

REQUESTOR NAME: **BC Sustainable Energy Association and Sierra Club BC**

INFORMATION REQUEST ROUND NO: 1

TO: **FortisBC Inc.**

DATE: **March 7, 2017**

PROJECT NO: **3698896**

APPLICATION NAME: **FortisBC Inc. 2016 Long Term Electric Resource Plan (LTERP) and Long Term Demand Side Management Plan (LT DSM Plan)**

A. Chapter 1 – Introduction

1.0 Topic: Long Term Resource Planning Objectives Reference: Exhibit B-1, section 1.3, p.5 (pdf p.26)

“The objectives of the LTERP are as follows:

- 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).”

During the October 27, 2016 meeting of the FBC Resource Planning Advisory Group FBC sought input regarding the statement of objectives. At the meeting, BCSEA-SCBC expressed the view that the first of the stated objectives of the LTERP should be extended along the following lines: “Ensure cost-effective, secure and reliable power for customers in a socially and environmentally responsible manner.”

- 1.1 Please explain why FBC chose not to refer to social and environmental responsibility in the first stated objective of the LTERP.

B. Chapter 8 – Resource Options

2.0 Topic: Simple Cycle Gas Turbine (SCGT) Reference: Exhibit B-1, Volume 1, Appendix J, Supply-Side Resource Options Report, section 2.1.2 B.C. Climate Leadership Plan, pp.3-4 (pdf p.391-392); section 3.2.1 Natural Gas-Fired Generation – SCGT, p.28 (pdf p.416)

“B.C.’s CLP was released in August 2016 and reaffirms the provincial target to reduce annual GHG emissions to 80 percent below 2007 levels by 2050. The CLP requires that, going forward, 100 percent of the supply of electricity acquired by BC Hydro in British Columbia for the integrated grid must be from clean or renewable sources, except where concerns regarding reliability or costs must be addressed. While this requirement is not aimed directly at FBC, FBC considers this in its long term resource planning.” [pp.3-4, underline added]

- 2.1 Does FBC agree that inclusion of an SCGT as a supply-side resource option in the preferred portfolio in the absence of justification regarding reliability or costs is inconsistent with the BC Climate Leadership Plan?

3.0 Topic: Wood-Based Biomass

Reference: Exhibit B-1, Table 8-1: FBC Demand-Side and 1 Supply-Side Resource Options, p.96 (pdf p.117)

“The CEA defines clean or renewable resources as including biomass, biogas, geothermal heat, hydro, solar, ocean, wind or any other prescribed resource.”

- 3.1 Please confirm that FBC’s consideration of “Wood-Based Biomass” as a clean or renewable resource did not include electricity generated from the combustion of creosote or pentachlorophenol contaminated rail ties.

C. Chapter 9 – Portfolio Analysis and Long Run Marginal Cost

4.0 Topic: Long Run Marginal Cost

Reference: Exhibit B-1, section 9.2, Long Run Marginal Cost, p.118 (pdf p.139); Appendix K, Long Run Marginal Cost, pdf p.436; Exhibit A-3, BCUC IR 35.3; Table 8-1: FBC Demand-Side and Supply-Side Resource Options, p.96 (pdf p.117)

“The LRMC values represent the cost to FBC of incremental resources needed to meet load requirements over the planning horizon. The LRMC includes both energy and capacity generation components. FBC’s LRMC values are outcomes of the portfolio analysis and are dependent upon which demand-side and supply-side resource options are included within a particular portfolio.” [Exhibit B-1, p.118 (pdf p.139)]

FBC states its definition of LRMC as follows:

“FBC has updated its definition of Long Run Marginal Cost to be **the incremental cost to build, contract, and/or procure reliable power to meet incremental long term forecast load requirements**. The LRMC is stated in real dollars (2015\$)₃ at the point of interconnection to FBC’s system. The LRMC includes both an energy and a capacity component.” [Exhibit B-1, Appendix K, p.1 (pdf p.439), emphasis in the original]

“While BC Hydro and FBC both investigate B.C. generation opportunities, it is not possible to draw a direct comparison between BC Hydro and FBC’s stated LRMC values. There are notable timing differences for required resources, locational differences in load and generation, volume differences in capacity and energy requirements, and differences in governing policy that can cause BC Hydro and FBC to consider different resource options. BC Hydro has indicated that resources are required in the near to medium term to meet forecast load¹⁶ and has identified specific resources, both demand side and supply side, that will be used to address this requirement. In contrast, FBC’s resource needs are further into the future, as identified in the LTERP, Section 9. To identify prospective future resources, FBC developed a collection of resource options and performed portfolio analysis, which is a fundamentally different approach from BC Hydro.” [pdf p.442]

In BCUC IR 35.3, staff ask FBC: “Does FBC consider that the LRMC of Portfolio Option A4 (\$96/MWh on page 125 of the Application) is the appropriate utility cost to estimate the effect of alternative DSM portfolios on residential bills and rates?”

