

Long Term Electric Resource Plan (LTERP)

Resource Planning Advisory Group (RPAG) Workshop

April 27, 2016 - Meeting Notes

Date and Time: April 27, 2016 - 8:30 am – 3:15 pm

Location: BCUC Hearing Office, 1125 Howe Street, 12th Floor, Vancouver

Attended in Person:

B.C. Sustainable Energy Association (BCSEA)	Tom Hackney
BC Hydro	Kathy Lee
First Nations Energy & Mining Council (FNEMC)	Cole Rheume
Lower Columbia Community Development Team Society	Gordon DeRosa
B.C. Municipal Electric Utilities	Alex Love
B.C. Public Interest Advocacy Centre	Tannis Braithwaite
B.C. Utilities Commission	Errol South
Clean Energy Association of BC	Paul Kariya
Commercial Energy Consumers Association of B.C.	David Craig
Commercial Energy Consumers Association of B.C.	Janet Rhodes
Industrial Customers Group (ICG)	Robert Hobbs
Irrigation Rate Payers Group	Brian Mennell
FortisBC (FBC)	Mike Hopkins
FortisBC	Dan Egolf
FortisBC	Ron Zeistra
FortisBC	David Bailey
FortisBC	Keith Veerman
FortisBC	Joyce Martin
FortisBC	Nguyen Pham
FortisBC	Danielle Wensink
FortisBC	Ryan Steele
Navigant	Peter Steele-Mosey
Fraser Basin Council	Charlotte Argue

Attended via conference call:

B.C. Ministry of Energy & Mines – Electricity and Alternate Energy Division	Nat Gosman
Navigant	Todd Williams

Introductions and Overview

- Attendees took turns introducing themselves and Mike Hopkins discussed the workshop objectives and encouraged attendees to ask questions and provide feedback. The BCUC has approved FBC's request to extend the filing date of the LTERP to Nov.30, 2016.

- Mike showed the current load-resource balance (LRB) gaps for energy and capacity for the 20-year planning horizon, using last year's long-term load forecast. The gaps shown are before any new DSM or supply-side resource options.
- It was asked how FBC would fill the gaps which appear in the near-term and long-term. Dan noted that if FBC renews the Brilliant Expansion contract, which expires in 2017, the gaps would be less. Also, DSM and market purchases would also reduce the near-term gaps. This would leave the more significant gaps mainly in the long-term rather than the near-term.
- The long-term load forecast presented in the LRB figure is consistent with the 2016 PBR update, although the forecast for the Annual Review to set rates is only for the upcoming year.
- It was asked if there would be a final report available for the CPR study. Yes, there will be a final report and it will be included in the LT DSM Plan.

Supply-Side Resource Options

- Ron presented FBC's approach, financial assumptions and resource options costs in determining the supply-side resource options to be included in its portfolio analysis.
- It was asked where the 6% and 8% discount rates came from and if they are in real or nominal terms. The 6% discount rate is close to FBC's weighted average cost of capital and is in real terms. The 8% discount rate is provided as a scenario so that we could see the effects of a higher discount rate, perhaps more applicable to a smaller independent power producer.
- It was asked if the FBC system line loss percent of 8% is for the whole transmission system and if it includes distribution losses how it compares with the FBC transmission tariff. FBC's tariff provides for losses of 6.08% or 11.53% for transmission service, depending on rate class.
- It was asked if the slide listing resource options energy and capacity is showing the total biogas available in BC. No, the slide shows a smaller subset of the potential resource options identified by the collaboration work with BC Hydro. A smaller subset of representative resource options is easier to manage in the FBC portfolio analysis. The subset of resources are considered the most applicable to FBC based on the criteria presented.
- It was asked if the resource options presented are in place already or would be new projects. They would all be new projects.
- It was asked if biogas is clean and renewable. Per the BC Clean Energy Act, biogas is included in the list of resource considered to be clean and renewable.
- It was asked if the resource option cost for utility-scale solar factors in the continuing declining cost of solar power. Yes, FBC made some assumptions that reflect the continuing cost declines for solar – FBC assumed a 2.5% decrease in capital costs for each of the next 10 years.
- It was asked if the solar projects are located in the Kootenay region. The solar projects identified were in both the Kootenay and Okanagan regions.
- It was suggested that more localized resource options, like rooftop and community solar, be included in the listing of resource options. FBC will consider this and how it presents these alternatives in the LTERP.
- It was asked if heat loss for heavy industry is a resource option. FBC will be discussing self-generation options and what incentives, if any, FBC should be providing to self-generation as

part of FBC's response to the Commission decision G-27-16 in regards to FBC's Self-Generation Policy Application. This will likely be filed prior to the LTERP and any appropriate information will therefore be included in the LTERP.

- It was asked if FBC only includes 10 run-of-river projects in its resource options. No, FBC has grouped projects by size into 10 different groups so there are more than 10 projects considered. The collaboration with BC Hydro identified about 7,000 potential run-of-river projects in BC, which is far too many for FBC to include in its portfolio analysis.

