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Re: Need for and Alternatives to BC Hydro's proposed Site C Project

Dear Minister Bennett and Minister de Jong,

It is our understanding that, in the coming days, you will be making a recommendation to Cabinet regarding a final investment decision (FID) with respect to BC Hydro's proposed Site C Project. As you know, this decision has profound implications for the Provincial treasury, electricity consumers and the Treaty 8 First Nations.

The Treaty 8 Tribal Association (T8TA) and our First Nations have been deeply involved in the review of this proposed hydroelectric project. This includes participation in the environmental assessment process as well as review of BC Hydro's most recent Integrated Resource Plan. The T8TA has also provided comments to the recent Industrial Electricity Policy Review and BCUC Review. These latter processes have been useful and beneficial to exploring important broader issues respecting electricity planning and regulation in the Province. We commend Minister Bennett for establishing these processes and for seeking broader consensus on how to proceed with developing and regulating the electricity sector going forward.

Following the release of the Site C Joint Review Panel Report in May of this year, the T8TA participated in several additional information exchanges with BC Hydro, concerning its updated electricity planning context as well as a number of outstanding issues from the environmental assessment process.

Based on these exchanges, **our First Nations remain convinced that the Site C Project is not the most economic alternative for British Columbia, and that it involves unacceptable and unnecessary risks**. Our reasons for reaching these conclusions are explained below.

1. The need for new power and energy

Minister Bennett was quoted in the media recently referring to "the 1100 megawatts of electricity that we need today."[1] We hope that the Minister was misquoted, as this statement represents a deep misunderstanding of the reality facing BC Hydro. In order to ensure that the Cabinet decision is based on a thorough understanding of the Crown Corporation's situation, we begin with a brief review of BC Hydro's current planning context.

Figure 1 below presents BC Hydro's needs for future capacity and energy. It reflects the Crown Corporation's most recent 2014 Load Forecast Update, including the Expected LNG (360 MW and 3000 GWh/year by F2021) and the No LNG scenarios, as well as Hydro's current demand-side management (DSM) targets. In this figure, we have advanced the dates for the two Resource Smart capacity projects, GM Shrum Units 1-5 upgrades and Revelstoke 6, and also added natural gas resources (simple-cycle or combined-cycle gas turbines, as appropriate), up to the limit set by the 93% clean energy requirement of the *Clean Energy Act* (*CEA*).

The figure demonstrates that, even with Expected LNG, there is no need for additional new resources until **F2027**. In the event that expected LNG loads do not materialize, the date for additional new resources extends further out to **F2031**.

Indeed, our analysis shows that the full 1100 MW mentioned in the quote will not be required until F2035, with Expected LNG, or by F2038, with No LNG. Under BC Hydro's low load scenario, the full 1100 MW will not be required until **F2041**.[2]

The Resource Smart projects included in these graphs are low-cost capacity resources, and natural gas has become and is widely expected to remain a very low-cost resource. There is thus little doubt that, through F2027, the costs of this scenario remain far lower than one where Site C is commissioned in F2024.

These graphs do indeed demonstrate that, under current forecasts and with Expected LNG, BC Hydro will have significant new energy and capacity needs to meet in the 2030s. However, this finding must be tempered with the following realizations:

- BC Hydro's DSM forecasts assume that annual gains in DSM will decline from over 1000 GWh/year in F2014 to 100 GWh/yr in F2024 to **zero** starting in F2034. In simple terms, BC Hydro anticipates that there will be no new technology innovations in this regard after F2024. As discussed further below, we consider this assumption to be entirely implausible.
- The twelve years between now and F2027 is a very long time in an electricity planning context. Most utilities only plan on a 10-year horizon. Thus, anywhere else in North America, BC Hydro's planning picture would be summarized as: "no new capacity or energy required". It is only to account for Site C that BC Hydro uses a 20- or 30-year planning period.

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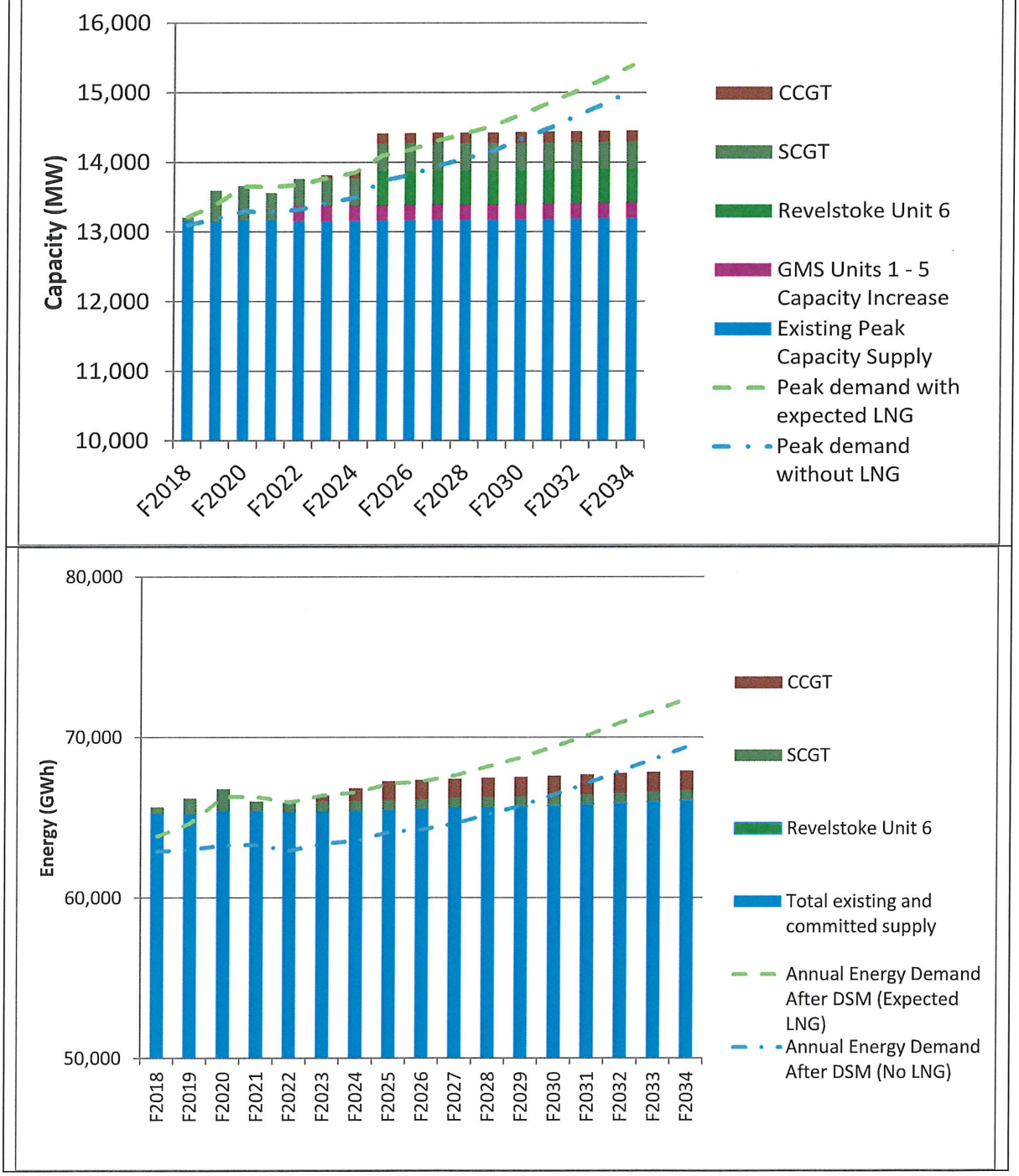
[1] "Geothermal can rival controversial B.C. dam in affordability, power generation: industry," Globe and Mail, Nov. 25, 2014.

