration of Fort Nelson to BCH grid
Next Steps

Joanna Sofield

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Next Steps

- Intervenor written comments accepted up to noon on this Friday - June 6th
- Target Filing Date - June 12th
- BCUC IR No. 1 - July 3rd
- Intervenor IR No. 1 - July 10th
- BC Hydro Responds - August 14th
- Evidentiary Update - August 21st
- BCUC IR No. 2 - August 27th
- Intervenor IR No. 2 - September 3rd
- BC Hydro Responds - October 1st
- Procedural Conference - October 3rd
1.12 Sub-Appendix Q-C: News Release for the Fort Nelson Resource Plan

BC Hydro launches Fort Nelson resource plan

Fort Nelson – BC Hydro is in the process of developing a resource plan that will allow it to meet its electricity service obligations in the Fort Nelson area over the long term.

Currently, the bulk of the electricity supply is provided from the Fort Nelson Generating Station, with backup supply provided from Alberta by a transmission line that connects Fort Nelson to the Alberta electric system.

In the medium to long-term, there may be potentially significant increases to electricity demand in the Fort Nelson area that are beyond the capability of the existing supply arrangements. As a result, BC Hydro is exploring several supply options to meet a variety of potentially significant increases in electricity demand in the Fort Nelson area, including:

- Improving the efficiency and capacity of the existing Fort Nelson Generating Station with a Resource Smart project.
- Continuation/expansion of backup supply with Alberta
- Acquiring or building new supply in the area
- Interconnection of the Fort Nelson area to the BC Hydro grid via a 300-kilometre transmission line connected to the Peace Region

“Fort Nelson is unique with its connection to the Alberta grid and uncertainty over load growth,” said Yvette Maiangowi, Project Manager for the Fort Nelson Resource Plan. “We need to be prepared to address a number of future load scenarios that could be requested at any time. This plan helps to ensure we are prepared to supply our customers in the most cost effective way possible.”

BC Hydro invites interested members of the public to a Community Open House on April 30 from 7 to 9 p.m. in the Aspen Room of the Fort Nelson Woodlands Inn at 3995 50th Avenue South to participate in a discussion of the planning process and the approach BC Hydro is taking to acquire new resources if and when they are needed. The Fort Nelson Resource plan is expected to be completed by late spring of 2008.

For more information, please contact Curtis MacPheat, Community Relations Manager, at (250) 561-4906 or email curtis.macpheat@bchydro.com.

Visit BC Hydro’s web site at www.bchydro.com
BC Hydro Launches Resource Plan for Fort Nelson

BC Hydro is in the process of developing a resource plan that will allow it to meet its electricity service obligations in the Fort Nelson area over the long term. Currently, the bulk of the electricity supply is provided from the Fort Nelson Generating Station, with backup supply provided from Alberta by a transmission line that connects Fort Nelson to the Alberta electric system. In the medium to long term, there may be potentially significant increases to electricity demand in the Fort Nelson area that are beyond the capability of the existing supply arrangements.

As a result, BC Hydro is exploring several supply options to meet a variety of potentially significant increases in electricity demand in the Fort Nelson area, including:
- Improving the efficiency and capacity of the existing Fort Nelson Generating Station with a Renovation Project;
- Continuation/construction of backup supply with Alberta;
- Acquiring or building new supply in the area;
- Interconnection of the Fort Nelson area to the BC Hydro grid via a 500-kilometre transmission line connected to the Peace River System.

"Fort Nelson is unique with its connection to the Alberta grid and uncertainty over load growth," said Yvonne Manzagol, Project Manager for the Fort Nelson Resource Plan. "We need to be prepared to address any of future load scenarios that could be requested at any time. This plan helps to ensure we are prepared to supply our customers in the most cost-effective way possible." BC Hydro invites interested members of the public to a Community Open House on April 30 from 7 to 9 p.m. in the Airport Room of the Fort Nelson Woodlands Inn to participate in a discussion of the planning process and the approach BC Hydro is taking to acquire new resources if and when they are needed. The Fort Nelson Resource plan is expected to be completed by late spring of 2008.
1.14 Sub-Appendix Q-E: Newspaper Advertisement for the Fort Nelson Resource Plan Community Open House

Invitation To Attend the BC Hydro Fort Nelson Resource Plan Community Open House

on April 30, 2008 at 7:00 p.m.

