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FortisBC Inc.

2016 Long Term Electric Resource Plan and Long Term Demand Side Management Plan

Decision and Order G-117-18

June 28, 2018

Before:

H. G. Harowitz, Panel Chair
D. J. Enns, Commissioner
M. Kresivo, QC, Commissioner

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COMMISSION ORDER
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Executive summary

FortisBC Inc. (FBC) submitted its 2016 Long Term Electric Resource Plan (LTERP) and Long Term Demand-Side Management (DSM) Plan (LTDSM Plan) Application (2016 LTERP & LTDSM Plan, Application) in November of 2016, seeking acceptance of its 2016 LTERP & LTDSM Plan and approval to rescind Electric Tariff No. 2 Schedule 90, Energy Management Services (RS90).

Eleven entities registered as interveners in the proceeding. Development of the evidentiary record included two rounds of information requests (IRs) on FBC's Application, submission of intervener evidence and a round of IRs thereon, submission of amended application material from FBC addressing errors in the original Application, and arguments from parties.

The Panel makes the following key findings and determinations:

- We find that FBC's overarching objectives to ensure cost-effective, secure and reliable power for customers; to provide cost-effective demand side management; and to ensure consistency with provincial energy objectives, such as the applicable *Clean Energy Act* (CEA) objectives (Overarching Objectives) are in the public interest, and we accept them.
- We find that FBC's objective to achieve self-sufficiency is not in the public interest, and the Panel rejects self-sufficiency as a valid planning objective. The Panel is not persuaded that a provincial target of electricity self-sufficiency logically translates into a case for FBC to be self-sufficient. Further, the Panel does not accept the line of reasoning that expected market conditions require the pursuit of a self-sufficiency objective at this time.
- We accept the demand forecast. To the extent that there may be a risk that the demand forecast is overstated, it is of limited material consequence since the forecast does not indicate any resource gaps until well after the next LTERP & LTDSM Plan will be filed.
- We find the LTDSM Plan, recommending adoption of the High DSM scenario, to be adequate and in the public interest, and we accept it. Noting that the Max DSM plan is also cost-effective, the Panel agrees with FBC's position that FBC is not compelled to adopt all DSM initiatives that are cost-effective, but rather to adequately explain its preferred DSM portfolio.
- We find the LTERP for the period through 2024 as being in the public interest and accept it. For the period from 2025 through to the end of the planning horizon, the Panel finds that the plan is not in the public interest and, therefore, the Panel does not accept that portion of the LTERP. In reaching these determinations, the Panel notes that the four portfolios put forward by FBC are identical through 2024, and are largely a continuation of recent/current plans. Beyond 2024, FBC's objective of achieving self-sufficiency, which the Panel does not accept as a valid objective, plays a large role in the ultimate selection of FBC's preferred portfolio. FBC's preferred portfolio has a Long Run Marginal Cost (LRMC) that is \$21/MWh (28 percent) higher than A1 portfolio and the Panel has not been persuaded that this increase in costs is justified as being in the public interest.
- Given these findings, the Panel determines that the next LTERP & LTDSM Plan should be developed and filed by no later than December 1, 2021.
- The Panel finds that RS90 is no longer of use, and approves the request to rescind it.

The Panel also provides comments in five additional areas: calculation of LRMC and its use; incremental cost evaluation of DSM scenarios; the framework for resource portfolio evaluation/selection; distributed generation; and the planning reserve margin.

1.0 Introduction

1.1 Application at a glance

Date of Application	November 30, 2016
Approvals sought	<ul style="list-style-type: none">• Acceptance of the FortisBC (FBC) 2016 Long Term Electric Resource Plan (LTERP), including the 2016 Long Term Demand-Side Management Plan (LTDSM Plan); and• Approval to rescind Electric Tariff No. 2 Schedule 90, Energy Management Services (Rate Schedule [RS] 90) (collectively, the Application)
British Columbia Utilities Commission (BCUC) Panel	<ul style="list-style-type: none">• Howard Harowitz (Chair)• Douglas Enns• Miriam Kresivo
Registered Interveners	<ul style="list-style-type: none">• Andy Shadrack (Shadrack)• B.C. Sustainable Energy Association and Sierra Club B.C.(BCSEA)• British Columbia Hydro and Power Authority (BC Hydro)• British Columbia Old Age Pensioners' Organization <i>et al.</i> (BCOAPO)• Commercial Energy Consumers Association of BC (CEC)• Donald Scarlett (Scarlett)• Industrial Customers Group (ICG)• Jerrilynn DeCock (DeCock)• Nicholas Marty (Marty)• Norman Gabana (Gabana); and• Zellstoff Celgar Partnership Limited (Celgar)
Regulatory process	<ul style="list-style-type: none">• Two rounds of Information Requests (IRs) on FBC's Application• Intervener Evidence• One round of IRs on Intervener Evidence• Panel IRs• Application Errata• FBC Final Argument• Intervener Final Argument• FBC Reply Argument
Date of Decision	June 28, 2018

1.2 Legislative and policy framework

FBC seeks acceptance of the 2016 LTERP under section 44.1 of the *Utilities Commission Act (UCA)*. Subsection 44.1(2) of the UCA sets out that a public utility is to file with the BCUC “in the form and at the times the commission requires” a long-term resource plan which includes:

- an estimate of the demand for energy the public utility would expect to serve if it does not take new DSM measures during the period addressed by the plan;
- a plan of how the public utility intends to reduce its demand by taking cost-effective DSM measures and an estimate of the demand for energy that the public utility expects to serve after it has taken those measures;
- a description of the facilities that the public utility intends to construct or extend, and information regarding the energy purchases from other persons the public utility intends to make, to serve demand after all cost-effective DSM measures⁴ are taken;
- an explanation as to why the demand for energy to be served by facilities the utility intends to construct or extend and energy purchases the utility intends to make cannot be met with DSM; and
- any other information required by the BCUC.

The LTERP must also meet the test of adequacy as set out in the BCUC Resource Planning Guidelines (RP Guidelines)¹.

This Panel must determine if carrying out the LTERP would be in the public interest and, therefore, whether it should be accepted.

1.2.1 Public interest

Subsection 44.1(6) of the UCA gives the BCUC the discretion to either accept the LTERP, if the BCUC determines that to carry it out would “be in the public interest,” or to reject it, subject to the discretion given to the BCUC in subsection 44.1(7) to accept or reject “a part” of an LTERP.

Pursuant to subsection 44.1(8) of the UCA, in determining whether to accept an LTERP, the factors that the BCUC “must consider” include:

- (a) the applicable BC energy objectives;
- (b) BC’s energy objective to achieve electricity self-sufficiency (section 6 of the *Clean Energy Act*);
- (c) whether the plan shows that the public utility intends to pursue adequate, cost-effective demand-side measures; and
- (d) the interests of persons in BC who receive or may receive service from the public utility.

As required by section 44.1(8)(a) of the UCA, the BCUC must consider the applicable British Columbia energy objectives in reviewing resource plans filed by utilities under its jurisdiction. Section 2 of the *Clean Energy Act* (CEA) sets out BC’s energy objectives for the province as a whole. Those most relevant to this proceeding include:

- to achieve electricity self-sufficiency;
- to take demand-side measures and to conserve energy;

¹ British Columbia Utilities Commission Resource Planning Guidelines, retrieved from http://www.bcuc.com/Documents/Guidelines/RPGuidelines_12-2003.pdf.

- to generate at least 93 percent of the electricity in BC from clean or renewable resources; and
- to reduce BC greenhouse gas (GHG) emissions.

The Demand-Side Measures Regulation, BC Reg. 326/2008 (DSM Regulation), defines the adequacy requirements and cost-effectiveness tests to be used by the BCUC in evaluating a DSM Application under subsection 44.1(8)(c) of the UCA.

It is important to note that a lack of comment by the Panel on any specific initiative provided in the LTERP does not indicate the Panel's acceptance of that initiative. Any specific projects proposed by FBC in the future must be appropriately evaluated in accordance with the requirements of the UCA and the BCUC.

2.0 2016 Long Term Electric Resource Plan objectives and planning inputs

The resource planning process involves a number of steps in identifying and evaluating resource options to meet expected load requirements. The long-term resource planning objectives set out by the utility set a foundation upon which the planning process is built and, in particular, how alternative portfolios are evaluated. Hence, the Panel first turns its attention to assessing the objectives that form the basis of this LTERP.

2.1 Overarching Long Term Electric Resource Plan objectives

Relevant evidence

FBC's 2016 LTERP presents a long-term plan for meeting the forecast peak demand and energy requirements of customers with demand-side and supply-side resources over the 20-year planning horizon (2016 to 2035). FBC states that its resource planning objectives form the basis for meeting any potential future load-resource balance gaps and for identifying and evaluating potential resource options and portfolios in the LTERP.² The objectives of its 2016 LTERP are to: "ensure cost-effective, secure and reliable power for customers; provide cost-effective demand side management, and ensure consistency with provincial energy objectives (for example the applicable CEA objectives"³ (collectively, the Overarching Objectives).

FBC argues that the 2016 LTERP objectives are consistent with the BCUC's mandate in assessing long-term resource plans as stated in the decision regarding the FBC 2012 LTERP.⁴ In FBC's 2012 LTERP decision, the BCUC stated: "The BCUC's mandate in assessing the resource plans of energy utilities is intended to assure the cost-effective delivery of secure and reliable energy services in a manner congruent with British Columbia's energy objectives."⁵

Positions of the parties

The CEC submits that "a consideration of the interests of persons in British Columbia who receive or may receive service from the public utility would weigh heavily towards ensuring the lowest appropriate cost of energy supply to enable the most affordable energy for its customers."⁶

BCOAPO supports FBC's planning objectives stating that they "are appropriate and reflect the broader applicable legislative requirements."⁷

² Exhibit B-1, p. 5.

³ Exhibit B-1, p. 5; FBC Final Argument, p. 1.

⁴ FBC Final Argument, pp. 1-2.

⁵ FBC 2012-2013 Revenue Requirements and 2012 Integrated System Plan, Decision and Order G-110-12, p. 143.

⁶ CEC Final Argument, p. 4.

⁷ BCOAPO Final Argument, p. 5.

FBC addresses the CEC's final argument in Reply Argument stating that in determining whether to accept a long-term resource plan, the BCUC must consider the interests of persons in British Columbia who receive or may receive service from the public utility but also states that contrary to the CEC's suggestion, the BCUC must also consider the applicable British Columbia energy objectives.

FBC submits that "the interests of FBC's ratepayers should not be interpreted in a manner that is inconsistent or incompatible with BC's energy objectives as expressed in the CEA. The energy objectives, like all statute law, are an expression of or were enacted to further the public interest. FBC's ratepayers must have an interest in the province's energy objectives being pursued and achieved."⁸

BCUC determination

The Panel finds that FBC's Overarching Objectives are consistent with the 2012 LTERP objectives, which have been accepted by the BCUC in the past. Further, the Overarching Objectives include due consideration for the provincial energy objectives.

Therefore, **the Panel accepts FBC's 2016 LTERP Overarching Objectives as being in the public interest.**

2.2 Self-sufficiency

In addition to the Overarching Objectives discussed above, FBC sets out an additional objective of achieving self-sufficiency in the long term. The goal of self-sufficiency plays a central role in this Application in terms of FBC's evaluation of alternative resource portfolios and the ultimate selection of the preferred portfolio.