[2] BC Hydro. November 2013. Integrated Resource Plan, Appendix 6A, at pp. 6A-69 and 6A-73. (Not shown on Figure 1)

That said, we are convinced that, even based on all of BC Hydro's assumptions, Site C remains less advantageous compared to several available alternatives, which are detailed below.

Figure 1. Capacity and Energy Balances, Existing Resources + Resource Smart + Gas within headroom

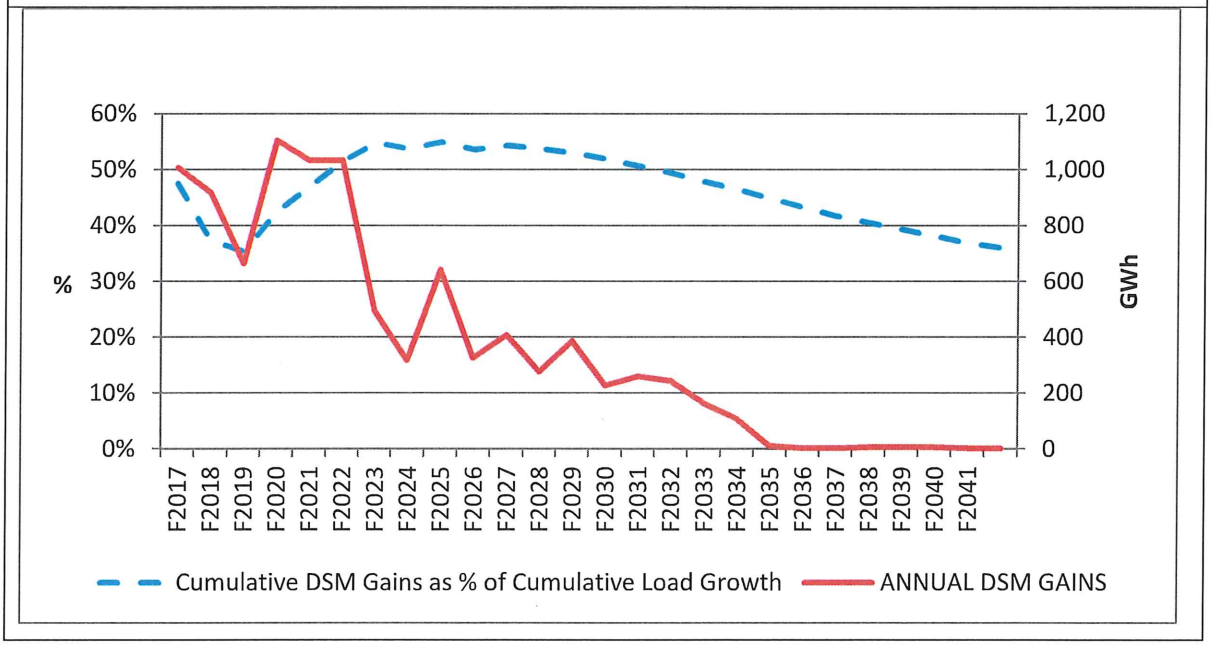


2. BC Hydro foresees no new energy conservation

As you know, the *Clean Energy Act* (*CEA*), adopted in 2010, includes the objective "to take demand-side measures and to conserve energy, including the objective of the authority reducing its expected increase in demand for electricity by the year 2020 by at least 66%" (s. 2(b)). We understand this objective to reflect the BC government's view that DSM is the most cost-effective and environmentally benign way to meet energy needs, and should be aggressively pursued.

We therefore would expect that, in its planning after 2020, BC Hydro would continue to give a high priority to DSM. But it does not. **We were surprised to learn that, in the planning scenario underlying BC Hydro's recommendation to proceed with Site C, expected DSM gains drop off rapidly after 2020, falling to less than 20% of annual load growth by F2024 and to zero by F2034**. As a result, cumulative energy savings as a percent of cumulative load growth also decline dramatically, as shown in the Figure 2, falling to about 35% by F2041. This compares to BC Hydro's current DSM Target of 69% of load growth with Expected LNG and 78% with No LNG by F2021.[3]

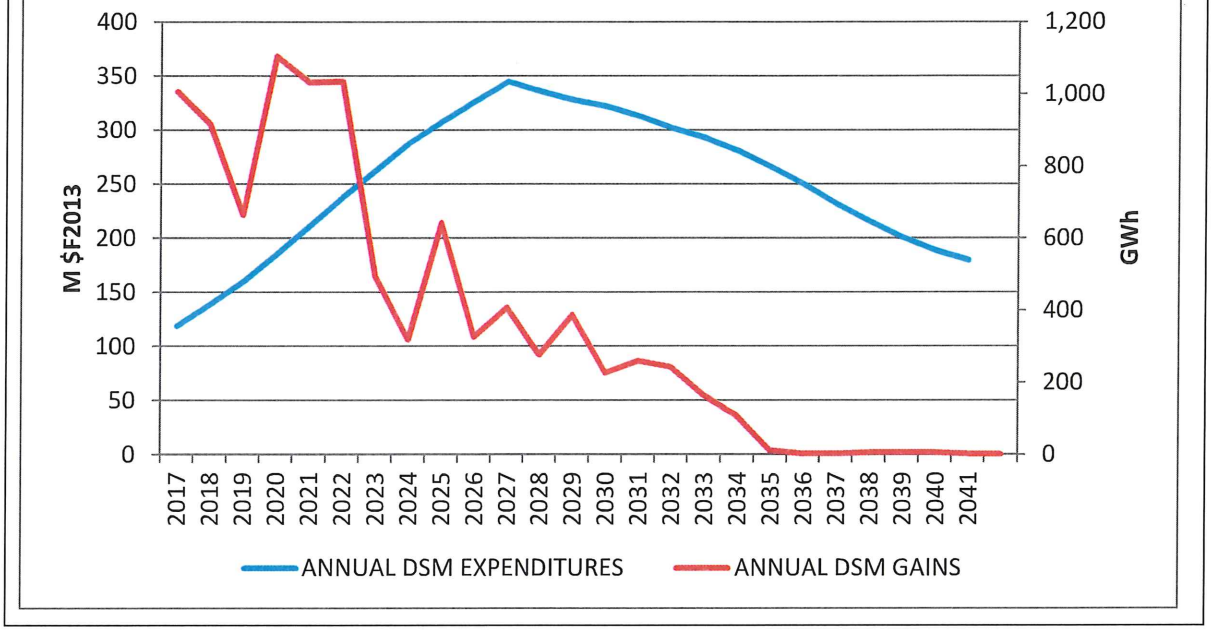
Figure 2. Cumulative DSM Gains as a Percentage of Load Growth



This is not because BC Hydro intends to cease investing in DSM. In fact, after reducing DSM expenditures in the next few years, it forecasts increasing them from F2017 through F2027, and then reducing them gradually, as shown in Figure 3.

[3] BC Hydro. November 2013. Integrated Resource Plan, Table 6-5, at p.6-25.

