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EB-2021-0002 EGI DSM Framework & Plan 2023-2027

Energy Probe Compendium

A. EGI Panel 2 Proposed Whole Home Program

B. Board Staff/ Optimum Energy Report Panel 9

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A. EGI Residential Whole Home Program (WHP)

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A.

10-EP-1-GEC/ED.1

Ref: Ex. L.GEC/ED.1 page 5

Preamble: Enbridge's proposed plan will actually produce lower average annual savings than the Company achieved between 2017 and 2019.

a) Please provide the Comparison that this statement is based upon.

b) Does EFG agree that in most Sectors, particularly the residential sector, the ratio of savings (m3/\$) are declining? Discuss the reasons for this.

c) Does EFG suggest the answer is to ramp up DSM budgets? If so what additional programs/measures for the residential sector would EFG propose e.g. exterior insulation wrap for older homes? Estimate the annual and 5-year cost for each proposed program/measure addition.

Response:

a) See the discussion on p. 8 and Figure 1 on p. 9 of our report.

b) The answer depends in part on what savings metric is being used, the period of time over which comparisons are being made and whether spending is being adjusted for inflation to enable a more apples-to-apples comparison. As the following table shows, the forecasted number of first year m3 saved per dollar spent in 2023 is not appreciably different, on an inflation adjusted basis, than the actual experience in 2017 through 2020.¹ For the residential sector, Enbridge's actual savings yields improved very slightly from 2017 through 2020 in inflation adjusted terms, but are forecasted to be about 10% lower in 2023 than the 2017 through 2020 values. EFG has not conducted an analysis to assess the reasons for such a reduction.

¹ The savings and spending per sector in 2017, 2018, 2019 and 2020 are from the summary tables of the independent Evaluation Contractor's annual verification report. The 2023 budget is as proposed by Enbridge in Exhibit D, Tab 1, Schedule 1, p. 11 and the 2023 savings are as proposed by Enbridge for its 100% target in Exhibit D, Tab 1, Schedule 3, p.4

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Sector	Spending (million nominal \$)					1st Year Savings (millions m3)					1st Year m3 per 2021 \$				
	2017	2018	2019	2020	2023	2017	2018	2019	2020	2023	2017	2018	2019	2020	2023
Residential	\$49.7	\$53.1	\$55.2	\$49.6	\$40.8	16.5	17.4	17.9	16.3	14.8	0.30	0.31	0.31	0.32	0.28
Low Income	\$18.7	\$21.4	\$24.3	\$20.9	\$23.0	6.9	8.7	9.4	7.5	7.9	0.34	0.38	0.37	0.34	0.31
Com/Ind	\$33.0	\$32.0	\$32.2	\$27.4	\$43.1	81.1	74.2	81.3	59.0	74.7	2.24	2.16	2.39	2.06	2.16
Large Volume	\$2.6	\$2.8	\$3.1	\$3.3	\$2.8	9.5	8.1	7.0	12.2	9.3	3.29	2.66	2.17	3.50	2.60
Energy Perf.	\$0.0	\$0.0	\$0.0	\$0.0	\$1.2	0.0		0.0		0.0	n.a.	n.a.	n.a.	n.a.	n.a.
Beyond Codes	\$8.4	\$9.3	\$9.3	\$8.2	\$8.4	0.0		0.0		0.0	n.a.	n.a.	n.a.	n.a.	n.a.
Low Carbon	\$0.0	\$0.0	\$0.0	\$0.0	\$4.6	0.0		0.0		0.0	n.a.	n.a.	n.a.	n.a.	n.a.
MT	\$2.8	\$3.1	\$2.9	\$2.0	\$0.0	0.0		0.0		0.0	n.a.	n.a.	n.a.	n.a.	n.a.
Other	\$0.4	\$0.2	\$0.4	\$0.1	\$0.0	0.0		0.0		0.0	n.a.	n.a.	n.a.	n.a.	n.a.
Portfolio	\$11.4	\$13.3	\$11.0	\$7.6	\$18.4	0.0		0.0		0.0	n.a.	n.a.	n.a.	n.a.	n.a.
Total	\$126.9	\$135.3	\$138.4	\$119.0	\$142.3	114.0	108.4	115.7	95.1	106.7	0.82	0.75	0.79	0.76	0.79

c) Yes, at least in part. While some increase in savings could be achieved by reallocation of the total annual budgets proposed by Enbridge. Increases on the order of magnitude necessary to ramp up to savings levels of North American leaders will also require absolute increases in total budgets.

