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October 29, 2018

FEI 2017 LONG TERM GAS RESOURCE PLAN
EXHIBIT A-9

Sent via email

Ms. Diane Roy
Vice President, Regulatory Affairs
FortisBC Energy Inc.
16705 Fraser Highway
Surrey, BC V4N 0E8
gas.regulatory.affairs@fortisbc.com

Re: FortisBC Energy Inc. 2017 Long Term Gas Resource Plan – Project Number 1598946 – Information Request No. 3

Dear Ms. Roy:

Further to your December 14, 2017 application of the FortisBC Energy Inc. 2017 Long Term Gas Resource Plan, enclosed please find Commission Information Request No. 3. Please file your responses electronically by November 15, 2018.

Sincerely,

Original signed by Ian Jarvis for:

Patrick Wruck
Commission Secretary

/yl

Enclosure



FortisBC Energy Inc.
2017 Long Term Gas Resource Plan

INFORMATION REQUEST NO. 3 TO FORTISBC ENERGY INC.

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A. ICF EVIDENCE

**74.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, pp. 6-7
Best Practice Review**

On page 6 of the Expert Witness Report of Michael Sloan and John Dikeos, ICF (ICF Report), in Exhibit B-11, ICF states:

Overall, our review of existing DSM programs at North American gas utilities in other jurisdictions found that the natural gas industry has extremely limited experience integrating DSM into the facilities planning process and in using targeted DSM to reduce the cost of facility investments. Furthermore, ICF did not identify any natural gas utilities in North America that actively consider the impact of DSM programs on peak hour or peak day demand forecasts used for facilities planning. Since ICF’s study was initiated in October of 2016, a few gas utilities have begun to consider these impacts.

On page 7, ICF states:

We also found that the gas utilities that have contemplated the potential to use DSM programs to avoid or defer specific infrastructure projects have generally expressed concerns about the reliability of the DSM impacts as a facility investment alternative due to the lack of information on the measured impacts of DSM on peak hourly demand.

74.1 Please provide a list of the gas utilities reviewed by ICF, including those that have begun to consider the impact of Demand Side Management (DSM) programs on peak hour/peak day demand forecasts.

74.2 Please discuss whether, based upon FEI’s current understanding of its load profile, FEI expects that any potential targeted DSM programs would need to achieve demand reductions in the peak hour only, or multiple hours that “shoulder” the peak hour.

74.2.1 Please discuss how this impacts the viability of demand reduction programs.

74.2.2 Please briefly discuss any risks associated with shifting the peak hour as a result of demand response programs.

**75.0 Reference: ICF EVIDENCE
Enbridge DSM Mid-Term Review, Submission to Ontario Energy Board,
January 15, 2018, Appendix D, p. 19
Review of Ontario Gas Utilities**

On page 7 of the ICF Report in Exhibit B-11, ICF states:

In Ontario, the Ontario Energy Board (OEB) directed the two major natural gas utilities, Enbridge and Union Gas, to evaluate the potential to use DSM to avoid or defer (reduce) infrastructure costs. The study was designed to assess the implementation of broad-based or geo-targeted DSM programs to meet the forecasted hourly peak energy demand, consistent with the primary goals and principles of facilities planning, to provide reliable natural gas service with reasonable costs.

On page 8, ICF states:

The main conclusion of this study is that additional research is necessary before the utilities would be able to rely on DSM to avoid or defer new infrastructure investments. In addition to the IRP study, the Ontario utilities filed an IRP Transition Plan as part of their midterm review, as per the OEB's requirements

...

Within the Transition Plan, the Ontario utilities have stressed that additional analysis and monitoring of DSM programs and higher energy efficiency equipment, as well as any subsequent impacts of these initiatives on peak period demand should be conducted and factored into infrastructure requirement planning and forecasting processes, prior to relying on these approaches as a targeted alternative to new infrastructure investment.

On page 6, ICF references the Enbridge DSM Mid-Term Review, Submission to OEB, January 15, 2018 (Enbridge Review). On page 19 of Appendix D of the Enbridge Review, ICF states:

While DSM programs do broadly impact facilities requirements, and the cost savings associated with a broad based reduction in distribution costs are generally included in the DSM planning process, the linkages between DSM planning and facilities planning are currently passive rather than active, and are not sufficient to actively integrate geo-targeted DSM programs into the facilities planning process.

- 75.1 Please discuss if any of FEI's current DSM programs could be considered "geo-targeted"
- 75.2 Please explain if geo-targeted DSM programs would likely be more or less expensive on a per-unit basis than "broad-based" programs.
- 75.3 Please summarize the details of any additional research/analysis proposed in the ICF study or the Integrated Resource Planning (IRP) Transition Plan.
 - 75.3.1 Please provide comment on whether FEI is considering undertaking any of these research activities.
- 75.4 Please discuss if FEI considers that DSM programs should be allocated benefits in DSM cost-effectiveness testing as a result of cost savings from "passive deferral"
 - 75.4.1 If yes, please suggest how an adder for passive deferral could be calculated.