Figure 3. Annual DSM Gains vs. Annual Expenditures



BC Hydro explains these declining returns, despite substantial funding, by noting that future DSM savings that are deducted from BC Hydro's Load Forecast will need to replace the savings that were previously acquired. BC Hydro assumes that the average DSM program life is about 15 years, depending on the program and the technology employed. At the end of this period, the savings are removed from the DSM plan since they are no longer incremental to what would have otherwise occurred. Thus, BC Hydro believes that in the late 2030s it will have to spend over $200 million per year simply to maintain the gains from past DSM programs.

As long as energy efficiency innovation continues to advance, these future expenditures can be expected to generate additional energy savings. Thus, underlying BC Hydro's forecast is an assumption that innovation in energy efficiency technologies will grind to a halt.

We find that position, quite simply, ridiculous. LED lights, time-of-use prices, programmable thermostats, community energy planning, micro-grids, real-time data analytics, and direct load control are just a few of the many social and technological energy management innovations of recent years, and there is no reason to believe that human inventiveness will come to an end over the next decade. In fact, the pace of energy innovations is increasing rapidly, not declining. The following recent expert testimony before the Manitoba Public Utilities Board speaks to this issue:

> The challenge of DSM for planning purposes, then, becomes the challenge of predicting innovations: we know they will happen, but we don't know exactly how or how much. Yet the reverse is true too: we know that a static view – one in which future DSM savings are limited to the savings opportunities available today – is

> wholly inappropriate for a long-term planning horizon, much less one covering the coming 20 years.
>
> Yet this static view, which implicitly assumes zero innovations over the coming two decades, lies at the root of two important documents in the current proceeding: Manitoba Hydro's Power Smart plan, which anticipates a significant reduction in new savings over the longer term, and EnerNOC's potential study, which similarly assumes significant reductions in DSM potential over time. In both cases, a very real methodological challenge has led to a very unrealistic prognosis for the future of DSM.[4]

Indeed, this belief in the end of technological innovation is symptomatic of a methodological error made systematically by BC Hydro. Many resources were excluded from its Integrated Resource Plan because they are "not ready for prime time". For example, in the case of capacity-focused DSM, geothermal energy, solar energy and other resources, BC Hydro chose to exclude them entirely from its long-term plan because they are not yet fully mature.

This reasoning would be perfectly appropriate for a three-year operational plan, where the utility's obligation to provide reliable service is paramount. It would be wrong for a utility to rely, in the short term, on technologies that have not yet been proven, but it is just as wrong to exclude them entirely on that same basis from a long-term plan.

The Joint Review Panel for Site C made a similar observation:

> It is not unreasonable to hope that every succeeding IRP will increase the contribution of innovations seen today as not well enough understood to be counted upon.[5]

BC Hydro's approach is that it is better to be "conservative" and not count on resources until they are proven. However, from a long-term planning perspective, this approach can be dangerous since it inevitably underestimates the future availability of cost-effective resources, and so tends toward over-supply.

A flagrant example of this type of error was made by Hydro-Quebec in 2002, when it held a tender for long-term supply resources, based on a conservative estimate of future DSM savings. As it turned out, DSM savings continue to be vastly greater than those counted on in 2002.[6] As a result (and combined with other factors), Hydro Quebec Distribution has over-acquired resources and expects to be in surplus until the mid-2020s. The cumulative surplus over the next decade is estimated at over 75,000 GWh, with rate impacts in the billions of dollars as a result of the need to export these surplus resources at far lower prices on the export markets.

There is no need for BC Hydro to make firm decisions in 2014 on how to serve its loads 20 years from now. The world today is very different than it was 20 years ago, and there is every reason

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[4] Dunsky, P. et al. February 3, 2014. The Role and Value of Demand-side Management in Manitoba Hydro's Resource Planning Process. Submitted to the Manitoba Public Utilities Board at the request of Consumers Association of Canada (Manitoba) and Green Action Centre, at p.35.

[5] Site C Joint Review Panel. May 2014. Report of the Joint Review Panel Site C Clean Energy Project BC Hydro, at p. 305.

[6] Commission sur les enjeux énergétique du Québec, Maîtriser notre avenir énergétique. 2013. at p. 179, and Raphals, P. October 9, 2013. Les enjeux énergétiques du Québec : Mémoire du Centre Hélios, at pp. 5-6.

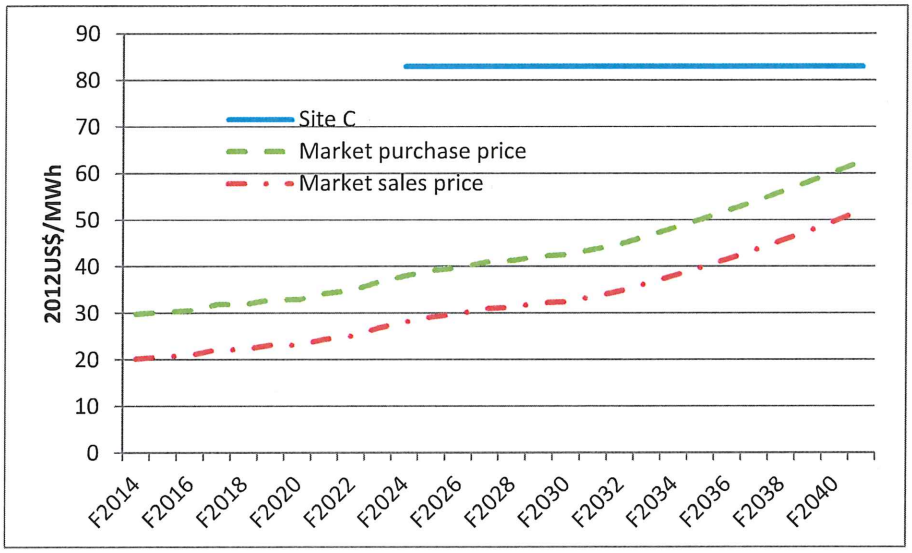
to believe it will be very different as well, in very unpredictable ways, in 2034. **The decision to commit to Site C, a large project with a long lead-time, creates significant risks of over-supply that are not adequately captured in BC Hydro's analysis.**

3. Site C is a high-cost option

BC Hydro estimates the long-term levelized cost of the Site C Project to be $83/MWh at the point of interconnection and $94/MWh delivered to the Lower Mainland. Compared to market prices, this is indeed a very expensive resource.

According to data presented in its 2013 IRP, the market price for BC Hydro purchases at the US Border, under the medium scenario, will remain under $40/MWh until 2027.[7] The selling price is even lower, as shown in Figure 4.

Figure 4. Site C levelized cost compared to forecast market prices



Thus, insofar as Site C could be avoided or delayed by relying on market-priced power, the costs to BC consumers would be dramatically reduced.

As you know, the self-sufficiency requirement of the *CEA* currently prevents BC Hydro from relying on market purchases to meet its future needs. However, as we demonstrate below, there is another option that would allow BC Hydro to access a substantial bloc of market-priced energy while respecting the intent of the *CEA*.