BC Hydro is in the process of developing a resource plan that will allow it to meet its electricity service obligations in the Fort Nelson area over the long term.

BC Hydro invites interested members of the public to a Community Open House on Wednesday, April 30, 2008 at 7:00 p.m. to 9:00 p.m. at the Fort Nelson Woodlands Inn at 3995 50th Avenue South in the Aspen Room to participate in a discussion of the planning process and the approach BC Hydro is taking to acquire new resources if and when they are needed. The Fort Nelson Resource plan is expected to be completed by spring, 2008.

For more information, please contact Curtis MacPhee, Community Relations at 250 561-4906 or email curtis.macphee@bchydro.com

www.bchydro.com

Paper: Fort Nelson News (Vanet)

Date: April 16, 23, 30

Size: 5 col (5.71") x 63 lines
1.15 Sub-Appendix Q-F: Radio Advertisement for the Fort Nelson Resource Plan Community Open House

RADIO AD:
: CKRX – Energy 102

DATE: April 25 – April 29

DAILY: 2 x daily

SPOTS: 10 total per station

### RADIO SCRIPT

Community Open House

BC Hydro is in the process of developing a resource plan that will allow it to meet its electricity service obligations in the Fort Nelson area over the long term.

BC Hydro invites interested members of the public to a Community Open House on Wednesday, April 30, 2008 at 7:00 p.m. to 9:00 p.m. at the Fort Nelson, Woodlands Inn at 3995 50th Avenue South in the Aspen Room to participate in a discussion of the planning process and the approach BC Hydro is taking to acquire new resources if and when they are needed. The Fort Nelson Resource plan is expected to be completed by spring, 2008.

For more information, please contact Curtis MacPheat, Community Relations at 250 561-4906 or email curtis.macpheat@bchydro.com.
DSM Plan Workshop

June 24, 2008
Agenda

• Context
• Strategy
• Plan development
• Plan description
• Plan justification
• Risk management
• Expenditure request
• Location of DSM content in LTAP
Context

• Legislative requirements and government policy
  > Utilities Commission Act
  > 2007 Energy Plan

• BC Hydro vision
  > Develop and foster a conservation culture in B.C. that leads to customers choosing to make a dramatic and permanent reduction in electricity intensity.

• First Nation and Stakeholder opinion
  > 2006 IEP participants
  > Electricity Conservation and Efficiency Advisory Committee
Amended Utilities Commission Act

- Government energy objective: encourage utilities to take demand-side measures

- 44.1 (2): resource plans to include DSM plans and to explain why new energy supply is not planned to be replaced with DSM

- 44.1(2) also provides that a public utility's long-term resource plan must show how the utility intends to reduce demand by taking cost-effective demand-side measures.
• 44.1 (4): BC Hydro’s resource plan to include a statement of the demand-side measures it would need to take, in combination with demand side-measures taken by governments, such that the demand increase would be reduced by 50% by 2020

• 44.1 (8): BCUC to consider government energy objectives and adequacy of DSM plans, among other things, when considering whether to accept resource plans

• 44.2 (5): BCUC to consider government energy objectives, among other things, when considering whether to accept DSM expenditures
2007 Energy Plan

- Policy Action 1: BC Hydro 50% conservation target
- Policy Action 3: Cost-effective DSM
- Policy Action 4: New rate structures
DSM Strategy

- Shaped by:
  - estimate of the DSM resource
  - strategic framework
  - barriers to energy efficiency

- DSM resource estimated through Conservation Potential Review and analysis of specific DSM tools and tactics
Conservation Potential Review

- Economic potential
  > All potential conservation within CPR scope costing less than 13 cents/kWh

- Achievable potential
  > Top-down, consensus judgement of CPR workshop participants on portion of economic potential that can be achieved through undefined government and utility actions
  > Lower achievable assumes status quo market conditions, program efforts and incentive levels
  > Upper achievable assumes supportive government policy and market conditions and energy savings are aggressively pursued
Conservation Potential Review (cont’d)

• CPR results informed decisions on:
  > the feasibility of different levels of conservation
  > where to focus DSM programs
  > unit cost and savings assumptions for selected DSM measures

• CPR results were complemented with additional available and appropriate information
Strategic Framework

Societal

Market

Individual

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.
Barriers to Energy Efficiency

• Awareness
  > Consumers are not aware of the more efficient technology and opinion leaders do not advocate for the more efficient technology.