In the October 27, 2016 Resource Planning Advisory Group workshop, FBC said, in the context of the analysis of varying DSM levels, that: “In the short to medium term, the high DSM scenario replaces more cost effective PPA and Market resources.” [slide 68] During the workshop, DSM and PPA were described as “swing resources” in the resource portfolio development.

“FBC ramped the High [DSM] scenario, beginning in 2021, from the 66% Base case to an 80% load growth offset, to optimize utilization of tranche 1 energy from the Power Purchase Agreement with BC Hydro under Rate Schedule 3808 (BC Hydro PPA) and thus minimize rate impact.” [pdf p.497]

- 4.1 Please explain (again?) how FBC determines the avoided cost of DSM in order to develop DSM scenarios for use in the resource options portfolios (including both supply- and demand-side resources) from which the respective LRMCs are determined. How is the apparent circularity dealt with?
- 4.2 Put another way, is the LRMC of a particular resource portfolio (including both supply- and demand-side resources) sensitive to the avoided cost figure used in defining the DSM component of the resource portfolio?
- 4.3 Please clarify what is meant by DSM and PPA being “swing resources” in the development of resource portfolios.
- 4.4 Please confirm, or otherwise explain, that in the High DSM scenario the ramp up beginning in 2021 to optimize utilization of tranche 1 PPA energy is in effect displacing cost-effective DSM with PPA purchases.
- 4.5 Should FBC’s resource portfolio analysis recognize the value to B.C., or to BC Hydro and its ratepayers, of reduced PPA purchases by FBC?
 - 4.5.1 Is this accomplished in FBC’s portfolio analysis? If so, please explain how. If not, why not?

5.0 Topic: Preferred Portfolio, SCGT
Reference: Exhibit B-1, section 9.3.6 Preferred Portfolio

Portfolio A4 is labeled “93% Clean with SCGT.” It includes Market (31%), Wind (65%), Biogas (3%) and SCGT (1%).

Portfolio C4 is labeled “100% Clean.” It includes Market (31%), Wind (65%), Biogas (3%), Biomass-Solar (1%).

Climate Leadership Plan, page 28 Exhibit B-1, Appendix B, pdf page 202:

“B.C.’s clean electricity supply is activating numerous opportunities to reduce GHG emissions across our industrial sectors. When an industry switches to electricity instead of fossil fuels, their emissions go down. The CLT recommended that we increase the target to 100 per cent clean energy on the integrated grid by 2025, while allowing for the use of fossil fuels for reliability. BC Hydro will focus on acquiring firm electricity from clean sources.

“Going forward, 100 per cent of the supply of electricity acquired by BC Hydro in British Columbia for the integrated grid must be from clean or renewable sources, except where concerns regarding reliability or costs must be addressed. Acquisition of electricity from any source in British Columbia that is not clean or renewable must be approved by government through an Integrated Resource Plan, where it will be aligned with the specific reliability or cost concerns.”

- 5.1 Please confirm that neither the “93% Clean with SCGT” portfolio nor the “100% Clean” portfolio includes an SCGT within the four-year action plan. Alternatively, please explain.

D. Chapter 10 – Stakeholder and First Nations Engagement

6.0 Topic: Consultation Reference: Exhibit B-1, Chapter 10, Stakeholder and First Nations Engagement

- 6.1 Please identify any significant differences between LTERP and LT DSM Plan in the Application and the draft LTERP and draft LT DSM Plan presented by FBC at the October 27, 2016 workshop of FBC’s Resource Planning Advisory Group.

