

Summary of BC Hydro's Position

BC Hydro is proposing to build the Site C Clean Energy Project (Project), a third dam on the Peace River in Northeast BC that would provide 5100 GWh/year of energy and 1100 MW of dependable capacity to help meet the growing demand for electricity in the Province. The Project is undergoing a joint Federal and Provincial environmental assessment process, including review by a Joint Review Panel.

The following discussion summarizes BC Hydro's evidence in the Environmental Impact Statement (EIS) and submissions to the Joint Review Panel.

BC Hydro has an obligation to serve its customers.

Under the Utilities Commission Act (UCA), BC Hydro has a legal obligation to serve its customers and, for over 50 years, has been meeting this obligation by planning carefully, building and maintaining its generation and transmission assets, and operating its system in a way that delivers reliable electricity to its customers when they need it. Importantly, in keeping with both provincial energy policy and BC Utilities Commission (BCUC) decisions, BC Hydro has continually met the electricity needs of its customers while keeping its rates amongst the lowest in North America.

BC Hydro fulfills its legislated obligation, in part, by regularly forecasting short, medium and long term demand and evaluating both demand side management (DSM) and supply options to meet the needs of its customers. Importantly, BC Hydro's planning and operations must align with the spirit and intent of government policy, the Clean Energy Act 2010, and all applicable legislation and regulations. This is a complex task - one that must take into account the inherent uncertainty in planning for the future, the complicated nature of our electricity system, the varied service requirements of disparate customer groups, the need to consider and include contingencies, and the importance of ongoing monitoring, and course correction as required.

Integrated Resource Plan informed the EIS.

Comprehensive long term plans are regularly developed. The most recent planning process resulted in the 2013 Integrated Resource Plan (IRP), a 20 year plan that projects future customer electricity demand, evaluates the options to meet that demand and then recommends the actions to be undertaken, which must align with government policy and are informed by input from province-wide stakeholder consultation. The current IRP was initiated in late 2011 and was reviewed, revised and ultimately approved by Cabinet in November 2013.

Demand forecast to grow by approximately 1% per annum after DSM.

The IRP formed the basis for the analysis in EIS and the evidence provided during the Joint Review Panel. The IRP, the EIS and supporting documents clearly demonstrate the need to acquire additional energy and capacity within the planning period to meet projected growth of approximately 40% from residential, commercial and industrial customers over the next 20 years, and about 22% after DSM. The EIS does not include any load for LNG or significant electrification of personal or commercial vehicles.

While BC Hydro recognizes the inherent uncertainty in forecasts of future load, and that indeed load could grow either more quickly or more slowly, it addresses this uncertainty by providing a range of high, medium and low forecasts and then planning to the mid-load, consistent with other utilities and BCUC decisions.

When BC Hydro looks back on its history, except for a couple of unusual periods including following the 2008 recession, BC Hydro has experienced long term growth in electricity demand. Looking at the period following the introduction of demand side management in 1989 to 2008, long term load growth after DSM has ranged from 1.5% to 2%. Long-term load is forecasted to grow about 1% after DSM, which is in line with other jurisdictions' assessments of their growing needs. Unless population and economic growth in the province stops altogether, demand will continue to grow and BC Hydro will need new supply for both energy and capacity in the planning period and beyond.

Conservation is the first choice to meet future demand.

To meet this projected growth, BC Hydro looks first to conservation and its Integrated Resources Plan targets meeting 78% of future load growth through conservation. This is an aggressive target by any measure; it far exceeds the Clean Energy Act objective of a 66% reduction in forecasted demand through DSM by 2020; the capacity savings represent 85% of the capacity load resource balance gap in F2021, and BC Hydro is among the leading jurisdictions (including California public utilities) as measured by DSM spending as a per cent of retail sales.

Once DSM is pushed to prudent limits, BC Hydro looks at supply side resources to fill the balance of the gap. This is the right thing to do – conserve first, but be able to have supply choices to meet the balance of the gap and, importantly, to be a back-up to the aggressive DSM target that requires all individuals, businesses, and industry to make significant changes to their current energy use.

BC Hydro evaluates options to fill the remaining gap.

