BRITISH COLUMBIA UTILITIES COMMISSION

Project No.3698896, FortisBC Inc. 2016 Long Term Electric Resource Plan (LTERP) and Long Term Demand Side Management Plan (LT DSM Plan)

British Columbia Sustainable Energy Association and Sierra Club British Columbia

Response to British Columbia Utilities Commission Information Request No. 1 [Exhibit A-8] on BCSEA-SCBC Evidence [Exhibit C5-5]

June 29, 2017

1.0 **Reference:** **DEMAND SIDE MANAGEMENT**
Exhibit B-1, Resource Options, p. 95, 2016 Long-Term DSM Plan, p. 1; Exhibit C5-5, p. 4; Decision on FortisBC Inc.'s (FBC) Application for Acceptance of Demand Side Management (DSM) Expenditures for 2015 and 2016, dated December 3, 2014, p. 11; Reasons for Decision on FBC's Application for Acceptance of DSM Expenditures for 2017 DSM Expenditures, January 25, 2017, pp. 4, 10; Exhibit B-11, BCUC IR 64.1, 79.3; *Clean Energy Act*, s.2(b)(c) Setting the DSM funding envelope

Mr. Grevatt states on page 4 of Exhibit C5-5:

> Fortis does not provide evidence to substantiate its claim that high DSM savings targets are too risky. Actually, many jurisdictions in North America routinely achieve high savings goals through DSM programs, and are often required by regulators to do so. These savings goals are often considerably larger than those contemplated by Fortis. … For example, according to the 2016 ACEEE State Scorecard, three U.S. states achieved net savings greater than 2.0% of sales in 2015, and an additional thirteen states achieved savings between 1.0% and 2.0% of sales. In all, nineteen states achieved greater than the 0.8% savings that Fortis contemplates in its Max scenario, and many of these states have been achieving high levels of savings year after year. …

FBC states on page 95 of its 2016 Long-Term Electricity Resource Plan (LTERP): "Demand-side resource options are typically more cost-effective than new supply-side resource options… Accordingly, FBC looks to demand-side resources first to meet any future [load resource balance (LRB)] gaps." FBC further states in response to BCUC Information Request (IR) 79.3: "The FBC [conservation potential review (CPR)] results show ample, cost effective DSM is available to achieve the funding envelopes proposed in the 2016 [long-term] DSM Plan."

The *Clean Energy Act* (CEA) includes as a BC energy objective: (c) to generate at least 93% of the electricity in British Columbia from clean or renewable sources. FBC states on page 1 of the 2016 Long-Term DSM Plan: "The proposed DSM target is to offset 77 percent of load growth over this 20 year period." FBC states in response to BCUC IR 64.1 that it plans to purchase 89.9% of energy in 2017 and 92% of energy in 2018 from sources that meet the CEA definition of electricity self-sufficiency.

The CEA includes as a BC energy objective: (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 <u>at least</u> 66%. [emphasis added]

The Commission stated on page 11 of the December 3, 2014 Decision on FBC's Application for Acceptance of Demand Side Management Expenditures for 2015 and 2016 (G-186-14):
"The Commission Panel considers that FBC's DSM proposal is consistent with the 50 percent reduction in load growth target. However, the Panel considers that this load reduction target should act as a floor rather than a cap on the level of cost-effective DSM funding."

In the Reasons for Decision on FBC's Application for Acceptance of DSM Expenditures for 2017 DSM expenditures (G-9-17), the Commission stated on pages 4, 10:

> Despite the acceptance of the proposed expenditure schedule, the Panel is concerned that it falls short of addressing a range of DSM possibilities that could be pursued in the coming year. …The Panel is further concerned that the extension of existing programming sits on a foundation of recent activity which in itself can be characterized as having fallen short. In other words, "more of the same" is inherently plagued by underperformance.

