BOMA TECHNICAL CONFERENCE QUESTION #1

INTERROGATORY

Reference: Report

Question:
For all citations of costs and incentives comparing US and Canadian jurisdictions, please provide the amount in both Canadian and US dollar equivalents. So to for comparisons of costs of fuel, please harmonize on either therms or cubic meters or provide both rather than comparing cost per therm to cost per cubic meter.

RESPONSE

Throughout the Synapse report, all monetary amounts are in Canadian dollars unless otherwise indicated. All USD to CAD conversions in the report use a 25 June 2015 exchange rate of $1CAD to $0.81USD.

For fuel conversions, we assumed 0.364 therm per m^3. This assumption is derived based on the following:

- 0.0283 m^3 per ft^3
- 1,030 btu per ft^3
- 36,374 btu per m^3 (1,030 btu per ft^3 / 0.0283 m^3 per ft^3)
- 36,374 btu = 0.036 MMBtu per m^3 (36,374 btu per m^3 /1,000,000)
- 10 therms per MMTBtu
- 0.364 therm per m^3 (0.036 MMBtu per m^3 * 10)

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #2

INTERROGATORY

Reference: Page 1, Paragraph 1.

Question:
Please confirm that Synapse is aware that the original framework for natural gas Demand Side Management (DSM) was established in EB0-169-III in 1993 and both utilities programs since 1995 under a number of different Board frameworks. Has Synapse reviewed the previous frameworks, particularly with respect to the evolution of the shareholder incentive?

RESPONSE

Confirmed. Synapse has reviewed the frameworks for the 2016-2020 DSM plans, and for the 2012-2014 DSM plans. We are most familiar with the shareholder incentive policies associated with the 2016-2020 DSM framework.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #3

INTERROGATORY

Reference: Page 1, Paragraph 1.

Question:
Please confirm that Synapse is aware of the Minister's Directive from March 31, 2014 and included direction to achieve all cost effective DSM.

RESPONSE

Confirmed; Synapse is aware of this directive. It is Synapse's understanding that this directive applies to the electric utilities implementation of CDM programs, and not to the gas utilities implementation of DSM programs.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #4

INTERROGATORY

Reference: Page 1 Paragraph 4.

Question:
Did Synapse interview any staff of the natural gas utilities, any members of the DSM Consultative (intervenors) or any staff of electric utilities in preparing this evidence?

RESPONSE

No, Synapse did not interview any staff of the natural gas utilities, any members of the DSM Consultative (intervenors), or any staff of electric utilities while preparing its report. We relied on the material presented by the utilities in the case proceeding, including their DSM plans and responses to interrogatories. However, the OEB staff assisted us in locating relevant material and data within the case proceeding or in historical proceedings as needed.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #5

INTERROGATORY

Reference: Page 1 Paragraph 5.

Question:
Please list all of the programs and utilities that Synapse considers representative of best practices in leading jurisdictions. Please identify the criteria that Synapse applied to determine the utilities and programs that they considered to be representative of best practices. Please identify how Synapse determined which are leading jurisdictions. Please indicate which are electric only, gas only or combined. Please include the number of commercial, industrial and residential customers served by each of these utilities and identify how many continuous years of programming has each utility delivered. Please identify the programs and utilities that failed to meet the criteria that Synapses used to determine best practices or leading jurisdictions.

RESPONSE

As states on the same page, "[b]est practices refer to energy efficiency practices that produce superior results when compared to other energy efficiency practices used to address a similar situation, market, or process." We identified such best practices based on our expert experience evaluating energy efficiency programs throughout North America and a detailed literature review of best practices on specific energy efficiency programs relevant to the proposed programs by the Ontario gas utilities. For more information, see the following excerpt from Exhibit L.OEBStaff.1, page 1.

> We constructed our recommendations using our expert experience and a detailed literature review. Synapse has extensive experience analyzing costs, energy savings, avoided costs, cost-effectiveness, potential studies, rate and bill impacts, and the regulatory policies used to promote and support energy efficiency resources. We have identified best practices while working in jurisdictions that are leaders in DSM implementation, such as Massachusetts, Vermont, California, and Rhode Island…. Further, while analyzing the Ontario programs, we conducted a comprehensive literature review of best practices and discussion papers that address the fields identified above. We surveyed reports from leading energy efficiency research institutions, such as the American Council for an Energy Efficient Economy (ACEEE), SEEAction, Lawrence Berkley National Laboratory (LBNL), the Regulatory Assistance Project (RAP), and the U.S. Department of Energy (DOE).

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #6

INTERROGATORY

Reference: Page 1, Paragraph 5.

Question:
Please identify how Synapse determined similar situations, markets or processes for its comparisons.

