

Meeting	Technical Advisory Committee – Meeting #5 Workplan, Key Uncertainties, Resource Options & Distributed Generation
Date	July 29, 2020 – 9:00 a.m. to 3:00 p.m.
Location	WEBEX Virtual Meeting
Committee attendees (participants and alternates)	<p>BC Hydro – Committee Moderator & Presenter – Basil Stumborg Association of Major Power Consumers (AMPC) – Melissa Davies BC First Nations Energy & 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) – Lauren Whyte Climate Action Secretariat (CAS) – Christopher Gilmore Commercial Energy Consumers (CEC) – David Craig FortisBC (Electric) – Ryan Steele Ministry of Energy, Mines and Petroleum Resources (MEMPR) – Warren Walsh* Ministry of Energy, Mines and Petroleum Resources (MEMPR) – Paul Wieringa Movement of United Professionals (MoveUP) – Jim Quail Pembina Institute – Hoda Talebian Pembina Institute – Tom Pierre Frappé-Sénéclauze</p> <p><i>* MEMPR and BCUC members attend as observers</i></p>
BC Hydro attendees	<p>Alex Tu – Presenter & Subject Matter Expert Bill Clendinning Dale Flood Hootan Jarollahi Laura Knezevic Margo Sadler Anne Wilson</p>
Meeting materials	Presentation slides

Introduction, IRP Workplan and Objectives Presented by Basil Stumborg (Slides 1-31)

Summary of Comments

The session began with an overall update on the progress of the project, and anticipated schedule for the next year prior to the application filing in September 2021. TAC Participants outlined their topics of interest for the day, which included discussion about how to conduct resource planning in a period of unprecedented uncertainty, general questions about rate design and other available levers to attract load, and requests for more specifics about distributed generation. There was also general discussion about load profiles and ways for BC Hydro to attract new loads that have a more even distributed usage (coined how can we attract load that is 'less lumpy').

Q&A Notes

Q: How can we make loads that are highly variable, also known as “large and lumpy”, less variable?

A: Not all electrification is large and lumpy. Connecting mining and natural gas loads may be large and lumpy but general electrification may be rapid but have a more gradual impact on load.

Q: In considering the “tools” available to BC Hydro in the IRP, is the obligation to cultivate load growth something that gets addressed in the IRP like DSM?

A: In general, we are going to use avenues such as rate design to incent electrification. BC Hydro's actions to incent load growth will not be IRP actions, but those actions and related uncertainty will inform IRP actions. We will confirm where you can get more information and provide feedback on BC Hydro's load growth strategies.

Q: Will you be contemplating the possibility that BC Hydro may be freed up to create more generation resources of its own?

A: Our approach on this depends on direction we get from the Province. However, regardless of policy, BC Hydro's choices on options will depend on the costs and benefits of the different options which BC Hydro is assessing regardless of who develops or owns the resource.

Q: Are you also considering future cost decline for solar resources and building retrofits made for efficiency?

A: Future cost declines of resources are something we are aware of and incorporating into this IRP.

Q: In considering generation resources, do you capture the potential resiliency that different generation resources may bring to regional and local grids? For example, the difference in reliability that distributed generation versus large, remote generation on local generation?

A: The IRP deals with the bulk transmission system and pressing/significant regional issues, and we are not modelling changes at the local (distribution) level.

Q: How could we create a metric for resilience to power interruptions? You mentioned that reliability is an assumed target in these scenarios?

A: We can take this away and consider whether resiliency (which can be defined as a property of the grid to minimize the impact to customers and society broadly from catastrophic events such as extreme weather or cyber attacks, recognizing the central role the grid plays in safety and security of communities) should be part of our comparison. Again, the IRP is at a bulk system level so if the options impact reliability at that level, we will need to talk to the TAC about it.

Key IRP Uncertainties Presented by Basil Stumborg (Slides 32-49)

Summary of Comments

BC Hydro presented a series of slides about the uncertain environment that will form a backdrop as we develop the IRP. TAC participants had comments about flexibility required in this IRP, and cautioned BC Hydro against making large capital commitments in the document to support uncertain growth. Further, participants had a series of questions about how BC Hydro conducts its analysis given the level of uncertainty.

Q&A Notes

Q: How often will you do IRPs?

A: The current expectation is that we plan to file every five years.

Q: BC Hydro has a greater role to play in creating transparency around risks and tradeoffs of large projects. The Northwest Transmission Line (NTL) was unanalyzed and put on to ratepayers. BC Hydro could play a valuable role in looking at these issues transparently.

A: In this IRP, we are considering the options and costs of pursuing them.

Q: In running NPV analysis, will you run a family of scenarios (low, medium, high) and see if optimized packages change if you change a characteristic? If flexibility is considered in cost risk and NPV, and this results in changes to the sensitivity, do you need to add a probability?

A: We will consider if it makes sense to combine two types of uncertainties to provide a more complete analysis. In general, the value of flexibility will show up as reduced cost risk, and so we will try to measure that impact directly, rather than tracking “flexibility” itself as a decision criterion.

Q: How does dispatchability of a resource get captured and how could it be better integrated into the IRP analysis? How is the flexibility of resources options get evaluated?

