

Summary Notes

Resource Options Update Session

December 12, 2019

Allwest reporting hearing room

Type of Meeting	Resource Options Update Session	
Agenda	<ol style="list-style-type: none"> 1. Overview 2. Generation Supply Side Options 3. Demand side management options – energy efficiency and capacity pilots 4. Demand-side management options – capacity focused rate options 5. Grid management system 	
Abbreviations	BCH	BC Hydro
	CPR	Conservation Potential Review
	DSM	Demand-side Management
	IRP	Integrated Resource Plan
	ROU	Resource Options Update

Welcome and Introductions

Participants were welcomed to the Update Session. The purpose of the session was outlined – to solicit feedback on our Resource Options Update process and some preliminary resource cost estimates – and participants were asked to provide feedback during the session or through written comments afterward.

1. Overview

No comments were made or questions asked.

2. Generation Supply Side Options

	Feedback	BC Hydro Response
A)	<p>Question 1 – (Utility Scale Solar) You are showing the installation costs in \$/W, when do we get a levelized unit cost (\$/MWh)?</p> <p>Question 2 – The costs are uncertain then. Is the divergence in costs dependent on the resource?</p>	<p>Answer Q1: We're not presenting the levelized unit costs today, but we are preparing it. For each individual site, we have been working with National Renewable Energy Laboratory (NREL) to use their 20 years of solar data to create a generation profile for each site. This will help us determine the appropriate technical assumptions such as hourly solar insolation, solar panel efficiency, system losses etc. We will also apply some consistent financial assumptions across all resource types, such as cost of capital and cost of debt. These assumptions will allow us to determine the unit energy costs which we will</p>

	Feedback	BC Hydro Response
		<p>present in the March timeframe.</p> <p>Answer Q2: Yes – different projects will have different generation profiles as well as potentially different capital or ongoing costs. This will result in different unit energy costs for different resources</p>
B)	<p>Question 1 (Wind): Regarding Slide 18, do you have any insight as to why there is such a steep price drop in wind prices in 2018?</p> <p>Question 2 – If proponents are being aggressive in bidding, does this mean that the prices you are quoting are not reliable? Do these prices represent completed projects as opposed to bidding prices?</p> <p>Question 3 – It would be helpful to have a graph showing the actual costs for just completed projects as opposed to mixing completed and non-completed.</p>	<p>Answer Q1: We did not have a call for power so cannot directly confirm what the prices would be in BC. We undertook work in 2018 to estimate updated BC wind costs using industry information. Some of the reasons we believe contribute to the price decline include lower operating costs (i.e. lower turbine prices and better financing options for larger proponents), improvements in efficiency of the generators (e.g., larger rotor sizes, taller tower heights) and the industry move away from incentives to competitive bidding processes. Also, while it is difficult to prove, there is a belief in the industry, which we share, that some companies trying to get into a market will be more aggressive in their pricing to gain access to these competitive markets.</p> <p>Answer Q2 – There have been instances where projects have not been completed. Our figures are based on bidding prices and not completed projects because it is difficult to get a price for a particular completed project due to confidentiality. So these figures are based on the public averages of bids.</p> <p>Answer Q3: We are not able to provide this information because the information needed is not public.</p>
C)	<p>Question (Wind) – Why are the prices for wind in 2016 so much higher in Canada than other jurisdictions (on Slide 18, around 2014)? For example, consider Ontario vs. Mexico – why is Canada’s prices higher?</p>	<p>Answer: We have two observations about the information on slide 18:</p> <ul style="list-style-type: none"> • The line that shows the average power purchase price in US reflects prices that are dominated by projects in the mid-west which are generally less expensive to build (e.g. they are bigger, with lower permitting costs and less complex installations). • In Canada, the outlier on the graph is Ontario. We have not been able to get an explanation as to why Ontario’s prices were so high.

