2021 IRP Consultation
Written Submissions
from stakeholder organizations

- BC Climate Alliance
- BlueEarth
- Capital Power
- City of Campbell River
- Cranbrook Climate Hub
- Evolugen
- Innergex
- Kitselas Geothermal (*also included in our Indigenous consultation*)
- Metro Vancouver
- TransAlta Corporation
- Vancouver Airport Authority

Received July 31, 2021

=== CONTACT INFO ===

First name:
Laura

Last name:
Sacks

Email:
[redacted]

Organization:
BC Climate Alliance

Organization description:
BC Climate Alliance is a non-partisan, non-profit advocacy organization working to create the political will for just, effective and sustainable provincial policies to address climate change in British Columbia.

=== LEVEL OF ALIGNMENT ===

1. Continue with a base level of energy efficiency programs and plan to ramp up

Energy conservation should be the first step in a strategy like this one, as it is the simplest way to meet the needs of the maximum number of customers with the minimum number of negative externalities. We are fully on board with ramping up and accelerating such programs.

2. Pursue voluntary time-varying rates supported by demand response programs

Time varying rates are helpful to make the most of the current electrical capacity, which is essential. However, we feel that this draft IRP plan is inadequate and should be redone using the Accelerated Contingency Scenario and considering risks of short term climate impacts to grid stability and community resilience (see additional feedback in other questions).

3. Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology

Maximizing efficient use of existing electrical capacity is essential. However, we feel that this draft IRP plan is inadequate and should be redone using the Accelerated Contingency Scenario and considering risks of short term climate impacts to grid stability and community resilience (see additional feedback in other questions).

4. Offer a market-price based renewal option to existing clean or renewable independent power producers

This question assumes that, as outlined in the IRP's Base Resource Plan, an increase in provincial energy needs will not come in the next decade. We are very concerned that this predicted surplus does not account for meeting our legislated climate targets, goals of Clean BC, and consumer demand for EVs and heat pumps / ACs which also can filter wildfire smoke. The Accelerated Scenario more accurately reflects the coming demand.

5. Advance the first sequential step of upgrades to transmission infrastructure into the South Coast

N/A. We feel that this draft IRP plan is inadequate and should be redone using the Accelerated Contingency Scenario and considering risks of short term climate impacts to grid stability and community resilience ((see additional feedback in other questions).

6. Plan to acquire new energy and capacity resources

The timeline outlined in the IRP's Base Resource Scenario does not align with provincial GHG emissions reductions targets, which assumes electrification of transit and heating. The Accelerated Scenario should be used instead.

At a time when extreme weather events are increasing, we need more locally generated, renewable energy for redundancy and climate resiliency.

7. Evaluate small BC Hydro plants that are at end-of-life

N/A. We feel that this draft IRP plan is inadequate and should be redone using the Accelerated Contingency Scenario and considering risks of short term climate impacts to grid stability and community resilience (see additional feedback in other questions).

8. Advancing utility-scale batteries in the South Coast

N/A. We feel that this draft IRP plan is inadequate and should be redone using the Accelerated Contingency Scenario and considering risks of short term climate impacts to grid stability and community resilience (see additional feedback in other questions).

9. Final feedback

This IRP does not align with BC's climate goals, consumer shifts towards electric vehicles and heating, and increased risks to power supplies from more extreme storms and wildfires.

The IRP should be redone using the Accelerated Scenario, with a shift from centralized energy generation and transmission to distributed renewable energy.

This is not the time for half measures. The climate crisis must be put at the forefront of all policy. We will be taking these points to BC Ministers.

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Please provide a brief description of your organization. For example, its mandate and/or purpose, non-profit/for profit status, composition of members/owners, and specific organizational goals related to BC Hydro's Integrated Resource Plan.

BluEarth is an independent power producer focused on the acquisition, development and operation of wind, solar, battery storage and hydro. BluEarth operates eleven clean energy projects in BC in partnership with First Nations including the Sechelt Nation, Squamish Nation, Kitselas and Coastal Tsimshian Nation. Over the past 12 months, BluEarth is approaching a half a billion dollars of invested or committed capital and we anticipate further announcements before the end of 2021.

Your alignment with Clean Power 2040

Provide the level of alignment of these elements with your organization's values and interests, as well as any other feedback:

1. Continue with a base level of energy efficiency programs (Base energy efficiency) and plan to ramp up to higher levels (Higher energy efficiency) in future years to achieve 1,700 GWh/year of energy savings and 290 MW of capacity savings at the system level by fiscal 2030. Share your organization's level of alignment and feedback
   BluEarth response: we support CEBC messaging on questions 1-3.
2. Pursue voluntary time-varying rates supported by demand response programs to achieve 220 MW of capacity savings at the system level by fiscal 2030 (Rate suite 2 and Demand Response Program A), and advance the Industrial Load Curtailment Program to achieve 100 MW of incremental capacity savings at the system level by no later than the fiscal 2027 to fiscal 2030 period. Share your organization's level of alignment and feedback.
   BluEarth response: we support CEBC messaging on questions 1-3.
3. Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology for customers to support a new or existing (as applicable) voluntary residential time-of-use rate to shift home charging by 50 per cent of residential electric vehicle drivers to off-peak demand periods (50 per cent EV driver participation) to achieve 100 MW of capacity savings at the system level by fiscal 2030. Share your organization's level of alignment and feedback. BluEarth response: we support CEBC messaging on questions 1-3.

4. Offer a market-price based renewal option to existing clean or renewable independent power producers with electricity purchase agreements expiring in the next five years. There are approximately 20 existing clean or renewable projects, that produce a total of roughly 900 GWh, with electricity purchase agreements set to expire before April 1, 2026. Share your organization's level of alignment and feedback.

BluEarth requires further information on this element. At a high level, we offer that the IRP document is not the place to set price and negotiate terms on privately held partnership projects. However, given that this recommendation has been made in the draft IRP document, our comments follow regarding the data and process that has been used to come up with this recommendation.

- Process: BC Hydro's lack of inclusion of Indigenous Reconciliation as a key planning priority and comments around "continue to consider how to reflect this in the final 2021 IRP" need to be further explained and understood.
- Clarification: comments on EPA renewals "will be offered at market price" require clarification. In past documents this was referred to as the Mid-C price, however, the global landscape has shifted considerably in the past 18 months due to increasing government and corporate commitments to net zero and ESG goals. Electricity generation that is clean unequivocally has an additional revenue stream that must be considered – carbon market price. This is especially true for BC with its net zero commitment and its Climate Change Accountability Act which sets out legislated targets for emission reduction[1], and the fact that the governments own modelling shows the current climate plan falls short of the 2030 target[2]. Further, the recent BC Hydro Phase 2 recommendation[3] of a 100% clean electricity standard and the suggestion for regulatory changes to implement internal price on carbon drive home the need to consider this aspect. . BluEarth requires further information on how this changing landscape will be evaluated when "market price" is referenced. Further, "market price" may also not accurately account for several important factors for BC; economic development and community investment, First Nation partnerships, the risk of long-term market price volatility and the benefit of energy security/resiliency due to in-province generation.
- Process: BC Hydro's plans to do the next IRP in 2026/7 is inappropriate for a market that is experiencing rapid transformation on both supply and demand sides. This adds to BC's risk of missing investment and cost savings due to technological advancements and is out of step with other provinces. For example, IESO has moved to publishing two annual planning documents, the Annual Planning Outlook (APO) and the Annual Acquisition Report (AAR). *"Along with the yearly publication of the APO, [the AAR] report is intended to provide the marketplace with annual sources of information so as to understand Ontario's forecasted needs, along with the proposed acquisition activities to satisfy those needs. With this information, existing and potential proponents will be better positioned to make decisions about assets and services they can bring to the market to address Ontario's reliability needs."*[4] The AESO also completes a Long-term outlook every two years, most recently in 2019 and 2021[5].
- Further BC Hydro Phase 2 recommendations will also accelerate sector transformation leading to a need for more regular supply/demand outlooks and scenario planning for the future.

5. Advance the first sequential step of upgrades to transmission infrastructure into the South Coast region including series compensation, shunt capacitors and thermal upgrades to achieve 550 MW of capacity for the South Coast region by fiscal 2033; prepare to initiate a second step of upgrades to achieve an additional 700 MW of capacity for the South Coast region by fiscal 2039. Share your organization's level of alignment and feedback.
    - Process: BC Hydro's plans to do the next IRP in 2026/7 is inappropriate for a market that is experiencing rapid transformation on both supply and demand sides (see comments in #4).

[1] Climate Change Accountability Act (gov.bc.ca)
[2] https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/2020_climate_change_accountability_report.pdf
[3] BC Hydro Review sets path for electrifying economy, supporting CleanBC | BC Gov News
[4] IESO Annual Acquisition Report, p. 3.
[5] Forecasting » AESO

- The characterization of energy storage in section 3.4 as a "relatively early in the technology lifecycle" is inaccurate. In fact, a new report, "Queued Up", by Lawrence Berkeley National Laboratory finds that as of 2020, there are 168,195 MW of Hybrid facilities in U.S. build queues.
- Further to this, when upgrades and new transmission are considered as in 6.1, non-wires alternatives should be continuously evaluated and cost assumptions updated given pace of technology advancement.
- In addition, we note that BC Hydro's own stakeholder feedback on the IRP shows that energy storage is strongly supported by stakeholders with 60% of stakeholders supporting energy storage as a distributed solution to future needs.

6. Beyond the elements identified above and after demand-side measures, plan to acquire new energy and capacity resources starting with 580 GWh in fiscal 2031, then shifting to primarily capacity resources starting with 110 MW in fiscal 2038. These future resources would be selected from amongst:

Expiring electricity purchase agreements with independent power producers;

New clean and renewable energy resources; and

Upgrades to BC Hydro facilities.

