

**Subject:** Site C - Organized Labour's perspective  
**Date:** Friday, November 3, 2017 at 4:35:50 PM Pacific Daylight Time  
**From:** Hughes, Trevor LBR:EX  
**To:** Wright, Don J. PREM:EX  
**CC:** Kennedy, Christine PREM:EX, Mihlar, Fazil JTT:EX  
**Attachments:** Scan\_20171103.pdf

Don, at DMC today, you asked that we think about a decision on Site C and what may be relevant from each Ministry for deliberations by Cabinet. I intend to cover this off with Minister Bains next week<sup>s.12;s.13</sup>

<sup>s.12;s.13;s.16;s.17</sup>

I have copied Fazil because this does link to the jobs and workforce development aspects of his ministry. I hope this is helpful.

T.

# BCGEU stands with First Nations to oppose Site C dam

"When a government refuses to consider alternative energy sources, sidelines its own utilities commission, ignores environmental concerns and Aboriginal People's constitutional rights, citizens have a responsibility to speak out." — Stephanie Smith, BCGEU President

Vancouver (27 July 2015) — The B.C. Government and Service Employees' Union (BCGEU/NUPGE) is joining First Nations and environmental advocates in opposing the B.C. government's approval of the Site C dam project, the union has announced.

## *There are better alternatives*

"Site C is the wrong choice for British Columbia. The project is not needed: there are better alternatives," says BCGEU President Stephanie Smith. "Site C will cause massive habitat loss. It violates First Nations' indigenous rights. It removes high-value agricultural lands from production."

"The BCGEU supports the Treaty 8 First Nations, who are challenging the project in federal court. Site C would have a negative impact on their traditional use of the land and would destroy traditional First Nations burial sites."

## *Dam is poor investment*

Site C fails the economic test of providing a lasting net benefit to British Columbians. A recent report by energy analyst Robert McCullough notes that the dam would cost twice as much as alternative energy options like renewables and natural gas generation.

The joint review panel also concluded that the government "has not fully demonstrated the need for the project on the timetable set forth."

## *Lack of consultation*

"There's been a shocking lack of public consultation on the Site C dam," says Smith. "The B.C. government has refused to allow the B.C. Utility Commission to review the project, and no effort has been made by this government to consider other sustainable energy sources."

"When a government refuses to consider alternative energy sources, sidelines its own utilities commission, ignores environmental concerns and Aboriginal People's constitutional rights, citizens have a responsibility to speak out. The BCGEU/NUPGE is proud to lend our voice to the growing chorus of British Columbians who say no to this ill-considered project."

## *UNESCO call for delay of dam sites*

The BCGEU announcement on Site C follows a recent call by UNESCO World Heritage Committee for the Canadian government to delay development of dam sites until an environmental assessment of its impact on Wood Buffalo National Park can be done. The park was declared a UNESCO World Heritage Site in 1983.

## **NUPGE**

The National Union of Public and General Employees (NUPGE) is one of Canada's largest labour organizations with over 360,000 members. Our mission is to improve the lives of working families and to build a stronger Canada by ensuring our common wealth is used for the common good. *NUPGE*

**NUPGE Components:** [BCGEU \(/components/bcgeu\)](/components/bcgeu)

**Issues and Campaigns:** [Equality and Human Rights \(/issues/equality-and-human-rights\)](/issues/equality-and-human-rights)  
[Environment \(/taxonomy/term/319\)](/taxonomy/term/319)

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Friday, November 3rd, 2017

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BC Building Trades reiterate support for Site C;  
express concern re. timelines, BC Hydro  
construction agreement process

Date: Tuesday, August 18, 2015

*VANCOUVER – The BC Building Trades Council says it remains a strong advocate of the Site C dam, but is increasingly concerned by project timelines and the slow pace of progress towards construction labour agreements with the four project proponents.*

"Our organization and 15 affiliate trade unions representing some 35,000 men and women continue to believe that Site C is essential to BC's future prosperity," says Executive Director Tom Sigurdson.

"We also believe that it is essential that this taxpayer-funded project be built by British Columbians first and foremost, and we'd be disappointed to see Site C project parking lots full of Alberta licence plates while BC workers, who pay BC taxes, are idle," he says.

A sub-group of BCBT affiliates remains in discussions with construction consortiums considering bids for Site C's massive civil works component.

"Bids for this billion dollar-plus contract are due in the next few weeks," says Sigurdson, "and while we continue to work with BC Hydro and proponents under the terms of a Memorandum of Understanding we signed with Hydro on May 22, 2015 we are concerned by possible project delays as construction labour agreements are not in place.

"Proponents and our affiliates are struggling with a lack of clear direction from Hydro," he adds.

"We have the skilled, guaranteed, BC-first labour supply Site C contractors need to build this project to the high quality and environmental standards the public and government expects," says Sigurdson.

"We want to ensure that BC workers have first-call on Site C jobs and form the bulk of the workforce.

"We will remain at the table with Hydro and proponents to reach an agreement that meets their needs plus those of BC workers."

-30-

**For More Information:**  
Contact the BC Building Trades office  
(778) 397-2220



## Read the Latest Edition of Trade Talk

Fall 2017 Vol. 20 No. 3

On the Cover  
Brian Christianson, working on the FortisBC gas pipeline from Surrey to Coquitlam.

Photo: Joshua Berson

## BC BUILDING TRADES

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Friday, November 3rd, 2017

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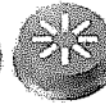
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## BC Building Trades Blasts BC Hydro & the provincial government after November Site C Employment Statistics Released

Date: Wednesday, January 18, 2017

*BC Hydro recently released employment statistics for the Site C project for November 2016. The report reveals 18% of workers, which equals 246, on the project were from outside BC.*

"This is simply unacceptable," said Tom Sigurdson, Executive Director for the BC Building Trades. "There are thousands of skilled and qualified British Columbians available and ready to work on this project. Instead, BC Hydro has allowed contractors to bring in hundreds of out of province workers each month to work on the project."

Building Trades members have negotiated agreements with BC Hydro to build every dam in BC for the past 60 years. The Allied Hydro agreement was put in place in 1963 by the late Premier W.A.C. Bennett. BC Hydro recently broke with that historic labour supply

model for the Site C project. Consequently, thousands of unionized construction workers have not secured employment on the project.

"We are proud of our historic role as dam builders in this province. We have a model that puts British Columbians to work," said Sigurdson. "Employment Statistics from recent projects we've worked on demonstrate the vast majority of workers are sourced from local communities and only 1-5% come from out of province."

In contrast, BC Hydro is only employing 47% of workers from the Peace River region and only 82% from BC. "There is no excuse for leaving certified British Columbians on the side lines on this project," said Sigurdson. "Month after month, BC Hydro proudly releases employment statistics that they should be ashamed of."

**For More Information:**  
Contact the BC Building Trades office  
(778) 397-2220



### Read the Latest Edition of *TradeTalk*

Fall 2017 Vol. 20 No. 3

On the Cover  
Brian Christianson, working on the FortisBC gas pipeline from Surrey to Coquitlam.

Photo: Joshua Berson

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**Subject:** FW: Letter to BCUC  
**Date:** Wednesday, November 15, 2017 at 10:45:15 AM Pacific Standard Time  
**From:** Nikolejsin, Dave MNGD:EX  
**To:** Wright, Don J. PREM:EX  
**Attachments:** IB\_Questions to BCUC\_Nov15\_949am\_LM\_DB.docx, KMs-QA\_Site C Report\_Questions to BCUC\_Nov15\_955am LM.docx, 102700 BCUC Final\_Signed.pdf

Copy of the signed letter here for you.

---

**From:** Haslam, David GCPE:EX  
**Sent:** November 15, 2017 10:27 AM  
**To:** Sanderson, Melissa EMPR:EX <Melissa.Sanderson@gov.bc.ca>; McNish, James EMPR:EX <James.McNish@gov.bc.ca>  
**Cc:** Nikolejsin, Dave MNGD:EX <Dave.Nikolejsin@gov.bc.ca>; MacLaren, Les EMPR:EX <Les.MacLaren@gov.bc.ca>; Beaupre, Darren GCPE:EX <Darren.Beaupre@gov.bc.ca>; Grewar, Colin GCPE:EX <Colin.Grewar@gov.bc.ca>; Sovka, David GCPE:EX <David.Sovka@gov.bc.ca>; Zadravec, Don GCPE:EX <Don.Zadravec@gov.bc.ca>  
**Subject:** Letter to BCUC

All – attached are the com products (IB/KM/QA) for the letter to the BCUC – final signed letter attached as well – which was just sent. Note the IB is not going to be distributed – but we have it on hand in case there's a change in direction. The com materials were reviewed by Les yesterday. Minor edits were made this am to reflect minor edits to the letter. Les is monitoring when we can expect the BCUC to post the letter. Probably by tomorrow. The media strategy is reactive with either emailed statements from MMM or interviews if she is available – which is unlikely for the next few days. I've included Don Zadravec. We have a meeting at 11:45 to discuss. We can adjust messaging if necessary.

I note the Hydro Allied Council of BC will be releasing a report today at 1 pm. We will monitor and produce an IN with recommended messaging as following:

- Government is reviewing the report
- The report indicates the level of interest in the government's decision on Site C
- Government will review all the information available to make the best decision in the interests of British Columbians and ratepayers

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## INFORMATION BULLETIN

Ministry of Energy, Mines and Petroleum  
Resources

[release number]

[Date]

### **Province asks Utilities Commission for clarification on Site C report**

VICTORIA – The Government of British Columbia has asked the B.C. Utilities Commission (BCUC) to clarify elements of its final report on Site C. The provincial government is taking this action as part of the due diligence necessary to make an informed decision that is in the best interests of ratepayers.

The deputy ministers of Energy, Mines and Petroleum Resources, and Finance have provided a letter to the BCUC asking for further clarification on a number of matters in the report, including the Commission's assumptions and calculations related to:

- The treatment of sunk costs (estimated \$2.1 billion already spent on the project) and termination and remediation costs (\$1.8 billion determined by the Commission) in comparing the costs to ratepayers of completing Site C against the costs of pursuing an alternative portfolio of generation resources.
- Whether BC Hydro or independent power producers (IPPs) would develop and finance projects included in the Commission's proposed alternative portfolio (wind, geothermal), the cost of capital financing applied to the alternative portfolio, and the impact of a higher cost of capital on ratepayers if the alternative portfolio were developed by IPPs rather than BC Hydro.
- The cost of demand side management (conservation) measures included in the alternative portfolio.
- The time period over which sunk, termination and remediation costs (approximately \$4 billion) would be recovered in the event the project is cancelled and the impact on ratepayers.
- The use of a low-load forecast instead of a mid-load forecast to assess the need for Site C, and whether the Commission included in its load forecast the potential increased electrical power demand of meeting the province's objectives to reduce greenhouse gas emissions through greater electrification of the economy.

The deputy ministers' letter and the BCUC response will be publicly available on the BCUC's website. (TBC)

Government is currently conducting a review of Site C and will consider the BCUC report along with other implications associated with completing or terminating the project.

A decision on the Site C project is anticipated by the end of the year.

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## INFORMATION BULLETIN

**Learn More:** <http://www.sitecinquiry.com/>

**Media contact:**

Suntanu Dalal

Media Relations

Ministry of Energy, Mines and Petroleum Resources

250 952-0628

Draft

**QUESTION AND ANSWERS  
SITE C DECISION MAKING PROCESS  
Nov. 15, 2017**

**Ministry of Energy and Mines**

- The current uncertainty and division over the Site C project is a direct result of the previous government's irresponsible decision to start construction without proper regulatory oversight.
- It fell to our government to correct that oversight and send the project to the BCUC for review.
- We are now considering the BCUC's final report and other issues as we work towards a final decision on completing or terminating the project that will keep rates affordable for B.C. families and businesses in the long-term.
- We are taking time and care in our decision-making process to ensure the data and analysis we are relying upon is accurate, and that we have a clear understanding of the impacts on ratepayers associated with completing the project or cancelling it.
- That includes working with the Ministry of Finance to conduct an intense economic review of the project over the next few weeks.

*Regarding questions to the BCUC and financial analysis:*

- As part of its economic review of Site C, Government has asked the BCUC to clarify some elements of its final report on the project delivered November 1, 2017.
- Our request to the BCUC is part of our due diligence as we work towards a final decision on Site C that will keep rates affordable for B.C. families and businesses in the long term.

- In the report the BCUC assesses a large amount of complex data and analysis and we want to make sure we fully understand the Commission's assumptions and calculations.
- Additionally, as part of our decision-making process the Ministry of Finance will be undertaking a financial analysis of BCUC report, including the implications for and risks to the fiscal plan in the event the project is continued or terminated.

## **Questions and Answers**

### **1. Why are you going back to the BCUC for more information?**

After reviewing the BCUC's final report staff in the Ministries of Finance and Energy, Mines and Petroleum Resources had some questions related to the BCUC's methodology, assumptions, calculations and the cost to ratepayers of completing the project, or terminating it and looking to alternative sources of energy and capacity.

Our decision on Site C will ultimately be based on what is best for ratepayers. As we work through that decision we want to make absolute certain that we have a clear understanding of the impact on ratepayers. Our questions to the BCUC will help to clarify some elements of the report.

### **2. Specifically, what are you asking the BCUC?**

The deputy-ministers of Finance, and Energy, Mines and Petroleum Resources have provided a letter to the BCUC asking for further clarification on a number of matters in the report, including the Commission's assumptions and calculations related to:

- The treatment of sunk costs (estimated \$2.1 billion already spent on the project) and termination and remediation costs (\$1.8 billion determined by the Commission) in comparing the costs to ratepayers of completing Site C against the costs of pursuing an alternative portfolio of generation resources.
- Whether BC Hydro or independent power producers (IPPs) would develop and finance projects included in the Commission's proposed alternative portfolio (wind, geothermal), the cost of capital financing applied to the alternative portfolio, and the impact of a higher cost of capital on ratepayers if the alternative portfolio were developed by IPPs rather than BC Hydro.
- The cost of demand side management (conservation) measures included in the alternative portfolio.
- The time period over which sunk, termination and remediation costs (approximately \$4 billion) would be recovered in the event the project is cancelled and the impact on ratepayers.
- The use of a low-load forecast instead of a mid-load forecast to assess the need for Site C, and whether the Commission included in its load forecast the potential increased electrical power

demand of meeting the province's objectives to reduce greenhouse gas emissions through greater electrification of the economy.

The full letter can be viewed on the BCUC's website (*TBC*) at <http://www.sitecinquiry.com/>

**3. Does this show you lack confidence in the BCUC's findings or their ability to conduct the review?**

Not at all. Given the short time they had the BCUC has conducted a remarkably comprehensive review and produced a report informed by contributions from BC Hydro, stakeholders, energy experts, First Nations and hundreds of concerned British Columbians.

We have full confidence in the BCUC as the province's energy regulator to advise Government on the project, however the final report is – by nature of the subject matter – very complex. As such, we are seeking clarity on some of the BCUC's assumptions and calculations as part of an economic review of the project and our due diligence process as we work towards a final decision that is in the best interests of ratepayers.

**4. Does BC Hydro also have questions about the final report?**

Staff in the ministries of Finance, and Energy, Mines and Petroleum Resources have discussed the BCUC report with BC Hydro, and government has identified a number of matters it would like the Commission's feedback on. These matters are captured in the deputy-ministers' questions to the Commission.

Government has also asked BC Hydro to provide an assessment of the model the Commission used to develop its illustrative alternative portfolio. We understand that BC Hydro will be providing the Commission with the results of that assessment separately.

**5. Why is the Ministry of Finance doing a financial analysis of the report?**

This is a multi-billion-dollar project that was started by the previous government without proper regulatory oversight. It fell to our Government to give the project the scrutiny it should have received years ago, including a detailed economic analysis.

Our decision on Site C, whether to proceed or terminate, will have a significant and long-term impact on BC Hydro's debt and financing, and on the Province's books as well. As such, it is the responsibility of the Ministry of Finance to take a close look at the numbers and ensure the impacts on the fiscal plan of continuing or terminating Site C are clearly understood.

**6. Does this mean that Government is looking at moving the costs of cancelling Site C from BC Hydro to the provincial debt?**

Government is exercising due diligence and working towards a decision on Site C that keeps rates affordable for B.C. families and businesses in the long term.

I don't want to pre-judge that decision in anyway so I cannot provide comment at this time on what Government may or may not do in relation to the costs associated with cancelling the project.

**7. Will your requests to the BCUC and the financial analysis delay your decision on Site C?**

We have asked the BCUC to respond to Government's questions in a timely manner, and we still anticipate a decision on the project by the end of the year.



November 15, 2017

Ref.: 102700

Mr. David Morton  
Chair  
BC Utilities Commission

Email: David.Morton@bcuc.com

Re: Inquiry Respecting Site C

The Ministry of Energy, Mines and Petroleum Resources and Ministry of Finance are supporting the government decision process surrounding the future of the Site C project. On behalf of our respective Ministers, we would like to thank the BC Utilities Commission (Commission) for the report *Inquiry Respecting Site C*. Completing an inquiry of this scope over an abbreviated timeframe and with high levels of public and First Nations input is a considerable achievement.

As our ministries analyze the Commission's report, along with other implications associated with government proceeding with or terminating the Site C project, we want to ensure that we fully understand the assumptions and computations that the Commission made in the analysis of potential alternative sources of energy generation and capacity. Accordingly, we are requesting further explanation or additional information on the points listed below and in the Appendix attached to this letter.

1. Did the Commission include sunk costs (the estimated \$2.1 billion that has been spent to date on the project) and termination costs (the \$1.8 billion determined by the Commission) in comparing the costs to ratepayers of completing Site C against the costs of pursuing an alternative portfolio of generation resources?

We were not able to determine whether the sensitivity analysis included on Page 17 of the report's executive summary includes sunk costs and termination costs consistently. If it does not, could the Commission advise on how including these sunk and termination costs might change the cost to ratepayers and the unit energy cost (UEC) in both scenarios?

2. In the event that government elects to terminate the Site C project, has the Commission assumed that BC Hydro would develop and finance the projects

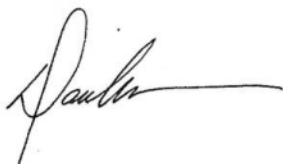
Page 1 of 3

included in the alternative portfolio (wind, geothermal) rather than independent power producers (IPPs)?

We observe that the Commission has in some cases used BC Hydro's lower cost of capital financing to calculate the cost of the alternative portfolio presented in the report, affecting the valuation of those projects. Could the Commission offer its view of the impact that a higher cost of capital would have on ratepayers if the alternative portfolio were developed by independent power producers rather than directly by BC Hydro?

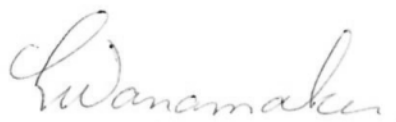
3. Government will need to consider the total cost of potential demand side management initiatives (rather than just the utility's costs) as it considers the alternatives. Could the Commission advise how the inquiry Terms of Reference led to assessing demand-side measures based on the Utility Resource Cost standard, when Total Resource Cost has been the standard for prior Commission proceedings?
4. If the Site C project were terminated, the \$4 billion sunk and remediation costs would need to be recovered, and the amortization period of that recovery would affect BC Hydro rates. Could the Commission please clarify whether it assumed that that these costs would be recovered over 10, 30 or 70 years?
  - Fair and appropriate rate-setting principles for rate-regulated utilities typically aim to avoid causing future generations to pay for investments from which they will derive no benefit. From the Commission's perspective, can recovery of the sunk and remediation costs of Site C over longer periods of 30 to 70 years remain consistent with these inter-generational principles?
  - Recently it has been stated that recovering the project's sunk and remediation costs over a 10-year period would lead to a 10 per cent hike in BC Hydro rates. Is this assertion consistent with the Commission's thinking?
5. We are unaware of prior instances when anything other than BC Hydro's mid-load forecast has been used for planning purposes. For that reason, we would like to clarify:
  - Did the Commission assume lower demand for electricity (reflected in the low-load forecast used in the report) because it is forecasting a period of lower economic growth for the province in which major power consumers such as mining, forestry, technology and commercial sectors are in decline?
  - Does the Commission include in its load forecast the potential increased electrical power demand of meeting the province's stated objectives to reduce greenhouse gas emissions through greater electrification of our economy?

We sincerely appreciate the Commission's timely response to these questions and requests for clarification. Government has committed to making a decision on the Site C project before the end of the year. The Commission's responses to our questions will assist our ministries in better understanding the report and the assumptions that underlie it as we prepare advice to support government in making a decision that will be in the best interests of British Columbians.



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Dave Nikolejsin  
Deputy Minister  
Ministry of Energy, Mines  
and Petroleum Resources



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Lori Wanamaker  
Deputy Minister  
Ministry of Finance

Attachment

## **Appendix: Detailed Questions for the Commission**

We understand that while BC Hydro modelled over 60 scenarios and tested various assumptions, including a number of alternatives requested by the Commission, the alternative portfolio that the Commission included in the final report was not analyzed using BC Hydro's modelling tools. On this basis, government has asked BC Hydro to provide an assessment of the model used to develop the Commission's final alternative portfolio. BC Hydro will provide the Commission with the results of that assessment separately.

In our initial analysis of the report, our ministries have identified several areas that we would appreciate the Commission's feedback on. Several of our questions relate to the impact of certain assumptions made in the report, and how the costs of those assumptions would be recovered from ratepayers.

We understand that BC Hydro follows standards for rate-regulated utilities in its financial statements and in preparing its applications for review by the Commission. This accounting framework follows a number of principles in relation to the amortization of capital assets and the deferral of other costs for the purpose of matching recoveries from ratepayers to periods over which benefits are provided.

It would be helpful if the Commission could clarify how the choices of cost amortization and recovery periods in the Termination scenario fit within appropriate utility rate-setting principles that recognize and avoid unnecessarily transferring current utility costs to future user generations when there are clearly no longer directly-related assets or benefits being provided. Such decisions lead rate-regulated accounting practice and use of regulatory accounts, which are areas of particular interest by the provincial Auditor General as well as credit rating agencies.

The Commission's process involved some deliberations on the cost of capital. The alternative portfolio presented in the report assumes that BC Hydro will finance all new resources on its balance sheet. However, other than redevelopment of existing sites and Site C, BC Hydro has, for almost three decades, been primarily procuring new supply from competitive processes or bilateral agreements that are benchmarked to competitive processes. This effectively means that BC Hydro avoids assuming such debt on its balance sheet and only recognizes the incremental costs of new energy purchases which would include the private sector's annual debt servicing costs and equity return within approved purchase contracts.

It would be helpful to understand how the Commission assesses the impact on ratepayers of the additional debt associated with the assumptions underlying the alternative portfolio. We would particularly appreciate better understanding the Commission's approach to using BC Hydro's cost of capital for IPP projects and the approach used for the cost of capital faced by an IPP (i.e. what IPPs actually pay) and the resultant rate impacts. For example, on page 159-160, the Commission appears to conclude that IPP financing is the relevant assumption for the alternative portfolio, and the BC Hydro financing assumption should only be used for the Unit Energy Cost (UEC) analysis. However, on pages 167, 170 and Appendix C (Assumption 2), it appears that the

Commission has used BC Hydro financing (100% debt financing at a cost of 3.43%) for the alternative portfolio. If we are interpreting this correctly, we would appreciate clarification on which cost of capital should be used in analysing rate impacts.

BC Hydro has suggested that recovery in rates of sunk costs in a termination scenario should occur over a 10-year period. If the project were to continue as planned, the sunk costs, as part of the overall project costs, will be recovered over a 70-year period, consistent with the amortization of the Site C asset. The Commission model appears to exclude sunk costs in the termination scenario, and has removed those costs from the completion scenario as well. Effectively this assumes that sunk costs will be recovered through rates over 70 years if the project is terminated. Recovering costs in rates over a shorter period has a material impact on the costs of the alternative portfolio. It would be helpful if the Commission could provide an estimate of the impact on rates of using these two timeframes.

The tables on page 17 of the executive summary and page 170 in the main report include a summary of the Commission's sample scenarios showing the effect of modifying one or more variables to the resulting Net Present Value cost to ratepayers. As noted above, the Commission's alternative portfolio does not appear to include sunk costs, and sunk costs have also been removed on the continue scenario. The tables also include UECs. For the Site C scenario, the UECs reflect costs, including sunk costs, of Site C being either \$10 billion or \$12 billion depending on assumptions. Our review of the Commission report suggests that the alternative portfolio does not include termination costs. It would be helpful if the Commission could confirm this and provide a version of the UEC portion of the table with termination costs included in the alternative portfolio. This would help provide a consistent basis for comparing costs between the scenarios of completing or terminating the project.

It is our understanding that in previous proceedings the Commission has concluded that the Total Resource Cost (TRC) test is the appropriate way to evaluate demand side management (DSM) in comparison to other resources. In this inquiry, the Commission's model uses the Utility Resource Cost (URC) standard. We believe that using the URC may underestimate the actual cost of DSM to ratepayers. It would be helpful for us to understand the Commission's rationale in choosing a test methodology that differs from past practice. Could the Commission confirm that the TRC test remains the appropriate metric, and if so, what impact would this have on the analysis?

We have noted that the Commission has concluded that BC Hydro's low load forecast was most appropriate for an assessment of the need for the capacity of Site C. It would be helpful for us to further understand the rationale, and whether the assessment includes the load requirements needed to meet the Province's *Clean Energy Act* energy objectives of:

- Reducing greenhouse gas emissions by 2050 by 80% less than 2007 levels;
- Encouraging the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia; and,
- Encouraging communities to reduce greenhouse gas emissions and use energy efficiently.

It would also be useful to know if the Commission examined the value of “dispatchable” resources versus intermittent resources, particularly as applied to the goal of moving industrial energy requirements now and in future to low carbon electricity.

It has been government’s assumption that electrification with low carbon electricity would be a key initiative to achieve greenhouse gas reductions. The provincial government is working with the Government of Canada on electricity system infrastructure investments to reduce and avoid greenhouse gas emissions, and has enabled BC Hydro to pursue electrification initiatives under the *Greenhouse Gas Reduction (Clean Energy) Regulation* under the *Clean Energy Act*. It would be helpful for our ministries to understand if the Commission has a different outlook, and if the Commission could further describe the impact on its analysis of electrification initiatives to meet greenhouse gas reduction objectives.

The report identifies an aggressive DSM program, coupled with load curtailments as a way to achieve the alternative portfolio scenario. We would appreciate further information from the Commission on how such load curtailments would practically be achieved in the natural resource sector without impairing operations, jobs and economic growth for sectors already facing trade sanctions and pressures.

We understand that BC Hydro has provided the Commission with a description of its view of what BC’s economic environment would look like under a low load outlook scenario. It would be helpful if the Commission could further describe its interpretation of the low load outlook. We observe that the Commission’s view is that the outlook could be even lower than that presented in BC Hydro’s low-load scenario, and we are interested in understanding how that outlook is based on realistic economic sustainability around which the alternative portfolio would be premised.

**Subject:** BC'S Energy, Climate and Investment Future  
**Date:** Friday, November 17, 2017 at 10:37:25 AM Pacific Standard Time  
**From:** Greg D'Avignon  
**To:** OfficeofthePremier, Office PREM:EX  
**CC:** Plecas, Bobbi ENV:EX, Nikolejsin, Dave MNGD:EX, Wright, Don J. PREM:EX, ken.peterson@bchydro.com, Deputy Minister ENV:EX, Weaver.MLA, Andrew LASS:EX, Minister, EMPR EMPR:EX  
**Attachments:** image003.jpg, 2017-Honorable John Horgan Site C and Prosperity.pdf

Dear Premier Horgan

Please find the attached letter from the Business Council of BC, with respect to our position on Site C, and BC's Energy, Climate and Investment Future.

Respectfully,  
Greg D'Avignon  
President & Chief Executive Officer  
Business Council of BC  
Direct: 604.696.6580



Where Leaders Meet to Unlock B.C.'s Full Potential

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Business Council of  
British Columbia  
Est. 1966

Suite 810 Telephone: 604-684-3384  
1050 West Pender Street info@bccbc.com  
Vancouver BC V6E 3S7 www.bccbc.com

November 17, 2017

The Honorable John Horgan  
Premier of British Columbia  
Government of British Columbia  
P.O. Box 9041, Stn. Prov. Govt.  
Victoria, BC; V8W 9E1

Dear Premier Horgan:

**Re: BC's Energy, Climate and Investment Future**

The Business Council of BC and our 250 members spanning every part of the province's economy write today to communicate our views on the future of the Site C project.

British Columbia is at a crossroads in terms of the prosperity of our province. Our ability to deliver equality of opportunity for citizens and to address climate change in a manner that creates the conditions for competitiveness and investment are at risk. Addressing these challenges relates directly to your cabinet's pending decision on Site C. We recognize that this is a complex matter, not least because the previous government failed to undertake a proper independent review of the economic and business case for the project. Nonetheless, the decision now rests with you and your colleagues.

Having considered the evidence, including the BC Utilities Commission's (BCUC) recent report, our reputational risk and the anticipated significant electricity demand as we accelerate into the digital age and low carbon economy, we offer our support for completing the project, for several reasons – some of which are also referenced in a recent submission from the BC Building Trades unions.

First, in reviewing Site C, the BCUC was given a narrow mandate and a very short timeframe. While we recognize that the Commission worked under tight constraints, its report does not reflect a comprehensive examination of the trends shaping the outlook for electricity demand over the medium- and longer-term. Therefore, the BCUC's default to the low load forecast is suspect and inadequate given the reality of our need for energy in the coming decades, let alone the potential of the contribution that reliable firm power can make to a lower carbon future.

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The Honourable John Horgan

November 17, 2017

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While actual demand growth has underperformed BC Hydro's projections over the last few years, there are reasons to anticipate stronger demand over the next two decades. Apart from a steadily rising provincial population, we anticipate significant growth in the digital economy, healthcare, film production, e-commerce, gaming, mixed reality technologies, financial services, fintech, tourism, the Gateway transportation sector, and segments of advanced manufacturing. Additional demand will arise through shifting regulatory realities touching everything from marijuana legalization (requiring electricity, substations and transmission for cultivation) to increased use of electric vehicles, server farms and carbon sequestration facilities. In addition, electrification transitions are either under way or possible in areas like port terminal operations, mining and metals production<sup>1</sup>, value added forest manufacturing, and industrial robotics. Then too, in the medium-term there may be opportunities to sell BC renewable power to Alberta as that province moves away from coal.

Also worth noting in this regard is the City of Vancouver's Renewable City Strategy, part of its Sustainable City plan, which targets 100% renewable energy consumption in Vancouver before 2050. The City's plans, analysed in their October 2017 report,<sup>1</sup> call for 50-75% growth in electricity use within a jurisdiction that accounts for 14% of the provincial population. It is conceivable that more BC municipalities will follow an energy path similar to Vancouver's in the years ahead.

In total, none of these sources of future electricity demand is considered in detail in BCUC's analysis.

As an added point, we would note that cancellation of Site C will stop any future investment and climate gains from upstream electrification in the natural gas and oil sector, while also complicating the situation for other BC industries looking to transition to lower carbon sources of energy. This includes LNG projects that may be developed in British Columbia. Our understanding is that one large LNG project would require all of the power from Site C to support two trains of electrified compression at the facility. As another example, Encana earlier this summer operationalized the electrification of new gas plants in the northeast that draw 200 MWH of firm power. The switch from gas fired operations reduced greenhouse gas emissions by ~ 900,000 tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) on an annual basis -- the equivalent of taking 191,000 cars off the road.<sup>11</sup> Within the upstream industry, there is further scope to dampen emissions via electrification. These kinds of transition projects in BC -- along with future electricity demand that may stem from Alberta's shift away from coal-fired power -- are overlooked in BCUC's low load forecast.

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<sup>1</sup> We note that the Commission assumes aggressive measures by metal mining operators to reduce energy demand at peak times; we believe this assumption to be dubious.



The Honourable John Horgan

November 17, 2017

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Second, the BCUC review suggests that the power to be produced by Site C can be replaced with a portfolio of additional renewable projects that are not in existence, and which would be challenging to develop in a timely manner given the delays experienced in advancing all types of energy, industrial and infrastructure projects in BC (and Canada).

Third, the BCUC report does not consider how cancelling Site C mid-way through the construction work would impact BC's and Canada's already eroding reputation as a place to invest. Outside of the real estate sector and the advanced technology industry, BC today is viewed, globally, as an increasingly uncertain, complex and costly place to invest compared to many other jurisdictions, including the United States but also – in some industry sectors – Australia and some emerging economies. The weakness of capital spending and the paucity of greenfield investment in manufacturing and some key natural resource industries are signs of the province's diminished competitiveness. Terminating Site C is likely to compound the problem.

Lastly, the BCUC review was undertaken absent the province having adopted a new energy policy framework that the Business Council believes is urgently needed. An updated and retooled provincial energy strategy is required given the opportunities available in BC to stimulate low-carbon economic growth, advance reconciliation with Indigenous peoples, and remain in the forefront of efforts to tackle climate change. We believe BC can be a leader in supplying relatively low-carbon goods and services, including energy, to the world. A revamped provincial energy policy framework can create conditions that allow this to happen and attract new investments by companies and entrepreneurs in sectors like light tight oil and condensate, LNG, hydro, and wind as well as digital technologies, clean technology, and manufacturing.

We stand ready to work with your Ministers and senior officials in developing a renewed energy strategy for the province.

In summary, our conclusion is that BCUC's Site C review falls short of the mark in some important respects. It ignores the difficulties of developing other sources of power if Site C is terminated. It underestimates the future growth in electricity demand in a global context, where electricity is destined to play a larger role in the overall energy system. Further, the BCUC review overlooks opportunities to export BC-produced renewable energy to other provinces committed to reducing their own carbon emissions.

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The Honourable John Horgan

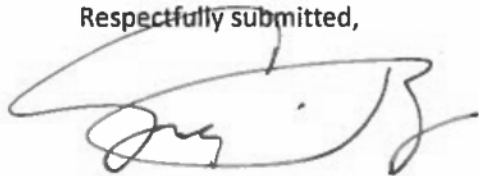
November 17, 2017

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Finally, unlike the Commission, cabinet must consider the consequences of its decision in terms of the province's reputation in capital markets and in the eyes of investors and corporate managers. Despite our size, bounty of resources, diverse pools of talent and demonstrated innovative capacity, we are at risk of squandering our riches and advantages while competitors benefit from our inaction and confused policies. The climate, reconciliation with Indigenous peoples and middle class incomes and jobs will all suffer unnecessarily if we abandon thoughtful policy approaches, innovation and foundational investment decisions.

Our prosperity will be greater and the global environment healthier if BC and Canada work together to pursue cogent and integrated climate and energy policies that leverage our strengths and keep us in the vanguard of innovation and efficient regulation.

Respectfully submitted,



Greg D'Avignon  
President and CEO

Copies to:

Right Honorable Justin Trudeau; Prime Minister of Canada

Honorable James Carr; Minister, Natural Resources Canada

Honorable Catherine McKenna; Minister, Environment and Climate Change Canada

Honorable Michelle Mungall; Minister, Energy, Mines and Petroleum Resources

Honorable George Heyman; Minister, Environment & Climate Change Strategy

Honorable Dr. Andrew Weaver; Leader, Green Party of British Columbia

Mr. Don Wright; Deputy Minister to the Premier

Mr. Dave Nikolejsin; Deputy Minister; Ministry of Energy, Mines and Petroleum Resources

Ms. Bobbi Plecas; Deputy Minister, Climate Change, Ministry of Environment & Climate Change Strategy

Dr. Mark Zacharias, Deputy Minister, Environment, Ministry of Environment & Climate Change Strategy

Mr. Ken Peterson; Executive Chairman of the Board, B.C. Hydro and Power Authority

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<sup>1</sup> City of Vancouver Energy and Emissions Forecast Oct 10, 2017

<sup>2</sup> "Greenhouse gas emissions from a typical passenger vehicle" EPA-420-F-14-040a May 2014

**Subject:** BC Hydro Results of Analysis of BCUC Portfolio  
**Date:** Saturday, November 18, 2017 at 5:21:35 PM Pacific Standard Time  
**From:** MacLaren, Les EMPR:EX  
**To:** Wright, Don J. PREM:EX, Meggs, Geoff PREM:EX, Kennedy, Christine PREM:EX, Lloyd, Evan GCPE:EX, Zdravec, Don GCPE:EX, Foster, Doug FIN:EX  
**CC:** Nikolejsin, Dave MNGD:EX, Wieringa, Paul EMPR:EX, Rowe, Katherine EMPR:EX, Sopinka, Amy EMPR:EX, Wanamaker, Lori FIN:EX  
**Attachments:** 20171117 - Results of portfolio analysis of Commission Portfolio.docx

Good afternoon:

This is for discussion at our meeting tomorrow.

As noted in BC Hydro's November 16 submission to the BCUC setting out the computational and input errors they identified in the BCUC's models for Site C and the Illustrative Alternative Portfolio, BC Hydro has also now completed its analysis of running the BCUC's assumptions through BC Hydro's modelling tools (attached).

After correcting for the errors, and using the BCUC's assumptions of \$10B capital cost, \$3.9B sunk plus termination cost amortized over 30 years, low market prices for surplus sales, and BC Hydro financing the alternative portfolio, the analysis shows Site C benefits to ratepayers of \$800M NPV under the low load scenario, and \$1.5B under the mid-load, compared to the BCUC's Alternative Portfolio.