To evaluate the supply-side resources that could meet the remaining load requirements after DSM, BC Hydro created technically and economically feasible portfolios of resource options. These portfolios were compared on the basis of financial, technical, environmental, and economic development attributes to determine the preferred method of meeting BC Hydro’s customer demand.

The primary financial test for portfolios was the portfolio present value (PV) comparison. This is a methodology that is consistent with the BCUC *Resource Planning Guidelines* and *CPCN Guidelines*. This analysis demonstrated that the Project is the lowest cost option compared to portfolios of alternative resources under a range of potential scenarios, including sensitivities on market gas and electricity prices, load resource balance (LRB) gap and capital costs. The portfolio PV analysis is conservative as it favours short-lived assets over long-lived assets such as the Project. The actual benefits to ratepayers of portfolios including the Project are significantly higher than is shown in the PV analysis results because the Project delivers benefits for at least 100 years.

In the BCUC approved PV method, these benefits are significantly discounted in comparison to the shorter term purchase agreements that require renewal and additional expenditures. This means that when you look at these portfolios 25 years out, the benefits are discounted to about 10 cents on the dollar. However, what experience demonstrates is that 25 years from now, those benefits would be delivered at 100 cents on the dollar. The choice of a 5% (real) discount rate applying to both the Project and all alternatives ignores the public nature of the good and the long term benefits that accrue to ratepayers and taxpayers. For an economic decision involving a public good, the use of a lower, social discount rate would only increase the relative advantage of the Site C project.

All new supply side resources have an environmental impact.

The comparison of environmental attributes demonstrates that all potential supply-side resources have an environmental impact. However, there is a difference in the level of certainty of the environmental footprint between portfolios. The footprint of the Site C Project is well-defined; however the footprint of the alternative portfolios is uncertain because the actual type and location of resources that may be selected through a potential future clean power call are unknown. It is likely that with many projects located around the province, the alternative portfolios would have higher linear disturbance impacts from the multiple transmission lines, gas pipelines and roads required to connect to the remote sites used for most wind and run-of-river projects.

The project footprint represents a conversion of terrestrial habitat to a reservoir habitat. With inundation, the existing regulated river would, on average, be 2 - 3 times wider. However the Project would deliver 35% of the energy from the WAC Bennett dam with 5% of the footprint because it utilizes the existing storage in the Williston Reservoir.

Evaluation concludes Site C preferred option to meet demand.

Based on the comparison of the financial, technical, environmental, and economic development attributes, Site C is the best option of meeting customer demand in the planning period and beyond.

BC Hydro is accountable to plan prudently and within provincial policy context.

During the Joint Review Panel stage for Site C, some participants provided alternate views about how BC Hydro should plan and operate its system. Some of these alternate views rely on gas-fired generation for capacity and/or energy supply – this results in higher GHG emissions, higher exposure to market price variability and exposure to permitting risk, as past attempts to permit gas at Duke Point and Sumas have demonstrated.

Others would have BC Hydro take more risk from a reliability perspective, rely on DSM to meet all of the future gap, or plan on unproven resource options that have not been commercially demonstrated. While BC Hydro is very interested in the development of new technology, it cannot rely on resources that are “maybes” especially when there is already a heavy reliance on assumed resources such as DSM capacity and intermittent generation.

Finally, some have suggested that BC Hydro rely on higher volumes from external markets, choose higher costs options or plan outside of the provincial policy framework. As a Crown Corporation governed by the laws of the province and accountable to government, BC Hydro must plan prudently and responsibly. This means that it takes a responsible approach to minimize the potential for a generation shortfall as the consequences of under planning can be severe as recently experienced in other Canadian jurisdictions. It also means that BC Hydro plans in accordance with government policy and direction. Doing so is clearly consistent with the EIS Guidelines, which requires the proponent to articulate the need for the project within “the relevant legal and policy context”.

Advancing Site C to meet future need.

The Site C project was identified as the preferred option to meet future need in the 2004 Integrated Electricity Plan and has been re-confirmed in each successive long term plan. In 2010, the Provincial government announced its intention to build the Project subject to achieving environmental certification and meeting the Crown’s duty to consult with First

Nations. Since that time BC Hydro has undertaken significant work required to advance engineering, undertake consultation, conduct field investigations and baseline environmental studies, develop a procurement approach, and prepare for the environmental assessment.