• Availability
  > The more efficient technology or process is not available on the market.

• Accessibility
  > The more efficient technology or process is not easily accessible to all consumers.

• Affordability
  > The higher first cost of a more efficient technology or process prevents consumers from adopting it, even though it is cost-effective over time.

• Acceptance
  > Consumers do not like the more efficient technology or process or may have other priorities.
## DSM Tools

<table>
<thead>
<tr>
<th></th>
<th>Individual</th>
<th>Market</th>
<th>Societal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes and Standards</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Rate Structures</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programs</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
# Supporting Initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| Public Awareness and Education     | Stronger conservation culture  
Enhanced public support for codes and standards and rate structures  
Enhanced customer response to rate structures and programs |
| Community Engagement               | Stronger conservation culture  
Enhanced customer response to rate structures and programs  
Enhanced utilization of municipal powers for conservation |
| Codes and Standards Support        | Supports realization of planned codes and standards savings |
| Technology Innovation              | New energy saving opportunities for codes and standards, programs and customers |
| Information Technology             | Information technology infrastructure  
More efficient program operation |
| Indirect and Portfolio Enabling    | General management and infrastructure |
## Supporting Initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Individual</th>
<th>Market</th>
<th>Societal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Awareness and Education</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Community Engagement</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Codes and Standards Support</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Technology Innovation</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Information Technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect and Portfolio Enabling</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assembling the DSM Options

Supporting Initiatives
- Public Awareness and Communication
- Community Engagement
- Information Technology
- Codes and Standards Support
- Technology Innovation
- Indirect and Portfolio Enabling

Codes and Standards
- A
- B

Rate Structures
- A
- B

Programs
- A
- B

Combined Options
- A = A codes and standards, rate structures and programs + program adjustments
- B = B codes and standards, rate structures and programs + program adjustments
DSM Plan Development

1. Identify alternatives within each of the three DSM tools of codes and standards, rate structures, and programs.

2. Screen alternatives and estimate electricity savings and costs for selected alternatives.

3. Assemble a smaller and a larger version of each DSM tool (“building blocks”).

4. Integrate building blocks into two DSM Plan options (Option A and Option B).

5. Develop supporting initiatives.
Portfolio Analysis

- Option A selected
  - Relative cost
  - Uncertainties
Planned Electricity Savings

- Planned level of DSM savings is reasonable for resource planning because:
  - Codes and standards
    - enacted, announced or planned by government
    - savings estimated with best available information
  - Rate structures
    - align with government policy and are in place, proposed or scheduled for redesign in near term
    - savings estimated with elasticity assumption
  - Programs
    - designed and managed by experienced staff with a proven track record
    - savings estimated with best available information
  - Supporting initiatives
    - comprehensive
    - designed and managed by experienced staff
Why not DSM Option B

- Option A already involves a certain level of deliverability risk
- Option B involves additional risk that is considered imprudent for resource planning
  > Would need to convince government to implement additional codes and standards that are not yet planned
  > Would require more customers to respond and Option A customers to do more in response to rate structures and programs
- Option B would involve a level of reliance on one resource that is considered imprudent given its uncertainties and risks
  > 92% and 127% of the energy and capacity gaps, respectively, in F2020
  > 106% and 138% of energy and capacity growth between F2008 and F2021
- Have flexibility to change mix and level of DSM effort in next DSM Plan
# Energy Savings in F2020 (GWh/yr)