E. VOLUME 2 – LONG-TERM DEMAND-SIDE MANAGEMENT PLAN

7.0 Topic: Long-Term DSM Plan, DSM Scenario Development Reference: Exhibit B-1, Volume 2, section 3, DSM Scenario Development, pdf p.497

“Both the BC Energy Plan and the CEA express DSM targets as a load growth offset (DSM offset).” [pdf p.497, underline added]

CEA s.2(b) states: “(b) to take demand-side measures and to conserve energy, including the objective of the authority reducing its expected increase in demand for electricity by the year 2020 by at least 66%,” [underline added]

- 7.1 Please provide FBC’s definition of “load growth offset (DSM offset).”
- 7.1.1 Please clarify whether “load growth offset” is an annual concept or a cumulative concept, and if it is cumulative, over what period.
- 7.1.2 Please confirm that FBC uses “load growth offset” and “DSM offset” interchangeably. If not, please explain.
- 7.2 Please explain how FBC’s use of the term “load growth offset” relates to the “by the year 2020” reference point in section 2(b) of CEA (albeit regarding BC Hydro).
- 7.3 Is FBC’s definition of “load growth offset (DSM offset)” the same as BC Hydro’s?

“The DSM offset is best used as a long run average (i.e. over the LTERP planning horizon) to smooth the short-term fluctuations shown in the load forecast, and reflected in annual sales.” [pdf p.497, underline added]

- 7.4 Please explain what is meant by “The DSM offset is best used as a long run average (i.e. over the LTERP planning horizon)...”
- 7.4.1 Does this mean that there is a difference between the definition of “DSM offset” and how the DSM offset is used?
- 7.4.2 Please define “long run average” as it is used here. Does it mean the cumulative DSM savings since the beginning of the planning period divided by the gross (pre-DSM) load growth since the beginning of the planning period?
- 7.4.3 Does FBC use “long run average” to mean the same as “average load growth offset over the planning period”?

“The key objective for LT DSM Plan is to determine the appropriate level of cost-effective DSM resource acquisition to match the Company’s resource needs over the LTERP’s planning horizon.” [pdf p.487, underline added]

- 7.5 The planning horizon of the 2016 LTERP is the 20-year period from 2016 to 2035. [pdf p.11] Is the planning horizon of the 2016 Long Term DSM Plan the same as that of the 2016 LTERP by definition? Or do the two 2016 plans have the same planning period because that is what FBC proposes in the current application?
- 7.6 Does FBC anticipate that future Long Term Electricity Resource Plans and Long Term DSM Plans will always have the same planning periods?

“FBC ramped the High scenario, beginning in 2021, from the 66% Base case to an 80% load growth offset, to optimize utilization of tranche 1 energy from the Power Purchase Agreement with BC Hydro under Rate Schedule 3808 (BC Hydro PPA) and thus minimize rate impact. Over the planning horizon the High case averages a 77% load growth offset.”

“The Max DSM scenario exhibits a similar ramp-up to 100% average load growth offset, resulting in a DSM offset of 89% over the planning horizon.” [pdf p.497]

- 7.7 Are the terms “load growth offset” and “average load growth offset over the planning horizon” used consistently in the above-quoted passages? For the High DSM scenario, the 80% figure is a “load growth offset” and the 77% figure is an “average load growth offset over the planning period.” However, for the Max DSM scenario, the 100% figure is an “average load growth offset,” and the 89% figure is a “DSM offset over the planning horizon.
- 7.8 Please define and explain “load growth offset” and “average load growth offset over the planning horizon.”

- 7.9 Is the concept of load growth offset, or DSM offset, in FBC's LT DSM Plan such that by definition the only point in time when it can be determined if the defined objective has been met is at the very end of the LTERP planning period, i.e., 2035 in the present case?

8.0 Topic: LT DSM Plan Key Objective
Reference: Exhibit B-1, Volume 2, pdf p.487

"The key objective for LT DSM Plan is to determine the appropriate level of cost-effective DSM resource acquisition to match the Company's resource needs over the LTERP's planning horizon. The proposed DSM savings target is to offset 77 percent of load growth over this 20 year period. The savings target for the first three years of the LT DSM Plan (2018-2020) are largely an extension of the approved 2016 DSM Plan and 2017 DSM Plan, as filed, (approximately 26 GWh/yr). Thereafter the savings target is escalated to 32 GWh/yr and held there to the end of the LTERP planning horizon." [underline added]

- 8.1 In FBC's view, when the Commission approves an FBC LT DSM Plan, does the Commission approve an "appropriate level of cost-effective DSM resource acquisition...over the planning horizon"?
- 8.2 If so, how is the approved "appropriate level of cost-effective DSM resource acquisition" defined? Is the definition the same or different for the planning horizon and for the first three years of the LT DSM Plan?
- 8.3 Is performance in terms of the achieved level of cost-effective DSM resource acquisition tracked against the approved level of cost-effective DSM resource acquisition in an approved LT DSM Plan? Is this done on an annual basis? Does the answer differ for savings targets for the first three years of the LT DSM Plan and for savings targets for the planning horizon? If not already stated, please confirm what metrics are used to define and track LT DSM Plan performance.