Market Price Forecasts and Carbon Price and PPA Rate Scenarios

- Mike presented forecasts of gas and power prices and carbon price scenarios and BC Hydro Power Purchase Agreement (PPA) rate scenarios.
- It was asked if there are any rate indications for BC Hydro in their latest Integrated Resource Plan (IRP). FBC did not see any explicit rate indications in the IRP.
- It was suggested that BC Hydro rates remaining flat on a real basis (i.e. just keeping up with inflation) would be an unlikely scenario and would likely be higher.
- One stakeholder noted that the PNW high-case carbon price of near \$250/tonne seemed high relative to the scenarios for BC. FBC agrees and so may use a lower value for the high case, more in line with the BC scenarios.
- It was noted that synthetic natural gas does not produce any GHGs and so would not attract carbon costs. This could be a cost effective option for FBC in the future. FBC will look further into this potential resource option.
- One stakeholder requested that FBC consider the high scenarios for carbon prices as sensitivities in its portfolio analysis. FBC plans to do this.

Long Run Marginal Cost (LRMC)

- Ryan presented on the topic of LRMC, including background, comparisons to BC Hydro's LRMC, definition and the FBC proposed portfolio approach to developing LRMCs as part of the LTERP.
- It was asked why FBC used the BC Hydro Standing Offer Program (SOP) price as a proxy for its LRMC. The SOP price was derived from the BC Hydro Clean Power Call and was a publicly available figure that represented the cost of clean and renewable resources in BC.
- One stakeholder suggested that the portfolio analysis include a First Nations resource portfolio to promote economic opportunities for developing projects with First Nations groups. FBC noted that this sounds more related to the actual procurement of resources, rather than planning to meet gaps, where FBC would collaborate with First Nations on a resource project when the time comes to build one. FBC continues to foster strong relations with First Nations groups. FBC will consider including First Nations collaboration and development within its resource options evaluation criteria.
- It was asked if the same baseline is used in the portfolio analysis for all the scenarios. Yes, FBC uses the same baseline in terms of assumed load in order to compare across the scenarios.

- It was asked if the LRMV for DSM purposes is like a threshold as it is an input in the benefit/cost ratio test. Yes, the LRMV for DSM is treated as a threshold. Although the LRMV is used within the benefit/cost analyses of DSM programs, it is not the only consideration. Proposed DSM programs that meet the required benefit/cost test are also evaluated against the needs of the utility.
- It was suggested that the LRMV is not really an average but more of the levelized present value of costs, which is technically the correct approach. The Average Incremental Cost (AIC) is the present value of the incremental costs of the optimal portfolio divided by the present value of incremental load served.
- It was noted that, like the resource options costs, there is also uncertainty in the LRMV values.

CPR and DSM Update

- Keith provided an update on the Conservation Potential Review (CPR) study and the DSM load-offsetting scenarios.
- It was asked if our Deferral Capital Expenditure (DCE) value of about \$80/kW-year includes generation capacity. No, it does not – it is only avoided Transmission and Distribution costs – generation costs are included in the LRMV values.
- It was asked why the industrial DSM projection is flat-lined rather than increasing. This means that there is industrial DSM potential but it does not grow significantly over time.
- It was asked if the cost differences between the different DSM targets would be made available. Yes, FBC plans to present these in a future workshop.
- It was asked if the DSM targets/programs are exclusive of rate setting initiatives, like time-of-use (TOU) rates. Yes they are. TOU rates, for example, would be part of a rate design application.
- It was suggested that FBC include DSM in the resource options rather than keeping it separate. FBC noted that while we have presented DSM and supply-side resource options in separate presentations in the workshop, FBC does consider both types of resources in its portfolio analysis as required by the BCUC resource planning guidelines. DSM activity addresses future load requirements by offsetting the forecasted load growth. Supply Side options are used to address resource gaps that remain after DSM. FBC does coordinate DSM and supply-side resource options discussions for resource planning purposes and does not conduct analysis in “silos”.
- It was asked how the DSM offset targets relate to the energy gaps included in the LRB figure, which shows gaps of almost 1,000 GWh by 2033. FBC noted that the DSM targets are annual GWh targets and so would add up over the years to meet a significant amount of the gaps.
- It was asked if Codes & Standards savings are included in the DSM offset targets. FBC explained that changes in codes and standards are mapped in and included in the CPR results. The CPR “stock & flow” model splits the savings between the natural turnover of stock and the incremental savings for higher tier products, e.g. appliances.
- It was asked how FBC determines its lighting percentage for DSM. FBC explained that surveys are done to see what customers have in their homes and use that as a baseline.

- It was asked if DSM could meet all the future LRB gaps. FBC will have to determine if the 100% load offset DSM target could do this. Even if DSM notionally offsets load growth on an annual basis, the granular timing (monthly etc.) of DSM resources may (or not) match resource gaps.
- It was asked why FBC changed its previous DCE value of \$35.60/kW-year. FBC explained that this is an old value which needed to be updated. The consultant study reviewed other utilities and various approaches and recommended a common approach which, based on FBC's projected transmission and distribution projects, has resulted in the higher DCE value.
- It was asked if FBC would be discussing Transmission and Distribution (T&D) planning in any of the workshops. FBC discussed T&D planning in a previous workshop and it would be included in a section of the LTERP.