BC Hydro also notes where it disagrees with the BCUC's assumptions and why. BC Hydro has included sensitivity cases related to IPP financing, demand side management costs, period of recovery of sunk/termination costs, and Site C capital costs. In all cases except Site C at \$12B in a low load scenario (NPV -\$100M), the impact of more reasonable assumptions improves the benefits of Site C to ratepayers materially.

Particularly useful are the two attachments on pages 6 and 7. Attachment 1 is a table that clearly shows the differences in assumptions between BC Hydro's initial August 30 filing, a more optimistic view of resource costs that was filed in response to a BCUC request, and the BCUC's assumptions about Site C and the Alternative Portfolio. Attachment 2 is a waterfall chart that shows the impact of various assumptions moving from August 30, to the optimistic scenario, to the current analysis using BCUC assumptions. Other than the BCUC's assumptions on higher termination costs, all other assumptions favour the Alternative Portfolio over Site C.

We are currently updating our draft PowerPoint for PAC this week, and will circulate that later today or tomorrow morning.

Les

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**From:** Savidant, Michael [mailto:michael.savidant@bchydro.com]  
**Sent:** Friday, November 17, 2017 5:31 PM  
**To:** MacLaren, Les EMPR:EX; Foster, Doug FIN:EX  
**Cc:** O'Riley, Christopher; McSherry, Diane; Reimann, Randy; Magre, Leela; Layton, Ryan; James, Fred  
**Subject:** Results of portfolio analysis of Commission Portfolio

Les and Doug,

Please find attached a note providing the results of our running the Commission's Illustrative Alternative assumptions through our portfolio modelling tools. As you'll see, the results for the Low Load Forecast scenario are roughly in-line with our high-level calculation of the impact of the errors.

Please let us know if you have any questions.

Thanks,  
Mike

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**Michael Savidant**

Manager – Commercial Negotiations  
Business and Economic Development

**BC Hydro**

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Vancouver, BC V6B 5R3

**P** 604.623.3694  
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**Site C Inquiry**  
**Portfolio Modelling Results using Commission Assumptions**

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As described in our letter to the Commission of November 16, 2017, BC Hydro has utilized its portfolio modeling to analyse the assumptions made by the Commission in its Illustrative Alternative Portfolio (Exhibit A-24). This document provides a summary of where BC Hydro's portfolio modelling differs from the Commission's methodology, as well as the findings from our portfolio analysis utilizing these assumptions.

BC Hydro continues to disagree with many of the assumptions made by the Commission in its Illustrative Alternative, but has retained the Commission's assumptions in the analysis of the Illustrative Alternative portfolio where they were believed to have been made on purpose. While BC Hydro has calculated the present value costs to ratepayers of the Commission's Illustrative Alternative portfolio, we do not believe the costs and resources utilized in this portfolio are plausible. As such, BC Hydro makes no representation on our ability to deliver this portfolio in the manner assumed by the Commission.

The key findings from this updated portfolio analysis as compared to previous BC Hydro submissions are as follows:

(\$2018 billions)	August 30 <sup>th</sup> Submission	Optimistic Portfolio Sensitivity	Commission Illustrative Alternative
Low Load Forecast	6.1	Not calculated	0.8
Mid Load Forecast	7.3	6.4	1.5
High Load Forecast	10.6	Not calculated	Not calculated

BC Hydro is also developing an annual incremental rate impact forecast consistent with these present value results and expects the incremental rate impact analysis to be available next week.

The following sections provide summaries of:

- Corrections to errors and methodology made by the Commission in their model
- Key assumptions which BC Hydro continues to believe are incorrect or not supported by the evidence.

**Correction for errors and methodological limitations in Commission model:**

BC Hydro's portfolio modelling corrects for the following errors in the Commission's model, as outlined to the Commission in our letter of November 16, 2017:

- Applying the correct discount rate to Site C surplus
- Correction of inconsistent inflation factors, financing costs, and discount rates<sup>1</sup>
- Elimination of double-counting of transmission losses on demand-side management
- Recovery of sunk costs in both the scenario where Site C is completed (over 70 years) and the scenario where Site C is terminated (over 30 years, as used by the Commission for termination costs).
- Applying the correct binary technology to geothermal resources rather than flash technology

BC Hydro's portfolio analysis methodology also provides a long-term system-wide assessment of the costs of the options available to BC Hydro to meet customer load. The key benefits of this methodology as compared to a more simplified method include:

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<sup>1</sup> Note that subsequent to the preparation of our November 16<sup>th</sup> letter, BC Hydro discovered that the Commission's model did not take into account higher near-term interest rates. This has also been corrected for in the current analysis.

**Site C Inquiry**  
**Portfolio Modelling Results using Commission Assumptions**

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- Allows for selection of resources in an optimal manner, rather than assuming specific resources come into service. System Optimizer selects from available resources in order to find the lowest present value cost to ratepayers.
  - o This functionality is why our portfolios select wind and pumped storage as the preferred non-DSM resource option. If we were to force the inclusion of geothermal resources as in the Commission portfolio, alternative portfolio costs would increase,
  - o Note that System Optimizer does not have functionality to select demand-side management options. As a result we have assumed the same DSM timing as in the Commission Illustrative Alternative.
- A long-term evaluation period that provides analysis representative of the impact to ratepayers of the decision to complete or terminate Site C.
  - o This includes in the evaluation the impact of the decision on Site C to “what comes next” to meet domestic load.
  - o The Commission’s analysis with a limitation to a shorter period or a fixed amount of energy and capacity creates a false choice between resources (such as enhanced DSM) that would be pursued in all cases.
- Analysis based upon BC Hydro’s planning view of the load resource balance, rather than an operational view.
  - o BC Hydro’s planning view of the Load Resource Balance reflects the capability of resources based on BC Hydro’s planning criteria, including the requirement contained in subsection 6(2) of the Clean Energy Act to achieve electricity self-sufficiency under prescribed water conditions from its hydroelectric Heritage assets.
  - o An operating view of the Load Resource Balance reflects the forecasted operation of the same resources (as in the planning view of the load resource balance) given market conditions, expected system conditions in the near term and average conditions in the long term<sup>2</sup>. Use of an operating view incorrectly advances the apparent need for new resources by approximately two years.
- Consideration of transmission impacts of resource options. In integrating a resource option to BC Hydro’s system, there needs to be (i) transmission from the generator to a point of interconnection on the BC Hydro system which is typically at a substation at a lower voltage than 500 kV, (ii) upgrades that are required from the lower voltage sub-station to the 500 kV bulk system, and (iii) upgrades on the bulk transmission system.
  - o BC Hydro’s resource option costs include the cost of transmission from the generator to a point of interconnection on the BC Hydro system. These costs have been estimated based on costs that were identified to accommodate IPP projects from the Clean Power Call.
  - o BC Hydro’s portfolio modelling also includes the costs of network upgrades that are required to accommodate IPP projects on the transmission lines from the IPP point of interconnection to the 500 kV bulk system.
  - o The Commission seems to have interpreted network upgrades to be included in the transmission costs from the project to the point of interconnection and have not considered any other transmission costs.
  - o BC Hydro’s portfolio modelling includes an assessment of when bulk transmission upgrades will be required to enable incremental resource options to effectively supply domestic demand. These upgrades were explicitly excluded from the Commission’s analysis.
- Consideration of the market benefits provided by shaping capability.
  - o BC Hydro’s portfolio modelling reflects the daily, monthly and seasonal value to resource shaping.

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<sup>2</sup> The most obvious difference between the Planning View and the Operational View is the energy from dispatchable thermal resources. The Planning View reflects the firm energy that dispatchable thermal resources are capable of generating and can be relied upon for planning purpose (Island Generation at 2,170 GWh and Prince Rupert Generating Station at 180 GWh). In contrast, the Operational View shows how much dispatchable thermal resources are expected to run (Island Generation at 140 GWh and Prince Rupert at 0 GWh).

**Site C Inquiry**  
**Portfolio Modelling Results using Commission Assumptions**

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**Remaining Commission assumptions which are incorrect or not supported by the evidence:**

Other than the correction for errors and methodological issues above, BC Hydro's analysis has preserved Commission assumptions that have been made in the Final Report (A-24) and associated modelling (A-24-2). In many cases BC Hydro believes these assumptions are incorrect or are not supported by the evidence. As previously stated, BC Hydro makes no representation that we will be able to deliver on the Commission portfolio's resources or costs should a decision be made to terminate Site C.

Key assumptions that BC Hydro continues to disagree with include:

- The Commission portfolio relies on substantially more savings from capacity-focused DSM than BC Hydro believes is appropriate to plan on.
  - o The Commission allows for up to 400MW of Industrial Load Curtailment at \$75/kW-yr.
    - The Commission's sole basis for this volume appears to be a submission from AMPC that suggests there is 200-400MW of Industrial Load Curtailment available based on "realistic procurement efforts, using less restrictive contract terms".
    - AMPC provides no analysis for how they arrived at this figure other than a pro-rated number from Hydro Quebec which would yield only 245MW. It is also unlikely the "less restrictive contract terms" would meet BC Hydro's long term planning needs.
    - BC Hydro notes that we tested a shorter term product (4 hours) in our Year 2 Load Curtailment pilot with the concept of aggregating products to meet our long term planning needs. No customer bid in such a product.
  - o The Commission allows for 400 MW of optional time of use savings.
    - This is substantially higher than BC Hydro's assessment of 120MW of available optional time of use savings.
    - The Commission appears to rely on jurisdictional evidence as rationale for the higher amount (400 MW) of TOU potential. However, in reviewing their references, we can only find evidence of residential customer TOU uptake. We believe that higher potential would only be possible if there is also participation by the General Service classes but are not aware of any jurisdictional evidence that shows that there is significant TOU potential with the General Service classes.
- The use of BC Hydro financing for all resources. This assumption either means a substantial change in how BC Hydro does business or does not reflect the true costs to ratepayers. BC Hydro financing either means:
  - o That BC Hydro builds all new resources on our balance sheet. This would be a change from the decades of policy and precedent that IPPs construct new resources in BC, and has the potential to have material impacts on BC Hydro's credit rating and the IPP industry.

OR

  - o That the Commission's PVs are not reflective of the true costs to ratepayers, who would pay IPP costs of capital rather than BC Hydro cost of debt. There is no question that an IPPs cost of capital can be expected to be higher than BC Hydro's cost of capital.

We have included a sensitivity scenario where this issue is addressed and IPP financing is used for IPP resources rather than BC Hydro financing.
- The use of the Utility Cost rather than the Total Resource Cost to evaluate the cost of DSM.
  - o This is incorrect. The incremental costs in the TRC are those paid directly by ratepayers – they are not "societal" costs. As a result, use of the Utility Cost underestimates the cost of DSM to ratepayers.

We have included a sensitivity scenario where this issue is addressed and Total Resource Cost is used rather than Utility Cost.
- The use of extremely low prices for wind resources.

**Site C Inquiry**  
**Portfolio Modelling Results using Commission Assumptions**

- The Commission has utilized extremely optimistic cost declines for wind projects, and also assumed that these projects could be renewed or refurbished at further aggressive cost savings.
  - The costs assumed by the Commission for new-build wind resources are less than half of the results of BC Hydro's most recent competitive call for power. While we agree that costs declines in wind projects are occurring, the costs of wind assumed by the Commission are not expected to be obtainable.
  - The Commission has assumed a further 30% cost savings for wind renewal terms. The Commission has also assumed that there will be no requirement to rebuild transmission lines and roads at refurbishment. This appears to double-count expected cost savings during refurbishment.
- The table below shows a comparison of the cost of wind used in BC Hydro's original analysis, our "Optimistic Portfolio Sensitivity", and the Commission's assumptions made in their Illustrative Alternative portfolio. Note that the Commission Assumptions column includes both the impact of the financing assumption and the cost decline assumption.

**Table 1 – Wind Cost Assumptions (2018 real dollars)**

\$/MWh	Cost Component	Aug 30 <sup>th</sup> Portfolio	Optimistic Sensitivity	Commission Illustrative Alternative <sup>3</sup>
New-build wind resources (F2040)	at point of interconnection	82	64	43
	Wind integration	5	5	1
Wind refurbishment (F2070)	at point of interconnection	82	58	31
	Wind integration	5	5	1

- The use of an electricity market price forecast below expert consensus.
  - The Commission has prepared their own Mid-C market forecast that is between the mid and low case of the ABB market price forecast.
  - This is well below not only the third party price forecast used by BC Hydro (ABB) but also all other third party price forecasts provided during the Site C Inquiry.
  - We have left in the Commission's assumption of providing a \$1/MWh benefit to Site C for the ability to integrate wind but note that we are unclear on the basis for this assumption.

## Results

Table 2 below shows the present value benefits to ratepayers of completing Site C. Values are shown using three sets of assumptions:

- The assumptions in our August 30<sup>th</sup> Submission (F1-1), which remains BC Hydro's best estimate of the impact of terminating Site C.

<sup>3</sup> Note that the unit energy costs we have utilized in our analysis of the Commission's Illustrative Alternative have been calculated based on the Commission's cost decline assumptions stated in their Final Report. These unit energy costs are approximately 2 to 3 \$/MWh lower than what the Commission seems to be utilizing in their spreadsheet model. We are unclear if this is an error in the stated assumptions, the spreadsheet calculation, or BC Hydro's interpretation of the Commission's intent. We emphasize that our assumption is more conservative and favors the alternative portfolio.

**Site C Inquiry**  
**Portfolio Modelling Results using Commission Assumptions**

- The assumptions used in our Optimistic Portfolio Sensitivity provided in the response to BCUC IR 2.46.0 (Exhibit F1-8), which remains BC Hydro's best assessment of a plausible, although low likelihood, set of resource planning assumptions.
- The assumptions used by the Commission in their Illustrative Alternative portfolio (Exhibit A-24-2). As noted above, BC Hydro has retained the Commission's assumptions in their Illustrative Alternative portfolio, but does not believe the assumptions used in this portfolio are plausible.

**Table 2 – Present Value Benefits of Completing Site C**

(\$2018 billions)	August 30 <sup>th</sup> Submission	Optimistic Portfolio Sensitivity	Commission Illustrative Alternative
Low Load Forecast	6.1	Not calculated	0.8
Mid Load Forecast	7.3	6.4	1.5
High Load Forecast	10.6	Not calculated	Not calculated

BC Hydro has prepared a table summarizing the differences in portfolio assumptions between the portfolio in BC Hydro's August 30<sup>th</sup> submission to the BCUC, the Optimistic Portfolio Sensitivity BC Hydro provided as part of our response to BCUC IR 2.46.0, and the Commission's Illustrative Alternative. Please refer to Attachment 1.

BC Hydro has also prepared a figure showing the present value impact of changing assumptions and methodologies between the August 30<sup>th</sup> portfolio and the Commission's illustrative alternative. Please refer to Attachment 2.

In addition to our base results, we have also developed sensitivity analyses for the following items:

- Use of IPP financing rather than BC Hydro financing for alternative resources
- Use of Total Resource Cost rather than Utility Cost for demand-side management

Table 3 below shows the results of this sensitivity analysis on the Commission's Illustrative Alternative

**Table 3 – Sensitivity Analysis for Commission Illustrative Alternative Portfolio**  
**(\$2018 billions)**

	Low Load Forecast	Mid Load Forecast
Base Commission Assumptions	0.8	1.5
<b>Financing:</b> IPP financing for alternative resources	1.2	2.8
<b>DSM Costs:</b> Total Resource Cost rather than Utility Cost	1.3	1.6
<b>Cost Recovery Period:</b> Sunk / termination costs recovered over 10 years	1.2	1.9
<b>Site C capital cost:</b> \$12B rather than \$10B	(0.1)	0.6

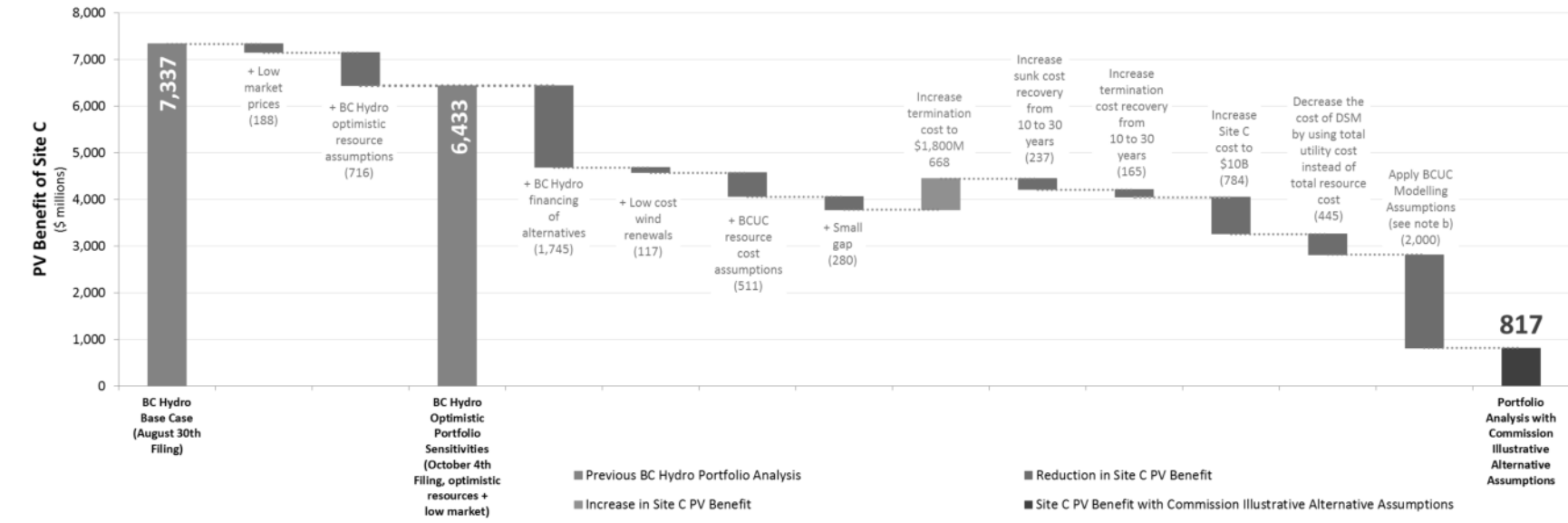
**Site C Inquiry**  
**Portfolio Modelling Results using Commission Assumptions**

**Attachment 1 – Summary of Portfolio Modelling Assumptions**

Assumptions Scenario	August 30 Filing	BC Hydro Optimistic Portfolio Sensitivity	BC Hydro Analysis using Commission Illustrative Alternative Portfolio Assumptions
<b>MODEL ASSUMPTIONS</b>			
Load Forecast Scenarios	- Low / Mid / High	- Low / Mid / High	- Low / Mid (insufficient time to run high load scenario)
Financing Assumption	- BC Hydro finances Site C, DSM, and Resource Smart - IPPs finance alternative resources	- BC Hydro finances Site C, DSM, and Resource Smart - IPPs finance alternative resources	- BC Hydro finances all resources
Market Prices	- ABB Mid Forecast	- ABB Mid Forecast	- BCUC Market Price Forecast
Site C Costs	- \$8.335 billion	- \$8.335 billion	- \$10 billion
Termination and Sunk Costs	- \$3.2 billion (\$2.1 sunk costs, \$1.1 termination costs)	- \$3.2 billion (\$2.1 sunk costs, \$1.1 termination costs)	- \$3.9 billion (\$2.1 sunk costs, \$1.8 termination costs)
Sunk & termination cost recovery period	- 10 years	- 10 years	- 30 years
<b>ALTERNATIVE RESOURCE ASSUMPTIONS</b>			
Capacity Focused DSM	- Industrial Load Curtailment: 85 MW	- Industrial Load Curtailment: 85 MW - Capacity Focused DSM potential: 450MW	- Industrial Load Curtailment: 400 MW - Capacity Focused DSM and optional TOU potential: 640MW
Resource Smart	- Revelstoke Unit 6 when selected by model	- Revelstoke Unit 6 when selected by model - GMS upgrade when selected by model	- Revelstoke Unit 6 assumed in-place in Fiscal 2026
Wind	BC Hydro Resource Options Update w/ IPP financing: - F2040 new build @ \$82/MWh (\$2018) - F2070 refurbishment @ \$82/MWh (\$2018) - Wind integration cost of \$5/MWh	Lower wind costs w/ BCH financing: - F2040 new build @ \$64/MWh (\$2018) - F2070 refurbishment @ \$58/MWh (\$2018) - Wind integration cost of \$5/MWh	Much lower wind costs w/ BCH financing, with further reductions for refurbishment/renewal: - F2040 new build @ \$43/MWh (\$2018) - F2070 refurbishment @ \$31/MWh (\$2018) - Wind integration cost of \$1/MWh
Pumped Storage	BC Hydro Resource Options Update: - F2030 new build @ \$125/kW-yr (\$2018)	BC Hydro Resource Options Update: - F2030 new build @ \$125/kW-yr (\$2018)	BC Hydro Resource Options Update: - F2030 new build @ \$52/kW-yr (\$2018)
Geothermal	- Excluded as not confirmed to be commercially viable	- 200MW of potential @ \$120/MWh	- 80MW of potential @ \$80/MWh (not selected in portfolio)
Solar	- Excluded as not economic	Modeled using NREL mid cost declines (43% by 2040) - (not selected in portfolio)	Modeled using Commission-suggested cost declines (60% by 2040) - (not selected in portfolio)
Batteries	- Excluded as not economic	- Modeled using Commission-suggested (Lazard) cost declines (50% by 2040) (not selected in portfolio)	- Screened out due to high cost. Aligns with suggestion in the Commission's final report.

## Site C Inquiry Portfolio Modelling Results using Commission Assumptions

### Attachment 2 – Impact of Changes to Portfolio Assumptions and Methodologies <sup>a</sup>



#### Notes:

- The value differentials are applied left to right in order. This is important, as there are overlap effects between some changes. As a result, if some changes are applied earlier in the “cascade” they will have a larger impact.
- The BCUC Modeling Assumptions that make up the \$2 billion difference in PV include:
  - Use of 630 MW of Capacity focused DSM + Optional Time of Use rates
  - Use of 400 MW of industrial load curtailment with no long-term commitments (i.e. can be “switched on and off” year to year)
  - Optimistic assumptions regarding renewal of wind projects
  - Commission market price assumption instead of ABB market prices
  - Reduction in wind integration adder to \$1/MWh

**Subject:** Fwd: New BCH Letter to BCUC  
**Date:** Sunday, November 26, 2017 at 10:18:08 AM Pacific Standard Time  
**From:** Lloyd, Evan GCPE:EX  
**To:** MacLaren, Les EMPR:EX  
**CC:** Wright, Don J. PREM:EX  
**Attachments:** 01\_SiteC\_BCH\_CRSP\_LTR.docx, ATT00001.htm, 02\_SiteC\_BCH\_CRSP\_ATT\_01.docx, ATT00002.htm, 03\_SiteC\_BCH\_CRSP\_ATT\_02.docx, ATT00003.htm, 04\_SiteC\_BCH\_CRSP\_ATT\_03\_CP.docx, ATT00004.htm, 05\_SiteC\_BCH\_CRSP\_ATT\_03.pdf, ATT00005.htm, 06\_SiteC\_BCH\_CRSP\_ATT\_04\_CP.docx, ATT00006.htm, 07\_SiteC\_BCH\_CRSP\_ATT\_04.pdf, ATT00007.htm

Les, as discussed - would appreciate your top line assessment, but this appears significant.

Evan

Sent from my iPad

Begin forwarded message:

**From:** "Zadravec, Don GCPE:EX" <[Don.Zadravec@gov.bc.ca](mailto:Don.Zadravec@gov.bc.ca)>  
**Date:** November 24, 2017 at 4:49:08 PM PST  
**To:** "Lloyd, Evan GCPE:EX" <[Evan.Lloyd@gov.bc.ca](mailto:Evan.Lloyd@gov.bc.ca)>  
**Cc:** "Kristianson, Eric GCPE:EX" <[Eric.Kristianson@gov.bc.ca](mailto:Eric.Kristianson@gov.bc.ca)>  
**Subject:** FW: Letter to BCUC

Evan, can we discuss briefly Monday a.m.?

---

**From:** Haslam, David GCPE:EX  
**Sent:** Friday, November 24, 2017 4:18 PM  
**To:** Zadravec, Don GCPE:EX  
**Subject:** Fwd: Letter to BCUC

Don. Second letter to bcuc from bch attached. All aware. Has not been sent yet. Call me and I will walk you thru it.

Sent from my iPhone

Begin forwarded message:

**From:** "Sauer, Darwin" <[Darwin.Sauer@bchydro.com](mailto:Darwin.Sauer@bchydro.com)>  
**To:** "Haslam, David GCPE:EX" <[David.Haslam@gov.bc.ca](mailto:David.Haslam@gov.bc.ca)>  
**Subject:** Fwd: Letter to BCUC

Sent from my iPhone

Begin forwarded message:

**From:** "Magre, Leela" <[Leela.Magre@bchydro.com](mailto:Leela.Magre@bchydro.com)>

**Date:** November 24, 2017 at 3:59:02 PM PST  
**To:** "Sauer, Darwin" <[Darwin.Sauer@bchydro.com](mailto:Darwin.Sauer@bchydro.com)>  
**Subject:** Letter to BCUC

Hi Darwin,

As discussed. The most important piece is the letter, the rest of the attachments are the analysis.

Thanks,  
Leela

---

**Leela Magre** | Manager, Policy & Research

**BC Hydro**  
333 Dunsmuir St, 15th floor  
Vancouver, BC V6B 5R3

**P** 604 623 4008  
**M** 236 993 0338  
**E** [leela.magre@bchydro.com](mailto:leela.magre@bchydro.com)

[bchydro.com](http://bchydro.com)

**Smart about power in all we do.**

---

**From:** BC Hydro, Regulatory Grp  
**Sent:** 2017, November 24 3:54 PM  
**To:** Magre, Leela; Savidant, Michael; BC Hydro, Regulatory Grp  
**Cc:** James, Fred; Reimann, Randy; De Zoysa, Sanjaya  
**Subject:** RE: OK to file

Please see attached, as requested.

Please let us know when we may file.

Thank you

BC Hydro Regulatory

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This email and its attachments are intended solely for the personal use of the individual or entity named above. Any use of this communication by an unintended recipient is strictly prohibited. If you have received this email in error, any publication, use, reproduction, disclosure or dissemination of its contents is strictly prohibited. Please immediately delete this message and its attachments from your computer and servers. We would also appreciate if you would contact us by a collect call or return email to notify us of this error. Thank you for your cooperation.

**Fred James**

Chief Regulatory Officer

Phone: 604-623-4046

Fax: 604-623-4407

[bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com)

November 24, 2017

Mr. Patrick Wruck  
Commission Secretary and Manager  
Regulatory Support  
British Columbia Utilities Commission  
Suite 410, 900 Howe Street  
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

**RE: Project No. 1598922**  
**British Columbia Utilities Commission (BCUC or Commission)**  
**British Columbia Hydro and Power Authority (BC Hydro)**  
**Site C Inquiry – Results of Analysis of Commission Portfolio**

---

BC Hydro is writing further to our letter to the Commission of November 16, 2017. As described in our previous letter, BC Hydro has now utilized our portfolio and rate impact models to analyze the assumptions made by the Commission in its Illustrative Alternative Portfolio referenced in the Final Report. This document provides a summary of the findings from our analysis utilizing these assumptions.

Our analysis of the Commission's Illustrative Alternative Portfolio addresses the methodological errors identified to the Commission in our November 16, 2017 letter, but has retained the Commission's assumptions in the analysis of the Illustrative Alternative Portfolio where they appear to be deliberate. Please refer to Attachment 1 for a summary of these corrections. Further details on the analysis methodology and results are provided in Attachments 2, 3 and 4.

BC Hydro continues to have concerns with a number of the assumptions made by the Commission in its Illustrative Alternative Portfolio. We believe the costs and resources utilized in this portfolio have a very low probability of occurring or of being achievable. As such, BC Hydro makes no representation on our ability to deliver this portfolio in the manner assumed by the Commission.

We have provided two scenarios:

1. A scenario which is consistent with the Commission's past decisions on how to assess the cost to ratepayers of demand-side management and current policy regarding financing of alternative resources, specifically:
  - Using Total Resource Cost (**TRC**) for demand-side management resources rather than the Utility Cost.

- ▶ Using IPP financing rates for new generation resources, reflective of IPPs constructing alternative resources other than Site C and upgrades to BC Hydro facilities.
2. A scenario which utilizes the Commission's assumptions from the Final Report regarding the cost of demand-side management and financing of alternative resources, specifically:
- ▶ Using Utility Cost rather than Total Resource Cost.
  - ▶ Using BC Hydro rather than IPP financing rates.

The key findings from this updated portfolio analysis as compared to previous BC Hydro submissions are shown in [Table 1](#) below. We have performed calculations for the Low and Mid Load forecasts. We have not had sufficient time to calculate impacts for the High Load forecast.

[Table 1](#) provides:

- Present value results representing the difference in present value costs between the Terminate and Continue scenarios.
- Incremental Cumulative Rate Impacts, which represent the difference in rates between the Terminate and Continue scenarios.

**Table 1 Ratepayer Impacts of Site C Termination**

Portfolio Assumptions	Current Policy and Precedent (TRC & IPP Financing)				Commission Assumptions (Utility Cost & BCH Financing)			
Present Value Cost Analysis (\$2018 billions)								
Low Load Forecast	1.7				0.8			
Mid Load Forecast	4.2				2.0			
Estimated Incremental Cumulative Rate Increases (%)								
	F20	F24	F44	F94	F20	F24	F44	F94
Low Load Forecast	6.8	7.7	10.5	36.5	6.8	7.7	9.0	32.5
Mid Load Forecast	6.4	7.2	8.3	25.1	6.4	7.2	3.8	13.8

As shown by these results:

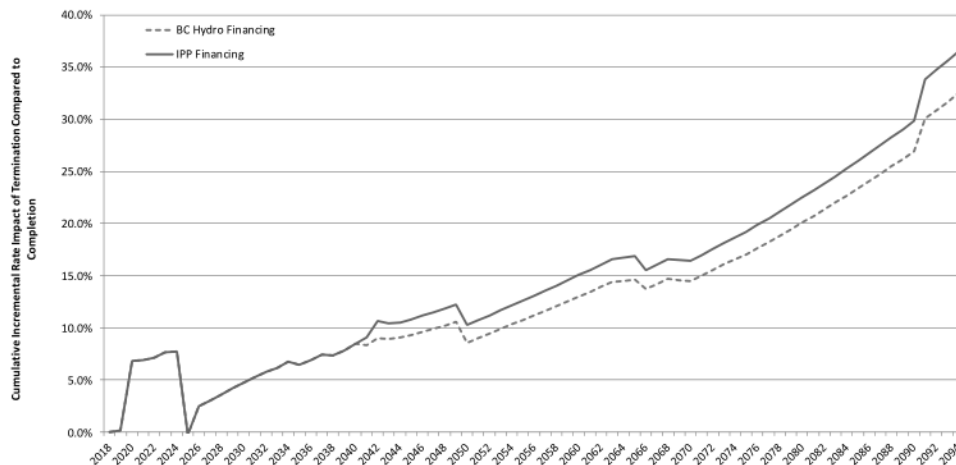
- Terminating Site C results in \$1.7 billion of higher present value costs to ratepayers than completing Site C, even when utilizing the low load forecast and the assumptions in the Commission's Illustrative Alternative.
- Terminating Site C results in higher cumulative rate impacts in all years relative to completing Site C, even when utilizing the low load forecast and the assumptions in the Commission's Illustrative Alternative.
- Utilizing a 30-year amortization period for termination and sunk costs (as the Commission assumes for termination costs) results in a near-term rate impact of approximately 7 per cent for five years when coupled with the Commission's

Illustrative Alternative Portfolio assumptions. This initial rate impact would be greater than 10 per cent if a ten-year amortization period is utilized.

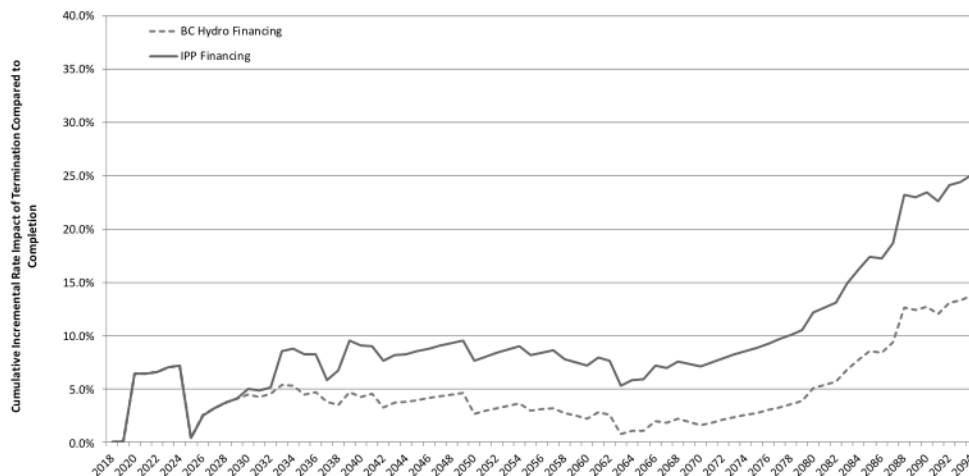
- ▶ BC Hydro believes it is contrary to the regulatory principle of intergenerational equity to have future ratepayers pay for a project decades from now that had been cancelled and from which they are deriving no benefit.
- In all portfolios, cumulative rate impacts of Termination are larger in the low load than the mid load forecast. This is because of the reduction in customer sales resulting from the combination of low load growth and a large amount of incremental demand-side management in the Commission's Illustrative Alternative Portfolio.

Figure 1 and Figure 2 below show the annual cumulative rate impacts, as set out in Table 1, of Termination as compared to Completion of Site C under the Low and Mid Load forecasts (respectively).

**Figure 1 Incremental Rate Impacts: Termination, Low Load**



**Figure 2 Incremental Rate Impacts: Termination, Mid Load**



November 24, 2017  
Mr. Patrick Wruck  
Commission Secretary and Manager  
Regulatory Support  
British Columbia Utilities Commission  
Site C Inquiry – Results of Analysis of Commission Portfolio

**Page 4 of 4**

For further information, please contact Fred James at 604-623-4046 or by email at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,

Fred James  
Chief Regulatory Officer

fj/ma

Enclosures (4)

- |              |   |
|--------------|---|
| Attachment 1 | Summary of Methodology and Areas of Correction                            |
| Attachment 2 | Comparison of Analysis to Previous Filings                                |
| Attachment 3 | Resources Identified in Analysis using Illustrative Alternative Portfolio |
| Attachment 4 | Incremental Cumulative Rate Impact Analysis                               |

## **Site C Inquiry**

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### **Results of Analysis of Commission Portfolio**

#### **Attachment 1**

#### **Summary of Portfolio Modelling Methodology and Assumptions**

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## 1 BC Hydro Portfolio Modelling, Corrected For Commission's Methodological and Input Errors

BC Hydro's portfolio modelling corrects for the following errors in the Commission's model, as outlined to the Commission in our letter of November 16, 2017:

- Applying the correct discount rate to Site C surplus.
- Correction of inconsistent inflation factors, financing costs, and discount rates.<sup>1</sup>
- Elimination of double-counting of transmission losses on demand-side management.
- Recovery of sunk costs in both the scenario where Site C is completed (over 70 years) and the scenario where Site C is terminated (over 30 years, as used by the Commission for termination costs).
- Applying the correct binary technology to geothermal resources rather than flash technology.

BC Hydro's portfolio analysis methodology also provides a long-term system-wide assessment of the costs of the options available to BC Hydro to meet customer load. The key benefits of this methodology as compared to a more simplified method include:

- Allows for selection of resources in an optimal manner, rather than assuming specific resources come into service. System Optimizer (a third party tool used by BC Hydro to identify the most cost-effective resource options) selects from available resources in order to find the lowest present value cost to ratepayers. Note that, as shown in Attachment 3, BC Hydro's system optimizer makes different resource selections than the Commission's Illustrative Alternative Portfolio. This is because these resources have lower costs to ratepayers than the ones selected by the Commission. Key differences are:
  - ▶ Use of Industrial Load Curtailment (ILC) for a larger number of years than the Illustrative Alternative.
  - ▶ Selection of wind and pumped storage as the preferred generation-side resource rather than geothermal resources. [Table 1](#) below shows an illustrative comparison of the cost of wind and pumped storage in 2040 using the Commission's cost assumptions (i.e. BC Hydro financing) to the cost of geothermal using the cost assumptions appropriate for binary rather than flash technology. As shown, a combination of wind and pumped storage is less expensive than geothermal when the Commission's cost assumptions are used. If we were to force the inclusion of geothermal resources as in the Commission portfolio, alternative portfolio costs would increase.

---

<sup>1</sup> Note that subsequent to the preparation of our November 16, 2017 letter, BC Hydro discovered that the Commission's model did not take into account higher near-term interest rates. This has also been corrected for in the current analysis.