It should also be noted that a growing DSM program cost per unit of gas savings is not necessarily a “problem” that can or should be “fixed”. Savings yields per program dollar can decline for a variety of reasons, including the elimination of a lower cost source of savings as a result of government codes or standards, an increased focus on more comprehensive treatment of efficiency opportunities, an increased focus on serving harder to reach customers, a significant increase in the level of savings being achieved, poor performance by program planners and delivery staff, etc.² If savings yields are declining because of poor performance, that would obviously be a problematic. **On the other hand, there are many other potential reasons lower yields can be reasonable and acceptable given market conditions and policy objectives.** EFG has not conducted the kind of detailed analysis necessary to offer comprehensive recommendations for modifications to Enbridge’s proposed program portfolio. See response to 6.OEB.Staff.2.GEC/ED.1 for some higher-level recommendations.

Exhibit D Tab 1 Schedule 1 Tables 1-4

Table 1: 2023-2027 Five-Year DSM Budget Envelope

	2023 Base Year	2024	2025	2026	2027
Program Budget	\$123,900,000	\$130,095,000	\$136,599,750	\$143,429,738	\$150,601,225
	<i>Formulaic increase of 5% (3% policy growth + CPI inflation) over year prior</i>				
Portfolio Admin, Evaluation, Research & Development	\$18,360,000	\$18,727,200	\$19,101,744	\$19,483,779	\$19,873,455
	<i>Formulaic increase of CPI inflation over year prior</i>				
Total Budget Envelope	\$142,260,000	\$148,822,200	\$155,701,494	\$162,913,517	\$170,474,680

Table 2: 2023-2027 Five-Year DSM Plan Budget

DSM Budget Category	2023 Base Year	2024	2025	2026	2027
Residential Program	\$40,804,802	\$41,762,686	\$42,597,940	\$43,449,899	\$44,318,896

Residential Program Is ~30 % of Total DSM Program

Table 4: 2023 DSM Plan Budget

/u

<i>Reference: Exhibit, Tab, Schedule</i>	2023 DSM Budget Item	Incentive Costs	Promotion Costs	Delivery Costs	Admin Costs	2023 Total
E-1-2	Residential Program	\$32,484,644	\$3,148,484	\$3,591,449	\$1,580,225	\$40,804,802
	<i>Residential Whole Home</i>	\$26,140,935	\$1,527,894	\$2,961,089		\$30,629,918
	<i>Residential Single Measure</i>	\$3,557,834	\$804,590	\$255,000		\$4,617,424
	<i>Residential Smart Home</i>	\$2,785,875	\$816,000	\$375,360		\$3,977,235

Exhibit D Tab 1 Schedule 4 Page 2

Table 1: 2023 TRC-Plus and Net Benefits

2023 TRC-Plus Forecast	TRC-Plus Benefits ¹	TRC Costs	Net Benefits ²	TRC-Plus Ratio
Residential Program	\$125,706,884	\$66,254,346	\$59,452,537	1.90
<i>Residential Whole Home</i>	\$73,977,785	\$46,006,919	\$27,970,866	1.61
<i>Residential Single Measure</i>	\$8,961,854	\$7,529,043	\$1,432,811	1.19
<i>Residential Smart Home</i>	\$42,767,245	\$11,229,960	\$31,537,285	3.81
<i>Program Level Admin</i>		\$1,488,425	-\$1,488,425	

Exhibit E Tab 1 Schedule 2 Page 12

Incentives/Enablers

32. There are three types of incentives available for participants: measure incentives, assessment incentives, and bonus incentives.