Share your organization's level of alignment and feedback

- Process: BC Hydro's plans to do the next IRP in 2026/7 is inappropriate for a market that is experiencing rapid transformation on both supply and demand sides (see further comments in #4).
- Process: selection from amongst the above items should align with BC's goal to achieve a 100% clean electricity standard as well as objectives for clean energy investment, reconciliation and greenhouse gas reductions. In addition, when considering upgrades to BC Hydro facilities vs. IPP built facilities, the complete value and benefits offered by IPPs must be considered, including local tax revenues, First Nation participation, economic growth and continued cost reductions of renewable technology. Fast build-outs and shielding ratepayers from construction cost overruns must also be considered and transparently shared with stakeholders.
- As an additional comment, we suggest that BC Hydro's consider updating its stakeholder engagement framework. Both IESO and AESO have done this over the past couple of years, in AESO's case to be "inclusive and accessible, strategic and coordinated, transparent and timely, customized and meaningful."[6]
- We also note that BC Hydro's IRP stakeholder feedback provided strong support for reducing greenhouse gases and specifically growing renewable energy and energy storage and Indigenous groups clearly prioritized EPA renewals and the opportunity to be full participants in the procurement process and future projects.

7. Undertake a structured decision-making approach to evaluate small BC Hydro plants that are at end-of-life, or in operation and nearing end-of-life, on a facility by facility basis to determine whether to decommission, divest or refurbish these facilities, on the proposed schedule. Share your organization's level of alignment and feedback.

[6] Engagement Framework » AESO

- Clarification; BC Hydro's evaluation of small plants (#7 p. 34), stakeholders require further information on how this process would work – for example, when would the stakeholder process be kicked off, how many engagement sessions would there be, what is the BCUC approval process envisioned and how that would overlay with any EPA renewal or new capacity requirements?
- Process; When considering upgrades to BC Hydro facilities vs. IPP build facilities, local tax revenues, First Nation participation, economic growth, continued cost reductions of renewable technology, fast build-outs and shielding ratepayers from construction cost overruns must also be considered.

8. Contingency plans: preparing to introduce utility-scale batteries in the South Coast, with the first units installed in fiscal 2029. Share your organization's level of alignment and feedback.

See question 5 answers.

Your feedback to the draft 2021 IRP

Please share any final feedback on the draft 2021 Integrated Resource Plan on how your organization sees the choices proposed in the draft IRP and the trade-offs involved.

Additional feedback

Our past record puts BluEarth in the top class of clean energy investors in British Columbia. As a private company with strong First Nations partnerships and a strong majority shareholder in DIF Capital Partners, we are well positioned to grow. However, there are significant challenges for our sector to continue to invest in BC – namely the continued discussion of the removal of self-sufficiency and most relevant to this consultation, the uncertainty over the incorporation of the **full** CleanBC plan into BC Hydro's IRP (affecting supply/demand requirements) and the relative prioritization of BC's economic development and reconciliation in the consideration of future supply options such as EPA renewals and new electricity procurement.

Overall, the IRP falls short of working to meet government mandated GHG emission reduction targets in the Climate Change Accountability Act by under-estimating the electrification need (which is also "opportunity" for BC Hydro) in BC. This under-estimation is further amplified by the fact that the CleanBC plan is only expected to achieve 56% to 72% of the 2030 target, according to the 2020 Climate Change Accountability Report[7]. Further, since the 2021 IRP will be filed prior to the government releasing the roadmap on how it will achieve 100% of the 2030 target and BC Hydro's plan to wait another 5 years prior to updating the IRP this sets BC Hydro up for continued and increasing misalignment with Provincial climate objectives and BC Hydro Phase 2 recommendations, in addition to the lost opportunity of prioritizing reconciliation, economic development and the creation and retention of jobs within the IPP sector.

Submit

[7] 2020 Climate Change Accountability Report (gov.bc.ca)

Capital Power
1200-10423 101 Street NW
Edmonton, AB T5H 0E9

July 31, 2021

Mr. Chris Sandve
Chief Regulatory Officer
British Columbia Hydro and Power Authority
16th Floor – 333 Dunsmuir Street
Vancouver, BC V6B 5R3

Dear Mr. Sandve,

Re: Capital Power comments in response to BC Hydro's Draft 2021 Integrated Resource Plan ("Draft IRP")

Capital Power provides this submission regarding the Draft IRP that was released by BC Hydro on June 21, 2021, and in response to BC Hydro's request for feedback on the Draft IRP by July 31, 2021.

Capital Power is the owner and operator of the 275 MW Island Generation facility located in Campbell River, which currently has an Electricity Purchase Agreement (EPA) with BC Hydro that runs through April 2022. Capital Power has consistently expressed our interest and willingness to re-contract Island Generation beyond April 2022 with BC Hydro under mutually agreeable terms and remains committed in this respect. Unfortunately, among the various measures set out in the Draft IRP, BC Hydro is proposing to not seek to re-contract with Island Generation. Capital Power strongly disagrees with this particular element of the Draft IRP, submits that it is ill-advised and imprudent from a system planning perspective, and believes that it requires urgent reconsideration and reversal.

Current circumstances, where Island Generation is being dispatched as a result of adverse weather conditions and system contingencies, including unforeseen outages on the transmission lines connecting Vancouver Island to the Mainland, are again highlighting the critical and unique role that Island Generation serves and can be expected to continue to serve in ensuring reliability on Vancouver Island and on the BC Hydro system. It is therefore surprising that the Draft IRP did not include any technical assessments or contingency analysis to support the basis for BC Hydro's position that Island Generation is not required for system reliability post-April 2022, or to demonstrate that other measures will be available and effective in ensuring reliability in the absence of Island Generation post-April 2022. The Draft IRP is fundamentally deficient in these key respects.

Capital Power also notes that there is a need for more urgent resolution of this particular part of the Draft IRP than would be provided through the schedule that BC Hydro proposes for finalizing and seeking approval for the Final IRP. This arises from the impending expiry of the current EPA in April 2022, and the need by Capital Power, as well as community stakeholders in Island Generation, to have certainty in advance of that date for various planning purposes. If BC Hydro does not intend to re-contract with Island Generation, Capital Power will undertake an assessment of the viability and future of the Island Generation facility, which would include potential decommissioning, and which would result in the facility not being available to BC Hydro post April 2022.

Capital Power's perspectives and concerns regarding the foregoing are described in detail below.

General Comments on Draft IRP

The "Base Resource Plan" and "Contingency Resource Plans" presented in the Draft IRP articulate several measures that BC Hydro intends to pursue to meet the electricity needs of British Columbians over a 20-year planning horizon extending through 2041. The first, and most prominent part of the Base plan is comprised of a suite of demand-side measures for energy and capacity savings, followed by measures to:

i. offer a market-based renewal option to existing clean or renewable IPPs with EPAs expiring in the next 5 years;
ii. plan to acquire new energy and capacity resources starting in fiscal 2031, and which would be selected from amongst expiring IPP EPAs, new clean and renewable energy resources, and upgrades to BC Hydro facilities;
iii. advance the first sequential step of upgrades to existing transmission infrastructure into the South Coast region by fiscal 2033, and prepare to initiate a second step of upgrades by fiscal 2039; and
iv. undertake a structured decision-making approach to evaluate small BC Hydro plants on a to determine whether they should be decommissioned, divested or refurbished.

Capital Power's principal concern is that the Draft IRP is deficient in that it does not fully assess Island Generation's potential roles in addressing the uncertainty related to electrification, demand side management ("DSM") and load growth, along with ensuring that customers on Vancouver Island and the Lower Mainland (also referred to as the South Coast) are served with reliable power.

Draft IRP Intention to Not Re-contract Island Generation

BC Hydro states at several points in the Draft IRP that the Base Resource Plan reflects its "preliminary thinking" and was developed for the purposes of continued consultation. It also highlights that the structured decision-making process described in the Draft IRP and that is used to assess the performance of different portfolios relative to the various planning objectives – including trade-offs between objectives – was applied "in full" only to the demand side measures of the plan. The Draft IRP also indicates that options analysis was only performed fully on transmission development timing.

The broad and incomplete approach to how BC Hydro evaluated different portfolios and resource options raises serious concerns regarding the basis for its stated intention to not seek renewal of the Island Generation EPA. The rationale for this important feature of the Draft IRP is only very briefly stated as follows:

> *While we have had discussions with the Island generation counterparty to understand potential terms of a renewal, there is no basis, at this time, to assume that the [EPA] with this facility will be renewed. Accordingly, Island Generation is not assumed to be in operation in the applicable Load Resource Balances after fiscal 2023, and its renewal is not contemplated in the Base resource Plan.*
>
> *(…)*
>
> *Looking for opportunities to reduce commitment with greenhouse gas emission facilities also incorporates consultation results which placed a high priority on reducing greenhouse gas emissions through clean electricity. Not renewing the McMahon and Island Generation [EPAs] could reduce annual system emissions by roughly 340,000 tonnes of CO2e and 10,000 tonnes of CO2e, respectively. (pp. 48-49, BC Hydro Draft IRP)*

This level of assessment is inadequate given that this measure will remove a key asset available to BC Hydro to ensure reliability and respond to unforeseen contingency events on Vancouver Island and in the Lower Mainland after April 2022. At minimum, BC Hydro should have fully assessed and presented the results of this element in the context of its "structured decision-making process," particularly in respect of how the core objective of reliability was considered vis-à-vis other planning objectives and considerations.