**Table 1 Comparison of Geothermal and Wind + Pumped Storage Unit Energy Costs (\$2018, using BCH financing)**

Resource	Units	Commission Illustrative Alternative <sup>2</sup>
Wind (new-build @ POI with wind integration)	\$/MWh	44
Pumped Storage (new-build @ POI)	\$/kW-year	53
<b>Cost of equivalent wind + pumped storage block</b>	<b>\$/MWh</b>	<b>48</b>
<b>Geothermal</b>	<b>\$/MWh</b>	<b>80</b>

- ▶ Note that System Optimizer does not have functionality to select demand-side management options other than ILC. As a result we have assumed the same timing for energy-focused DSM as in the Commission Illustrative Alternative.
- A long-term evaluation period that provides analysis representative of the impact to ratepayers of the decision to complete or terminate Site C.
  - ▶ This includes in the evaluation the impact of the decision on Site C to “what comes next” to meet domestic load.
  - ▶ The Commission’s analysis used a shorter period for assessing costs and benefits and a fixed amount of energy and capacity. These constraints create a false comparison between resources (such as enhanced DSM) that would be pursued in all cases. Refer to our comments on the Commission’s October 11, 2017 portfolio (Exhibit F1-17) for additional discussion.
- Analysis based upon BC Hydro’s planning view of the load resource balance, rather than an operational view as used by the Commission.
  - ▶ BC Hydro’s planning view of the Load Resource Balance reflects the capability of resources based on BC Hydro’s planning criteria, including the requirement contained in subsection 6(2) of the *Clean Energy Act* to achieve electricity self-sufficiency under prescribed water conditions from its hydroelectric Heritage assets. The planning view is what determines the timing of future resource acquisitions.
  - ▶ An operating view of the Load Resource Balance reflects the forecasted operation of the same resources (as determined by the planning view of the load resource balance) given market conditions, expected system conditions in the near term and average

<sup>2</sup> Note that the unit energy costs we have utilized in our analysis of the Commission’s Illustrative Alternative have been calculated based on the Commission’s cost decline assumptions stated in their Final Report. These unit energy costs are approximately 2 to 3 \$/MWh lower than what the Commission seems to be utilizing in their spreadsheet model. We are unclear if this is an error in the stated assumptions, the spreadsheet calculation, or BC Hydro’s interpretation of the Commission’s intent. We emphasize that our methodology is more conservative and favors the alternative portfolio.

conditions in the long term.<sup>3</sup> Use of an operating view incorrectly advances the apparent need for new resources by approximately two years.

- Consideration of transmission impacts of resource options.
  - ▶ In integrating a resource option to BC Hydro's system, there needs to be (i) transmission from the generator to a point of interconnection on the BC Hydro system which is typically at a substation at a lower voltage than 500 kV, (ii) upgrades that are required from the lower voltage sub-station to the 500 kV bulk system, and (iii) upgrades on the bulk transmission system.
  - ▶ BC Hydro's resource option costs include the cost of transmission from the generator to a point of interconnection on the BC Hydro system. BC Hydro's portfolio modelling also includes the costs of network upgrades that are required to accommodate IPP projects on the transmission lines from the IPP point of interconnection to the 500 kV bulk system, which further understates the costs associated with these resources. The costs of network upgrades were estimated based on costs that were identified from the Clean Power Call
  - ▶ The Commission appears to have interpreted network upgrades to be included in the transmission costs from the project to the point of interconnection and have not considered any other transmission costs.
  - ▶ BC Hydro's portfolio modelling includes an assessment of when bulk transmission upgrades will be required to enable incremental resource options to effectively supply domestic demand. These upgrades were explicitly excluded from the Commission's analysis.
- Consideration of the market benefits provided by shaping capability.
  - ▶ BC Hydro's portfolio modelling reflects the daily, monthly and seasonal value to resource shaping, in contrast to the Commission's use of a flat Mid-C export price.
- Consideration of the actual cost of financing resources, through the use of IPP financing for new generation resources other than Site C, upgrades to BC Hydro facilities, and DSM. This is consistent with current practice and policy regarding the development of IPP resources.
  - ▶ We have also included a scenario in which BC Hydro financing is used for IPP resources rather than IPP financing.
- Consideration of the actual cost of demand-side management to ratepayers, through the use of the Total Resource Cost rather than solely the Utility Cost. This is consistent with a ratepayer perspective and how the Commission has considered DSM costs in the past.

---

<sup>3</sup> The most obvious difference between the Planning View and the Operational View is the energy from dispatchable thermal resources. The Planning View reflects the firm energy that dispatchable thermal resources are capable of generating and can be relied upon for planning purpose (Island Generation at 2,170 GWh and Prince Rupert Generating Station at 180 GWh). In contrast, the Operational View shows how much dispatchable thermal resources are expected to run (Island Generation at 140 GWh and Prince Rupert at 0 GWh).

- ▶ The incremental costs in the Total Resource Cost are those paid directly by ratepayers – they are not “societal” costs. As a result, use of the Utility Cost underestimates the cost of DSM to ratepayers.
- ▶ We have also included a scenario where the Commissions assumption of Utility Cost is used over the Total Resource Cost.

## **2 Rates Modelling of Cumulative Rate Increases Alternative Portfolios as Compared to Site C**

For each scenario, BC Hydro estimated the incremental impact on the main components of BC Hydro's total revenue requirement (amortization, finance charges, operating costs and energy costs), compared with their respective base cases (i.e., continuation of Site C).

For both load scenarios, the incremental impact is measured against hypothetical Base Cases which use the same Commission cost and DSM assumptions described above. In both the Base Cases and the Termination Cases, BC Hydro's system optimizer selects the most cost-effective resources to meet customer demand based on either the mid or low load forecast.

The incremental changes to BC Hydro's revenue requirement, as well as changes to revenue from incremental DSM, are used to estimate the incremental cumulative rate increases for each scenario. The estimated incremental cumulative rate increases represents the magnitude (in percentages), in a given future year, that cumulative rate increases (compared with current fiscal 2017 rates) would be higher or lower in the scenario than they would have otherwise been in the base case, in that same year.

BC Hydro considered the following main items in estimating the ratepayer impact under a termination and remediation scenario:

1. Costs spent to-date on advancing the Project and costs directly related to termination and remediation; and
2. Costs for ratepayers of advancing energy and capacity resources in comparison to a portfolio that includes the Project.

These incremental costs are described below:

- Remove:
  - ▶ Site C costs of \$10 billion (total Site C construction costs as estimated by the Commission including the forecast balance of Site C Regulatory Account) are removed at the end of fiscal 2024;
  - ▶ Site C operating costs (comprised of water rental costs, operating costs, and taxes) are removed beginning in fiscal 2025; and
  - ▶ Future sustaining capital expenditures totalling \$2.1 billion are removed from the fiscal 2024 to fiscal 2094 period.

- 
- Replace with:
    - ▶ Site C Regulatory Account costs of \$4.0 billion (sunk, termination and remediation costs) are added at the end of fiscal 2019. These are comprised of the costs of \$3.8 billion recognized as shown below at December 31, 2017 (which would increase by interest to \$4.0 billion by the end of fiscal 2019):
      - Project capital costs to termination date (\$1.6 billion);
      - Costs already in the Site C regulatory account (\$0.5 billion); and
      - Costs directly related to the Project termination and remediation that would be recovered from ratepayers (\$1.7 billion of recognized present value, which will increase to \$1.8 billion, to be recovered from ratepayers); and
    - ▶ Incremental cost of advancing alternative sources of energy and capacity in order to compensate for the removal of Site C. These include advancing both energy and capacity focused DSM measures and generation resources.

## **Site C Inquiry**

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### **Results of Analysis of Commission Portfolio**

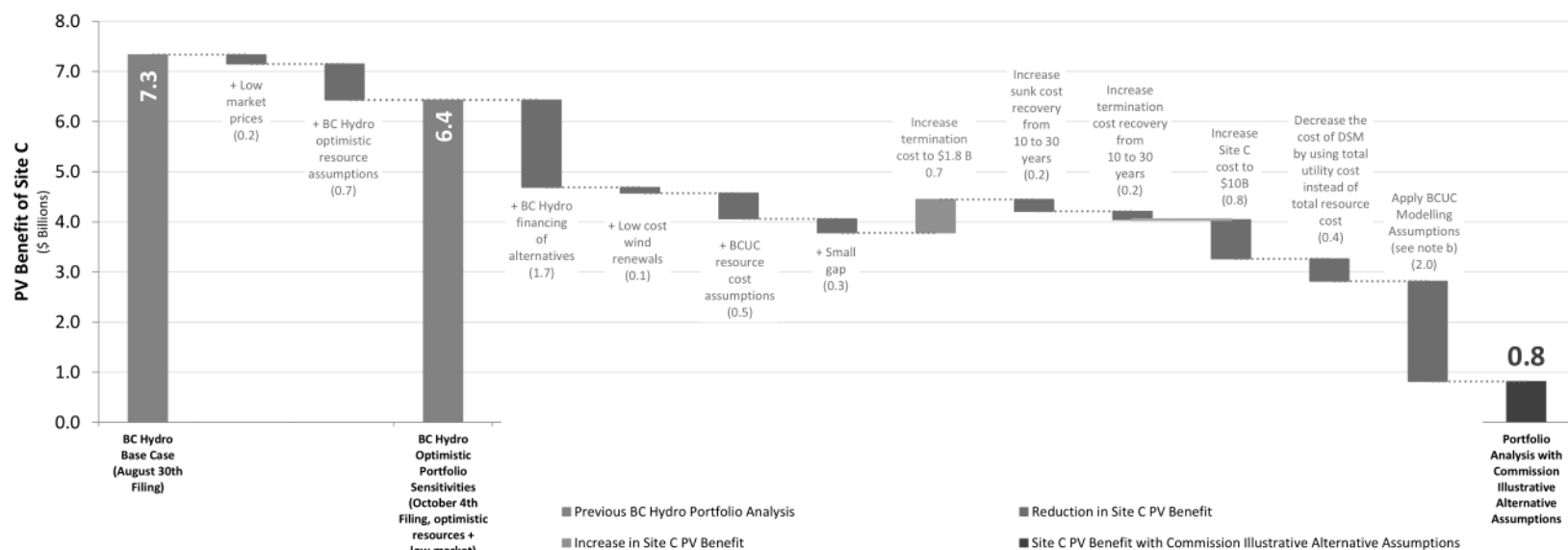
#### **Attachment 2**

#### **Comparison of Assumptions and Results to Previous Filings**

Assumptions Scenario	August 30 Filing	BC Hydro Optimistic Portfolio Sensitivity	Commission Illustrative Alternative Portfolio Assumptions
<b>MODEL ASSUMPTIONS</b>			
<b>Load Forecast Scenarios</b>	- Low / Mid / High	- Low / Mid / High	- Low / Mid (insufficient time to run high load scenario)
<b>Financing Assumption</b>	- BC Hydro finances Site C, DSM, and Resource Smart - IPPs finance alternative resources	- BC Hydro finances Site C, DSM, and Resource Smart - IPPs finance alternative resources	- BC Hydro finances Site C, DSM, and Resource Smart - IPP financing for alternatives (BCH financing run as sensitivity)
<b>Market Prices</b>	- ABB Mid Forecast	- ABB Mid Forecast	- BCUC Market Price Forecast
<b>Site C Costs</b>	- \$8.335 billion	- \$8.335 billion	- \$10 billion
<b>Termination and Sunk Costs</b>	- \$3.2 billion (\$2.1 sunk costs, \$1.1 termination costs)	- \$3.2 billion (\$2.1 sunk costs, \$1.1 termination costs)	- \$3.9 billion (\$2.1 sunk costs, \$1.8 termination costs)
<b>Sunk &amp; termination cost recovery period</b>	- 10 years	- 10 years	- 30 years
<b>ALTERNATIVE RESOURCE ASSUMPTIONS</b>			
<b>Energy focused demand-side management</b>	- Baseline: RRA DSM plan - Option: 2012 IRP option 2 - Total Resource Cost	- Baseline: RRA DSM plan - Option: 2012 IRP option 2 - Total Resource Cost	- Baseline: 2012 IRP option 2 - Total Resource Cost (Utility Cost run as sensitivity)
<b>Capacity Focused DSM</b>	- Industrial Load Curtailment: 85 MW	- Industrial Load Curtailment: 85 MW - Capacity Focused DSM potential: 450 MW	- Industrial Load Curtailment: 400 MW - Capacity Focused DSM and optional TOU potential: 640 MW

Assumptions Scenario	August 30 Filing	BC Hydro Optimistic Portfolio Sensitivity	Commission Illustrative Alternative Portfolio Assumptions
<b>Resource Smart</b>	- Revelstoke Unit 6 when selected by model	- Revelstoke Unit 6 when selected by model - GMS upgrade when selected by model	- Revelstoke Unit 6 assumed in-place in Fiscal 2026
<b>Wind</b>	BC Hydro Resource Options Update w/ IPP financing.	Lower wind costs w/ IPP financing.	Lower wind costs, with further reductions for refurbishment/renewal.
<b>Pumped Storage</b>	BC Hydro Resource Options Update	BC Hydro Resource Options Update	BC Hydro Resource Options Update
<b>Geothermal</b>	Excluded as not confirmed to be commercially viable	- 200 MW of potential	- 80MW of potential at reduced prices (not selected in portfolio)
<b>Solar</b>	Excluded as not economic	Modeled using NREL mid cost declines (43% by 2040) (not selected in portfolio)	Modeled using Commission-suggested cost declines (60% by 2040) - (not selected in portfolio)
<b>Batteries</b>	Excluded as not economic	Modeled using Commission-suggested cost declines (50% by 2040) (not selected in portfolio)	- Screened out due to high cost. Aligns with suggestion in the Commission's final report.

### Impact of Changes to Portfolio Assumptions and Methodologies <sup>a</sup>



#### Notes:

- The value differentials are applied **left to right in order**. This is important, as there are overlap effects between some changes. As a result, if some changes are applied earlier in the “cascade” they will have a larger impact.
- The BCUC Modeling Assumptions that make up the \$2 billion difference in PV include:
  - Use of 630 MW of Capacity focused DSM + Optional Time of Use rates;
  - Use of 400 MW of industrial load curtailment with no long-term commitments (i.e., can be “switched on and off” year to year);
  - Optimistic assumptions regarding renewal of wind projects;
  - Commission market price assumption instead of ABB market prices; and
  - Reduction in wind integration adder to \$1/MWh.

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## **Site C Inquiry**

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### **Results of Analysis of Commission Portfolio**

#### **Attachment 3**

#### **Resources Selected in Analysis using Illustrative Alternative Assumptions**

Continue Site C, Mid Load Forecast						
Generation			DSM			
Year	Name	Capacity	Annual Energy	Year	Name	Capacity Annual Energy
2023	Site C	1145	5286	2024	BCUC_CFD	210
2025	Revelstoke Unit 6	500	26	2024	BCUC_oTOU_2025start	430
2035	Wind_PC18	138	524	2029	Ind Load Curtailment	100
2035	Wind_NC09	333	1074	2032	Ind Load Curtailment	150
2036	Pumped_Storage_LM	1000	0	2033	Ind Load Curtailment	250
2038	Wind_PC14	144	570	2034	Ind Load Curtailment	400
2039	Wind_PC28	153	641	2035	Ind Load Curtailment	400
2040	Wind_PC10	297	1119	2038	Ind Load Curtailment	100
2040	Wind_PC48	150	538	2039	Ind Load Curtailment	300
2041	Wind_PC20	156	594	2040	Ind Load Curtailment	400
2041	Pumped_Storage_LM	1000	0			
2042	Wind_VI02	147	446			

Terminate Site C, Mid Load Forecast						
Generation			DSM			
Year	Name	Capacity	Annual Energy	Year	Name	Capacity Annual Energy
2025	Revelstoke Unit 6	500	26	2018	BCUC_oTOU_2018start	430
2029	Wind_NC09	333	1074	2018	BCUC_CFD	210
2032	Wind_PC14	144	570	2024	Ind Load Curtailment	250
2032	Wind_PC18	138	524	2025	Ind Load Curtailment	50
2032	Pumped_Storage_LM	1000	0	2026	Ind Load Curtailment	150
2033	Wind_PC20	156	594	2027	Ind Load Curtailment	300
2034	Wind_VI02	147	446	2028	Ind Load Curtailment	350
2035	Wind_PC28	153	641	2029	Ind Load Curtailment	400
2035	Wind_PC48	150	538	2030	Ind Load Curtailment	250
2036	Wind_PC13	135	577	2031	Ind Load Curtailment	400
2037	Wind_PC10	297	1119	2035	Ind Load Curtailment	150
2037	Wind_PC17	102	335	2036	Ind Load Curtailment	400
2037	Wind_SI15	303	898	2037	Ind Load Curtailment	400
2038	Pumped_Storage_LM	1000	0	2040	Ind Load Curtailment	150
2039	Wind_PC19	117	482	2041	Ind Load Curtailment	300
2040	Wind_PC09	207	774	2042	Ind Load Curtailment	400
2041	Wind_PC21	99	405			
2041	Wind_SI12	186	586			
2042	Wind_SI16	660	1814			

Cell in red indicates final DSM volume. DSM capacity ramps up to this value beginning in the year shown

Continue Site C, Low Load Forecast						
Generation			DSM			
Year	Name	Capacity	Annual Energy	Year	Name	Annual Energy
2023	Site C	1145	5286	2029	BCUC_CFDSM_2030start	210
2025	Revelstoke Unit 6	500	26	2029	BCUC_oTOU_2030start	430
				2040	Ind Load Curtailment	100
				2041	Ind Load Curtailment	200
						0

Terminate Site C, Low Load Forecast						
Generation			DSM			
Year	Name	Capacity	Annual Energy	Year	Name	Annual Energy
2025	Revelstoke Unit 6	500	26	2024	BCUC_CFDSM_2025start	210
2040	Wind_PC14	144	570	2024	BCUC_oTOU_2025start	430
2040	Wind_PC18	138	524	2037	Ind Load Curtailment	50
2040	Wind_PC48	150	538	2038	Ind Load Curtailment	200
2041	Pumped_Storage_LM	1000	0	2039	Ind Load Curtailment	350
				2040	Ind Load Curtailment	400
						0

Cell in red indicates final DSM volume. DSM capacity ramps up to this value beginning in the year shown

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## **Site C Inquiry**

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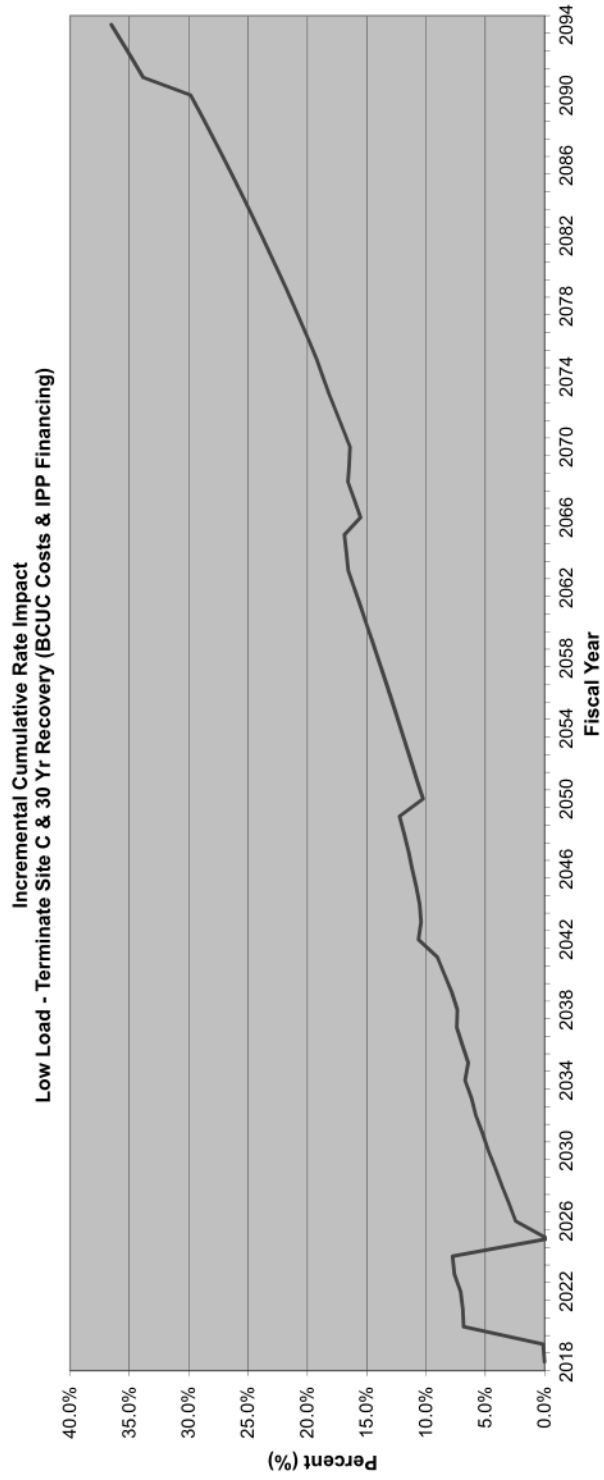
### **Results of Analysis of Commission Portfolio**

#### **Attachment 4**

### **Incremental Cumulative Rate Impact Analysis**

Low Load - Terminate 30 Yrs with BCUC Costs & IPP Financing.xlsx

BC Hydro  
Rate Impact Analysis



Revenue Requirement (Ratepayer Costs) Summary

Rate Impact Model - Low Load - Terminate 30 Yrs with BCUC Costs & IPP Financing.xlsx

BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
Fiscal Year Column Reference	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Change in Revenue Requirement (Ratepayer Costs):																											
1	290.4	296.2	302.1	308.1	314.3	320.6	327.0	333.5	340.2	347.0	354.0	361.0	368.3	375.6	383.1	390.8	398.6	406.6	414.7	423.0	431.5	440.1	343.4	350.3	357.3	364.4	371.7
2	46.6	64.1	61.9	61.4	62.6	62.8	63.0	64.2	65.5	66.8	68.1	69.5	70.9	72.3	73.8	75.2	76.7	78.3	79.8	81.4	83.1	84.7	86.4	88.2	89.9	91.7	93.6
3	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.9)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(151.6)	(160.2)	(160.2)	(160.2)	(173.9)	(187.6)	
4	(193.2)	(191.7)	(189.9)	(188.3)	(186.6)	(185.1)	(181.5)	(175.6)	(169.7)	(163.9)	(158.2)	(152.4)	(146.6)	(140.8)	(135.0)	(129.2)	(123.4)	(117.6)	(111.8)	(106.0)	(111.7)	(117.2)	(110.7)	(104.1)	(97.6)	(112.0)	(125.8)
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	(124.5)	(143.7)	(143.1)	(144.1)	(147.0)	(148.9)	(150.8)	(153.8)	(156.9)	(160.0)	(163.2)	(166.5)	(169.8)	(173.2)	(176.6)	(180.2)	(183.8)	(187.5)	(191.2)	(195.0)	(198.9)	(202.9)	(207.0)	(211.1)	(215.3)	(219.6)	(224.0)
7	102.2	100.9	103.0	105.9	109.7	114.4	120.7	126.2	130.2	134.3	138.0	140.4	143.5	147.3	151.0	154.8	158.5	161.2	164.1	167.3	170.5	173.8	177.3	180.8	184.5	188.1	191.9
8	111.7	116.0	124.3	133.2	143.1	153.8	35.4	51.6	66.3	81.1	95.7	109.1	123.3	138.2	153.3	168.4	183.6	197.9	212.6	227.7	222.8	218.4	129.3	143.9	158.6	138.8	119.7
9	9.762	9.976	10.193	10.414	10.631	10.854	11.075	11.296	11.520	11.755	11.988	12.235	12.477	12.723	12.973	13.226	13.483	13.748	14.018	14.294	14.577	14.866	15.161	15.462	15.769	16.083	16.402
10	9.873	10.092	10.317	10.547	10.774	11.008	11.240	11.478	11.720	11.966	12.216	12.344	12.600	12.861	13.126	13.394	13.667	13.946	14.231	14.522	14.800	15.084	15.360	15.606	15.928	16.221	16.522
11	(9.301)	(9.505)	(9.712)	(9.923)	(10.130)	(10.343)	(10.553)	(10.764)	(10.977)	(11.201)	(11.433)	(11.659)	(11.889)	(12.123)	(12.362)	(12.603)	(12.848)	(13.100)	(13.357)	(13.620)	(13.889)	(14.166)	(14.447)	(14.733)	(15.026)	(15.325)	(15.630)
12	572.1	587.2	605.5	623.8	644.0	665.2	557.2	583.8	609.1	635.0	661.0	686.6	711.1	737.7	764.5	791.6	818.9	846.7	873.1	901.2	909.6	918.8	843.7	872.4	901.6	896.6	892.5
13	6.15%	6.18%	6.23%	6.29%	6.36%	6.43%	5.28%	5.42%	5.55%	5.67%	5.78%	5.88%	5.98%	6.08%	6.18%	6.28%	6.37%	6.46%	6.54%	6.62%	6.65%	6.49%	5.84%	5.92%	6.00%	5.85%	5.71%
14	171.2	175.1	178.9	182.4	186.2	190.1	193.9	197.8	201.7	205.9	210.1	214.3	218.5	222.8	227.2	231.6	236.1	240.8	245.5	250.3	255.3	260.3	265.5	270.8	276.1	281.6	287.2
15	161.7	165.9	169.0	173.8	178.0	182.3	186.6	190.9	195.2	199.5	203.8	208.1	212.4	216.7	221.0	225.3	229.6	233.9	238.2	242.5	246.8	251.1	255.4	259.7	264.0	268.3	272.6
16	71.2%	75.1%	78.9%	82.4%	86.2%	90.1%	93.9%	97.8%	101.7%	105.9%	110.1%	114.3%	118.5%	122.8%	127.2%	131.6%	136.1%	140.8%	145.5%	150.3%	155.3%	160.3%	165.5%	170.8%	176.1%	181.6%	187.2%
17	81.7%	85.9%	90.0%	93.8%	98.0%	102.3%	106.2%	109.8%	113.9%	117.5%	120.3%	123.3%	125.9%	128.4%	130.8%	133.1%	135.4%	137.6%	139.7%	141.8%	143.8%	145.8%	147.8%	149.7%	151.6%	153.5%	155.4%
18	10.5%	10.8%	11.2%	11.5%	11.8%	12.2%	12.6%	13.0%	13.4%	13.8%	14.2%	14.6%	15.0%	15.4%	15.8%	16.2%	16.6%	17.0%	17.4%	17.8%	18.2%	18.6%	19.0%	19.4%	19.8%	20.2%	20.6%

Rate Impact Model - Low Load - Terminate 30 Yrs with BCUC Costs & IPP Financing.xlsx

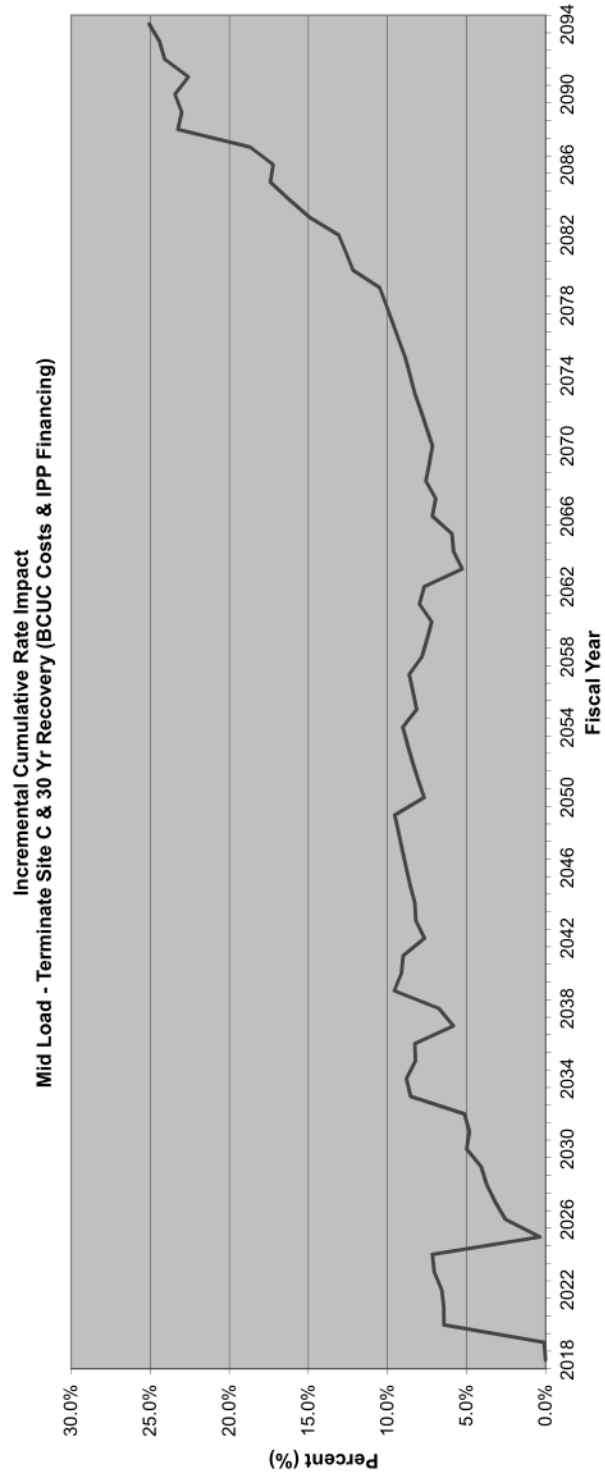
BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	Fiscal Year Column Reference	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
Change in Revenue Requirement (Ratepayer Costs):																									
1	Domestic Energy Costs	379.2	366.8	394.5	402.4	410.4	418.6	427.0	435.5	444.3	453.1	462.2	471.5	480.9	490.5	500.3	510.3	520.5	530.9	541.5	552.4	562.4	573.2	584.6	596.4
2	Operating Costs	95.4	97.3	99.3	101.3	103.3	105.4	107.5	109.6	111.8	114.0	116.3	118.6	121.0	123.4	125.9	128.4	131.0	133.6	136.3	139.0	141.8	144.6	147.5	150.5
3	Amortization	(187.6)	(187.6)	(187.6)	(189.6)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)
4	Finance Charges	(118.3)	(110.7)	(103.1)	(98.8)	(94.5)	(89.7)	(84.8)	(79.8)	(74.8)	(69.8)	(64.8)	(59.8)	(54.8)	(49.8)	(44.8)	(39.8)	(34.8)	(29.8)	(24.8)	(19.8)	(14.8)	(9.8)	(4.8)	(0.0)
5	Return on Equity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	DSM Account	(228.5)	(233.1)	(237.7)	(242.5)	(247.3)	(252.3)	(257.3)	(262.5)	(267.7)	(273.1)	(278.5)	(284.1)	(289.8)	(295.6)	(301.5)	(307.5)	(313.7)	(320.0)	(326.4)	(332.9)	(339.5)	(346.3)	(353.3)	(360.3)
7	DSM Recoveries	196.7	199.7	203.7	207.7	211.9	216.1	220.4	224.8	229.3	233.9	238.6	243.4	248.2	253.2	258.3	263.4	268.7	274.1	279.6	285.2	290.9	296.7	302.6	308.7
8	Estimated Total Change in Revenue Requirement:	135.9	152.3	168.9	180.5	192.3	203.7	215.2	226.8	238.1	249.6	261.3	273.1	285.0	296.8	308.7	320.5	332.4	344.3	356.2	368.1	380.0	391.9	403.8	415.7
9	Estimated Revenue Requirement - Base Case	16,729	17,062	17,401	17,748	18,101	18,461	18,829	19,204	19,587	19,977	20,375	20,781	21,195	21,617	22,048	22,488	22,936	23,393	23,860	24,336	24,821	25,316	25,821	26,336
10	Estimated Revenue Requirement - Scenario	16,865	17,214	17,570	17,928	18,293	18,671	19,056	19,449	19,850	20,258	20,675	21,099	21,532	21,974	22,424	22,884	23,352	23,829	24,316	24,813	25,316	25,821	26,336	26,853
11	Domestic Revenues	(15,941)	(16,258)	(16,581)	(16,911)	(17,248)	(17,592)	(17,942)	(18,299)	(18,664)	(19,036)	(19,415)	(19,802)	(20,196)	(20,599)	(21,009)	(21,428)	(21,855)	(22,291)	(22,736)	(23,189)	(23,651)	(24,123)	(24,604)	(25,095)
12	Revenue Shortfall (Surplus)	924.1	956.2	988.8	1,016.7	1,045.1	1,079.5	1,114.4	1,149.8	1,185.9	1,222.5	1,259.8	1,297.6	1,336.1	1,375.2	1,415.0	1,455.4	1,496.5	1,538.3	1,580.8	1,624.1	1,668.1	1,712.3	1,756.5	1,800.7
13	Estimated Incremental Impact on Future Rates	5.80%	5.88%	5.96%	6.01%	6.06%	6.14%	6.21%	6.28%	6.35%	6.42%	6.49%	6.55%	6.62%	6.68%	6.74%	6.79%	6.85%	6.90%	6.95%	7.00%	7.05%	7.10%	7.15%	7.20%
14	Typical Customer Bill (F2017 = 100)	293.0	298.8	304.7	310.8	317.0	323.3	329.7	336.3	343.0	349.8	356.8	363.9	371.2	378.6	386.1	393.8	401.7	409.7	417.8	426.2	434.7	443.3	452.2	461.2
15	Base Case Scenario	309.9	316.4	322.9	329.5	336.2	343.1	350.2	357.4	364.8	372.3	380.0	387.8	395.7	403.8	412.1	420.6	429.2	437.9	446.9	456.0	465.1	474.1	483.1	492.7
16	Base Case Scenario	193.0%	198.8%	204.7%	210.8%	217.0%	223.3%	229.7%	236.3%	243.0%	249.8%	256.8%	263.9%	271.2%	278.6%	286.1%	293.8%	301.7%	309.7%	317.8%	326.2%	334.7%	343.3%	352.2%	361.2%
17	Base Case Scenario	209.9%	216.4%	222.9%	229.5%	236.2%	243.1%	250.2%	257.4%	264.8%	272.3%	280.0%	287.8%	295.7%	303.8%	312.1%	320.6%	329.2%	337.9%	346.9%	356.0%	365.0%	374.1%	383.1%	392.7%
18	Estimated Incremental Cumulative Rate Impact	17.0%	17.6%	18.2%	18.7%	19.2%	19.8%	20.5%	21.1%	21.8%	22.5%	23.2%	23.8%	24.6%	25.3%	26.0%	26.7%	27.5%	28.3%	29.1%	29.8%	30.6%	31.4%	32.2%	33.0%

Mid Load - Terminate 30 Yrs with BCUC Costs & IPP Financing.xlsx

BC Hydro  
Rate Impact Analysis



Rate Impact Model - Mid Load - Terminate 30 Yrs with BCUC Costs & IPP Financing.xlsx

BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Change in Revenue Requirement (Ratepayer Costs):																											
1	0.0	(7.3)	(13.7)	(25.6)	(41.0)	(55.0)	(62.9)	50.7	137.6	148.6	170.4	182.0	236.6	249.8	287.9	493.7	531.7	554.0	577.1	467.0	560.4	747.8	743.8	766.5	715.3	785.5	
2	0.0	11.5	95.7	126.3	140.9	149.5	133.0	121.7	98.5	68.8	34.7	(69.4)	(60.2)	(80.3)	(79.7)	(98.0)	(140.0)	(168.0)	(165.7)	(132.6)	(116.8)	(93.3)	(78.0)	(81.1)	(63.4)	(36.8)	
3	0.0	0.0	133.0	133.0	133.0	133.0	133.0	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	
4	0.0	0.2	150.6	144.8	135.4	135.1	134.3	(207.5)	(204.1)	(201.2)	(199.4)	(200.3)	(202.7)	(205.4)	(208.3)	(211.4)	(215.4)	(220.5)	(225.6)	(229.6)	(232.2)	(233.6)	(234.0)	(233.7)	(232.8)	(230.7)	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	(11.5)	(95.7)	(126.3)	(140.9)	(149.5)	(133.0)	(137.1)	(138.5)	(124.5)	(91.5)	11.5	1.1	20.0	18.3	35.3	76.1	102.8	99.1	64.7	47.5	22.7	5.9	7.6	(11.5)	(39.6)	
7	0.0	0.0	0.8	7.1	15.6	25.0	34.9	43.8	52.9	62.2	70.5	76.6	75.8	75.7	74.4	73.2	70.8	65.0	51.7	36.7	23.0	9.9	(0.5)	(10.1)	(19.8)	(27.3)	
8	0.0	(7.1)	270.6	259.4	243.0	238.1	219.4	(138.2)	(63.3)	(56.0)	(25.2)	(9.4)	40.8	50.0	82.7	283.0	313.3	323.4	326.8	196.4	272.1	443.6	427.5	439.5	377.9	421.2	
9	4,638	4,851	5,038	5,293	5,525	5,727	5,946	6,308	6,517	6,719	6,741	6,956	7,178	7,392	7,633	7,885	8,101	8,106	8,382	8,828	9,037	9,325	9,648	9,947	10,223	10,621	
10	4,638	4,843	5,309	5,553	5,768	5,966	6,166	6,170	6,453	6,663	6,716	6,946	7,219	7,442	7,716	8,168	8,414	8,429	8,709	9,025	9,309	9,769	10,075	10,386	10,601	11,042	
11	(4,638)	(4,639)	(5,016)	(5,255)	(5,460)	(5,632)	(5,823)	(6,152)	(6,329)	(6,505)	(6,528)	(6,740)	(6,962)	(7,191)	(7,446)	(7,713)	(7,941)	(7,979)	(8,251)	(8,698)	(9,027)	(9,220)	(9,545)	(9,856)	(10,145)	(10,546)	
12	0.0	4.4	293.3	297.4	308.3	333.5	343.0	17.7	124.7	157.6	187.1	206.6	256.3	250.9	270.2	455.2	473.0	449.9	457.8	326.4	382.4	548.2	530.4	530.2	455.8	496.0	
13	0.00%	0.09%	5.85%	5.60%	5.65%	5.92%	5.89%	0.29%	1.97%	2.42%	2.87%	3.06%	3.68%	3.49%	3.63%	5.90%	5.96%	5.64%	5.55%	3.75%	4.28%	5.95%	5.56%	5.38%	4.49%	4.70%	
Estimated Incremental Impact on Future Rates																											
Typical Customer Bill (\$2017 = 100)																											
14	103.3	106.3	109.9	113.8	116.4	118.9	121.5	126.8	128.1	131.8	130.4	132.9	135.5	138.2	141.4	144.7	147.8	146.0	148.9	155.4	157.3	160.8	164.0	167.5	170.3	174.4	
15	103.3	106.4	116.3	120.2	123.0	125.9	128.7	127.2	131.6	135.0	134.1	137.0	140.4	143.0	146.5	153.2	156.6	154.3	157.2	161.2	164.0	170.4	173.2	176.5	178.0	182.6	
16	3.3%	6.3%	9.9%	13.8%	16.4%	18.9%	21.5%	26.8%	29.1%	31.8%	30.4%	32.9%	35.5%	38.2%	41.4%	44.7%	47.8%	46.0%	48.9%	55.4%	57.3%	60.8%	64.0%	67.5%	70.3%	74.4%	
17	3.3%	6.4%	16.3%	20.2%	23.0%	25.9%	28.7%	27.2%	31.8%	35.0%	34.1%	37.0%	40.4%	43.0%	46.5%	53.2%	56.8%	54.3%	57.2%	61.2%	64.0%	70.4%	73.2%	76.5%	78.0%	82.6%	
18	0.0%	0.1%	6.4%	6.4%	6.6%	7.0%	7.2%	0.4%	2.5%	3.2%	3.7%	4.1%	5.0%	4.8%	5.1%	6.5%	8.6%	8.2%	8.3%	5.8%	6.7%	9.6%	9.1%	9.0%	7.7%	8.2%	
Estimated Incremental Cumulative Rate Impact																											