33. Measure incentives are provided to participants according to the measure installed. Table 1 details the measure incentives contemplated at the time of submission.

Table 1: Whole Home Measure Incentives

<u>Measure</u>	<u>Criteria</u>	<u>Incentive</u>
Attic Insulation	Increase insulation from R35 or less to at least R60	\$650
	Increase cathedral/flat roof insulation by at least R14	\$650
Air Sealing	Achieve 10% or more above base target	\$150
	Achieving base target	\$100
Basement Insulation Must upgrade a minimum of 20 per cent of the total wall area	Add at least R23 insulation to 100% of basement	\$1,250
	Add at least R12 insulation to 100% of basement	\$750
	Add at least R23 insulation to 100% of crawl space wall	\$1,000
	Add at least R12 insulation to 100% of crawl space wall	\$500
	Add at least R23 insulation to 100% of floor above crawl space	\$1,000
Exterior Wall Insulation Must upgrade a minimum of 20 per cent of the total wall area	Add at least R20 to 100% of building	\$3,000
	Add at least R9 insulation to 100% of building to achieve a minimum of R12	\$1,750
	Add at least R3.8 to 100% of building to achieve a minimum of R12	\$1,000
Furnace/Boiler	For replacing a less than 96% AFUE natural gas furnace with a 96% AFUE or higher condensing natural gas furnace; OR, For replacing a less than 90% AFUE natural gas boiler with a 90% AFUE or higher condensing natural gas boiler.	\$250 for furnace or \$1,000 for boiler
Water Heater	Replace existing natural gas water heater with 0.80 EF or higher tanked ENERGY STAR® qualified natural gas water heater. Or Replace existing natural gas water heater with 0.87 UEF or higher tankless ENERGY STAR qualified natural gas water heater.	\$400
Window/Door/Skylight	For each window, door or skylight replaced with an ENERGY STAR qualified model.	\$40

¹⁰ Incentive details are provided as currently contemplated, Enbridge Gas routinely examines and adjusts incentive amounts in response to opportunities and market conditions, and in an effort to maximize program performance and results over the course of the Multi-Year term.

Energy Probe IR 10 referred to ED 22 re Whole Home Program

Exhibit I.10.EGI.ED.22

Page 2 of 4

Plus Attachment

Question(s):

(a) What is the expected life of a residential furnace for the purposes of estimating the cost-effectiveness of measures involving a furnace? If different, what is the expected life of a residential boiler for the purposes of estimating the cost-effectiveness of measures involving a furnace?

(b) Please provide a spreadsheet calculating the TRC cost-effectiveness of incentivizing a 96% AFUE furnace (incremental to the 95% AFUE standard). Please include all underlying assumptions and calculations. Please calculate the TRC ratio and TRC net costs/benefits.

(c) Please calculate the PAC/UCT for the \$250 rebate discussed above.

(d) How many customers received the \$250 rebate in 2018, 2019, and 2020?

(e) How many customers are forecast to receive the \$250 rebate in 2023-2027?

(f) Please provide the assumed annual gas consumption (m³) for an average customer with a 95% AFUE furnace versus an average customer with a furnace that received the \$250 rebate discussed above.

(g) When calculating the cost-effectiveness of measures involving gas furnaces and boilers, does Enbridge use the manufacturer specifications for the AFUE? If no, please explain?

(h) Has Enbridge researched whether the manufacturer AFUE specifications accurately reflect the AFUE results in real-world applications? If yes, please provide a copy or link to all studies that have been consulted.

(i) Please provide a spreadsheet calculating the TRC cost-effectiveness of incentivizing a 90%+ AFUE boiler (incremental to the 90% AFUE standard). Please include all underlying assumptions and calculations. Please calculate the TRC ratio and TRC net costs/benefits.

(j) Please calculate the PAC/UCT for the \$1,000 boiler rebate discussed above.