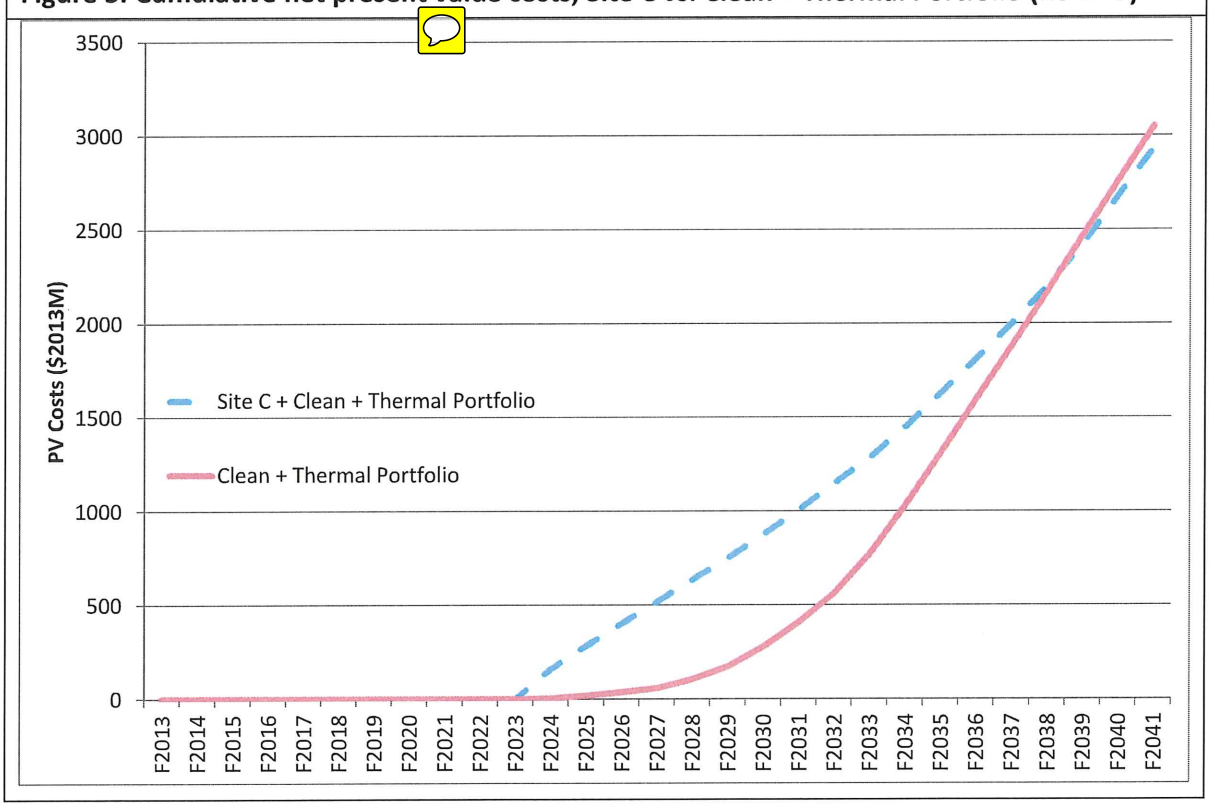
[7] BC Hydro. November 2013. Integrated Resource Plan, Appendix 5A.

4. Site C is a high-risk option

BC Hydro purports to demonstrate that Site C is the least-cost solution to its long-term needs. However, careful analysis demonstrates that the claimed benefits are slight, and would occur only under a series of assumptions that are exceedingly unlikely to remain true into the future. Under more reasonable assumptions, there is a very real risk that the costs of Site C will exceed those of the alternatives, resulting in a long-term adverse effect on rates as a result of the large capital expenditure associated with Site C and the large surplus it would inevitably create. Looking back from the 2030s, Site C would be seen as a very expensive choice considering the affordability of the alternatives, which will only improve over time. **We cannot afford to place the indefinite high-cost burden of Site C on future generations and on the future economy of our Province**.

Figure 5 compares the evolution of cumulative net present value costs for portfolios with and without Site C, based on BC Hydro's analysis and assumptions.

Figure 5. Cumulative net present value costs, Site C vs. Clean + Thermal Portfolio (no LNG)



This figure, based on data generated by BC Hydro's System Optimizer software package, demonstrates that, **until F2038, the cumulative present value portfolio costs without Site C are in fact lower than those with Site C**. Beyond the "crossover point" in F2038, the Site C portfolio does indeed show a lower net present value, but for many years, the expected benefits of the Site C portfolio remain slim. Furthermore, this crossover point is dependent on a

number of highly questionable assumptions. Should BC Hydro be proved wrong on any of these assumptions, the crossover point would be delayed or would never occur. In such a scenario, the decision to proceed with Site C would cause British Columbians to incur costs higher than those of readily available alternatives, for decades into the future.

It is important to understand that, because the export market prices are dramatically lower than the unit cost of energy from Site C, the surplus from Site C can only be exported at a considerable loss, resulting in a substantial burden on ratepayers until such time as that energy is fully utilized in BC. As such, it is necessary to consider BC Hydro's assumptions respecting the various factors that could delay this full utilization of the Site C surplus, as well as the utility's assumptions regarding the cost and progression of the alternatives. In general, BC Hydro's scenario is based on the following assumptions:

- An optimistic load forecast – If load growth is lower than expected, the crossover date will be even farther out since BC Hydro will have overbuilt and will have to export the surplus for a longer period of time. In the low load scenario contemplated in the IRP, the crossover point does not occur, as the alternative portfolio remains cheaper than Site C throughout the planning period.[8]
- Expensive wind power – **BC Hydro assumes there will be no further declines in real wind costs before F2041**, and that the real cost of wind generation will remain equivalent to what it was in 2012. However, since 2009, turbine costs have declined substantially, on the order of 20% to 40%.[9] Turbine performance continues to improve, and some North American jurisdictions are reporting overall project cost declines on the order of 60% since 2009. In the IRP, BC Hydro acknowledges only a portion of these recent cost declines and performance improvements.[10]

  In its exchanges with BC Hydro, the Treaty 8 Tribal Association presented the utility with Figure 5, below, from the US National Renewable Energy Laboratory, requesting the Crown Corporation's views. The figure illustrates 18 different projections of the future levelized cost of energy (LCOE) from wind resources. All but one of these 18 projections forecast substantial reductions in the real cost of wind energy.

  BC Hydro acknowledged that its view was the outlier in the graph, namely the uppermost blue line, according to which there would be no future declines in the real cost of wind energy, and the cost of wind in 2030 would be 100% of its cost in 2011. However, all other industry observers consulted, including the US Department of Energy and the Energy Information Administration, believe that wind costs will decline by an additional 20% to 30% in real terms by 2030, as technology improves. Since wind resources comprise much of the energy in the alternative portfolio to Site C, if real wind costs decline, the crossover date will be farther out, if it occurs at all.