	Feedback	BC Hydro Response
D)	Question – Going back to the solar and wind data – is the intention to include total system costs or to only focus on actual installation costs?	<p>Answer: We are estimating costs based on the “at gate” costs for the product – i.e. just the cost to build the project. The additional costs and requirements for connecting to the grid, integrating the project to the grid and perhaps providing additional capacity the grid needs could be brought in through a more detailed portfolio modelling for the system.</p> <p>One thing to add to this, we now believe that there may be benefits from co-locating intermittent energy and storage resources. This is a piece of work that still needs to be done for this ROU.</p>
E)	<p>Question 1 - For the geothermal estimates, does the installed cost include a risk factor to reflect projects that are explored but don't proceed?</p> <p>Question 2 – Is the biomass resources study update publicly available? Also, does it contemplate the use of rail ties as a supply option?</p>	<p>Answer Q1: No – the cost of individual geothermal resources do not include any costs associated with other potential resources that were investigated but did not proceed. The costs reported here are reflective of a project that has been explored, with some fraction of the investment during exploration drilling that do not result in viable production wells, but which is ultimately deemed viable and then developed.</p> <p>Answer Q2: Yes, the study is on BC Hydro's website and our last slide includes the link. No, it does not include the use of rail ties as a supply option.</p>
F)	Question – To what extent do we see countervailing trends, so while costs are decreasing over time, location matters, and over time the best locations will be taken up, pushing costs up for the remaining resources?	<p>Answer: We have not considered this but will consider it as we move forward to see if it is appropriate to include in our analysis.</p>

3. Demand side management options – energy efficiency and capacity pilots		
	Feedback	BC Hydro Response
A)	<p>Question 1 – Is there an attempt to characterize how the existing building stock has changed over time, due to impact of DSM? In theory if BCH is providing incentives and measures to customers, there should be a change to the building stock.</p> <p>Question 2 – How do you distinguish between different loads (e.g., heating and lighting)?</p>	<p>Answer Q1: We have updated our base year sales as reflected in our 2014 CPR to reflect actual sales in 2019. We have seen that the average use of energy per household has reduced and we can see that intensity reduction linked to certain uses, such as decreased lighting load. This 2019 baseline will be used to as the basis for future projections.</p> <p>Answer Q2: Navigant used the information in our Residential End-Use Survey and Commercial End-Use Survey to tease out the different intensity of the end uses.</p>
B)	<p>Question – You mentioned that you are using a lower load forecast. With CleanBC coming forward, do you expect the load forecast to be lower or higher in future?</p>	<p>Answer: We are considering the base load forecast in our work. However, electrification scenarios will be considered in the Integrated Resource Plan (IRP), but that is getting beyond the scope of what we are addressing in the ROU.</p>
C)	<p>Question 1 – Do BC Hydro and FortisBC coordinate their load forecasts so that an accurate, consolidated, and coherent forecast is brought forward for the Province (i.e. to reflect fuel switching, EV uptakes etc.)? Or will different projections of the same issue be brought forward?</p> <p>Comment – It would be useful in considering issues like the electrification of the EV fleet in the Province and fuel switching programs to have this consolidated view.</p>	<p>Answer Q1: We have recently collaborated on our CPR creation in the past. Currently, BC Hydro and FortisBC create independent load forecasts. But, in response to issues such as the ones you have raised, we are commencing discussions with FortisBC to see if there are opportunities for better coordination amongst some aspects of our load forecasts.</p>

4. Demand-side management options – capacity focused rate options		
	Feedback	BC Hydro Response
A)	<p>Question – Regarding rates to reduce customer peak usage, how does the utility determine if the customer reduces their use under the Peak Time Rebate rate design?</p>	<p>Answer: A customer specific baseline is created so that it can be determined that there is a reduction in use. This is complex. However this rate is easy for customers to understand and is not risky for customers.</p>

5. Grid management system

	Feedback	BC Hydro Response
A)	<p>Question 1 – Is this grid management system going to be a big factor in the next IRP? Or is it something further in the future?</p> <p>Question 2 – If not in the IRP, where will it show up?</p>	<p>Answer Q1: The reason we are talking about this is to give comfort that we are going to be able to manage distributed resources and load. We do not anticipate this being highlighted in the IRP. Rather, BC Hydro will be managing this on an ongoing basis. As an example, BC Hydro is performing pilots and monitoring penetration of distributed resources (DRs) so that we can support the additional load when needed.</p> <p>Answer Q2: In the IRP, we will describe what options BC Hydro can pursue and which key grid investments may be needed, but the IRP will not go down to the specific spending requirements. This type of spending request will show up in the Revenue Requirements Application (RRA).</p>

6. Closing and Next Steps

Participants were thanked for their participation, and all feedback received during the session and in writing will be considered as the Resource Options Update process continues into the Spring of 2020.