The Project is undergoing a thorough environmental assessment.

Extensive planning and technical studies were conducted over a number of years and the findings are included in a large number of technical data reports that are included in the EIS body of evidence.

The engineering studies and review of alternative means of carrying out the project re-confirmed that the earthfill dam located at Site C, downstream of the Moberly River is the preferred site. The updated design meets current seismic, safety, and environmental guidelines and practises that conform to both Canadian and International standards.

Potential changes to the physical environment and these predicted changes to land, water and air were taken into account in the assessment of the potential effects of the Project. The spatial extent of potential physical changes resulting from the Project, were used to prepare the effects assessment.

The potential changes to the Peace River, from the Project, were predicted to be negligible beyond the Town of Peace River, Alberta, located 300 kilometres downstream of the proposed Project. Expert witnesses provided evidence on paleolimnology, hydrology, ice and ecological studies of the Peace Athabasca Delta (PAD) and confirmed that the effects of Site C would not extend to the PAD.

The potential interaction of Project activities with Valued Components during construction and operations informed the environmental assessment. Conservative assumptions were adopted in undertaking the effects assessment of the Project. Through detailed design and project refinement, it may be possible to further reduce the footprint of the Project, however, the assessment was undertaken with the larger footprint.

The effects of the Project can largely be mitigated.

The conclusion of the substantial work undertaken as part of the evidentiary record indicates that the effects of the Project can largely be mitigated through careful comprehensive mitigation programs and ongoing monitoring during construction and operations. As a result, the Project is unlikely to result in a significant adverse effect on most of the valued components including: Greenhouse Gases, Local Government Revenue, Labour Market, Regional Economic Development, Agriculture, Forestry, Oil, Gas and Energy, Minerals and Aggregate, Harvest of Fish and Wildlife Resources, Outdoor Recreation and Tourism, Navigation, Visual Resources, Population and Demographics, Housing, Community Infrastructure and Services, Transportation, Heritage Resources and Human Health.

A determination of significance was made for 4 valued components.

A determination of significance was made for Fish and Fish Habitat, Wildlife Resources, Vegetation and Ecological Communities and Current Use of Lands and Resources for Traditional Purposes.

For the Fish and Fish Habitat Valued Component, the transformation of a river to a reservoir would create a new and productive aquatic ecosystem. The reservoir is expected to support a fish community of equal or greater productivity than in the existing riverine environment. However, the composition of the fish species is expected to change. Three distinct groups of fish, the migratory Arctic grayling in the Moberly River, the migratory bull trout that spawn in the Halfway River and mountain whitefish that rely on Peace River habitat, may be lost. Although these distinct groups would be affected, these species would continue to be present in the Peace River tributaries and downstream of the Project, and may persist in the reservoir. The probability of loss of the migratory bull trout in the Halfway River is low, and resident bull trout would continue to be found in the Halfway and Pine watersheds. Arctic grayling would continue to be found in the upper Moberly, Pine, Halfway and Beatton watersheds, and mountain whitefish in the Halfway and Pine watersheds, and in the Peace River downstream of the Project.

The assessment of the potential effects of the Project on the Wildlife Resources Valued Component, included the following key species groups: butterflies and dragonflies, amphibians and reptiles, migratory birds, non-migratory game birds, raptors, bats, furbearers, ungulates, and large carnivores. The potential for the Project to result in habitat alteration and fragmentation, disturbance and displacement, and direct and indirect mortality to individual animals for each key species group was assessed. Habitat for certain migratory birds (Canada, Cape May and Bay-breasted Warblers, Yellow Rail and Nelson's Sparrow), considered species at risk, affected by the creation of the reservoir led to a determination of significance. None of the other species of wildlife assessed are expected to be significantly affected by the Project as proposed mitigation would be effective or the populations are not at risk.

For the Vegetation and Ecological Communities Valued Component, the creation of the reservoir and other Project activities and the alteration and fragmentation of some unique terrestrial ecosystems and the loss of some occurrences of rare plants led to a determination of significance.

The creation of the reservoir would result in the loss of some important multi-use, cultural areas and valued landscapes, including sites at Attachie, Bear Flats and Farrell Creek. As a result, a determination of significance has been made for the effect on the use of these areas by certain Treaty 8 First Nations for Current Use of Lands and Resources for Traditional Purposes. Based on the assessment of Wildlife Resources and Fish and Fish Habitat, the effect on hunting, trapping and fishing opportunities and practices was not considered significant.