(k) How many customers received the \$1,000 boiler rebate in 2018, 2019, and 2020?

(l) How many customers are forecast to receive the \$1,000 boiler rebate in 2023-2027?

(m) Please provide the assumed annual gas consumption (m³) for an average customer with a 90% AFUE boiler versus an average customer with a boiler that received the \$1,000 boiler rebate discussed above.

(n) Does a customer receive the \$150 bonus incentive for three measures even if one of those measures is a gas furnace or boiler?

(o) Please provide the data that Enbridge has on the efficiency level of the gas furnaces and gas boilers of its customers. For example, please provide (a) an approximate average efficiency of customer gas furnaces, (b) the number of customers with gas

furnaces, (c) the number of customers with furnaces within 5% efficiency ranges (e.g. 80-85, 85-90, 90-95 etc). Please also provide this information for boilers. Please provide a breakdown by customer type as possible (single family, etc.).

Response

a) The Whole Home offering is a whole home residential energy efficiency program offer and uses a measure life of 25 years.

b) By design, the Whole Home offering is a whole home performance program and uses NRCAN's HOT2000 software to calculate the whole home savings (including interactive effects) across all measures undertaken. These whole home savings are used for cost effectiveness screening.

c) See response to part b.

d) The following DSM participants received the furnace rebate applicable for the program year:

	2018	2019	2020
L-EGD	13,037	14,257	8,777
L-UG	14,152	8,993	4,451
Total	27,189	23,250	13,228

e) Enbridge Gas cannot provide this information. The average rebates for the Whole Home offering for 2023-2027 are based on historical average incentive values at the whole home level, not at the individual measure level.

f) Unless a customer is a participant in one of our DSM programs, Enbridge Gas is unaware of the type of equipment that exists in a customer's home, and therefore is not able to complete this analysis.

g) See response to part b.

Page 4 of 4 Plus Attachment

h) No, Enbridge Gas has not conducted research into accuracy of Seasonal Performance Ratings, such as "Annual Fuel Utilization Efficiency" (AFUE).

i) See response to part b.

j) See response to part b.

k) The following DSM participants received the boiler rebate applicable for the program year:

	2018	2019	2020
L-EGD	298	251	266
L-UG	187	116	130
Total:	485	367	396

l) See response to part e.

m) See response to part f.

n) Yes.

o) Please see Attachment 1, 2020 Residential Single Family Natural Gas End Use

Survey. Furnace efficiency is categorized as high efficiency, medium efficiency or conventional based on the customer’s response. The survey does ask about boiler efficiency. The survey does not ask about water heater efficiency. It is important to note that this is a self-reported customer driven survey. Customers are asked a set of questions based on their best knowledge so equipment efficiency levels may not be accurate.

Filed: 2022-03-16

EB-2021-0002

Exhibit JT2.17

Page 1 of 1

ENBRIDGE GAS INC.

Undertaking Response to Energy Probe Research Foundation

Undertaking Tr: 140

With reference to the table in ED 22, to advise the participants, the average rebates, and the totals for 2021, unaudited and not final data.

Response:

	Attic Insulation	Basement Insulation	Exterior Wall Insulation	Air Sealing	Furnace	Boiler	Water Heater	Window/Door/Skylight
2021 Incentives Paid*	\$11,012,799	\$2,948,181	\$1,720,520	\$2,123,200	\$2,347,250	\$496,000	\$1,697,200	\$1,164,000
2021 Participants*	17,215	3,057	1,188	19,887	7,146	498	4,658	3,974
2021 Avg. Measure Incentive**	\$640	\$964	\$1,448	\$107	\$328	\$996	\$364	\$293

* Subject to finalization of 2021 results. Unaudited.

** Where rebates have been updated over time the participant incentive is based on the offer rebates available at the time of the initial home energy assessment.

