

# BC Hydro Integrated Resource Plan

# Technical Advisory Committee Meeting #6 Summary Notes November 26, 2020

<b>Meeting</b>	Technical Advisory Committee – Meeting #6 Load Resource Balances, Generation Capacity Planning & Market Price Forecast
<b>Date</b>	November 26, 2020 – 9:00 a.m. to 2:30 p.m.
<b>Location</b>	WEBEX Virtual Meeting
<b>Committee attendees (participants and alternates)</b>	<p>BC Hydro – Committee Chair &amp; Presenter – Kathy Lee  BC Hydro – Committee Moderator &amp; Presenter – Basil Stumborg  BC First Nations Energy &amp; Mining Council (BCFNEMC) – Cam Osler  BC Public Interest Advisory Council (BCPIAC) – Irina Mis  BC Sustainable Energy Association (BCSEA) – Thomas Hackney  BC Utilities Commission (BCUC) – Nicola Simon*  Clean Energy Association of BC (CEABC) – Stephen Cheeseman  Clean Energy Association of BC (CEABC) – Peter Zell  Commercial Energy Consumers (CEC) – David Craig  Commercial Energy Consumers (CEC) – Janet Rhodes  FortisBC (Electric) – Ryan Steele  FortisBC (Electric) – Ken Ross  Ministry of Energy, Mines and Petroleum Resources (MEMPR) – Jack Buchanan*  Ministry of Energy, Mines and Petroleum Resources (MEMPR) – Paul Wieringa*  Movement of United Professionals (MoveUP) – Jim Quail  Pembina Institute – Tom Pierre Frappé-Sénéclauze  University of Victoria – Andrew Rowe  * MEMPR and BCUC members attend as observers</p>
<b>BC Hydro attendees</b>	<p>Nan Dai – Presenter &amp; Subject Matter Expert  Amy Pryce-Phillips – Presenter &amp; Subject Matter Expert  Magdalena Rucker – Presenter &amp; Subject Matter Expert  Arisa Assadipour  Bill Clendinning  Tony Chu  Sanjaya De Zoysa  Dale Flood  Alex Tu  Amanda Ward  Anne Wilson  Eddie Young</p>
<b>Meeting materials</b>	Presentation slides

## **Introduction**

### **Presented by Basil Stumborg & Kathy Lee (Slides 1-8)**

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#### **Summary of Discussion**

The session began with an overall update on the progress of the IRP, and anticipated schedule over the next year in preparation for filing following the most recent provincial election. TAC participants noted their interest in discussing electrification topics, and the potential impacts on BC Hydro's long-term load forecast and this IRP. There was also general discussion about anticipated policy changes regarding the self-sufficiency mandate, and how BC Hydro would approach its planning as new policy is being developed.

## **Load Resource Balance (System)**

### **Presented by Magdalena Rucker (Slides 9-20)**

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#### **Summary of Discussion**

BC Hydro presented a series of slides about the current system wide load resource balances (LRBs) from fiscal 2021 to fiscal 2040, for both energy and capacity. Included in the description of the LRBs was information about existing and committed energy. TAC Participants continued to have questions about electrification initiatives and how that is being captured in our LRBs, and how the LRBs reflect other energy initiatives ongoing around the province.

## **Q&A Notes**

**Q: Please confirm the increase in load for fiscal 2022-2024. Is that a rebound from COVID?**

A: Confirmed. BC Hydro's current load forecast includes a COVID adjustment.

**Q: When will BC Hydro need new energy resources or capacity resources?**

A: BC Hydro is currently forecasting a need for energy in fiscal 2030 and a need for capacity in fiscal 2032.

**Q: Are uncertainty bands to do with the degree of confidence around the load forecasts?**

A: That is right. The bands being shown are low and high forecast. A later slide shows how the modelling maps to the uncertainty bands.

**Q: Energy or Capacity, which is more dominant over the next ten-years?**

A: Our initial modelling is indicating that capacity will be the more dominant issue in this IRP. In previous IRP's, energy was more dominant, so we are therefore expecting the look and feel of this IRP to be different.