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BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary  
(\$ million)

Line	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
Fiscal Year	Column	Reference																									
Change in Revenue Requirement (Ratepayer Costs):																											
1	760.8	796.4	812.4	828.6	845.2	862.1	879.3	896.9	914.9	933.2	951.8	900.3	918.3	936.7	892.2	872.8	855.3	904.0	884.9	736.5	786.0	812.3	885.8	870.0	904.5	922.6	941.0
2	(21.8)	(38.6)	(42.8)	(50.8)	(75.3)	(80.5)	(84.0)	(87.6)	(93.3)	(97.2)	(101.2)	(99.0)	(98.9)	(100.9)	(102.9)	(104.9)	(107.0)	(109.2)	(111.4)	(113.6)	(115.9)	(118.2)	(120.5)	(122.9)	(125.4)	(127.9)	(130.5)
3	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(151.6)	(160.2)	(160.2)	(160.2)	(173.9)	(187.6)	
4	(227.8)	(224.8)	(222.2)	(219.9)	(218.3)	(217.3)	(214.2)	(209.0)	(204.2)	(199.7)	(195.4)	(191.1)	(186.7)	(182.3)	(177.9)	(173.4)	(168.9)	(164.2)	(159.4)	(154.5)	(161.3)	(167.7)	(162.2)	(156.6)	(151.1)	(166.5)	(181.5)
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	(56.2)	(41.0)	(38.3)	(32.0)	(9.1)	(5.5)	(3.8)	(1.9)	2.0	4.0	6.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	(30.8)	(26.3)	(23.5)	(19.6)	(16.2)	(13.3)	(7.8)	(0.7)	6.0	10.2	13.1	14.2	14.5	15.0	14.2	11.6	7.8	5.1	2.5	0.4	(0.2)	(0.6)	(0.8)	(0.9)	(0.8)	(0.5)	(0.1)
8	434.5	456.1	475.7	496.5	516.5	535.6	426.5	454.6	482.3	507.4	531.5	483.4	504.1	525.4	482.6	463.0	444.2	492.7	473.6	325.8	359.1	365.7	442.1	429.3	487.0	453.7	441.3
9	10,938	11,167	11,402	11,641	11,870	12,108	12,342	12,575	12,811	13,060	13,319	13,572	13,831	14,094	14,363	14,648	14,938	15,132	15,433	15,739	16,015	16,291	16,503	16,792	17,146	17,486	17,834
10	11,372	11,623	11,878	12,138	12,387	12,643	12,769	13,030	13,293	13,568	13,851	14,056	14,335	14,620	14,846	15,111	15,383	15,625	15,906	16,065	16,374	16,657	16,945	17,221	17,613	17,940	18,275
11	(10,866)	(11,099)	(11,339)	(11,582)	(11,815)	(12,057)	(12,296)	(12,535)	(12,775)	(13,030)	(13,294)	(13,553)	(13,818)	(14,089)	(14,363)	(14,648)	(14,938)	(15,132)	(15,433)	(15,739)	(16,015)	(16,291)	(16,503)	(16,792)	(17,146)	(17,486)	(17,834)
12	505.7	523.5	539.3	555.8	571.4	586.0	472.2	495.3	517.9	537.7	556.2	502.3	517.0	532.0	482.6	463.0	444.2	492.7	473.6	325.8	359.1	365.7	442.1	429.3	487.0	453.7	441.3
13	4.65%	4.72%	4.76%	4.80%	4.84%	4.86%	3.84%	3.95%	4.05%	4.13%	4.18%	3.71%	3.74%	3.78%	3.36%	3.16%	2.97%	3.26%	3.07%	2.07%	2.24%	2.24%	2.68%	2.56%	2.72%	2.59%	2.47%
Typical Customer Bill (F2017 = 100)																											
14	177.8	181.5	185.2	188.6	192.3	196.1	199.9	203.7	207.5	211.5	215.7	219.8	224.0	228.3	232.6	237.3	242.0	246.1	250.0	254.9	259.4	263.9	267.3	272.0	277.7	283.2	288.9
15	166.0	150.1	154.0	157.6	161.2	164.8	168.4	172.0	175.6	179.2	182.8	186.4	190.0	193.6	197.2	200.8	204.4	208.0	211.6	215.2	218.8	222.4	226.0	229.6	233.2	236.8	240.4
16	77.8%	81.5%	85.2%	88.6%	92.3%	96.1%	99.9%	103.7%	107.5%	111.5%	115.5%	119.8%	124.0%	128.3%	132.6%	137.3%	142.0%	146.1%	150.0%	154.9%	159.4%	163.9%	167.3%	172.0%	177.7%	183.2%	188.9%
17	86.0%	90.1%	94.0%	97.6%	101.6%	105.6%	109.6%	113.7%	117.7%	121.8%	125.8%	129.8%	133.8%	137.9%	141.9%	145.9%	149.9%	153.9%	157.9%	161.9%	165.2%	169.8%	174.5%	178.9%	183.3%	188.0%	192.0%
18	8.3%	8.6%	8.8%	9.0%	9.3%	9.5%	7.7%	8.0%	8.4%	8.7%	9.0%	8.1%	8.4%	8.6%	7.8%	7.5%	7.2%	8.0%	7.7%	5.3%	5.8%	5.9%	7.2%	7.0%	7.6%	7.3%	7.1%
Estimated Incremental Cumulative Rate Impact																											

Rate Impact Model - Mid Load - Terminate 30 Yrs with BCUC Costs & IPP Financing.xlsx

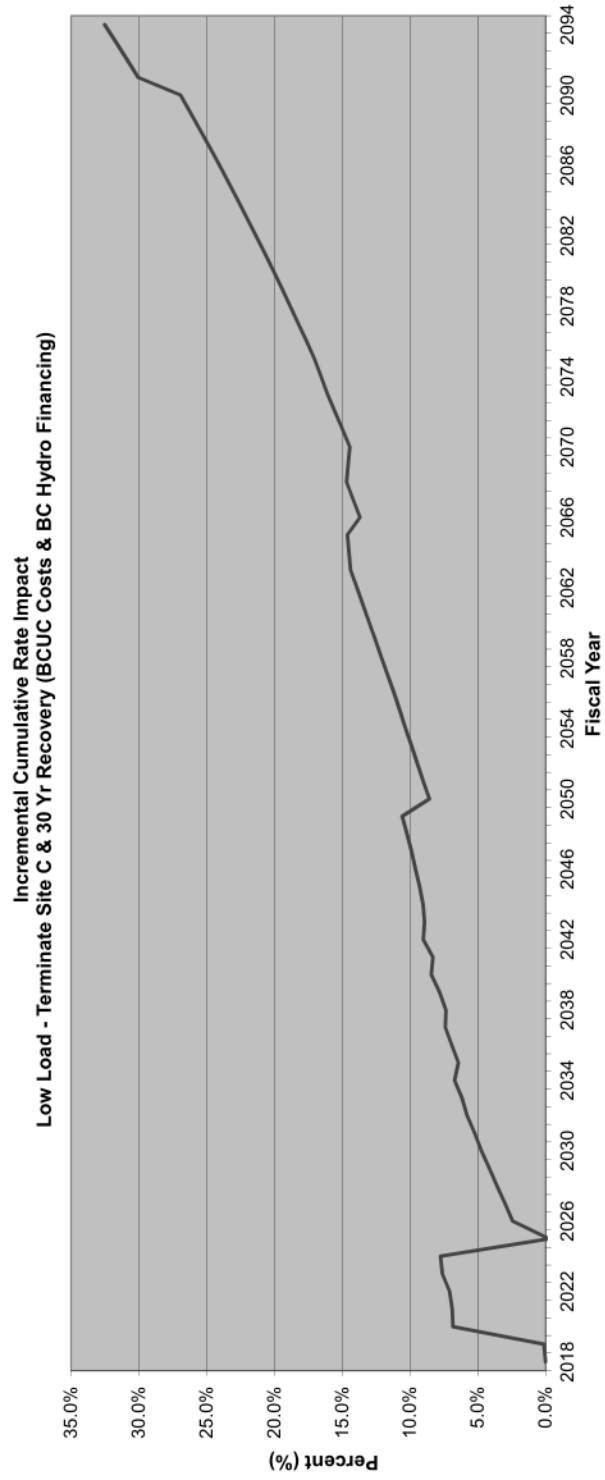
BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	Fiscal Year Column Reference	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
Change in Revenue Requirement (Ratepayer Costs):																									
1		959.9	979.1	998.6	1,018.6	1,039.0	1,059.8	1,081.0	1,102.6	1,124.6	1,146.6	1,225.1	1,249.6	1,274.6	1,394.9	1,459.8	1,530.9	1,517.8	1,604.3	1,865.8	1,890.0	1,834.6	1,924.5	1,941.2	1,980.1
2		(133.1)	(135.7)	(138.5)	(141.2)	(144.1)	(146.9)	(149.9)	(152.9)	(155.9)	(159.0)	(162.2)	(165.5)	(168.8)	(172.2)	(175.6)	(179.1)	(182.7)	(186.3)	(190.1)	(193.9)	(197.8)	(201.7)	(205.7)	(209.9)
3		(187.6)	(187.6)	(187.6)	(189.6)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)
4		(175.0)	(168.6)	(162.2)	(159.1)	(155.9)	(149.3)	(142.8)	(136.2)	(129.6)	(123.0)	(116.5)	(109.9)	(103.3)	(96.8)	(90.2)	(83.6)	(77.1)	(70.5)	(63.9)	(57.4)	(50.8)	(44.2)	(37.7)	(31.1)
5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	DSM Account	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	DSM Additions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	DSM Recoveries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9		464.1	487.1	510.4	528.8	547.5	572.0	596.8	622.0	647.6	751.5	779.4	807.7	921.3	996.4	1,073.6	1,063.5	1,153.0	1,435.2	1,420.3	1,447.2	1,394.5	1,487.1	1,506.3	1,547.6
Estimated Total Change in Revenue Requirement:																									
10		18,189	18,551	18,920	19,297	19,681	20,074	20,473	20,881	21,297	21,722	22,155	22,596	23,047	23,506	23,975	24,605	25,096	25,596	26,162	26,747	27,462	28,073	28,609	29,180
Estimated Revenue Requirement - Base Case																									
11		18,653	19,038	19,431	19,826	20,229	20,646	21,070	21,503	21,945	22,394	22,849	23,304	23,769	24,244	24,506	25,049	25,469	26,249	27,031	27,582	28,194	28,856	29,560	30,319
Estimated Revenue Requirement - Scenario																									
12		(18,189)	(18,551)	(18,920)	(19,297)	(19,681)	(20,074)	(20,473)	(20,881)	(21,297)	(21,722)	(22,155)	(22,596)	(23,047)	(23,506)	(23,975)	(24,605)	(25,096)	(25,596)	(26,162)	(26,747)	(27,462)	(28,073)	(28,609)	(29,180)
Domestic Revenues																									
13		464.1	487.1	510.4	528.8	547.5	572.0	596.8	622.0	647.6	751.5	779.4	807.7	921.3	996.4	1,073.6	1,063.5	1,153.0	1,435.2	1,420.3	1,447.2	1,394.5	1,487.1	1,506.3	1,547.6
Revenue Shortfall (Surplus)																									
Estimated Incremental Impact on Future Rates																									
14		2.55%	2.63%	2.70%	2.74%	2.78%	2.85%	2.92%	2.98%	3.04%	3.46%	3.52%	3.57%	4.00%	4.25%	4.48%	4.32%	4.59%	5.61%	5.43%	5.41%	5.08%	5.30%	5.27%	5.30%
Typical Customer Bill (F2017 = 100)																									
15		294.6	300.5	306.5	312.6	318.8	325.1	331.6	338.2	345.0	351.8	358.8	366.0	373.3	380.7	388.3	398.5	406.5	414.6	423.8	433.2	444.8	454.7	463.4	472.6
16		302.1	308.4	314.7	321.1	327.7	334.4	341.3	348.3	355.5	362.0	371.5	379.1	388.2	396.9	405.7	415.8	425.2	437.8	446.8	456.7	467.4	478.8	487.8	497.7
Base Case Scenario																									
17		194.6%	200.5%	206.5%	212.6%	218.8%	225.1%	231.6%	238.2%	245.0%	251.8%	258.8%	266.0%	273.3%	280.7%	288.3%	298.5%	306.5%	314.6%	323.8%	333.2%	344.8%	354.7%	363.4%	372.6%
18		202.1%	208.4%	214.7%	221.1%	227.7%	234.4%	241.3%	248.3%	255.5%	262.0%	268.5%	275.1%	282.2%	289.9%	298.0%	305.7%	315.8%	325.2%	332.8%	346.8%	356.7%	367.4%	378.8%	387.8%
Base Case Scenario																									
19		7.5%	7.9%	8.3%	8.6%	8.9%	9.3%	9.7%	10.1%	10.5%	12.2%	12.6%	13.1%	14.9%	16.2%	17.4%	17.2%	18.7%	23.23%	23.03%	23.4%	22.6%	24.1%	24.4%	25.1%
Estimated Incremental Cumulative Rate Impact																									

Low Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

BC Hydro  
Rate Impact Analysis



Rate Impact Model - Low Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	(\$ million)																											
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Fiscal Year Column Reference																												
Change in Revenue Requirement (Ratepayer Costs):																												
1	0.0	(6.9)	(12.7)	(23.8)	(38.3)	(51.3)	(78.4)	25.6	122.4	122.6	122.8	120.7	122.5	123.4	124.4	121.9	127.3	119.4	119.3	131.5	139.4	156.9	175.8	164.2	210.1	204.2		
2	0.0	6.1	80.1	96.6	112.6	117.0	121.6	121.6	121.8	123.6	93.3	86.8	52.2	40.2	25.8	14.1	(10.8)	3.5	27.0	28.3	35.0	56.3	47.9	39.4	41.8	44.0		
3	0.0	0.0	133.0	133.0	133.0	133.0	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)		
4	0.0	0.1	150.1	143.6	133.3	132.1	130.8	(210.9)	(206.9)	(202.4)	(198.5)	(195.6)	(193.7)	(192.9)	(192.7)	(193.1)	(194.3)	(195.7)	(196.6)	(196.9)	(197.0)	(196.6)	(195.9)	(195.4)	(194.9)	(194.2)		
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
6	0.0	(6.1)	(80.1)	(96.6)	(112.6)	(117.0)	(121.6)	(137.0)	(161.7)	(179.3)	(150.1)	(144.7)	(111.3)	(100.5)	(87.3)	(76.8)	(53.2)	(68.8)	(93.6)	(96.1)	(104.3)	(126.9)	(119.9)	(116.8)	(116.8)	(120.5)		
7	0.0	0.0	0.4	5.7	12.2	19.7	27.5	35.6	44.7	55.5	67.5	77.5	87.1	94.5	101.2	107.1	112.2	115.3	114.6	114.4	113.3	112.4	112.8	111.6	108.4	104.2		
8	0.0	(6.8)	270.8	258.5	240.2	233.5	213.0	(175.0)	(88.5)	(89.8)	(74.9)	(65.2)	(53.0)	(45.0)	(38.3)	(36.7)	(28.5)	(36.0)	(39.0)	(28.8)	(23.4)	(7.7)	10.8	(2.9)	38.8	28.0		
9	4,638	4,768	4,931	5,156	5,350	5,525	5,718	6,065	6,257	6,435	6,432	6,626	6,800	6,992	7,201	7,414	7,599	7,571	7,782	8,012	8,187	8,414	8,658	8,927	9,069	9,484		
10	4,638	4,761	5,201	5,414	5,590	5,768	5,931	5,890	6,168	6,345	6,358	6,560	6,747	6,947	7,163	7,378	7,571	7,542	7,743	7,983	8,163	8,407	8,669	8,924	9,108	9,512		
11	(4,638)	(4,756)	(4,907)	(5,116)	(5,282)	(5,425)	(5,589)	(5,901)	(6,059)	(6,210)	(6,195)	(6,370)	(6,527)	(6,702)	(6,889)	(7,083)	(7,248)	(7,230)	(7,402)	(7,615)	(7,793)	(8,008)	(8,234)	(8,489)	(8,630)	(9,032)		
12	0.0	5.2	294.3	298.1	308.3	333.1	342.0	(10.8)	108.8	134.8	162.9	190.5	219.9	245.4	274.4	294.3	322.8	312.6	340.5	367.9	370.3	399.0	435.4	434.7	477.5	480.1		
13	0.00%	0.11%	6.00%	5.83%	5.84%	6.14%	6.12%	-0.18%	1.79%	2.17%	2.63%	2.99%	3.37%	3.66%	3.98%	4.15%	4.45%	4.32%	4.60%	4.83%	4.75%	4.98%	5.29%	5.12%	5.53%	5.32%		
Estimated Incremental Impact on Future Rates																												
Typical Customer Bill (\$2017 = 100)																												
14	107.7	110.4	113.8	118.2	121.3	123.9	126.6	133.0	135.6	137.9	136.3	139.0	140.9	142.9	145.5	148.5	150.7	148.8	150.5	153.2	154.5	156.9	159.4	162.4	163.0	168.0		
15	107.7	110.5	120.6	125.1	128.3	131.5	134.4	132.7	138.0	140.9	139.9	143.2	145.7	148.2	151.3	154.7	157.4	155.2	157.5	160.6	161.9	164.7	167.9	170.7	172.1	177.0		
16	7.7%	10.4%	13.8%	18.2%	21.3%	23.9%	26.6%	33.0%	35.6%	37.9%	36.3%	39.0%	40.9%	42.9%	45.5%	48.5%	50.7%	48.8%	50.5%	53.2%	54.5%	56.9%	59.4%	62.4%	63.0%	68.0%		
17	7.7%	10.5%	20.6%	25.1%	28.3%	31.5%	34.4%	32.7%	38.0%	40.9%	39.9%	43.2%	45.7%	48.2%	51.3%	54.7%	57.4%	55.2%	57.5%	60.6%	61.9%	64.7%	67.9%	70.7%	72.1%	77.0%		
18	0.0%	0.1%	6.8%	6.9%	7.1%	7.6%	7.7%	-0.2%	2.4%	3.0%	3.6%	4.2%	4.7%	5.2%	5.8%	6.2%	6.7%	6.4%	6.9%	7.4%	7.3%	7.8%	8.4%	8.3%	9.0%	8.9%		
Estimated Incremental Cumulative Rate Impact																												

## Revenue Requirement (Ratepayer Costs) Summary

(\$ million)		Fiscal Year		Line		Comments		Reference																			
2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071
27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Change in Revenue Requirement (Ratepayer Costs):																											
1	208.3	212.5	216.7	221.1	225.5	230.0	234.6	239.3	244.1	249.0	253.9	259.0	264.2	269.5	274.9	280.4	286.0	291.7	297.5	303.5	309.6	315.7	243.5	248.4	253.4	258.4	263.6
2	46.6	64.1	61.9	61.4	62.6	62.8	63.0	64.2	65.5	66.8	68.1	69.5	70.9	72.3	73.8	75.2	76.7	78.3	79.8	81.4	83.1	84.7	86.4	88.2	89.9	91.7	93.6
3	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.9)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(151.6)	(160.2)	(160.2)	(160.2)	(160.2)	(173.9)	(187.6)	
4	(193.2)	(191.7)	(189.9)	(188.3)	(186.6)	(185.1)	(181.5)	(175.6)	(169.7)	(163.9)	(158.2)	(152.4)	(146.6)	(140.8)	(135.0)	(129.2)	(123.4)	(117.6)	(111.8)	(106.0)	(111.7)	(117.2)	(110.7)	(104.1)	(97.6)	(112.0)	(125.8)
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	(124.5)	(143.7)	(143.1)	(144.1)	(147.0)	(148.9)	(150.8)	(153.8)	(156.9)	(160.0)	(163.2)	(166.5)	(169.8)	(173.2)	(176.6)	(180.2)	(183.8)	(187.5)	(191.2)	(195.0)	(198.9)	(202.9)	(207.0)	(211.1)	(215.3)	(219.6)	(224.0)
7	102.2	100.9	103.0	105.9	109.7	114.4	120.7	126.2	130.2	134.3	138.0	140.4	143.5	147.3	151.0	154.8	158.5	161.2	164.1	167.3	170.5	173.8	177.3	180.8	184.5	188.1	191.9
8	29.6	32.3	38.9	48.1	54.3	63.2	67.0	(42.7)	(28.8)	(17.8)	(4.3)	7.1	19.2	32.1	45.0	58.0	71.0	83.0	95.5	108.2	100.9	94.1	29.4	42.0	54.6	32.8	11.6
9	9.781	9.996	10.213	10.434	10.651	11.096	11.318	11.542	11.776	12.021	12.259	12.501	12.747	12.988	13.231	13.509	13.774	14.045	14.302	14.605	14.895	15.190	15.492	15.799	16.114	16.434	
10	9.810	10.028	10.252	10.480	10.705	10.938	11.039	11.275	11.512	11.761	12.017	12.266	12.520	12.760	13.043	13.350	13.580	13.857	14.140	14.430	14.706	14.989	15.290	15.534	15.864	16.146	
11	(9.319)	(9.624)	(9.731)	(10.480)	(10.149)	(10.363)	(10.573)	(10.785)	(10.998)	(11.223)	(11.455)	(11.681)	(11.912)	(12.147)	(12.385)	(12.627)	(12.873)	(13.125)	(13.383)	(13.647)	(14.193)	(14.474)	(14.762)	(15.055)	(15.354)	(15.660)	
12	491.0	504.4	521.1	537.7	556.2	575.6	465.8	490.6	514.0	538.0	562.1	584.7	608.2	632.7	657.4	682.4	707.5	732.0	757.2	783.0	789.0	795.8	745.1	771.9	799.0	759.4	785.9
13	5.27%	5.30%	5.35%	5.41%	5.48%	5.55%	4.41%	4.55%	4.67%	4.79%	4.91%	5.01%	5.11%	5.21%	5.31%	5.40%	5.50%	5.59%	5.66%	5.74%	5.67%	5.61%	5.15%	5.23%	5.31%	5.16%	5.02%
Typical Customer Bill (F2017 = 100)																											
14	171.5	175.5	179.2	182.7	186.5	190.4	194.3	198.2	202.1	206.3	210.5	214.7	218.9	223.2	227.6	232.1	236.6	241.2	246.0	250.8	255.8	260.8	266.0	271.3	276.7	282.2	287.8
15	160.5	164.8	168.6	172.6	176.7	180.9	185.2	189.7	194.3	199.0	203.9	208.9	214.0	219.2	224.5	229.9	235.4	240.9	246.5	252.1	257.8	263.6	269.5	275.5	281.6	287.8	
16	71.5%	75.5%	79.2%	82.7%	86.5%	90.4%	94.3%	98.2%	102.1%	106.3%	110.5%	114.7%	118.9%	123.2%	127.6%	132.1%	136.6%	141.2%	146.0%	150.8%	155.8%	160.8%	166.0%	171.3%	176.7%	182.2%	187.8%
17	80.5%	84.8%	88.8%	92.6%	96.7%	101.0%	102.9%	107.2%	111.6%	116.1%	120.9%	125.4%	130.1%	134.9%	139.7%	144.6%	149.6%	154.7%	159.9%	165.2%	170.3%	175.5%	179.7%	185.5%	191.4%	196.7%	202.2%
18	9.0%	9.3%	9.6%	9.9%	10.2%	10.6%	8.6%	9.0%	9.4%	9.9%	10.3%	10.7%	11.2%	11.6%	12.1%	12.5%	13.0%	13.5%	13.9%	14.4%	14.6%	14.3%	14.2%	14.7%	14.6%	14.4%	14.4%

Rate Impact Model - Low Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

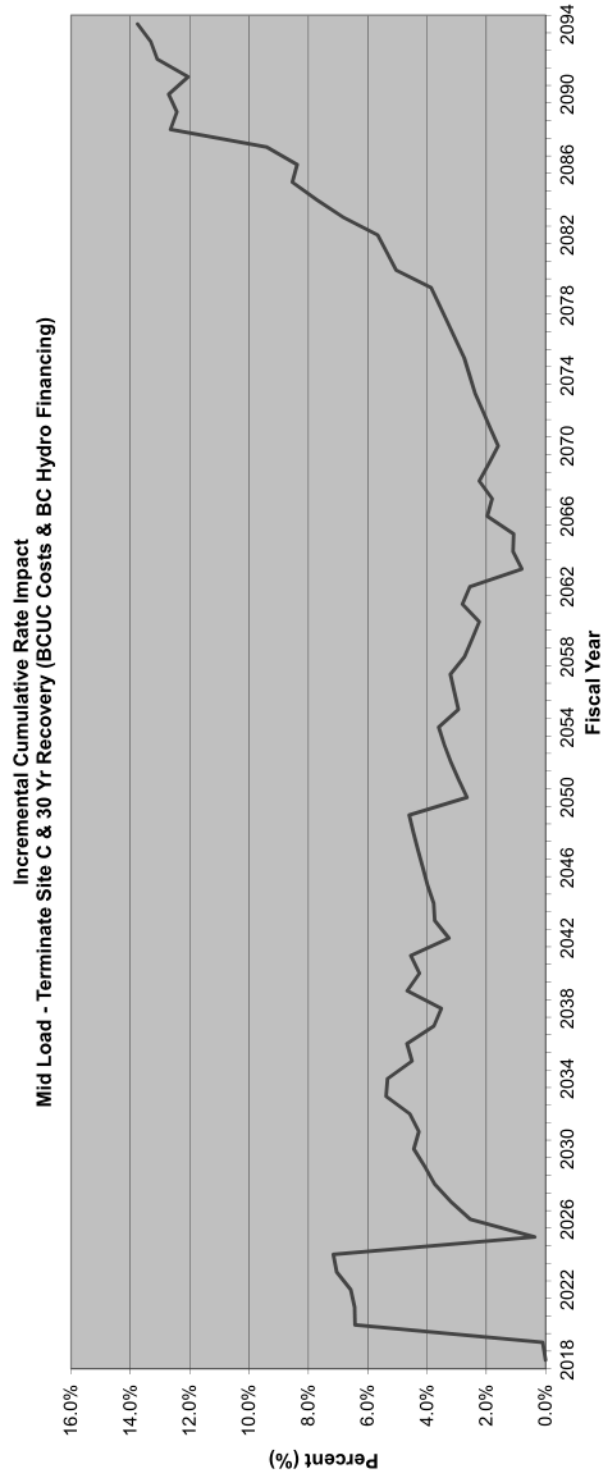
BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	Fiscal Year Column Reference	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
Change in Revenue Requirement (Ratepayer Costs):																									
1	Domestic Energy Costs	269.9	274.2	279.7	285.3	291.0	296.9	302.8	308.8	315.0	321.3	327.8	334.3	341.0	347.8	354.8	361.9	369.1	376.5	384.0	391.7	528.4	538.9	549.7	560.7
2	Operating Costs	95.4	97.3	99.3	101.3	103.3	105.4	107.5	109.6	111.8	114.0	116.3	118.6	121.0	123.4	125.9	128.4	131.0	133.6	136.3	139.0	141.8	144.6	147.5	150.5
3	Amortization	(187.6)	(187.6)	(187.6)	(189.6)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)
4	Finance Charges	(118.3)	(110.7)	(103.1)	(98.8)	(94.5)	(86.7)	(78.8)	(71.0)	(63.1)	(55.2)	(47.3)	(39.3)	(31.4)	(23.4)	(15.3)	(7.3)	0.8	9.0	17.1	25.3	33.5	41.8	50.1	58.4
5	Return on Equity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	DSM Account	(228.5)	(233.1)	(237.7)	(242.5)	(247.3)	(252.3)	(257.3)	(262.5)	(267.7)	(273.1)	(278.5)	(284.1)	(289.8)	(295.6)	(301.5)	(307.5)	(313.7)	(320.0)	(326.4)	(332.9)	(339.5)	(346.3)	(353.3)	(360.3)
7	DSM Additions	196.7	199.7	203.7	207.7	211.9	216.1	220.4	224.8	229.3	233.9	238.6	243.4	248.2	253.2	258.3	263.4	268.7	274.1	279.6	285.2	290.9	296.7	302.6	308.7
8	Estimated Total Change in Revenue Requirement:																								
9	Estimated Revenue Requirement - Base Case	16,761	17,095	17,435	17,762	18,136	18,497	18,865	19,241	19,624	20,015	20,414	20,821	21,236	21,659	22,091	22,531	22,980	23,439	23,906	24,383	24,869	25,365	25,871	26,387
10	Estimated Revenue Requirement - Scenario	16,787	17,134	17,489	17,845	18,209	18,585	18,968	19,359	19,758	20,165	20,579	21,002	21,433	21,873	22,321	22,779	23,245	23,720	24,205	24,699	25,332	25,849	26,376	26,913
11	Domestic Revenues	(15,971)	(16,289)	(16,613)	(16,944)	(17,281)	(17,626)	(17,977)	(18,335)	(18,700)	(19,072)	(19,452)	(19,840)	(20,235)	(20,639)	(21,050)	(21,470)	(21,896)	(22,334)	(22,780)	(23,234)	(23,697)	(24,170)	(24,652)	(25,144)
12	Revenue Shortfall (Surplus)	815.3	845.3	875.6	901.2	927.4	959.4	991.9	1,024.9	1,058.4	1,092.5	1,127.2	1,162.4	1,198.1	1,234.5	1,271.5	1,309.0	1,347.2	1,386.0	1,425.5	1,465.6	1,635.3	1,679.3	1,724.1	1,769.7
13	Estimated Incremental Impact on Future Rates																								
14	Typical Customer Bill (F2017 = 100)	5.10%	5.19%	5.27%	5.32%	5.37%	5.44%	5.52%	5.59%	5.66%	5.73%	5.79%	5.86%	5.92%	5.98%	6.04%	6.10%	6.15%	6.21%	6.26%	6.31%	6.90%	6.95%	6.99%	7.04%
15	Base Case	293.5	299.4	305.3	311.4	317.6	323.9	330.4	337.0	343.7	350.5	357.5	364.6	371.9	379.3	386.9	394.6	402.4	410.5	418.6	427.0	435.5	444.2	453.1	462.1
16	Base Case Scenario	308.5	314.9	321.4	328.0	334.6	341.6	348.6	355.8	363.1	370.6	378.2	386.0	393.9	402.0	410.2	418.6	427.2	435.9	444.8	453.9	463.6	473.1	482.7	492.6
17	Base Case Scenario	193.5%	199.4%	205.3%	211.4%	217.6%	223.9%	230.4%	237.0%	243.7%	250.5%	257.5%	264.6%	271.9%	279.3%	286.9%	294.6%	302.4%	310.5%	318.6%	327.0%	335.5%	344.2%	353.1%	362.1%
18	Base Case Scenario	208.5%	214.9%	221.4%	228.0%	234.6%	241.6%	248.6%	255.8%	263.1%	270.6%	278.2%	286.0%	293.9%	302.0%	310.2%	318.6%	327.2%	335.9%	344.8%	353.9%	363.6%	373.1%	382.7%	392.6%
19	Estimated Incremental Cumulative Rate Impact	15.0%	15.5%	16.1%	16.6%	17.0%	17.6%	18.2%	18.8%	19.5%	20.1%	20.7%	21.4%	22.0%	22.7%	23.4%	24.1%	24.8%	25.5%	26.2%	26.9%	30.1%	30.9%	31.7%	32.5%

Mid Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

BC Hydro  
Rate Impact Analysis



Rate Impact Model - Mid Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

BC Hydro Rate Impact Analysis		Revenue Requirement (Ratepayer Costs) Summary (\$ million)		Fiscal Year Column Reference		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Line						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Change in Revenue Requirement (Ratepayer Costs):																															
1	Domestic Energy Costs		0.0	(7.3)	(13.7)	(25.6)	(41.0)	(55.0)	(62.9)	50.7	137.6	148.6	170.4	182.0	208.8	221.4	258.9	325.3	345.3	350.2	378.7	353.6	379.4	468.9	462.6	505.7	455.4	497.3			
2	Operating Costs		0.0	11.5	95.7	126.3	140.9	149.5	133.0	121.7	98.5	68.8	34.7	(69.4)	(80.2)	(80.3)	(79.7)	(86.0)	(140.0)	(168.0)	(165.7)	(132.6)	(116.8)	(93.3)	(78.0)	(81.1)	(63.4)	(36.8)			
3	Amortization		0.0	0.0	133.0	133.0	133.0	133.0	133.0	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)			
4	Finance Charges		0.0	0.2	150.6	144.8	135.4	135.1	134.3	(207.5)	(204.1)	(201.2)	(199.4)	(200.3)	(202.7)	(205.4)	(208.3)	(211.4)	(215.4)	(220.5)	(225.6)	(229.6)	(232.2)	(233.6)	(234.0)	(233.7)	(232.8)	(230.7)			
5	Return on Equity		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	DSM Account		0.0	(11.5)	(95.7)	(126.3)	(140.9)	(149.5)	(133.0)	(137.1)	(138.5)	(124.5)	(91.5)	11.5	1.1	20.0	18.3	35.3	76.1	102.8	99.1	64.7	47.5	22.7	5.9	7.6	(11.5)	(39.6)			
7	DSM Additions		0.0	0.0	0.8	7.1	15.6	25.0	34.9	43.8	52.9	62.2	70.5	76.6	75.8	75.7	74.4	73.2	70.8	65.0	51.7	36.7	23.0	9.9	(0.5)	(10.1)	(19.8)	(27.3)			
8	Estimated Total Change in Revenue Requirement:		0.0	(7.1)	270.6	259.4	243.0	238.1	219.4	(138.2)	(63.3)	(56.0)	(25.2)	(9.4)	12.9	21.7	53.7	114.6	126.9	119.6	128.5	83.0	91.1	164.7	146.3	178.7	118.1	153.0			
9	Estimated Revenue Requirement - Base Case		4,638	4,851	5,038	5,293	5,525	5,727	5,946	6,308	6,517	6,719	6,741	6,956	7,178	7,392	7,633	7,885	8,101	8,106	8,345	8,687	8,893	9,165	9,468	9,725	9,863	10,373			
10	Estimated Revenue Requirement - Scenario		4,638	4,843	5,309	5,553	5,768	5,966	6,166	6,170	6,453	6,663	6,716	6,946	7,191	7,414	7,687	8,000	8,228	8,225	8,473	8,770	8,984	9,330	9,614	9,904	10,081	10,526			
11	Domestic Revenues		(4,638)	(4,839)	(5,016)	(5,255)	(5,460)	(5,632)	(5,823)	(6,152)	(6,329)	(6,505)	(6,528)	(6,740)	(6,962)	(7,191)	(7,440)	(7,713)	(7,941)	(7,979)	(8,214)	(8,559)	(8,785)	(9,082)	(9,367)	(9,636)	(9,887)	(10,300)			
12	Revenue Shortfall (Surplus)		0.0	4.4	283.3	297.4	308.3	333.5	343.0	17.7	124.7	157.6	187.1	205.6	228.5	222.5	241.3	286.8	286.6	246.0	258.9	211.0	199.6	267.5	247.3	267.4	194.0	226.1			
13	Estimated Incremental Impact on Future Rates		0.00%	0.09%	5.85%	5.60%	5.65%	5.92%	5.89%	0.29%	1.97%	2.42%	2.87%	3.08%	3.28%	3.09%	3.34%	3.72%	3.61%	3.08%	3.15%	2.47%	2.27%	2.95%	2.64%	2.78%	1.96%	2.20%			
14	Typical Customer Bill (\$2017 = 100)		103.3	106.3	109.9	113.8	116.4	118.9	121.5	126.8	128.1	131.8	130.4	132.9	135.5	138.2	141.4	144.7	147.8	146.0	148.3	152.9	154.8	158.1	161.0	163.7	166.0	170.4			
15	Base Case Scenario		103.3	106.4	116.3	120.2	123.0	125.9	128.7	127.2	131.6	135.0	134.1	137.0	139.9	142.4	146.0	150.1	153.1	150.5	152.9	156.6	158.3	162.7	165.2	168.3	169.3	174.1			
16	Base Case Scenario		3.3%	6.3%	9.9%	13.8%	16.4%	18.9%	21.5%	26.8%	29.1%	31.8%	30.4%	32.9%	35.5%	38.2%	41.4%	44.7%	47.8%	46.0%	48.3%	52.9%	54.8%	58.1%	61.0%	63.7%	66.0%	70.4%			
17	Base Case Scenario		3.3%	6.4%	16.3%	20.2%	23.0%	25.9%	28.7%	27.2%	31.8%	35.0%	34.1%	37.0%	39.9%	42.4%	46.0%	50.1%	53.1%	50.5%	52.9%	56.6%	59.3%	62.7%	65.2%	68.3%	69.3%	74.1%			
18	Estimated Incremental Cumulative Rate Impact		0.0%	0.1%	6.4%	6.4%	6.6%	7.0%	7.2%	0.4%	2.5%	3.2%	3.7%	4.1%	4.4%	4.3%	4.6%	5.4%	5.3%	4.5%	4.7%	3.8%	3.5%	4.7%	4.3%	4.5%	3.3%	3.7%			