Similarly, the Contingency Resource Plans discussed in the Draft IRP do not address the particular risks and challenges that non-renewal of the Island Generation EPA will present for system operations post-April 2022, when the uncontracted facility should not be assumed to be available to BC Hydro. As described further in the sections below, the appropriate type of contingency analysis that should be undertaken regarding any potential non-renewal of Island Generation is the detailed power system load flow analysis that is generally performed by transmission system operators as part of ongoing system planning efforts, and which assesses the impact various generation, transmission, load, and other system contingency events present for reliability at all points on the system, and relative to applicable reliability standards. The distinct electrical attributes of Vancouver Island relative to the rest of the BC Hydro system make this type of analysis particularly critical in respect of Island Generation.

Island Generation Operations

Capital Power has owned and operated the Island Generation facility since 2010. The 275 MW capacity facility is the single largest power generation facility on Vancouver Island, representing approximately one-third of the generation capacity on Vancouver Island. Island Generation employs 15 permanent employees (which includes 10 union positions) and one contractor. It contributes roughly $1.5 million per year in annual property tax to Campbell River as well as payment for water and sewer services averaging more than $100,000 per year since 2018. Through our community giving programs, Capital Power has worked with employees and community officials to provide funding and support to a range of local organizations, with total contributions across these programs totalled $21,750 in 2020.

In the brief discussion of Island Generation in the Draft IRP, BC Hydro states that it operates Island Generation "as a dispatchable facility based on system requirements and market conditions" and "generally…on an infrequent basis in favour of other lower cost resources…" This is in an incomplete description of the specific role and value Island Generation provides to BC Hydro. A more complete overview was provided in the BCUC Site C Inquiry Final Report from November 2017. Based on information provided by BC Hydro as part of that process, the BCUC noted that BC Hydro does "make use of Island Generation's ability to provide dependable capacity, and does so on an as-needed basis" and that BC Hydro dispatches Island Generation for the following reasons:

- to support Vancouver Island reliability during periods of Vancouver Island transmission outages;
- to serve high domestic loads during cold snaps,
- to support PowerEx trade exports under opportune market conditions, and
- as part of routine testing.

It is concerning that the Draft IRP includes no discussion or analysis suggesting that there will not be a continued requirement to address any of the above circumstances, or that an alternative (including new transmission) to the dependable capacity provided by Island Generation will be available to meet these key reliability and system requirements, particularly in the near to medium term after April 2022.

Recent weather and system events highlight the continued importance and unique role Island Generation has in addressing these types of system requirements. The facility has been dispatched on a regular basis since April 2021 in response to a number of unanticipated and extreme conditions affecting the grid, including the significant and extended heat event of late June/early July 2021 that resulted in record levels of load on the system but that also limited the availability of existing transmission connections to Vancouver Island. Capital Power has more recently been advised that the unit will continue to be dispatched beyond July 2021 to support Site C construction activities. Attachment 1 is a chart prepared by Capital Power illustrating monthly generation from Island Generation since January 2016, and which clearly indicates the significant degree to which the facility has recently been relied on to support system reliability.

Given these current circumstances, it is perplexing that BC Hydro is seriously considering not renewing the existing EPA without having provided any contingency analysis and modeling demonstrating that – in the

event similar circumstances arise in Summer 2022 – continued reliability can be assured without the Island Generation facility. Nowhere in the plan are there any mention of near-term actions that would reduce BC Hydro's reliance on the facility. Without dependable capacity on the Island, Capital Power is concerned that similar conditions as recently experienced could result in supply shortfalls.

Capacity Role of Island Generation and EPA Renewal Assessment

The terms of the Island Generation EPA provide BC Hydro with exclusive rights to dispatch the facility at any time and responsibility for procuring the associated natural gas fuel requirements. Capital Power is required to ensure the facility is available as and when required by BC Hydro.

As a predominantly hydro-based utility, BC Hydro's EPAs have generally been structured as energy procurements, rather than capacity supply. As most of the EPAs are also for run-of river hydro, wind and solar developments, which provide minimal to no firm or dispatchable capacity, a continued focus on the energy value provided by those facilities for the purposes of future IPP EPA re-contracting, as proposed in the Draft IRP, may be appropriate.

In contrast, Island Generation primarily contributes capacity on Vancouver Island where there is no market to measure the value of that capacity. The value of this particular EPA must instead be considered in the context of its ability and unique location on the system to mitigate capacity shortfalls that are the result of forecast uncertainties or operational contingencies as describe above, and at a competitive cost compared to any alternative, including demand response programs that target capacity. In addition, the value of the ability to defer peak capacity related investments or programs also needs to be considered.

The Draft IRP does not include analysis related to how proposals not to renew IPP EPAs balances costs and reliability on a regional basis. While references to "market price" provide some indication that cost is a consideration, it is unclear how that concept relates to "cost-effectiveness", which BC Hydro refers to as a "flexible concept". The cost-effectiveness concept is also noted as not to be exclusive of social, environmental and indigenous interests. Assuming the Draft IRP contemplates utilization of imports from adjacent jurisdictions for reliability under certain conditions, it is unclear how those imports – which will be from markets with grid intensity factors greater than zero – are compared to internal resources in consideration of environmental interests. Nor does the Draft IRP clearly articulate how these imports are evaluated against the local development, economic, and indigenous interests that come with internal resources.

With respect to emissions, Capital Power notes the efficiency and low emissions intensity of the facility also results in a low overall level of emissions, given the generally capacity-driven dispatch of the facility. Annual emissions from Island Generation represent less than 1% of BC's overall GHG emissions.

Vancouver Island Regional Planning Considerations

The capacity balance and reserves of Vancouver Island deserves careful attention due to its unique location in BC's grid. As the bulk of required capacity on the Island is provided by submarine transmission from the mainland, the Island is vulnerable to contingencies that may limit transfer capacity coincident when other stresses such as adverse weather that may already have created challenging conditions for industry and residents.

Although such events may have low probabilities, they also have a high impact and contingency plans must be in place to ensure reliable delivery for Island customers. The damage to the Island's connector cables arising from the June 2021 heatwave is a stark example of this type of contingency, and the value of the Island Generation facility as cost-effective insurance against such unpredictable events.

Transmission interconnections also allow the capacity of the Island Generation facility to be made available to supplement possible capacity shortfalls on the Lower Mainland by reducing demands on interior

generation and transmission during unpredictable peak loads. There is a wide range in the load forecast for capacity, reflecting significant uncertainties in the adoption of electric vehicles and responses to further DSM measures and tariff related incentives to reduce peak demand, particularly in the lower mainland. This uncertainty appears to have the largest impact on the South Coast. One of the Draft IRP Contingency Resource Plans indicates that should electrification accelerate, and DSM measures fail to perform as expected (which is very possible given the intrinsic nature of DSM), savings may not materialize until 2026 and may not be verified until a few years later. In that situation, BC Hydro may be required to rely on temporary market allowances for imports in the mid-2020s. Island Generation is clearly an alternative to these imports, but BC Hydro has not evaluated it as an alternative option to meet this bridging requirement.

It is also unclear from the Draft IRP if the value of generating capacity on Vancouver Island has been considered in managing the uncertainties of South Coast capacity requirements that would allow the deferral of future measures such as temporary market allocations, battery investments, and/or mainland transmission enhancements.

Transmission Planning and Contingency Analysis

To accomplish goals around electrification, it is necessary to ensure that reliable supplies are available for consumers. While the Draft IRP provides some high-level tables of results (e.g. Tables 3 and 4), Capital Power believes much more detail is required to properly evaluate what conclusions can be drawn from the results, particularly whether system reliability will be robust across a range of contingency events.

Overall, Capital Power notes that there is no indication of how the reliability risk of capacity shortfalls and various transmission or generation contingencies that may have different values or consequences for the Island versus the Lower Mainland have been quantified and evaluated in the Draft IRP. Specific issues of concern regarding contingency analysis aspects of the Draft IRP are as follows:

- Particularly with respect to the capacity balance tables for Vancouver Island and the South Coast it is necessary to understand how BC Hydro has calculated the firm transmission capability, and what conditions (e.g. N-0, N-1, seasonal variation in transmission ratings) were used in determining this value as transmission delivery is critical to providing reliable power. For example, in Table 4 (Vancouver Island Capacity Load Resource Balance), starting in F2023, without Island Generation, there is a reported surplus of 234 MW, but should load be higher, and/or one of the undersea transmission lines be on outage, there would equally be a capacity shortfall.

- Further, to assess the deliverability of generating assets, the Draft IRP does not articulate the effective load carrying capability of the resources in these tables. Among many key questions in this regard, it is not clear whether these are based on nameplate, derated for forced/planned outages, reflect seasonal variations in fuel, or aligned with time of peak demand. Additional detail regarding these input assumptions is critical to confirmation that BC Hydro has ensured that from a planning perspective enough supplies are available to meet demand, even under standard contingencies.

- The Draft IRP does not compare the value of having the reliability option that is Island Generation against the value of lost load, which is typically in the $3,000-$10,000/MWh range or more depending on the customer. Capital Power believes that the risks inherent in the plan could lead to a high impact, low probability event that could be alleviated by maintaining BC Hydro's option to call on dependable, dispatchable capacity at Island Generation.

- Within the Draft IRP it is mentioned that should capacity in the region be required, BC Hydro may look to quickly site a battery as they have relatively short lead times. Capital Power submits that, given the current state of battery technology, it is unlikely that any battery storage solution would be capable of providing the dependable long duration backstop capacity provided by Island Generation, and particularly in the near-term.

Timing Considerations

Capital Power understands BC Hydro intends to develop a Final IRP that will be filed with the BCUC by the end of 2021. While the timelines for the subsequent BCUC process to consider the Final IRP are unknown at this time, Capital Power would expect this to extend into mid-2022.

