

From: [Ian and Roz MacLean](#)
To: [Site C Submissions BCUC:EX](#)
Cc: [Kelvin Ketchum](#); [Ian MacLean](#)
Subject: Site C Review by BCUC
Date: Tuesday, August 29, 2017 11:30:42 PM
Importance: High

We would like provide the following information relevant to the [terms of reference](#) and questions issued by provincial government for the review of Site C by the BCUC.

a. whether the project is on time and within budget;

- Completing a project on time and on budget is one aspect of adding a new revenue generating facility. The Shareholder should also be concerned that all of the expected revenue and benefits for implementing the project are included during the BCUC review. When looking at any of the previous BC Hydro large hydro plant additions, the benefit of these facilities were usually underestimated before they were installed. Reviewing the business case for installing the plant 10, 20, or 30 years after first energized found that the benefit-cost ratio was much higher than originally estimated on a plant with a service life of 100 years minimum.

b. the cost to ratepayers of suspending the project;

- Suspending the project delays the availability of energy, capacity and revenue expected in 2024 when Site C is expected to be put in service. Construction costs to the date of cancellation will still have to be paid by BC Hydro customers through higher rates, or from the Provincial Government through higher taxes or deferred support of other programs.
- There is a risk that suspending the project will result in Site C never being able to put the plant into service due to duplicating costs to update design, re-issue contracts, changes to environmental regulations, or new external factors that are not currently known.
- The long lead time (8-10 years) to plan, design, get approvals and build a clean energy project like Site C requires taking a long-term view (i.e. at least 100 years). The obligation of BC Hydro to reliably and continuously meet future public energy needs requires that projects of this magnitude be completed well in advance, despite the possibility of having surplus electrical capacity upon completion. It is not practicable to try to optimize when Site C should be built, since future electrical demand is subject to unknown and uncontrollable future events.

c. the cost to ratepayers of terminating the project;

- Cancelling Site C will still require the payment of the \$2 to \$4 billion spent thus far in construction and committed contracts. This payment will either have to come from BC Hydro's customers through higher

rates, or from the Provincial Government through higher taxes or deferred support of other programs.

- If the project is completed, it will generate \$400 - \$600 million per year of electricity which will, over time, pay for the \$8.8 billion project, which has a projected life of at least 100 years.
- Ontario Hydro cancelled the construction of a gas-powered electrical generating plant several years ago, but the \$1 billion cost had to be repaid by its customers. The resulting high electricity rates are still in the news.
- Revelstoke (REV) Generating Station was the last large new power-plant developed in BC. The 1840 MW REV Generating Station was completed in 1984 during an economic downturn. For several years after completion, all of the REV power that was not needed domestically was sold into the Western North America grid (Alberta & western U.S.), displacing thermal generation there. No spill was required at the REV dam due to a “lack of electricity demand”. REV cost \$2 billion to build during a time of 19% interest rates. The Site C cost of \$8.8 billion will be easier to pay for with much lower interest rates.
- Currently 2,000 workers are employed at Site C, with this number scheduled to grow until the facility is completed in 2024. With the current poor market conditions for minerals, oil and gas and other industry sectors, employment building a public asset that will generate public wealth and benefits for 100 years or more will help bridge the BC economy until new sectors are created or traditional ones recover.

d. what portfolio of generating projects and demand-side management initiatives could provide similar benefits;

- Electricity is generally acknowledged to be an essential service. BC Hydro has the responsibility for continuously and reliably supplying this essential service to the citizens of B.C.
- B.C. Electrical consumption peaks in the winter, requiring maximum power generation during our colder, darker winter days and evenings. Most types of green energy, including solar, wind, and run-of-river hydro, are not “dispatchable” (i.e. cannot be turned on/off as needed to meet electrical demand). Site C, due to the upstream storage and coordination with upstream power-plants, will be a dispatchable electricity resource and able to respond to electricity usage peaks and produce more electricity during high-demand times (e.g. winter, weekdays, morning/evening peak loads). Green energy, if economic, should be encouraged, but it will always need to be coordinated with dispatchable resources such as Site C to keep the electrical system stable and reliable.
- The Peace River has been regulated (lower spring flows, higher fall/winter flows) by the Bennett Dam & Williston Reservoir since the 1960’s. This river regulation allows the production of electricity at the G.M. Shrum (GMS) and Peace Canyon (PCN) generating stations during times when most needed (fall/winter), while storing the high

freshet inflows (spring) for later use. Site C, in coordination with GMS and PCN, will produce a significant amount of clean hydro power when most needed (fall/winter) from the Peace River that is already regulated for that very purpose.

- It has also been suggested that the Canadian Entitlement to Downstream Benefits under the Columbia River Treaty (CRT) could be used to replace the power from Site C. However, there is no guarantee that the Canadian Entitlement will last more than 10 years into the future, since either the U.S. or Canada can give 10 years' notice of CRT termination at any time. Furthermore, the Canadian Entitlement (energy and "dispatchability") is expected to naturally diminish over time based on long-established CRT principles. The CRT Canadian Entitlement is clearly not a replacement for Site C.

e. what are expected peak capacity demand and energy demand.

- The Green Party favours cancelling Site C construction immediately. When discussing their Green energy strategy, the Green Party wants to reduce the 40% of greenhouse gas production of households by replacing gasoline powered cars with electric cars. Site C would support the transition to more electrical powered cars and equipment, which in turn will reduce greenhouse gas generation.
- If Site C produces more power than BC can use in 2024, Site C could support significant greenhouse gas reductions by selling energy to Alberta in its transition from coal-fired generation to cleaner electricity sources. This could be facilitated by a new transmission line from BC's Peace River power-plants into central Alberta, which may be financially supported by the federal government's infrastructure program. The purchase of electricity by Alberta could continue until BC's own electricity needs increase.
- It has been suggested that many small hydro plants are better than one large hydro plant. However, the aggregate environmental impact of small hydro must be considered for a valid comparison. One large (1100 megawatt) Site C hydro plant will have lower aggregate environmental impact (number of transmission lines & roads required, farmland and rivers affected) than the large number (>100) of smaller renewable projects (typically 10 megawatt) that would have to be built in its place. In addition, small hydro plants typically do not have access to water storage for operation in winter when power is needed most, whereas Site C does.

We feel the benefits for installing Site C far outweigh the concerns and construction should continue with a planned in-service date 2024.

Ian F. MacLean P. Eng.

Retired BC Hydro Generation employee

Kelvin Ketchum P. Eng.

Retired BC Hydro Generation employee