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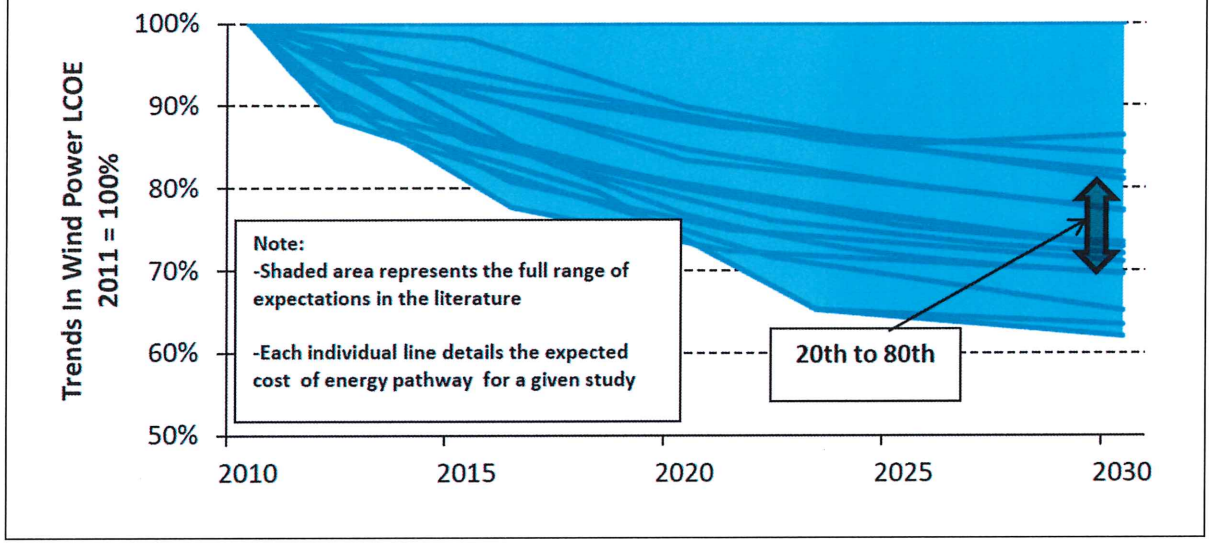
[8] BC Hydro. November 2013. Integrated Resource Plan, Appendix 6A, Table 4, at p. 6A-37. In the low load (small gap) scenario, the non-Site C portfolios cost approximately $1B less than the Site C portfolios.

[9] US Department of Energy. August 2014. 2013 Wind Technologies Market Report, at p.48.

[10] BC Hydro. November 2013. Integrated Resource Plan, Appendix 3A-1: 2013 Resource Options Report Update, at p. 110.

In response to a request from the Association, BC Hydro modeled a scenario following a more mainstream view of future wind costs in BC, involving a 20% decline in the real unit energy cost of wind resources between F2015 and F2030. The result of this single change altered the cumulative present value difference by about $400 million in favour of the alternative portfolio.

Figure 6. Estimated range of wind LCOE energy cost projections[11]



- Very pessimistic DSM forecasts — As noted above, **BC Hydro believes that additional DSM savings will decline rapidly during the next decade and disappear entirely by F2034**. If BC Hydro is wrong, and new technologies create new opportunities to reduce energy consumption, the crossover date will be farther out if it occurs at all, as it would be more affordable to conserve.
- Capacity-focused DSM will not prove effective — As called for by Recommended Action #2 of its IRP, BC Hydro has recently carried out a pilot study of direct load control (DLC), a particularly effective form of capacity-focused DSM.[12] The study, carried out for the Kamloops region, concluded that the potential for DLC is considerably greater than the 300 MW of capacity required by BC Hydro by F2023.[13] However, **BC Hydro continues to decline to include any capacity-focused DSM savings in its long-term plan, because it would be "premature" to do so**. Should any such capacity savings materialize, the

[11] National Renewable Energy Laboratory. May 2012. IEA Wind Task 26: The Past and Future Cost of Wind Energy, at p.26

[12] Enbala Power Networks. Undated. Capacity Focused Demand Side Management at BC Hydro: Industrial and Commercial Potential in the Kamloops Region.

[13] The study was based on a 4-hour curtailment period, and BC Hydro has explained that, in part because of the downstream flow restrictions affecting all generating facilities on the Peace River, it also has 8-hour and 16-hour requirements to meet shoulder capacity needs. However, the addition of gas capacity within the available headroom, which can be operated as required, can address this issue.

crossover date by which Site C starts to show a financial advantage over the alternative portfolio will be even farther out, since it would be more affordable to implement these savings than to develop Site C.

- Distributed generation will not occur – **BC Hydro believes that solar power will not be cost-effective in British Columbia before F2041**, and, more broadly, that BC consumers will never produce significant amounts of their own electrical energy. Industry observers disagree, believing that the cost of solar will decline such that it will be competitive for net metering in BC some time during the 2020s. To the extent customers produce their own electricity, the surplus created by Site C will persist, increasing its costs to ratepayers relative to the alternatives.
- Smart Meters have limited utility – **BC Hydro believes that Smart Meters will never be used for anything other than catching crooks**. In its Business Case for Smart Metering Infrastructure (SMI), BC Hydro claimed that voluntary time-of-use rates made possible by those meters would be adopted by 30% of the population by 2015, and would decrease their capacity needs by 10%.[14] Furthermore, in-home displays were expected to be in 30% of homes, with savings of 4% of total energy consumption.[15]

  Now, however, these goals have been abandoned. In its responses to our questions, BC Hydro made clear that the only gains expected from Smart Meters are from Theft Reduction and VAR and Voltage Optimization. Should the previously expected gains from SMI in fact materialize, they would add to the surplus created by Site C, defer the date when Site C's energy is fully required in BC, and so increase the period during which Site C results in costly energy exports.
- **Geothermal energy will not be developed in British Columbia** — BC Hydro's IRP clearly indicates the cost-effectiveness of at least 500 MW and 4,000 GWh/year of geothermal resources in BC, at a unit energy cost of $100/MWh.[16] Though this cost exceeds the unit energy cost of Site C, the geothermal resource could be developed as required so as to avoid the costly surplus inherent in developing Site C, resulting in substantial benefits for ratepayers. However, BC Hydro continues to hold the following views:

BC Hydro has not seen any successful geothermal development in B.C. to date and it is still highly uncertain and speculative to rely upon an undeveloped resource in B.C. to meet load requirements for which investment decisions must be made now.[17]

Of course, no investment decision must be made now, unless it is to begin construction of Site C for an in-service date of F2024. There remains time to resolve the "uncertain and speculative" nature of the undeveloped geothermal resource in B.C. In addition, BC

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[14] BC Hydro. Undated. Smart Metering & Infrastructure Program Business Case, at p. 27. https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/projects/smart-metering/smi-program-business-case.pdf

[15] *Ibid.*, at p. 28.

[16] BC Hydro. November 2013. Integrated Resource Plan Appendix 3A-1: 2013 Resource Options Report Update, at Figure 5-10.

[17] Letter from Trevor Proverbs, First Nations Engagement Director, to Rick Hendriks for the Treaty 8 Tribal Association, December 5, 2014, at p.4.

Hydro neglects to note the reasons for the lack of geothermal development in the Province, which were made clear in the JRP Report:

> The 1983 BCUC decision on Site C advised BC Hydro to explore the possibilities of unconventional energy sources, including geothermal energy, but little was done. At that time, BC Hydro's budget for such exploration was about $20 million, mostly concentrated on the geothermal resources near Meager Creek. In testimony, BC Hydro characterized its present level of effort as "under $100,000 [per year]." Moreover, BC Hydro said "we don't really have funding to do R&D... In fact we're expected not to do that." However, section 2(d) of the Clean Energy Act states that it is a Provincial objective "to use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources." ...
>
> BC Hydro is not solely to blame for this lack of performance. Governments used to fund geological exploration. In the recent past, B.C. has enjoyed plentiful low-cost electricity, making the exploration of alternative renewable sources seem less than urgent. But times have changed. Failure to ramp up this work a decade ago means that BC Hydro is without a well understood opportunity in the present.
>
> The Panel concludes that a failure to pursue research over the last 30 years into B.C.'s geothermal resources has left BC Hydro without information about a resource that BC Hydro thinks may offer up to 700 megawatts of firm, economic power with low environmental costs. [18]

Should geothermal energy be developed in BC anytime over the next 20 years, the crossover date would be even farther out or non-existent, since it would be more affordable to develop geothermal resources as they are required than to develop Site C with its costly surplus.