Relevant evidence

FBC submits that the portfolio it ultimately selected is "predicated on achieving electricity self-sufficiency by 2025, after which time incremental supply will come from FBC's own generation and/or energy purchases from BC suppliers."⁹

FBC has assumed that it will be able to access low-cost reliable market supply for the next 10 years, out to 2025. After this time, FBC has assumed that it will become self-sufficient, with incremental supply coming from its own generation and/or long-term contracts from BC suppliers.¹⁰ FBC is of the view that self-sufficiency at some point in the planning horizon is a more prudent approach to resource planning as it could mitigate market risks and it also provides consistency with the CEA objective of achieving electricity self-sufficiency.¹¹

FBC makes numerous references in this proceeding to the CEA as a foundational basis for achieving self-sufficiency, summarized in Reply Argument as follows.

[The BCUC must consider], under section 44.1(8)(b) "the extent to which the [LTERP] is consistent with the applicable requirements under sections 6 and 19 of the Clean Energy Act". Section 6(4) of the CEA provides that: (4) A public utility, in planning in accordance with section 44.1 of the Utilities Commission Act for (a) the construction or extension of generation facilities, and (b) energy purchases, must consider British Columbia's energy objective to achieve electricity self-sufficiency.

⁸ FBC Reply Argument, p. 7.

⁹ FBC Final Argument, p. 54.

¹⁰ Exhibit B-1, p. 117.

¹¹ Ibid., p. 120.

While these provisions do not establish an express legislative requirement for FBC to achieve self-sufficiency, it is also clear that FBC cannot simply ignore self-sufficiency in favour of cost-based objectives. FBC “must consider” the objective of achieving self-sufficiency in its long term planning and the Commission’s public interest review of the LTERP includes the extent to which it is consistent with this provincial energy objective.¹²

FBC notes that the British Columbia Hydro and Power Authority (BC Hydro) is acquiring additional energy and capacity through electricity purchase agreements and the development of new and existing generation sites including Mica Unit 5, Revelstoke Unit 6 and Site C. FBC considers that some of this power may be surplus and could be available to FBC at potentially attractive prices.¹³ However, FBC states that it has not considered the possibility of meeting all of its energy and capacity needs over the planning period with surplus power from BC Hydro as part of this LTERP.¹⁴

For the long-term resource planning process FBC compares the forecast price of market purchases to the forecast price of the Power Purchase Agreement (PPA) and other resources to evaluate market purchases within the resource options portfolio. FBC states that based on current base forecasts for market prices, some reliance on market purchases of energy and capacity is more cost-effective than other resource options over the short to medium term.¹⁵

FBC states that relying on market purchases over the long-term can be risky in terms of price and supply availability. FBC elaborates that:

[W]hile there are market price forecasts for future electricity prices, there is no guarantee that market prices will remain at these levels given the degree of price volatility and uncertainty in the marketplace....There is also no guarantee that FBC will be able to access market supply reliably, especially if there is no access to long term firm transmission.¹⁶

In FBC’s view, market supply is relied upon as a Planning Reserve Margin (PRM) resource to meet unforeseen increases in demand or forced plant outages, and if increased amounts of market supply were also relied upon as a base resource in the preferred portfolio to meet expected gaps, then the PRM test could fail. Specifically, FBC states in its PRM report that it only has 150 MW (225 MW in June) of reliable access to the US market over Line 71, however the PRM report did not specify whether there was a similar limit on purchases of BC Hydro surplus energy.¹⁷

FBC comments that it may consider delaying its self-sufficiency target of 2025 in the next long-term resource plan if the delay of self-sufficiency can be accomplished while meeting the objectives of the long-term resource plan at that time.¹⁸ Market conditions such as reduced transmission availability, increased market costs or reduced liquidity in the market would support FBC’s plan to become self-sufficient by 2025, while favourable market conditions such as the availability of cost-effective, secure and reliable power would support continued reliance on market supply beyond 2025.¹⁹

¹² FBC Reply Argument, p. 6-7

¹³ Exhibit B-1, pp. 36, 37.

¹⁴ Exhibit B-14, CEC 36.3.

¹⁵ Exhibit B-1, p. 111.

¹⁶ Exhibit B-1, pp. 111–112.

¹⁷ FBC Reply Argument, p. 22; Exhibit B-1, Appendix L, pp. 10, 16.

¹⁸ Exhibit B-5, CEC IR 21.1.

¹⁹ Exhibit B-5, CEC IR 21.2, 21.3, 24.2.

Position of the parties

The CEC argues that FBC has “unreasonably established a criterion of self-sufficiency” which is not included in section 44.1(8) of the UCA²⁰ and states that according to section 6(2) of the UCA, the electricity self-sufficiency requirement applies only to BC Hydro and is only a consideration, not a requirement, for FBC.²¹ The CEC submits that FBC has prioritized this self-sufficiency criterion over the interests of persons in British Columbia who receive or may receive service from FBC.²² The CEC further submits that a consideration of the interests of persons in British Columbia who receive or may receive service from FBC would weigh heavily towards ensuring the lowest appropriate cost of energy supply to enable the most affordable energy for its customers.²³

The CEC notes that FBC may consider extending the self-sufficiency target further out in time if FBC can continue to purchase market power cost-effectively, securely and reliably beyond 2025.²⁴ The CEC submits that FBC's pursuit of self-sufficiency would result in additional, unnecessary costs to FBC ratepayers and calculates the difference between portfolio A1 (no self-sufficiency) and FBC's preferred portfolio (A4) to be \$19.8 million in 2035 depending on the cost of other planned resources.²⁵ In conclusion, the CEC submits that “the BCUC should deny FBC's objective of self-sufficiency and recommend that FBC resubmit its LTERP using Portfolio A1.”²⁶ The CEC supports a full review of FBC's self-sufficiency target in the next LTERP to be filed in 2021, or before.²⁷

BCOAPO notes that if PPA Tranche 2 energy is included in FBC's resources, new resources are not truly needed for most, if not all, of the planning period and submits that the decision to build new resources during the period should be based on cost and market supply risk considerations.²⁸ BCOAPO submits that FBC should be directed to critically assess the cost and risks of continuing to rely on market purchases as an alternative to acquiring new resources as preparation for its next long-term resource plan.²⁹

FBC counters in its Reply Argument and disagrees with the CEC's statutory interpretation of the UCA and the CEA. FBC states that the self-sufficiency objective does not only apply to BC Hydro and also states that FBC must consider BC's energy objectives as required by section 6(4) of the CEA.³⁰ FBC states that while these provisions “do not establish an express legislative requirement for FBC to achieve self-sufficiency, it is also clear that FBC cannot simply ignore self-sufficiency in favour of cost-based objectives.”³¹

FBC argues that “the interests of FBC's ratepayers should not be interpreted in a manner that is inconsistent or incompatible with BC's energy objectives as expressed in the CEA. The energy objectives, like all statute law, are an expression of or were enacted to further the public interest.”³² FBC further states that its ratepayers must have an interest in the province's energy objectives being pursued and achieved. FBC concludes by stating that “its consideration of and decision to pursue a self-sufficiency target date by the end of 2025 in the LTERP is consistent with the applicable legislative and regulatory framework.”³³

²⁰ CEC Final Argument, p. 4.

²¹ CEC Final Argument, p. 5.

²² CEC Final Argument, p. 4.

²³ CEC Final Argument, p. 4.

²⁴ CEC Final Argument, p. 5.

²⁵ CEC Final Argument, p. 7.

²⁶ CEC Final Argument, p. 8.

²⁷ CEC Final Argument, p. 21.

²⁸ BCOAPO Final Argument, p. 16.

²⁹ BCOAPO Final Argument, p. 17.

³⁰ FBC Reply Argument, pp. 6–7.

³¹ FBC Reply Argument, p. 6.

³² FBC Reply Argument, p. 7.

³³ FBC Reply Argument, p. 7.

BCUC determination

FBC's position in support of its self-sufficiency objective rests on two principal lines of argument: alignment with the CEA objectives; and market conditions. The Panel addresses each in the comments that follow.

With regard to the CEA objective of electricity self-sufficiency, the Panel draws a sharp distinction between an objective for the Province as a whole and an objective for FBC in particular. The CEA speaks to self-sufficiency for British Columbia. Notably, while specific reference is made to BC Hydro's mandatory role in respect of that objective, there is no such explicit mention of any other utility (including FBC). The Panel notes that if the lawmakers had intended for this objective to apply specifically to FBC as well as to BC Hydro, they would have provided that clarity.

Thus, the Panel views the imperative for FBC to consider the energy self-sufficiency objective to obligate FBC to evaluate the extent to which its plan furthers or impedes achieving the provincial objective, but does not obligate FBC to actively pursue its own self-sufficiency.

For the reasons above, the Panel does not accept the line of reasoning that the CEA objectives support the case for FBC to pursue self-sufficiency.

Turning to the line of reasoning regarding market conditions, FBC acknowledges that market purchases have been a reliable strategy in the recent past, and further argues that it is FBC's preferred strategy through 2024. FBC comments that markets could change in ways that compromise a continuation of that strategy beyond 2024 and/or that the PRP test could fail at some time in the future. That said, the Panel has not been persuaded that events are likely to unfold in a way that produces either of these potential outcomes and, therefore, compromises a continuation of the current strategy. For these reasons, the Panel does not accept the line of reasoning that expected market conditions require the pursuit of a self-sufficiency objective at this time.

Thus, the Panel finds that FBC's objective of achieving electricity self-sufficiency is not in the public interest, and therefore does not accept it as a valid planning objective against which portfolio options should be evaluated.

3.0 Demand forecast

Relevant evidence

FBC produced reference case forecasts, before incorporating the effects of DSM, for annual energy and peak demand over the 20-year planning horizon (2016-2035). The annual energy forecast represents annual consumption while the peak demand forecast provides an estimate of the maximum hourly electricity demand under expected peak summer and winter conditions.³⁴

FBC produces forecasts by customer groups (residential, commercial, wholesale, industrial, lighting and irrigation) using a different method for each group, and then aggregates the customer group forecasts into a total forecast. The reference case load forecast after load savings is used to determine the load-resource balance before assessing incremental demand- and supply-side resources.³⁵

FBC's reference case load forecast anticipates an increase in total gross load after-savings from 3,544 GWh in 2016 to 4,334 GWh by 2035 and an increase in total net load after-savings from 3,264 GWh in 2016 to 4,003

³⁴ Exhibit B-1, Appendix E, p. 1.

³⁵ Exhibit B-1, Appendix E, pp. 2-15

GWh by 2035.³⁶ Both the gross load and net load forecasts represent a compound annual growth rate of 1.1 percent over the twenty year planning horizon. Gross load forecasts include system losses, while net load forecasts exclude system losses. FBC assumes system losses of 8 percent of gross load.³⁷

To account for future variability in the load forecast inputs, FBC employed a Monte Carlo (MC) simulation; employed Navigant Consulting Ltd. (Navigant) to assist in identifying emerging trends and technologies not reflected in the reference case load forecast that could drive future load requirements; and discussed the load scenarios with the Resource Planning Advisory Group (RPAG) stakeholders.³⁸

FBC considers that there are no “significant issues that would call into question its long term load forecasts in a material way...”³⁹ FBC submits that “the load forecasts presented in the LTERP are adequate to satisfy the legislative requirement found at section 44.1(2)(a) of the UCA and the MC range and alternative load scenarios developed for the LTERP conform with the direction in the RP Guidelines to include multiple load forecasts in a long term resource plan to account for future load uncertainty.”⁴⁰

Position of the parties

BCOAPO addressed each customer group and submits that the forecasts for each customer group and the aggregate forecast are reasonable for the purposes of Section 44.1(2)(a) of the UCA and the FBC’s 2016 LTERP.⁴¹

ICG submit that FBC’s load forecast is appropriate for the purposes of this LTERP.⁴²

The CEC submits that the BCUC should request FBC to reconsider its Load Forecast and to resubmit it in a manner that more accurately reflects historical load increases.⁴³ The CEC submits that both FBC’s gross and net load forecasts anticipate a compound annual growth rate of 1.1 percent over 20 years while FBC’s actual growth rates data shows that the actual growth rate averaged 0.14 percent for the ten years between 2006 and 2015 and was 0.75 percent over the twenty years between 1996 and 2015.⁴⁴ The CEC submits that FBC’s load forecast is likely to be overstated given the lower rates historically. The CEC concludes that over-forecasting of load in the LTERP could lead to a planned requirement for more resources than necessary which would increase cost to ratepayers, especially when the utility is relying upon non-flexible resources.⁴⁵

BCSEA observes that “under the 2016 LTERP and LTDSM Plan FBC requires no new supply-side resources in the next ten years...the accuracy of FBC’s pre-DSM load forecast will be an important consideration in the review of FBC’s next long term plan, anticipated in 2021, when the prospect of new supply-side resources is more imminent.”⁴⁶

In reply to the CEC, FBC notes that the compound annual growth rate of 1.1 percent for both gross and net load forecasts provided in the LTERP is a before-DSM forecast, while the historical growth rates on which the CEC refers to in its final argument includes the effects of DSM savings.⁴⁷ FBC further states that “when the savings

³⁶ Exhibit B-1, pp. 53-54.