1.1 ***Please describe alternative approaches used in other jurisdictions to set the overall size of the DSM funding envelope.***

RESPONSE:

There are likely as many different specific approaches to setting the size of DSM funding envelopes as there are jurisdictions.

In many jurisdictions, a savings target, known as an energy efficiency resource standard (EERS) is established by statute or regulation. The funding levels deemed necessary to achieve the EERS savings are proposed by the utility or quasi-governmental agency that is responsible for achieving the EERS, typically with a formal process for obtaining regulator approval. ACEEE has found that states that have an EERS save far more on average than states that do not: "In 2015, states with an EERS achieved incremental electricity savings of 1.2% of retail sales on average, compared to average savings of 0.3% in states without an EERS."[1]

In other jurisdictions, regulators rely on program implementers to make funding proposals in the absence of formal savings targets. The regulators then assess the funding proposals to determine if they meet whatever regulatory or statutory guidance drives DSM investments in the absence of formally quantified goals. In a few cases, there are statutory spending caps that limit the size of the funding envelope regardless of the cost-effectiveness of the investment.

In Mr. Grevatt's view, DSM funding envelopes should be established such that they maximize benefits to ratepayers, and are consistent with jurisdictional policy drivers. Typically such jurisdictional policy drivers include both cost-effectiveness requirements and other balancing objectives, such as assuring that all classes of ratepayers, including those with low incomes, have a reasonable opportunity to participate in DSM programs. Low income program investments may fail at the program level to meet jurisdictional cost-effectiveness requirements, and this is addressed either by relaxing the cost-effectiveness requirements of the low income programs or by considering the low income programs in the context of a larger portfolio, with the cost-effectiveness requirement applied only at the portfolio or sub-

[1] ACEEE Policy Brief on State Energy Efficiency Resource Standards (EERS), January 2017. http://aceee.org/sites/default/files/state-eers-0117.pdf

portfolio level.

1.1.1 Please describe the advantages/disadvantages of using the following approaches to set the size of the DSM funding envelope for FBC: (i) offsetting a percentage of load growth; (ii) achieving net savings greater than a minimum percentage of sales; and (iii) undertaking a 'bottom up' analysis to identify all cost effective DSM.

RESPONSE:

This response is based on the premise that the DSM funding envelope should be determined such that it maximizes benefits to ratepayers and is consistent with jurisdictional policy drivers.

i) DSM targets defined in terms of the amount of energy required to offset a percentage of load growth may succeed in limiting load growth if significant load growth is expected. However, defining DSM targets in this way can fail to maximize the benefits to ratepayers because it may leave cost-effective opportunities untapped, especially when load growth is low or flat.

Establishing a savings target as a percentage of load growth can also lead to erratic DSM programming if loads and forecasts vary significantly from year to year, for example due to changes in economic conditions. Erratic DSM program funding can make it considerably harder to keep customers and vendors engaged with programs, which in turn can make it harder to achieve expected savings levels.

In EFG's view, defining DSM savings objectives in terms of a percentage of load growth is not likely to maximize the benefits to ratepayers. Where cost-effective DSM opportunities exist, it could be beneficial to ratepayers and consistent with government policies to turn forecasted pre-DSM load growth "flat" or even "negative," such that sales are actually declining rather than only growing at a reduced rate. Flat or negative load growth can be beneficial to ratepayers, for example where it allows deferral of infrastructure investments and expensive peak power purchases.

ii) DSM savings targets that are determined as a percentage of sales, especially when the targets are established on a multi-year basis, will provide stable program investments. This can bolster participation from vendors and ratepayers. Targets that are based on a relatively aggressive percentage of sales can drive innovation as program administrators strive to meet requirements. However, if set too low, such targets can also fail to maximize cost-effective investments, leaving cost-effective resources untapped, to the detriment of ratepayers. The majority of the 26 states that ACEEE reports as having an EERS in place have established savings targets in terms of a percentage of sales.[2] Please also see BCSEA response to CEC IR 1.1.

iii) The question asks about the advantages and disadvantages of setting FBC's DSM spending envelope based on a bottom-up analysis identifying all cost effective DSM opportunities.