- **There will be no construction cost overruns for Site C** – It is rare for large-scale hydroelectric projects not to show cost overruns. Considering that BC Hydro has not developed a large-scale hydroelectric project in decades, the most appropriate comparison for the purposes of potential cost overruns is more recent large-scale hydroelectric development in neighbouring northern jurisdictions. The cost of Manitoba Hydro's Keeyask Project increased 5% just within the period between the environmental assessment and commencement project construction, with the potential for further cost increases during the 5-year construction period.[19] In Labrador, the cost of Nalcor Energy's Muskrat Falls Project and its associated Labrador Island Transmission Link have risen from $5.0 billion in 2010 to $7.0 billion in 2014, an inflation-adjusted (i.e. real cost) increase of 28%.[20,21] The higher the actual construction cost, the longer the alternatives will remain cheaper than Site C.

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[18] Site C Joint Review Panel. May 2014. Report of the Joint Review Panel Site C Clean Energy Project BC Hydro, at p. 299.

[19] Manitoba Public Utilities Board. 2014. Manitoba Hydro Need for and Alternatives to Review of Manitoba Hydro's Preferred Development Plan, Hearing Transcripts March 10, 2014, at p. 1450.

[20] Nalcor Energy. 2011. Muskrat Falls Presentation to the PUB, at p. 37
http://www.pub.nf.ca/applications/MuskratFalls2011/files/presentation/Nalcor-ProjectOverview-July18-11.pdf

- Exchange rates — BC Hydro assumes a constant exchange rate of $0.9693 USD/CAD through F2041. It has stated that it does not need to address exchange rate risk directly, because it is subsumed in market price scenarios.[22] This thinking is simplistic, potentially risky and would not be tolerated in the private sector.

  The value of the Canadian dollar is already 10% lower than the long-term value assumed by BC Hydro. To the extent that Site C construction costs are priced in US dollars, the capital cost of the project has already increased. For example, including inflation and interest during construction, the cost of power facilities alone was $1.4 billion before the current slide in the Canadian dollar began.[23]

  In fact, it is the pattern of future exchange rate fluctuations that influences the economics of Site C. If the Canadian dollar continues to decline over the next 5 years only to appreciate after 2020, the consequences could be severe. Capital costs would be higher, but then, just as Site C energy starts to flood the market, a rising Canadian dollar would reduce export revenues. This scenario illustrates that there are exchange-related risks that have not been addressed and that could materially affect the cost of Site C in relation to the alternatives.

5. The Canadian Entitlement and the self-sufficiency requirement

BC Hydro's import capacity is 2000 MW from the US, and imports of 2000 MW are not uncommon.[24] In fact, in the past, BC Hydro has imported as much as 8,400 GWh in a single year.[25] There is thus no technical obstacle to importing large amounts of power.

However, BC Hydro cannot plan on using these resources because of the self-sufficiency requirement set out in s. 6(2) of the *CEA,* which requires that BC Hydro plan to meet all energy needs with in-province generation. This excludes not only energy purchases from the wholesale market, but also the Canadian Entitlement under the Columbia River Treaty.

The Canadian Entitlement varies from year to year. In F2014, it consisted of 1,330 MW of hydroelectric capacity and 4,425 GWh of energy. These amounts represent "half of the extra power capability at generation facilities in the U.S. that results from the improved water regulation made available by the Columbia River Treaty." [26] The Canadian Entitlement is owned by the Province of B.C. and is marketed on its behalf by Powerex at low market prices similar to those shown in Figure 4, above. However, because the turbines generating the electricity are

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[21] "Muskrat Falls costs rise to almost $7B: Average bill will be $8 per month higher than projected at sanction." CBC News. June 26, 2014. http://www.cbc.ca/news/canada/newfoundland-labrador/muskrat-falls-costs-rise-to-almost-7b-1.2688582

[22] BC Hydro. October 2013. Site C Clean Energy Project Evidentiary Update, at p. 59.

[23] BC Hydro. May 2013. Response to Working Group and Public Comments on the Site C Clean Energy Project Environmental Impact Statement. Technical Memo Project Costs, at p.4.

[24] BC Transmission Corporation. Undated. Planning for the Future: The Interties, pp. 5, 10 and 11. http://transmission.bchydro.com/nr/rdonlyres/b636fd4e-84a0-4384-9c42-ab8fe50d61ad/0/finalintertiepresentationjune2007.pdf

[25] Government of British Columbia. June 2011. Review of BC Hydro, at p. 93.

[26] BC Hydro. 2014. BC Hydro Annual Report 2014, at p. 8.

located in the United States, under the self-sufficiency requirement as formulated in the *CEA*, this energy is not produced by "generating facilities within the Province." As a result, this hydropower, which reflects the contribution of reservoirs located in British Columbia to the hydropower produced on the Columbia River system, cannot be relied upon by BC Hydro for long-term planning purposes. As such, it cannot be used to displace far more expensive resources, such as Site C.

It should be noted that ss. 35(i) and 6(3) of the *CEA* do allow the government to authorize BC Hydro by regulation to enter into electricity import contracts otherwise barred under s. 6(2).

> Subsection 6(3) of the CEA provides an exception to the self-sufficiency requirement found in subsection 6(2). The LGIC may by regulation authorize BC Hydro to enter into contracts for purposes of not meeting the self-sufficiency requirement.[27]

In fact, in its 2013 IRP, BC Hydro announced that it would seek such a regulation to allow it to rely on market purchases of capacity from F2019 to F2023.[28]

In its IRP process, BC Hydro had to assume that the self-sufficiency criterion would remain unchanged throughout its planning period. The Joint Review Panel faced a similar constraint. **The Government of British Columbia, however, is not so constrained, given its executive power to allow exemptions to the self-sufficiency requirement.**

The Joint Review Panel spoke only briefly of the self-sufficiency requirement. However, its comments raise questions as to whether or not this criterion is in the public interest of British Columbians:

> Taken literally, this [self-sufficiency requirement of the *CEA*] means a B.C. disconnected to the outside world, a vision of autarchy truly strange for a province that relies on trade, and a long way from its recent history. (It could also explain the neglect of geothermal opportunities.)
>
> Minor relaxations could mean being connected for reliability or for diversity exchange, which are current practices apparently not condoned by the regulation, or for multi-year balance, all of which seem consistent with the intent if not the drafting of the regulation. ...[29]

The Industrial Energy Policy Review panel established by Minister Bennett in January 2013 raised the same issue in its Final Report:

> As BC Hydro's surplus diminishes, Government should consider whether a requirement for self-sufficiency is consistent with a long-run approach to least cost electricity prices.[30]

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[27] BC Hydro. November 2013. Integrated Resource Plan, at p. 9-39.

[28] *Ibid.*

[29] Site C Joint Review Panel. May 2014. Report of the Joint Review Panel Site C Clean Energy Project BC Hydro, at pp. 304-305. In the same section, the JRP also questioned the current treatment of the Columbia River Treaty and the natural gas "headroom" policy, both of which constrain rational planning options.