³⁷ Exhibit B-1, pp. 53–54; Appendix E, p. 1 (System losses definition).

³⁸ Exhibit B-1, p. 70.

³⁹ FBC Final Argument, p. 13

⁴⁰ FBC Final Argument, pp. 15–16.

⁴¹ BCOAPO Final Argument, p. 9

⁴² ICG Final Argument, p. 10.

⁴³ CEC Final Argument, p. 1.

⁴⁴ CEC Final Argument, p. 10.

⁴⁵ CEC Final Argument, pp. 10–11.

⁴⁶ BCSEA Final Argument, p. 5.

⁴⁷ FBC Reply Argument, p. 11.

associated with the High DSM scenario are applied to the reference case forecast, the reduction in load growth over the 20-year planning horizon reflects a CAGR of 0.26 percent (compared to 1.1 percent without DSM).⁴⁸

FBC submits that this 0.26 percent after-DSM savings is roughly consistent with the averages the CEC calculated for the actual growth rate over the last 10 and 20-year periods.⁴⁹ FBC concludes that the CEC has not demonstrated any issues or inaccuracies with FBC's long term forecast and that they should not be directed to reconsider, revise or resubmit its load forecast.⁵⁰

In reply to BCSEA's comment about load scenarios, FBC states that it will continue to monitor the situation and will determine, taking into account input from the RPAG, what level of scenario development is appropriate as the next LTERP is prepared.⁵¹

BCUC determination

The Panel notes the CEC's concern with regard to the possibility of FBC's forecasts being overstated in the light of recent demand trends, but notes that even if the forecast is overstated, it still does not precipitate the need for new resources until comfortably beyond the timing of the anticipated filing of FBC's next LTERP. By then, FBC will have additional years of history with which to evaluate whether there has been a shift in longer term demand growth trends.

The Panel is satisfied with the approach taken by FBC in developing its demand forecasts, and **the Panel accepts the load forecast for purposes of this 2016 LTERP & LTDSM Plan.**

4.0 2016 Long Term Demand-Side Management Plan

FBC submits that the 2016 Long Term Demand-Side Management Plan (LTDSM Plan) is in the public interest pursuant to section 44.1(6) of the UCA.⁵² FBC notes that it is not seeking approval of the pro-forma DSM expenditures listed in section 3.3 of the LTDSM Plan.⁵³

FBC partnered with three other BC utilities to perform a provincial, dual-fuel conservation potential review (CPR), to determine the energy efficiency potential for electricity and natural gas across British Columbia in the residential, commercial, and industrial sectors over the planning horizon of 2016 to 2035.⁵⁴

FBC presents four DSM scenarios, which are based on increasing targets for load growth offset over the 20-year period of the LTERP, summarized in the table below.⁵⁵

⁴⁸ FBC Reply Argument, p. 11.

⁴⁹ FBC Reply Argument, p. 11.

⁵⁰ FBC Reply Argument, p. 12.

⁵¹ FBC Reply Argument, p. 10.

⁵² Exhibit B-1, Volume 1, p. 14.

⁵³ Exhibit B-1, Volume 2, p. 1.

⁵⁴ Exhibit B-1, Volume 2, p. 7.

⁵⁵ Exhibit B-2, BCUC IR 33.1.

Table 1 – Summary of DSM Scenarios

	Low	Base	High	Max
2017 – 2021 period				
Total Dollars (\$millions)	\$28	\$39	\$40	\$40
Average Annual GWh Savings	21	26	27	27
2017 – 2031 period				
Total Dollars (\$millions)	\$45	\$88	\$104	\$114
Average Annual GWh Savings	20	26	31	36

There are three key requirements relating to the adequacy of the LTDSM Plan. It must:

- indicate how the public utility intends to reduce the anticipated pre-DSM demand by taking cost-effective demand-side measures (Cost Effectiveness);⁵⁶
- explain why the demand for energy to be served by the supply-side facilities and/or market purchases are not planned to be replaced by demand-side measures (Explanation);⁵⁷ and
- contain, at a minimum, programs in three specific areas of low-income households, rental accommodation, and education programming for students (Completeness).⁵⁸

4.1 Cost-effectiveness

Relevant evidence

The key indicator of cost effectiveness is the Total Resource Cost (TRC) ratio, which compares total benefits against total costs (i.e. a TRC value greater than 1.0 delivers positive benefits, and the higher the value above 1.0, the more cost effective the portfolio). FBC submits that the BCUC has consistently applied the TRC at the portfolio level, and this approach is appropriate for FBC’s current LTDSM plan.⁵⁹ The average costs and the TRC values of each DSM scenario is shown in the table below.

Table 2 – Average Costs and TRC Benefit/Cost Ratios of DSM Scenarios

	Low DSM	Base DSM	High DSM	Max DSM
Average cost incl. program costs (\$2016/MWh)⁶⁰	\$42	\$52	\$58	\$64
TRC Benefit/Cost Ratios⁶¹	3.4	2.6	2.2	2.0

⁵⁶ UCA s.44.1(2)(b)

⁵⁷ UCA s. 44.1(2)(f)

⁵⁸ DSM Regulation 326/2008, Section 3

⁵⁹ FBC Final Argument, pp. 9–10.

⁶⁰ Exhibit B-1-1, p. 166.

⁶¹ Exhibit B-1-1, p. 3.

BCUC determination

The analysis presented indicates that each of the four scenarios are cost effective as indicated by TRC values greater than 1.0 in each case. **The Panel finds the High DSM scenario to be cost effective.**

4.2 Explanation

Relevant evidence

FBC puts forward the High DSM portfolio as its preferred option. In explaining its choice, FBC provides the following comments:

The high level of DSM under the scenario proposed in FBC's LTDSM Plan has an average incremental cost of \$98/MWh. This is closely comparable to FBC's LRMC for BC clean or renewable resources (approximately \$100/MWh) that is used in the cost-effectiveness test under the *DSM Regulation*.⁶²

...

[The Max scenario] would require higher-cost DSM measures with marginal costs averaging \$108/MWh. This is significantly more than the cost of the proposed DSM scenario. It is also materially higher than the \$100/MWh LRMC of BC clean or renewable resources, and would result in rate increases for customers if implemented.⁶³

...

FBC considered the higher levels of DSM under the Max scenario to be sub-optimal for a number of other reasons, including the inherently non-firm, non-dispatchable nature of DSM savings compared to supply side options. DSM requires voluntary participation by customers and the Max scenario therefore creates risks in managing the [load-resource balance] if DSM program uptake does not materialize as planned.⁶⁴

Position of the parties

BCSEA submits that "the requirement that a public utility's long-term resources plan must provide an explanation of why planned supply-side resources are not instead planned to be replaced by demand-side measures, evinces a clear legislative direction that DSM resources are to be considered the first and best approach to meeting anticipated shortfalls in meeting energy needs, ahead of supply-side resources."⁶⁵

FBC disagrees with BCSEA, and submits that "for utilities other than BC Hydro, section 44.1(2)(f) simply reflects a neutral approach in which utilities are required to give adequate consideration of both supply and demand resources to meet gaps in their long-term LRB, based on their own unique circumstances, and to provide a reasoned explanation for the decision ultimately made."⁶⁶ FBC submits that the LTERP includes an adequate explanation for its decision not to pursue additional levels of DSM that meets the standard BCSEA proposes, and that the BCUC should accept its explanation.⁶⁷

⁶² FBC Final Argument, pp. 43–44.

⁶³ FBC Final Argument, p. 44.

⁶⁴ FBC Final Argument, p. 45.

⁶⁵ BCSEA Final Argument, p. 22.

⁶⁶ FBC Reply Argument, p. 9.

⁶⁷ FBC Reply Argument, p. 5.

BCOAPO submits that comparing the incremental cost of the additional DSM measures (i.e. Max compared to High) is problematic, and the TRC test indicates that the Max scenario is cost-effective. Having said that, the BCOAPO goes on to say that it agrees with FBC that the Company is not required to include all cost-effective DSM, but rather provide an adequate explanation of its choice.⁶⁸

BCUC determination

The Panel agrees with FBC that the UCA does not compel FBC to pursue any and all DSM resources that are cost effective, but rather to provide an explanation for its choice of DSM scenarios.

The Panel notes BCOAPO’s comments that FBC’s use of the incremental cost of the Max scenario is problematic, and more will be said on that issue later in this Decision in Section 8.2.

FBC has set out in some detail the basis on which it constructed the alternative DSM scenarios, evaluated the pros and cons of each, and ultimately selected the High DSM scenario. The Panel is satisfied that, whether or not all parties agree that the High DSM is their preferred scenario, FBC has adequately explained why it is FBC’s preferred scenario.

Thus, the Panel finds that FBC has provided an adequate explanation as to why it prefers the High DSM scenario.

The Panel notes that FBC did not model a range of DSM scenarios for the period 2017–2021. Looking to FBC’s next 2016 LTERP & LTDSM Plan filing, the Panel expects that FBC will update its short-term market assumptions and develop a richer analysis of DSM alternatives for the first five years of the LTDSM Plan.

4.3 Completeness

With regard to requirements to include specific programs, the table below summarizes the programs where FBC submits that the LTDSM Plan meets the adequacy requirements of the DSM Regulation.

Table 3 – DSM Regulation Section 3 Adequacy Requirements - LTDSM Plan Programs

Section of DSM Regulation	Adequacy Requirement	Summary of Programs in LTDSM Plan
3(a)	a demand-side measure intended specifically to assist residents of low-income households to reduce their energy consumption	Low-Income Households Program: Energy Saving Kits (ESK), Energy Conservation Assistance Program, rebates for multi-unit residential buildings (MURBs) ⁶⁹
3(b)	a demand-side measure intended specifically to improve the energy efficiency of rental accommodations	Rental Apartment Program: ESK installation for rental MURBs, energy audits and technical support ⁷⁰
3(c)	an education program for students enrolled in schools in the public utility's service area	Education Programs: online education program, funding support for third party educational organizations ⁷¹
3(d)	an education program for students enrolled in post-secondary institutions in the public utility's service area	Education Programs: financial and in-kind support for post-secondary curriculum and behaviour change initiatives ⁷²

⁶⁸ BCOAPO Argument p. 14.

⁶⁹ Exhibit B-1, Volume 2, p. 19.

⁷⁰ Exhibit B-1, Volume 2, p. 19.

⁷¹ Exhibit B-1, Volume 2, p. 23.