[2] Id., See Table 1. Electricity EERS policy status by state.

Setting the spending envelope so as to achieve all cost-effective DSM makes sense. One challenge is that bottom-up savings potential studies do not necessarily define the optimum timing and methods of incenting the identified savings. Also, there are concerns in the industry that savings potential studies may under-estimate savings potential. The Regulatory Assistance Project (RAP) found that "…potential study results are derived from forecasts that involve both complexity and uncertainty. As such, findings from these studies need to be viewed carefully, particularly when used to inform and direct long-term policy objectives."[3]

EFG suggests that potential studies have value as a tool that can be used to inform savings targets, and they should be considered along with past savings performance and an understanding of the savings achievements and methods in other jurisdictions rather than in isolation.

1.2 ***Does BC Sustainable Energy Association and Sierra Club BC (BCSEA) consider that FBC could reasonably be expected to achieve cost effective net energy savings that equal (i) 1.0% of sales; (ii) 1.5% of sales; and (iii) 2.0% of sales? Please explain.***

RESPONSE:

EFG has not conducted the analyses required to support quantified conclusions. Based on the accomplishments of leading states, it is reasonable to expect that FBC could achieve cost-effective savings of 1%, 1.5%, and even 2% of sales if that was the objective. Further, a recent report co-authored by Mr. Grevatt and his colleague Chris Neme on behalf of the Regulatory Assistance Project provides an argument that significant program savings remain available for programs across North America—even those that have been saving at very high levels year after year:

"This study examines …whether it would be possible to meet 30 percent of electricity system needs in ten years. Though very aggressive—requiring 50 percent to 100 percent more savings than what even the leading states are pursuing today—we conclude that this goal is likely to be achievable, but only with both an unwavering commitment to promoting efficiency whenever it is cost-effective and with innovative thinking and approaches to a variety of topics."[4]

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[3] Kramer, Chris and Reed, Glenn: Ten Pitfalls of Potential Studies, The Regulatory Assistance Project, November, 2012, p.3. http://www.raponline.org/wp-content/uploads/2016/05/energyfutures-kramerreed-tenpitfallsesdraft2-2012-oct-24.pdf

[4] Neme, C., & Grevatt, J. (2016, February). The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years. The Regulatory Assistance Project: Montpelier, VT. Available at: http://www.raponline.org/document/download/id/7944.

2.0 **Reference:** **DEMAND SIDE MANAGEMENT**
Exhibit C5-5, p. 4; ACEEE 2016 State Energy Efficiency Scorecard, September 26, 2016, p. 28;[5] Exhibit B-2, BCUC IR 45.6
Calculation of net energy savings

Mr. Grevatt states on page 4 of Exhibit C5-5: "… three U.S. states achieved net savings greater than 2.0% of sales in 2015, and an additional thirteen states achieved savings between 1.0% and 2.0% of sales."

The 2016 ACEEE State Scorecard referenced in Mr. Grevatt's evidence states on page 28: "At least a portion of savings reported as gross. We adjusted the gross portion by a net-to-gross factor of 0.817 to make it comparable with net savings figures reported by other states." FBC states in response to BCUC IR 45.6 that key assumptions include free-rider/spillover rates of zero percent.

2.1 ***Please explain the difference between 'gross' and 'net' energy savings, and whether FBC's assumption of zero free-rider/spillover rates is generally consistent with industry practice.***

RESPONSE:

<u>Gross</u> energy savings represent the actual expected reduction in energy usage, either at the customer's meter or at the generator, that is expected to occur as a result of installing a DSM measure, regardless of why the customer chose to install the measure.

<u>Net</u> energy savings represent the savings that occur as a result of a DSM program, or the savings that the program can take responsibility for achieving, and which would not have been achieved if the program did not exist. At a minimum, net energy savings account for both "free riders" (participants that would have installed the efficiency measure even in the absence of a program) and "spillover" (savings that the program is responsible for inducing to occur but that are not reported by the program).