On page 7 of the ICF Report in Exhibit B-11, ICF states:

The potential penetration rate for DSM programs can be a limiting factor in the ability to use DSM to offset demand growth, particularly in rapidly growing areas.

On page 19 of the ICF Report in Exhibit B-11, ICF states:

ICF's analysis for Enbridge and Union in Ontario in 2017 and early 2018 suggested that, before consideration of costs, DSM could be used to reduce annual peak demand growth by up to 1.0- 1.2 percent. While this study was specific to Ontario, the DSM options in Ontario and British Columbia are generally similar and we expect the conclusions for Ontario to be generally valid in British Columbia.

75.5 Assuming a similar level of maximum available peak demand reductions from DSM in BC as in the Ontario examples, would FEI consider that approximately 1.2 percent annual load growth represents the upper limit where multi-year deferral of infrastructure investments as a result of DSM would be feasible?

75.5.1 Please discuss whether FEI considers that there could be benefit in undertaking a study of potential peak demand reductions from DSM, similar to the assessments completed for Enbridge and Union.

75.5.2 Please explain any potential reasons that the maximum annual peak demand reductions from DSM may be significantly different in BC compared to Ontario.

**76.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, pp. 9-10
Review of Con Edison**

On page 9 of the ICF Report in Exhibit B-11, ICF states:

The non-pipeline solutions portfolio selected by Con Edison is projected to reduce growth in peak period capacity requirements on interstate pipelines into the Con Edison Service territory by 84,500 Decathterms (Dth)/day by 2023 at a cost of \$305 million. The proposed nonpipeline solutions portfolio includes energy efficiency programs designed to provide 25,000 Dth/day of peak period gas demand reductions, programs designed to convert 12,400 Dth/day of natural gas space heating load to alternative fuels (electric heat pumps), 7,100 Dth/day of increased peak period natural gas supply from Renewable Natural Gas (RNG), and 40,000 Dth/day of peak period natural gas supply from CNG/LNG delivered by truck to strategic locations on the Con Edison system.

It is important to note that despite committing \$305 million to non-pipeline solutions, Con Edison does not expect to eliminate the need for new pipeline capacity, and is undertaking a series of other efforts, including parallel planning for a traditional pipeline solution to meet demand growth.

On page 10, ICF states:

Although natural gas DSM is part of the Con Edison's portfolio of non-pipelines solutions and may help defer the need for new pipeline capacity, Con Edison's situation is somewhat unique and natural gas DSM would be even less cost-effective in most other jurisdictions where the comparative cost of gas infrastructure is much lower than in New York.

76.1 Please confirm if the energy efficiency programs included in the Con Edison portfolio includes demand response programs.

- 76.2 Please briefly explain how, in the Con Edison example, RNG is expected to reduce pipeline capacity requirements.
- 76.2.1 Please discuss whether FEI's current or future RNG projects could potentially reduce pipeline capacity requirements.
- 76.3 Please discuss whether FEI has considered the feasibility of truck deliveries of CNG/LNG as a means of reducing peak period supply in targeted locations.
- 76.4 Please clarify whether in the absence of eliminating the need for new pipeline capacity, Con Edison may be able to invest in smaller capacity, less costly pipeline solutions.
- 76.5 Please briefly discuss the strengths and weaknesses of developing an integrated supply-side and demand-side portfolio of non-pipeline solutions, as proposed by Con Edison.
- 76.6 Please confirm that FEI's understanding is that gas infrastructure investments are less costly in BC than in the New York service area.

**77.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, p. 11
Review of Northwest Natural**

On page 11 of the ICF Report in Exhibit B-11, ICF states:

As part of the assessment of demand side management alternatives, firm customers with significant annual gas consumption in the targeted areas are engaged to determine if they are willing to pursue interruptible recall agreements.

- 77.1 Please discuss whether FEI has considered engaging large firm customers regarding the feasibility of interruptible agreements.
- 77.1.1 Please explain whether FEI views that this could be considered as a viable demand side alternative to infrastructure investments.

**78.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, pp. 14-15
Risk and Reliability Criteria**

On pages 14 to 15 of the ICF Report in Exhibit B-11, ICF states:

DSM and facilities planning have fundamentally different reliability requirements that must be reconciled in order to transition to an integrated DSM and facilities planning process:

- A primary goal of facilities planning is to ensure the utility pipeline system is sufficiently sized to ensure that demand will not exceed the system capacity at design conditions. As a result, the facilities planning process is based on a primary philosophy of risk avoidance.
- Some primary goals of DSM program planning are to ensure natural gas is used more efficiently and to influence a culture of conservation.