<table>
<thead>
<tr>
<th></th>
<th>Codes and Standards</th>
<th>Rate Structures</th>
<th>Programs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>2,760</td>
<td>980</td>
<td>1,070</td>
<td>4,810</td>
</tr>
<tr>
<td>Commercial</td>
<td>500</td>
<td>390</td>
<td>1,480</td>
<td>2,370</td>
</tr>
<tr>
<td>Industrial</td>
<td>110</td>
<td>730</td>
<td>2,590</td>
<td>3,430</td>
</tr>
<tr>
<td>Total</td>
<td>3,370</td>
<td>2,090</td>
<td>5,150</td>
<td>10,610</td>
</tr>
</tbody>
</table>
### Three Sets of DSM Numbers in LTAP

<table>
<thead>
<tr>
<th>Energy Savings in F2020</th>
<th>Represents</th>
<th>Location</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: 10,820 GWh/yr</td>
<td>Rate of energy savings at customer meter</td>
<td>Section 3.2</td>
<td>Inputs to DSM probability assessment</td>
</tr>
<tr>
<td>B: 13,030 GWh/yr</td>
<td>Single point estimate of planned savings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: 10,900 GWh</td>
<td>Volume of energy savings within the fiscal year at generator</td>
<td>Section 5.5</td>
<td>Inputs to LTAP portfolio analysis</td>
</tr>
<tr>
<td>B: 12,900 GWh</td>
<td>Mid outcome from probability distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,610 GWh/yr</td>
<td>Same as Section 3.2 except updated with new information</td>
<td>Section 6.2.1</td>
<td>Basis for DSM expenditure request</td>
</tr>
</tbody>
</table>
## BC Hydro Costs ($ million)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>285</td>
<td>567</td>
<td>744</td>
<td>906</td>
</tr>
<tr>
<td>Commercial</td>
<td>228</td>
<td>547</td>
<td>959</td>
<td>1,433</td>
</tr>
<tr>
<td>Industrial</td>
<td>232</td>
<td>699</td>
<td>1,048</td>
<td>1,370</td>
</tr>
<tr>
<td>Portfolio-level</td>
<td>156</td>
<td>328</td>
<td>518</td>
<td>730</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>901</strong></td>
<td><strong>2,141</strong></td>
<td><strong>3,269</strong></td>
<td><strong>4,438</strong></td>
</tr>
</tbody>
</table>

Reliable power, at low cost, for generations. Reliable power, at low cost, for generations. Reliable power, at low cost, for generations.
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Energy Savings in F2020 (GWh/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic equipment</td>
<td>Standby power, set-top boxes, external power supplies, battery chargers</td>
<td>1,311</td>
</tr>
<tr>
<td>Incandescent lighting</td>
<td></td>
<td>845</td>
</tr>
<tr>
<td>Other residential equipment</td>
<td>Windows, ceiling fans, furnace blower motors, torchieres, hot tubs, small motors, room air-conditioners</td>
<td>537</td>
</tr>
<tr>
<td>Building code</td>
<td></td>
<td>353</td>
</tr>
<tr>
<td>Appliances</td>
<td>Clothes washers, refrigerators, freezers, dishwashers</td>
<td>158</td>
</tr>
<tr>
<td>Large motors</td>
<td></td>
<td>125</td>
</tr>
<tr>
<td>Commercial equipment</td>
<td>High intensity discharge lamps and ballasts, packaged terminal air-conditioners, ice-cube makers, large air-conditioners, commercial clothes washers</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3,367</td>
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</tbody>
</table>
## Rate Structures

<table>
<thead>
<tr>
<th>Sector</th>
<th>Rate Class</th>
<th>Energy Savings in F2020 (GWh/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Residential</td>
<td>980</td>
</tr>
<tr>
<td>Commercial</td>
<td>Small general service</td>
<td>140</td>
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<tr>
<td>Commercial</td>
<td>Large general service</td>
<td>250</td>
</tr>
<tr>
<td>Industrial</td>
<td>Large general service</td>
<td>270</td>
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<tr>
<td>Industrial</td>
<td>Transmission</td>
<td>460</td>
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<tr>
<td>Total</td>
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<td>2,090</td>
</tr>
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</table>
## Programs