**Q: Will BC Hydro break out what portion of the load forecast is *CleanBC* electrification?**

A: Yes, BC Hydro will do our best to clarify what is in our reference forecast versus our various scenarios, and any potential impacts or assumptions from specific policies or programs. The NAVIUS Report provided in TAC meeting #4 provides additional background information on the electrification scenarios.

**Q: With all the issues surrounding Site C's current challenges, is there any need for a contingency plan around the project?**

A: This IRP will assume that Site C is a committed resource for energy and capacity. Some members encouraged BC Hydro to consider the situation where Site C is cancelled.

## **Generation Capacity Planning and Load Resource Balances Presented by Nan Dai (Slides 21-43)**

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### **Summary of Discussion**

BC Hydro presented details on how generation capacity planning assesses the capacity contribution of individual generation resources and establishes how our integrated generation system is able to reliably meet future peak electricity demand. TAC participants had questions about how emerging renewable resources like pumped storage or battery storage integrate into our load resource balances, and how reliable BC Hydro sees these resources in meeting our capacity requirements.

### **Q&A Notes**

**Q: How does BC Hydro distinguish between capacity resources that are highly dispatchable and can help to integrate intermittent resources?**

A: Integration of intermittent resources is being considered separately. It is not part of the planning reserve being talked about today (i.e. discussion of how BC Hydro meets peak load).

**Q: Is a planning reserve considered in a Loss of Load Expectation (LOLE) assessment?**

A: Yes, the planning reserve is the output of the LOLE assessment. It indicates how much additional generation capacity is needed in order to meet our 1-day-in-10-years LOLE resource adequacy standard. It is meant to account for mechanical failure of generation units or other unforeseen events. The reserve requirement is dependent on the generation resource mix and load shape.

**Q: What is BC Hydro's assumption for energy loss for batteries?**

A: Our current assumption is 90 per cent round trip efficiency (from charging to storage to discharging) which means about 10 per cent loss.

**Q: BC Hydro needs to properly assess new capacity resources and how they fully impact the integrated system (e.g. timing, reliability).**

A: This will be evaluated as part of this IRP.

**Q: What are some of the baseline assumptions with modelling pumped storage projects?**

A: BC Hydro assumes pumped storage has a 6 to 8 hour peak output capability. We also recognize that during winter peak, operating pumped storage means recharging the pumped storage facility during off-peak hours. This means we may run into challenges of meeting energy requirements of the system, especially during critical water years. Thus, it can have an impact on operations.

**Q: How does this analysis consider the cost of battery and pumped storage, and the impact on rates?**

A: The analysis being shown today is focused on how these non-traditional (to BC Hydro) capacity resources contribute in load shaping capability and cost is not considered. Later the portfolio analysis will look at costing and other attributes of these potential resources.

## **Load Resource Balances (Regional) Presented by Magdalena Rucker (Slides 44-56)**

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### **Summary of Discussion**

BC Hydro presented slides that showed load resource balances broken down by specific regions or areas of the province – Lower Mainland/Vancouver Island, Vancouver Island, North Coast, and the Dawson Creek/Groundbirch and North Montney areas. TAC Participants had several technical questions about the inputs to the reference load resource balances versus various higher load scenarios which capture potential expansion from electrifying new or existing mines or LNG facilities.

### Q&A Notes

**Q: Is load from LNG Canada Phase 1 only in BC Hydro's load forecast base reference case? Is potential load from LNG Canada Phase 2 captured within the separate Mining and LNG scenario?**

A: Yes, only load expectations from LNG Canada Phase 1 is in our load forecast reference case.

**Q: What are the parameters that determine that uncertainty band?**

A: The uncertainty band for a load forecast is determined by the upper and lower parameters of the high-load forecast and low-load forecast. Information on uncertainty bands was presented at TAC meeting #2.

**Q: Is there any consideration for providing incentives for electrification of upstream gas that would support LNG developments?**

A: In this IRP, we will be considering the costs and benefits of advancing transmission in support of electrification. However, electrification incentives for upstream gas are not considered in the scope of this IRP.