RESPONSE

See our response to BOMA #5, above.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #7

INTERROGATORY

Reference: Page 1, Paragraph 6.

Question:
Please provide a list of the sources that were included in your detailed literature review.

RESPONSE

Please refer to the References section of the report, found at L.OEBStaff.1, pages 132-137.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #8

INTERROGATORY

Reference: Page 1, Paragraph 6.

Question:
Please provide examples of how suboptimal policies hinder energy efficiency growth. When Synapse references policies, does that refer to government policies, or regulatory policies?

RESPONSE

As an example of a suboptimal energy efficiency policy that hinders energy efficiency growth, many jurisdictions do not account for participant non-energy benefits when screening for cost-effectiveness using the Total Resource Cost (TRC) test. Because the TRC test includes both utility- and participant-perspectives, it should include all of the costs and benefits to utilities and participants. By excluding certain participant benefits such as non-energy benefits, the results of the cost-effectiveness test are skewed, and can lead to under investment in energy efficiency resources.

Generally speaking, Synapse is referencing policies that have been articulated in legislation, commission orders, regulations, guidelines, or other policy directives.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #9

INTERROGATORY

Reference: Page 2, Paragraph 3.

Question:
Given the Minister's direction to achieve all cost effective DSM, what is the purpose of the "cautious and balanced approach" with respect to the budget? Was this the result of direction from Board Staff? Please file your financial and economic analysis of increased budgets. Please file your estimate of how much program budgets could be decreased if your recommendations were full implemented.

RESPONSE

It is Synapse's understanding that the Minister's directive to achieve all cost-effective energy efficiency applies to the electric utilities implementation of CDM programs, and not to the gas utilities implementation of DSM programs.

The Ontario Energy Board has provided direction to the gas utilities on implementation of DSM programs regarding the maximum budget that the utilities should spend in achieving energy efficiency savings. Therefore, the utilities should take a cautious and balanced approach when considering adopting our recommendations so that new changes would not push the utilities' programs over the current proposed budgets.

Synapse did not conduct financial or economic analysis of increased budgets.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #10

INTERROGATORY

Reference: Page 3, Paragraph 1.

Question:
Beyond the statistical customer sector profiles on page 11, please file the analysis of the service territories of Enbridge and Union that led Synapse to suggest that both utilities should offer identical programs.

RESPONSE

Synapse did not conduct an analysis of Enbridge and Union's service territories.

Synapse did not suggest that both utilities should offer identical programs. Instead, Synapse suggested both utilities "should coordinate with each other to implement similar programs." (L.OEBStaff.1, page 3, paragraph 1).

Our experience is that in other jurisdictions where program administrators offer programs that have similar designs, incentives offered, application processes, and marketing, such as in Massachusetts, such programs allow for decreased confusion among customers, facilitate review of the programs by stakeholders and regulators, and maximize efficiencies across the companies and program designs.

In such instances, utilities are still able to modify programs as needed to service their customers best, but the overall design and implementation of the programs is similar. For example, in Massachusetts, program administrators typically provide C&I customers with incentives that are approximately 70% of the incremental costs. The Cape Light Compact is a municipal aggregator that provides 100% incentives to government C&I energy efficiency projects because that is the direction provided to the Cape Light Compact by its governing board. The other program administrators in Massachusetts treat government and non-government projects the same (i.e., by providing an approximately 70% incentive).

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #11

INTERROGATORY

Reference: Page 4, Paragraph 1

Question:
Did Synapse review the role intervenors play in the Audit Committees for each of the Utilities?

RESPONSE

Synapse did not review the role intervenors play in the Audit Committees.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #12

INTERROGATORY

Reference: Page 5, Paragraph 2.

Question:
Did Synapse analyse the similarities and differences between the framework for DSM and CDM in Ontario? Please provide Synapse view of the difficulties inherent in coordinating programs developed under different frameworks and with different regulatory regimes.

RESPONSE

We did not analyze the similarities and differences between the framework for DSM and CDM in Ontario.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #13

INTERROGATORY

Reference: Page 5, Paragraph 3.

Question:
Has Synapse reviewed the alternative financing options available to Ontario gas customers?

RESPONSE

While we are aware of some alternative financing options available to Ontario gas customers such as Toronto's Home Energy Loan program, we did not review such financing options in detail.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #14

INTERROGATORY

Reference: Page 8, Paragraph 3.

Question:
Please provide Synapse's understanding of the Participant Cost Test. Is Synapse aware of any jurisdictions that approve programs with negative participant cost tests>

RESPONSE

The Participant Cost Test includes the costs and benefits experienced by the customer who participates in the efficiency program. The costs include all the direct expenses incurred by the customer to purchase, install, and operate an efficiency measure. The benefits include the reduction in the customer's energy bills, any financial incentive paid by the program administrator, and non-energy benefits experienced by the participating customer.