DSM success is measured using a variety of metrics, including program participation rates and savings. However, the use of deemed savings in DSM program evaluations can lower the precision and confidence behind the actual savings resulting from DSM programs. Risk is inherent in DSM planning and implementation by design. Typically, utilities are encouraged to innovate in their approaches to program delivery in order to increase program uptake.

However, a DSM program implemented as an alternative to a new infrastructure project could lead to a shortage of system capacity if the program does not perform as intended, with potentially significant impacts on consumers. As a result, if a geo-targeted DSM program designed to reduce facility investments is non-performing and fails to deliver the expected savings, or if the savings appear to be uncertain during the evaluation phase, the utility will be required to proceed with the facility investment to ensure the same level of overall system reliability. This would lead to an increase in the overall cost of serving the load growth, as both the DSM costs and the facility investment costs would need to be recovered. In addition, the facility investment may need to be accelerated to meet the need, resulting in higher than anticipated or originally budgeted project costs.

- 78.1 In FEI's view, could the application of a "risk adjustment factor" to the DSM cost-effectiveness tests (i.e. a reduction in the calculated benefits of a DSM measure) be an appropriate means of reconciling the differing reliability requirements of DSM and facilities planning?
- 78.1.1 If yes, please suggest what metrics could be used to calculate the required risk adjustment.
- 78.1.2 Similarly, are there other adjustment factors that could potentially mitigate other concerns identified in ICF's evidence?

**79.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, pp. 7, 16
Planning Timelines**

On page 7 of the ICF Report in Exhibit B-11, ICF states:

The results showed that DSM can cost effectively defer infrastructure investments in certain situations where annual peak hour demand growth is limited and facility project costs are relatively high.

On page 16 of the ICF Report in Exhibit B-11, ICF states:

Given the need to evaluate the impacts, the DSM program would need to be completed, or demonstrate measurable results; at least two years prior to when the additional capacity was initially projected to be required. Hence, a successful geo-targeted DSM program would need to be approved and put into motion approximately three to five years before the expected in-service date of the targeted facility investment. However, the need for new facilities is generally uncertain at this stage. As a result, geo-targeted DSM programs may need to be implemented before gas utilities have a high degree of certainty that the facility investment will actually be required.

- 79.1 Does FEI consider that the need for new facilities is always uncertain three to five years before the expected in-service date, or are there instances where there is a relatively strong degree of certainty?
- 79.2 Please provide FEI's view on how feasible geo-targeted DSM could be:
- a) Rapidly scaled up following smaller "proof of concept" program(s).
 - b) Scaled down if the facility investment was determined to no longer be required.
- 79.3 Please provide a list of FEI's expected infrastructure investments as identified in the 2017 LTGRP that could be categorized as "limited" forecasted growth in annual peak hour demand, and relatively high facility project costs.

79.3.1 Please discuss whether, based upon current understanding, FEI considers that any of the infrastructure investments identified could act as viable candidates to evaluate targeted demand side alternatives in future.

**80.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, pp. 17-18
Other Considerations**

On pages 17 to 18 of the ICF Report in Exhibit B-11, ICF states:

Allocation of Risk: There is an increase in risk and an increase in cost to the utility of relying on DSM programs as an alternative to infrastructure investment due to the uncertainty regarding the reliability of these programs. This leads to a number of public policy questions:

- How much risk is appropriate? And how should the risk of underestimating facilities requirements be weighted relative to the risk of overestimating facilities requirements? Is the risk to society of potentially not having the necessary energy services in place an acceptable risk? How would this risk be assessed?
- Who bears the risk if a geo-targeted DSM program does not lead to a deferral of an infrastructure investment?
- Who bears the risk if the benefits of a geo-targeted DSM program do not materialize, and the utility pipeline system is insufficient to meet peak demand?

Additional Research: The incorporation of DSM to reduce infrastructure investments as part of the normal infrastructure planning process will require additional certainty regarding the costs of geo-targeted DSM programs, and the impact of DSM programs on peak period demand, which will require additional data collection and research.

Cross-Subsidization: Currently the costs of new infrastructure are shared across customer classes. Geo-targeted DSM programs have the potential to lead to cross-subsidization between customer classes, and between DSM participants and other customers.

In its response to BCUC IR 1.29.1, FEI states:

FEI is conducting a pilot project on advanced meters for residential and commercial customers that could provide hourly or more frequent meter readings. As part of that pilot, FEI will be examining the ability of such meters to provide improved data for analyzing end use trends which might lead to a better understanding of the impacts of C&EM activities on peak demand.

...