<table>
<thead>
<tr>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour</td>
<td>Power Smart Partner</td>
<td>Mechanical Pulping</td>
</tr>
<tr>
<td>Voltage Optimization</td>
<td>Product Incentive</td>
<td>Power Smart Partner – Transmission</td>
</tr>
<tr>
<td>Lighting</td>
<td>High Performance Building</td>
<td>Power Smart Partner – Distribution</td>
</tr>
<tr>
<td>Sustainable Community</td>
<td>Voltage Optimization</td>
<td>New Plant Design</td>
</tr>
<tr>
<td>Refrigerator Buy-Back</td>
<td>Sustainable Community</td>
<td>Load Displacement</td>
</tr>
<tr>
<td>Renovation Rebate</td>
<td>Load Displacement</td>
<td>Sector Enabling Activities</td>
</tr>
<tr>
<td>New Home</td>
<td>Sector Enabling Activities</td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appliances and Electronics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Displacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector Enabling Activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DSM Plan Justification

- Aligns with UCA and 2007 Energy Plan
  - Exceeds 50% of load growth and incremental resource needs
  - Cost-effective
- Low cost relative to new electricity supply
  - Average unit cost of $41/MWh compared to $125/MWh
- Comprehensive
  - Complementary mix of DSM tools with broad opportunities to participate
- Flexible
  - Can change over time in response to new information
- Equity impacts are limited and mitigated
  - Lower rates overall
  - Programs support mitigation of rate impacts
## Risk Management Strategies

| Codes and Standards | DSM programs enable changes by increasing market share of efficient products  
|                     | BC Hydro’s support will:  
|                     | > Support development of standards, regulations and codes  
|                     | > Build stakeholder support  
|                     | > Support enforcement  
| Rate Structures     | Designed to achieve conservation while limiting bill impacts  
|                     | Customer response forecasted with best available information and updated with new information  
|                     | Programs and supporting initiatives designed to support customer response to rate structures  
| Programs            | Cost-effectiveness assessed per BCUC directives  
|                     | Designed to address barriers. Able to change design if necessary  
|                     | New rate structures and supporting initiatives will motivate participation  
|                     | Savings forecasted using best available information  
| Supporting Initiatives | Designed using best available information  
|                     | Impacts will be monitored. Able to change design if necessary  

# DSM Expenditure Request

<table>
<thead>
<tr>
<th></th>
<th>F2009</th>
<th>F2010</th>
<th>F2011</th>
<th>3-Year Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSM Plan Costs</td>
<td>129.8</td>
<td>161.8</td>
<td>195.6</td>
<td>487.3</td>
</tr>
<tr>
<td>Less DSM Costs to be included in Other Expenditure Requests</td>
<td>25.1</td>
<td>31.6</td>
<td>36.6</td>
<td>93.4</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>104.7</td>
<td>130.2</td>
<td>159.0</td>
<td>393.9</td>
</tr>
<tr>
<td>Add Capital Overhead</td>
<td>7.4</td>
<td>8.0</td>
<td>8.7</td>
<td>24.1</td>
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<tr>
<td>DSM Expenditure Request in 2008 LTAP</td>
<td>112.1</td>
<td>138.2</td>
<td>167.7</td>
<td>418.0</td>
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</tbody>
</table>
## Location of DSM content in LTAP

<table>
<thead>
<tr>
<th>Topic</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>DSM options</td>
<td>Section 3.2</td>
</tr>
<tr>
<td>Additional detail on DSM options</td>
<td>Appendix F-17</td>
</tr>
<tr>
<td>Portfolio analysis of DSM</td>
<td>Section 5.5</td>
</tr>
<tr>
<td>Description of DSM probability assessment</td>
<td>Appendix F-14</td>
</tr>
<tr>
<td>Expenditure request for energy-focused DSM</td>
<td>Section 6.2.1</td>
</tr>
<tr>
<td>Expenditure request for capacity-focused DSM</td>
<td>Section 6.2.2</td>
</tr>
<tr>
<td>Implementation plan for energy-focused DSM</td>
<td>Appendix K</td>
</tr>
</tbody>
</table>