On March 24, 2017, the DSM Regulation was amended adding additional adequacy requirements under section 3, including measure(s) to address local government and First Nations step codes.⁷³ FBC submits that the amendments were not passed or in effect until well after the LTERP was filed on November 30, 2016, and that the BCUC's review of the LTERP should be based on the pre-amendment version of the *DSM Regulation*, as it read at the time the LTERP was filed.⁷⁴

Position of the parties

The CEC submits that the amendment took place within the time period of the proceedings for the LTERP. The CEC also notes that the amended DSM Regulation will be in effect during the period covered by the LTERP, and therefore the BCUC is entitled to and should weigh all the evidence before it and to make a determination on the matter.⁷⁵

BCSEA submits the amendment to the *DSM Regulation* must be construed as “always speaking”, and the BCUC's determination as to whether carrying out the plan would be in the public interest is made in accordance with the law as it stands at the time of the determination.⁷⁶

In its Reply Argument, FBC counters that the LTERP and LTDSM Plan could and should be accepted on the basis that FBC's plan shows it intends to pursue adequate, cost effective demand-side measures. Further, FBC states the adequacy requirements set out in section 3 of the DSM Regulation are in practice met through FBC's DSM expenditure schedule application and its 2018 DSM expenditure schedule application notes that its existing Community Energy Planning program already meets the new requirement in section 3(f) of the amended DSM regulation.⁷⁷

BCUC determination

The Panel is satisfied that FBC has included programs that meet each of the requirements set out in Section 3 of the DSM Regulation, and therefore **the Panel finds the LTDSM Plan to be adequate for the purposes of Section 3 of DSM Regulation 326/2008**. The Panel is assured by FBC's statement that it intends to pursue adequate, cost-effective demand-side measures. Further, the adequacy requirements set out in section 3 of the DSM Regulation will be assessed with each future DSM expenditure schedule filing.

The Panel finds that the High DSM scenario is complete in terms of containing the necessary specific programs.

Having found the High DSM scenario to be cost effective (section 4.1), adequately explained (section 4.2), and complete (section 4.3), **the Panel finds that FBC intends to pursue adequate, cost effective DSM measures, and accepts the LTDSM plan as being in the public interest.**

5.0 Resource planning

Relevant evidence

FBC applies the High DSM portfolio to the reference case load forecast to produce an analysis of LRB over the forecast horizon.

⁷² Exhibit B-1, Volume 2, p. 23.

⁷³ B.C. Reg. 117/2017.

⁷⁴ FBC Final Argument, pp. 7–9.

⁷⁵ CEC Final Argument, p. 14.

⁷⁶ BCSEA Final Argument, pp. 3–4.

⁷⁷ FBC Final Argument, p. 8.

Key assumptions factoring into the Energy LRB include:

- the Brilliant Expansion contract is extended to 2027 and discontinues after that;
- the PPA with BC Hydro is renewed and continues beyond the September 2033 expiration date; and,
- FBC uses only the Power Purchase Agreement (PPA) Tranche 1 Energy amount, as FBC expects that it would be able to build or contract for new energy resources at a cost lower than the PPA Tranche 2 Energy cost.⁷⁸

A key assumption factoring into the Capacity LRB is whether the Brilliant Expansion contract is renewed until 2027 after which it expires. The capacity LRB also assumes that 200 MW of capacity is available to FBC from the PPA but can be reduced if not required to meet the load forecast. As with the energy LRB, FBC also assumes the renewal of the BC Hydro PPA in 2033.⁷⁹

The results of this analysis are summarized by FBC in the following charts:

Figure 1 – Energy LRB (After DSM)⁸⁰

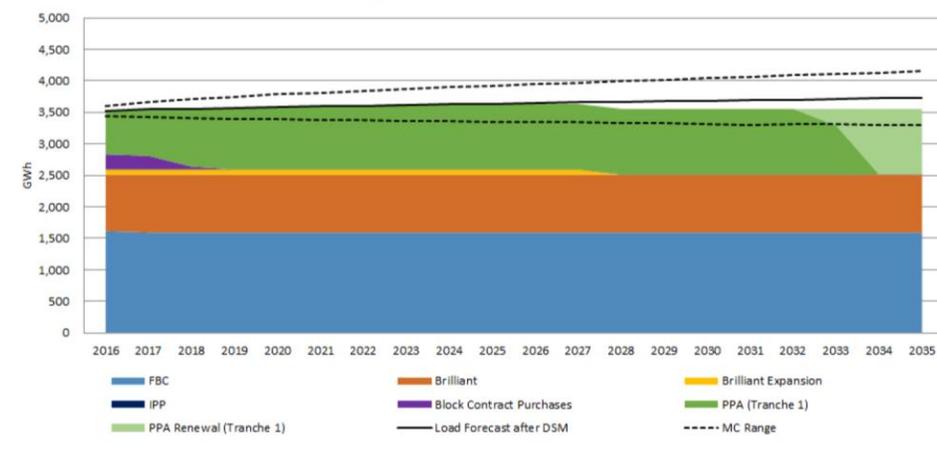
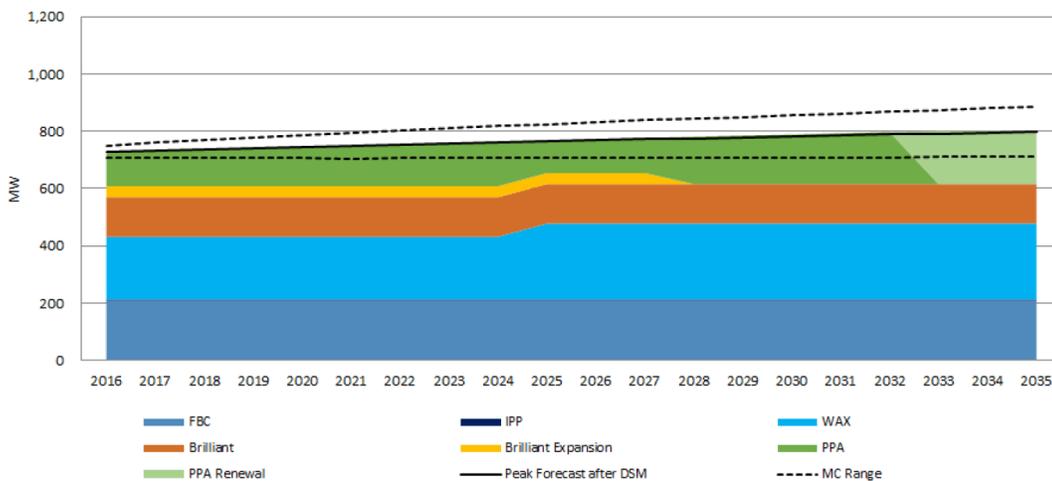


Figure 2 – Capacity LRB (After DSM)⁸¹



⁷⁸ Exhibit B-1, p. 93.

⁷⁹ Exhibit B-1, p. 94.

⁸⁰ Exhibit B-1, p. 101.

⁸¹ Exhibit B-1, p. 102.

The charts show that with the high level of DSM applied to the reference case (solid black line) there are no energy gaps (spread between anticipated demand and supply) out to 2024. Slight gaps start in 2025, which increase to almost 200 GWh by 2035 if the PPA is renewed.⁸²

For the capacity, the figure above shows that with the High scenario level of DSM offsetting about 56 percent of future peak load growth, there are no gaps that need to be filled if the PPA is renewed based on the reference load forecast peak after DSM. FBC notes that based on the peak load forecast after DSM, there would be surpluses of capacity for most years if the PPA is assumed to provide its full peak supply of 200 MW. However, the figure reflects the reduction in the PPA to match what is required to meet the peak demand forecast.⁸³

FBC states that there are minimal gaps for peak capacity if the PPA is renewed beyond 2033 and therefore, the main focus for FBC is to fill any gaps related to energy.⁸⁴

FBC presented 16 possible resource portfolios for evaluation based on several different base characteristics and then explored sensitivities around these base characteristics (as shown in table 4). The portfolios were then analysed across a range of attributes (technical, financial, environmental and socio-economic).

Table 4 – Portfolio Analysis Base Characteristics and Sensitivity Cases⁸⁵

Portfolio Base Characteristics	Sensitivity Cases
DSM Level <ul style="list-style-type: none"> Proposed High level 	<ul style="list-style-type: none"> No DSM Max DSM Low DSM
Reliance on Market Purchases <ul style="list-style-type: none"> Self-sufficiency by 2025 	<ul style="list-style-type: none"> No self-sufficiency Self-sufficiency by 2020 High market and carbon prices
Percent Clean or Renewable <ul style="list-style-type: none"> 93 percent clean or renewable 	<ul style="list-style-type: none"> 100 percent clean or renewable High market and carbon prices
Load Requirements <ul style="list-style-type: none"> Reference case load forecast 	<ul style="list-style-type: none"> High load scenario Low load scenario
PPA Renewal <ul style="list-style-type: none"> PPA renewed in 2033 	<ul style="list-style-type: none"> PPA not renewed

FBC also conducted online discussion boards to survey customers about their views regarding the ranking of FBC’s resource planning objectives. When presented with choosing among resource planning objectives, the majority of residential and commercial customers surveyed ranked “cost effective secure and reliable power” as “the most critical” objective for LTERP planning.⁸⁶ The reported findings state the following:

- [Residential] Customers who view this objective as critical tend to focus on the importance of maintaining reasonable costs for the everyday customer. They either believe that current costs are already too high or that, given that costs will inevitably increase in the future, the focus has to be on affordability.⁸⁷
- [Commercial] Customers who view this objective as critical cite the central role of electricity in everyday life – “everything revolves around electricity” – and the need to contain costs so that electricity can be an affordable option.⁸⁸

⁸² Exhibit B-1, p. 101.

⁸³ Exhibit B-1, p. 102.

⁸⁴ Exhibit B-1, p. 103.

⁸⁵ Exhibit B1, p.116.

⁸⁶ Exhibit B-11, BCUC IR 65.1.2; Exhibit B-1, LTDSM Plan Appendix B, pp. 14, 24.

⁸⁷ Exhibit B-1, LTDSM Plan Appendix B, p. 14.

⁸⁸ Exhibit B-1, LTDSM Plan Appendix B, p. 24.

Four of the portfolios were brought forward as the short list for final consideration as the preferred resource portfolio. FBC states that it “believes that [these four portfolios] best meet the LTERP’s objectives of cost-effectiveness, reliability, inclusion of cost-effective DSM and consideration of BC’s energy objectives.”⁸⁹ The composition of the four portfolios is summarized in the following table:⁹⁰

Table 5 – Incremental Resources Included in Each Resource Portfolio

A1 No Self-Sufficiency	C1 93% Clean with CCGT	A4 93% Clean with SCGT	C4 100% Clean BC Resources
Market (97%)	Market (51%)	Market (31%)	Market (31%)
Biogas (3%)	CCGT (48%)	Wind (65%)	Wind (65%)
	Biogas (1%)	Biogas (3%)	Biogas (3%)
		SCGT (1%)	Biomass, Solar (1%)

FBC’s submissions show that for each year from 2016 through to 2024 the incremental resources used in each of the above portfolios are identical,⁹¹ and the differences in incremental resources between each of the four portfolios occur only from 2025 through to 2035.⁹² From 2016 through to 2024, the incremental resources used are PPA Tranche 1 Energy and Capacity, Market Purchases and DSM.⁹³ FBC further states “For portfolio A1 with no self-sufficiency, market purchases are selected throughout the 20 years [planning horizon] because market power is lower cost than the other resource options.”⁹⁴

FBC states three out of the four alternative portfolios FBC considered for the preferred portfolio and the portfolio it ultimately selected are predicated on achieving electricity self-sufficiency. From 2026 onwards, portfolios C1, A4 and C4 do not utilize market purchases as an incremental resource, instead relying on Simple Cycle Gas Turbine (SCGT), Combined Cycle Gas Turbine (CCGT), biogas, solar or wind resources as determined by the selected portfolio.⁹⁵

FBC uses the criteria listed below to assess each of the four portfolios and to determine the preferred portfolio:⁹⁶

1. Cost (using the LRMC of each portfolio);
2. Reliability;
3. Geographic diversity of generation resources; and
4. Consistency with the CEA objectives of:
 - a. encouraging socio-economic development and the creation and retention of jobs, and
 - b. reducing environmental impacts in terms of GHG emissions.