This timeline would not provide the timely resolution and certainty that Capital Power, and local stakeholders with interests in the Island Generation in terms of the local employment, taxes and other community benefits it provides, require with respect to whether or not the facility will be re-contracted.

Capital Power advises that, in the event that BC Hydro affirms its intention to not re-contract with Island Generation, Capital Power will undertake an assessment of the viability and future of the facility, which would include potential decommissioning, and which would result in the uncontracted facility not being available to BC Hydro post-April 2022.

Closing Remarks

For reasons described above, Capital Power believes the Island Generation facility remains essential to BC Hydro's ability to ensure a reliable electricity system for British Columbians, particularly on Vancouver Island. As has been communicated consistently over the last several years, Capital Power remains willing and committed to working with BC Hydro to renew the EPA on mutually acceptable terms beyond its currently scheduled expiry of April 2022 to ensure it remains available to support BC Hydro's mandate in this key respect.

We urge BC Hydro to reconsider and reverse its intention reflected in the Draft IRP to not re-contract with Island Generation. The Draft IRP does not provide adequate technical information and analysis to demonstrate that system reliability would not be diminished or impaired without the Island Generation facility being available to manage contingency events as soon as May 2022, and that BC Hydro not proceeding with Island Generation re-contracting is reasonable and prudent from a transmission system planning and operations perspective.

Please contact me at [redacted] or at [redacted] if you have any questions or wish to discuss Capital Power's comments.

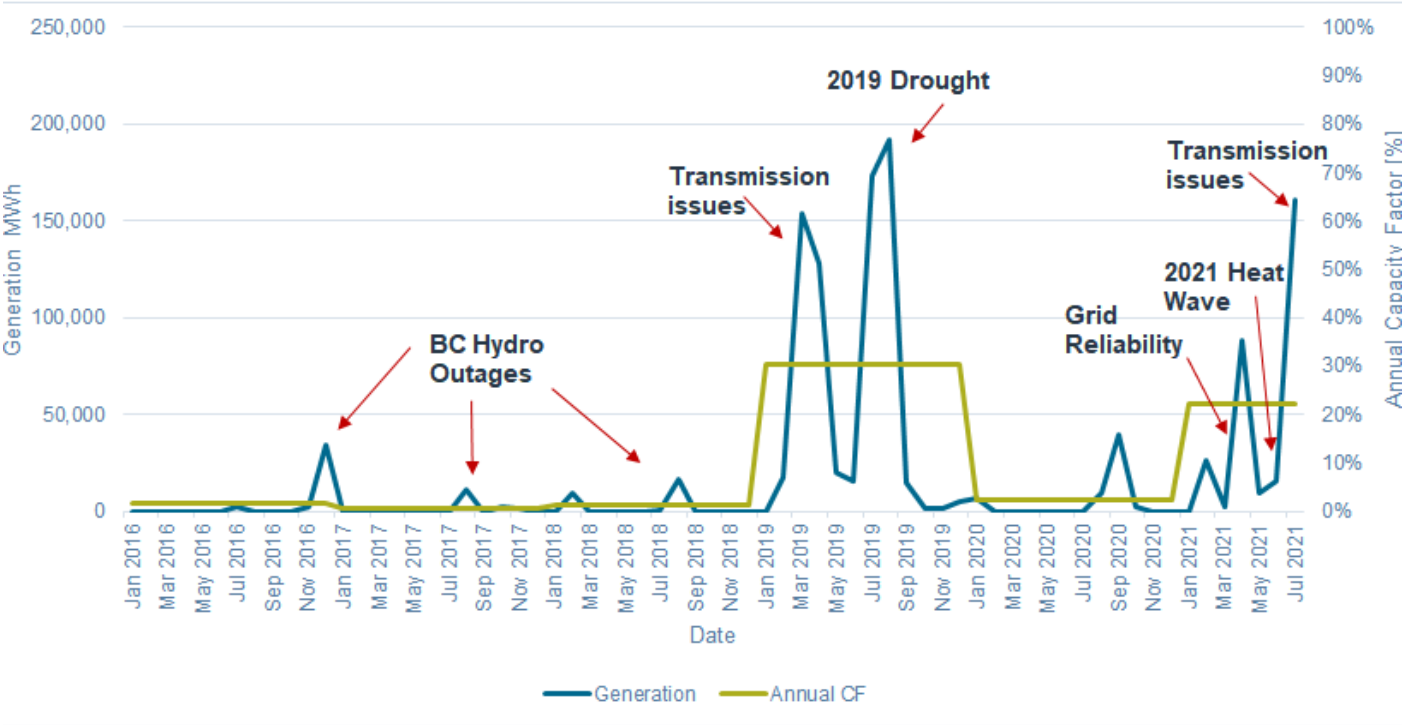
Regards,

Daniel Jurijew
Vice-President, Government Relations, Regulatory & Environmental Policy

cc: C. Kopecky, SVP, Capital Power
K. Chisholm, Q.C., SVP, Capital Power

ATTACHMENT 1

Island Generation
Monthly Generation & Annual Average Capacity Factor



City of Campbell River
From the Office of the Mayor

22 July 2021

Mr. Chris O'Riley, President & CEO
British Columbia Hydro and Power Authority
18th Floor, 333 Dunsmuir Street
Vancouver, BC V6B 5R3

Via email: cp2040@bchydro.com

Dear Mr. O'Riley:

Re: Renewal of Island Generation's electricity purchase agreement in Campbell River

City of Campbell River Council received correspondence from Mr. Daniel Jurijew of Capital Power, expressing Capital Power's concern that BC Hydro's draft IRP indicates that BC Hydro does not intend to renew Island Generation's electricity purchase agreement for their power generation facility located in Campbell River.

Council is of the understanding that the Island Generation facility is the single largest power generation facility on Vancouver Island, and plays an essential role in providing low cost, reliable power to Vancouver Island and the Vancouver Metro regions.

The City of Campbell River Council considers Island Generation a valuable member of our community and encourages BC Hydro to reconsider their decision, and renew Island Generation's electricity purchase agreement for their Island Generation's power generation facility in Campbell River.

Thank you for your consideration.

Sincerely,

Andy Adams
Mayor

C Maureen Daschuk, Senior Vice-President, Integrated Planning, BC Hydro
Daniel Jurijew, Vice-President, Government Relations, Regulatory & Environmental Policy, Capital Power

Received July 28 2021

=== CONTACT INFO ===

First name:
Suzanne

Last name:
Cairns

Email:
[redacted]

Organization:
Cranbrook Climate Hub

Organization description:
We envision a thriving Cranbrook where residents and the environment are healthy, energy is affordable and comes from clean, renewable sources, and the economy is resilient and sustains us all, including future generations. Our purpose is to empower residents to advance toward a low-carbon economy, through: Public communication and education on related topics. Community activities to engage city residents. Support for effective municipal, provincial and federal climate policy and planning.

=== LEVEL OF ALIGNMENT ===

1. Continue with a base level of energy efficiency programs and plan to ramp up

No alignment since the base scenario for this plan is not based on achieving legislated GHG emissions reductions targets and assumes that climate impacts do not increase which does not reflect current science.

The draft IRP is inadequate and should be redone using the Accelerated Contingency Scenario and consider risks of short term climate impacts to grid stability and community resilience.

2. Pursue voluntary time-varying rates supported by demand response programs

3. Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology

4. Offer a market-price based renewal option to existing clean or renewable independent power producers

For community resilience and increased electrification, we need BC Hydro to support significant increases in distributed renewable energy at the community scale.

5. Advance the first sequential step of upgrades to transmission infrastructure into the South Coast

6. Plan to acquire new energy and capacity resources

7. Evaluate small BC Hydro plants that are at end-of-life

8. Advancing utility-scale batteries in the South Coast

9. Final feedback

The inputs and assumptions used for the plan are not valid for a world striving to net zero by 2050 and experiencing accelerated climate impacts.

The plan does not align with meeting our climate goals, which will require significant electrification of transportation, heating, and industry in the next 2 decades.

The plan does not include climate projections of increased risks to power supplies, such as more extreme storms and wildfires. Interruptions are being experienced now.

=== end ===

BC Hydro Draft IRP Feedback Form

Contact information

First Name: Roxana

Last Name: Lund

Email: [redacted]

Organization: Evolugen

Please provide a brief description of your organization. For example, its mandate and/or purpose, non-profit/for profit status, composition of members/owners, and specific organizational goals related to BC Hydro's Integrated Resource Plan.

Brief description of your organization

Evolugen is Brookfield Renewable's Canadian business. Brookfield Renewable is a global developer, owner and operator of renewable energy resources. Worldwide, Brookfield Renewable businesses and affiliates have a portfolio of over 19,000 MW of installed capacity and approximately $50 billion in assets under management. In BC, Evolugen owns 6 hydropower facilities representing 173 MW.

Your alignment with Clean Power 2040

Provide the level of alignment of these elements with your organization's values and interests, as well as any other feedback:

1. Continue with a base level of energy efficiency programs (Base energy efficiency) and plan to ramp up to higher levels (Higher energy efficiency) in future years to achieve 1,700 GWh/year of energy savings and 290 MW of capacity savings at the system level by fiscal 2030.

   Share your organization's level of alignment and feedback:

   [Nil response]

2. Pursue voluntary time-varying rates supported by demand response programs to achieve 220 MW of capacity savings at the system level by fiscal 2030 (Rate suite 2 and Demand Response Program A), and advance the Industrial Load Curtailment Program to achieve 100 MW of incremental capacity savings at the system level by no later than the fiscal 2027 to fiscal 2030 period.