Different jurisdictions have different policies regarding reporting of net vs. gross savings and the definition of expected savings targets. Some jurisdictions report both, some only one or the other, and statutory savings targets can be based on either.

In general, best practice is to use net savings for determining the extent to which a program administrator achieves its savings target, for evaluating program cost-effectiveness, and for determining a program administrator's performance incentives where such incentives are based on reported savings. However, in practice it can be difficult for parties to agree on determinations of free rider and spillover rates, and disagreements can be challenging to resolve. For this reason, some jurisdictions may find it more expedient to simply report gross savings.

2.2 ***Does BCSEA consider that it would be appropriate to adjust the FBC estimated energy savings by a net-to-gross factor of 0.817 in order to estimate net energy savings? Please explain.***

RESPONSE:

Net-to-gross factors vary by jurisdiction, depending on numerous factors, such as incentive levels, and the length of time a program or measure has been in the market. Ideally, a NTG

[5] http://aceee.org/research-report/u1606

factor would be determined specifically for FBC. However, for discussion purposes and in the absence of FBC-specific NTG values, it would be appropriate to use ACEEE's assumed average 0.817 NTG factor to determine a proxy value for net savings for the specific purpose of comparing FBC's results to those programs identified in the ACEEE scorecard. Such an approach would be consistent with ACEEE's Scorecard methodology.

3.0 **Reference: DEMAND SIDE MANAGEMENT**
Exhibit C5-5, p. 11; Exhibit B-13, BCSEA IR 23.4; Exhibit B-11, BCUC IR 81.1.2
DSM cost effectiveness tests

Mr. Grevatt states on page 11 of Exhibit C5-5 that FBC should use marginal, rather than average, line losses in screening the cost-effectiveness of DSM initiatives.
FBC states in response to BCSEA IR 23.4: "Therefore, while it is correct that in general DSM reduces the requirement for energy and capacity at the margin, it is incorrect to assume that all DSM savings benefit the system at the peak marginal loss rate."

FBC states in response to BCUC 81.1.2:

> Evaluating the utility cost (only) of alternative DSM portfolios, targeting those measures against the utility cost of supply side alternatives, would inherently place DSM at an advantage since that approach would ignore the customers' portion of costs that are also borne by DSM participants.

3.1 ***Is the use of marginal, rather than average, line losses in screening the cost-effectiveness of DSM initiatives consistent with industry practice in other jurisdictions? Please explain.***

RESPONSE:

The use of marginal, rather than average, line losses in screening the cost-effectiveness of DSM initiatives is not typical industry practice in other jurisdictions. However, it is considered to be industry best practice. The RAP publication that Mr. Grevatt cited in his Evidence states that:

> **"The line losses avoided by energy efficiency measures are generally underestimated. Most analysts who consider line losses at all use the system-average line losses, not the marginal line losses that are actually avoided when energy efficiency measures are installed. Generally this is because average line losses are a measured and published figure, while determining marginal line losses requires more information and more detailed calculations."[6]**

Some jurisdictions do use marginal line loss values in the development of their avoided costs, including Illinois and New Jersey.

3.1.1 Please explain how marginal losses would be estimated, given that DSM energy

[6] Lazar, Jim and Baldwin, Xavier: *Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements*. Regulatory Assistance Project, August, 2011., p.1. http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-eeandlinelosses-2011-08-17.pdf

savings also occur during off-peak time periods.

RESPONSE:

Each measure or end use for which DSM savings would occur would typically also have an associated load profile showing the time periods in which DSM savings would be expected to occur for that measure or end use. The value of the savings in each time period would be determined as part of the avoided cost development process and would not vary by measure. The load profiles would determine the amount of time that savings would occur in different time periods, and hence would determine, at the measure or end use level, the amount of savings that would occur during peak and off-peak time periods.