A: In terms of flexibility, the way it shows up is in the size of the cost risk. We don’t measure this directly but rather in terms of its ability to impact cost risk. For example, large lumpy generation increases size of the cost risk whereas smaller resources will mitigate the cost risk. To the extent that the rooftop solar options are more granular, this ‘flexibility’ of being more able to closely match load will show up as reduced cost and reduced cost risk.

Generation Resource Options Presented by Alex Tu (Slides 50-86)

Summary of Comments

TAC participants had several questions and comments about BC Hydro’s price and energy forecasts for renewing Energy Purchase Agreements (EPAs), with concerns about timing and negotiation approach. Other areas of queries included emerging renewable storage technologies, such as batteries, geothermal, and power to gas storage.

Q&A Notes

Q: BC Hydro has been historically held to a test of looking at supply alternatives. With BC Hydro’s current context, there should be flexibility in how it contracts

A: BC Hydro’s IRP analysis will consider a number of options in how it approaches EPA renewals.

Q: With the potential removal of self-sufficiency, how will power imports for planning purposes be compared with these B.C.-supplied supply side resources?

A: In this IRP, we are considering these options and costs of pursuing them, but haven’t determined details yet.

Q: How are renewed EPA contracts negotiated 'fairly' when there is only one possible buyer?

A: Our EPA assumptions are not reflective of how the EPAs will actually be negotiated or acquired. When these contracts are negotiated, IPPs will have options to sell to the market instead of BC Hydro, and so there isn't only one buyer in that situation.

Q: There are a substantial amount EPA contracts coming up for renewal during the IRP period (40 years). Will there be another point during the TAC process where we consider this in relation to the LRB and the modelling results?

A: When the Load Resource Balance is presented to the TAC, the need for EPAs as a resource will be considered. Committed generation is reflected there. Going forward, the model will consider new IPP contracts, renewing existing EPAs, DSM etc. We will bring analysis back to the TAC for review.

Q: Why are batteries assumed to have just a four-hour peak duration in the analysis?

A: Modern batteries may last six hours, but we think four hours is the most supportable assumption.

Q: Have you analyzed the opportunity for power to gas as a storage technology?

A: Recognized, yes. Analyzed, no. It is an emerging resource, but we cannot characterize it today. There is nothing larger than a 20 MW power to gas facility operating today.

Q: BC Hydro should also examine geothermal energy as a potential capacity resource?

A: Agree.

Distributed Generation Presented by Alex Tu (Slides 87-99)

Summary of Comments

TAC participants were highly engaged throughout the day on Distributed Generation (DG), its potential, and BC Hydro's approach to it in the IRP. Specific areas of discussion included DG price estimates, the potential of DG in various regions in the provinces, scale and technological advancement, and how BC Hydro as a large-hydro backed utility would manage this new load potential.

Q&A Notes

Q: Is BC Hydro looking at pricing energy received under its net metering tariff at its real-time value to BC Hydro and its other ratepayers?

A: Our net metering structure currently pays customers at retail rate regardless of time of day. We currently don't have, and are not looking at a real-time rate like this at the moment.

Q: What are the largest uncertainties in this projection not in the scenarios examined? You have reference case, high solar, but what about technology change? This does not absorb that.?

A: There are lots of uncertainties. The big uncertainties we see are customer rate structures as well as the evolution of storage. Under our current flat rate structure there is no incentive to invest in storage or change consumption. But a change in rate structures and an evolution for energy storage costs could change that picture substantially.

Q: Some forecasts for solar costs in next year are forecast to go down 59%.

A: This is not consistent with BC Hydro's current analysis, but we will consider this feedback as source information is made available.

Q: Will there be a geographic component to the assessment of distributed generation, i.e. will distributed generation be more valuable in some places?

A: We will review this question and get back to you.

Session Schedule & Next Steps Presented by Basil Stumborg (Slide 22)

To conclude the session, TAC participants were asked to summarize their feedback for BC Hydro.

Consideration of TAC Meeting Feedback

TAC Member Feedback	Consideration
Materials were informative. Moving forward, pertinent comparisons between supply side options and demand side options like rates would be helpful. Curious how these will be assessed against each other.	UECs are only a partial snapshot of value. The portfolio modelling is ultimately where the cost of each and the contribution of each resource to system need is best compared. These results will be presented in the fall to TAC including how the

TAC Member Feedback	Consideration
	demand and supply options were assessed in the analysis.
Congratulate BCH on a dynamic format. Reemphasize need for section in IRP to consider how flexibility can lead to more productive management of supply and demand.	BC Hydro will take this message into consideration when shaping the application.
In relation to low carbon electrification, I am disappointed that the IRP is only showing it in the load forecast versus BC Hydro taking a proactive approach on this given how important it is for climate action and BC Hydro's role as a leading utility. Being more proactive would be great.	BC Hydro recognizes the interest TAC members have in this topic and will continue to bring back more information about other low carbon electrification activities BC Hydro is undertaking that are considered in company activities outside of the IRP process.
Why are rate attraction measures to offset declining demand outside the scope of the IRP? When does the preparation start for the next rate application and how much of the IRP analysis will be able to address that?	BC Hydro will consider this and get back to you.

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