EB-2021-0002, Exhibit I.10.EGI.ED.22, Attachment 1, Residential Survey Page10

Home Heating: Age and Efficiency Levels

Residential: Single Family Natural Gas End Use Study

40% of those who currently have a furnace that is less than 5 years old have replaced it in the last 2 years (or 13% of the total)

50% of customers who replaced their furnace in the past 2 years and also had an air conditioner also replaced it at the same time.

5 years or less 39%

6 to 10 years 29%

11 to 20 years 23%

More than 20 years 4%

Don't Know 4%

High efficiency (over 90% efficiency) 82%

Medium efficiency 4%

Conventional (less than 75%) 4%

Don't Know 11%

92% of customers whose furnace is less than 10 years old indicate that their furnace is high-efficiency

66% of customers whose furnace is more than 10 years old indicate that their furnace is high-efficiency, among the remainder, 14% indicate having a midefficiency furnace and 15% a conventional furnace (5% indicate "don't know")

• Most forced air furnaces are less than 10 years old (68%) with 2-in-5 of those whose furnace is less than 5 years old indicating that they replaced it in the last 2 years, with about half of those also replacing their air conditioner at the same time.

• The Northern region has a larger proportion of older furnaces, specifically those aged 16-20 years (15%) compared to the average (8%).

EFG Presentation Slide 19

Enbridge DSM Plan Biases Customer Fuel Choices

- Building Code program requires use of gas
- Program should be scrapped, budget reallocated to other programs
- “Low-Carbon Transition” program includes gas heat pumps
- No chance of meaningful impact on the market until 2030s or later
- Not cost-effective
- Gas heat pump measure should be removed from program, budget reallocated to other measures/program
- Res. Whole Building program includes gas furnace & gas water heater rebates
- \$250 rebate for 96% furnace provides only \$110 in benefits because of min standard of 95%
- Gas water heaters clearly not cost-effective
- Rebates for gas-consuming appliance should be eliminated from residential programs, budget reallocated to other measures/programs

See EFG Report pp. 35-36, 38-

Exterior Wall Insulation Measure

Technical Conference Undertaking Responses of Energy Futures Group

JT3.4: Page 1 of 2

To provide a high-level view on cost-effectiveness of home energy program measures.

Response:

Dr. Higgin was specifically asking about the cost-effectiveness of exterior wall insulation. That measure has not been characterized in the Ontario Gas Technical Reference Manual. Thus, we do not have a readily accessible set of assumptions about savings and costs to use for such an assessment. However, we have endeavored to be responsive and have developed an initial high-level estimate of savings using the following engineering calculation:

$$\Delta m_3 = ((1/R_{old} - 1/R_{new}) * \text{Wall sq. ft.} * 24 * \text{Heating Degree Days}) / (\text{Heating Efficiency} * 35,300 \text{ Btu}/m_3)$$

For purposes of this calculation, we assumed a two-story home with dimensions of 24 x 40 feet. That is 1,920 square feet of living space and 1,741 square feet of insulated wall area assuming 15% of walls are windows or doors.¹² We further assumed 5500 heating degree days relative to a balance point of 60 degrees Fahrenheit, which is approximately the average for the Toronto Pearson airport.¹³ Finally, we assumed an average heating system efficiency of 80%. That accounts for both furnace efficiency losses and ducted distribution system losses.

¹² (

To monetize those savings, we assumed exterior wall insulation would have a life of 25 years and the weather sensitive avoided costs, value for carbon emission reductions and nominal discount rate used by Enbridge in this proceeding.¹⁴ That yields a net present value (NPV) of \$7.97 per annual m₃ saved. With the 15% non-energy benefits adder under the TRC+ test, the total benefit would be \$9.17 per annual m₃ saved.