The table below shows the results of FBC’s analysis of each of the portfolios using the above criteria as metrics.

⁸⁹ Exhibit B-1, p. 125.
⁹⁰ Exhibit B-1, p. 125.
⁹¹ Exhibit B-1-1, FBC Errata, Revised Responses to BCOAPO IR No. 1, pp. 4, 6, 13, 15.
⁹² Ibid.
⁹³ Ibid.
⁹⁴ Exhibit B-1, p. 125.
⁹⁵ Exhibit B-1-1, FBC Errata, Revised Responses to BCOAPO IR No. 1, pp. 4, 6, 13, 15.
⁹⁶ Exhibit B-1, p. 125.

Table 6 – Attributes of Portfolios Considered for Preferred Portfolio⁹⁷

Portfolio	Incremental Resources	LRMC (\$/MWh)	Max % Non-Clean BC Resources (based on energy)	GHG emissions produced in BC (tonnes CO2e)	Full-Time Equivalents per year	Geographic Resource Diversity	
A1	No Self-Sufficiency	Market (97%) Biogas (3%)	\$75	0.0%	0	14	Low
C1	93% Clean with CCGT	Market (51%) CCGT (48%) Biogas (1%)	\$90	3.9%	189k	164	Medium
A4	93% Clean with SCGT	Market (31%) Wind (65%) Biogas (3%) SCGT (1%)	\$96	0.2%	3k	145	High
C4	100% Clean BC Resources	Market (31%) Wind (65%) Biogas (3%) Biomass, Solar (1%)	\$97	0.0%	0	216	Medium

FBC determined portfolio A4 (93 percent clean with SCGT) to be its preferred portfolio stating that it was determined to best meet the LTERP objectives in terms of balancing cost, reliability, socio-economic benefits, geographic resource diversity, as well as BC’s energy objectives.⁹⁸ FBC states that this portfolio produces minimal GHG emissions, only 3,000 CO2 equivalents over twenty years, because the SCGT resource is not required until 2033 and is only required to run during peak demand periods, unlike a CCGT plant that would run more frequently as a base load resource. FBC points out that a SCGT plant in the portfolio provides FBC with additional reliability and flexibility for unforeseen capacity and/or energy requirements because it can be used to run more frequently than required for peak demand periods. FBC noted A4’s socioeconomic benefits of 145 full time equivalent employees (FTEs) per year and states that A4 provides high geographic resource diversity with the wind energy and the SCGT resources likely being located in the Okanagan.

FBC concludes that portfolio A4 “best meets the LTERP objectives in terms of balancing cost, reliability and geographic resource diversity with BC’s energy objectives as relates to its preferred portfolio.”⁹⁹

FBC notes that the inclusion of the SCGT in the preferred portfolio offers flexibility for contingency planning if market prices are higher than forecast, if new large loads arise, or as a backup resource due to the uncertain nature of wind generation.¹⁰⁰ FBC states that the preferred portfolio also satisfies planning reserve margin requirements without the need for incremental resource requirements or additional costs.¹⁰¹

Position of the parties

The CEC, BCSEA and ICG oppose FBC’s preferred portfolio and each propose an alternative from the four portfolios considered by FBC.¹⁰² BCOAPO does not support FBC’s preferred portfolio but notes that the Action Plan for this current LTERP will be the same regardless which of the four portfolios is chosen. BCOAPO further notes that the time at which a decision must be made regarding the preferred portfolio does not occur prior to the preparation of FBC’s next long term resource plan.¹⁰³

⁹⁷ Exhibit B-1-1, Table 9-2, p. 126.

⁹⁸ FBC Final Argument, p. 39.

⁹⁹ Exhibit B-1, p. 127.

¹⁰⁰ FBC Final Argument, p. 40.

¹⁰¹ FBC Final Argument, p. 40.

¹⁰² CEC Final Argument, p. 1; BCSEA Final Argument, p. 19; ICG Final Argument, p. 11.

¹⁰³ BCOAPO Final Argument, p. 18.

The CEC submits that that the BCUC “should deny FBC’s objective of self-sufficiency and recommend that FBC resubmit its LTERP using Portfolio A1.”¹⁰⁴ Portfolio A1 is a market-based portfolio that comprises of 97 percent market supply and 3 percent biogas with a LRMC of \$75 per MWh.

The CEC disputes FBC’s stated goal of self-sufficiency and submits that FBC’s discussion of uncertainty of access to market power in the LTERP is overstated. The CEC provides several reasons in support of market supply including a reference to an information request where FBC assumes that “the market will be available 99.84 percent of the time and that transmission to the market will be available 99.45% of the time.”¹⁰⁵ The CEC also argues that FBC and BC Hydro have an Imbalance Agreement whereby BC Hydro provides FBC with imbalance energy as needed, during unexpected conditions or circumstances, and the only consequence to FBC is a financial penalty.¹⁰⁶

The CEC refers to the updated PPA Tranche 2 energy price of \$85 per MWh and further recommends that “to the extent the Commission does not wish to rely on market energy, the Commission recommend that FBC maximize the use of PPA Tranche 2 energy wherever it is the most cost-effective option.”¹⁰⁷

BCOAPO submits that additional new resources are “not truly needed” because FBC already has existing resources, such as PPA Tranche 2 energy, to meet the energy gap that arises in 2024.¹⁰⁸ BCOAPO submits that one alternative approach would be to continue to use market supply and “rely on PPA Tranche 2 energy simply as insurance.”¹⁰⁹ BCOAPO acknowledges that this may increase costs but reiterates that it would only be required in case market supply was inaccessible or too costly.¹¹⁰ BCOAPO concludes that the Action Plan for this current LTERP will be the same regardless of which of the four portfolios is chosen and submits that it is appropriate for the BCUC to accept FBC’s 2016 LTERP in the public interest.¹¹¹

BCSEA strongly opposes any new gas-fired generation as a supply resource and states that this precludes portfolios C1 and A4 which have a CCGT and a SCGT respectively.¹¹² BCSEA also opposes portfolio A1 stating that “market power is more carbon intensive than clean or renewable BC power or DSM resources.”¹¹³ BCSEA states its preference for portfolio C4, however BCSEA concludes by highlighting that FBC will not need to consider whether to build or acquire new generation resources until its next LTERP.¹¹⁴

ICG opposes FBC’s selection of preferred portfolio A4. ICG submits that portfolio C1 should be chosen as the preferred portfolio because it meets the 93 percent clean energy target, does not rely on the market, and has a lower LRMC of \$90 per MWh versus 96 per MWh for portfolio A4.¹¹⁵ ICG also states that FBC should include in its action plan “opportunities for contracts with self-generation customers based on an LRMC from portfolio C1” and further submits that the incentives for purchases from self-generation should be “to advance BC energy objectives and for more prudent resource planning.”¹¹⁶

¹⁰⁴ CEC Final Argument, p. 8.

¹⁰⁵ CEC Final Argument, p. 8; Exhibit B-14, CEC IR 2.33.1

¹⁰⁶ CEC Final Argument, p. 8.

¹⁰⁷ CEC Final Argument, p. 13.

¹⁰⁸ BCOAPO Final Argument, p. 16

¹⁰⁹ BCOAPO Final Argument, p. 16.

¹¹⁰ BCOAPO Final Argument, p. 17.

¹¹¹ BCOAPO Final Argument, p. 18.

¹¹² BCSEA Final Argument, p. 19.

¹¹³ BCSEA Final Argument, p. 20.

¹¹⁴ BCSEA Final Argument, pp. 19–20.

¹¹⁵ ICG Final Argument, p. 11.

¹¹⁶ ICG Final Argument, p. 11.

Panel discussion

The Panel takes particular note of the fact that the incremental resources contained in each of the four portfolios (A1, C1, A4, C4) are identical through to 2024, and the portfolios only begin to diverge in composition beginning thereafter. Further to that point, no interveners have raised concern over the proposed resource portfolio out to 2024. The Panel considers the portfolio strategy through 2024 to be largely a continuation of current practice, and finds it to be a reasonable approach for that time span.

Looking beyond 2024, the LRMC for the preferred portfolio A4 is \$21/MWh more expensive than A1 (a 28 percent increase), and the third-highest LRMC of the four portfolios presented as final candidates. This is in sharp opposition to FBC's customer consultation process that indicated customers ranked cost as the most critical planning objective for the LTERP process.

Despite the significant cost differential, FBC recommends A4. The justification for A4 rests in large measure on the fact that it achieves FBC's electricity self-sufficiency objective, an objective that the Panel has rejected as a valid planning objective for this exercise.

Thus, having indicated that the final four portfolios best meet the LTERP's objectives of cost-effectiveness, reliability, inclusion of cost-effective DSM and consideration of BC's energy objectives, the Panel has not been persuaded that A4 is, in fact, the best of the four.

It is also noteworthy that FBC contemplates a more thorough review of its longer-term portfolio strategy as part of its next LTERP submission. Therefore, no aspect of the shorter-term plan is compromised by not committing to any specific trajectory beyond 2024.

BCUC determination

For these reasons, **the Panel finds the LTERP for the years up to 2024 is in the public interest and accepts it. Given the concerns identified, the Panel finds the recommended portfolio plan for years beyond 2024 not to be in the public interest, and rejects that portion of the plan.**

6.0 Timing of the next filing

FBC expects it will file its next long term resource plan in 2021, given that it requires no new supply-side resources in the next ten years.¹¹⁷ FBC submits that this is approximately five years from the filing of this LTERP, which is consistent with five year interval the BCUC directed following acceptance of FBC's 2012 LTERP.¹¹⁸

Position of the parties

BCSEA submit that the BCUC should direct FBC to file its next LTERP in 2021 and not later.¹¹⁹ The CEC supports a full review of FBC's self-sufficiency target in the next LTERP to be filed in 2021, or before.¹²⁰

BCUC determination

The Panel agrees with FBC that the appropriate timing for filing the next LTERP and LTDSM plan is 2021, and therefore **directs FBC to file its next LTERP and LTDSM plan by no later than December 1, 2021.**

¹¹⁷ Exhibit B-1, Vol. 1, p. 141; FBC Final Argument 64; Exhibit B-5, p.74

¹¹⁸ FBC Final Argument, p. 64.

¹¹⁹ BCSEA Final Argument, p. 28.

¹²⁰ CEC Final Argument, p. 21.

7.0 Rate Schedule 90

In this Application, FBC requests approval to rescind Electric Tariff No. 2 Schedule 90, Energy Management Services (RS90).