   Share your organization's level of alignment and feedback:

   [Nil response]

3. Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology for customers to support a new or existing (as applicable) voluntary residential time-of-use rate to shift home charging by 50 per cent of residential electric vehicle drivers to off-peak demand periods (50 per cent EV driver participation) to achieve 100 MW of capacity savings at the system level by fiscal 2030.

   Share your organization's level of alignment and feedback:

[Nil response]

4. Offer a market-price based renewal option to existing clean or renewable independent power producers with electricity purchase agreements expiring in the next five years. There are approximately 20 existing clean or renewable projects, that produce a total of roughly 900 GWh, with electricity purchase agreements set to expire before April 1, 2026.

   Share your organization's level of alignment and feedback:

   We appreciate that BC Hydro has acknowledged that existing IPP projects can offer a cost-effective option for meeting longer-term requirements, while avoiding potential environmental impacts associated with building new generation. As an owner/operator of IPP projects, we strongly believe that these facilities have the potential to make a long-term contribution to BC's clean energy and climate change objectives while delivering economic benefits to local communities, including property taxes, well-paying and skilled employment, ongoing capital investments, and other spillover benefits. Many of these benefits flow to smaller, economically vulnerable communities that depend heavily on the ongoing operation of these projects – and in some cases hold ownership interests in them.

   We recognize BC Hydro's desire to align compensation under EPAs with market-based rates and believe there is a pathway to do so that offers full and fair compensation for IPPs and a long-term, cost-effective source of renewable electricity for BC Hydro. In particular, we believe that a "value stack" methodology can ensure that IPPs are "paid what they are worth" – a common goal that BC Hydro and IPPs should be able to agree upon. Such an approach would take into account the full suite of advantages (and disadvantages) delivered by a given project on long-term basis (i.e., projected and representative of the value over the term of the contract). It would comprehensively consider a project's energy, capacity, ancillary, and environmental attribute (carbon/REC) contribution to the province. It could distinguish between intermittent and non-intermittent energy, as well as peaking capabilities. Finally, it should consider the value of domestic resources over imports, including their ability to provide firm capacity and grid benefits (e.g., avoided curtailment risk, lower transmission costs, increased reliability) and avoided carbon emissions as compared to imported electricity.

   We would encourage BC Hydro to begin working with the IPP sector as soon as possible to develop a value stack framework for EPA renewals. Such a framework can create the foundation for a productive dialogue between IPPs and BC Hydro, streamline renewal discussions with individual IPPs, and serve as a flexible framework that can adapt in the future as market conditions evolve. It would also provide certainty and clarity to investors regarding what attributes are valued and compensated by BC Hydro, which can inform future project investments (e.g., addition of storage at existing renewables to improve capacity factors). IPPs routinely invest in their projects to ensure that they continue to deliver clean electricity in a safe and reliable manner. A predictable and sufficient contracted revenue stream is critical to ensuring these investments can continue to take place.

5. Advance the first sequential step of upgrades to transmission infrastructure into the South Coast region including series compensation, shunt capacitors and thermal upgrades to achieve 550 MW of

capacity for the South Coast region by fiscal 2033; prepare to initiate a second step of upgrades to achieve an additional 700 MW of capacity for the South Coast region by fiscal 2039.

Share your organization's level of alignment and feedback:

We support transmission investments in the South Coast region to increase the capacity to deliver clean energy to load centres in this area. Ensuring adequate transmission capacity is available to serve this region is particularly important given expectations of electrification and EV uptake. Indeed, we feel that the timing for transmission upgrades should be advanced to align with and facilitate the province's climate objectives, in particular the 2030 EV target.

6. Beyond the elements identified above and after demand-side measures, plan to acquire new energy and capacity resources starting with 580 GWh in fiscal 2031, then shifting to primarily capacity resources starting with 110 MW in fiscal 2038. These future resources would be selected from amongst:
    - Expiring electricity purchase agreements with independent power producers;
    - New clean and renewable energy resources; and
    - Upgrades to BC Hydro facilities.

    Share your organization's level of alignment and feedback:

    As additional energy and capacity needs emerge, we would recommend that BC Hydro prioritize renewing existing EPAs with IPPs. As noted in the draft IRP, these projects can offer a cost-effective option for meeting longer-term requirements, while avoiding potential environmental impacts associated with building new generation. We recommend that EPA renewals be conducted based on a "value stack" framework, as described in response to Question 4, which would balance the interests of IPPs, BC Hydro and BC ratepayers. Renewing EPAs is crucial to ensuring that IPPs continue to invest in their facilities and the province, and BC retains the clean energy and economic benefits associated with these projects.

    If additional incremental energy and/or capacity is needed, Evolugen believes the most cost-effective approach would be to publish technology agnostic Request for Proposals in which both BC Hydro and IPPs could participate on equal footing.

7. Undertake a structured decision-making approach to evaluate small BC Hydro plants that are at end-of-life, or in operation and nearing end-of-life, on a facility by facility basis to determine whether to decommission, divest or refurbish these facilities, on the proposed schedule.

    Share your organization's level of alignment and feedback:

    Maintaining or decommissioning BC Hydro facilities reaching end of life cannot be evaluated in isolation. The costs of maintaining or decommissioning these facilities should be compared to alternative pathways to meeting the province's electricity needs and climate objectives, in particular private sector solutions. As proposed above, incremental energy and/or capacity needs should be met with a technology agnostic Request for Proposals in which BC Hydro and IPPs would be able to propose the most cost-effective projects for the BC ratepayers.

8. Contingency plans: preparing to introduce utility-scale batteries in the South Coast, with the first units installed in fiscal 2029.

   Share your organization's level of alignment and feedback:

   We support efforts to evaluate battery storage as a solution for emerging energy and capacity needs in the South Coast load centre. However, battery solutions should be procured through a competitive process that allows private sector participation. The private sector has existing expertise in battery storage and is better placed to bear the risks associated with the deployment of new technologies.

Your feedback to the draft 2021 IRP

Please share any final feedback on the draft 2021 Integrated Resource Plan on how your organization sees the choices proposed in the draft IRP and the trade-offs involved.

Additional feedback:

We do not agree with BC Hydro's decision to consider BC's GHG reduction targets as part of contingency planning ("Accelerated Scenario") instead of as part of the Base Scenario. Doing so ignores the crucial role BC Hydro and electrification must have in decarbonizing BC and sets the province up for failure in meeting its climate targets. Under the Accelerated Scenario, system level energy and capacity deficits advance to 2024 and 2028, respectively. This is the future BC Hydro should be planning for, given the focus on decarbonization across all levels of government, industry and the public. BC Hydro must do more to preserve existing renewable capacity and plan for future procurements given the time it takes to permit and construct new resources.

INNERGEX

Renewable Energy.
Sustainable Development.

July 30, 2021

BC Hydro
CP2040@bchydro.com

Re: Draft 2021 Integrated Resource Plan

Thank you for the opportunity to provide feedback on BC Hydro's draft 2021 Integrated Resource Plan (IRP). Innergex Renewable Energy Inc. (Innergex) is a key partner to BC Hydro, has invested over $2.5 billion in capital in British Columbia's electricity system, and has global expertise in electricity systems and markets. As such, we have elected to submit this letter to highlight several critical issues that the online feedback form did not provide space to address and Innergex has not had the opportunity to share with BC Hydro until now. We also note that our feedback is limited to the information provided in the draft IRP, which has a number of blank placeholder sections.

In BC, our electricity system is the keystone to meeting greenhouse gas (GHG) reduction targets. Without enough clean electricity and the requisite electrical infrastructure to allow for fuel switching, then residential, commercial, industrial, and transportation emissions reductions will not be achieved. The next decade is critical for meeting climate targets and BC Hydro's IRP is a necessary tool for success. As it is written, the draft IRP poses a serious barrier to achieving GHG reductions. This key concern and others are explained in more detail below.

The IRP's Base Resource Plan

The targets of a 30% reduction in GHG emissions by 2030, 60% by 2040, and 80% by 2050 (all relative to 2007 levels) were legislated under B.C.'s *Climate Change Accountability Act* in 2018. In December 2020, the Province set a new near-term target to reduce emissions 16% below 2007 levels by 2025. BC Hydro's 2021/22 Government Mandate Letter requires the utility to align its operations with targets and strategies for minimizing GHG emissions and managing climate change risk, consistent with legislation and the CleanBC climate action plan. According to the 2020 Climate Change Accountability Report, BC is not on track to meet its targets.

While the draft IRP states that it is aligned with CleanBC, it proposes a Base Resource Plan that explicitly does not account for these legislated climate targets to be met. Once approved by the BC Utilities Commission (BCUC), this will be the plan that will be implemented until a new IRP is

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prepared in 2026/27. It will not be possible for the 2030 targets to be met if BC comes up short on its GHG reduction targets for the next 5 years.

A contingency plan in the draft IRP that assumes the province does meet its GHG reduction targets over the milestone years of 2025, 2030 and 2040, is called the "Accelerated Scenario". As a contingency, the Accelerated Scenario is reactive fallback instead of a proactive plan. For the planned levels of electrification to be achieved, British Columbians and businesses in BC need BC Hydro to proactively plan for it in the 2021 IRP. Unless BC Hydro steps up to the plate with the measures and infrastructure necessary to meet electrification needs, the targets won't be met. This is relevant both for provincial-level emissions reduction requirements and the sectoral-level requirements that have been established for buildings, transportation, industry, and oil and gas. Furthermore, from Innergex's experience, the lead time needed for several of the approaches outlined in the Accelerated Scenario do not allow for a late-term swap out from the proposed Base Resource Plan.