To then estimate the value of exterior wall insulation, one needs to make an assumption about the pre-existing wall insulation R-value and how much the R-value is increased. Based on experience, we assume that an uninsulated wall has an R-value of 4.5.¹⁵ Using the formula above, that would provide annual savings of 1,247 m₃ with a TRC+ economic value of about \$11,400 for the addition of R-10 insulation.¹⁶ We have not conducted an extensive assessment of the cost of exterior wall insulation, but did find one reference that (after adjustments for inflation and exchange rates) suggests it may be on the order of \$3 to \$4 CDN per square foot.¹⁷ At that cost, it would appear that insulating an uninsulated exterior wall could be quite cost-effective, with a benefit-cost ratio on the order of about 1.8 to 1. Note that if a real discount rate of 0.5% (the value we recommend in our report) is used instead of the 4.0% used by Enbridge, the benefits would be about 50% greater,¹⁸ leading to a benefit-cost ratio on the order of 2.7 to 1.

¹² $(24+40+24+40)*16*0.85 = 1741$

¹³ <https://www.weatherdatadepot.com/heating-degree-days>

¹⁴ I.5.EGI.ED.16_Attachment 1

¹⁵ That accounts for the insulating value of exterior sheathing, wood studs, interior drywall, etc.

¹⁶ Annual savings would be 1476 m₃, with a TRC+ economic value of about \$13,500 for the addition of R-20 insulation.

¹⁷ <https://www.remodelingexpense.com/costs/cost-of-exterior-insulation/>

¹⁸ Even with a real discount rate of 1.0%, the NPV of the savings for this measure would increase by about 40% relative to the use of a 4.0% rate.

JT3.4: Page 2 of 2

However, it should be noted that the level of savings achieved and, therefore, the cost-effectiveness of the measure, is very sensitive to the assumption regarding the existing wall R-value and measure cost, as well as the discount rate assumption.

With respect to measure cost, we know that exterior wall insulation can sometimes cost more than \$3 to \$4 per square foot. However, customers are often interested in the measure because of the improved aesthetic associated with the addition of stucco placed on the outside of the exterior wall insulation. That raises an important question regarding what to treat as the measure cost in the context of investments often made in significant part for aesthetic or other non-energy reasons. Finally, it should be emphasized that the calculations we have provided are preliminary and high-level. We would need to more rigorously assess likely savings levels and costs to draw definitive conclusions about the cost-effectiveness of different levels of exterior wall insulation.

EGI Presentation Slide 19

CGHG* – Impact on DSM Plan Proceeding

Enbridge Gas notes: Proposed DSM Framework, program portfolio, scorecards **are appropriate regardless of outcome of negotiations**

Expected **implementation timeline is for 2022**, beyond scope of current application

□ Outcomes: Agreement with NRCan, the Company expects: **No change to proposed budget or budget flexibility requirements**

No change to the scorecard structure and metrics

Possible change to Residential target based on final forecast and attribution agreement

No agreement: no change to proposed DSM Plan, proposed residential program is valid

□ Commitment: file update with any target adjustments once agreement finalized (no different from expectations if agreement was reached in middle of a plan term)

Reference: EGI Letter, February 25, 2022, Attachment 2

***Canadian Greener Homes Grants**

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B.

Board Staff-Optimal Energy Report

Interrogatory from Energy Probe

7-EP-1-OEB Staff.1

Reference:

Exhibit L.OEB Staff.1, p. ii, Table 5

Preamble:

Amortization Consideration Option 1 "We therefore recommend that the interest rate be set at the utility cost for borrowing money, or the short-term carrying cost of debt".

(a) Has Optimal estimated the annual DSM Portfolio Cost, using 2022 budget base for the costs, using

- i) EGI Weighted Average Cost of Debt (WACD) and
- ii) The OEB approved cost of short term debt?

If so please provide the calculations preferably in Excel Format. If not please perform this calculation (Excel)

(b) In terms of precedents, please list those jurisdictions where the regulator uses WACC and those that use ST debt rates,

Response

See Attachment 9 for an analysis of the costs. The interest rates used for jurisdictions that amortize costs that we looked at in our report can be found in Exhibit L.OEB Staff.1, Table 5.