9.0 Topic: Role of CPR in LT DSM Plan Development
Reference: Exhibit B-1, Volume 2, Section 2, DSM Plan Development, pdf p.493

Section 2.3 of the LT DSM Plan describes the assessment of technical and economic DSM potentials in the Conservation Potential Review (CPR). However FBC does not appear to describe how the economic DSM potentials in the CPR have been translated into proposed DSM programs.

- 9.1 Please describe how FBC used the economic DSM potentials in the CPR to inform its DSM plan.
- 9.2 Please describe any other data sources (i.e., other than the CPR) used by FBC in developing its DSM scenarios and its preferred scenario.
- 9.2.1 Please provide any such data sources.
- 9.3 Did FBC develop an assessment of 'achievable' DSM potentials?

9.3.1 If so, please provide the assessment.

9.4 Please describe the process by which FBC used the CPR, any other data sources, and any assessment of achievable DSM potential to develop its DSM scenarios.

9.4.1 How were FBC's projected costs for the different DSM scenarios developed?

9.4.2 What is FBC's view of whether the cost estimates in the DSM scenarios could be higher or lower than what might be required to achieve the savings levels in each scenario?

10.0 Topic: Long-Term DSM Plan, DSM Scenario Development

Reference: Exhibit B-1, Volume 2, Table 3-1: Key DSM Scenario Data, p.14, pdf p. 500; Exhibit A-3, BCUC IR 38.2, 38.2.1

In Table 3-1: Key DSM Scenario Data, FBC provides energy savings (by average per annum, percentage of load growth, and total 2016 to 2035), resource cost, and incremental cost including program costs, for each of the Low, Base, High and Max DSM Scenarios.

In BCUC IR 38.2, staff list key DSM metrics (annual savings in GWh, % of load growth and % of total load, annual DSM funding levels, utility incentive levels as a percentage of the TRC, TRC, and utility cost of energy savings).

In BCUC IR 38.2.1, staff ask FBC to provide data for these metrics for the past 10 years of historical actual and historical forecasted (as approved under s. 44.1) DSM, and 5 years of projected DSM based on the proposed DSM portfolio in the 2017 LT DSM Plan.

10.1 Please provide data for the listed DSM metrics by program.

10.2 Please also provide participant numbers and FBC estimates of the number of eligible participants by program, if available.

11.0 Topic: Long-Term DSM Plan, Reliability

Reference: Exhibit B-1, Volume 1, p.104 (pdf p.125); Volume 2, p.15 (pdf p. 501); Exhibit A-3, BCUC IR 39.3

In the 2016 LTERP Application on p. 104 FBC says that "DSM is neither available on demand nor as reliable as a supply-side resource option because DSM programs require voluntary participation by customers... [A]n over-reliance on DSM could leave unexpected gaps in LRB that still need to be filled to meet customer load requirements."

On page 15 (pdf p.501) of the LT DSM Plan, FBC says that "The Max scenario presents: higher risks of insufficient customer participation or incurring higher costs if load growth falls short of expectations..."

In BCUC IR 39.3, staff asks: "Please identify any key concerns FBC would have with spending that achieves savings that offsets 100% load growth. Please specifically identify whether concerns include: lack of cost-effective DSM

opportunities, difficulty in scaling-up DSM programs, timing of Commission approval received, rate impact.”

- 11.1 Does FBC mean by the statements quoted above that in its view investing in DSM is riskier than investing in supply options? If so, please provide the evidence to support that view.
- 11.2 Is FBC aware that some jurisdictions, such as Vermont,¹ adjust avoided costs in DSM benefit-cost analysis to account for reduced risk from DSM compared with supply options? In FBC’s view, would such an approach be appropriate for FBC?
- 11.3 By saying that in the Max DSM scenario there is a “risk of incurring higher costs if load growth falls short,” is FBC suggesting that with Commission approval of a long-term DSM plan involving the Max DSM scenario FBC would be locked into an approved level of DSM investment with no ability to adjust if market conditions change (i.e. load growth falls short)?