See also BCSEA response to CEC IR 3.1 and BCSEA response to BCOAPO IR 6.1.

3.2 ***In undertaking a cost-effectiveness analysis, please explain whether comparing (i) the utility cost of DSM programs that pass the Total Resource Cost TRC against (ii) the utility cost of supply side options (such as market purchases) places DSM at an unfair advantage compared to supply side options.***

RESPONSE:

Comparing (i) the utility cost of DSM programs that pass the Total Resource Cost test against (ii) the utility cost of supply side options does not place DSM at an unfair advantage compared to supply side options.

The TRC cost test, provided it is done such that costs and benefits are symmetrically considered, provides a view into the relative cost-effectiveness of DSM programs without regard to the party that is responsible for making the investment. Its purpose is not to compare the costs and benefits of different utility investment options, but rather to assess the benefits and costs associated with a particular investment regardless of who receives them or pays for them.

It <u>is</u> appropriate to consider the results of the utility cost test in determining the most prudent among multiple investment options for a utility to make, and TRC results have no bearing on this assessment. In fact, it is entirely possible that a DSM program could fail the TRC and still provide an attractive alternative for utility investment based on the utility cost test (UCT). This is because in the UCT only the utility costs are considered, rather than the total of utility and participant costs. Utility costs commonly are less than half of the total costs that are considered in the TRC test. This is the purpose of the utility cost-test, and it does not put DSM at an unfair advantage.

4.0 **Reference:** **DEMAND SIDE MANAGEMENT**
Exhibit C5-5, p. 10; Exhibit B-11, BCUC IR 83.1.1
Fuel switching

Mr Grevatt states on page 10 of Exhibit C5-5 that it found FBC's space heating fuel switching analysis to be insufficient, and believes that it is premature to conclude that low-carbon electrification is not cost effective on this basis.

FBC states in response to BCUC IR 83.1.1:

FBC considers that calculating the modified TRC (mTRC) using [zero emission energy alternative (ZEEA)] is moot, since the [*Greenhouse Gas Reduction (Clean Energy) Regulation* (GGRR)] has prescribed a new benefit/cost calculation for Electrification (fuel-switching) purposes. Section 4(1) of [Order in Council (OIC)] 101/2017 (now s. 4(1) of the GGRR) provided as follows:

Prescribed undertaking - electrification

4 (1) In this section:

"benefit", in relation to an undertaking in a class defined in subsection (3) (a) or (b), means all revenues the public utility reasonably expects to earn as a result of implementing the undertaking, less revenues that would have been earned from the supply of undertaking electricity to export markets;

"cost", in relation to an undertaking in a class defined in subsection (3) (a) or (b), means costs the public utility reasonably expects to incur to implement the undertaking, including, without limitation, development and administration costs;

"cost-effective" means that the present value of the benefits of all of the public utility's undertakings within the classes defined in subsection 3 (a) or (b) exceeds the present value of the costs of all of those undertakings when both are calculated using a discount rate equal to the public utility's weighted average cost of capital over a period that ends no later than a specified year;

4.1 ***Does BCSEA consider that OIC 101/2017 supports an assumption that electrification initiatives (such as natural gas to electricity for heat and hot water, electric vehicles) do provide a BC benefit (i.e. they pass the total resource cost test)? Please explain.***

RESPONSE:

BCSEA-SCBC consider that OIC 101/2017 in conjunction with section 18 of the *Clean Energy Act* provides a mechanism for a public utility to recover in rates the costs of carrying out an undertaking designed to reduce B.C. greenhouse gas emissions by substituting the use of electricity for a source of energy that produces more GHG emissions. Undertakings of this sort are often referred to as low-carbon electrification.