Staff Optimal Energy Attachment 9			
	Costs With WACC	Costs with short term rate	Savings from short term
2023	\$13,569,066	\$9,801,184	\$3,767,883
2024	\$27,764,050	\$20,054,478	\$7,709,571
2025	\$42,615,195	\$30,781,731	\$11,833,464
2026	\$58,154,238	\$42,005,865	\$16,148,373
2027	\$74,414,482	\$53,750,935	\$20,663,547
2028	\$74,414,482	\$53,750,935	\$20,663,547
2029	\$74,414,482	\$53,750,935	\$20,663,547
2030	\$74,414,482	\$53,750,935	\$20,663,547
2031	\$74,414,482	\$53,750,935	\$20,663,547
2032	\$74,414,482	\$53,750,935	\$20,663,547
2033	\$74,414,482	\$53,750,935	\$20,663,547
2034	\$74,414,482	\$53,750,935	\$20,663,547
2035	\$74,414,482	\$53,750,935	\$20,663,547
2036	\$74,414,482	\$53,750,935	\$20,663,547
2037	\$74,414,482	\$53,750,935	\$20,663,547
2038	\$74,414,482	\$53,750,935	\$20,663,547
2039	\$60,845,415	\$43,949,751	\$16,895,664
2040	\$46,650,432	\$33,696,456	\$12,953,976
2041	\$31,799,287	\$22,969,204	\$8,830,083
2042	\$16,260,244	\$11,745,070	\$4,515,174

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DR. HIGGIN: Right. There is the table. And there it is.

MR. McDONALD: Okay.

DR. HIGGIN: Finally. I just wanted to talk a bit about the residential sector and specifically if we could just pull that up a little bit to the number 5 that you have in there. Okay.

Now, if you have been listening, we have been asking a lot of questions about furnaces and boilers and so on, and the various positions that are being taken as to keep or remove the measure that Enbridge has. So that is the context I am asking for. Do you understand the context that I am trying to explore here?

MR. McDONALD: I believe so.

DR. HIGGIN: Good. So the first thing in number 5 that I wanted to ask you is this question of saying: They are now code baseline. Okay. So that's where I am going to ask the question.

The question is: What AFUE did you mean for that in Ontario? What is code baseline?

MR. McDONALD: Yeah, that is fair. I mean you can go a little bit above code baseline, but the increase is relatively marginal.

DR. HIGGIN: So what is code baseline? It was discussed with Mr. Neme and it was 95 percent. Do you agree with that?

MR. McDONALD: Yes, 95 AFUE, that's right.

DR. HIGGIN: Okay. So as you have just mentioned, the EGI whole home program incents above the code baseline.

You said above. So have you done any TRC or tests to see to support this recommendation which is to remove this measure?

MR. McDONALD: We have not -- you mean look at the TRC of just incrementally going from a 95 to 97?

DR. HIGGIN: Yes. That was discussed with Mr. Neme.

MR. McDONALD: So just offhand, I think there would be a very high degree of uncertainty in trying to figure out what the incremental cost is between a 95 AFUE and a 97 percent AFUE.

I wouldn't expect to be able to get that number would any degree of confidence, but we do kind of know the savings are marginal. On a retrofit basis, I would not expect it to be cost-effective compared to -- compared to just a code replacement as is. But on a lost opportunity basis, I think it would be very hard to derive out what that incremental cost is just going from a 95 to 97.

There is a lot of variation between model and model and installer and installer with several additional features. It is hard to do that kind of detailed tear down of, you know, what does this one additional percentage point inefficiency mean in terms of incremental cost.

That said, the savings are marginal enough going from 95 to -- I think the highest you would get is a 97 maybe 98. But going from 95 to 97 produces enough marginal savings that it doesn't seem that worthwhile, you know.

The code minimum is at 95 percent. I suspect that the average installation without the program is somewhat higher than that. So you know, it may even be less of a difference that the program is making and so, you know, that marginal savings, to me,

is likely not worth kind of an incentive dollar paid for by ratepayers especially if there is any concern about, you know, creating a lost opportunity for electrification for a heat pump, or something of that nature down the line.