Rate Impact Model - Mid Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

BC Hydro  
Rate Impact Analysis

Revenue Requirement (Ratepayer Costs) Summary

Line	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
Fiscal Year Column Reference	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Change in Revenue Requirement (Ratepayer Costs):																											
1	507.3	517.4	527.8	538.3	549.1	560.1	571.3	582.7	594.4	606.3	618.4	579.7	591.3	603.2	578.5	563.1	549.1	584.4	568.9	460.2	498.8	513.0	565.1	551.9	575.4	586.9	598.6
2	(21.8)	(38.6)	(42.8)	(50.8)	(75.3)	(80.5)	(84.0)	(87.6)	(93.3)	(97.2)	(101.2)	(99.0)	(98.9)	(100.9)	(102.9)	(104.9)	(107.0)	(109.2)	(111.4)	(113.6)	(115.9)	(118.2)	(120.5)	(122.9)	(125.4)	(127.9)	(130.5)
3	(9.8)	(9.8)	(9.8)	(9.8)	(9.8)	(9.9)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(143.0)	(151.6)	(160.2)	(160.2)	(160.2)	(173.9)	(187.6)	
4	(227.8)	(224.8)	(222.2)	(219.9)	(218.3)	(217.3)	(214.2)	(209.0)	(204.2)	(199.7)	(195.4)	(191.1)	(186.7)	(182.3)	(177.9)	(173.4)	(168.9)	(164.2)	(159.4)	(154.5)	(161.3)	(167.7)	(162.2)	(156.6)	(151.1)	(166.5)	(181.5)
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DSM Account																											
6	(56.2)	(41.0)	(38.3)	(32.0)	(9.1)	(5.5)	(3.8)	(1.9)	2.0	4.0	6.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	(30.8)	(26.3)	(23.5)	(19.6)	(16.2)	(13.3)	(7.8)	(0.7)	6.0	10.2	13.1	14.2	14.5	15.0	14.2	11.6	7.8	5.1	2.5	0.4	(0.2)	(0.6)	(0.8)	(0.9)	(0.8)	(0.5)	(0.1)
8	161.0	177.0	191.2	206.3	220.4	233.6	118.4	140.4	161.8	180.6	198.0	162.9	177.2	191.9	168.9	153.3	138.0	173.1	157.7	49.5	67.8	66.4	121.4	111.2	137.9	118.0	98.9
Estimated Total Change in Revenue Requirement:																											
9	10.685	10.909	11.139	11.373	11.597	11.829	12.058	12.286	12.515	12.760	13.012	13.260	13.512	13.770	14.032	14.310	14.594	14.808	15.102	15.401	15.680	15.961	16.197	16.490	16.832	17.167	17.508
Estimated Revenue Requirement - Base Case																											
10	10.846	11.086	11.330	11.579	11.817	12.062	12.177	12.426	12.677	12.940	13.211	13.423	13.690	13.962	14.201	14.464	14.732	14.981	15.259	15.451	15.748	16.027	16.318	16.601	16.970	17.285	17.607
Estimated Revenue Requirement - Scenario																											
11	(10.615)	(10.843)	(11.077)	(11.315)	(11.543)	(11.780)	(12.013)	(12.246)	(12.481)	(12.730)	(12.988)	(13.241)	(13.500)	(13.763)	(14.032)	(14.310)	(14.594)	(14.808)	(15.102)	(15.401)	(15.680)	(15.961)	(16.197)	(16.490)	(16.832)	(17.167)	(17.508)
Domestic Revenues																											
12	230.5	243.0	253.2	264.2	274.1	282.9	163.1	180.2	196.6	210.1	222.1	181.3	189.7	198.3	168.9	153.3	138.0	173.1	157.7	49.5	67.8	66.4	121.4	111.2	137.9	118.0	98.9
Revenue Shortfall (Surplus)																											
Estimated Incremental Impact on Future Rates																											
13	2.17%	2.24%	2.29%	2.33%	2.37%	2.40%	1.36%	1.47%	1.57%	1.65%	1.71%	1.37%	1.41%	1.44%	1.20%	1.07%	0.95%	1.17%	1.04%	0.32%	0.43%	0.42%	0.75%	0.67%	0.82%	0.69%	0.57%
Typical Customer Bill (F2017 = 100)																											
14	173.7	177.4	180.9	184.2	187.8	191.6	185.3	199.0	202.7	206.7	210.8	214.8	218.9	223.0	227.3	231.8	236.4	239.9	244.6	249.5	254.0	258.5	262.3	267.1	272.6	278.1	283.6
15	177.4	181.3	185.0	188.5	192.3	196.2	190.0	203.9	207.9	211.9	216.4	217.7	221.9	226.2	230.0	234.3	238.6	242.7	247.2	250.3	255.1	259.6	264.3	268.9	274.9	280.0	285.2
Line 14 + (Line 13)																											
16	73.7%	77.4%	80.9%	84.2%	87.8%	91.6%	95.3%	99.0%	102.7%	106.7%	110.8%	114.8%	118.9%	123.0%	127.3%	131.8%	136.4%	139.9%	144.6%	148.5%	154.0%	158.5%	162.3%	167.1%	172.6%	178.1%	183.6%
Base Case																											
17	77.4%	81.3%	85.0%	88.5%	92.3%	96.2%	98.0%	101.9%	105.9%	110.1%	114.4%	117.7%	121.9%	126.2%	130.0%	134.3%	138.6%	142.7%	147.2%	150.3%	155.1%	159.6%	164.3%	168.9%	174.9%	180.0%	185.2%
Scenario (Line 15 - 100) / 100																											
18	3.8%	4.0%	4.1%	4.3%	4.5%	4.6%	2.7%	2.9%	3.2%	3.4%	3.6%	2.9%	3.1%	3.2%	2.7%	2.5%	2.2%	2.8%	2.6%	0.6%	1.1%	1.1%	2.0%	1.8%	2.2%	1.9%	1.6%
Line 17 - Line 16																											
Estimated Incremental Cumulative Rate Impact																											

Rate Impact Model - Mid Load - Terminate 30 Yrs with BCUC Costs & BCH Financing.xlsx

**BC Hydro  
Rate Impact Analysis**

**Revenue Requirement (Ratepayer Costs) Summary**

(\$ million)	Line	Fiscal Year Column Reference	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
		54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	
Change in Revenue Requirement (Ratepayer Costs):																										
	1		610.6	622.8	635.3	648.0	660.9	674.2	687.7	701.4	715.4	784.7	800.4	816.4	884.7	936.2	984.3	971.4	1,031.6	1,229.2	1,212.9	1,227.4	1,184.1	1,246.2	1,256.9	1,282.0
	2		(133.1)	(135.7)	(138.5)	(141.2)	(144.1)	(146.9)	(149.9)	(152.9)	(155.9)	(159.0)	(162.2)	(165.5)	(168.8)	(172.2)	(175.6)	(179.1)	(182.7)	(186.3)	(190.1)	(193.9)	(197.8)	(201.7)	(205.7)	(209.9)
	3		(187.6)	(187.6)	(187.6)	(189.6)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)	(191.5)
	4		(175.0)	(168.6)	(162.2)	(159.1)	(155.9)	(149.3)	(142.8)	(136.2)	(129.6)	(123.0)	(116.5)	(109.9)	(103.3)	(96.8)	(90.2)	(83.6)	(77.1)	(70.5)	(63.9)	(57.4)	(50.8)	(44.2)	(37.7)	(31.1)
	5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8		114.9	130.9	147.0	158.1	169.5	186.4	203.5	220.8	238.4	311.1	330.1	349.5	421.1	475.8	527.0	517.1	580.3	780.9	767.4	784.7	744.0	808.7	822.0	848.6
	9		17,856	18,212	18,574	18,944	19,321	19,706	20,099	20,499	20,907	21,324	21,749	22,183	22,625	23,076	23,536	24,116	24,597	25,088	25,629	26,186	26,840	27,422	27,953	28,511
	10	Line 9 + Line 9	17,971	18,342	18,721	19,102	19,491	19,892	20,302	20,720	21,146	21,635	22,079	22,532	23,046	23,551	24,063	24,633	25,178	25,869	26,396	26,970	27,584	28,231	28,775	29,361
	11		(17,856)	(18,212)	(18,574)	(18,944)	(19,321)	(19,706)	(20,099)	(20,499)	(20,907)	(21,324)	(21,749)	(22,183)	(22,625)	(23,076)	(23,536)	(24,116)	(24,597)	(25,088)	(25,629)	(26,186)	(26,840)	(27,422)	(27,953)	(28,511)
	12	Line 10 + Line 11	114.9	130.9	147.0	158.1	169.5	186.4	203.5	220.8	238.4	311.1	330.1	349.5	421.1	475.8	527.0	517.1	580.3	780.9	767.4	784.7	744.0	808.7	822.0	848.6
	13	-Line 12 / Line 11	0.64%	0.72%	0.79%	0.83%	0.88%	0.95%	1.01%	1.08%	1.14%	1.46%	1.52%	1.58%	1.86%	2.06%	2.24%	2.14%	2.36%	3.11%	2.99%	3.00%	2.77%	2.95%	2.94%	2.98%
	14	Typical Customer Bill (F2017 = 100)	289.2	295.0	300.9	306.8	313.0	319.2	325.5	332.0	338.6	345.4	352.3	359.3	366.5	373.8	381.2	390.6	398.4	406.4	415.1	424.1	434.7	444.2	452.8	461.8
	15	Base Case Scenario	291.1	297.1	303.2	309.4	315.7	322.2	328.8	335.6	342.5	350.4	357.6	365.0	373.3	381.5	389.8	399.0	407.8	419.0	427.5	436.9	446.8	457.3	466.1	475.6
	16	Base Case Scenario	189.2%	195.0%	200.9%	206.8%	213.0%	219.2%	225.5%	232.0%	238.6%	245.4%	252.3%	259.3%	266.5%	273.8%	281.2%	290.6%	298.4%	308.4%	315.1%	324.1%	334.7%	344.2%	352.8%	361.8%
	17	Base Case Scenario	191.1%	197.1%	203.2%	209.4%	215.7%	222.2%	228.8%	235.6%	242.5%	250.4%	257.6%	265.0%	273.3%	281.5%	289.8%	299.0%	307.8%	319.0%	327.5%	336.9%	346.8%	357.3%	366.1%	375.6%
	18	Estimated Incremental Cumulative Rate Impact	1.9%	2.1%	2.4%	2.6%	2.7%	3.0%	3.3%	3.6%	3.9%	5.0%	5.3%	5.7%	6.6%	7.7%	8.5%	8.4%	9.4%	12.6%	12.4%	12.7%	12.1%	13.1%	13.3%	13.8%

**Subject:** s.13

**Date:** Monday, November 27, 2017 at 8:52:43 AM Pacific Standard Time

**From:** Parkinson, Elizabeth PREM:EX

**To:** Wright, Don J. PREM:EX

Hi Don,

I'm forwarding this email from s.22 as requested.

Elizabeth

---

**From:** s.22

**Sent:** Saturday, November 25, 2017 4:20 PM

**To:** John Horgan; Parkinson, Elizabeth PREM:EX; Carole James; Meggs, Geoff PREM:EX; Don Wright

s.13

Page 072 of 538

Withheld pursuant to/removed as

s.13; s.22

**Subject:** s.13

**Date:** Monday, November 27, 2017 at 8:53:08 AM Pacific Standard Time

**From:** Parkinson, Elizabeth PREM:EX

**To:** Wright, Don J. PREM:EX

**Attachments:** s.13

The second email from s.22

Elizabeth

-----Original Message-----

From s.22

Sent: Saturday, November 25, 2017 6:01 PM

To: John Horgan; Parkinson, Elizabeth PREM:EX; Carole James; Meggs, Geoff PREM:EX; Don Wright  
s.13;s.22

Page 074 of 538 to/à Page 076 of 538

Withheld pursuant to/removed as

s.13

Page 077 of 538

Withheld pursuant to/removed as

s.13; s.22

**Subject:** FW: Site C Nov 29 Presentation Nov 28 v10 LM.pptx  
**Date:** Tuesday, November 28, 2017 at 9:51:20 PM Pacific Standard Time  
**From:** Nikolejsin, Dave MNGD:EX  
**To:** MacLaren, Les EMPR:EX, Wright, Don J. PREM:EX, Kennedy, Christine PREM:EX  
**Attachments:** Site C Nov 29 Presentation Nov 28 v10 LM.pptx

Here you go...

Les, can you confirm that this version contains the latest edits from Finance after they briefed their Minister?  
Once you confirm or fix let Christine know before 7AM so she can print the materials for Cabinet.

Thanks.

---

**From:** Mungall, Michelle EMPR:EX  
**Sent:** November 28, 2017 9:39 PM  
**To:** Sanderson, Melissa EMPR:EX <Melissa.Sanderson@gov.bc.ca>; Nikolejsin, Dave MNGD:EX <Dave.Nikolejsin@gov.bc.ca>  
**Subject:** Site C Nov 29 Presentation Nov 28 v10 LM.pptx

Hi,

This is what I'm presenting tomorrow.

Please have a version with the speaking notes and slides printed for me. I will be in the office for 8:30am.

Thanks,

Michelle



BRITISH  
COLUMBIA

# Site C

## Cabinet Information Session

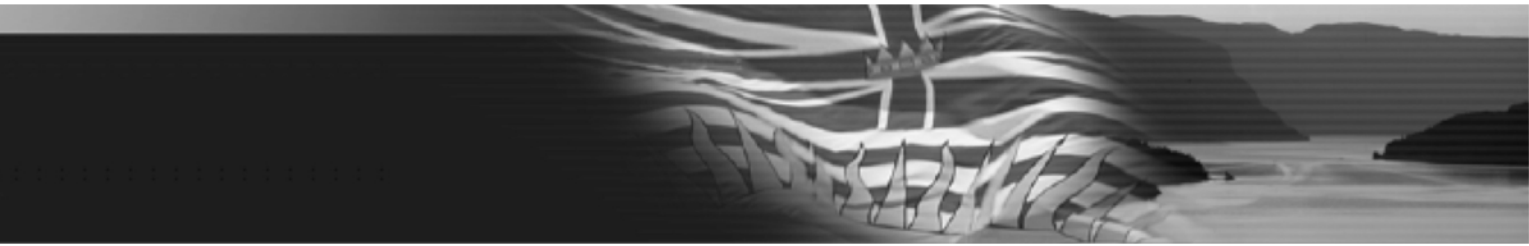
November 29, 2017



Today

# **Backstory Chapters 1-4**

## **Decision-making Chapters 5-8**



## Foreward: Process

- Cabinet Information Session (Today)
- Expert Panel of Advisors (November 30)
- Caucus Briefing (December 5)
- Cabinet Decision Meeting (December 6)
- Green Party Caucus Briefing (TBD)



## Expert Panel of Advisors – November 30

### Panelists

David Austin

David Craig

Colleen Giroux-Schmidt

Dr. Mark Jaccard

Robert McCullough

Karen Tam Wu

### Perspective

Power industry

BC Hydro ratepayers

Power industry,  
clean energy investors

Climate change

Power industry and  
Peace Valley landowners

Environmental



# Backstory

## Chapter 1

# Electricity Terminology



**Capacity** – the maximum sustainable amount of electricity that can be produced by a generator or carried over wires at any instant

### **How capacity is measured**

- 1 kilowatt (kW) = 1,000 watts
- 1 megawatt (MW) = 1,000 kilowatts (or 1 million watts)
- 1 gigawatt (GW) = 1,000 megawatts (or 1 billion watts)



**Energy** - how much is consumed (or produced) over a period of time

### How energy is measured

- 1 kilowatt hour (kWh) = 100 watt bulb for 10 hours (1,000 watt hours)
- 1 megawatt hour (MWh) = 1,000 kWh
- 1 gigawatt hour (GWh) = 1,000 MWh



**Firm Energy:** firm power is available on demand  
e.g. Hydro electric dams, gas, coal

**Intermittent Energy:** is not always available  
because its energy source cannot be controlled  
e.g. wind, solar, run-of-river



## Energy vs. Capacity





# The difference between energy and capacity is important in the context of Site C



# Backstory

## Chapter 2

# Supply and Demand



**Supply** is how much electricity is available

**Demand** is how much is needed

- Power generation plants create electricity supply
  - Examples of generation types: wind, solar, hydro, biomass
- If you reduce demand, not as much generation is needed.



- Demand-side Management (DSM) programs are designed to encourage consumers to reduce their electricity use using incentives

**BC**hydro   
**powersmart**

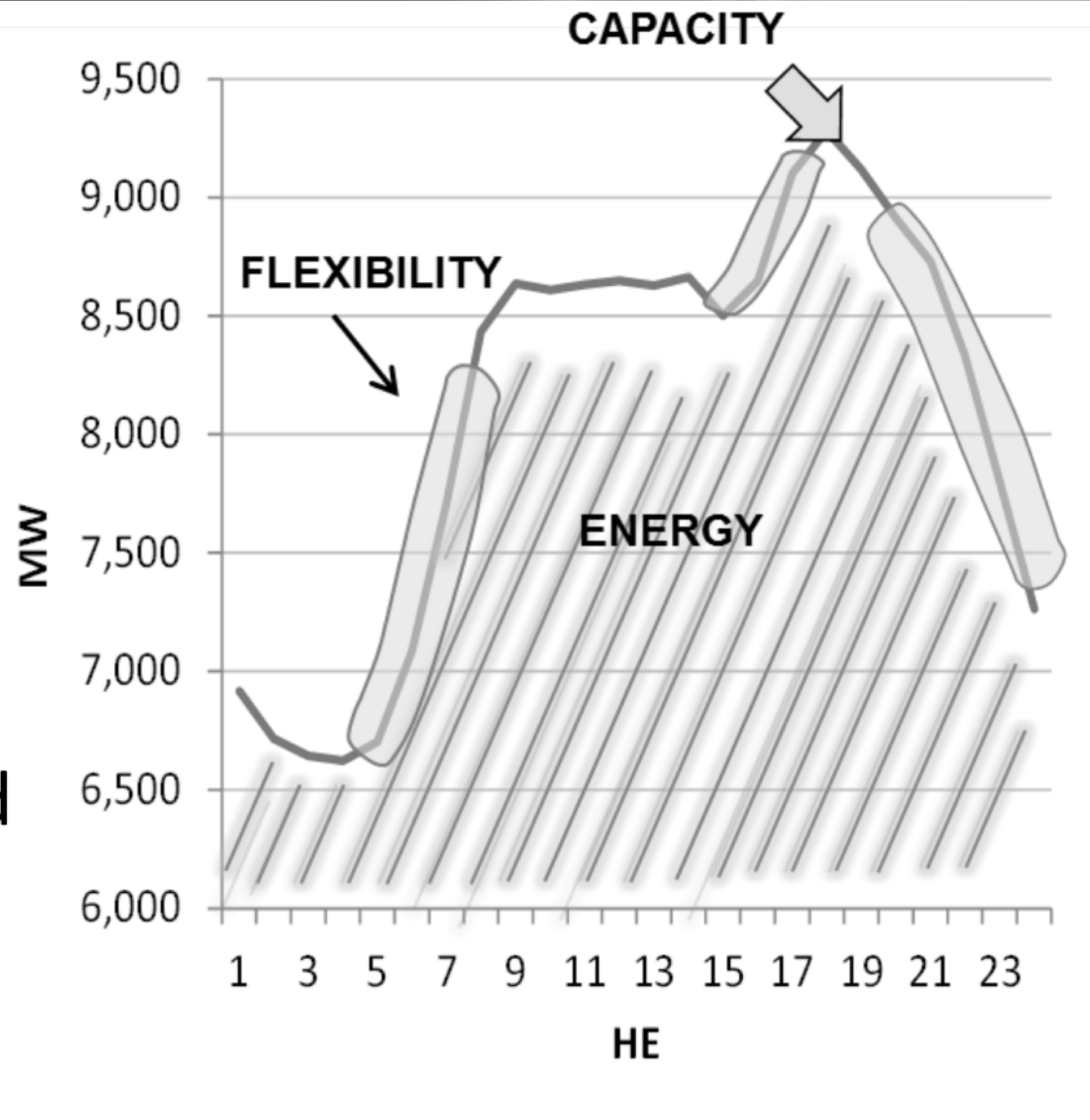


## Key Drivers of Electricity Demand

- **Population growth** (more people = more electricity use)
- **Economic growth** (more economic activity = more electricity use)
- **GHG policy** (less GHGs = more electricity use)
- **Industrial demand** (volatile based on commodity prices)
- **Pricing** (higher rates = less electricity use)
- **Disruptive Trends** (solar PV and batteries for home use = less grid electricity demand)

# A Day in the Life of Electricity

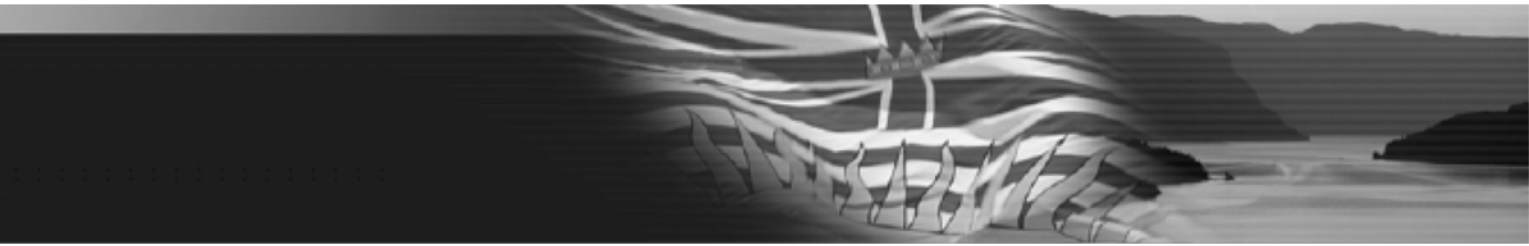
- Power supply and use must be balanced in real time - 24/7/365
- Demand fluctuates hourly, seasonally and over time





## Demand Comparisons

- Average BC Hydro residential customer – 11,000 kWh/yr
- Large industrial (pulp mill) – 400 GW.h/yr = 40,000 homes
- Large office (20-25 floors) – 5 GW.h/yr = 500 homes
- Big box store – 3.5 GW.h/yr = 350 homes



## BC Hydro planning process to meet demand

- Done every 5 years
- Look 20 to 30 years out
- Forecast annual future capacity and energy needs – high, mid, and low cases
- Look at ways to reduce demand (Power Smart)
- Assess any remaining gaps in capacity and energy, and the most cost effective resources to fill any gaps, including need for new transmission



# Backstory

## Chapter 3

### How we got here

## 2001 Liberal Government Elected

- Begin breakup of BC Hydro
- New Transmission Corp to allow easier connection of private sector renewable generation

## 2002 Energy Plan:

- IPP's to supply new power, BC Hydro upgrades existing assets only
- First wave of run-of-river and wind project get long term Energy Purchase Agreements (EPA's)
  - EPA's provide risk-free returns to developers while burdening hydro rate payers with the cost
- High-priced contracts for IPPs leads to \$56B in future EPA commitments
- Primarily intermittent energy costing over \$100 MWh
- Bioenergy provides some capacity, but is even more expensive

## Result:

- We don't have enough capacity to firm up all this intermittent energy

## Clean Energy Act (2010)

- Put 2007 Energy Plan and 2008 Climate Action Plan into Legislation
- Exempted projects and procurements from BCUC review:
  - Site C
  - Northwest Transmission Line
  - Mica and Revelstoke expansions
  - Clean Power Call
  - Bioenergy Call for Power
  - Standing Offer Program
  - Smart Meters
- BC Hydro states they need firm capacity by 2022-2024
- Planning for Site C begins in earnest.



## Why was Site C chosen?

- 2010-2013: emphasis shifted to controlling rate increases driven by capital spending and IPPs
- Site C identified as the least costly of the options
- BC Hydro to build, own and operate Site C to provide needed capacity, keep rates low, and integrate future intermittent resources



## Site C Environmental Review Process

- Over 7 years of consultation with First Nations, communities, and the public
- 2013/14 - federal-provincial joint review panel (JRP) held public hearings
- May 2014 - JRP report to Canada and BC
- December 2014 - decision to proceed with Site C

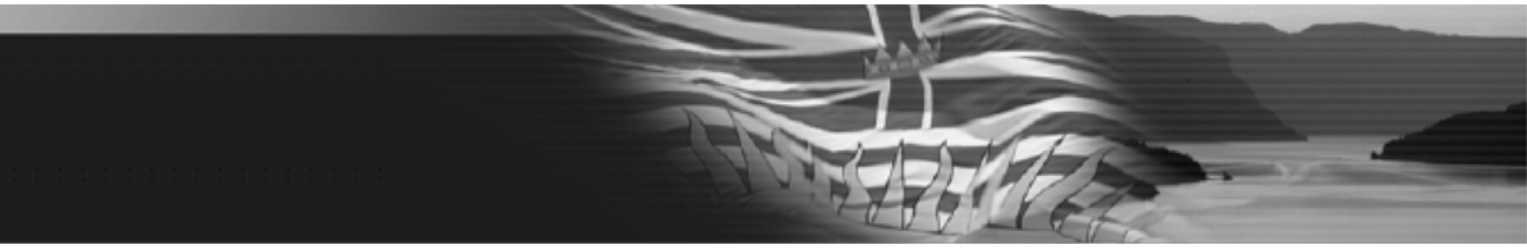
# Key Findings of the Joint Review Panel in 2014

## Upsides

- Least expensive of the alternatives
- Small burden of GHGs compared to alternatives
- Provides local and regional economic benefits

## Downsides

- Unmitigated losses to wildlife, plants, and fish/fish habitat
- Archaeological, historical and paleontological losses
- Social costs to farmers, ranchers, hunters, and other users
- Changes to use of lands and waters by Treaty 8, other First Nations, and Métis



**The JRP also recommended that Site C be  
referred to the BCUC**

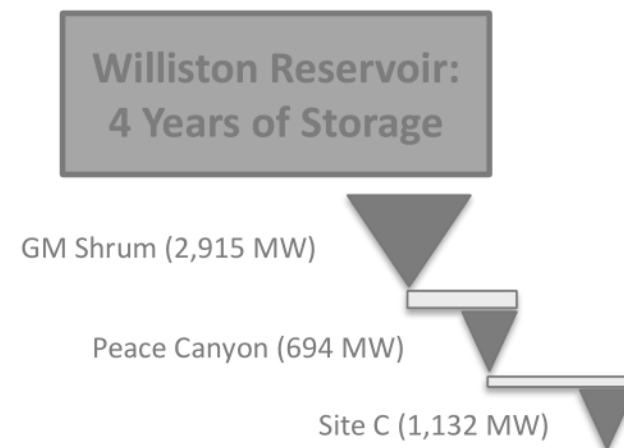
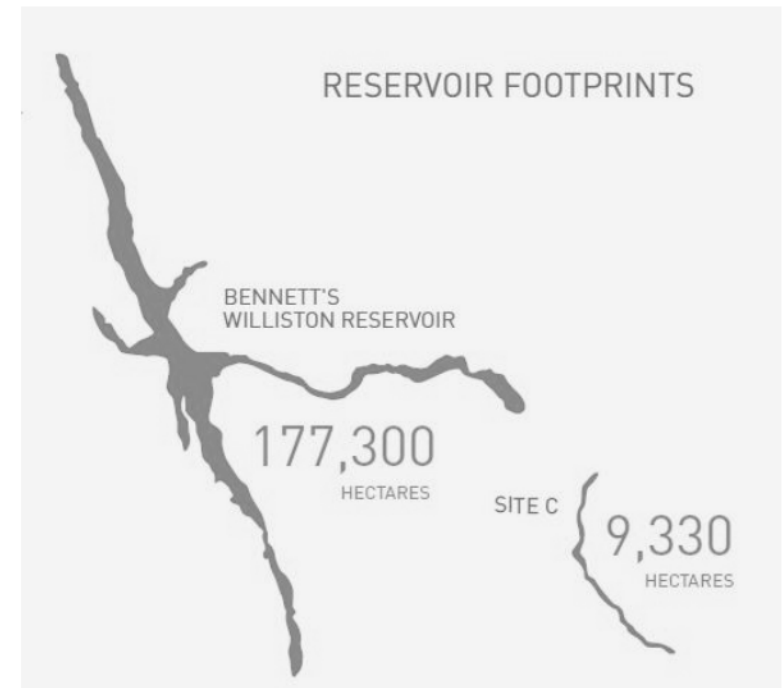


# Backstory

## Chapter 4

### BTWs. What is Site C?

- Third dam on the Peace River
  - WAC Bennett (Site A, 1968)
    - 2,915 megawatts (MW)
    - 13,100 gigawatt-hours per year (GWh/yr)
    - 25% of BC Hydro capacity
  - Peace Canyon (Site B, 1980)
    - 694 MW, 3,500 GWh
  - Site C: 1,132 MW, 5,100 GWh



## Current Status of the Project

- Started July 2015, approximately 20% complete, \$2.1 billion spent by Dec. 31
- As of September, Site C directly employed 2,357 workers:
  - 1,917 from B.C., 593 workers from PRRD, 49 apprentices, 172 Indigenous people, and 354 women

Site C Employment Statistics – September 2017				
	# of Total Workers	# of B.C. Primary Residents	% of B.C. Workers	# (and %) of Peace River Regional District Primary Residents
<b>Construction and Non-Construction Contractors<sup>2</sup></b> <i>Excludes work performed outside of B.C. (e.g., Manufacturing)</i>	1,914	1,489	78%	593 (31%)
<b>Engineers and Project Team<sup>3</sup></b>	461	428	93%	---
<b>Total Workforce</b>	2,375	1,917	81%	---



# Status of Construction and Procurement

## Contracts Awarded

s.12,s.13,s.16

- Site preparation
- Construction bridges
- Worker Accommodation
- Road Upgrades
- Main Civil Works
- Turbines and Generators

## Procurements Underway

- Generating Station and Spillways
- Transmission lines and substations

## Upcoming Procurements

- Highway 29 Realignment



Worker Accommodation



Peace River construction bridge

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s.12; s.13



## What \$4 billion of Site C Equivalent to:

- About \$860 per British Columbian Taxpayer-supported capital projects:
- 3 Pattullo bridges (\$1.3B each)
- 3 Evergreen line projects (\$1.4B each)
- 3 Royal Columbian hospitals (phases 1 – 3: \$1.36B)
- 66 secondary schools (\$60M each)

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s.13; s.12

Page 125 of 538 to/à Page 140 of 538

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s.12; s.13

**Subject:** FW: Site C Dec6 Presentation Dec 3 v5 DN.pptx  
**Date:** Sunday, December 3, 2017 at 12:34:09 PM Pacific Standard Time  
**From:** Nikolejsin, Dave MNGD:EX  
**To:** Wright, Don J. PREM:EX  
**Attachments:** Site C Dec6 Presentation Dec 3 v5 DN.pptx

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**From:** Nikolejsin, Dave MNGD:EX  
**Sent:** December 3, 2017 12:33 PM  
**To:** Mungall, Michelle EMPR:EX <Michelle.J.Mungall@gov.bc.ca>  
**Cc:** Sanderson, Melissa EMPR:EX <Melissa.Sanderson@gov.bc.ca>; MacLaren, Les EMPR:EX <Les.MacLaren@gov.bc.ca>  
**Subject:** Site C Dec6 Presentation Dec 3 v5 DN.pptx

Minister, here is the deck. Apologies for taking so long. It has not been for lack of effort. My suggestion would be for you to go through this and just familiarize yourself with the layout and flow. I tried to type lots of info into the notes to help you understand the slides. Once you get a sense we should talk about what you want changed before you start editing. That's cause there are still lots of moving parts behind the scenes and I worry about version control. I am available to talk anytime.

The sub will be on it's way shortly.



# Site C Decision

December 6, 2017

Page 143 of 538 to/à Page 145 of 538

Withheld pursuant to/removed as

s.12; s.13

## Energy vs. Capacity



**Capacity** – the maximum sustainable amount of electricity that can be produced by a generator or carried over wires at any instant – **size of the pipe**

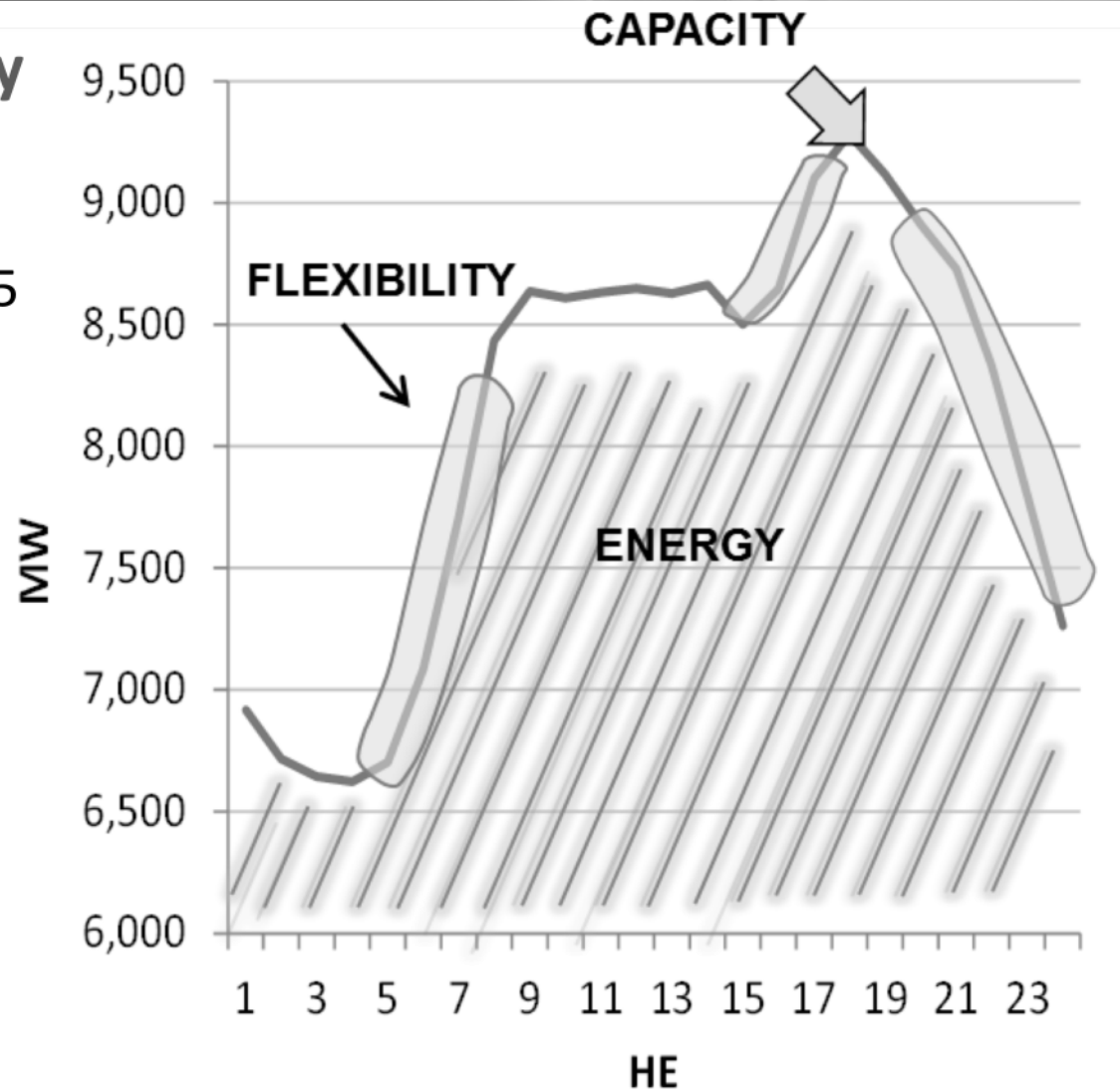
**Energy** - analogous to the amount of water that **flows through the pipe over time** and it will vary.