12.0 Topic: Long-Term DSM Plan

Reference: Exhibit A-3, BCUC IR 40.2, 40.2.1

In BCUC IR 40.2, staff ask if “FBC’s definition of ‘cost-effective’ DSM is the same as that used by BC Hydro in its 2013 IRP?”

In BCUC IR 40.2.1, staff ask “Please explain how environmental and non-energy benefits are incorporated into the ‘cost effective’ DSM definition.”

- 12.1 Please compare FBC’s methodology for incorporating environmental and non-energy benefits of DSM into the benefit-cost analysis with BC Hydro’s use of the Modified TRC set out in the DSM Regulation.

13.0 Topic: Long-Term DSM Plan

Reference: Exhibit A-3, BCUC IR 45.1, 47.1

In BCUC IR 45.1, staff ask FBC to replicate Table 3-2 for all the DSM scenarios considered.

In BCUC IR 47.1, staff ask FBC to “Please calculate, for each DSM portfolio considered, (i) DSM spend as a percentage of FBC revenues and (ii) DSM energy savings as a percentage of energy sold.”

- 13.1 Please provide a version of the table produced in response to BCUC IR 45.1 that has two additional columns, one showing the expected customer sales or load for each year, and one showing new DSM annual savings as a percent of sales by year.

14.0 Topic: Long-Term DSM Plan

Reference: Exhibit B-1, Volume 2, 2016 Long-Term DSM Plan, section 2.3 Conservation Potential Review, p.7 (pdf p.493)

¹ http://psb.vermont.gov/sites/psbnew/files/doc_library/order-re-eeu-avoided-cost-2016-2017.pdf, pages 9-11.

- 14.1 Does the CPR provide expected measure penetration rates by measure, by year? If so, please provide these results or indicate where they are in the filed evidence.
- 14.2 Did FBC consider expected measure penetration rates by measure, by year, in developing the four different DSM scenarios? If so, please provide a table showing how the measure penetration rates were considered for each of the four DSM scenarios. If not, please explain how the four DSM scenarios were developed.

15.0 Topic: Long-Term DSM Plan

Reference: Exhibit B-1, Volume 2, 2016 Long-Term DSM Plan, 2.4 The TRC and FBC Avoided Costs, p.8 (pdf p.494)

FBC states: "The measures' energy and demand savings are grossed-up by the avoided transmission and distribution energy losses (line losses) value of 8%, before the benefits are calculated."

- 15.1 Is the avoided T&D line losses value (8%) an average line loss value or a marginal line loss value? Please explain why the chosen metric was selected.

16.0 Topic: Long-Term DSM Plan

Reference: Exhibit B-1, Volume 2, 2016 Long-Term DSM Plan, 3.2 Preferred DSM Scenario, p.14 (pdf p.501)

FBC says that the High DSM scenario "includes the majority of cost effective DSM from an LRMC perspective."

- 16.1 How does FBC define "the majority" in this context?
- 16.2 Please provide a table showing the percentage of cost-effective DSM from an LRMC perspective included in each of the four DSM scenarios, or for each of the scenarios for which this data is available.
- 16.3 Please explain the basis on which FBC determined how much cost-effective DSM to include or exclude from each DSM scenario.
- 16.4 Please describe and provide anticipated costs and savings values for a scenario that includes all the cost-effective DSM from an LRMC perspective.

17.0 Topic: FBC Conservation Potential Review

Reference: Exhibit B-1, Volume 2, Appendix A, FBC Conservation Potential Review, Figure 3-8. Electric Energy Technical Savings Potential by End-Use (GWh/year), pdf p.589

The term "Whole Facility" is used in Figure 3-8 and elsewhere.

- 17.1 Please explain the term "Whole Facility." Is it equivalent to 'building envelope'? Is the term used differently for the Residential, Commercial and Industrial sectors?

18.0 Topic: Long-Term DSM Plan, FBC CPR Next Phase

Reference: Exhibit B-1, section 6.3 Anticipated System Reinforcements, p.87 (pdf p.108); Executive Summary, pp. ES9-DS10 (pdf pp.19-20); Exhibit A-3, BCUC IR 23.2.1; Exhibit B-1, Volume 2, Appendix A, FBC Conservation Potential Review, pdf p.527

In BCUC IR 23.2.1, staff ask “Please explain whether targeted regional DSM programs could defer the requirement for the anticipated network system reinforcements.” BCSEA-SCBC look forward to FBC’s response to BCUC IR 23.2.1.