FEI expects that this pilot will also provide insights into whether or not demand response programs (please also refer to the response to BCUC IR 1.29.1.1), other than industrial curtailment as noted above, would potentially be effective in reducing or shifting peak demand.

In response to BCUC IR 1.64.1.1.1, FEI outlines additional activities that could help in better understanding the impacts of C&EM activities on peak demand.

80.1 Please discuss if FEI has a position on the “public policy questions” posed by ICF with respect to risk allocation.

- 80.2 Please confirm if FEI's position is that it requires additional research as outlined in BCUC IRs 1.29.1 and 1.64.1.1.1, before it would be in a position to trial geo-targeted DSM programs.
- 80.3 Please explain if FEI expects that the costs of any future geo-targeted DSM programs would be shared across customer classes.
- 80.3.1 Please elaborate from FEI's perspective the cross-subsidization risk of geo-targeted DSM compared to traditional infrastructure investments.

**81.0 Reference: ICF EVIDENCE
Exhibit B-11, ICF Report, p. 22
Conclusions and Recommendations**

On page 22 of the ICF Report, ICF states:

Based on the progress to-date and the uncertainty surrounding any pathway for further activities, we recommend that FEI be allowed to continue to conduct exploratory research to determine if and how targeted DSM should be incorporated into the infrastructure planning process, rather than having the approach and timeline determined as part of a regulatory process without any significant assessment of the potential benefits of setting a pre-determined timeline at such an early stage.

- 81.1 Please elaborate on the suggested scope of the "exploratory research" and the expected costs and timing associated as applicable.

B. NAVIGANT EVIDENCE

**82.0 Reference: Navigant Evidence
Exhibit B-11, Navigant Report, pp. 3-4
Conservation Potential Review Model**

On page 3 of the Navigant Consulting, Inc. (Navigant) Rebuttal Evidence on DSM Energy Savings Trajectories (Navigant Report) in Exhibit B-11, Navigant states:

As described in the BC CPR, "The equilibrium market share can be thought of as the percentage of individuals choosing to purchase a technology provided those individuals are fully aware of the technology and its relative merits (e.g., the energy- and cost-saving features of the technology) [...] This study calculates an equilibrium market share as a function of the payback time of the efficient technology relative to the inefficient technology. In effect, measures with more favorable customer payback times will have higher equilibrium market share, which reflects consumers' economically rational decision making...

- 82.1 Please confirm that the equilibrium market share calculation does not assume that all individuals will necessarily adopt a DSM measure, even if payback periods are relatively favourable.

On page 4 of the Navigant Report in Exhibit B-11, Navigant states:

Calibrating the initial starting point for the model to historic program performance also acknowledges that it is more realistic to assume that conditions like customer awareness and acceptance of efficient technologies take time to change, rather than assuming that the market could immediately shift and transform overnight with greater investments in incentives and marketing, as might be assumed in an assessment of (theoretical) maximum achievable potential.

82.2 Please briefly discuss if FEI's experience with DSM programs substantiates the assumption that customer awareness and acceptance of efficient technologies take time to change. Please outline any exceptions.

**83.0 Reference: Navigant Evidence
Exhibit B-11, Navigant Report, pp. 3-4
FEI DSM Market Potential**

On page 5 of the Navigant Report in Exhibit B-11, Navigant states:

FEI's Reference Case inherently assumes no budget restrictions on energy efficiency funding streams. In many jurisdictions, this is one of the underlying assumptions underpinning the difference between a realistic achievable and a (theoretical) maximum achievable scenario, in addition to higher incentive, administrative, and marketing costs. However, unrestricted funding streams are already considered in FEI's market potential forecast.

On page 7, Navigant states:

...Mr. Grevatt does not acknowledge in his evidence that, in the BC CPR, there is a diminishing rate of acquired savings per dollar of incentive spending, for incentive levels above those used in the market potential forecast. By testing a range of incentive sensitivities, Navigant determined that the realistic market potential forecast provides a reasonable level of spending on a \$/GJ basis for FEI.

...

Ultimately, the impact from a higher level of incentive spending may translate to increased customer rate impacts.

83.1 Please confirm that the FEI market potential analysis did not assume incentive levels of 100 percent of a measure's incremental cost.

83.1.1 If confirmed, please further explain the statement that "unrestricted funding streams are already considered."

83.2 Please confirm if the incentive sensitivity analysis included cost-effectiveness testing or rate impact calculations, for the higher incentive level assumptions.

83.2.1 If confirmed, please provide the results.

Navigant states on page 5:

...as a crucial step in the development of the CPR, Navigant and FEI prepared a comprehensive measure list, inclusive of measures included within FEI's existing portfolio, as well as measures beyond FEI's existing portfolio.

83.3 Please briefly summarize the process by which the measure list was developed, prior to being reviewed by stakeholders.