If you need more water (rising demand) you **need a bigger pipe**

## A Day in the Life of Electricity

- Power supply and use must be balanced in real time - 24/7/365
- Demand fluctuates hourly, seasonally and over time
- Need capacity, energy and flexibility for reliability
- Energy can be generated a variety of ways
- Capacity supports more energy and provides flexibility
- Capacity and flexibility are valuable





- Site C provides capacity, energy and flexibility
- BC Hydro forecasts a need for new capacity by 2023.
- In addition to Site C, BC Hydro plans to acquire new resources over the next 30 years:
  - Enhanced energy-focused DSM activities
  - 2,000 MW of pumped storage
  - 1,800 MW of wind
  - 85 MW of industrial load curtailment



## Key Drivers of Electricity Demand

- **Population growth** (more people = more electricity use)
- **Economic growth** (more economic activity = more electricity use)
- **GHG policy** (less GHGs = more electricity use)
- **Industrial demand** (volatile based on commodity prices)
- **Pricing** (higher rates = less electricity use)
- **Disruptive Trends** (solar PV and batteries for home use = less grid electricity demand)



## Current Status of the Project

- Started July 2015, approximately 20% complete, \$2.1 billion spent by Dec. 31
- As of September, Site C directly employed 2,357 workers:
  - 1,917 from B.C., 593 from PRRD
  - 49 apprentices, 172 Indigenous people, 354 women
- Spending continues - \$2 million per day
  - Bids for Generating Station and Spillways received and under review
  - Turbines and generators contractor on site
- River diversion shifted to 2020; November 2024 completion unchanged





## Advice from the BCUC – Continue or Cancel?

- BCUC rejected suspend option – expensive and risky
- BCUC alternative portfolio has PowerSmart, Time of Use Rates, Industrial curtailment, wind, geothermal
  - This portfolio only works because they used the LOW DEMAND forecast
- BCUC report inconclusive – even with high construction costs, the BCUC felt they could not provide a recommendation.



## BCUC Review

- Cost to Complete Site C: \$10B to \$12B
- \$2.1B spent to date plus remediation costs of \$1.8B
- Electricity Forecast: low demand growth; no consideration of Climate Targets
- Alternative Portfolio: expand PowerSmart program to postpone need for energy and capacity; technology will reduce cost of new resources; buy new supply - wind in the late 2030s
- Result: Site C cost is about 10% lower, however, the range of assumptions leads the BCUC to conclude that they cannot make a firm recommendation on terminating or completing the project.
- British Columbia families and businesses are interested in keeping rates low

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Withheld pursuant to/removed as

s.12; s.13



## Expert Panel of Advisors – November 30

### Panelists

David Austin

Robert McCullough

Dr. Mark Jaccard

David Craig

Colleen Giroux-Schmidt

Karen Tam Wu

### Perspective

Power industry

Power industry and  
Peace Valley landowners

Climate change

BC Hydro ratepayers

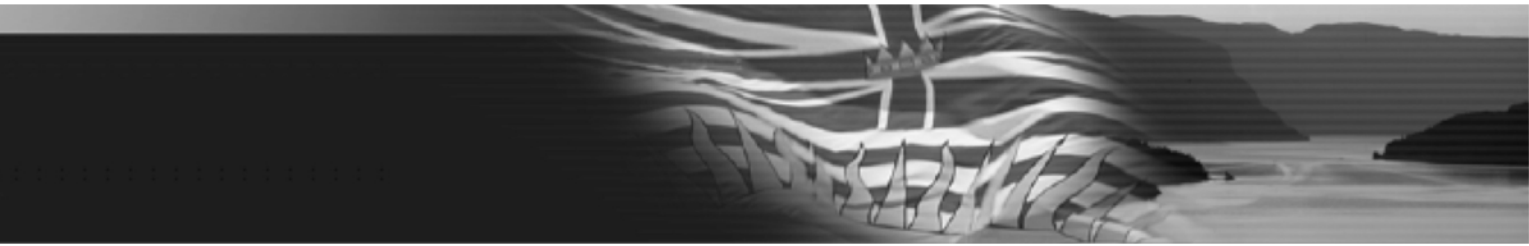
Power industry,  
clean energy investors

Environmental

Page 155 of 538 to/à Page 187 of 538

Withheld pursuant to/removed as

s.12; s.13



## What \$4 billion of Site C is Equivalent to:

- About \$860 per British Columbian Taxpayer-supported capital projects:
- 3 Pattullo bridges (\$1.3B each)
- 3 Evergreen line projects (\$1.4B each)
- 3 Royal Columbian hospitals (phases 1 – 3: \$1.36B)
- 66 secondary schools (\$60M each)

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s.12; s.13

Page 194 of 538

Withheld pursuant to/removed as

s.13; s.12

Page 195 of 538 to/à Page 217 of 538

Withheld pursuant to/removed as

s.12; s.13

**Subject:** latest materials fyi  
**Date:** Sunday, December 3, 2017 at 8:05:12 PM Pacific Standard Time  
**From:** Nikolejsin, Dave MNGD:EX  
**To:** Wright, Don J. PREM:EX  
**Attachments:** Cabinet Submission - Future of Site C Dec 3 V17 clean.docx, Site C Dec6 Presentation Dec 3 v8.pptx, Site C Caucus Presentation.pptx

3<sup>rd</sup> attachment is MMM's deck that she prepared for caucus on the 5<sup>th</sup>.

**Dave Nikolejsin**

Deputy Minister  
Energy, Mines and Petroleum Resources

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Withheld pursuant to/removed as

s.12



# Site C Decision

December 6, 2017

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Withheld pursuant to/removed as

s.12; s.13

## Energy vs. Capacity



**Capacity** – the maximum sustainable amount of electricity that can be produced by a generator or carried over wires at any instant – **size of the pipe**

**Energy** - analogous to the amount of water that **flows through the pipe over time** and it will vary.



If you need more water (rising demand) you **need a bigger pipe**



- Site C provides capacity, energy and flexibility
- BC Hydro forecasts a need for new capacity by 2023.
- In addition to Site C, BC Hydro plans to acquire new resources over the next 30 years:
  - Enhanced energy-focused DSM activities
  - 2,000 MW of pumped storage
  - 1,800 MW of wind
  - 85 MW of industrial load curtailment



## Current Status of the Project

- Started July 2015, approximately 20% complete, \$2.1 billion spent by Dec. 31.
- Cost of the project is now \$10.7 billion
  - P90 Estimate
  - Was \$8.335 billion (P50)
- As of September, Site C directly employed workers:
  - 1,917 from B.C., 593 from PRRD
  - 49 apprentices, 172 Indigenous people, 354 women
- Spending continues - \$2 million per day
  - Bids for Generating Station and Spillways received and under review
  - Turbines and generators contractor on site





## Advice from the BCUC – Continue or Cancel?

- Cost to Complete Site C: \$10B to \$12B
- \$2.1B spent to date plus remediation costs of \$1.8B
- Electricity Forecast: low demand growth; no consideration of Climate Targets
- BCUC rejected suspend option – expensive and risky
- BCUC alternative portfolio has PowerSmart, Time of Use Rates, Industrial curtailment, wind, geothermal
  - This portfolio only works because they used the LOW DEMAND forecast
- BCUC report inconclusive – even with high construction costs, the BCUC felt they could not provide a recommendation.

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s.12; s.13



## Expert Panel of Advisors – November 30

### Panelists

David Austin

Robert McCullough

Dr. Mark Jaccard

David Craig

Colleen Giroux-Schmidt

Karen Tam Wu

### Perspective

Power industry

Power industry and  
Peace Valley landowners

Climate change

BC Hydro ratepayers

Power industry,  
clean energy investors

Environmental

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s.12; s.13

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s.13; s.12

Page 286 of 538 to/à Page 287 of 538

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s.12; s.13

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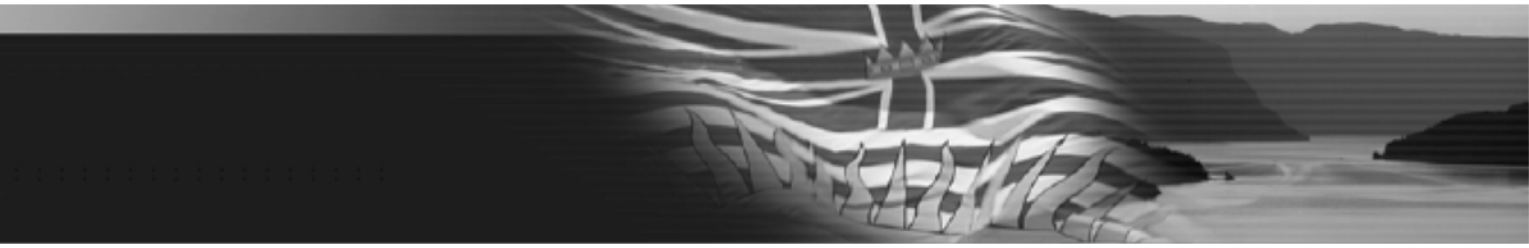
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Page 289 of 538 to/à Page 323 of 538

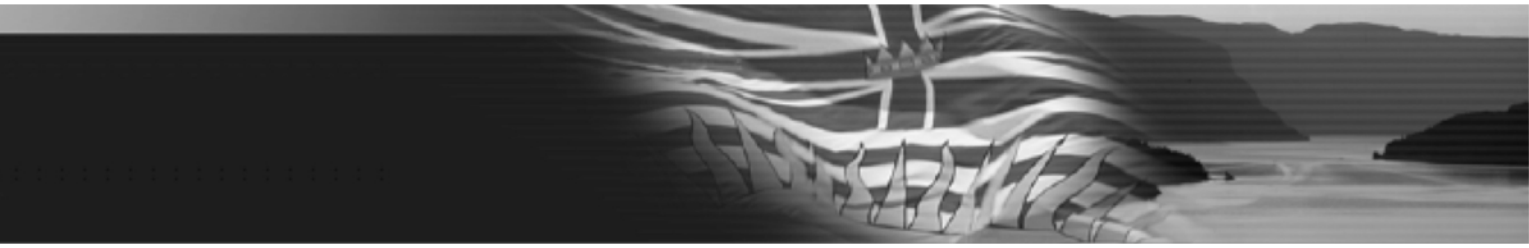
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# Site C Presentation to Caucus

December 3, 2017



Today

# **Backstory Chapters 1-4**

## **Decision-making Chapters 5-8**

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s.12; s.13



# Backstory

## Chapter 1

# Electricity Terminology



**Capacity** – the maximum sustainable amount of electricity that can be produced by a generator or carried over wires at any instant

### **How capacity is measured**

- 1 kilowatt (kW) = 1,000 watts
- 1 megawatt (MW) = 1,000 kilowatts (or 1 million watts)
- 1 gigawatt (GW) = 1,000 megawatts (or 1 billion watts)



**Energy** - how much is consumed (or produced) over a period of time

### **How energy is measured**

- 1 kilowatt hour (kWh) = 100 watt bulb for 10 hours (1,000 watt hours)
- 1 megawatt hour (MWh) = 1,000 kWh
- 1 gigawatt hour (GWh) = 1,000 MWh



**Firm Energy:** firm power is available on demand  
e.g. Hydro electric dams, gas, coal

**Intermittent Energy:** is not always available  
because its energy source cannot be controlled  
e.g. wind, solar, run-of-river



## Energy vs. Capacity





# Backstory

## Chapter 2

# Supply and Demand



**Supply** is how much electricity is available

**Demand** is how much is needed

- Power generation plants create electricity supply
  - Examples of generation types: wind, solar, hydro, biomass
- If you reduce demand, not as much generation is needed.



- Demand-side Management (DSM) programs are designed to encourage consumers to reduce their electricity use using incentives.
  - A major part of BC Hydro planning

**BC Hydro**   
**powersmart**

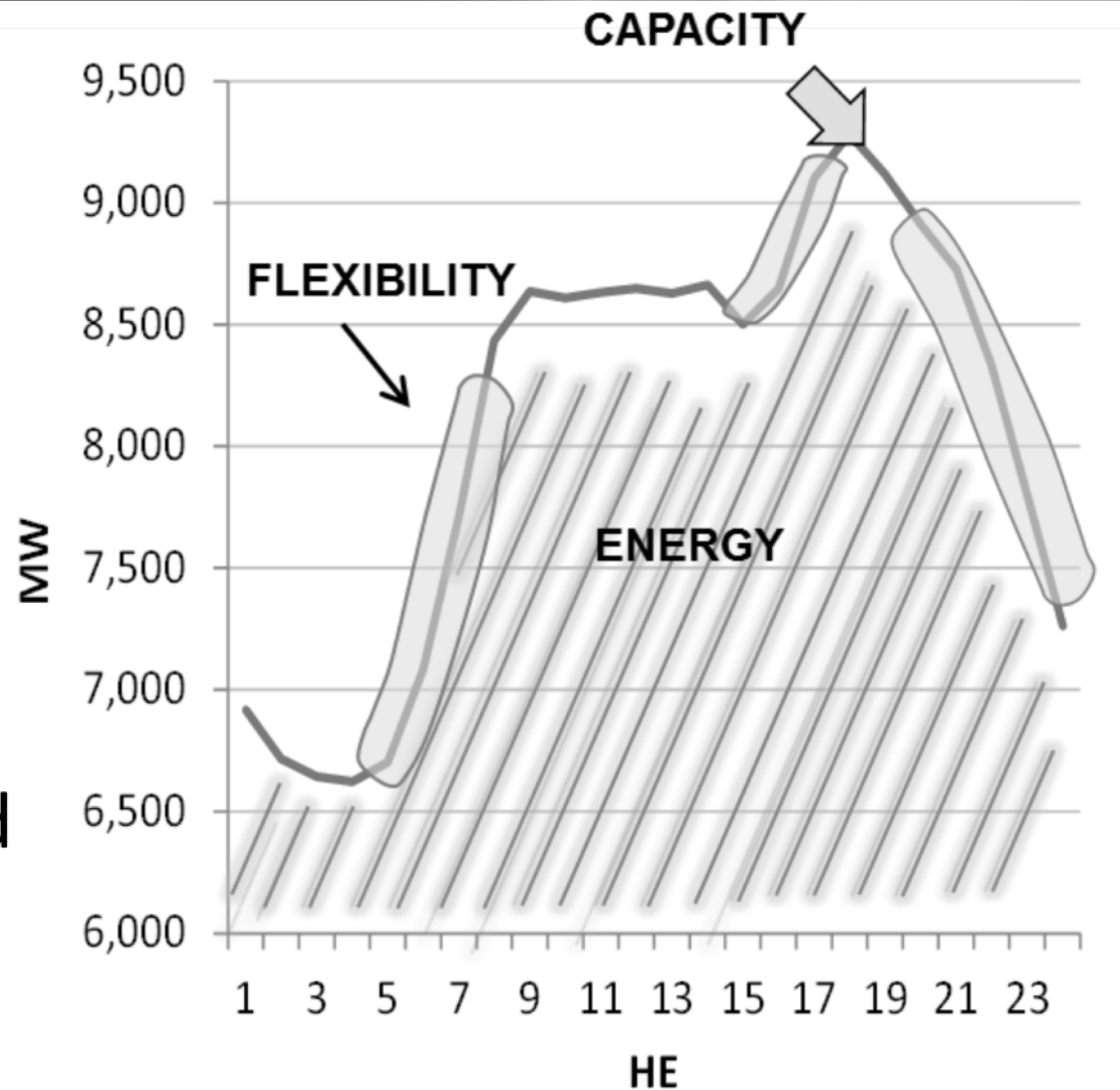


## Key Drivers of Electricity Demand

- **Population growth** (more people = more electricity use)
- **Economic growth** (more economic activity = more electricity use)
- **GHG policy** (less GHGs = more electricity use)
- **Industrial demand** (volatile based on commodity prices)
- **Pricing** (higher rates = less electricity use)
- **Disruptive Trends** (solar PV and batteries for home use = less grid electricity demand)

# A Day in the Life of Electricity

- Power supply and use must be balanced in real time - 24/7/365
- Demand fluctuates hourly, seasonally and over time





## Demand Comparisons

- Average BC Hydro residential customer – 11,000 kWh/yr
- Large industrial (pulp mill) – 400 GW.h/yr = 40,000 homes
- Large office (20-25 floors) – 5 GW.h/yr = 500 homes
- Big box store – 3.5 GW.h/yr = 350 homes



# **Backstory**

## **Chapter 3**

### **How we got here**



## 2001 Liberal Government Elected

Focus was developing private power ➡ **IPPs**

IPPs were intermittent power, so often not available when we needed them. We needed back up, or capacity.

**Site C seen as the least costly option**  
that would also provide power generation  
for future need

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s.12; s.13



# Backstory

## Chapter 4

### BTWs. What is Site C?



## Third dam on the Peace River

WAC Bennett (Site A, 1968)

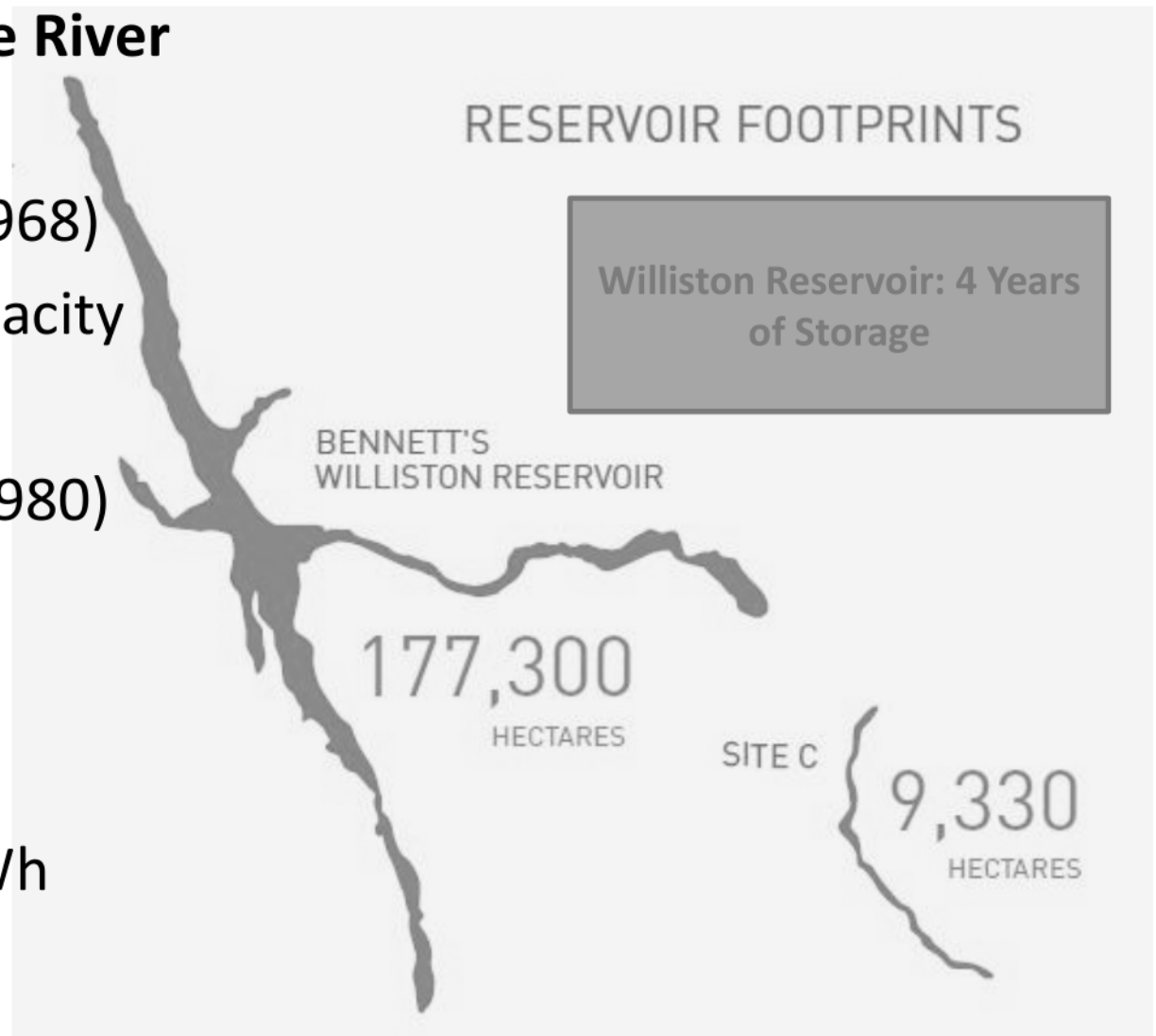
- 25% of BC Hydro capacity

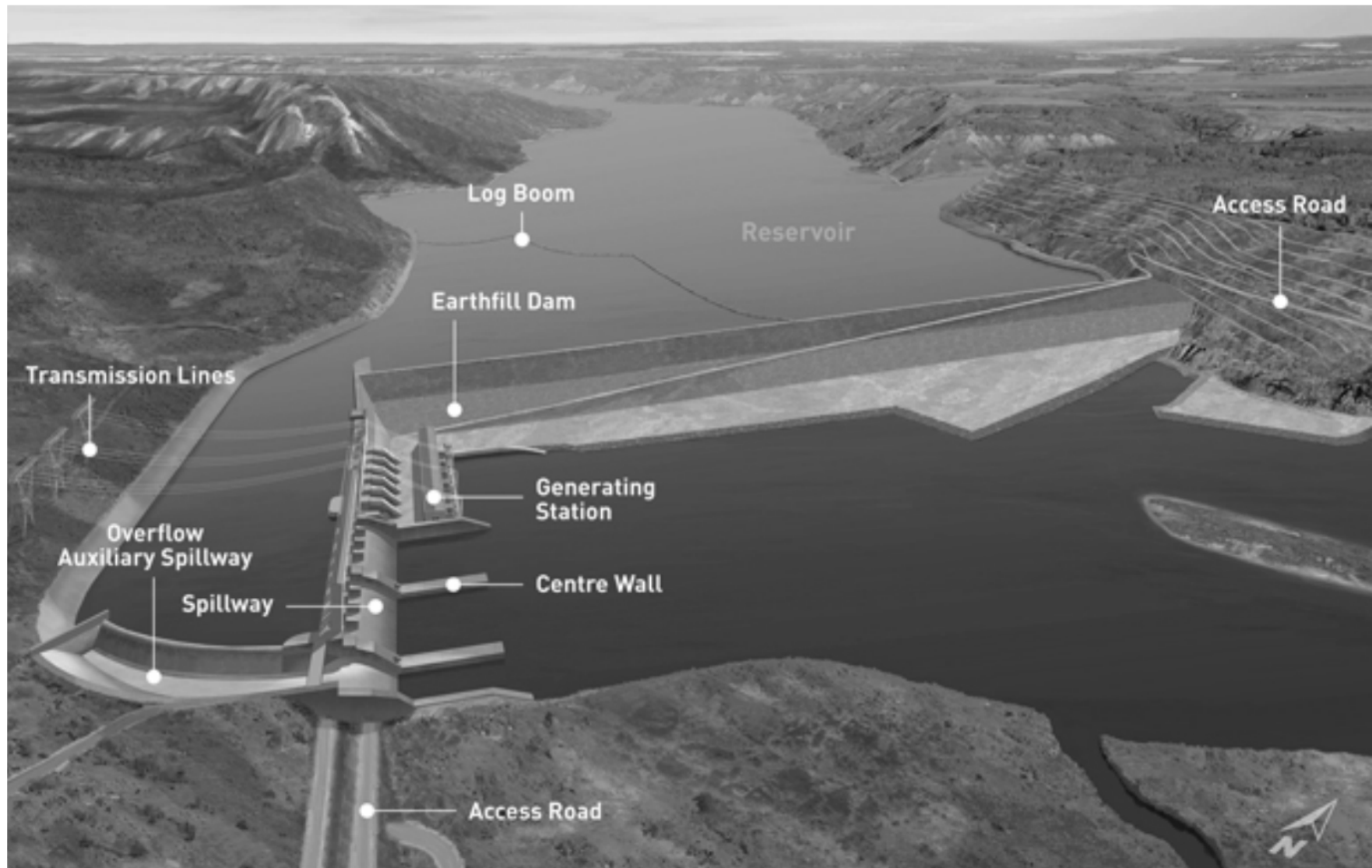
Peace Canyon (Site B, 1980)

- 694 MW, 3,500 GWh

Site C

- 1,132 MW, 5,100 GWh





## Current Status of the Project

**Started July 2015, approximately 20% complete, \$2.1 billion spent by Dec 31**

Site C Employment Statistics – September 2017				
	# of Total Workers	# of B.C. Primary Residents	% of B.C. Workers	# (and %) of Peace River Regional District Primary Residents
<b>Construction and Non-Construction Contractors<sup>2</sup></b> <i>Excludes work performed outside of B.C. (e.g., Manufacturing)</i>	1,914	1,489	78%	593 (31%)
<b>Engineers and Project Team<sup>3</sup></b>	461	428	93%	---
<b>Total Workforce</b>	2,375	1,917	81%	---

**49 apprentices, 172 Indigenous people, and 354 women**



# Status of Construction and Procurement

## Contracts Awarded

s.12,s.13,s.16

- Site preparation
- Construction bridges
- Worker Accommodation
- Road Upgrades
- Main Civil Works
- Turbines and Generators

## Procurements Underway

- Generating Station and Spillways
- Transmission lines and substations

## Upcoming Procurements

- Highway 29 Realignment



Worker Accommodation



Peace River construction bridge

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s.12; s.13



## What \$4 billion of Site C Equivalent to:

- About \$860 per British Columbian

Taxpayer-supported capital projects:

- 3 Pattullo bridges (\$1.3B each)
- 3 Evergreen line projects (\$1.4B each)
- 3 Royal Columbian hospitals (phases 1 – 3: \$1.36B)
- 66 secondary schools (\$60M each)

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s.12; s.13

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Withheld pursuant to/removed as

s.13; s.12

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Withheld pursuant to/removed as

s.12; s.13

**Subject:** FW: FINAL FINAL deck  
**Date:** Tuesday, December 5, 2017 at 8:05:35 PM Pacific Standard Time  
**From:** Nikolejsin, Dave MNGD:EX  
**To:** Kennedy, Christine PREM:EX, Wright, Don J. PREM:EX  
**CC:** MacMillan, Elizabeth PREM:EX, MacLaren, Les EMPR:EX  
**Attachments:** Site C Dec6 Presentation Dec 5 MMM Final.pptx

Christine, here is the final slide deck for tomorrow. Can you please print copies for everyone as you did last time as this has not been distributed. We needed to wait till caucus today to finalize. And if you can have ready on projector as well. Thanks.

Don – fyi I handed Premier paper copies of the rates curves slides so he could look at them before the meeting tomorrow.

---

**From:** Nikolejsin, Dave MNGD:EX  
**Sent:** December 5, 2017 8:03 PM  
**To:** Mungall, Michelle EMPR:EX <Michelle.J.Mungall@gov.bc.ca>; Sanderson, Melissa EMPR:EX <Melissa.Sanderson@gov.bc.ca>  
**Cc:** MacLaren, Les EMPR:EX <Les.MacLaren@gov.bc.ca>  
**Subject:** FINAL FINAL deck

Minister, Finance wanted a couple last minute changes to their section. They took out one slide they felt was duplicative and fixed a couple typos. No change to your slides from previous version I sent. This is what Cabops will have printed and on screen tomorrow.

**Dave Nikolejsin**

Deputy Minister  
Energy, Mines and Petroleum Resources



# Site C Decision

December 6, 2017

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Withheld pursuant to/removed as

s.12; s.13



## Current Costs of the Project

- Approximately 20% complete
- \$2.1 billion spent by Dec. 31
- **Cost of the project is now \$10.7 billion**
  - **P90 Estimate**
  - **Was \$8.335 billion (P50)**
- Spending continues - \$2 million per day
  - Bids for Generating Station and Spillways received and under review
  - Turbines and generators contractor on site



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s.12; s.13



## BCUC Report Overview

- Cost to Complete Site C: \$10B to \$12B
- \$2.1B spent to date plus remediation costs of \$1.8B
- Electricity Forecast: low demand growth; no consideration of Climate Targets
- BCUC rejected suspend option – expensive and risky
- BCUC Alternative Portfolio has PowerSmart, Time of Use Rates, industrial curtailment, wind, geothermal
- BCUC report inconclusive – even with high construction costs, the BCUC felt they could not provide a recommendation.

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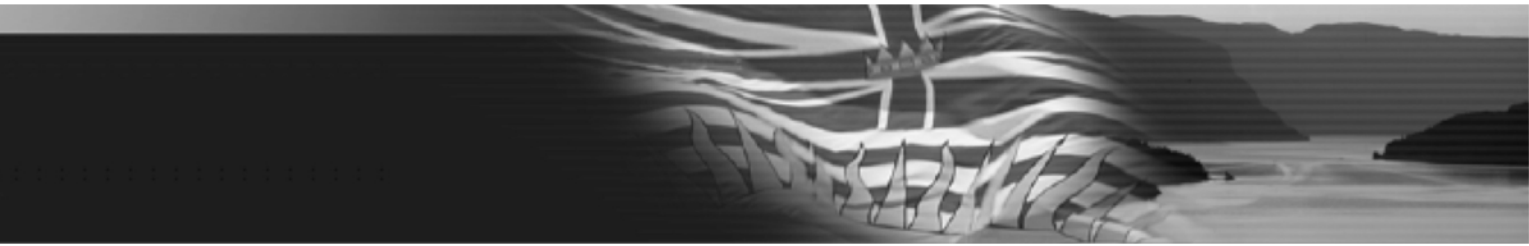
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s.13; s.12

Page 410 of 538 to/à Page 418 of 538

Withheld pursuant to/removed as

s.12; s.13



## What \$4 billion of Site C is Equivalent to:

- About \$860 per British Columbian Taxpayer-supported capital projects:
- 3 Pattullo bridges (\$1.3B each)
- 3 Evergreen line projects (\$1.4B each)
- 3 Royal Columbian hospitals (phases 1 – 3: \$1.36B)
- 66 secondary schools (\$60M each)

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Withheld pursuant to/removed as

s.12; s.13

**Subject:** CMC Follow up - Information for Cabinet - Regarding Site C  
**Date:** Thursday, December 7, 2017 at 2:49:38 PM Pacific Standard Time  
**From:** David Craig  
**To:** Wright, Don J. PREM:EX  
**CC:** MacLaren, Les EMPR:EX  
**Attachments** s.12;s.13

Don,

As promised, here is a letter covering analysis raised in my presentation to Cabinet and subsequent completion of my analysis.

s.12;s.13

I am now moving to assemble more explicit backing for this analysis from my constituent groups and from others.

I hope it will still be possible to get this completion of my analysis factored into the Cabinet decision making in some way.

Thank you for the opportunity to contribute. I have really appreciated the opportunity.

s.12;s.13

s.12;s.13 I am very excited about being able to help with this opportunity.

Cheers  
David

Mr. David Craig  
President  
Consolidated Management Consultants Ltd.  
Suite 720 - 1190 Melville Street  
Vancouver, B.C., V6E 3W1

Phone: 604-568-4904  
Cell: 604-351-2332

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Withheld pursuant to/removed as

s.12; s.13

**Subject:** FW: updated materials  
**Date:** Friday, December 8, 2017 at 3:44:59 PM Pacific Standard Time  
**From:** Lloyd, Evan GCPE:EX  
**To:** Wright, Don J. PREM:EX  
**Priority:** High  
**Attachments:** s.13

Don – we are meeting (via teleconference) with Geoff et al at 4pm to discuss these and the rest of the package. WE are also sharing with MGH and MMM at this time.  
Your thoughts and comments are welcome.

**Evan**

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Withheld pursuant to/removed as

s.13

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## NEWS RELEASE

For Immediate Release  
[release number]  
Dec. 11, 2017

Office of the Premier

### **Government will complete Site C construction Will not saddle taxpayers or ratepayers with previous government's debt**

VICTORIA – The B.C. government has committed to following through with construction of the Site C hydroelectric dam, saying that to do otherwise would put BC taxpayers and Hydro ratepayers on the hook for almost \$4 billion in debt rolled up by the previous government.

“The previous government’s legacy of megaproject mismanagement has left B.C. in an impossible situation,” said Premier John Horgan in making today’s announcement. “But we can’t punish British Columbians for those mistakes and we can’t change the past, we can only make the best decision for the future.

“We believe Site C is a bad project, but to cancel it would add billions to the province’s debt – putting at risk our ability to deliver housing, child care, schools and hospitals for families across B.C. And that’s a price we’re not willing to pay,” said Horgan.

Had government decided to cancel Site C, it would have taken on the project’s \$3.8 billion in debt, made up of \$2 billion already spent and another \$1.8 billion in remediation costs. That debt would become the responsibility of taxpayers or BC Hydro customers.

“We will not ask British Columbians to take on \$4 billion in debt and have nothing to show for it – and even worse, have to impose massive cuts to the services people count on us to deliver.

“The last government recklessly committed billions of dollars to this project without appropriate planning and oversight. Our job now is to make the best of a bad deal and do everything possible to turn Site C into a positive contributor to our energy future.”

The premier says that in moving forward with the project, his government will be adding a number of new initiatives to contain project costs while adding tangible benefits, including:

- A new Project Board that will provide independent oversight to future contract procurement and management, project deliverables, environmental integrity, and quality assurance – all within the mandate of delivering the project on time and budget. Based on current projections, BC Hydro has revised the budget to \$10.7 billion.
- Bringing in a Community Benefits Agreement to improve project quality, bring further benefits to communities, and increase the number of local hires, apprentices and First Nations workers hired onto the project.
- A Peace River Legacy Fund that will see BC Hydro invest millions in community, Indigenous, environmental, agricultural, social and economic initiatives in perpetuity.

- A dedicated \$20 million agricultural mitigation and compensation fund to support the Peace Region's agriculture industry.
- Enhanced provincewide food security by adding double the number of flooded hectares to the Agricultural Land Reserve.

"We're taking the steps the previous government showed no interest in: a solid budget, independent review and oversight, community benefits, and an eye to the future," said Horgan.

"We're putting an end to the years of energy policy that put politics ahead of people – where government forced BC Hydro into costly run-of-river contracts, hiking rates for homeowners and renters, and delivering dividends to government it simply couldn't afford."

Horgan adds his government will also be pursuing an alternative energy strategy to put B.C. more firmly on the path to green, renewable power that helps the province exceed its climate goals.

"I respect and honour the passion and commitment demonstrated by those who oppose Site C. I share their determination to move B.C. to a clean, renewable energy future and to embrace the principles of reconciliation with Indigenous communities.

"As we move forward, I welcome their ideas as we define an energy strategy that delivers on our climate responsibilities, powers future generations, and creates jobs and opportunities for all British Columbians."

-30-

#### **Quick Facts:**

- The Site C project is already two years into construction, with earth moving projects substantially complete.
- To date, \$2 billion has already been spent; it's estimated that another \$1.8 would be needed for site remediation (which, even then, would not restore the site to its previous condition).
- The \$4 billion in Site C termination costs is equivalent to \$860 per British Columbian, or eliminating taxpayer-supported capital projects:
  - 3 Pattullo bridges (\$1.3 billion each)
  - 66 secondary schools (\$60 million each)
  - 3 Royal Columbian hospitals (phases 1-3, \$1.36 billion each)
- 99 per cent of Class 1-5 agricultural lands (capable of crop production) in the Peace Agricultural Region will not be affected by Site C. Permanent loss of approximately 3,800 hectares of class 1-5 agricultural lands leaves approximately 2.7 million hectares of Class 1 to 5 lands available for agricultural production in the Peace Agricultural Region.

#### **Media contact(s):**

**Subject:** RE: Further information needed  
**Date:** Saturday, December 9, 2017 at 4:26:07 PM Pacific Standard Time  
**From:** MacLaren, Les EMPR:EX  
**To:** Wright, Don J. PREM:EX, Nikolejsin, Dave MNGD:EX  
**CC:** Kennedy, Christine PREM:EX, Foster, Doug FIN:EX  
**Attachments:** Site C Cost Estimate Evolution 9-12-17.docx, Site C Project and existing regional benefits 9-12-17.docx

Hi Don et al

I have added some explanations below to the Premier's questions, and additional information is attached related to the project budget and regional payments.

Les

---

**From:** Wright, Don J. PREM:EX  
**Sent:** Saturday, December 9, 2017 1:31 PM  
**To:** MacLaren, Les EMPR:EX; Nikolejsin, Dave MNGD:EX  
**Cc:** Kennedy, Christine PREM:EX  
**Subject:** Further information needed

Hi Les and Dave,

This will be a bit of a dump, but just had chat with Premier, and he would like to have the following in digestible form:

s.13

To the extent that you have this stuff on the shelf just flip it over one-by-one. To the extent that we need to ask Hydro to do some work, feed it back to me piecemeal.

s.22 \_\_\_\_\_ and can pick this up later this evening or tomorrow morning.

Thanks. Sorry for the lost weekend.