Comprehensive mitigation measures are proposed.

A framework for environmental and safety management has been developed for activities during construction and operations. The framework is consistent with existing BC Hydro policies and practices and is based on standard environmental and safety management principles. The purpose of these plans is to protect the health and safety of the public and workers and to ensure that measures recommended to mitigate the potential adverse

effects of the Project are implemented. A detailed list of these measures was included in the EIS, and BC Hydro will continue to explore and consider additional potential mitigation and avoidance measures, should the Project proceed.

The Project would require a large number of additional permits and authorizations. These include Federal authorizations under the Fisheries Act and Navigable Waters Protection Act as well as Provincial permits granted by the Ministry of Environment, Ministry of Forests, Lands and Natural Resource Operation and Ministry of Transportation and Infrastructure.

Monitoring of effects and mitigation effectiveness proposed.

In some cases, where the prediction of project effects, or the effectiveness of mitigation measures are uncertain, BC Hydro has proposed monitoring programs. These measures are intended to be transparent, and provide stakeholders with appropriate and relevant information so that the requirements for additional mitigation or compensation can be determined.

Legacy Benefit Agreement ensures long term benefit to regional communities.

BC Hydro has entered into a Legacy Benefit Agreement with the Peace River Regional District and its member municipalities. Under this agreement, BC Hydro would provide an annual payment of \$2.4 million, indexed to inflation, over a seventy year period. This legacy benefit agreement would provide a total of \$360 million (nominal) in payments to the region over a 70 year period. These funds would be utilized by the communities, at their discretion, to provide a long term benefit from the Project.

Extensive consultation with Aboriginal groups and potential for benefits.

BC Hydro began consultation with Aboriginal groups about the Project in late 2007, before any decision to advance the Project to an environmental assessment. As directed in the EIS Guidelines, BC Hydro focussed its consultation efforts on 29 Aboriginal groups, including Treaty 8 First Nations and Métis groups in British Columbia, Alberta and the Northwest Territories, as well as two non-treaty First Nations in B.C.

The EIS contains an assessment of the potential adverse impacts of the Project on the exercise of asserted or established Aboriginal rights and treaty rights of the identified Aboriginal groups. This assessment includes BC Hydro's understanding of each Aboriginal group's asserted or established Aboriginal rights and treaty rights, and how the exercise of those rights may be affected by the Project. This information is derived from the effects assessment carried out for the Current Use of Lands and Resources for Traditional Purposes VC. The EIS presents measures to mitigate or accommodate potential adverse impacts of the Project on the exercise of the identified asserted or established Aboriginal rights and treaty rights.

The EIS also includes summaries of background information for each Aboriginal group, including maps of their traditional territories where they have been made available to BC Hydro. Aboriginal land and resource use summaries have been prepared for each Aboriginal group, involving a review of information made available by Aboriginal groups through traditional land use studies, as well as other publicly available information, to inform BC Hydro's understanding of past, current and reasonably anticipated future use of lands and resources by the 29 Aboriginal groups. Summary information is also included respecting elements included in Impact Benefit Agreements that have been offered or tabled with those First Nations which may be most affected by the Project.

BC Hydro's record of consultation is extensive. The issues and interests raised by Aboriginal groups are described fully in the EIS in an issues tracking table, and are considered in the effects assessments for each applicable Valued Component. BC Hydro

is also working to build capacity among Aboriginal people who may benefit from opportunities that may arise as a result of the Project.

Consultation with Aboriginal groups respecting potential impacts of the Project on the exercise of asserted or established Aboriginal and treaty rights is ongoing. If the Project receives approval, consultation with potentially-affected Aboriginal groups will continue through construction and operations.

SiteC provides important benefits.

While the Project has the potential to result in some adverse effects, it would also provide important benefits to important economic, environmental, system and social benefits to British Columbians and Canada. Key benefits include providing energy, dependable capacity and flexibility, regional economic development, job creation and increased government revenues, as well as benefits for communities and First Nations.