In addition, while FBC’s response to BCUC IR 23.2.1 could potentially include capacity-focused DSM, BCSEA-SCBC want to address capacity-focused DSM directly. In addition, BCSEA-SCBC want to ask about the next phase of the FBC CPR.

The FBC CPR states:

“Next Steps

This report contains the Technical and Economic potential savings results, which comprise the initial and fundamental phase of the broader BC CPR. The next, and final, phase of the BC CPR includes additional scope services, namely Market potential, Fuel Switching potential, Demand Response (DR) and the requisite supporting calculations including total thermal demand as well as customization and enhancements to Navigant’s DSMSim model specific to BC, and utility staff training.” [pdf p.527]

- 18.1 Please confirm that the FBC Conservation Potential Review filed as Appendix A does not address capacity-focused DSM.
- 18.2 Please confirm that FBC expects that a next and final phase of the BC CPR will be carried out for FBC, as described in the quotation from the FBC CPR above.
- 18.3 When does FBC expect the next module of the FBC CPR to be completed?
- 18.4 Please provide updated information on the topics that will be addressed in the next module of the FBC CPR.
- 18.5 Please provide as much detail as is available on what aspects of capacity-focused DSM will be addressed in the next module of the CPR.
 - 18.5.1 Will the next module of the CPR address specific locations within FBC’s system where capacity-focused DSM could defer transmission or distribution investments?
- 18.6 Has FBC (or Navigant) examined, outside of the CPR process, DSM measures focused on capacity benefits? If so, please provide the results.
- 18.7 Is FBC aware of BC Hydro’s development of capacity-focused DSM measures?

18.8 Please confirm, or otherwise explain, that the 2016 Long-Term DSM Plan does not mention FBC developing DSM measures focused on capacity benefits, immediately or over the course of the plan period.

18.9 Does FBC intend to examine capacity-focused DSM measures over the course of the 2016 Long-Term DSM Plan period? If so, should this be acknowledged in the Plan? If not, why not?

18.9.1 Does FBC intend to wait until the development of its next long-term DSM plan to begin considering capacity-focused DSM measures? If so, why?

19.0 Topic: Long-Term DSM Plan, Street Lighting
Reference: Exhibit B-1, Volume 2, section 4.2 Commercial Sector Programs, pdf p.506; Conservation Potential Review, Table 2-13, pdf p.546; Table 2-28, pdf p.573; pdf p.546

FBC includes street lighting within the DSM portfolio.

BC Hydro has three types of street lighting situations: BC Hydro owned street lights (RS 1701), customer owned street lights on customer owned poles (RS 1702), and customer owned street lights on BC Hydro owned poles (RS 1703). For BC Hydro owned street lights, BC Hydro is exploring conversion from high-pressure sodium (HPS) to light emitting diode (LED) in order to reduce energy consumption and to reduce costs to the customers. BCSEA-SCBC understand that this conversion program would be outside of BC Hydro's DSM portfolio. [BC Hydro Rate Design Application Module 2, Presentation March 3, 2017]

19.1 Does FBC own and operate street lights on its own poles for municipal or private customers (as BC Hydro does)?

19.2 If so, is it FBC's responsibility to consider converting them to LEDs, i.e., outside of the DSM portfolio?

19.3 If so, does FBC have plans to convert its street lights to LED? If so, please describe them. If not, why not?

20.0 Topic: Planning Environment, Low Carbon Fuel Switching
Reference: Exhibit B-1, Volume 1, section 2.2 Energy and Environmental Policy, p.16 (pdf p.37), et seq.; Appendix B, BC Climate Leadership Plan; Volume 2, section 5.1 Fuel-Switching, pdf p.510; Appendix C, Fuel Switching Analysis, pdf p.682; Exhibit A-3, BCUC IR 9

"In August 2016, the B.C. government released the Climate Leadership Plan which outlined action items to reduce GHG emissions while promoting development and creating jobs." [p.17, pdf p.38]

"FBC has addressed relevant items from the CLP in its load scenarios, market price forecasts and portfolio analysis. FBC discusses scenarios involving fuel switching between natural gas and electricity, increased electricity demand and increased use of electric vehicles in its load scenarios in Section 4 and includes

clean and renewable resources in its alternative and preferred portfolios in Section 9.”