[30] IEPR Task Force. October 31, 2013. IEPR Task Force Final Report, at p.18. http://www.newsroom.gov.bc.ca/downloads/Industrial_Electricity_Policy_Review_Task_Force_Final_Report.pdf

The Government's formal response suggested that it is open to reviewing this restraint in the future:

> BC Hydro is currently in surplus. While not under consideration at this time, this recommendation could be considered as energy forecasts change.[31]

However, when the construction of the Site C Project begins, the horse will already have left the barn. Once Site C is commissioned, B.C. Hydro will face energy surpluses into the 2030s and potentially longer. The economic benefit that would flow from the repatriation of the Canadian Entitlement under the Columbia River Treaty would be lost. Powerex would also be in the disadvantageous position of selling the Canadian Entitlement at extremely low market prices.

The self-sufficiency requirement was apparently designed in large part to make it impossible to circumvent BC's clean energy legislation by importing high-GHG power. The Canadian Entitlement, however, consists of hydropower, the environmental costs of which are already borne by British Columbians. Adopting a regulation allowing the import of the Canadian Entitlement could not be seen as compromising BC's climate policies or its goal of energy self-sufficiency.

The consequences of the self-sufficiency criterion were evaluated in the BC Hydro Review in 2011:

> The panel recognizes that the economic and energy situations have changed, and that the existing self sufficiency definition may be overly conservative and place an undue burden on ratepayers. The panel recommends that BC Hydro and the province evaluate alternative definitions and timelines for self-sufficiency that meet the needs of the province and ratepayers in a way that is sustainable for the long term.[32]

To cast more light on this issue, we have prepared a scenario that meets BC Hydro's current load forecast plus Expected LNG (360 MW and 3,000 GWh/yr) assuming that the Canadian Entitlement is exempted by regulation under *CEA* s. 6(3) from application of the self-sufficiency requirement. Given the uncertainties surrounding the renegotiation of the Columbia River Treaty, we have limited the Downstream Benefits in this scenario to 50% of the energy and capacity currently available.[33]

Were the Government of BC to do so, **adopting a regulation exempting the Canadian Entitlement from application of the self-sufficiency requirement would immediately defer the need date for new capacity resources (beyond gas headroom) to F2033 for capacity and to F2031 for energy**, as shown in Figure 7 below.

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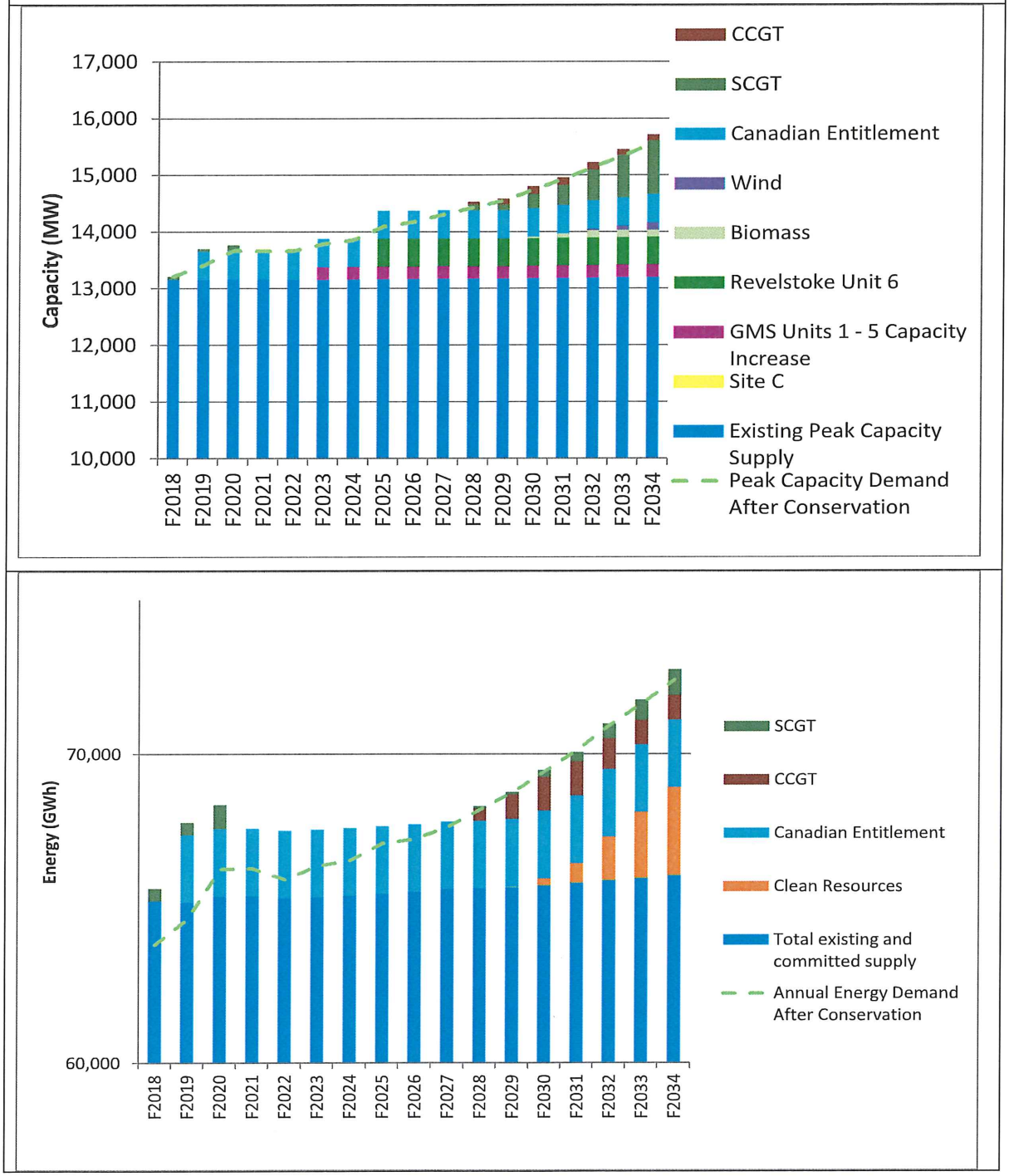
[31] Government of British Columbia. November 2013. Backgrounder: Industrial Electricity Policy Review Background Report. http://www.newsroom.gov.bc.ca/downloads/Backgrounder_Industrial_Electricity_Policy_Review_Report.pdf

[32] Government of British Columbia. June 2011. Review of BC Hydro, at p.10.

[33] Given the importance of the Treaty to US system operations, T8TA considers it implausible that the Americans would abrogate the treaty. However, it is possible that the Downstream Benefits will be reduced. (See: U.S. Benefits from the Columbia River Treaty – Past, Present and Future: A Province of British Columbia Perspective, BC Ministry of Energy and Mines, June 25, 2013. http://blog.gov.bc.ca/columbiarivertreaty/files/2012/07/US-Benefits-from-CRT-June-25-132.pdf)

Figure 7. Capacity and Energy Balances, Existing Resources + Resource Smart + Canadian Entitlement + Gas Within Headroom



Furthermore, one of the additional benefits of exempting the Canadian Entitlement from the self-sufficiency requirement is that doing so would reduce the overall need in BC for electricity generated from natural gas, delaying by several years the development of gas turbines, which are contemplated for development later this decade in all portfolios, including those containing Site C. Indeed, it is paradoxical that, in this context, the application of the self-sufficiency principle as embodied in s. 6(2) would result in British Columbia relying on burning natural gas rather than using its own hydropower, because it happens to be generated by turbines in the United States.

