British Columbia Utilities Commission

Association of Major Power Customers of BC ("AMPC")

Inquiry Respecting Site C - Comments re Commission's Alternative Portfolio Costs

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This submission responds to the Commission's October 11, 2017 invitation to comment on the three "Illustrative Alternative Portfolio" models released by the Commission in spreadsheet form. The Commission invited comment on the "underlying assumptions" (pp. 5-8 of ex. A-22) and the "calculations, inputs and assumptions" used by the spreadsheet.

1. Preliminary Comment

At the outset, AMPC wishes to note that despite the highly compressed timeframes dictated by the Order in Council giving rise to this proceeding, the record reflects broad and strong participation, and commends the Commission and parties for achieving that result to date. However, the timelines have limited parties' ability to review the record, consider others' submissions, and develop their own submissions. Each of these steps would have yielded a richer record, and improved the quality of contending points of view. In the future, the Commission's standard processes should remain the default for a regulatory proceeding.

2. Overview

Regarding the Illustrative Alternative Portfolio models, AMPC is concerned by the embedded assumption that battery storage can be projected in the near-to-mid term as a reliable source of capacity, especially given that industrial load curtailment is both a proven option to provide needed capacity and significantly cheaper than speculative projected battery costs. In AMPC's view, the Commission's alternative portfolio should consider a fully developed load curtailment program first. In addition, AMPC believes that the Commission ought to consider optionality when considering the economic cost of any alternative energy portfolio, given that optionality acts to mitigate the risks associated with load forecasting. AMPC elaborates below.

3. Curtailable Loads vs. Battery Technology

Curtailable loads have already demonstrated that they can feasibly, cost-effectively and dependably provide system capacity for the necessary duration of peak load events. AMPC's October 11 submission details the specifics of AMPC's position.[1] Once long term curtailable tariffs are established; scalable capacity resources can be delivered in appropriate quantities and at very short notice compared to generation sources. From BC Hydro's forecasts of capacity and energy need, the immediate implementation of curtailable contracts and/or tariffs could provide the necessary time to take a more detailed look at how future energy needs are most reliably and affordably provided. This time is particularly valuable during a period of significant technological development in energy storage, to reduce the risk of adopting a potentially short-lived technology path. Moreover, this provides a non-rate mechanism to retain existing, and attract additional, industrial load.

The alternative portfolio ignores this possibility, and instead suggests that battery technology is an option with relatively low costs (on a $/MW basis). However, this analysis has assumed battery costs that are far too low for the task they would be set to, given that the costs used in the alternative portfolio do not consider the length of charge/discharge cycles required to provide the volume of energy storage required to meet daily peak loads during times of low wind resource output.

For batteries to provide useful capacity when deployed (as envisaged in the profile, namely as back-up for wind energy), they need to be available to provide an amount of energy not just instantaneously, but

[1] Exhibit F81-2, paras. 38-45.

across time periods where wind-speeds are low, which may be several hours per day, over consecutive days.

Based on current technology, the alternative portfolio includes optimistically low battery costs chosen to reflect "balance of system" installations. In these transmission level installations discharges are limited to a few minutes rather than the multiple hours required to meet a typical winter load profile. When one considers the need to provide capacity over multiple hours, given that battery costs are a linear function of the energy storage (MWh) required, the costs of providing the amount of battery capacity needed to provide system capacity are likely understated in the alternative portfolio by at least an order of magnitude.[2]

Finally, the availability of battery technology depends on speculative assumptions about technological improvements in battery function over time, which cannot be predicted with any degree of accuracy. There is therefore a significant risk that battery technology, when needed, is either unavailable or uneconomic.

As a result, AMPC submits that the Commission should, as part of any alternative energy portfolio evaluated, consider the full use of industrial load curtailment to generate needed system capacity, because load curtailment is a well-developed, well-studied program that can be implemented economically and quickly, without the need to speculate on the its potential availability in the future.

4. Energy/Capacity Optionality

Given the uncertainty regarding BC Hydro's load forecast, the flexibility and construction lead-times of the various portfolios' components are key considerations for the Commission, in addition to the cost of supplying forecast loads. Theoretically, a portfolio consisting of scalable elements that can be rapidly deployed to meet actual capacity and energy needs *as they materialize,* will be more likely to produce lower costs to ratepayers than a portfolio consisting of a single large, long-lead time project, even if it has a lower unit energy cost over its life (due to forecasting risk of overbuilding).

Choosing alternatives that may be more slightly expensive on a unit-cost basis but which do not have a significant lead time for construction provides three key benefits:

a) The risk of building excess or premature capacity is reduced.

b) As technology advances and market prices change, there can be greater confidence that the least cost resource is selected at the time of need, meaning that the utility does not need to try to predict the future today.

c) The regulations that restrict portfolio selection may also change over time, reflecting the need to maintain reliable infrastructure at affordably low costs, which may reflect a legitimate policy choice in the face of an alternative of significant rate increases that harm consumers and the economy.

The flexible alternative is likely cheaper for ratepayers if increases in the load forecast do not materialize, or if they materialize later than anticipated, because it allows for small step-wise changes in energy availability that do not require ratepayers to pay for the full cost of a large infrastructure project when the full complement of energy/capacity provided is not needed. The long lead-time capital project will likely be preferred where there is significant confidence in the load forecast.

[2] See August 2016 NERL Report, "Exploring the Potential Competitiveness of Utility-Scale Photovoltaics plus Batteries with Concentrating Solar Power 2015-2030", cited at p. 8 of the BCUC Portfolio Study.

5. Conclusion

In summary, the balance between the value realized by the low unit cost of a large asset relative to the risk of stranded capacity is at the heart of this Inquiry. It is important for the Commission strike a balance between building too early, while ensuring that access to competitive power is not an impediment to general growth in the province.

AMPC believes that if an alternative scenario is to be contemplated, it should maximize customer resources in the form of curtailable loads as a low risk, load encouraging mechanism, before exploring more exotic technologies. AMPC believes this is important because curtailable loads may provide BC Hydro with a cushion for its capacity needs, allowing it to defer deciding on which projects or technologies to implement, and therefore making those decisions with better information.