“As part of the development of the 2016 Conservation Potential Review (CPR), FortisBC Inc. (“FortisBC Electric”) retained Navigant to identify and assess the financial and economic attractiveness of selected fuel switching measures for the Residential and Commercial sectors. Specifically, Navigant assessed the economics of switching from gas to electricity.” [pdf p.682]

20.1 Did FBC retain Navigant, or some other consultant, to identify and assess the financial and economic attractiveness of selected fuel switching measures for the Industrial sector? If so, please provide the results. If not, why not?

“Navigant and FortisBC Electric selected the fuel-switching measures based on commercially available electric and gas space heating technologies that were characterized as part of the broader BC CPR study. These electric and gas heating technologies are potential fuel-switching alternatives, but may or may not be economic.” [pdf p.682]

20.2 Please confirm that the low carbon electrification analysis addressed only one residential measure (air source heat pump) and one commercial measure (commercial rooftop unit).

20.3 What criteria did Navigant and FBC use in selecting the gas to electric fuel-switching measures for assessment? Please provide a table showing the measures considered for assessment and the measures selected for assessment.

20.4 Did Navigant and FBC consider any fuel oil to electric fuel switching measures?

20.4.1 Does FBC have an estimate of the number of its customers who heat their homes or businesses with fuel oil? If so, please provide it.

20.5 Did FBC (or Navigant) explore any early retirement measures, or only ‘replace on burnout’ measures? If the former, please provide the results.

20.6 Did FBC (or Navigant) explore any low carbon electrification fuel switching measures in new construction? If so, please provide the results. If not, why not?

20.7 The CPR reports electric energy technical savings potential in 2025 for residential ductless mini split heat pump of 14.7 GWh/year [pdf p.592] and 5.6 MW for electric demand technical savings in 2015 [pdf p.593]. Did FBC explore low carbon electrification fuel switching measures using ductless mini-split heat pumps? If so, what were the results? If not, why not?

20.8 In comparing the cost-effectiveness of low carbon electrification fuel switching measures did FBC (or Navigant) include any benefits

associated with increased cooling efficiency from heat pumps compared with central air conditioning units?

20.8.1 If so, did the comparison include the capital costs of central air conditioning along with the capital costs of a furnace or rooftop unit?

20.9 To what extent are there opportunities for low carbon fuel switching from non-transportation fossil fuels other than natural gas to electricity within FBC's service territory? Were these examined? Will they be examined during the course of the LT DSM Plan?

20.10 Does FBC see low carbon electrification measures as falling exclusively within FBC's DSM portfolio? Are there any low carbon electrification measures that are outside FBC's DSM portfolio?

21.0 Topic: Long-Term DSM Plan, Low-Carbon Fuel Switching
Reference: Exhibit B-1, Volume 2, section 5.1 FUEL-SWITCHING, pdf p.510

"Directive 9 in the 2015-16 DSM Plan Decision (Order G-186-14) required: a cost-benefit analysis (including supporting assumptions) showing whether FBC can allow customers with gas as their primary heating source to access FBC's DSM programs and still be compliant with the DSM Regulations.

The B/C analysis was completed by the BC CPR consultants and is attached as Appendix C of the LT DSM Plan. The finding was that the fuel switching measure failed, on a TRC basis, which is the governing test under the DSM Regulation. Since the measure is uneconomic the Company will not propose a gas to electric fuel switching measure or program."

21.1 Given that FBC/Navigant assessed only two gas to electricity fuel switching measures (residential air source heat pump and commercial rooftop unit) in Appendix C would FBC agree that it would be premature to conclude that there are no cost-effective low carbon fuel switching measures available to FBC over the course of the Long Term DSM Plan?

21.2 Does FBC see value in assessing other gas to electricity fuel switching measures for cost-effectiveness and GHG emissions reduction potential? If so, is this part of the long term DSM plan? If not, why not?

22.0 Topic: Proposed Energy Step Code under the *Building Act*
Reference: Exhibit B-1, Section 2.2.1.4 Climate Leadership Plan (pdf p. 40):

"The CLP also encourages the development of net zero buildings, including accelerating increased energy requirements in the B.C. Building Code by taking incremental steps to make buildings ready to be net zero by 2032." [footnote removed]

Reference: Exhibit B-1, Section 2.2.3 Municipal Policy Actions (pdf p. 41):

"Many municipalities in B.C. and across Canada are using their municipal powers

to take policy actions aimed at reducing greenhouse gases. This can range from building code and zoning by laws placing restrictions around building energy use, to municipalities investing in energy efficiency and conservation programs, or municipal investments in renewable energy generation.”