Climate Impacts Modeling

The draft IRP utilizes climate modeling from 2013 to determine the impact of various climate change scenarios on load. It indicates that while there is more recent modeling available, BC Hydro has not analyzed it for potential impacts to future load. There are two problems with this approach.

Firstly, climate modeling from 2013 is outdated as many of the impacts of climate change that were anticipated to occur further into the future are already occurring today. In June, parts of BC reached over 46C, breaking all-time Canadian temperature records. BC's 2017 and 2018 fire seasons were the worst two on record and to date in 2021 the province is significantly higher than the 10-year average in both the number of fires and the area burned. BC Hydro's system broke the all-time summer peak hourly demand record for 3 nights in a row in June with demand about 30 percent higher than the average June day. In this context, modeling from 2013 is not sufficient to prepare our electricity system for the impacts of climate change.

Secondly, BC Hydro should be using climate impacts modeling for more than just forecasting load. Summer 2021 has demonstrated that extreme weather events such as the heat dome, flooding, and wildfires impact generation and transmission as well as load. Our changing weather patterns require the electricity system to be more resilient across every facet. These impacts are relevant with respect to domestic supply and transmission availability as well as imported supply and transmission availability and price.

Competition for renewable electricity resources resulting from climate policy in interconnected jurisdictions should be analyzed in greater detail before planning to rely on electricity imports as there is considerable risk and uncertainty related to the impacts that a sharp increase in market demand for renewable electricity will also have on the cost, reliability, and future adequacy of regional renewable supply. Active discussions are currently underway in the U.S. on how to ensure resource adequacy in the Western Interconnection as states compete for clean electricity supply while dealing with previously unseen temperatures. This issue requires attention in the IRP or BC faces a likely risk of being underprepared.

Indigenous Reconciliation

Advancing the economic reconciliation and self-determination of Indigenous peoples is a BC Government priority per the *Declaration on the Rights of Indigenous Peoples Act* (DRIPA). BC Hydro's 2021/22 Government Mandate Letter states that all Crown agencies are expected to support this work and must remain focused on creating opportunities that implement the Truth and Reconciliation Commission's recommendations through their mandate.

The draft IRP recognizes that BC Hydro has a mandate to advance Indigenous reconciliation and, in accordance with earlier feedback, has ensured that reconciliation is not treated as a competing planning objective. However, the draft IRP does not take this commitment any further and does not demonstrate how reconciliation will be adequately considered as a standalone objective. There is a missed opportunity for BC Hydro to work in partnership with Indigenous communities, beyond consultation, to incorporate the initiatives and projects that are priorities for these communities into its electricity system planning.

Market Based Renewals

The draft IRP proposes to offer a market price based renewal option to existing clean or renewable independent power producers with electricity purchase agreements expiring in the next five years. Details about the basis for or calculation of a market price are not provided.

In a competitive wholesale electricity market, generators have access to a range of revenue streams beyond compensation for the megawatt-hours they produce. Additional revenues may come from a capacity market, ancillary services market, and the sale of renewable energy certificates (RECs). Generators also have access to multiple potential offtakers, like corporate entities, and mechanisms for transmission access. These conditions provide the elements of a competitive market in which electricity generators and purchasers can negotiate for fair contract terms that allow for the generator to manage the risk associated with fluctuating market prices.

Offering a market price based renewal to BC generators is a complex proposition in the absence of an actual wholesale electricity market. Without access to other potential customers or revenue streams, generators are blocked from being a market actor with any market power, posing significant fairness issues. The stated intention to move to market-based pricing without acknowledgement of the need to work closely with generators to address this complexity sends a strong negative signal about the risks of investing in BC at a time when the province is seeking to attract investment from clean and renewable industries, grow its clean economy, and solidify its position as a leader in clean tech.

Integration with Related Plans

Government and BC Hydro are currently developing, or have recently launched, a number of plans and initiatives with direct implications for the electricity system. These are either not mentioned in the draft IRP or only in passing:

- Electrification Plan: BC Hydro intends to file this plan with the BCUC in August 2021. While the draft IRP states that it considers strategies including a near-term electrification target, it is not clear that outcomes from the Electrification Plan are accounted for in the IRP's forecasts.
- Roadmap to 2030: Government's update to CleanBC is intended for release in fall 2021. It is not clear from the draft IRP whether any new or strengthened electrification measures in the Roadmap will be reflected in the final IRP.
- Phase 2 Review: On July 9, Government announced a first set of recommendations from this review, with additional expected to follow. BC Hydro shares responsibility to act on these recommendations and they should be accounted for in the final IRP.
- Hydrogen Strategy: Released in July, it includes an immediate priority to scale-up green hydrogen production using B.C.'s renewable electricity supply. BC Hydro's 2021/22 Government Mandate Letter requires the utility to support the implementation of this strategy. The draft IRP does not refer to hydrogen.
- BC Building Electrification Roadmap: BC Hydro was on the steering committee for this roadmap, which has implications for utility programs, rates, and electricity capacity, yet it is not accounted for in the draft IRP.

Uncoordinated energy planning from Government and the Crown utility sends mixed investor signals to businesses looking to locate, expand, or make new investments in BC for reasons such as ESG goals. Aligning and integrating the final IRP and its forecasts with these directly related plans would increase the chance of BC being successful across all these initiatives.

Recommendations

Considering the issues discussed above, we make the following recommendations:

1. The Accelerated Scenario should be used as the Base Resource Plan as it is the only scenario that results in BC's GHG reduction targets being met.
2. Plans to support businesses to meet the sectoral emissions reduction targets should be part of the final Base Resource Plan in the IRP.
3. To ensure reliable, clean and cost-effective electricity for British Columbians, updated climate impacts modeling should be an integral part of all aspects of the 2021 IRP.
4. The final IRP should better reflect DRIPA legislation and BC Hydro's mandate to advance Indigenous reconciliation, starting with a clearer indication of how reconciliation is being applied as a stand alone objective.
5. Renewals for expiring electricity purchase agreements should be negotiated with generators on a facility-specific basis, taking into account the full suite of benefits that these projects provide. Protection of ratepayer interests and reconciliation can undoubtedly be better achieved without turning to a market-based pricing scheme without a market-based electricity system. However, should BC Hydro want to make wholesale changes to how pricing and contracts with generators are structured, this needs to be done in direct and close communication with generators through a fair process to design a fair outcome.
6. As part of the whole of government approach needed to mitigate climate change, the IRP should take all related Government and BC Hydro plans into account, as listed above, to ensure that they are fully aligned and facilitate one another.

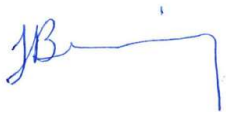
Thank you for taking the time to understand these concerns and consider the recommendations. While we recognize that the IRP is not technically binding, it does establish a planning framework that informs government policymaking, BCUC decisions, private sector investment decisions, and BC Hydro's priority programs and actions. BC's electricity system is foundational to achieving our climate targets and the path that the IRP sets us on over the next 5 years will be a critical determinant of our success.

If you should have any questions or wish to discuss then please do not hesitate to contact me.

INNERGEX

Renewable Energy.
Sustainable Development.

Sincerely,



Julia Balabanowicz
Director, Government Relations
Innergex Renewable Energy Inc.
[redacted]

cc. Jeremy Hewitt, Assistant Deputy Minister, Ministry of Environment and Climate Change Strategy

Les MacLaren, Assistant Deputy Minister, Ministry of Energy, Mines and Low Carbon Innovation

Paul Wieringa, Executive Director, Ministry of Energy, Mines and Low Carbon Innovation

Kitselas Geothermal Inc.
4562-J Queensway Drive
Terrace, BC
V8G 3X6

July 21, 2021

BC Hydro
333 Dunsmuir St.
Vancouver, BC V6B 5R3

Re: Clean Power 2040 – BC Hydro IRP Engagement Phase Two

Framing this submission

Kitselas Geothermal Inc.'s mission is to harness the geothermal energy located under the traditional territory of Kitselas First Nation. Kitselas Geothermal Inc. (KGI) has been developing this geothermal energy resource since 2012. KGI is majority-owned and controlled by Kitselas Development Corporation (KDC), the economic development arm of Kitselas First Nation.

KGI will use geothermal energy to provide Kitselas First Nation and the local/regional Terrace and Kitimat-Stikine communities with social, economic, and environmental benefits including economic self-determination, training opportunities, jobs, and clean air.

KGI is providing comment on the BC Hydro Draft IRP for the purpose of highlighting the premise that a narrow focus on electrification is not necessarily the most effective course of action for BC Hydro or the Province to meet its energy goals.

Direct-use Geothermal for Demand Side Management

Presently, BC Hydro is focused on using DSM programs and rate structures to encourage its customers to reduce electricity demand. KGI would propose that BC Hydro support the use of geothermal district heating and cooling systems to complement the programs seeking to reduce electricity demand.

KGI's geothermal district heating and cooling project would be a viable project for BC Hydro to support, given that it would be a green-energy, cost-effective method of achieving new incremental electricity savings. KGI would welcome the opportunity to discuss with BC Hydro opportunities to partner or support geothermal energy. Unlike solar and wind alternative, geothermal is a baseload energy source.

KGI's geothermal district heating and cooling project is proposed to provide ~206,000 GJ/yr of geothermal heat to Top Speed Energy to drive a pre-cooling stage in their natural gas liquefaction process. Preliminary engineering estimates indicate that the use of KGI's direct cooling energy will reduce Top Speed Energy's electricity grid consumption by ~15,000 MWh/yr. Against the backdrop of an existing electricity reliability and capacity issue in the Terrace-Kitimat transmission corridor, KGI's project will create grid capacity for other uses. BC Hydro can use its electricity for other fuel switching initiatives, such as the electrification of LNG industry operations near Kitimat and the charging of zero-emissions vehicles.