Synapse is aware that approximately 23 states apply the Participant Cost Test when reviewing energy efficiency programs. However, none of these states rely on the Participant Cost Test as a primary test for cost-effectiveness screening.[1] Synapse has not specifically researched whether jurisdictions approve programs with negative Participant Cost Test benefit-cost ratios.

A program with a negative Participant Cost Test benefit-cost ratio is likely not well designed, is not likely to attract many program participants, and/or is not fully capturing all benefits and costs to participants. Presumably participants conducted their own benefit-cost analyses and determine whether the benefits outweigh the costs of participating in a DSM program.

[1] See, Kushler, M., Nowak, S., Witte, P., "A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs," American Council for an Energy Efficient Economy, February 2012, available at: http://aceee.org/research-report/u122.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #15

INTERROGATORY

Reference: Page 9, Paragraph 2.

Question:
Please provide a substantiation (evidence) for your comment: "Generally speaking, benefit costs ratios of 2.0 or greater are considered acceptable."

RESPONSE

By definition, cost-effectiveness tests indicate that benefits exceed costs when the benefit-cost ratio exceeds 1.0. In Synapse's experience and expert opinion, benefit-cost ratios greater than 2.0 indicate that programs are "within a healthy cost-effectiveness range," meaning that every dollar spent will result in at least two dollars in benefits.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #16

INTERROGATORY

Reference: Page 9, Paragraph 2.

Question:
With respect to the sentence: "Enbridge has greater net benefits ($654 million) than Union ($140 million)", has Synapse reviewed why this is the case? In particular, has Synapse reviewed the history of Union's participation in the industrial market under previous frameworks, the role of intervenors like the Industrial Gas Users Association (IGUA) and Association of Power Producers of Ontario (APPRO) or Board direction in an earlier framework with respect to the Union's largest industrial customers?

RESPONSE

Refer to Exhibit M.Staff.UNION.1.

Refer to Exhibit L.OEBStaff.1, pages 82-84 for Synapse's review of Union's Large Volume offering.

We did not review the history of Union's participation in the industrial market under previous frameworks, role of intervenors, or board direction in an earlier framework with respect to the largest industrial customers.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #17

INTERROGATORY

Reference: Page 11, Paragraph 2.

Question:
With respect to the differences in the costs of energy saved in the two low income programs, has Synapse reviewed the geographic dispersion of Union's low income customers or determined how that the size and distance affect costs? Has Synapse reviewed with the availability of DSM contractors across northern Ontario?

RESPONSE

Synapse has not reviewed the geographic dispersion of Union's low income customers.

Synapse has not reviewed the availability of DSM contractors across northern Ontario.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #18

INTERROGATORY

Reference: Page 13, Table 12.

Question:
Please file the most recent evaluation of Massachusetts National Grid gas weatherization program. Please file population density statistics for the program. Has Synapse analyzed the impact of population density, customer mix, industry mix on the proportional make up of energy savings results for any of the leading jurisdictions?

RESPONSE

All of the Massachusetts evaluation studies can be found on the Massachusetts Energy Efficiency Advisory Council's website: http://ma-eeac.org/studies/

Specifically, the most recent evaluation of the gas residential weatherization program was conducted by Cadmus in March 2015 title "High Efficiency Heating Equipment Impact Evaluation," and is available at: http://ma-eeac.org/wordpress/wp-content/uploads/High-Efficiency-Heating-Equipment-Impact-Evaluation-Final-Report.pdf

For this report, Synapse has not analyzed the impact of population density, customer mix, industry mix on the proportional make up of energy savings results for any of the leading jurisdictions.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #19

INTERROGATORY

Reference: Page 13, Paragraph 2.

Question:
Please confirm that if customers in your leading jurisdictions use the same amount of natural gas where one is residential and one is commercial, they have different rate structures.

RESPONSE

The referenced paragraph reads:

> In general, costs should be allocated to each sector in proportion to how the costs are collected from the sectors. However, such an approach may not be appropriate or transparent in Ontario, where the rate structure is determined by volume of use by a customer rather than the type of customer.

Our understanding is that, typically, the rates applied to customers are not determined by the customer's usage alone. Residential and commercial customers, including those who use the same amount of natural gas, typically receive service under different sets of rates.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #20

INTERROGATORY

Reference: Page 30, Paragraph 2.

Question:
Please file the comparisons of government codes and standards for the equipment listed under Residential Products among your leading jurisdictions and Ontario.

RESPONSE

Synapse was tasked with reviewing the proposed DSM programs and commenting on the program design elements that could be modified or improved. Thus, the requested assessment is beyond the scope of our work. However, we note that the status of state building energy codes in the U.S. is available at https://www.energycodes.gov/status-state-energy-code-adoption

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #21

INTERROGATORY

Reference: Page 31, Paragraph 5.