**Q: Is there a reason you haven't covered the Kootenays/Merritt/Kamloops areas of BC?**

A: Those communities fall into the Southern Interior region, which has more generation than load throughout the planning horizon. Today, we are showing Load Resource Balances (LRBs) from those regions which have a potential capacity constraint.

### Market Price Forecast

#### Presented by Amy Pryse-Phillips (Slides 57-66)

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### Summary of Discussion

BC Hydro provided slides that outlined our methodology in providing a long-term forecast for the market price of energy, including our utilization of a Power Reference Case from vendor ABB to support this forecast. The market price forecast was provided. TAC participants had several questions about the methodology, including potential variables such as self-sufficiency (increasing BC Hydro's ability to acquire power from the market), and a potential carbon tax in the US.

### **Q&A Notes**

**Q: Is a potential US carbon tax included in the forecast range?**

A: BC Hydro's internal assumption is a potential carbon tax would put prices up by around \$20 a MW from the current forecast. At this time, a carbon tax is not represented in the forecast.

**Q: How big of a scenario will self-sufficiency play in the IRP, small line or a very large issue?**

A: It is an important consideration in the IRP and will be discussed in the December meeting.

**Q: If we relax self-sufficiency, how do we factor in the carbon impact of energy imports?**

A: The Government of B.C. has asked BC Hydro to look at a 100 per cent clean electricity standard. This topic will be discussed at future TAC meetings.

**Q: Why is the reference market price forecast not in the middle of the forecast range? Why did BC Hydro pick the scenario that is trending up?**

A: That is ABB's prediction of their mid-case and it just happens to trend up to the high scenario.

**Q: I assume that renewable generation cost will trend upward as the most cost-effective sites and resources tend to be developed first, so more renewable resources being brought on (and less cost-effective sites) will increase the marginal price?**

A: That is BC Hydro's assumption as well.

### **Session Schedule & Next Steps**

#### **Presented by Basil Stumborg & Kathy Lee (Slide 67)**

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The participants were thanked, and the session was concluded.

## **Consideration of TAC Meeting Feedback**

<b>TAC Member Feedback</b>	<b>Consideration</b>
Will BC Hydro break out what portion of the load forecast is CleanBC electrification versus what is in the scenarios?	Yes, BC Hydro will do our best to clarify what is in our reference forecast versus our various scenarios, and any potential impacts or assumptions from specific policies or programs. The NAVIUS Report provided to TAC members for meeting #4 provides additional background information on the electrification scenarios.
Materials were informative. Could you circulate the updated load forecast when it becomes available?	BC Hydro will update TAC members with our most recent load forecast after it is approved and is publicly available.
Some TAC members stated that BC Hydro needs to be more proactive in meeting the provincial government's GHG targets	Feedback received, and BC Hydro will provide more information about our electrification plans as they become available.

During the meeting a member asked a question and BC Hydro committed to following up with a response, which is provided below.

### **QUESTION:**

My understanding is that IRP aims to balance annual energy requirement and peak capacity requirement (hourly) but not explicitly seasonal requirements. If we have a seasonal constraint in winter, are we valuing resource options that are matched to that seasonal peak?

Consider two scenarios:

**Scenario A:** A building installs more efficient chillers reducing annual demand by X kWh and battery storage able to reduce peak demand on coldest day peak by Y MW over a 4-hour peak.

**Scenario B:** A building gets better insulation, reducing annual demand by X kWh and reducing coldest day peak by Y MW over coldest day. Scenario B however reduces most of its energy in winter, rather than summer. Would our portfolio analysis be able to detect that Option B is better for our system given we have a seasonal energy constraint? IF so, how?

### **ANSWER:**

Yes. The model (System Optimizer) selects resources to meet annual energy requirement as well as peak requirement. The model also recognizes the energy production/energy savings profile of the resource options over the year (sub monthly time step). It knows that that options with more winter energy are more valuable.

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