Over the minimum estimated 30-year operating lifetime of the Top Speed Energy micro-LNG facility, KGI's geothermal absorption cooling for Top Speed is expected to conserve 450 GWh of electricity. For example, a BC Government or BC Hydro contribution of $3 Million to the capital costs of the project is equivalent to $6.66 per MWh conserved over the 30-year life of the operation. This compares favourably to BC Hydro's current demand side management portfolio.

First Nations and Reconciliation

Overall, KGI does not think that BC Hydro should exercise such a monopolistic control of BC's energy market. BC Hydro takes pride in their low electricity rates and the relative cleanliness of the electricity, however, BC Hydro's legacy infrastructure is grounded upon unceded Indigenous territory without sufficient consultation and compensation, as is now acknowledged by BC Hydro.

The levelized costs of First Nations energy projects are disadvantaged by a relative lack of resources and capacity; BC Hydro's economies of scale for example. Should First Nations energy projects be able to enjoy access to BC Hydro's transmission capacity at the true marginal cost, or free of charge, there is reason to believe that many First Nations energy projects would be able to be economically viable and competitive.

KGI submits that geothermal direct-use heating and cooling is a more efficient use of capital and energy than generating electricity to use for heating and cooling.

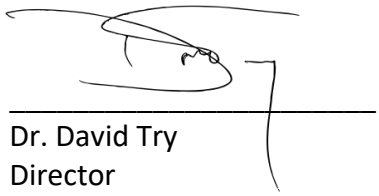
In the spirit of DRIPA, BC Hydro should take steps to share BC's energy market with Indigenous energy companies.

Conclusion

In conclusion, KGI would like to respectfully suggest that the entire Province of BC does not need to be electrified to meet its GHG reduction commitments, and that direct-use geothermal energy, where available, is a cost-effective method of reducing electricity demand related to heating and cooling. Finally, KGI respectfully suggests that BC Hydro consider its historical obligations, in the context of modern energy policy, and their monopolistic control of the current energy market when evaluating Indigenous energy projects.

KGI encourages BC Hydro to make better use of KGI's and the Canadian Geothermal Energy Association's technical expertise when developing its Integrated Resource Plans. With information from geothermal experts with real experience and real projects, BC Hydro would be able to better identify how geothermal energy projects can be incorporated into the Integrated Resource Plan for the benefit of all.

Regards,



Dr. David Try
Director
Kitselas Geothermal Inc.

Alison Thompson
Director
Kitselas Geothermal Inc.

METRO VANCOUVER STAFF COMMENTS ON BC HYDRO DRAFT 2021 INTEGRATED RESOURCE PLAN (IRP)
July 30, 2021

Below is a summary of Metro Vancouver staff comments on BC Hydro's draft 2021 Integrated Resource Plan (IRP). Due to time constraints for the consultation period, these comments represent the views of staff and have not been reviewed or endorsed by the MVRD Board of Directors. Note that italicized text has been taken directly from the draft IRP.

Seven elements of the Base Resource Plan

1. ***Continue with a base level of energy efficiency programs (Base energy efficiency) and plan to ramp up to higher levels (Higher energy efficiency)*** *in future years to achieve 1,700 GWh/year of energy savings and 290 MW of capacity savings at the system level by fiscal 2030.*

- It would be helpful to understand how "new construction", "customer solar", and "customer batteries supported by solar" were considered in the Base Resource Plan. The Base Resource Plan cites a base level and a higher level of energy efficiency, but is not specific on whether it includes the aforementioned portfolio options within energy efficiency.

- While the "higher energy efficiency" and "higher plus energy efficiency" options have modest rate impacts, there are significant savings in portfolio cost for BC Hydro as well as reduced land and water impacts. Higher energy efficiency, such as incentivizing customers to switch from natural gas furnaces or to electric air-source heat pumps, also result in critical co-benefits for residents, such as cooling in homes, reductions to criteria air contaminant emissions and reductions to BC's greenhouse gas emissions. As noted in CleanBC, by 2030, 60% of homes and 40% of commercial buildings will be heated with clean electricity and alignment with CleanBC needs to be reflected in this IRP. Regarding the rate impact, BC Hydro should address the specific impacts on low-income and disadvantaged populations through specific rate design solutions and increased rebate and incentive programs targeted at low income households so they are able to participate equitably in this transition and not increase their cost burden.

2. ***Pursue voluntary time-varying rates supported by demand response*** *programs to achieve 220 MW of capacity savings at the system level by fiscal 2030 (Rate suite 2 and Demand Response Program A), and advance the Industrial Load Curtailment Program to achieve 100 MW of incremental capacity savings at the system level by no later than the fiscal 2027 to fiscal 2030 period.*

- Given that rate suite 3 for time-varying rates and demand response programs is beneficial compared to rate suite 2 in all planning objectives considered, it is unclear whether "the challenges of implementing default (opt-out) time-of-use rates" is a sufficient argument to not pursue these benefits. Concerns about equity need to be addressed by sufficient programming by BC Hydro to ensure that customers are well-informed of what these rates entail. It is also noted that these are not mandatory rates, but opt-out rates – therefore, customers preserve the optionality to opt-out if these rates do not work for them. BC Hydro should be pursuing the best

outcome as per the planning objectives, while developing specific solutions that will help customers make the right decision for their situation with regards to opt-out rates.

3. ***Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology*** *for customers to support a new or existing (as applicable) voluntary residential time-of-use rate to shift home charging by 50 per cent of residential electric vehicle drivers to off-peak demand periods (50 per cent EV driver participation) to achieve 100 MW of capacity savings at the system level by fiscal 2030.*

- Staff are supportive of this strategy in general but without the results of the full rate impacts for 75% EV driver participation, it is difficult to make an assessment of whether a 75% EV driver participation would be more beneficial to residents. Staff recognize that risk of under-delivery is higher with a higher level of driver participation and would encourage BC Hydro to continually re-evaluate this risk as these programs are implemented and more program data becomes available. Staff would also encourage BC Hydro to include BC's GHG reduction targets in the decision framework. Introducing incentives for off-peak EV charging may support more residential customers in deciding to switch to EVs from internal combustion engines, which support BC in meeting GHG reduction targets.

4. ***Offer a market-price based renewal option to existing clean or renewable independent power producers with electricity purchase agreements*** *expiring in the next five years. There are approximately 20 existing clean or renewable projects, that produce a total of roughly 900 GWh, with electricity purchase agreements set to expire before April 1, 2026.*

- Staff agree with the principle of keeping costs down, prioritizing contracts that have Indigenous interests and minimizing land and water impacts.

- While staff are strongly supportive of phasing out fossil fuel generation, it is unclear whether renewable gas, such as renewable natural gas, was considered in relation to the McMahon and Island Generation facilities. Renewable gas is a clean, renewable source of energy that can support BC in reaching its greenhouse gas targets. Given that gas-fired generation can provide energy and firm capacity, and that re-purposing existing infrastructure will minimize impacts to land and water and emissions associated with construction of new generation infrastructure, staff would encourage BC Hydro to explore use of RNG in these facilities, if it hasn't been considered previously.

- Staff are strongly supportive that 100% of all renewals should be for clean or renewable resources.

5. ***Advance the first sequential step of upgrades to transmission infrastructure into the South Coast region*** *including series compensation, shunt capacitors and thermal upgrades to achieve 550 MW of capacity for the South Coast region by fiscal 2033; prepare to initiate a second step of upgrades to achieve an additional 700 MW of capacity for the South Coast region by fiscal 2039.*

- Staff would like to see resilience to the impacts of climate change and other disruptive natural events incorporated as a consideration when comparing transmission upgrades to other non-wire solutions such as utility-scale batteries or enhanced energy efficiency. As noted in the comment at the end, transmission lines are susceptible to the impacts of wildfires and high heat events, which will be exacerbated by climate change.

- Staff would like to understand whether pursuing higher levels of energy efficiency, time-varying rate programs and higher EV driver participation would impact the need for Step 1 and Step 2 transmission upgrades.

- Staff would like to understand what are the land and water impacts of the Step 1 and Step 2 transmission upgrades to the South Coast and specifically whether this would impact land use within the Metro Vancouver region.

6. ***Beyond the elements identified above and after demand-side measures, plan to acquire new energy and capacity resources*** *starting with 580 GWh in fiscal 2031, then shifting to primarily capacity resources starting with 110 MW in fiscal 2038. These future resources would be selected from amongst:*
    a. *Expiring electricity purchase agreements with independent power producers;*
    b. *New clean and renewable energy resources; and*
    c. *Upgrades to BC Hydro facilities.*

- Staff would encourage BC Hydro to take into consideration all GHG emissions that BC Hydro has influence over when selecting future resources. The current planning objective of "tonnes of carbon dioxide equivalent emissions from system generation" does not seem to consider Scope 3 emissions. Scope 3 emissions are emissions that BC Hydro has indirect control over, such as embodied energy in materials used in construction.

- Staff are strongly supportive that 100% of all future new resources are clean or renewable.

7. ***Undertake a structured decision-making approach to evaluate small BC Hydro plants that are at end-of-life,*** *or in operation and nearing end-of-life, on a facility by facility basis to determine whether to decommission, divest or refurbish these facilities, on the proposed schedule.*

- Staff are strongly supportive that 100% of all BC Hydro generation capacity should be clean or renewable.

8. ***Contingency plans: preparing to introduce utility-scale batteries in the South Coast****, with the first units installed in fiscal 2029.*

- Staff are supportive of having contingency plans but would like further clarity on how this option was selected compared to the other capacity options listed in Table 3. As noted in the plan, BC Hydro has not completed the structured decision-making processes for any resources beyond

demand-side measures so it is unclear how utility-scale batteries was selected as the contingency plan.

