

**2021 LTERP – Resource Planning Advisory Group (RPAG) Meeting
November 25, 2020
Meeting Notes**

Attendees via Teams:

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| • David Craig | Commercial Energy Consumers Association of BC |
| • Nicola Simon | British Columbia Utilities Commission |
| • Jim Quail | Movement of United Professionals |
| • Alex Tu | BC Hydro |
| • Kayle Tillapaugh | Friends of Kootenay Lake Stewardship Society |
| • Tom Hackney | BC Sustainable Energy Association |
| • Hoda Talebian | Pembina Institute |
| • Scott Spencer | Nelson Hydro and BC Municipal Electric Utilities |
| • Carmen Proctor | Nelson Hydro |
| • Robert Hobbs | Industrial Customers Group |
| • Mark Blom | First Nations Energy and Mining Council |
| • Jonathan Baynes | Penticton Indian Band |
| • Mike Hopkins | FortisBC |
| • David Bailey | FortisBC |
| • Dan Egolf | FortisBC |
| • Ron Zeilstra | FortisBC |
| • Steven Groves | FortisBC |
| • Ryan Steele | FortisBC |
| • Keith Veerman | FortisBC |
| • Corey Sinclair | FortisBC |
| • Ken Ross | FortisBC |
| • Anda Telman | FortisBC |
| • Jassi Randhawa | FortisBC |

Load Scenarios

Question: Where are the 18 crowd forecast participants from?

Response: They are from this RPAG, located throughout southern BC. Responses were anonymous unless the responder self-identified. Of the 18 responses, 9 were external and 9 were FortisBC Inc. (FBC) employees.

Market Price and Rate Forecasts and Scenarios

Question: Did FBC look at any other renewable natural gas (RNG) price forecasts such as ones from Alberta?

Response: No. Our forecast is based on existing contracts with less cost certainty going further out in time.

Different RNG technologies and hydrogen supply can result in different cost structures. FEI could be a price driver if there is limited supply.

Question: Is it possible to see these cost structures?

Response: FBC is not able to provide the details of the cost structures as the RNG contract information is confidential. The RNG price forecasts are intended to cover the potential range of changes in costs and technologies going forward.

Question: Why is there a scenario for carbon tax going to zero?

Response: While it does seem unlikely at this time, it is still a possibility and so has been included as a scenario.

Question: Is the BC Hydro Power Purchase Agreement (PPA) Tranche 1 energy price high scenario based on specific factors?

Response: No, it is based on a high-level estimate taking into consideration previous BC Hydro rate increases. At this point, there is a lot of uncertainty regarding long-term BC Hydro rate increases.

Question: Aren't the PPA Tranche 1 and 2 energy purchases flexible subject to your market purchase amounts?

Response: Yes, in the short-term for operational purposes, FBC optimizes PPA and market based on current market conditions. For long-term resource planning purposes we do not include such short-term operational optimizations but still assume that the PPA is a flexible resource option. The Long Term Electric Resource Plan (LTERP) resource portfolio planning model does not encompass all the flexibility available to FBC on an operational basis.

Question: Why is the assumption that the BC Hydro Long Run Marginal Cost (LRMC) will go down rather than up in the future?

Response: We assume it will go down rather than up due to the decreasing costs of renewable resources like wind and solar as BC Hydro's LRMC is based on resource options' unit energy costs plus adders. Also, note that the BC Hydro's LRMC has decreased from its previous value of \$129.70/MWh¹ to the current value of \$95.09/MWh².

Supply-Side Resource Options

¹ BC Hydro Rate Schedules effective April 1, 2016, Schedule 3808 – Transmission Service - FortisBC

² BC Hydro Rate Schedule 3808 – Revision 5 effective January 1, 2020 (page 5-47).

Question: Is hydrogen included in the resource options?

Response: We have not included it as a resource option for this LTERP since BC Hydro has not included it as a specific resource option (treating it more as an emerging resource with qualitative discussion only) and it is likely high cost relative to the other resource options which would be used in producing the hydrogen. For the LTERP, we have treated hydrogen production as a load driver and included this in the load scenarios.

Question: Is cogeneration a resource option?

Response: It can be but we did not include cogeneration as a resource option for this LTERP. Instead, through the collaboration with BC Hydro, we included combined cycle and simple cycle gas generation plants that provide power only.

Question: For pumped storage hydro, what is the breakdown between fixed and variable costs?

Response: The variable energy cost for pumping the water back up is not included in the unit capacity cost (UCC) values in the presentation. The UCC values are the quotient of fixed costs divided by dependable capacity. The variable energy pumping costs, as well as any applicable wheeling costs, are included costs in our portfolio analysis if the resource is dispatched, but are not reflected in the UCC calculation presented.

Question: Why is Waneta Expansion (WAX) capacity not a resource option?

Response: We consider WAX capacity an existing resource but not a variable resource option. The PPA is an existing resource but is also a variable resource and so it is considered a resource option.

Question: Where are the energy costs shown for resource options like pumped storage hydro and batteries?