Question:
Is Synapse aware that the requirement for two measures was the result of the DSM Consultative proceedings?

RESPONSE

Yes.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #22

INTERROGATORY

Reference: Page 33, Paragraph 5.

Question:
Please provide the average savings from a Mass Save insulation project.

RESPONSE

Based on the 2014 Report Technical Reference Manual (TRM),[2] unit savings are provided in the table below, both in MMBtus per unit as presented in the TRM and converted to cubic meters per unit.[3]

Type of Insulation	MMBtu Saved per Unit	Cubic Meters Saved per Unit
Air Sealing and Insulation (Overall)	26.3	723.0
Air Sealing	10.5	288.7
Attic Insulation	8.3	228.2
Wall Insulation	11.5	316.2
Basement Ceiling Insulation	1.5	41.2
Basement Wall Insulation	1.3	35.7

[2] The Massachusetts 2014 Report Technical Reference Manual from June 2015, page 353 is available at http://web1.env.state.ma.us/DPU/FileRoomAPI/api/Attachments/Get/?path=15-49%2fCMA_Appendix_3_Tech_Ref_Manual.pdf
[3] We assumed 0.036 MMBtu per m3. See response to BOMA #1.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #23

INTERROGATORY

Reference: Page 34, Paragraph 3.

Question:
Has Synapse reviews the history of showerhead programs in Ontario since 1989 by both gas and electric utilities.

RESPONSE

Synapse did not review any documents regarding the history of showerhead programs in Ontario except Navigant's 2008 report titled "Residential Rebate Program: Participation Forecast and Incentive Bundling Strategy – Key Findings Summary."

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #24

INTERROGATORY

Reference: Page 38, Paragraph 2.

Question:
Synapse make many suggestions with respect to harmonization of incentives between Enbridge and Union. However, with respect the incentives for adaptive thermostats, Ontario's electric utilities all offer different incentive levels. Are these programs considered best practices according to Synapse?

RESPONSE

Synapse analysis focused on the gas DSM programs in Ontario. As such, we did not review the incentives for adaptive thermostats offered by Ontario's electric utilities, nor did we review the electric CDM programs in detail.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #25

INTERROGATORY

Reference: Page 39, Paragraph 2.

Question:
Has Synapse reviewed the various documents approved by the Board for cataloguing measure savings which are a precursor to the Technical Reference Manuals?

RESPONSE

Synapse reviewed Union's filing Exhibit A, Tab 3, Appendix D "2016-2-2- Input Assumptions."

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #26

INTERROGATORY

Reference: Page 66, Paragraph 9.

Question:
Regarding Aboriginal Program. Please provide any analysis that Synapse has completed with respect to the location of First Nations communities within the gas service territories. Please not the reference on page 66 is incorrect.

RESPONSE

Synapse has not completed analysis regarding the location of First Nations communities within the gas service territories.

Synapse contends that the reference on page 66 is correct regarding the summary of the Aboriginal Offering provided on that page.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #27

INTERROGATORY

Reference: Page 73, Paragraph 8.

Question:
Did Synapse review the documentation for Enbridge's previous efforts with respect to working with realtors with respect to home energy labelling? Has Synapse reviewed the housing market in Ontario, particularly with respect to multiple bids very often over the asking price? Has Synapse reviewed the past and current government initiatives on building labelling?

RESPONSE

Synapse reviewed the documentation for Enbridge's Home Rating program as presented in the company's plan at Exh. B, Tab 2, Sch. 1, pp. 71-75.

Synapse has not reviewed the housing market in Ontario.

Synapse has not reviewed the past and current government initiatives on building labelling in Ontario.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #28

INTERROGATORY

Reference: Page 81, Paragraph 2.

Question:
In Ontario, a government regulation including schools requires all broader public sector agencies to file energy management plans; this data is public. Have any of the jurisdictions considered leading by Synapse established such regulations.

RESPONSE

Synapse is not aware of such a government regulation.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon

BOMA TECHNICAL CONFERENCE QUESTION #29

INTERROGATORY

Reference: Page 85, Paragraph 42.

Question:
What is about the definitions of the categories that Synapse finds vague?

RESPONSE

It is not clear from the description provided by Enbridge what makes a building more or less complex. While the company provides example of types of buildings that it finds to be more or less complex, it does not provide a definition for complexity. For example, it is not clear why an office is considered moderately complex while an elementary school is considered simple, or why a multi-residential building with multiple systems is moderately complex but a multi-residential building is simple.

Witnesses: T. Woolf
K. Takahashi
E. Malone
J. Kallay
A. Napoleon