Load Scenarios

- Peter from Navigant led the group through the 8 load drivers and 2 boundary and 3 intermediate load scenarios. It was noted that these scenarios illustrate what would happen to FBC load requirements if the load drivers went a certain path rather than trying to predict what path would actually occur in the future.
- It was asked if the EV charging assumption of beginning to charge during the dinner hour was based on the current rate structure and not incenting customers to charge at different times. Yes it is. FBC might need to consider incentives or changes to rate structures if there was significant uptake of EVs and adverse impacts on peak loads in the future.
- It was suggested that FBC differentiate between residential battery storage and grid-scale utility storage with regard to costs.
- It was asked if Navigant considered the vehicle manufacturers' capacity to produce this many EVs in the future. No, the load drivers and scenarios were based on reasonable "what if" scenarios to determine the impacts for FBC if the drivers and scenarios played out the way they were modelled rather than in consideration of capacity, carbon taxes, gasoline prices and the multitude of other causes. They are "cause agnostic".
- One stakeholder noted that some other load drivers could be missing, such as a financial crisis driver like that which occurred in 2008. FBC noted that economic growth (or decline) is picked up in the monte carlo range as it is an existing driver while EVs and solar PV are not existing load drivers in the base load forecast. FBC noted that the monte carlo range for the industrial sector is wider than that for the residential sector, for example, due to things like variability in economic growth impacting industrial sector more significantly.
- One stakeholder commented that he liked that FBC was considering load scenarios. He wondered if the EV penetration was too high in the high scenario. Navigant noted that this is a boundary scenario (a reasonable extreme) and that the intermediate scenarios covered less EV penetration. The load drivers tool provided to stakeholders in the workshop will enable them to determine the penetrations of the various drivers and provide that feedback back to FBC.
- It was asked if Navigant considered the older population of the FBC customer base which would result in less EV miles driven. Navigant noted that the drivers and scenarios are "what if"

scenarios and the older population could be mimicked by reducing the number of EVs in the model and it would likely be similar to an intermediate scenario.

- It was asked if solar PV storage only made sense if TOU rates were used and that 50% IPSS (storage) seemed high. Navigant explained that the 50% is applicable only to those with solar PV (i.e. 50% of 33%) . It was also noted that some people might want storage for energy independence and that you don't need solar PV to have electricity storage.
- It was asked if Navigant can change the driver penetrations in their model. Yes, they can be changed. The load driver tool is also a way for stakeholders to provide their input and feedback.
- One stakeholder commended FBC and Navigant on their approach to the load scenarios.
- It was asked what are the impacts on the FBC system of these load drivers. FBC explained that the potential impacts of these drivers and scenarios will be discussed in the LTERP – they could impact a number of areas including resources, T&D system requirements, rate structures, etc.
- David Bailey went over the load scenarios tool with stakeholders and how they could use it to provide their input and feedback back to FBC by sending their results back.

Electric Vehicles in BC

- Charlotte from the Fraser Basin Council presented on electric vehicle growth in BC and EV charging infrastructure and funding and initiatives.
- It was asked if Quebec has higher EV incentives than BC. Yes, Quebec offers up to \$8000 while the limit in BC is \$5000.
- It was asked why other provinces do not appear on the EV penetration figure. While they do have EVs in other provinces, the numbers are very low and not visible on the figure.
- It was asked what is driving EV sales. Right now, it is primarily the incentives.
- It was asked if there is any active mobile charging available yet. No there isn't. This might be a good business opportunity and help curb range anxiety.
- It was asked about the Tesla drop-in batteries and how that is progressing. Charlotte noted that Tesla is focusing on their highway charging network right now.
- One stakeholder noted that it is difficult to get chargers in apartment buildings and retrofits can be costly. Plug In BC offers incentives right now. Future strata act rules could include the right to charge in the future – this will have to be determined by government policy. Currently, BC government policy requires 20% of new condo/apartment parking stalls to be EV charge ready.
- It was asked if a fee structure for EV charging is developing. Currently, it is up to the EV charging hosts which usually provide the power for free. One stakeholder suggested that a rental fee for EV charging spots could help cover the electricity costs.
- It was asked if Plug In BC did scenarios for charging routes. Not specifically, but alternative routes and feedback were considered.
- It was asked if the charging infrastructure is paid for by the province. Per slide 16, other players are involved and provide funding.
- It was asked if there is a standard plug in location on the EVs. No there is not.

- One stakeholder mentioned the right for BC Hydro to sell power to EV chargers and that the BC Hydro Rate Design Application (RDA) might be the venue for that. He mentioned that FBC should also consider EV charging impacts in its future RDA.

Wrap-Up and Next Steps

- Mike wrapped up the meeting by discussing next steps.
- Stakeholders were encouraged to send back their load scenarios tool results.
- Presentations and meeting notes will be posted on:
<http://www.fortisbc.com/About/ProjectsPlanning/ElecUtility/ElecResourcePlanning/Pages/Stakeholder-consultation.aspx>