Additional Feedback on the draft 2021 IRP

The following are Metro Vancouver staff comments on the choices proposed in the draft IRP and the trade-offs involved.

- It is unclear how resiliency is included in the planning objectives. For example, transmission lines are susceptible to wildfire impacts, both in causing wildfires and being impacted by wildfires. Decentralized generation resources, such as customer solar with batteries, seems to carry a lower risk profile with respect to wildfires and other disruptive natural events. Staff would prefer to see resiliency directly considered as a planning objective, and to have the resource option selection process consider this objective. Other transmission and distribution infrastructure may also be more susceptible to hazards such flooding and sea level rise due to climate change.

- Load growth/accelerated electrification does not appear to have been considered as a key principle in the draft IRP, and should be added. As BC Hydro's Electrification Impact Study notes, increased electrification will be essential to BC meeting its GHG reduction targets. As noted in CleanBC, by 2030, 60% of homes and 40% of commercial buildings will be heated with clean electricity, and alignment with CleanBC needs to be reflected in this IRP. By using rates, programs, and incentives, BC Hydro has the ability to influence load growth. Maximum load growth needs to be a key tenet of the plan because electricity load growth is directly related to achieving BC's GHG reduction targets. As noted in Section 44.1 (8) of the *Utilities Commission Act*, the commission is required to consider BC's energy objectives, such as BC's GHG reduction targets, when approving the long-term resource plan, and therefore, it seems appropriate that an enhanced focus on load growth would be consistent with BC Hydro's regulatory obligations.

- While it is understood that the Electrification Plan will focus on how BC Hydro will support current and future efforts for electrification, and reduce GHG emissions in BC, it is unclear why this plan was not included in the BC Hydro draft 2021 IRP. BC Hydro's efforts to support electrification (such as new rates, programs and incentives) will likely impact the reference load forecast, similar to how DSM impacts the reference load forecast, and BC Hydro will need to plan to service this load. Similarly, there are trade-offs to increased supports for electrification that need to be evaluated in a holistic framework, such as the one outlined in the BC Hydro IRP. For example, new rates, programs and incentives regarding electric air-source heat pumps will likely have rate base impacts, but also have a positive contribution to achieving BC's GHG reduction targets. As noted in Section 44.1 (8) of the *Utilities Commission Act*, the commission is required to consider BC's energy objectives when approving the long-term resource plan, and therefore, it seems appropriate that enhanced electrification efforts, such as the ones in the Electrification Plan, be included in the BC Hydro draft 2021 IRP, for the commission's consideration.

- Within the new clean resource options, vehicle-to-grid was not considered. If this had been included in the resource options it would have been possible to evaluate this resource in

comparison with others listed. Furthermore, should this resource further develop in the future and BC Hydro determines that it could be a viable capacity option, it would be informative to have considered which policies could be in place now to support vehicle-to-grid in the future, such as policies around ensuring that new EVs have bi-directional charging capabilities.

- In general, BC Hydro should consider what long-term resources may require policy actions now to enable these resources in the future, such as with vehicle-to-grid.

- It would be helpful to better understand how land and water impact was categorized as it is not clear how the numerical system translates to impacts.

- Staff would like to emphasize that the impact on BC's GHG emissions, not just emissions from generation resources, should be explicitly included as a planning sub-objective under the objective "Reduce greenhouse gas emissions".

- Extreme temperature events, such as the July 2021 heat wave, will become more common due to climate change, so the associated increased demand for cooling should be modelled within the IRP forecast.

- The Draft IRP addresses the impact that EVs are expected to have on BC Hydro's system. There is a brief mention of TransLink and BC Transit transitioning to electric buses. It would be helpful to see the role BC Hydro could play in expanding electrified public transit to reduce the continued reliance on personal vehicles in pursuit of BC's GHG reduction targets.

- The life-cycle social and environmental impacts of generation options should also be included as a planning sub-objective, within the objective of limiting land and water impacts. Technologies such as batteries will have social and environmental impacts beyond direct land and water impacts within BC.

- Staff are supportive of the BC Hydro Phase 2 recommendations for a 100% clean electricity standard and for BC Hydro to use an internal carbon price when evaluating programs and infrastructure that support customers in switching from fossil fuels to electricity. Given the significance of these recommendations, these core recommendations should be embedded into the draft IRP.

Received July 5 2021

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Organization:
TransAlta Corporation

Organization description:
TransAlta is an Independent Power Producer in BC.

=== LEVEL OF ALIGNMENT ===

1. Continue with a base level of energy efficiency programs and plan to ramp up

The draft IRP has aggressive energy efficiency targets that may be difficult to achieve. We support BC Hydro's scenario planning approach, which also considers the impacts of not achieving the energy efficiency target, to consider a wider range of future outcomes.

2. Pursue voluntary time-varying rates supported by demand response programs

No comments at this time.

3. Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology

We agree that targeting a change in customer behavior will likely require a combination of customer education as well as aligned incentives and penalties to encourage demand shifting.

4. Offer a market-price based renewal option to existing clean or renewable independent power producers

TransAlta supports recontracting with existing clean or renewable independent power producers with electricity purchase agreements expiring in the next five years. These renewable energy sources positively contribute to BC Hydro's clean energy system and BC's low carbon electricity system.

Furthermore, we agree that there is value to BC ratepayers in ensuring that these facilities remain on-line to meet future BC system capacity and energy needs.

5. Advance the first sequential step of upgrades to transmission infrastructure into the South Coast

No comments at this time.

6. Plan to acquire new energy and capacity resources

We agree with BC Hydro that expiring electricity purchase agreements should be prioritized to meet future resource requirements followed by new clean and renewable energy resources, and upgrades to BC Hydro facilities.

7. Evaluate small BC Hydro plants that are at end-of-life

We support this approach and recommend that the evaluation be supplemented by independent expert review.

8. Advancing utility-scale batteries in the South Coast

No comment at this time.

9. Final feedback

TransAlta appreciates the effort and time spent by BC Hydro in developing its draft 2021 Integrated Resource Plan (IRP). We wish to be involved in future stakeholder consultation on the IRP.

=== end ===

Received July 30 2021

=== CONTACT INFO ===

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Organization:
Vancouver Airport Authority

Organization description:
Vancouver Airport Authority is the non-share capital private corporation that operates the Vancouver International Airport (YVR) in service of our community and the economy. Our Environmental Management Plan sets clear, measurable activities and targets in four key areas including carbon reduction. Our operations are carbon neutral as of 2020 and will be net zero by 2030. Our mission is to connecting British Columbia proudly to the world and our vision is a world class sustainable hub airport.

=== LEVEL OF ALIGNMENT ===

1. Continue with a base level of energy efficiency programs and plan to ramp up

The Vancouver Airport Authority has committed to net zero carbon emissions by 2030. Energy conservation measures are key to achieving this net zero goal. We currently participate in BC Hydro's Strategic Energy Manager (SEM) program and make use of many the energy-efficiency programs/incentives offered by BC Hydro. We strongly support a continuation of these programs in the future to achieve greater energy efficiency.

2. Pursue voluntary time-varying rates supported by demand response programs

We support demand response programs that avoid the cost/environmental impact of more infrastructure. However, YVR's electricity use is dependent on airline flight schedules which tend to peak during daytime peaks. Shifting activity to non-peak periods outside of our control so we are concerned about higher daytime rates. Higher electricity costs could harm our ability to meet our net zero goals and shift the business case away from electrification as the preferred method for decarbonization.

3. Pursue a combination of education and marketing efforts as well as incentives for smart-charging technology

Electrification of the Airport Authority's fleet is part of our roadmap to net zero emissions by 2030. Smart-charging technology and other digital innovations to help shift vehicle charging to off-peak times, where applicable will be looked at and will take advantage of lower pricing for non-peak EV charging if offered to industrial/commercial customers, as well.

4. Offer a market-price based renewal option to existing clean or renewable independent power producers

To reach net zero emissions by 2030, the Airport Authority will be relying on low carbon electricity from the BC grid as a means to decarbonize. If market-price offering leads to fewer viable IPP projects in BC,

the Airport Authority would expect that the purchase of needed power from outside of BC (imports) be low/zero-carbon as well.

5. Advance the first sequential step of upgrades to transmission infrastructure into the South Coast

YVR is located in the South Coast region and the Airport Authority is projecting load increases at YVR and on Sea Island. We strongly support any infrastructure improvements that improve the availability and reliability of clean power in the region.

6. Plan to acquire new energy and capacity resources

To reach net zero emissions by 2030, the Airport Authority will be relying on low carbon electricity from the BC grid as a means to decarbonize. We strongly support any plans to acquire new energy and capacity resources if they maintain or lower the carbon intensity of the provincial grid.

7. Evaluate small BC Hydro plants that are at end-of-life

The Airport Authority supports the structured decision-making approach and the inclusion of greenhouse emissions as a decision-making criterion.

8. Advancing utility-scale batteries in the South Coast

As YVR is located in the South Coast Region, the Airport Authority supports any solution, such as batteries or other low carbon storage solutions, that will improve power reliability and availability in the South Coast in a cost-effective way.

9. Final feedback

Electrification is key to decarbonization of YVR's operations. Investment in electrification (fuel-switching away from gas/liquid fuels) will be bolstered by a low/zero-carbon intensive electrical grid in BC and will need to be cost-competitive with renewable fuels and carbon removals (as other means to decarbonize). We would welcome support from BCH in exploring energy storage solutions to help mitigate peaks and associated demand charges as well as increasing power line/substation costs.

=== end ===