Don

## Site C Estimate History

### CONFIDENTIAL

Estimate Basis	Stage 1	Stage 3	FID	Review
Estimate Date	2007	2010	2013	2017
Design Basis	1980s	Modern	Modern	Modern
In-service Date	F2020	F2021	F2024	F2024

### Cost Breakdown

Dollar base	2008	2010	2014	Nominal
Direct Costs	2,214	3,825	4,468	5,839
Indirects and Overheads	464	1,105	1,129	2,010
Contingency	417	730	680	858
Inflation and Escalation	1,165	775	651	
IDC	920	1,525	1,407	1,285
Risk Reserve	450	-	440	708
<b>Grand Total</b>	<b>5,630</b>	<b>7,960</b>	<b>8,775</b>	<b>10,700</b>

### Description of Changes

#### Key Changes from Stage 1 estimate to current

##### Direct costs - change from 1980s to modern design standards

**Approximate cost impact:** \$1.5 billion

- Increase in seismic withstand (ability to withstand earthquakes)
- Improved water passage capability (ability to pass water under flood events, even with no site power)
- Change in dam orientation to mitigate geotechnical risks (rebound)
- Increase in generating capacity (to reflect expected requirement to integrate intermittent renewables such as wind)
- Increase in worker accommodation standards to reflect need to attract and retain skilled labour

##### Changes in construction management standards and market conditions:

**Approximate cost impact:** \$0.8 billion

- Contractor productivities lower due to:
  - higher safety and environmental standards
  - changes in workforce composition
- Increase in management costs to reflect modern safety and environmental management standards

##### Indirect Costs - inclusion of modern expectations around First Nations and Community Benefits:

**Approximate Cost Impact:** \$0.6 billion

- Addition of funding for regional benefits agreements (not included in Stage 1 estimate)
- Realistic forecast for First Nations benefits agreements (only minor amounts in Stage 1 estimate)
- Increase in expected regulatory costs due to modern expectations for environmental assessment

- Realistic forecast for mitigation and compensation funding based on modern standards

**Inflation - change in project schedule:**

**Approximate Cost Impact:** \$0.8 billion

- Project in-service date changed from F2020 to F2024. This shifts spending later in time, which will be at higher prices due to inflationary effects
- Partially offset by decreases in expected escalation rates from 2008 baseline.

**Interest During Construction – changes in financing costs:**

**Approximate cost impact:** Negligible

- There have been several changes related to IDC that roughly offset in total:
  - Extension to the project schedule, meaning debt is carried for longer with resulting increase in interest payments
  - Decrease to interest rates

**Other Changes**

- Changes to market prices and conditions
- Changes to risk assessment, and resulting:
  - Contingency
  - Risk reserve

Page 461 of 538

Withheld pursuant to/removed as

s.12; s.16

Page 462 of 538

Withheld pursuant to/removed as

s.16; s.12

Page 463 of 538 to/à Page 464 of 538

Withheld pursuant to/removed as

s.12; s.16

**Subject:** RE: Further information needed  
**Date:** Sunday, December 10, 2017 at 5:58:05 AM Pacific Standard Time  
**From:** MacLaren, Les EMPR:EX  
**To:** Wright, Don J. PREM:EX; Nikolejsin, Dave MNGD:EX  
**CC:** Kennedy, Christine PREM:EX; Foster, Doug FIN:EX

s.13

Les

---

**From:** MacLaren, Les EMPR:EX  
**Sent:** Saturday, December 9, 2017 4:26 PM  
**To:** Wright, Don J. PREM:EX; Nikolejsin, Dave MNGD:EX  
**Cc:** Kennedy, Christine PREM:EX; Foster, Doug FIN:EX  
**Subject:** RE: Further information needed

Hi Don et al

I have added some explanations below to the Premier's questions, and additional information is attached related to the project budget and regional payments.

Les

---

**From:** Wright, Don J. PREM:EX  
**Sent:** Saturday, December 9, 2017 1:31 PM  
**To:** MacLaren, Les EMPR:EX; Nikolejsin, Dave MNGD:EX  
**Cc:** Kennedy, Christine PREM:EX  
**Subject:** Further information needed

Hi Les and Dave,

This will be a bit of a dump, but just had chat with Premier, and he would like to have the following in digestible form:

s.13

To the extent that you have this stuff on the shelf just flip it over one-by-one. To the extent that we need to ask Hydro to do some work, feed it back to me piecemeal.

s.22

and can pick this up later this evening or tomorrow morning.

Thanks. Sorry for the lost weekend.

Don

**Subject:** some additional site C material - background

**Date:** Sunday, December 10, 2017 at 1:35:02 PM Pacific Standard Time

**From:** Foster, Doug FIN:EX

**To:** Wright, Don J. PREM:EX

**CC:** MacLaren, Les EMPR:EX

- here is Hydro's stuff on mitigation plans for agriculture and outdoor rec that went for public/stakeholder consult in Feb 2017.

<https://www.sitecproject.com/bc-hydro-releases-site-c-mitigation-plans-for-agriculture-and-outdoor-recreation>

- I asked Hydro Site C folks about some of the <sup>s.13</sup>

**From:** <sup>s.19</sup>

**Sent:** Saturday, December 2, 2017 12:11 PM

**To:** Foster, Doug FIN:EX

**Cc:** O'Riley, Christopher

**Subject:** RE: Analysis of Direct Costs

Doug:

s.13;s.17

---

s.19

[bchydro.com](http://bchydro.com)

s.13

s.13

**From:** s.19

**Sent:** Friday, December 1, 2017 9:36 PM

**To:** Foster, Doug FIN:EX

**Cc:** O'Riley, Christopher

**Subject:** RE: Analysis of Direct Costs

Doug:

s.13;s.17

---

s.19

[bchydro.com](http://bchydro.com)

**Smart about power in all we do.**

s.13

Hope this is helpful.  
d

**Subject:** RE: Final Power Point Deck  
**Date:** Monday, December 11, 2017 at 9:24:18 AM Pacific Standard Time  
**From:** Kennedy, Christine PREM:EX  
**To:** Devereux, Rick GCPE:EX, Lloyd, Evan GCPE:EX, Hagglund, Jarrett GCPE:EX  
**CC:** Wright, Don J. PREM:EX, Zadravec, Don GCPE:EX  
**Attachments:** Site C Technical Presentation, December 11 2017.pptx, Site C Technical Presentation, December 11 2017.pdf

Here is the presentation with Don's final updates, in PowerPoint and PDF.

Christine

---

**From:** Devereux, Rick GCPE:EX  
**Sent:** Monday, December 11, 2017 6:40 AM  
**To:** Lloyd, Evan GCPE:EX; Kennedy, Christine PREM:EX; Hagglund, Jarrett GCPE:EX  
**Cc:** Wright, Don J. PREM:EX; Zadravec, Don GCPE:EX  
**Subject:** Final Power Point Deck

Hi All,

My colleague Jarrett is included in this email and is the lead in the execution of the event in Vancouver. Can he be sent the final power point when it is ready?

Please let me know if we should be contacting someone else about this.

Thanks  
Rick

# Site C

# Technical Briefing

**Don Wright**  
**Deputy Minister to the Premier**  
**December 11, 2017**



**After review by BCUC, meeting with Treaty 8  
First Nations, advice from independent experts  
and lengthy deliberation**

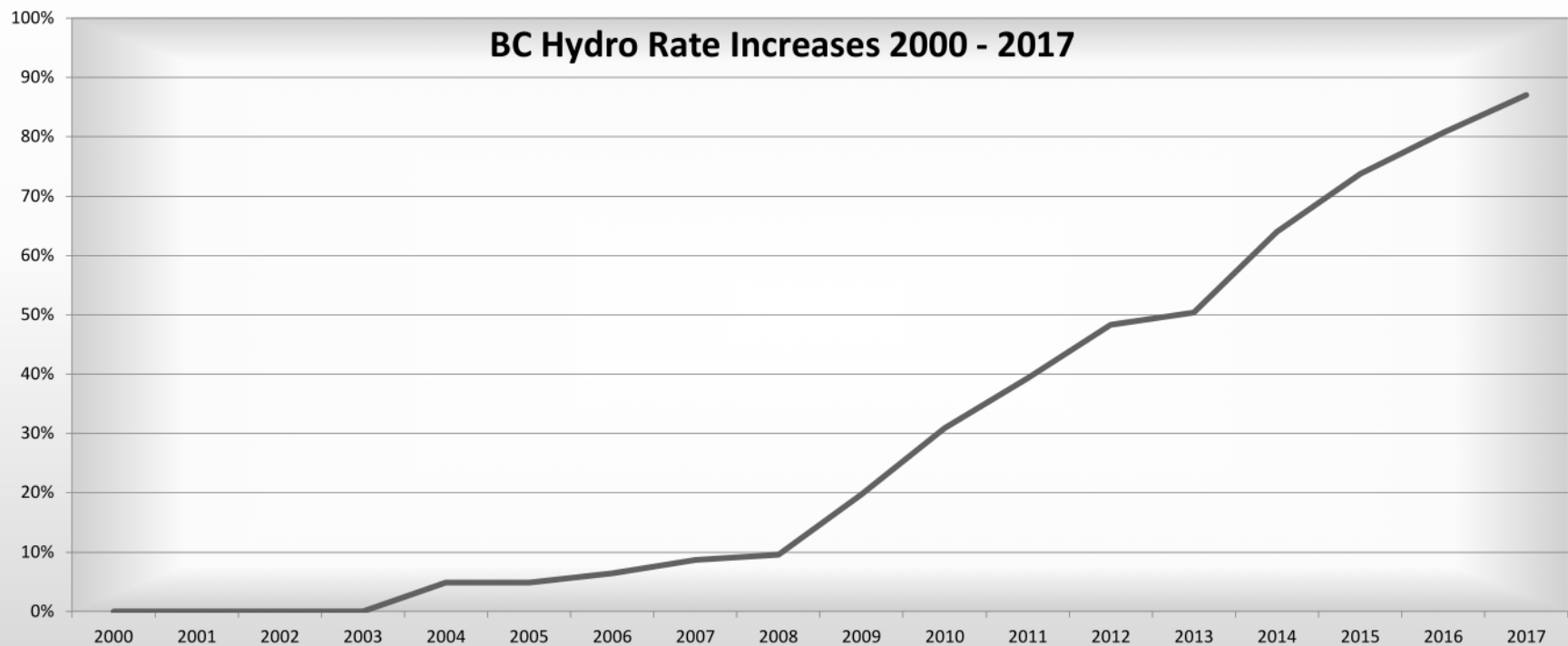
**Cabinet has made the difficult decision to  
complete Site C construction**

# Outline of Technical Presentation

- I. Historical Context
- II. Government's Decision Criteria
- III. Revised Cost Estimates
- IV. Ratepayer Impacts
- V. Fiscal Impacts/Risks
- VI. Concluding Comments

# I. Historical Context

# Hydro Rates Have Been Rising Significantly Since 2003

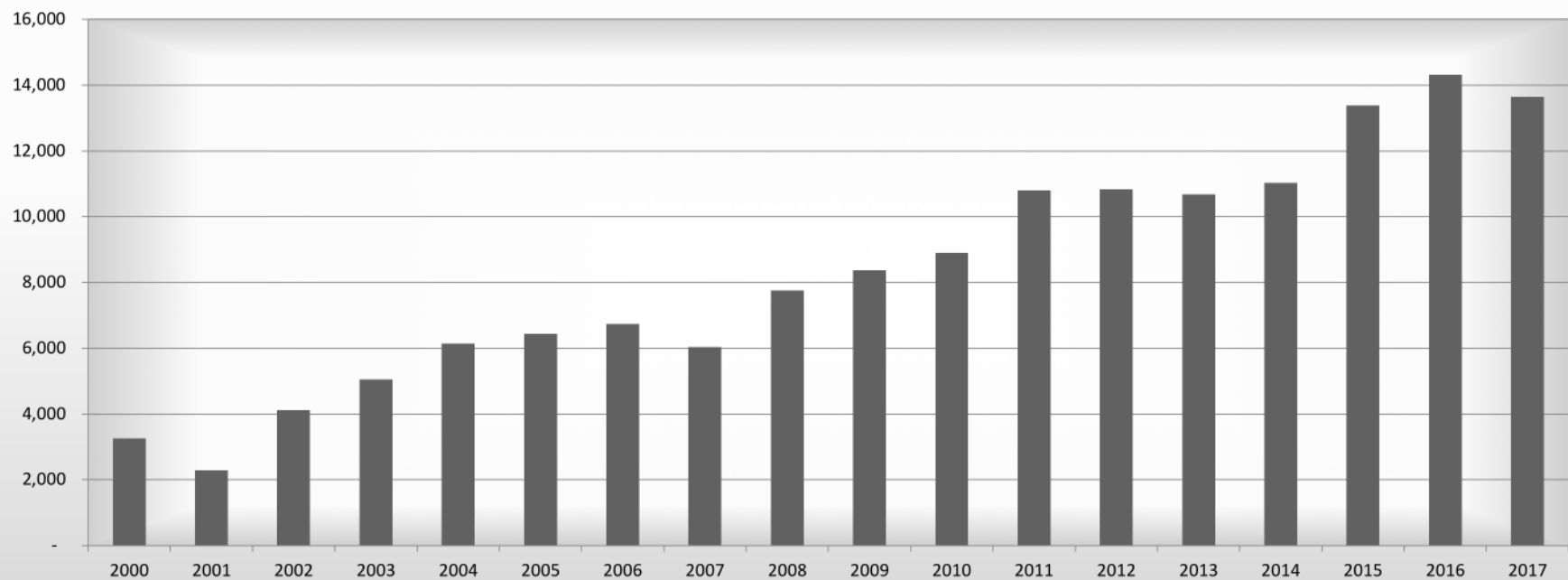


# New Power More Expensive Than Heritage Assets

Heritage Assets	Average of IPP	Projected Site C
\$32 / MWh	\$100 / MWh	\$60 / MWh

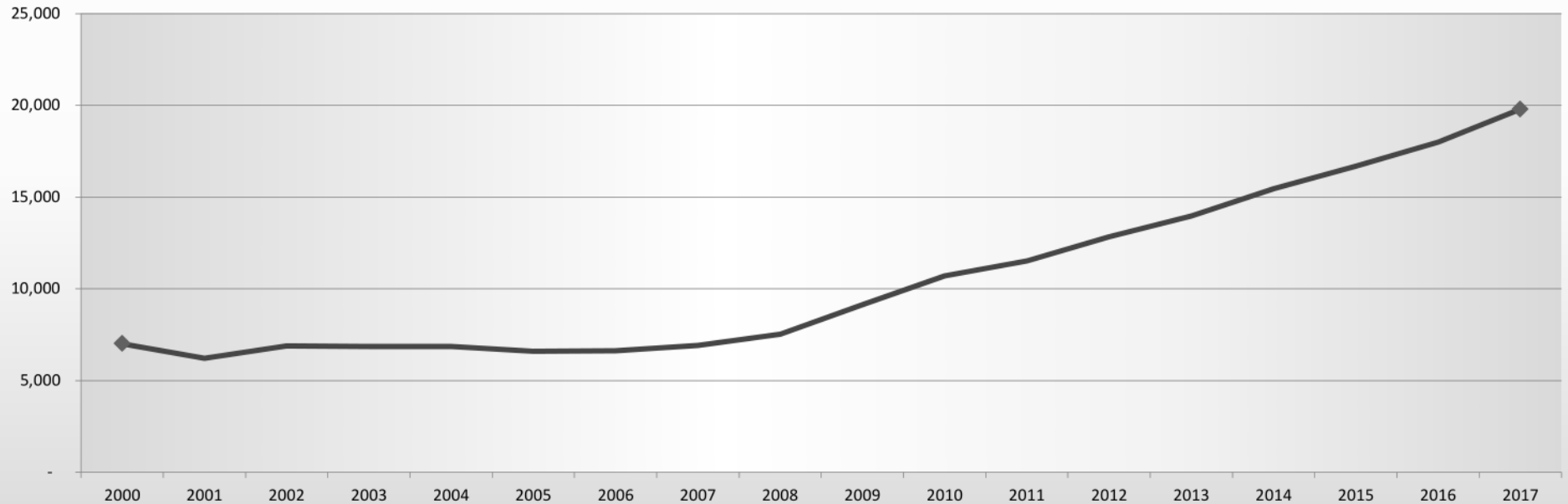
# IPP Share of Supply Growing

**IPP Historical Generation (GWh)**



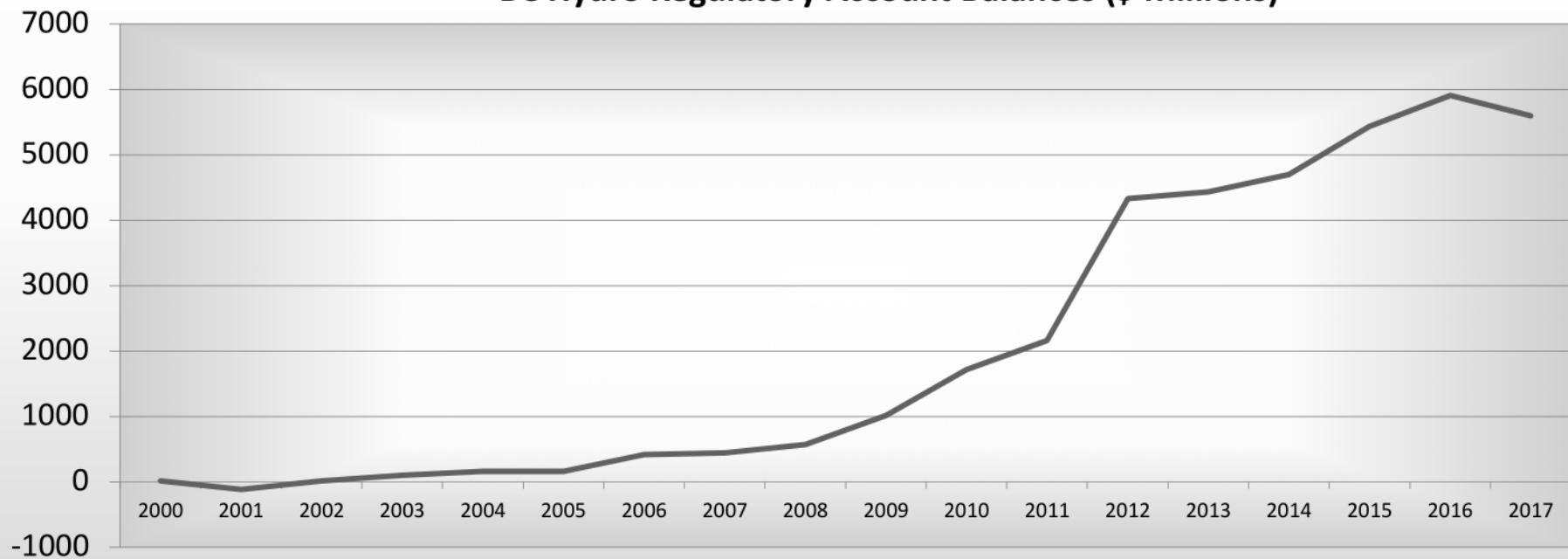
# BC Hydro Debt is Growing

**BC Hydro Net Long-Term Debt (\$ Millions)**

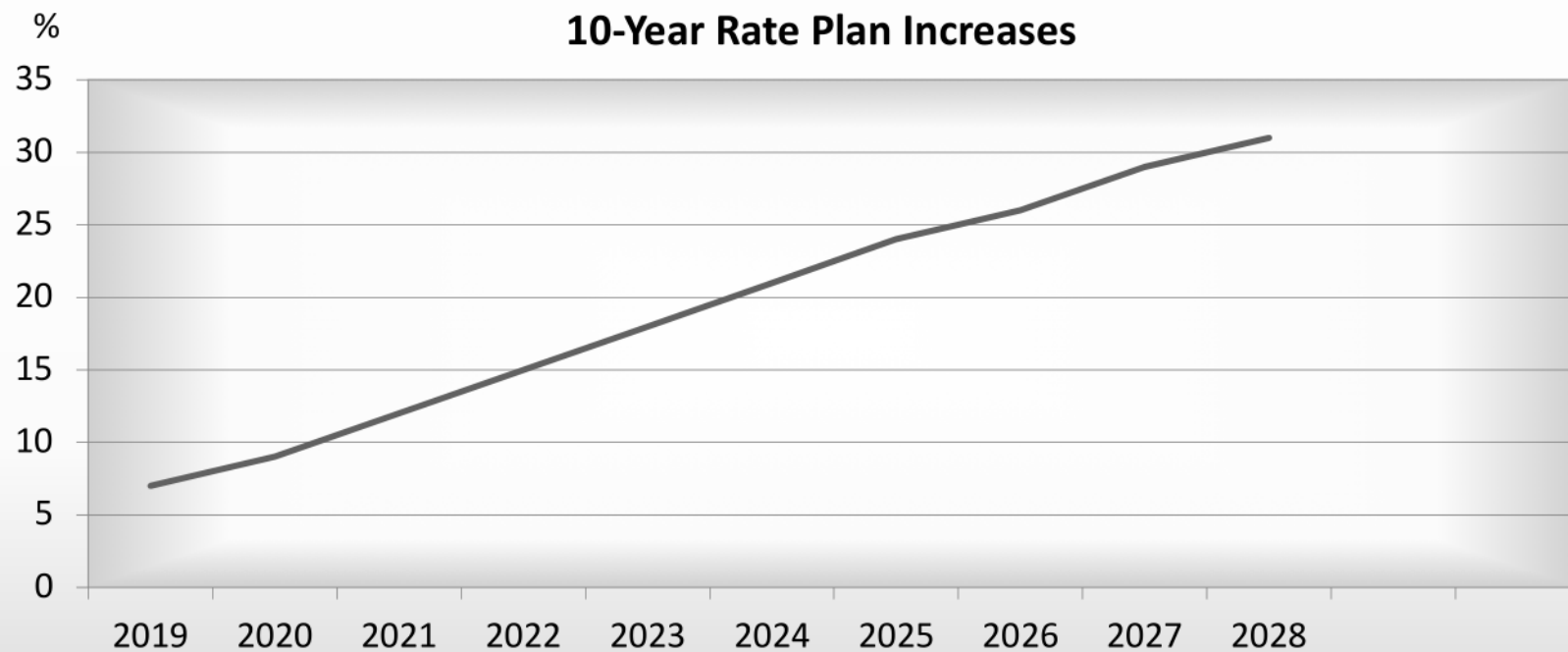


# BC Hydro's Regulatory Account Balance Is Growing

BC Hydro Regulatory Account Balances (\$ Millions)

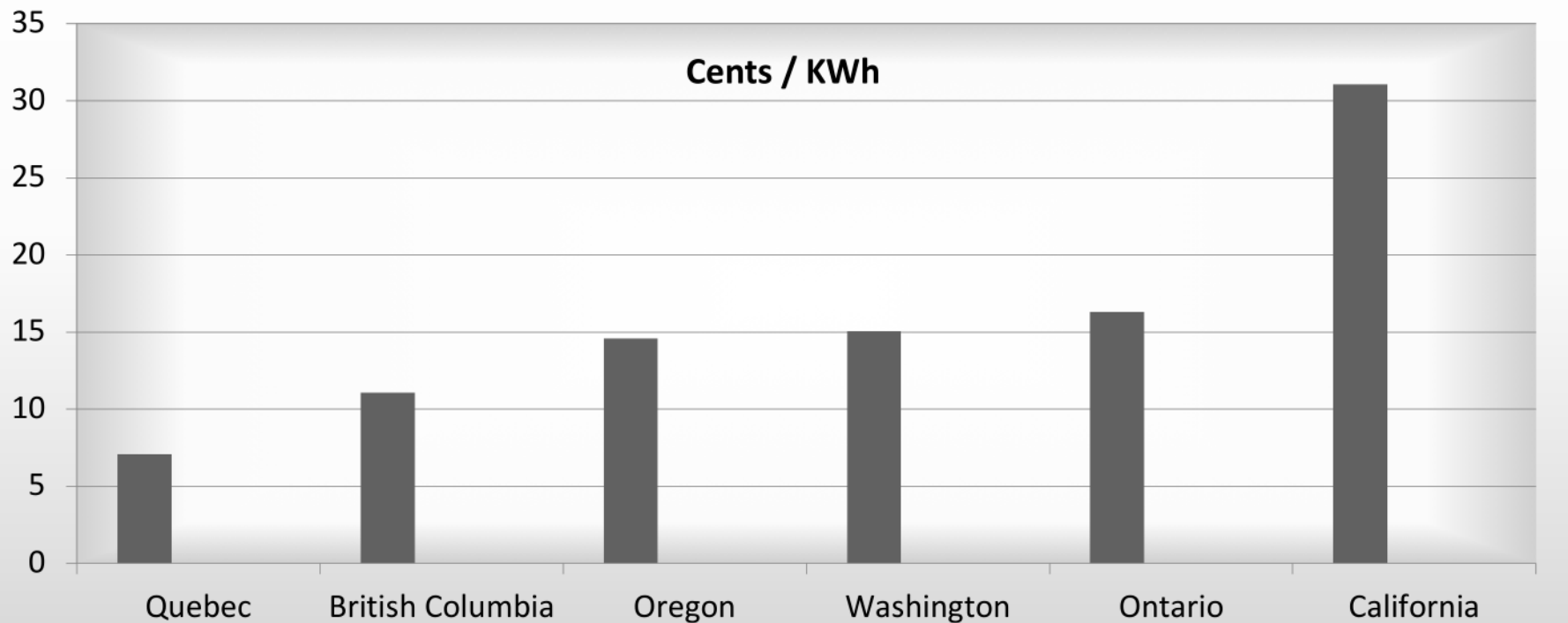


# Current 10-Year Rate Plan Schedules Further Increases



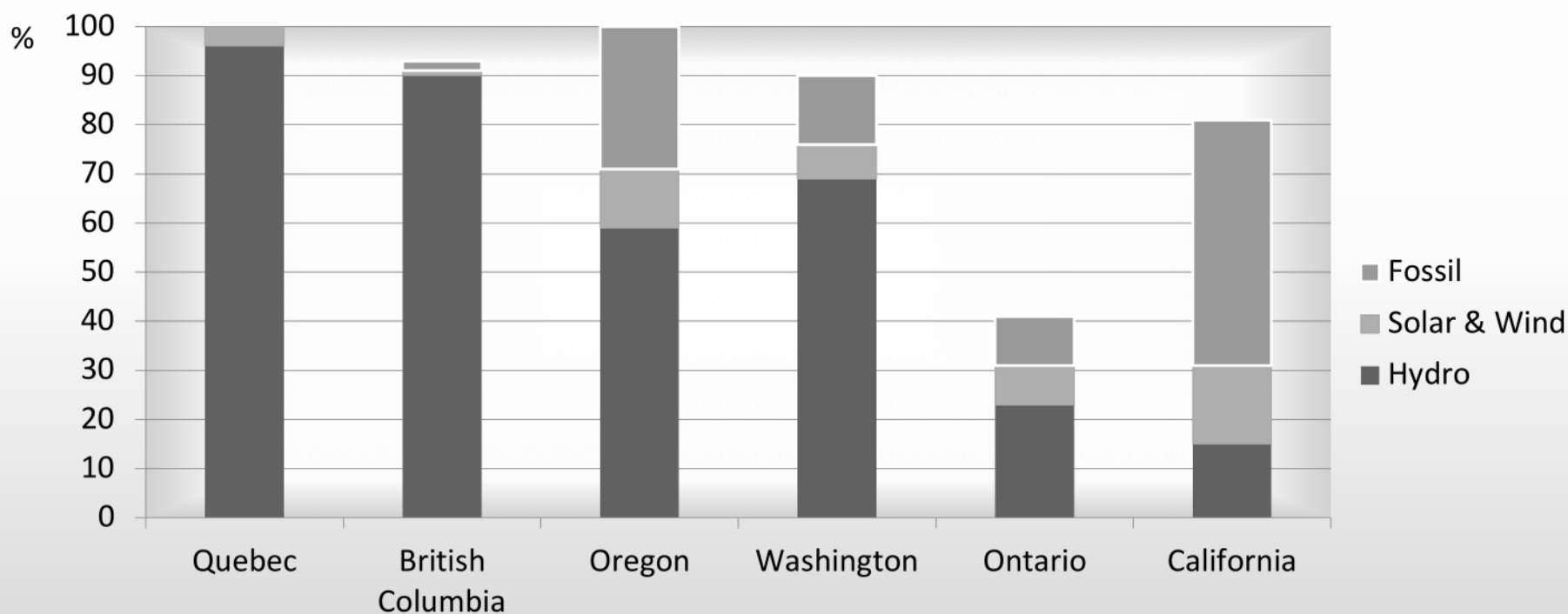
# How Our Rates Compare, Residential

Source: Hydro Quebec, NRCAN, US EIA



# Sources of Electricity

Source: Hydro Quebec, NRCAN, US EIA  
Other sources to 100% includes biomass, nuclear



## II. Government's Decision Criteria

# Criteria

1. Ratepayer Impact
2. Fiscal Impact / Risks
3. First Nation Impacts
4. GHG Targets
5. Agriculture / Food Security

# III. Revised Cost Estimates

# Projected Cost to Complete: \$10.7 Billion

- 2014 approval was for \$8.335 billion
  - With an additional \$440 million risk reserve
  - For a total of \$8.775 billion
- Costs to date have exceed budgeted amounts
- One-year delay of river diversion estimated to increase costs by \$610 million
- Future contracts projected to be higher than budgeted amounts
- Current mid-point estimate is now \$9.992 billion
  - \$1.657 billion over 2014 estimate
- Given what has happened to date, risk reserve has been increased

# Change in Cost Estimate

\$ millions

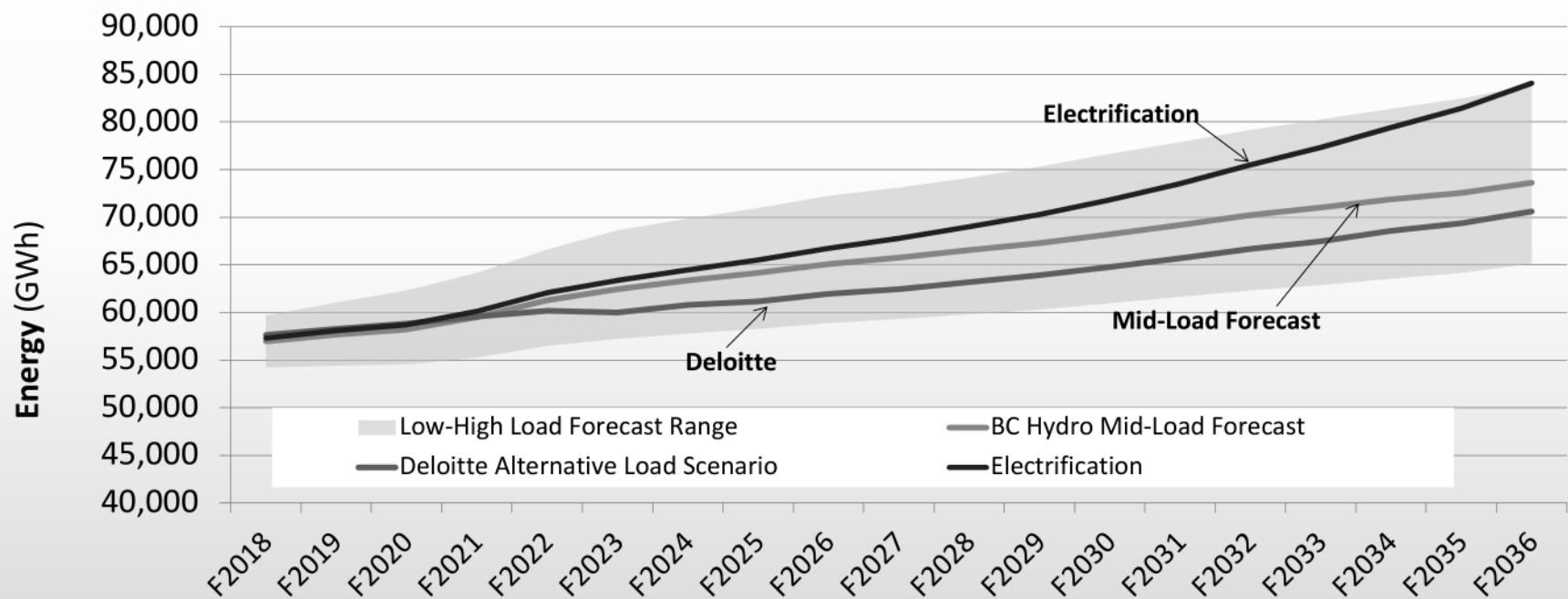
Cost	2014	Current
Direct Costs	4,940	5,839
Indirect and Overhead	1,194	2,010
Contingency	794	858
Interest before completion	1,407	1,285
<b>Total Before Risk Reserve</b>	<b>8,335</b>	<b>9,992</b>
Risk Reserve	440	708
<b>Total</b>	<b>8,775</b>	<b>10,700</b>

# Comments on Cost Escalation

- Government will be putting in place enhanced oversight to ensure final costs are at or below \$10.7 billion
- \$10.7 billion is used in making comparisons of the continue versus terminate scenarios

# IV. Rate Impacts

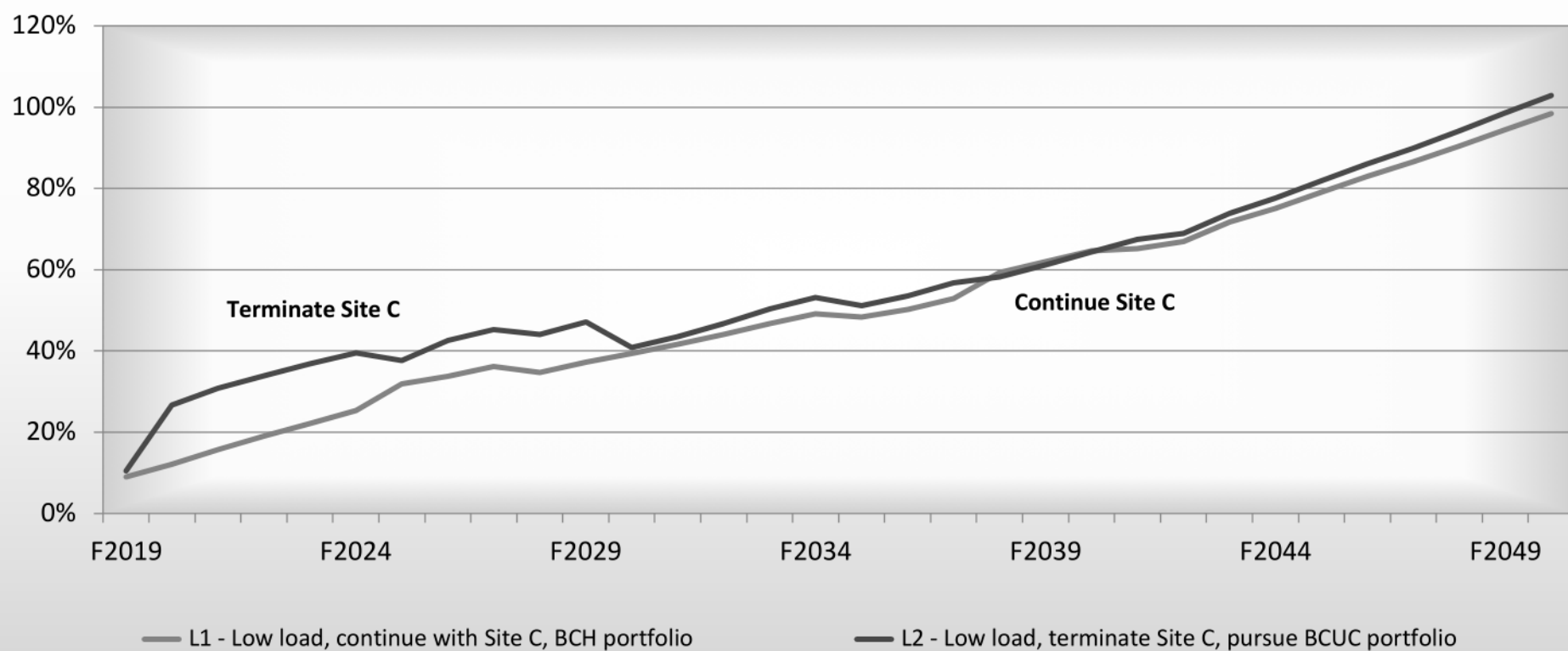
# Comparison of Load Forecasts



# Rate Impact Analysis Assumptions

- BCUC Low Load Forecast
- BCUC “Alternative Portfolio” assumptions
- \$10.7 B Site C Cost
- 10 year amortization of \$4 billion in termination scenario

# Rate Impacts Under a Low Load Forecast



# What Is The Impact On Ratepayers?

Complete Site C	Terminate Site C
<ul style="list-style-type: none"><li>• Rate impact 1.1% in 2025, and 1.1% in 2026 under a rate smoothing scenario over 10 years, then decreasing (assuming revised \$10.7B project cost)</li></ul>	<ul style="list-style-type: none"><li>• Increases rates, starting in 2020 to recover sunk and termination costs</li><li>• A 12% rate increase would need to be in place for 10 years</li></ul>

# Impact of Terminating Site C on Customers

## Results in a rate increase of 12%, effective 2020



### **Single Family Home, Vancouver Island**

- Annual hydro bill \$1,650 **+\$198 / year**



### **Lumber Mill, BC Interior**

- Annual hydro bill \$1.6 million **+\$192,000 / year**



### **Medium Data Centre**

- Annual hydro bill \$1.5 million **+\$180,000 / year**



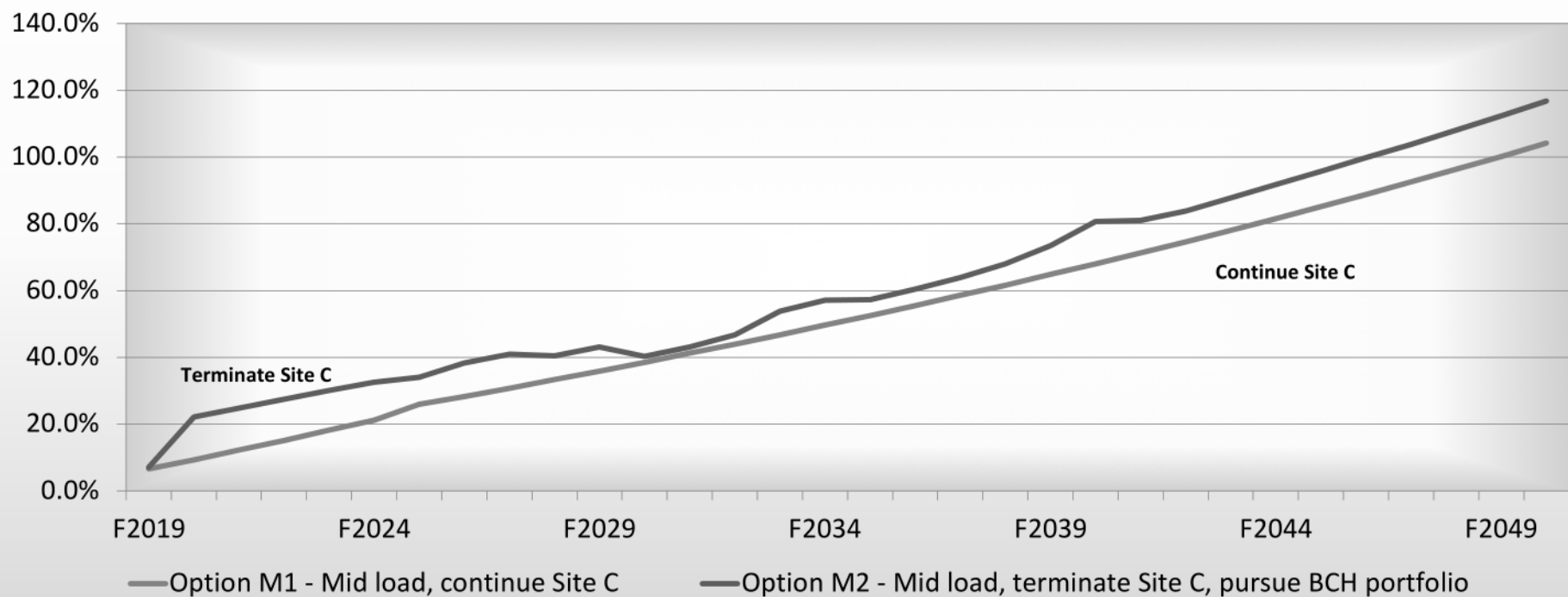
### **Large Lower Mainland Hospital**

- Annual hydro bill \$3.1 million **+\$372,000 / year**

# Demand Affects Relative Rate Impact

- If demand exceeds low load forecast, relative advantage of complete scenario increases over terminate scenario

# Rate Impacts Under a Mid Load Forecast



# V. Fiscal Impacts / Risks

## Some Inconvenient Arithmetic

- If government decided to terminate, \$4 billion in debt has to be absorbed by someone
  - Ratepayers
  - BC Hydro
  - Taxpayers
- The previous section looked at the implications if ratepayers absorbed the cost

# Could BC Hydro Absorb Termination Costs?

- They could
- But this would
  - Wipe out more than 80% of BC Hydro's equity
  - The \$4 billion loss would still be consolidated on the books of the Government Reporting Entity
  - Involve ongoing debt interest costs of \$120-150 million per year

# Biggest Risk Of The Hydro Absorb Scenario

- In a scenario where BC Hydro was to absorb the \$4 billion termination costs:
  - Credit rating agencies could determine that BC Hydro was no longer a commercially viable entity  
Resulting in \$20 billion debt being reclassified as taxpayer-supported debt
    - Likely leading to a downgrade of the Province's credit rating
    - Resulting in higher interest costs for the (then) \$65 billion in taxpayer-supported debt

# Could the Minister of Finance Absorb Termination Costs?

- Central Government's Consolidated Revenue Fund would take on the \$4 billion of debt and recapitalize BC Hydro
- This would likely preserve BC Hydro's status as a commercial entity
- But...