Prior to the adoption of OIC 101/2017, a public utility's ability to recover in rates its costs of spending on low-carbon electrification initiatives was limited to measures that met the relatively narrow definition of demand-side measure in the *Clean Energy Act*.[7] As a result, a public utility's costs of a low-carbon electrification program were not generally recoverable in rates unless

(a) the measure resulted in a reduction of net energy consumption, and

(b) the measure met cost-effectiveness requirements designed for DSM measures and portfolios in which the main "benefit" is the avoided cost of energy rather than a reduction in GHG emissions.

Relatively few low-carbon electrification opportunities could meet these requirements and few if any were implemented.

OIC 101/2017 introduces two significant innovations.

[7] In commenting on the relationship between OIC 101/2017 and DSM, BC Hydro states "In the utility industry, demand-side management is generally understood to include actions to reduce, increase or shift the use of electricity, which is broader than the legal definition of demand-side management in the Clean Energy Act." BC Hydro F2017-F2019 Revenue Requirements Application, Exhibit B-22, BCSEA 3.67.11, pdf p.27.

- **First, a public utility's costs of a qualifying low-carbon electrification undertaking can be recovered in rates without the undertaking necessarily resulting in a reduction in net energy consumption. These are electricity load-building initiatives to reduce GHG emissions, not energy consumption reduction initiatives.**
- **Second, OIC 101/2017 defines a methodology for determining whether a low-carbon electrification measure is "cost-effective" that is limited to whether the revenue from incremental electricity sales, net of foregone export revenue, exceeds measure costs on an NPV basis.**

OIC 101/2017 signifies that the B.C. legislative framework now supports two different regulatory frameworks in which a public utility can recover in rates its costs of qualifying measures involving low-carbon electrification:

> **(a) as a DSM measure, where there is a net reduction in energy consumption and the measure passes a TRC test on its own or within a DSM portfolio, and**
>
> **(b) as an OIC 101/2017 prescribed undertaking, where electricity is substituted for an energy source that produces more GHG emissions and the undertaking passes a cost-effectiveness test based on net utility revenue on an NPV basis.**

BCSEA-SCBC consider that OIC 101/2017 supports a conclusion that B.C. government policy supports qualifying low-carbon electrification initiatives by a public utility as providing a B.C. benefit. These low-carbon electrification initiatives could certainly include measures to substitute electricity for natural gas in space and water heating, and measures to incent electric vehicles in substitution for fossil-fuel vehicles, assuming such initiatives meet the cost-effectiveness test specially defined for this purpose.

To be clear, however, the cost-effectiveness test for low-carbon electrification initiatives under OIC 101/2017 is not the TRC test, which is a test that applies to DSM measures (including the relatively few low-carbon electrification measures that are also DSM measures).

4.2 ***Does BCSEA consider that OIC 101/2017 indicates that the key cost effectiveness test for electrification initiatives is whether such programs are cost effective from the utility perspective (i.e. whether they pass the utility cost test)? Please explain.***

RESPONSE:

BCSEA-SCBC agree that, yes, the OIC 101/2017 cost-effectiveness test for low-carbon electrification programs under OIC 101/2017 is a test of whether such programs are cost-effective from the utility perspective.

However, the OIC 101/2017 cost-effectiveness test is not the same as the utility cost test applied to DSM measures. Therefore, no, BCSEA-SCBC do not agree that the cost-effectiveness test for low-carbon electrification programs under OIC 101/2017 is a test of whether such programs pass the utility cost test.

To explain, BCSEA-SCBC consider that the utility cost test for DSM programs and portfolios <u>and</u> the OIC 101/2017 cost-effectiveness test for low-carbon electrification are both tests of whether an initiative is "cost-effective from the utility perspective." However, as stated above, the two cost-effectiveness metrics are not the same.

Both tests include the change in utility sales revenues from participating customers: a

revenue decrease in the case of DSM measures and a revenue increase in the case of low-carbon electrification load-building measures.

However, the two tests define avoided costs differently. The DSM utility cost test defines avoided cost based on the utility's supply-side marginal cost. In contrast, the OIC 101/2017 test defines avoided cost based on foregone revenue from sales to export markets.