We have also prepared scenarios that include the Canadian Entitlement while also meeting the additional demands beyond F2031 through a combination of additional DSM, wind, biomass and geothermal resources. According to our analysis, **the present value cost of these alternative portfolios are at least $2 billion less than that of the Site C + Clean + Thermal portfolio favoured by BC Hydro**.

We asked BC Hydro to prepare its own analysis of these scenarios, using its System Optimizer software package. Unfortunately, it declined to study any scenario that included repatriation of the Canadian Entitlement. We find this refusal regrettable.

BC Hydro explained its refusal to examine the implications of repatriation of the Canadian Entitlement (CE) in the following terms:

> [T]he definition of self-sufficiency has essentially remained the same since 2007 when Special Direction No. 10 was issued, with sole exception of the move to Heritage hydro average water condition planning in 2012. BC Hydro is not prepared to speculate on changes to existing legislation, and has consistently refused to run scenarios which do not meet existing legal requirements, including refusing a request from the BCUC in 2008 as part of its review of BC Hydro's 2008 LTAP. T8TA has provided no evidence that the B.C. Government is contemplating the CE as a long–term planning resource available to BC Hydro because no such evidence exists. In BC Hydro's view, B.C. Government approval of the 2013 IRP demonstrates otherwise. This comment carries over and forms part of why BC Hydro sees no basis to run T8TA Scenarios 2 and 6.[34]

Thus, in the absence of explicit evidence that the B.C. Government is contemplating the Canadian Entitlement as a long–term planning resource, BC Hydro considers itself barred from examining the implications of so doing.

How, then, would the Provincial Government ever become aware that it could avoid the environmental and Treaty infringement consequences of the Site C Project, avoid borrowing billions of dollars and avoid major rate impacts by repatriating BC hydropower, if BC Hydro believes it is barred from even mentioning this possibility unless explicitly asked to do so by the Government?

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[34] Letter from Trevor Proverbs, First Nations Engagement Director, to Rick Hendriks for the Treaty 8 Tribal Association, December 5, 2014, at p.2.

The BCUC order cited earlier in the letter[35] only states the obvious: that, given the wording of s. 6(2) *CEA*, the Canadian Entitlement is not considered a domestic resource. However, **we have been unable to find any reference from BC Hydro, the BCUC or the BC Government ever explaining why the hydropower from BC reservoirs that constitutes the Canadian Entitlement should be considered a foreign resource**.

How can government make a reasoned decision, if the information before it excludes an option that would dramatically reduce costs while respecting the intent of the existing legislation?

6. Summary: Site C achieves no compelling and substantive objective

As noted at the outset of this letter, **we remain convinced that the Site C Project is not the most economic alternative for British Columbia**. There is no immediate need for the proposed project. The available evidence indicates that the purported need used to justify Site C, even with Expected LNG, will not materialize until **F2027,** and with No LNG until **F2031**. Under BC Hydro's low load scenario, the full 1100 MW provided by Site C will not be required until **F2041**.

BC Hydro asserts present value cost benefits of Site C on the order of several hundred million dollars compared to the various alternative portfolios over a planning period to F2041. More recently, BC Hydro has been reframing the purported economic benefits of Site C compared to the alternatives using an 80-year planning period, long enough to include the entirety of the 70-year financial life and debt-repayment period for Site C. It now claims that the comparative economic benefits of Site C over an 80-year planning period are on the order of $2 billion.

The use of an excessively long planning period deliberately masks the reality that any potential economic advantage of Site C occurs, at the earliest and if at all, several decades into the future. In its recent application to the Manitoba Public Utilities Board, Manitoba Hydro tried a similar strategy. **The Manitoba PUB was unequivocal in expressing its rejection of Manitoba Hydro's 78-year planning period for evaluating alternatives to large hydro projects,** indicating the following as the very first paragraph in the Board's recommendations to the Government of Manitoba:

> As a result of its review, **the Panel rejects Manitoba Hydro's Preferred Development Plan, as well as Manitoba Hydro's suggestion to consider pathways that map out a 78-year future, as the Panel sees Manitoba Hydro's long-term future projections as highly speculative and too uncertain.**[36] [emphasis added]

The conclusions reached by BC Hydro concerning the potential economic advantages of Site C compared to the alternative portfolios are dependent on a series of implausible and dubious assumptions that include the following:

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[35] British Columbia Utilities Commission. December 2009. Order G-150-09, concerning BC Hydro's 2008 Long-Term Acquisition Plan (LTAP).

[36] Manitoba Public Utilities Board. June 2014. Need for and Alternatives To (NFAT) Review of Manitoba Hydro's Preferred Development Plan – Final Report, at p.18 of 306.

- future gains in demand-side management will drop off rapidly after F2020, falling to less than 20% of load growth by F2024 and to **zero** by F2034;
- there will not be any future energy efficiency or technology innovations beyond the next decade;
- no capacity-focused demand-side management will be viable before F2041;
- there will be no further declines in real wind costs between the estimates in the BC Hydro November 2013 IRP and F2041;
- solar power will not be cost-effective in British Columbia before F2041;
- smart meters will never be used for anything other than catching crooks; and
- geothermal energy will not be developed in British Columbia before F2041.

In addition to the available cost-effective alternatives to Site C under existing laws and regulations, the Province also has available to it the Canadian Entitlement under the Columbia River Treaty. On the order of 1300 MW and 4.4 TWh, the Canadian Entitlement is owned by the Province of B.C. and sold at market prices that are currently low and are expected to remain low indefinitely. Currently, the self-sufficiency requirement of s.6(2) of the *Clean Energy Act* bars consideration of this capacity and energy for use in BC since it is not produced by "generating facilities within the Province." As such, it cannot be used to displace far more expensive resources, such as Site C.

In its IRP process, BC Hydro had to assume that the self-sufficiency criterion would remain unchanged throughout its planning period. The Joint Review Panel faced a similar constraint. **The Government of British Columbia, however, is not so constrained, and adopting a regulation exempting the Canadian Entitlement from application of the self-sufficiency requirement would immediately defer the need date for new capacity resources (beyond gas headroom) to F2033 for capacity and to F2031 for energy**.

We have estimated the potential benefits to ratepayers of enacting such a regulation to repatriate the Canadian Entitlement to be at least $2 billion compared to the Site C portfolio preferred by BC Hydro. Importantly, unlike the benefits espoused by BC Hydro in relation to Site C, which are in the distant future and highly uncertain, those of a portfolio including the Canadian Entitlement would be immediate, substantial and highly certain since they occur in the earliest years of the planning period and not several decades hence or not at all.

Our First Nations remain available to continue discussions with BC Hydro and the Province respecting the need for and alternatives to the proposed Site C Project. We believe that all parties gained considerable knowledge respecting the alternatives, including their technical, economic, financial and environmental attributes as a result of these respectful discussions and exchanges of information. Despite best efforts, we were unable to convince BC Hydro to model several alternative portfolios contemplating more realistic future DSM targets, reasonably priced alternative resources, and repatriation of the Canadian Entitlement.

There is much at stake for the Government of BC, for our First Nations, and for our future relations. A cost-effective solution that does not involve Site C is readily available should BC Hydro and the Provincial Government choose to consider it seriously.

Chief Lynette Tsakoza
Prophet River First Nation

Chief Roland Willson
West Moberly First Nations

cc: Treaty 8 First Nations – Chiefs
MLIB – Chief Derek Orr
Government of BC – Treasury Board
Honourable John Horgan – Leader, NDP Official Opposition
Dr. Andrew Weaver – MLA, B.C. Green Party