# Having the Minister of Finance Absorb Termination Costs Would

- Still entail a \$4 billion loss in Government Reporting Entity
- Still involve \$120-\$150 million / year in interest costs that would have to be serviced
- Could lead to a credit rating downgrade, adding even more debt interest costs to taxpayers
- Crowd out room for new capital project spending
  - Schools, hospitals, housing, bridges, highways, etc.

# What is \$4 Billion Equivalent To?



66 secondary schools (\$60 million each); or,



11 hospital projects similar to the North Island Hospitals (Province's share \$365 million); or,



12 highway projects similar to the Okanagan Valley Corridor Project (Province's share \$ 330 million); or,



3 Pattullo Bridges (\$1.3 billion each).

# VI. Concluding Comments

# In Summary

- Very tough decision for Government
- Decision to proceed primarily driven by need to:
  - Minimize impacts on BC Hydro ratepayers
  - Preserve the fiscal room to build schools, hospitals, housing, bridges etc.



Questions?

Page 507 of 538

Withheld pursuant to/removed as

s.13; s.12

Page 508 of 538

Withheld pursuant to/removed as

s.12; s.13

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, December 1, 2017 9:40 AM  
**To:** Hardin, Karl GCPE:EX  
**Subject:** RE: Report download URL for #SiteC Social Trends

Thanks. It was Star-Bellied Sneetches. I thought so.

### GEOFF MEGGS

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Hardin, Karl GCPE:EX  
**Sent:** Friday, December 1, 2017 9:39 AM  
**To:** Meggs, Geoff PREM:EX  
**Subject:** Re: Report download URL for #SiteC Social Trends

Here's the culprit: <https://twitter.com/DeSmogCanada/status/935933909484806144>

--

**Karl Hardin**

Executive Director | Digital Communications  
Government Communications and Public Engagement  
Cell: (778) 584 1251

---

**From:** "Meggs, Geoff PREM:EX" <[Geoff.Meggs@gov.bc.ca](mailto:Geoff.Meggs@gov.bc.ca)>  
**Date:** Friday, December 1, 2017 at 9:33 AM  
**To:** "Hardin, Karl GCPE:EX" <[Karl.Hardin@gov.bc.ca](mailto:Karl.Hardin@gov.bc.ca)>  
**Subject:** FW: Report download URL for #SiteC Social Trends

There's that Seuss book again

g

**GEOFF MEGGS**

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Hootsuite Insights Notifications [<mailto:insights.hello@hootsuite.com>]

**Sent:** Friday, December 1, 2017 1:01 AM

**To:** Hardin, Karl GCPE:EX

**Subject:** Report download URL for #SiteC Social Trends

Your report titled #SiteC Social Trends is ready to be downloaded.

## Report Download

Your **#SiteC Social Trends** report is ready to be downloaded.

Please use the link below. It will expire in 7 days.



### DOWNLOAD REPORT AS A PDF FILE

*You can open the report with any PDF reader application: Adobe Reader, PDF Reader, PDF Viewer etc.*

Do you have any questions? Contact support at [insights.support@hootsuite.com](mailto:insights.support@hootsuite.com)

Go to Settings to edit your Signals & Mentions email alerts. [insights.hootsuite.com/#account](https://insights.hootsuite.com/#account)

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Vancouver, BC V5T 1R6, Canada

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, November 17, 2017 12:13 PM  
**To:** Horgan.MLA, John LASS:EX  
**Subject:** RE: Deputy Ministers' Inquiries Respecting Site C

Yes, thanks

### GEOFF MEGGS

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Horgan.MLA, John [<mailto:John.Horgan.MLA@leg.bc.ca>]  
**Sent:** Friday, November 17, 2017 10:53 AM  
**To:** Meggs, Geoff PREM:EX  
**Subject:** FW: Deputy Ministers' Inquiries Respecting Site C

Geoff,  
Not sure if you saw or received this email...../mms

---

**From:** Robert McCullough [<mailto:robert@mresearch.com>]  
**Sent:** Thursday, November 16, 2017 10:59 PM  
**To:** Horgan.MLA, John <[John.Horgan.MLA@leg.bc.ca](mailto:John.Horgan.MLA@leg.bc.ca)>; Geoff Meggs<sup>s.22</sup>  
FIN:EX <[Lori.Wanamaker@gov.bc.ca](mailto:Lori.Wanamaker@gov.bc.ca)>; Dave Nikolejsin <[ave.nikolejsin@gov.bc.ca](mailto:ave.nikolejsin@gov.bc.ca)>  
**Cc:** Harry Swain<sup>s.22</sup>  
**Subject:** Deputy Ministers' Inquiries Respecting Site C

Wanamaker, Lori

Dear Mr. Horgan, Mr. Meggs, Ms. Wanamaker, and Mr. Nikolejsin:

We are writing you at the request of our clients, the Peace Valley Landowner Association and the Peace Valley Environment Association, regarding the questions raised in the attached letter dated November 15th, 2017.

We have included detailed answers to your questions as well as highlighting the all important Canadian Entitlement and Non-Treaty Storage issues.

Please feel free to contact us if you have any questions.

Yours,

Robert McCullough and Harry Swain

--

Robert McCullough  
*Principal*  
*McCullough Research*



*6123 S.E. Reed College Place*  
*Portland, Oregon 97202*  
*Robert@mresearch.com*  
*www.mresearch.com*

503-771-5090 (direct) 503-777-4616 (office) 503-784-3758 (cell)

This e-mail message contains confidential, privileged information intended solely for the addressee. Please do not read, copy, or disseminate it unless you are the addressee. If you have received it in error, please call 503-777-4616 and ask to speak with the message sender. Also, we would appreciate your forwarding the message back to us and deleting it from your system. Thank you.

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Sunday, December 17, 2017 12:22 PM  
**To:** Wright, Don J. PREM:EX  
**Subject:** RE: DBRS Commentary - BC Hydro Site-C

THanks, very interesting

g

### GEOFF MEGGS

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Wright, Don J. PREM:EX  
**Sent:** Sunday, December 17, 2017 12:04 PM  
**To:** Meggs, Geoff PREM:EX; Lloyd, Evan GCPE:EX  
**Subject:** FW: DBRS Commentary - BC Hydro Site-C

In case you haven't seen this.

---

**From:** Lori Wanamaker <[Lori.Wanamaker@gov.bc.ca](mailto:Lori.Wanamaker@gov.bc.ca)>  
**Date:** Wednesday, December 13, 2017 at 8:11 AM  
**To:** Don Wright <[don.j.wright@gov.bc.ca](mailto:don.j.wright@gov.bc.ca)>  
**Subject:** FW: DBRS Commentary - BC Hydro Site-C

Good news....

---

**From:** Latham, David FIN:EX  
**Sent:** Tuesday, December 12, 2017 2:59 PM  
**To:** Hopkins, Jim FIN:EX; Foster, Doug FIN:EX; MacLaren, Les EMPR:EX; Galbraith, David J FIN:EX  
**Cc:** Wanamaker, Lori FIN:EX; Redchurch, Kevin FIN:EX; Myers, Sam FIN:EX; Philadelphia, Neil FIN:EX; Lewis, Jason FIN:EX; Horan, Greg J FIN:EX; Wingerter, Dean M FIN:EX; Popham, Rex T FIN:EX; Rawluk, Jacqueline FIN:EX  
**Subject:** DBRS Commentary - BC Hydro Site-C

Attached is a commentary published by DBRS today. As usual, please do not distribute further.

Regards,

**David Latham**

*Director, Corporate Relations and Portfolio Settlements*  
Debt Management Branch, Provincial Treasury  
Province of British Columbia

Box 9423 STN PROV GOVT, VICTORIA, BC V8W9V1

☎: 778-698-5906 📠: 250-356-2121 ✉: [david.latham@gov.bc.ca](mailto:david.latham@gov.bc.ca)

**From:** Meggs, Geoff PREM:EX  
**Sent:** Tuesday, December 12, 2017 11:15 AM  
**To:** Aaron, Sage PREM:EX  
**Cc:** s.17  
**Subject:** Re: For Review: Site C Op Ed

A few grammatical quibbles but good. Sentence starting "Worse" does not seem like a full sentence  
Geoff

Sent from my iPhone

On Dec 12, 2017, at 11:12 AM, Aaron, Sage PREM:EX <[Sage.Aaron@gov.bc.ca](mailto:Sage.Aaron@gov.bc.ca)> wrote:

For your review:

**Making the best decision on Site C for people, and for the future of B.C.**

As Premier, my priority is to deliver on our commitments we made to British Columbians: to make life more affordable, fix the services people count on, create jobs, protect the environment, and make reconciliation with Indigenous peoples a reality.

For many years, we have been critical of the B.C. Liberal government's decision to build Site C. We questioned their motivations, their business case and their budget. Worse, raided Hydro's accounts to balance their budgets, while making people pay more. Hydro rates are up 24 per cent in four years, 70 per cent since 2001.

For these reasons and more, we sent the Site C project to an independent review by the BC Utilities Commission. The BCUC review validated many of our concerns, and left us with two clear options: Complete Site C at a cost of \$10.7 billion. Or cancel Site C and absorb \$4 billion in construction and remediation costs.

Our government listened, deliberated, and debated. But at the end of the day there was only one decision our government could make.

Site C is not the project our government favoured, and it is not the project we would have started, but we must complete it.

I know this decision will be a profound disappointment to some. However, cancelling Site C would mean asking British Columbians to take on \$4 billion in debt with nothing to show for it in return, and worse yet, the province could not pay that bill without hydro rates increasing or making cuts to services people count on.

We will not ask the people of B.C. to take on this debt, and we will not put at risk our ability to deliver the housing, child care, schools, hospitals and other infrastructure people desperately need.

We have not made this decision lightly. I sat across the kitchen table from families, whose farms and homes overlook the Peace River. I met with Treaty 8 First Nations. I met with workers, whose

livelihoods depend on Site C. The decision affects all of these people, and will have profound and lasting impacts for everyone in this province.

To those who demanded that we cancel Site C: I respect the strength of your convictions, and your concern for our future. We share your determination to protect B.C.'s farmland, to move B.C. to a clean, renewable energy future and to move forward with reconciliation with Indigenous peoples.

We can't change the past; we can only make the best decision for B.C.'s future.

The old government committed billions to Site C without appropriate planning and oversight. Our job now is to do everything possible to turn Site C into a positive contributor to our energy future.

We are launching a new project oversight team to ensure the revised Site C budget remains on target.

We will use community benefit agreements to make sure Site C creates training opportunities for British Columbians, and sub-contracting opportunities for local business.

We will enhance food security with new funding to boost the productivity of our agricultural lands, and we will introduce new measures to support reconciliation with Indigenous peoples, including re-opening BC Hydro's standing offer program to trigger new partnerships with First Nations for renewable energy.

We know this decision is not what some First Nations wanted. Your voices were heard and your perspectives were an important part of the deliberations on a very challenging decision. Your voices will be heard as we move forward.

We're putting an end to the years of energy policy that put politics ahead of people – where government forced BC Hydro into costly contracts, hiking rates for homeowners and renters, and delivering dividends to government it simply couldn't afford.

As we move forward, we will define an energy strategy that protects our environment, delivers on our climate responsibilities, powers future generations, and creates jobs and opportunities for all British Columbians and helps the province exceed its climate goals.

Mismanagement by the old government left B.C. in a terrible situation, but we cannot punish British Columbians for those mistakes.

Our decision on Site C was incredibly difficult, but we made the best choice we could for the future and for the people of B.C.

You can count on us to keep working hard to deliver on our commitments and make life better for people.

<20171211 Op\_Ed- Site C\_DRAFT\_V1\_CM dz dd saedits.docx>

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, December 8, 2017 6:46 AM  
**To:** Gibbs, Robb GCPE:EX  
**Cc:** Aaron, Sage PREM:EX  
**Subject:** Re: Draft 1 Site C NR

s.13

G

Sent from my iPhone

On Dec 7, 2017, at 6:09 PM, Gibbs, Robb GCPE:EX <[Robb.Gibbs@gov.bc.ca](mailto:Robb.Gibbs@gov.bc.ca)> wrote:

Hi Geoff,

Attached is a first draft of the Site C NR. Sage and I briefly talked about it this evening, but I'm hoping you two can get together on it in the morning and provide feedback asap.

Tks,

Robb

---

Robb Gibbs  
ADM – Strategic Communications  
Government Communications & Public Engagement  
P: 1-778-698-7469  
C: 1-778-584-1242

<SiteC-NR-Dec7V2.docx>

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, December 1, 2017 9:54 AM  
**To:** Aaron, Sage PREM:EX  
**Subject:** Re: KMs on Site C panelists

Tnx

Sent from my iPhone

On Dec 1, 2017, at 9:50 AM, Aaron, Sage PREM:EX <[Sage.Aaron@gov.bc.ca](mailto:Sage.Aaron@gov.bc.ca)> wrote:

Is this sufficient? Can get more on other angles.

<Presentations to Cabinet.docx>

Page 519 of 538

Withheld pursuant to/removed as

s.22

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Saturday, November 25, 2017 11:53 AM  
**To:** Wright, Don J. PREM:EX  
**Cc:** Nikolejsin, Dave EMPR:EX; MacLaren, Les EMPR:EX; Kennedy, Christine PREM:EX; Lloyd, Evan GCPE:EX  
**Subject:** Re: Check in on Site C

Sounds good

Sent from my iPhone

On Nov 25, 2017, at 11:25 AM, Wright, Don J. PREM:EX <[Don.J.Wright@gov.bc.ca](mailto:Don.J.Wright@gov.bc.ca)> wrote:

I think it would be helpful for us to do a check in on presentation for Wednesday.

I don't think we need the whole crowd as this is mostly getting comfortable about what we present to Cabinet.

4 pm in the West Annex tomorrow?

Sent from my iPhone

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Wednesday, November 22, 2017 9:02 PM  
**To:** Murray Rankin  
**Subject:** Re: The Globe and Mail: Site C might be past the point of no return

Murray, thanks for this note, it's very helpful. I will make sure there is a call to the MPs at the right time, probably around December 6.<sup>s.13</sup>

s.13

s.13

dinner next month.

Look forward to talking more over

Geoff

---

**From:** Murray Rankin <[mrarkin@murrayrankin.ca](mailto:mrarkin@murrayrankin.ca)>  
**Sent:** Wednesday, November 22, 2017 9:29 AM  
**To:** Meggs, Geoff PREM:EX  
**Subject:** Fwd: The Globe and Mail: Site C might be past the point of no return

Hi from chilly Ottawa, Geoff. I just wanted to touch base about Site C as I know that you are involved in this difficult decision.<sup>s.22</sup>

s.13;s.22

All the best!

Murray

<https://www.theglobeandmail.com/opinion/site-c-might-be-past-the-point-of-no-return/article37046330/>

## OOP FOI PREM:EX

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**From:** Meggs, Geoff PREM:EX  
**Sent:** Monday, November 20, 2017 2:07 PM  
**To:** Nikolejsin, Dave EMPR:EX; Wright, Don J. PREM:EX; Lloyd, Evan GCPE:EX  
**Cc:** Sanderson, Melissa EMPR:EX  
**Subject:** RE: Site C Green Party Qs 17-11-19

Thanks, Dave, this looks fine.

Geoff

### GEOFF MEGGS

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Nikolejsin, Dave MNGD:EX  
**Sent:** Monday, November 20, 2017 11:37 AM  
**To:** Wright, Don J. PREM:EX; Lloyd, Evan GCPE:EX; Meggs, Geoff PREM:EX  
**Cc:** Sanderson, Melissa EMPR:EX  
**Subject:** Site C Green Party Qs 17-11-19

Here are the draft answers to the Green Party questions.  
Let me know if you think this approach is ok, or would prefer another.

## OOP FOI PREM:EX

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, November 17, 2017 5:19 PM  
**To:** Lloyd, Evan GCPE:EX  
**Subject:** RE: Site C results

Yes and very interesting results from Insights West.

g

### GEOFF MEGGS

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West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Lloyd, Evan GCPE:EX  
**Sent:** Friday, November 17, 2017 5:09 PM  
**To:** Meggs, Geoff PREM:EX  
**Subject:** Re: Site C results

Note p13 re top priority

---

**From:** Geoff Meggs <[Geoff.Meggs@gov.bc.ca](mailto:Geoff.Meggs@gov.bc.ca)>  
**Date:** Friday, November 17, 2017 at 5:01 PM  
**To:** "Lloyd, Evan GCPE:EX" <[Evan.Lloyd@gov.bc.ca](mailto:Evan.Lloyd@gov.bc.ca)>  
**Subject:** RE: Site C results

Thanks

### GEOFF MEGGS

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501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Lloyd, Evan GCPE:EX  
**Sent:** Friday, November 17, 2017 4:59 PM  
**To:** Meggs, Geoff PREM:EX; Gibbs, Robb GCPE:EX  
**Subject:** Re: Site C results

If you mean BCH Poll? Attached. Otherwise Robb now has the full Insights material – will circulate.  
Evan

---

**From:** Geoff Meggs <[Geoff.Meggs@gov.bc.ca](mailto:Geoff.Meggs@gov.bc.ca)>  
**Date:** Friday, November 17, 2017 at 4:47 PM  
**To:** Robb Gibbs <[Robb.Gibbs@gov.bc.ca](mailto:Robb.Gibbs@gov.bc.ca)>

**Cc:** "Lloyd, Evan GCPE:EX" <[Evan.Lloyd@gov.bc.ca](mailto:Evan.Lloyd@gov.bc.ca)>

**Subject:** RE: Site C results

Robb, can we not get the entire poll?

Geoff

**GEOFF MEGGS**

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Gibbs, Robb GCPE:EX

**Sent:** Friday, November 17, 2017 10:18 AM

**To:** Lloyd, Evan GCPE:EX; Meggs, Geoff PREM:EX; Aaron, Sage PREM:EX; Kristianson, Eric GCPE:EX; Zdravec, Don GCPE:EX; Haslam, David GCPE:EX; MacLaren, Les EMPR:EX; Nikolejsin, Dave MNGD:EX; Howlett, Tim GCPE:EX; Sanderson, Melissa EMPR:EX; Haslam, David GCPE:EX

**Subject:** RE: Site C results

Agreed. s.13

s.13

Note also that this then means this poll was all pre-BCUC.

---

Robb Gibbs  
ADM – Strategic Communications  
Government Communications & Public Engagement  
P: 1-778-698-7469  
C: 1-778-584-1242

---

**From:** Lloyd, Evan GCPE:EX

**Sent:** Friday, November 17, 2017 10:04 AM

**To:** Gibbs, Robb GCPE:EX; Meggs, Geoff PREM:EX; Aaron, Sage PREM:EX; Kristianson, Eric GCPE:EX; Zdravec, Don GCPE:EX; Haslam, David GCPE:EX; MacLaren, Les EMPR:EX; Nikolejsin, Dave MNGD:EX; Howlett, Tim GCPE:EX; Sanderson, Melissa EMPR:EX; Haslam, David GCPE:EX

**Subject:** Re: Site C results

s.13

**EVAN LLOYD**

Deputy Minister,  
Government Communications and Public Engagement – GCPE  
[evan.lloyd@gov.bc.ca](mailto:evan.lloyd@gov.bc.ca)  
250 812 9153

---

**From:** Robb Gibbs <[Robb.Gibbs@gov.bc.ca](mailto:Robb.Gibbs@gov.bc.ca)>

**Date:** Friday, November 17, 2017 at 9:23 AM

**To:** Geoff Meggs <[Geoff.Meggs@gov.bc.ca](mailto:Geoff.Meggs@gov.bc.ca)>, Sage Aaron <[Sage.Aaron@gov.bc.ca](mailto:Sage.Aaron@gov.bc.ca)>, "Lloyd, Evan GCPE:EX" <[Evan.Lloyd@gov.bc.ca](mailto:Evan.Lloyd@gov.bc.ca)>, Eric Kristianson <[Eric.Kristianson@gov.bc.ca](mailto:Eric.Kristianson@gov.bc.ca)>, Don Zadravec <[Don.Zadravec@gov.bc.ca](mailto:Don.Zadravec@gov.bc.ca)>, "Haslam, David GCPE:EX" <[David.Haslam@gov.bc.ca](mailto:David.Haslam@gov.bc.ca)>, Les MacLaren <[Les.MacLaren@gov.bc.ca](mailto:Les.MacLaren@gov.bc.ca)>, "Nikolejsin, Dave MNGD:EX" <[Dave.Nikolejsin@gov.bc.ca](mailto:Dave.Nikolejsin@gov.bc.ca)>, "Howlett, Tim GCPE:EX" <[Tim.Howlett@gov.bc.ca](mailto:Tim.Howlett@gov.bc.ca)>, "Sanderson, Melissa EMPR:EX" <[Melissa.Sanderson@gov.bc.ca](mailto:Melissa.Sanderson@gov.bc.ca)>, "Haslam, David GCPE:EX" <[David.Haslam@gov.bc.ca](mailto:David.Haslam@gov.bc.ca)>

**Subject:** Site C results

Hi all,

s.13

Tks,

Robb

---

Robb Gibbs

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## OOP FOI PREM:EX

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**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, November 17, 2017 9:51 AM  
**To:** Gibbs, Robb GCPE:EX; Aaron, Sage PREM:EX; Lloyd, Evan GCPE:EX; Kristianson, Eric GCPE:EX; Zadavec, Don GCPE:EX; Haslam, David GCPE:EX; MacLaren, Les EMPR:EX; Nikolejsin, Dave EMPR:EX; Howlett, Tim GCPE:EX; Sanderson, Melissa EMPR:EX; Haslam, David GCPE:EX  
**Subject:** RE: Site C results

Robb could you please resend the Hydro poll and<sup>s.13</sup>  
s.13 for example

Thanks

Geoff

### GEOFF MEGGS

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Gibbs, Robb GCPE:EX  
**Sent:** Friday, November 17, 2017 9:24 AM  
**To:** Meggs, Geoff PREM:EX; Aaron, Sage PREM:EX; Lloyd, Evan GCPE:EX; Kristianson, Eric GCPE:EX; Zadavec, Don GCPE:EX; Haslam, David GCPE:EX; MacLaren, Les EMPR:EX; Nikolejsin, Dave MNGD:EX; Howlett, Tim GCPE:EX; Sanderson, Melissa EMPR:EX; Haslam, David GCPE:EX  
**Subject:** Site C results

Hi all,  
s.13

Tks,

Robb

---

Robb Gibbs  
ADM – Strategic Communications  
Government Communications & Public Engagement  
P: 1-778-698-7469  
C: 1-778-584-1242

**From:** [Meggs, Geoff PREM:EX](#)  
**To:** [Wright, Don J. PREM:EX](#)  
**Subject:** Fwd: Site C impact on rates  
**Date:** Wednesday, December 20, 2017 8:38:42 AM  
**Attachments:** 20171206 Letter from Robert McCullough to Ken Boon.pdf  
ATT00001.htm

---

See Boon phone below

G

Sent from my iPhone

Begin forwarded message:

**From:** Ken Boon <[pvla@xplornet.com](mailto:pvla@xplornet.com)>  
**Date:** December 7, 2017 at 3:24:07 PM PST  
**To:** John Horgan <[premier@gov.bc.ca](mailto:premier@gov.bc.ca)>, Honourable Melanie Mark <[AEST.Minister@gov.bc.ca](mailto:AEST.Minister@gov.bc.ca)>, Honourable Lana Popham <[AGR.Minister@gov.bc.ca](mailto:AGR.Minister@gov.bc.ca)>, Honourable David Eby <[AG.Minister@gov.bc.ca](mailto:AG.Minister@gov.bc.ca)>, Honourable Katrine Conroy <[MCF.Minister@gov.bc.ca](mailto:MCF.Minister@gov.bc.ca)>, Honourable Katrina Chen <[CC.Minister@gov.bc.ca](mailto:CC.Minister@gov.bc.ca)>, Honourable Jinny Sims <[CITZ.Minister@gov.bc.ca](mailto:CITZ.Minister@gov.bc.ca)>, Honourable Rob Fleming <[educ.minister@gov.bc.ca](mailto:educ.minister@gov.bc.ca)>, "Minister, EMPR EMPR:EX" <[EMPR.Minister@gov.bc.ca](mailto:EMPR.Minister@gov.bc.ca)>, Honourable George Heyman <[ENV.Minister@gov.bc.ca](mailto:ENV.Minister@gov.bc.ca)>, Honourable Carole James <[FIN.Minister@gov.bc.ca](mailto:FIN.Minister@gov.bc.ca)>, Honourable Doug Donaldson <[FLNR.Minister@gov.bc.ca](mailto:FLNR.Minister@gov.bc.ca)>, <[HLTH.Minister@gov.bc.ca](mailto:HLTH.Minister@gov.bc.ca)>, Honourable Scott Fraser <[IRR.Minister@gov.bc.ca](mailto:IRR.Minister@gov.bc.ca)>, Honourable Bruce Ralston <[JTT.Minister@gov.bc.ca](mailto:JTT.Minister@gov.bc.ca)>, Honourable George Chow <[Minister.TRD@gov.bc.ca](mailto:Minister.TRD@gov.bc.ca)>, Honourable Harry Bains <[LBR.Minister@gov.bc.ca](mailto:LBR.Minister@gov.bc.ca)>, Honourable Judy Darcy <[MH.Minister@gov.bc.ca](mailto:MH.Minister@gov.bc.ca)>, Honourable Selina Robinson <[MAH.Minister@gov.bc.ca](mailto:MAH.Minister@gov.bc.ca)>, "Honourable Mike Farnworth" <[PSSG.Minister@gov.bc.ca](mailto:PSSG.Minister@gov.bc.ca)>, Honourable Shane Simpson <[SDPR.Minister@gov.bc.ca](mailto:SDPR.Minister@gov.bc.ca)>, Honourable Lisa Beare <[TAC.Minister@gov.bc.ca](mailto:TAC.Minister@gov.bc.ca)>, Honourable Claire Trevena <[Minister.Transportation@gov.bc.ca](mailto:Minister.Transportation@gov.bc.ca)>  
**Cc:** <[Geoff.Meggs@gov.bc.ca](mailto:Geoff.Meggs@gov.bc.ca)>, <[don.wright@gov.bc.ca](mailto:don.wright@gov.bc.ca)>  
**Subject:** Site C impact on rates

Dear Premier Horgan and Cabinet Members,

I understand that rate impacts continue to be a big issue. I asked Robert McCullough to summarize the rate impact issue and his response to me is in the letter attached.

Mr. McCullough concludes:

***The bottom line is that regardless of BC Hydro's claims, the current estimate based on BCUC findings is that cancelling Site C will save rate payers a minimum of \$266 million per year or \$123 per household in 2024.***

There is nothing in the law or regulatory practice requiring that BC rate payers be penalized for a termination of a project that is:

- <!--[if !supportLists]-->● <!--[endif]-->twice the cost of the wind backed by Mica Dam alternative,
- <!--[if !supportLists]-->● <!--[endif]-->headed for further cost overruns that could take the total project cost to \$12-\$15 billion,
- <!--[if !supportLists]-->● <!--[endif]-->poorly managed,
- <!--[if !supportLists]-->● <!--[endif]-->environmentally costly, and
- <!--[if !supportLists]-->● <!--[endif]-->one which has adverse impacts on the ability of First Nations to exercise their treaty rights.

It is important to recognize that part of the money spent so far was used for building infrastructure and developing resources in the Peace valley region that have a value and will be utilized.

And, this is without entering into a long term sales agreement of BC power under the Columbia River Treaty entitlement - an agreement which would generate billions of dollars to offset Site C cancellation costs and fund other BC government infrastructure projects.

To continue with Site C is fraught with problems. In 2017, there is no need to destroy our river valley's for power, and the BCUC Final Report has clearly shown we are not "past the point of no return."

I hope this helps towards your decision to terminate Site C which will allow us to take part in the exciting advances happening around the world.

Yours sincerely,  
Ken Boon

Peace Valley Landowner Assoc.

Ken Boon, President

SS#2, Site 12, Comp 19

Fort St. John, BC V1J 4M7

(250)262-3205

Email address: [pvla@xplornet.com](mailto:pvla@xplornet.com)

Facebook page: <https://www.facebook.com/peacevalleylandownerassoc>

Website: <http://www.peacevalleyland.com/>

# McCULLOUGH RESEARCH

ROBERT F. MCCULLOUGH, JR.  
PRINCIPAL

Date: December 7, 2017  
To: Ken Boon  
From: Robert McCullough  
Subject: Repayment of \$2.1 Billion Sunk Cost and \$.5-\$1.8 Billion Reclamation Cost of Site C

I understand that you have been advised that the most important sticking point for canceling the Site C dam is the rate impact. Let me share with you my calculations and observations.

## ***Rate Impact of \$2.1 Billion Sunk Cost***

The first issue is the \$2.1 billion already spent. It is important to note that this amount has already been financed with 30-year bonds and is being paid back on a quarterly basis by BC taxpayers. There is no need to change this approach with or without Site C proceeding.

Importantly, BC's AAA credit rating was recently confirmed taking into account this \$2.1 billion financing commitment.

If the BC Government decides to convert this to ratepayer supported debt, it is the BC Government that ultimately can direct what the amortization is for that debt.

The BCUC treatment was to amortize this over seventy years. Regardless of statements to the contrary, this is well within the BCUC's authority.

Letter to Ken Boon  
December 7, 2017  
Page 2

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The 2024 impact (projected completion date if Site C proceeded) of this is \$104 million per year or \$48 per household.

Also, it is important to recognize, even if some do not fully accept the concept of the “Sunk Cost Fallacy”, not all of the \$2.1 billion is “wasted” when Site C is terminated. Part of that money was used for building infrastructure and developing resources in the Peace valley region that have a value and will be utilized.

***Rate Impact of \$.5 Billion (First Nations estimate) - \$1.2 Billion (BC Hydro/Deloitte estimate) - \$1.8 (BCUC estimate) Reclamation Cost***

There are widely differing estimates of reclamation costs. The very high BCUC reclamation cost estimate of \$1.8 billion was amortized over thirty years.

The 2024 impact of \$1.8 Billion over 30 years is \$123 million per year or \$57 per household.

We think this rate impact estimate is very high, especially given the much lower reclamation estimates of BC Hydro and Deloitte, not to mention the \$ 500 million First Nations estimate. There is also nothing preventing the BC government from using a longer amortization period.

Lower reclamation costs and a longer amortization period would reduce this impact.

***How does the rate impact of Site C cancellation compare to the rate impact of Site C completion?***

Letter to Ken Boon  
December 7, 2017  
Page 3

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Completing Site C (the BCUC base case) involves a minimum cost of \$10 billion amortized over seventy years. The rate payer impact in 2024 would be \$492 million per year or \$228 per household.

Further cost overruns are expected to increase the total project cost to \$12 billion + which will further increase the rate impact.

The bottom line is that regardless of BC Hydro's claims, the current estimate based on BCUC findings is that cancelling Site C will save rate payers a minimum of \$266 million per year or \$123 per household in 2024.

There is nothing in the law or regulatory practice requiring that BC rate payers be penalized for a termination of a project that is twice the cost of the wind backed by Mica Dam alternative, headed for further cost overruns that could take the total project cost to \$12-\$15 billion, poorly managed, environmentally costly, and one which has adverse impacts on the ability of First Nations to exercise their treaty rights.

And this is without entering into a long term sales agreement of BC power under the Columbia River Treaty entitlement which would generate billions of dollars to offset Site C cancellation costs and fund BC government infrastructure projects.

Yours,

A handwritten signature in black ink, appearing to be 'RH' or similar, written in a cursive style.

**From:** [Meggs, Geoff PREM:EX](#)  
**To:** [Gibbs, Robb GCPE:EX](#); [Aaron, Sage PREM:EX](#)  
**Cc:** [Clark, Layne PREM:EX](#)  
**Subject:** Re: Site C full deck  
**Date:** Saturday, November 25, 2017 3:37:32 PM  
**Attachments:** [PremierSeptFinal1.jpg](#)  
[Memorandum - cab retreat slides.docx](#)

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Robb, here are slides I would like for the retreat -- if you're too pressed to get them formatted (graphs for the most part, very simple) let me know and I'll take a run at it. I'll be around tomorrow.

Geoff

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**From:** Gibbs, Robb GCPE:EX  
**Sent:** Friday, November 24, 2017 6:21 PM  
**To:** Meggs, Geoff PREM:EX; Aaron, Sage PREM:EX  
**Subject:** RE: Site C full deck

I'm going to be working that over the weekend, and hopefully early Sunday for delivery.

But for that, it would be great to get both your thoughts on the paper version as soon as you can. I just went over it with Evan and his comments related mostly to the material I indicated that I forgot which is around the green innovative economy.

Tks,

Robb

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Robb Gibbs  
ADM – Strategic Communications  
Government Communications & Public Engagement  
P: 1-778-698-7469  
C: 1-778-584-1242

---

**From:** Meggs, Geoff PREM:EX  
**Sent:** Friday, November 24, 2017 6:02 PM  
**To:** Gibbs, Robb GCPE:EX; Aaron, Sage PREM:EX  
**Subject:** RE: Site C full deck

Robb, when do you think you'll be able to send me the retreat stuff?

Geoff

**GEOFF MEGGS**

Chief of Staff, Office of the Premier  
West Annex, Parliament Buildings,  
501 Belleville St, Victoria, BC V8V 2L8  
(250) 356-6271

---

**From:** Gibbs, Robb GCPE:EX  
**Sent:** Friday, November 24, 2017 5:31 PM  
**To:** Meggs, Geoff PREM:EX; Aaron, Sage PREM:EX  
**Subject:** Site C full deck

Hi there,

This was the full deck I put together going over some cross-tab material on Site C. I realize now that I kept satisfied/dissatisfied with govt core results out of this to try to keep the number of slides down, but I do use satisfied/dissatisfied in cross-tab slides regarding support and arguments.

But my intention is to use that in the Retreat deck.

Tks,

Robb

---

Robb Gibbs  
ADM – Strategic Communications  
Government Communications & Public Engagement  
P: 1-778-698-7469  
C: 1-778-584-1242

Page 535 of 538 to/à Page 537 of 538

Withheld pursuant to/removed as

s.12; s.13

Page 538 of 538

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