RS90 was introduced in 1990, pursuant to BCUC Order G-47-89. At that time, the purpose of RS90 was to describe each of the Company's specific programs, including the associated offers and financial incentives, and the overall program terms and conditions. Any revisions or extensions to a specific DSM program required an application to and order from the BCUC. In 2010 a major revision to RS90 removed much of the program specific pages and reduced RS90 to a generic high-level outline of program attributes.¹²¹

FBC is proposing to rescind RS 90 from its Electric Tariff to increase the Company's flexibility in DSM program design, to allow the Company to respond to market trends and new technologies more quickly and effectively, and to better align FBC's DSM programs with similar DSM programs and best practices from other utilities, including BC Hydro and FortisBC Energy Inc. (FEI). FBC submits that services offered under RS90 have been essentially made redundant by the specific DSM programs in FBC's approved DSM Plan portfolios, and that parts of RS90 conflict with the Company's offers or practices.¹²²

The CEC has no objections to RS90 being rescinded,¹²³ and BCSEA supports FBC's request for BCUC approval of rescission of RS90.¹²⁴

BCUC determination

The Panel agrees that RS90 currently serves no useful purpose, and that rescinding it would provide added flexibility in DSM program design. **The Panel approves FBC's request to rescind FBC's Electric Tariff No. 2 Schedule 90, Energy Management Services (RS90).**

8.0 Issues arising

In addition to the matters discussed above, the following issues arose during the proceeding and will be addressed in the following sections:

- Calculation of LRMC and its use;
- Incremental cost evaluation of DSM scenarios;
- Framework for resource portfolio evaluation/selection;
- Distributed generation; and
- Planning reserve margin.

8.1 Calculation of LRMC and its use

Two matters relating to LRMC arose during this proceeding: inclusion of DSM in calculating the value; and the manner in which the LRMC is then used in other contexts.

¹²¹ Exhibit B-1, Volume 2, p. 24.

¹²² Exhibit B-1, Volume 2, p. 25.

¹²³ CEC Final Argument, p. 22.

¹²⁴ BCSEA Final Argument, p. 29.

8.1.1 Inclusion of DSM

FBC's calculation of the LRM value includes DSM costs.¹²⁵ FBC indicated that the exclusion of DSM from the portfolio A4 would reduce the LRM from \$95.52 to \$94.00/MWh.¹²⁶

FBC also does not consider that the LRM estimate of portfolio A4 (which includes DSM) is useful in informing future applications, but instead proposes an alternative LRM based on the avoided cost of supply side resources only that excludes DSM.

FBC states that is not anticipating a requirement for additional resources for a considerable period of time and does not anticipate using the LRM to justify obtaining new resources to meet either load or planning reserve margin requirements at this time.¹²⁷

FBC further states, "If the resource provides little to no winter energy, such as solar PV, then it will have little to no impact on the LTERP required resources in the preferred portfolio A4, meaning that any energy produced at best only displaces BC Hydro PPA energy costs."¹²⁸ In addition, FBC indicated that it considers that the most reasonable proxy for its avoided cost of power is the rate at which it is able to purchase power under its PPA with BC Hydro.¹²⁹

FBC also states that the levelized unit energy cost for market purchases is about \$51 per MWh including transmission costs and losses from Mid-C, and submits that this is similar to the base case scenario for the PPA Tranche 1 Energy rate, with a levelized value of about \$50 per MWh over twenty years.¹³⁰

Panel discussion

FBC has not previously included DSM as a component of its LRM estimate, and it is not an approach currently used by other utilities in British Columbia. The Panel is not persuaded of the benefit of including DSM in the estimate of FBC's LRM, and encourages FBC to consider revising its LRM calculation method in its next LTERP filing.

8.1.2 Purpose and application of LRM beyond this Application

Intervenors in both the recent FBC Net Metering proceeding and this proceeding have raised the issue that FBC's estimate of avoided energy cost in the Net Metering proceeding (BC Hydro's RS 3808 Tranche 1 rate) differs from its LRM estimate put forward in the FBC's LTERP.

Subsequent to the filing of this LTERP Application, FBC has put forward the following LRM values.

¹²⁵ Exhibit B-1, pp. 125, 127; Exhibit B-1-1, IR Responses, p. 7.

¹²⁶ Exhibit B-1-1, IR Responses, p. 9.

¹²⁷ Exhibit B-11, BCUC IR 55.1.

¹²⁸ Exhibit B-2, BCUC IR 36.3.

¹²⁹ Exhibit B-18, Shadrack IR.2.7.

¹³⁰ Exhibit B-1, Appendix J, p. 42.

Table 7 – LRMC Values Used in FBC Subsequent Proceedings

Proceeding		LRMC
1	FBC Community Solar Pilot Project Application	FBC proposed: \$46.99/MWh (BC Hydro PPA Tranche 1 rate for F2017) ¹³¹
2	FBC Net Metering reconsideration	FBC proposed: \$43.03/MWh plus 5% rate rider (BC Hydro PPA Tranche 1 rate) ¹³²
3	FBC Electric Vehicle (EV) Rate	FBC proposed: \$50/MWh (levelized market purchase price). ¹³³

The FBC Rate Design and Rates of Electric Vehicle (EV) Direct Current Fast Charging Service (DCFC) Application, dated December 22, 2017, specifically refers the 2016 LTERP for guidance on FBC’s avoided cost. However, the LRMC guidance referred to is the levelized unit energy cost for market purchases of about \$51/MWh included in Appendix J to the LTERP, and not the \$96/MWh stated as the LRMC for Portfolio A4.¹³⁴

In the LTERP Application, FBC states that it “considers the long run marginal cost to be a price signal and is one of many considerations when assessing the cost-effectiveness of different resource options. FBC does not expect to acquire all available resources up to the LRMC, nor should the LRMC be viewed as a clearing price in isolation from other prudent resource planning considerations, such as energy or capacity profiles or environmental factors.”¹³⁵

FBC further explains that, while a particular resource option may be cost effective relative to a given LRMC value, it may not fit the energy or capacity requirements of customers in the future. For this reason, FBC believes the LRMC values presented should be viewed as price signals, rather than threshold targets, for resource options.¹³⁶

Panel discussion

For regulatory efficiency, the long-run marginal cost(s) developed in the LTERP should be a key input in future FBC proceedings.

The Panel agrees with FBC that a single calculation of the LRMC is not necessarily applicable in all situations: adjustments are sometimes warranted in respect of different circumstances surrounding such characteristics as the time horizons, shape, intermittency, and firmness of the energy being considered. That said, while agreeing that the LRMC needs to be adapted to specific situations, the Panel is of the view that this argues for starting with the LRMC developed in the LTERP as the jumping-off point for making appropriate adjustments at the margin, but not for abandoning the (LTERP’s) LRMC altogether and substituting an entirely different value.

FBC is encouraged to develop an LRMC framework that provides more consistency (and hence regulatory efficiency and clarity) across its future applications.

¹³¹ FBC Community Solar Pilot Project Application proceeding, Exhibit B-1, pp. 11, 12.

¹³² FBC Application for Reconsideration and Variance of Order G-199-16 FBC Net Metering Program Tariff Update Decision proceeding, Phase 2, Application dated March 17, 2017, p. 20; FBC Net Metering Update Application, dated April 15, 2016, p. 11.

¹³³ FBC Rate Design and Rates of Electric Vehicle Direct Current Fast Charging Service Application, dated December 22, 2017, p. 14.

¹³⁴ FBC Rate Design and Rates of Electric Vehicle Direct Current Fast Charging Service Application, dated December 22, 2017, p. 14.

¹³⁵ Exhibit B-1, Appendix K, p. 10.

¹³⁶ Exhibit B-1, p. 118.

8.2 Incremental cost evaluation of DSM scenarios

BCOAPO submits that, while the incremental cost analysis provides some insights, comparing the incremental cost of the additional DSM measures in each scenario to the average avoided cost of Portfolio B1 is problematic, as the two “cost” definitions are fundamentally different. The appropriate approach would compare the average to average (i.e. the average LRMV for Portfolio B1, and the average cost of each DSM scenario including programing costs). BCOAPO notes that on this basis, the Max DSM scenario would also be cost-effective¹³⁷.

FBC asserts that presenting the incremental costs of each DSM portfolio clearly illustrates the increased cost, i.e. declining economics, of obtaining higher load growth offsets. FBC submits that use of average Total Resource Cost (TRC) has the effect of blending lower and higher cost resources and thereby obscuring the marginal measures that likely should not be pursued.¹³⁸ FBC also submits that DSM programs can have a cost of energy above the LRMV of \$100/MWh and still be considered cost effective on a TRC basis.¹³⁹

In its Reply Argument, FBC agrees with BCOAPO that “the ‘incremental cost’, including program costs, of the DSM scenarios...is not directly comparable to the \$100 per MWh LRMV estimate for clean or renewable BC resources calculated pursuant to Portfolio B1. FBC submits that while it does not dispute that the Max scenario is cost-effective, this is only one of the factors that go into the analysis as between the different DSM scenarios and does not signify that the Max scenario is appropriate to pursue.”¹⁴⁰

Panel discussion

The Panel does not consider the comparison of the incremental costs of DSM scenarios to be an appropriate metric for comparison and ultimate selection of FBC’s preferred DSM scenario.

The portfolio approach (i.e. as opposed to program-by-program approach) to assess cost-effectiveness of DSM has as its foundation an approach that measures and compares entire portfolios against one another as opposed to comparing the ‘top slice’ of one against the aggregate of the other. Said another way, breaking the portfolio into distinct parts is essentially a departure from the portfolio method, towards using the program-by-program (or arbitrary groupings thereof) approach.

The determining cost metric for a DSM plan as prescribed by regulation is the cost-effectiveness test pursuant to section 4 of the DSM Regulation. The Panel notes that while a discussion of incremental costs does arguably add some information, it does not in itself satisfy the regulatory requirements of the cost-effectiveness test. Further, it creates a problem of ‘apples to oranges’ comparisons by juxtaposing the average TRC of one DSM scenario with the marginal TRC of another grouping of DSM programs.

For these reasons, the Panel does not place weight on FBC’s use in this Application of the incremental DSM costs in its rationale for selecting its preferred DSM scenario. Going forward, the Panel encourages FBC to use the average cost approach outlined in the DSM Regulation as the basis for its comparative analysis of portfolios.

¹³⁷ BCOAPO Final Argument, p. 14

¹³⁸ Exhibit B-2, BCUC IR 35.2.1.

¹³⁹ Exhibit B-3, BCOAPO IR 4.3.

¹⁴⁰ FBC Reply Argument, p. 30.

8.3 Framework for resource portfolio evaluation/selection

In Sections 5 of this Decision, the Panel made a determination on the acceptability of FBC’s preferred portfolio option. This section deals with a related but different aspect of the portfolio analysis presented by FBC: the nature of the decision-making framework (i.e. as opposed to the resulting decision itself).

As noted in Section 5, FBC has identified four portfolios (A1, C1, A4, C4) for final consideration, stating that each meets the LTERP’s objectives. FBC presents the evaluation framework for comparison among the four in the following table.

Table 8 – Attributes of Portfolios Considered for Preferred Portfolio¹⁴¹

Portfolio	Incremental Resources	LRMC (\$/MWh)	Max % Non-Clean BC Resources (based on energy)	GHG emissions produced in BC (tonnes CO2e)	Full-Time Equivalents per year	Geographic Resource Diversity	
A1	No Self-Sufficiency	Market (97%) Biogas (3%)	<u>\$75</u>	0.0%	0	14	Low
C1	93% Clean with CCGT	Market (51%) CCGT (48%) Biogas (1%)	<u>\$90</u>	3.9%	189k	164	Medium
A4	93% Clean with SCGT	Market (31%) Wind (65%) Biogas (3%) SCGT (1%)	\$96	0.2%	3k	145	High
C4	100% Clean BC Resources	Market (31%) Wind (65%) Biogas (3%) Biomass, Solar (1%)	<u>\$97</u>	0.0%	0	216	Medium

FBC’s submits that its selection of Portfolio A4 reflects a reasonable balance and compromise among differing objectives, such as: cost-effective and reliable supply to meet its customers’ energy requirements, consistency with provincial energy objectives (including self-sufficiency, pursuing adequate, cost effective DSM, and providing socio-economic benefits), and geographic resource diversity¹⁴². The other portfolios that Interveners prefer, all rank lower on important planning objectives compared to Portfolio A4, for example, as FBC states:

- Portfolio A1 (No Self Sufficiency), which is the CEC’s preference, ranks lowest in terms of socio-economic benefits and geographic resource diversity, in addition to the reliability concerns with over-reliance on market supply and inconsistency with the BC energy objective of achieving electricity self-sufficiency;
- Portfolio C1 (93 percent clean with CCGT), which is ICG’s preference, includes the most non-clean resources and produces the most GHG emissions while also generating lower socio-economic benefits and having less geographic resource diversity than Portfolio A4; and
- Portfolio C4 (100 percent clean or renewable), which is BCSEA’s preference, has the highest LRMC of the four portfolios, has less geographic resource diversity than Portfolio A4, and its resource composition offers less reliability and flexibility than Portfolio A4 based on the inclusion of the SCGT in that portfolio.¹⁴³

¹⁴¹ Exhibit B-1-1, Table 9-2, p. 126.