Response: The energy costs are not shown in the unit capacity costs but are accounted for in the portfolio model when the particular resource option is used and re-charged. Both pumped storage and batteries are less than 100 percent efficient, and therefore consume energy on a monthly basis rather than supply energy. Batteries are assumed to have a 90% round trip efficiency and pumped storage is assumed to have a 75% round trip efficiency. Round trip efficiency refers to the process of charging, storing, and discharging the storage resource.

Question: What about rate design, demand management and customer-owned rooftop solar as resource options?

Response: Slide 69 characterizes how we classify these items for our portfolio modelling purposes. Demand management is not treated as a supply-side resource option but will be considered in addressing load-resource balance gaps. Rooftop solar can be thought of as a supply-side resource or a reduction in utility load – we have used the latter approach for the LTERP. Rate design such as creating a billing structure similar to FortisBC Energy Inc., which separates the natural gas commodity from

delivery rate components, is considered out of scope for the LTERP. FBC expects that it will discuss some possible rate options, such as time-based rates, or programs in the LTERP as another alternative to help manage future peak loads if that becomes necessary. Detailed analysis regarding the results of specific rate options or programs will be left for a future rate design application as required.

Question: With the proposal to develop a clean energy standard through Clean Energy Act amendments, will FBC consider a clean portfolio?

Response: Yes, we will develop portfolios that are based on clean and renewable resources and those that include non-clean and renewable resources.

DSM Update

Question: Regarding DSM measures (slide 60), will there be more potential for industrial pumping equipment upgrade measures?

Response: Yes, the previous constraint was removed and so there is more potential in the 2020 Conservation Potential Review (CPR) Update.

Question: Do codes and standards affect the DSM achievable potential?

Response: Yes, codes and standards constrain the technical potential and it filters down - i.e. less economic and achievable potential too.

Question: Why is about 40% of the DSM economic potential not achievable? How much of this 40% is not really variable – i.e. stock turnover versus awareness?

Response: The achievable potential is largely based on market conditions and customer facing economics. Additionally stock turnover and awareness are variables.

Question: For DSM targets, why not use a percentage of the achievable potential?

Response: We will consider using this metric as we develop the DSM portfolios.

Portfolio Analysis

Question: Does FBC have Time-of-use (TOU) rates?

Response: FBC currently has TOU rates for all rate classes, however the residential TOU rate was closed to new participants in 2012 by BCUC order when the residential conservation rate was implemented.

Question: What is the capacity achieved through rate design?

Response: At this point, we do not know. FBC expects to discuss possible options, including time-based rates or other programs, in the LTERP. As noted beforehand, the analysis to determine the potential capacity impacts is more appropriate for a rate design application rather than the LTERP.

Question: Why not separate the system and commodity costs in rate components like FortisBC Energy Inc. does for gas customers? And then implement TOU rates? The new kinds of loads and complexity of resource options dictates new types of rates.

Response: As noted above, this is better left for a rate design application. FBC expects it will discuss TOU rates in the LTERP, among other options. Note that FBC does not have capacity gaps until later in the planning horizon.

Question: Could FBC consider variations on the resource options cost curves?

Response: FBC will consider variations on the resource options cost curves for a limited number of portfolios, such as the preferred portfolio, to see the potential impacts of any changes in costs.

Question: Can FBC provide a summary of the WAX contract and capacity requirements?

Response: The WAX plant is included as part of the Canal Plant Agreement (CPA) with BC Hydro and as such FBC has total flexibility to use all capacity not required to deliver the BCH purchased energy entitlements. Operationally, for power supply requirements, it is treated the same as any other available CPA resource, such as the FBC owned generation. As such, the capacity and energy from all the available CPA resources is a joint resource for power supply purposes. In other words, the energy FBC uses to make use of the WAX capacity is not from the WAX energy entitlements (which are delivered to BC Hydro) but from other CPA energy FBC has available. CPA operations can be complex and if there is interest we can schedule an additional presentation describing CPA operations.

Question: For the portfolio evaluation framework, is operational flexibility and contingency planning over and above the Planning Reserve Margin (PRM) requirement?

Response: Yes. All portfolios considered for the preferred portfolio must, at a minimum, meet the PRM requirements. Then, some portfolios may also provide some additional operational flexibility for contingency planning.

Question: How many portfolios will be developed?

Response: We do not know the exact number at this point. We expect to bring forward a representative subset of several portfolios to the RPAG to discuss and provide feedback on in a future meeting.

Question: Why not include a technology column in the portfolio framework that includes the risks and opportunities with various options like renewables and demand response?

Response: FBC will take this into consideration when developing its portfolio analysis.

Question: There is a slight energy deficit in 2023 in slide 64 – what is the trigger point for new resources?

Response: Our DSM plan and portfolio analysis will determine this. At this point, we do not expect these small gaps starting in 2023 to trigger the need for new resources. New resources, if required, may be required towards the end of this decade.

Comment: One stakeholder noted that they discourage the use of natural gas resources.

Wrap-Up and Next Steps

Comment: One stakeholder noted preference to receive meeting materials one week prior to the meeting.

Response: FBC also prefers to distribute the meeting material to stakeholders in advance but notes that this is not always possible.