Reference: Exhibit B-1, Section 2.3.5.1 Climate Change and Regulatory Requirements (pdf p. 50):

“With increasing B.C. building code baselines and the anticipated adoption of “stretch” building codes to improve the energy performance of new homes in B.C., it will become more challenging to achieve energy savings within DSM programs. Increased customer communications, more creative program planning and higher rebate values may be needed to drive greater participation and to move market transformation.” [underline added]

Reference: Exhibit B-1, Appendix B, *Climate Leadership Plan*, (pdf p. 211):

“Developing energy efficiency requirements for new buildings that go beyond those in the BC Building Code, called Stretch Codes, that interested local governments could implement in their communities.” [underline added]

Reference: Exhibit B-1, Section 4.4 Supporting Initiatives, Subsection 4.4.2, Community Energy Planning (pdf 508):

“This element of Supporting Initiatives provides financial assistance to local governments and qualified institutions to facilitate energy efficiency planning activities like the development of community energy efficient strategic plans, energy efficient design practices and organizational policies like energy efficiency building code bylaws.”

Reference: Government of British Columbia web page: Energy Step Code, <http://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/energy-efficiency/energy-step-code>:

“The [Climate Leadership Plan](#) released in August 2016 states that the Province is implementing a number of policies to encourage the development of net-zero buildings. One of those policies is to develop energy-efficiency requirements for new buildings that go beyond those in the BC Building Code.

“The Building and Safety Standards Branch convened a Working Group to examine how such a ‘Step Code’ could be implemented. The proposed Step Code supports the [Building Act](#), by providing a consistent provincial standard for energy efficiency to replace the wide range of existing policies and programs developed by local governments.

“The proposed Step Code also supports consumer choice, by allowing designers and builders to use natural gas, electricity, or other energy sources for their project without imposing a penalty on this decision. This ‘fuel neutral’ approach provides builders with the flexibility to make energy-efficient buildings using all available technologies.

“The Building and Safety Standards Branch is pleased to share the results of this

policy work.

“Read the [full report of the working group](#) (PDF, 1.6MB)

“While the Building and Safety Standards Branch is directly involved, the report also recommends actions by other parties with a stake in this policy. This highlights the need for collaboration and the report can form the basis for ongoing consultation with those stakeholders. In the meantime, the Branch is reviewing the multi-stakeholder consensus recommendations found in the report.

“Intended next steps include the development of Energy Step Code technical requirements that will be enacted by Regulation in the coming months, but followed only as a voluntary measure to allow stakeholders to gain familiarity with the content.

“The Branch is also supporting the reconstitution of the Energy Efficiency Working Group as an Advisory Committee. The balanced interests represented on this Advisory Committee will provide advice to the Branch as the Province works towards the goals of the Climate Leadership Plan and the ongoing implementation of BC’s new Building Act.”

- 22.1 Please confirm that FBC participated in the Energy Efficiency Working Group that examined how a ‘Step Code’ could be implemented.
- 22.2 Please file the Energy Step Code Implementation Recommendations Final Report, August 2016 of the Stretch Code Implementation Working Group.
- 22.3 Please confirm that the “‘stretch’ building code” referenced in Section 2.3.5.1 of the Application and the *Climate Leadership Plan* is the same as the “Energy Step Code” referred to by the Building and Safety Standards Branch.
- 22.4 Please discuss the immediate and longer term implications for FBC’s DSM measures and planning of the implementation of an Energy Step Code as contemplated by the Building and Safety Standards Branch in the quotation above.
 - 22.4.1 Would the implementation of an Energy Step Code create opportunities for FBC to promote energy efficiency to local governments in its service area? Please discuss.
 - 22.4.2 How has the possible implementation of an Energy Step Code been factored into the Long Term DSM Plan?
 - 22.4.3 Do any supporting initiatives in the proposed DSM plan provide support to local governments in relation to an Energy Step Code? If so, please describe the type of support being offered and the proposed budget.

22.4.4 What is FBC's view of the opportunity presented by an Energy Step Code for FBC to actively increase the energy efficiency of new construction in its service territory?