¹⁴² Exhibit B-1, p. 127.

¹⁴³ FBC Reply Argument, p.36.

Panel discussion

The Panel has concerns relating to the evaluation framework in two respects. First, it has concerns with the specific columns set out in the framework and how they are applied. Two examples illustrate the point.

- While energy self-sufficiency is put forward as a key planning objective, this objective does not explicitly show up as a rating column. Rather, it appears to have been applied outside of the framework (both to formulate portfolios in the first instance, and in narrative outside of, and subsequent to, application of the evaluation framework).
- Geographic Resource Diversity appears to be based on a hyper-sensitive rating paradigm. More specifically, the difference in valuation scores between A4 (High) and C4 (Medium) appears to arise singularly from the swapping out of one percent of the incremental resources from SCGT to Biomass/Solar.

The second concern relates to the apparent selectivity of comparisons made between alternative portfolios. FBC justifies its choice by referencing only the shortcomings of each of the alternatives in comparison to its preferred portfolio, while making no mention of their respective advantages. FBC dismisses A1 vs. A4 on the grounds of self-sufficiency and FTEs while remaining silent on the significant cost advantage of A1 (a difference of \$21, or 28 percent), but then dismisses C4 vs. A4 on the grounds of cost (albeit an LRMC difference of \$1, or 1 percent) while staying silent on its advantages on environment and FTEs. In short, FBC's explanation suffers from the appearance of being an exercise in starting from a portfolio preference (i.e. A4) and then justifying the selection after the fact.

Looking to the next LTERP filing, the Panel encourages FBC to develop and apply a more transparent and balanced rating framework that consistently subjects all portfolio alternatives to the same evaluation rigor.

8.4 Distributed generation

FBC defines distributed generation (DG) as an individual-use generation resource, such as solar or small wind turbines, distributed among and utilized by customers.¹⁴⁴

Issues were raised in this proceeding by BCSEA, ICG and Shadrack related to how DG should be defined, where it fits within the LTERP (a supply-side resource, demand-side resource, load forecast adjustment or a combination), and if FBC had appropriately considered DG in the LTERP.

FBC states that "the LTERP does reflect and has accounted for the potential future proliferation of DG as a load reducing driver within the alternative load scenarios."¹⁴⁵ In addition, FBC states that DG can be considered both a supply-side or demand-side resource.¹⁴⁶ However, FBC states that it did not include power supply from DG or purchases from self-generating customers as resource options to be considered in the portfolio analysis as the availability of DG supply is not within FBC's control and FBC does not have any information at present regarding available energy, capacity, timing or cost of supply from self-generators.¹⁴⁷

FBC submits that it "views DG from the same perspective as it does any potential resource that may be considered within the resource planning process [and that it] seeks to neither advantage nor disadvantage DG regardless of size, type or ownership."¹⁴⁸

¹⁴⁴ Exhibit B-2, BCUC IR 10.1.

¹⁴⁵ FBC Final Argument, p. 32.

¹⁴⁶ Exhibit B-1, Appendix J, p. 41.

¹⁴⁷ FBC Final Argument, p. 31-33.

¹⁴⁸ Exhibit B-2, BCUC IR 10.2.

Panel discussion

The Panel is satisfied that FBC has appropriately factored DG into this LTERP planning framework.

Looking at the broader policy issues relating to the extent to which DG should be encouraged, the Panel notes that a proceeding is currently underway, in which FBC is seeking approval of a policy that will guide self-generation in the future.

8.5 Planning Reserve Margin

In its Decision on FBC's 2012 Integrated System Plan (ISP), the BCUC found FBC's planning reserve margin (PRM) methodology to be under-developed and agreed with FBC's suggestion to complete its PRM methodology study and file it with the BCUC at a later date.¹⁴⁹ The BCUC accepted the resource supply/demand analysis provided by FBC (with the exception of the PRM) as FBC had no capacity gap forecast until sometime in the 2021–2040 period, however the BCUC directed FBC to include a full portfolio analysis in the next LTERP.¹⁵⁰

FBC states, "The Planning Reserve Margin (PRM) is conceptually the capacity above-expected load necessary to maintain a certain resource adequacy level." The PRM's role is to ensure resource adequacy when dealing with unforeseen increases in demand and forced outages in the system.¹⁵¹

FBC has since adopted a loss-of-load expectation (LOLE) methodology as the reliability metric for the assessment of PRM adequacy and targets a one day in ten years threshold.¹⁵² This is the same methodology and target used by BC Hydro and has widespread use in the industry.¹⁵³

There were no objections from Registered Interveners to FBC's proposed PRM methodology.

BCUC determination

FBC's PRM methodology is consistent with industry practice, and **the Panel finds the PRM methodology used in this LTERP is acceptable.**

¹⁴⁹ FBC 2012-2013 Revenue Requirements and Review of 2012 Integrated System Plan, Decision dated August 15, 2012 (G-110-12), p. 41.

¹⁵⁰ *Ibid.*, p. 147.

¹⁵¹ Exhibit B-1, Appendix L, p. 1.

¹⁵² *Ibid.*, p. ES-1.

¹⁵³ Exhibit B-2, preamble to BCUC IR 29.0.

DATED at the City of Vancouver, in the Province of British Columbia, this

28th

day of June 2018.

Original signed by:

H. G. Harowitz
Panel Chair / Commissioner

Original signed by:

D. J. Enns
Commissioner

Original signed by:

M. Kresivo, QC
Commissioner



ORDER NUMBER
G-117-18

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Inc.
2016 Long Term Electric Resource Plan and
2016 Long Term Demand Side Management Plan

BEFORE:

H. G. Harowitz, Panel Chair/Commissioner
D. J. Enns, Commissioner
M. Kresivo, QC, Commissioner

on June 28, 2018

ORDER

WHEREAS:

- A. On November 30, 2016, FortisBC Inc. (FBC) applied to the British Columbia Utilities Commission (BCUC) pursuant to section 44.1(6) of the *Utilities Commission Act* (UCA) for acceptance of its 2016 Long Term Electric Resource Plan (2016 LTERP) and Long Term Demand-Side Management Plan (2016 LTDSM Plan) (Application);
- B. In the Application, FBC also applies to rescind Electric Tariff No. 2 Schedule 90, Energy Management Services (Rate Schedule 90);
- C. The 2016 LTERP sets out a long term plan for meeting the forecast peak and energy requirements of FBC customers with demand-side and supply-side resources over the next 20 years;
- D. The 2016 LTDSM Plan includes an assessment of the energy efficiency and conservation potential for FBC customers and identifies FBC's preferred DSM scenario for long term planning purposes;
- E. By Orders G-197-16, G-102-17 and G-107-17 dated December 22, 2016, June 30, 2017 and July 13, 2017 respectively, the BCUC established a regulatory timetable and written hearing process for the review of the Application, which included: two rounds of Information Requests (IR) to FBC, Intervener Evidence and IR's on that evidence, and one round of Panel IRs;
- F. On August 25, 2017, FBC filed for a suspension of the regulatory timetable. By Order G-134-17 dated August 29, 2017, the BCUC suspended the regulatory timetable until further notice;
- G. On September 8, 2017, FBC filed a letter indicating its intent to file errata to its Application;

- H. By Order G-139-17 dated September 13, 2017, the BCUC established a regulatory timetable setting out dates for FBC to file the errata, and interveners to review the errata and to comment on further process;
- I. On September 15, 2017, FBC filed the errata to its Application;
- J. By Order G-155-17, dated October 6, 2018, the BCUC ordered that the proceeding proceed to the Final Argument stage;
- K. FBC's Final Argument and Intervener Final Arguments were submitted on October 20, 2017 and November 9-10, 2017 respectively, followed by a Reply Argument from FBC on November 24, 2017; and
- L. The BCUC has reviewed and considered the evidence and submissions and makes the following determinations.

NOW THEREFORE the British Columbia Utilities Commission orders as follows:

1. The 2016 LTERP for the years up to 2024 is in the public interest and is accepted. For years beyond 2024 the 2016 LTERP is not in the public interest and is rejected;
2. The 2016 LTDSM Plan is in the public interest and is accepted;
3. Rate Schedule 90 is rescinded from FBC's Tariff. FBC is directed to submit revised tariff pages in respect of Rate Schedule 90 no later than 30 days of the date of this order;
4. FBC is directed to file its next Long Term Resource Plan and Long Term Demand-Side Management Plan no later than December 1, 2021.

DATED at the City of Vancouver, in the Province of British Columbia, this 28th day of June 2018.

BY ORDER

Original signed by:

H. G. Harowitz
Commissioner

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Inc.
2016 Long Term Electric Resource Plan (LTERP)
and Long Term Demand Side Management Plan (LT DSM) Plan Application

EXHIBIT LIST

Exhibit No.	Description
<i>COMMISSION DOCUMENTS</i>	
A-1	Letter dated December 8, 2016 – Appointing the Panel for the review of FortisBC Inc.’s Long Term Electric Resource Plan & Long Term Demand Side Management Plan
A-2	Letter dated December 22, 2016 – Commission Order G-197-16 establishing a Regulatory Timetable with Public Notice
A-3	Letter dated February 28, 2017 – Commission Information Request No. 1 to FBC
A-4	Letter dated March 7, 2017 – Commission response to Mr. Gabana’s Extension Request
A-5	Letter dated April 19, 2017 – Confirming Regulatory Timetable with Intervener Evidence as set out in Order G-197-16
A-6	Letter dated April 27, 2017 – Commission Information Request No. 2 to FBC
A-7	Letter dated May 12, 2017 – Commission response to FBC and Mr. Shadrack regarding Questions Out of Scope
A-8	Letter dated June 8, 2017 – Commission Information Request No. 1 on BCSEA’s Evidence
A-9	Letter dated June 8, 2017 - Commission Information Request No. 1 on ICG’s Evidence
A-10	Letter dated June 8, 2017 - Commission Information Request No. 1 on Shadrack’s Evidence
A-11	Letter dated June 30, 2017 – Commission Order G-102-17 Amending the Regulatory Timetable
A-12	Letter dated July 13, 2017 – Commission Order G-107-17 Accepting Late Intervener Evidence and Amending the Regulatory Timetable

- A-13 Letter dated July 27, 2017 – Commission Information Request No. 1 to Mr. Shadrack regarding Shadrack Late Intervener Evidence
- A-14 Letter dated July 27, 2017 – Panel Information Request No. 1 to FortisBC Inc.
- A-15 Letter dated July 7, 2017 – Commission Correspondence to Mr. Shadrack Regarding Confidential Responses to IR No. 1 on Intervener Evidence
- A-16 Letter dated July 31, 2017 – Commission Correspondence Regarding Request to Withdraw Exhibit B-23
- A-17 Letter dated August 18, 2017 – Commission Panel Denying Mr. Shadrack’s Request to Withdraw Exhibit B-23
- A-18 Letter dated August 29, 2017 – Commission Order G-134-17 Suspending the Regulatory Timetable
- A-19 Letter dated September 13, 2017 – Commission Order G-137-17 Establishing a Regulatory Timetable
- A-20 Letter dated October 6, 2017 – Commission Order G-155-17 Establishing a Regulatory Timetable