The generation provided by the Project provides direct benefits to customers within the planning horizon and beyond. The Project is the least expensive means to meet BC Hydro's customer demand for energy and capacity within the planning period and is unique in that costs are predictable and continue to decline over time as compared to other resources where the costs increase and can be exposed to fluctuations in the market prices for fuel. The Project would result in decreases to customer rates within the first five years of operations, and would continue to decrease rates for the remainder of the Project life. This would allow BC Hydro's customers to continue to benefit from electricity rates that are among the lowest in North America.

The Project's generation would also contribute to the environment and sustainability over the long-term. The energy from the Project would have low GHG emissions intensity, contributing to both B.C.'s and Canada's GHG emission reduction goals. The Project also provides dynamic capacity that allows the Province and nearby jurisdictions to integrate more renewable energy resources such as wind, solar and run-of-river hydro.

This would, in-turn, lower the GHG emissions and footprint of providing electricity long beyond the planning horizon.

Beyond the economic development benefits of maintaining BC Hydro's low rates, the Project's construction and operations would, in themselves, provide economic development benefits and government revenues. The project would provide 33,000 person-years of employment through all phases of development and construction and would increase Provincial GDP by \$3.2 billion. BC Hydro has taken steps to enable local residents and First Nations to participate in these economic benefits, including funding of training programs and promotion of job opportunities within the community.

The construction of the Project would also provide additional revenues to local, provincial and Federal governments to support health care, education and other services in B.C. and Canada. During operations, revenues would continue to flow to local governments as grants-in-lieu and to the Province through water rental payments.

In addition to the financial benefits to the local communities, there would be a number of non-financial benefits that would leave the region better off. These include improvements to transportation and infrastructure, new recreation facilities and improved transmission reliability.

BC Hydro believes the effects are justified.

BC Hydro has concluded that while the Project has the potential to result in some significant residual effects, they are justified by (1) the public interest served by delivering long term, reliable electricity to meet growing demand, (2) the employment, economic development, ratepayer, taxpayer, and community benefits that would result (3) the ability of the Project to meet this need for electricity with lower GHG impact than other resource options, (4) the limited footprint of the Project, given its generation capability, using water already stored in the upstream reservoirs to generate over 35 per cent of the energy from BC Hydro's largest facility with only 5 per cent of the reservoir

area; and (5) the honourable process of engagement with First Nations and the potential for accommodation of their interests.

This is an inter-generational decision.

There is no debating the fact that a project like Site C is lumpy. It provides a large amount of energy and capacity at a certain point in time and may result in a short-term surplus. This has been true throughout BC Hydro's history when it has brought new large hydro-electric facilities online. This short-term surplus was taken into account when BC Hydro compared the costs of different options in this EIS. History also indicates that, as load has grown, this short-term surplus has been eliminated and the Province now enjoys the benefits of low cost reliable electricity from BC Hydro's heritage assets. This is true for other Canadian jurisdictions, who have the geography and natural topography to pursue large hydro projects and are also doing so at this time.

As the rate analysis provided for Site C shows, within a ten year period this project would, on its own, reduce the price our customers are paying for electricity for the remainder of its operating life. This is a project that is expected to operate for as long as it is maintained and would provide long-term benefits to ratepayers. The analysis in the EIS clearly shows the project is cost-effective over a 20-year period of operations. However, the benefits of the project would continue long after.

The analysis in the EIS assumes there is no LNG load. If even one LNG facility takes service for the non-compression load, the need for energy is advanced and the short-term Project surplus correspondingly reduced.

It is not possible to perfectly match the addition of any new supply resource to exact load growth or plan to the "head of a pin". Site C, gas, and indeed other renewable IPP projects all have lead times and permitting requirements. For large hydro projects, this lead time is longer because of the time required to plan, permit, and construct a facility that will reliably generate power for more than 100 years.

If BC Hydro were to wait until there was a deficit of energy and capacity to precisely match the production of Site C, it would end up exposing its customers to a substantial deficit over a number of years. This is something a prudent utility would never do.

It is BC Hydro's belief, as the entity responsible for planning, maintaining and operating the electricity system to meet the needs of customers in British Columbia, that building Site C is the right thing to do. Based on the analysis and evidence, Site C is the best resource option to meet future electricity requirements, within the planning horizon and for generations beyond.