APPLICANT DOCUMENTS

- B-1 **FORTISBC INC. (FBC)** Letter dated November 30, 2016 - 2016 Long Term Electric Resource Plan (LTERP) and Long Term Demand Side Management Plan (LT DSM Plan) Application
- B-1-1 Letter dated September 15, 2017 – FBC Filing Errata
- B-2 Letter dated April 6, 2017 - FBC Response to BCUC IR No.1
- B-2-1 **CONFIDENTIAL** Letter dated April 6, 2017 - FBC Confidential Response to BCUC IR No.1
- B-3 Letter dated April 6, 2017 - FBC Response to BCOAPO IR No.1
- B-4 Letter dated April 6, 2017 - FBC Response to BCSEA IR No.1
- B-5 Letter dated April 6, 2017 - FBC Response to CEC IR No.1
- B-6 Letter dated April 6, 2017 - FBC Response to Gabana IR No.1
- B-6-1 Letter dated April 18, 2017 - FBC Response to Gabana IR 1.11 Supplemental Information
- B-7 Letter dated April 6, 2017 - FBC Response to ICG IR No.1
- B-7-1 Letter dated May 18, 2017 – FBC Response to ICG IR 1.1.2 Erratum

- B-8 Letter dated April 6, 2017 - FBC Response to Scarlett IR No.1
- B-9 Letter dated April 6, 2017 - FBC Response to Shadrack IR No.1
- B-10 Letter dated May 3, 2017 – FBC Submitting comments regarding Questions Out of Scope Shadrack IR No. 2
- B-11 Letter dated May 18, 2017 – FBC Response to BCUC IR No. 2
- B-12 Letter dated May 18, 2017 – FBC Response to BCOAPO IR No. 2
- B-13 Letter dated May 18, 2017 – FBC Response to BCSEA IR No. 2
- B-14 Letter dated May 18, 2017 – FBC Response to CEC IR No. 2
- B-15 Letter dated May 18, 2017 – FBC Response to Gabana IR No. 2
- B-16 Letter dated May 18, 2017 – FBC Response to ICG IR No. 2
- B-17 Letter dated May 18, 2017 – FBC Response to Scarlett IR No. 2
- B-18 Letter dated May 18, 2017 – FBC Response to Shadrack IR No. 2
- B-19 Letter dated June 8, 2017 – FBC Information Request No. 1 on BCSEA’s Evidence
- B-20 Letter dated June 8, 2017 - FBC Information Request No. 1 on ICG’s Evidence
- B-21 Letter dated June 8, 2017 - FBC Information Request No. 1 on Shadrack’s Evidence
- B-22 Letter dated July 17, 2017 – FBC Comments on Order G-107-17 – Shadrack Filing of Late Evidence
- B-23 Letter dated July 21, 2017 – FBC Comments on Mr. Shadrack’s Late IR Responses
- B-24 Letter dated August 1, 2017 - FBC Submitting Comments on Mr. Shadrack’s Request to Withdraw Exhibit B-23
- B-25 Letter dated August 24, 2017 – FBC Submitting Response to Panel Information Request No. 1
- B-26 Letter dated August 25, 2017 – FBC Submitting Request for Suspension of Regulatory Timetable
- B-27 Letter dated September 8, 2017 – FBC Submitting Proposed Timetable
- B-28 Letter dated September 26, 2017 – FBC Submitting Response to Mr. Shadrack’s Carbon Tax Query Exhibit C10-15
- B-29 Letter dated October 2, 2017 - FBC Reply Submission on Process

INTERVENER DOCUMENTS

- C1-1 **NICHOLAS MARTY (MARTY)** – Form dated January 17, 2017 Request to Intervene by Nicholas Marty
- C2-1 **BRITISH COLUMBIA HYDRO AND POWER AUTHORITY (BC HYDRO)** – Form dated January 24, 2017 Request to Intervene by Fred James
- C3-1 **JERRILYNN DECOCK (DECOCK)** – Form dated January 17, 2017 Request to Intervene by Jerrilynn DeCock
- C4-1 **COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BC (CEC)** – Form dated January 26, 2017 Request to Intervene by David Craig
- C4-2 Letter dated March 7, 2017 – CEC Submitting Information Request No. 1
- C4-3 Letter dated April 27, 2017 - CEC Submitting Information Request No. 2
- C4-4 Letter dated June 8, 2017 - CEC Submitting Information Request No. 1 on ICG's Evidence
- C4-5 Letter dated June 8, 2017 - CEC Submitting Information Request No. 1 on BCSEA Evidence
- C4-6 Letter dated September 28, 2017 - CEC Submitting Comments on Further Process
- C5-1 **BC SUSTAINABLE ENERGY ASSOCIATION AND SIERRA CLUB OF BC (BCSEA)** – Form dated January 26, 2017 Request to Intervene by Thomas Hackney
- C5-2 Letter dated March 7, 2017 – BCSEA Submitting Information Request No. 1
- C5-3 Letter dated April 9, 2017 – BCSEA Submitting Notice on Filing Intervener Evidence
- C5-4 Letter dated April 27, 2017 - BCSEA Submitting Information Request No. 2
- C5-5 Letter dated May 25, 2017 - BCSEA Submitting Intervener Evidence
- C5-6 Letter dated June 8, 2017 - BCSEA Submitting Information Request No. 1 on ICG's Evidence
- C5-7 Letter dated June 8, 2017 - BCSEA Submitting Information Request No. 1 on Shadrack's Evidence
- C5-8 Letter dated June 29, 2017 - BCSEA Submitting Response to BCUC Information Request No. 1
- C5-9 Letter dated June 29, 2017 - BCSEA Submitting Response to BCOAPO Information Request No. 1
- C5-10 Letter dated June 29, 2017 - BCSEA Submitting Response to CEC Information Request No. 1
- C5-11 Letter dated June 29, 2017 - BCSEA Submitting Response to FBC Information Request No. 1

- C5-12 Letter dated June 29, 2017 - BCSEA Submitting Response to Shadrack Information Request No. 1
- C5-13 Letter dated July 17, 2017 – BCSEA Submitting Information Request No 2. to Shadrack
- C5-14 Letter dated September 26, 2017 – BCSEA Submitting Reply to FortisBC Inc proposed timetable
- C6-1 **ZELLSTOFF CELGAR PARTNERSHIP LIMITED (CELGAR)** – Form dated January 26, 2017 Request to Intervene by Robert Hobbs
- C6-2 Letter dated April 13, 2017 - Celgar Submitting Notice of Intervener Evidence
- C7-1 **INDUSTRIAL CUSTOMERS GROUP (ICG)** – Form dated January 26, 2017 Request to Intervene by Robert Hobbs
- C7-2 Letter dated March 7, 2017 – ICG Submitting Information Request No. 1
- C7-3 Letter dated April 27, 2017 - ICG Submitting Information Request No. 2
- C7-4 Letter dated May 25, 2017 - ICG Submitting Intervener Evidence
- C7-5 Letter dated June 29, 2017 - ICG Submitting Response to BCUC Information Request No. 1
- C7-6 Letter dated June 29, 2017 - ICG Submitting Response to BCOAPO Information Request No. 1
- C7-7 Letter dated June 29, 2017 - ICG Submitting Response to BCSEA Information Request No. 1
- C7-8 Letter dated June 29, 2017 - ICG Submitting Response to CEC Information Request No. 1
- C7-9 Letter dated June 29, 2017 - ICG Submitting Response to FBC Information Request No. 1
- C7-10 Letter dated September 29, 2017 - ICG Submitting Comments on Further Process
- C8-1 **BRITISH COLUMBIA OLD AGE PENSIONERS’ ORGANIZATION, ACTIVE SUPPORT AGAINST POVERTY, COUNCIL OF SENIOR CITIZENS’ ORGANIZATIONS OF BC, DISABILITY ALLIANCE BC, AND THE TENANT RESOURCE AND ADVISORY CENTRE, (BCOAPO)** – Form dated January 26, 2017 Request to Intervene by Michael Seaborn and Kate Feeney
- C8-2 Letter dated March 7, 2017 – BCOAPO Submitting Information Request No. 1
- C8-3 Letter dated April 27, 2017 - BCOAPO Submitting Information Request No. 2
- C8-4 Letter dated June 8, 2017 - BCOAPO Submitting Information Request No. 1 on ICG’s Evidence
- C8-5 Letter dated June 8, 2017 - BCOAPO Submitting Information Request No. 1 on BCSEA Evidence
- C8-6 Letter dated September 27, 2017 - BCOAPO Submitting Comments on Further Process

- C9-1 **DONALD SCARLETT (SCARLETT)** – Form dated January 27, 2017 Request to Intervene by Donald Scarlett
- C9-2 Letter dated March 7, 2017 – Scarlett Submitting Information Request No. 1
- C9-3 Letter dated April 27, 2017 - Scarlett Submitting Information Request No. 2
- C9-4 Letter dated August 2, 2017 - Scarlett Submitting Comments on Request to Withdraw Exhibit B-23
- C10-1 **ANDY SHADRACK (SHADRACK)** – Form dated January 26, 2017 Request to Intervene by Andy Shadrack
- C10-2 Letter dated March 7, 2017 – Shadrack Submitting Information Request No. 1
- C10-3 Letter dated April 7, 2017 – Shadrack Submitting Notice on Filing Intervener Evidence
- C10-4 Letter dated April 27, 2017 - Shadrack Submitting Information Request No. 2
- C10-5 Letter dated May 8, 2017 - Shadrack Submitting Comments regarding Out of Scope Issue
- C10-6 Letter dated May 23, 2017 - Shadrack Submitting Intervener Evidence
- C10-7 Letter dated June 6, 2017 – Shadrack Submitting Information Request No. 1 on Intervener Evidence
- C10-8 Letter dated June 29, 2017 – Shadrack Submitting IR No.1 Response
- C10-8-1 Letter dated July 13, 2017 – Shadrack Submitting Supplemental Background Information on IR No.1 Response
- C10-9 Letter dated July 7, 2017 – Shadrack Submitting Late Intervener Evidence
- C10-10 Letter dated July 21, 2017 – Shadrack Submitting comments on Late Intervener Evidence
- C10-11 Letter dated August 4, 2017 – Shadrack Submitting Reply Submission Regarding Withdrawal of Exhibit B-23
- C10-12 Letter dated August 4, 2017 - Shadrack Submitting Notice of Legal Counsel Update
- C10-13 Letter dated August 10, 2017 - Shadrack Submitting Response to Commission Information Request No. 1 on Late Intervener Evidence
- C10-14 Letter dated August 10, 2017 - Shadrack Submitting Response to BCSEA Information Request No 2.
- C10-15 Letter dated September 12, 2017 - Shadrack Submitting Reply to FortisBC Inc proposed timetable
- C10-16 Letter dated September 28, 2017 - Shadrack Submitting Comments on Further Process

- C11-1 **GABANA, NORMAN (GABANA)** – Form dated January 27, 2017 Request to Intervene by Norman Gabana
- C11-2 Letter dated March 5, 2017 – Gabana Submitting Request for Filing Extension
- C11-3 Letter dated March 14, 2017 – Gabana Submitting Information Request No. 1
- C11-4 Letter dated April 27, 2017 - Gabana Submitting Information Request No. 2

INTERESTED PARTY DOCUMENTS

LETTERS OF COMMENT