ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 2, p.4

Question(s):

Enbridge Gas has proposed structuring its Annual Scorecards Incentive by applying 50% of the maximum shareholder incentive tied to that scorecard awarded for a weighted scorecard performance of 100%.

a) Please discuss the rationale for splitting the available incentive amounts between 50-100% and 100-150% evenly, as opposed to the former structure of the OEB-approved incentive design where 40% was available between 75-100% and 60% was available for achievement above 100% up to a maximum of 150% for each scorecard.

b) Please provide example shareholder incentive calculations that compare the Annual Scorecard shareholder incentives earned during the 2016 to 2020 program years (including draft 2020 results if final are not published) with the proposed structure that has 50% of incentives available between 50-100% of achievement and 50% available between 100-150% achievement.

Response

a) Enbridge Gas has proposed these specific details as part of an overall rethinking of the Performance Incentive opportunity to better align with the OEB's stated objectives and expectations for accessibility for all customer groups including call outs for specific customer groups including low income harder-to-reach customers as an example. With the reallocation of one third of the annual incentive opportunity to an Annual Net Benefits shared savings calculation (based on the overall costs and benefits of the entire DSM portfolio) and two-thirds of the annual incentive directed to the achievement of gas savings targets at a sector/program level (as reflected in the proposal of a scorecard design with differentiated performance targets across the major sectors/programs), the Company is incented to maintain a

balanced and consistent effort across each of the customer groups. Additionally, a portion of the maximum performance incentive has been allocated to long term incentives, as shown in Exhibit D, Tab 1, Schedule 2, Table 2 to align with other priorities.

Specifically, with respect to the current methodology which starts with 40% of the maximum shareholder incentive at 100% performance, comparisons are difficult in that the 40% referenced is taken on a substantively different base. There can be no direct comparison to the proposed 50% at 100% performance, as the proposed annual scorecard incentive opportunity encompass only a fraction of the total maximum shareholder incentive opportunity as opposed to all of the total maximum shareholder incentive in the current methodology. Since the proposed Performance Incentive opportunity has four components, it would be inappropriate to compare one element alone to the current methodology, as the comparison would be missing the other three elements of the proposal.

Enbridge Gas notes that all of the efforts towards gas savings achievement are challenging. To suggest that the first 75% of achievement of savings for each and every sector merits no earnings opportunity is not a reasonable approach in the Company's estimation, particularly given the new scorecard design has separated scorecards to drive performance for each sector separately. In addition, the previous methodology of allocating only a 40% earning opportunity for 100% achievement of target is not reasonable. As expected by all parties, the Company has proposed budgets to drive achievement of 100% targets, to suggest that any significant increase above 100% target achievement can be achieved with the addition of 15% overspend allowed through the DSMVA in no way provides the Company with a reasonable opportunity to access any significant portion of the remaining 60% of incentive earnings available. The Company believes therefore the proposal for a splitting of the available incentive amounts between 50-100% and 100-150% evenly with 50% of the annual scorecard incentive attributed to achievement of 100% provides a more reasonable incentive for the Company necessary to ensure the requisite resources and attention are focused on DSM efforts.

The fact is, the maximum shareholder incentive of $20.9 million, both in the current and the proposed incentive structure is unachievable. The Company believes the focus of the OEB's assessment of the proposed incentive structure should be based on the reasonableness of the earning opportunity at 100% achievement. As is clear in the tables provided in in Exhibit I.8.EGI.STAFF.18a and referenced in response to part b below, the combined utility has earned in the range of $6.3 -12.7 million in annual shareholder incentive over the 2016-2020 DSM plan years, with an average of $9.5 million annually demonstrating how challenging achievement of 100% targets is. The 2015-2020 shareholder incentive which discounts all achievements below 75%, such that no earnings can be achieved until that threshold, coupled with having

60% of the entire earning opportunity only available at levels that are effectively out of reach does not meet the definition of an incentive if it becomes entirely unachievable. The more balanced linear straight-lined proposal Enbridge Gas has detailed for the Annual Scorecard incentive provides for a lower band of 50%, an upper band of 150% and an earning opportunity of 50% of the maximum at 100% achievement, allowing a reasonable opportunity for attainable earnings.

b) The comparison of the shareholder incentive earned in 2016-2020 with what would have been earned in those years with the application of the proposed hybrid annual shareholder incentive structure (including 50% of incentives available between 50-100% of achievement and 50% available between 100-150% achievement) is illustrated in Exhibit I.8.EGI.STAFF.18a.

As outlined in the tables, shareholder incentives earned for the combined utilities in 2016 to 2020 based on the current shareholder incentive structure range from approximately $6.3 million to $12.7 million with an average annual earned incentive of approximately $9.5 million. In comparison a recalculation of the shareholder incentive applying the proposed hybrid annual shareholder incentive would have been lower overall, in the range of $6.8 million to $11.5 million with an average annual earned incentive of approximately $8.9 million.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 2, pp.7-11

Question(s):

Enbridge Gas has included the proposed metrics, metric weightings and DSMI allocations in Tables 5-9.

a) Please discuss the decision to propose net annual gas savings as a metric, as opposed to the current OEB-approved net cumulative gas savings. In your response, please discuss how shifting from net cumulative gas savings to net annual gas savings will produce results that will provide long-term gas savings.

b) Please discuss the decision to propose to only allocate 1% of the DSMI to the Energy Performance Program. In your response, please discuss how Enbridge Gas will ensure that resources are dedicated to ensuring the program receives sufficient attention to drive whole building pay for performance results.

Response

a) For clarity, in the 2015-2020 DSM Framework, the gas utilities were encouraged to "include metrics for both total net annual and lifetime (cumulative) natural gas savings. The scorecards should also include other performance metrics that will motivate the gas utilities to undertake the appropriate activities that result in sustained, long-term results and reduced natural gas consumption levels to ultimately lower overall costs to the natural gas system."[1]

   In this Application, Enbridge Gas has proposed a shareholder incentive structure that maintains a focus on sustained, long-term results through the Annual Net Benefits Shared Savings mechanism; net benefits increase substantially with

[1] EB-2014-0134, OEB Report of the Board Demand Side Management Framework for Natural Gas Distributors (2015-2020) (December 22, 2014), p. 12.

increased measure life and therefore provide a continued focus on long life energy efficiency opportunities. Notwithstanding that the Company has focused on net annual (first-year) savings metrics in the assessment of annual scorecards, Enbridge Gas continues to propose programs that drive long measure life projects.

In the course of drafting this Application, Enbridge Gas reviewed other jurisdictions to assess what target metrics were employed across the DSM landscape. Enbridge Gas's research found that many jurisdictions were incorporating a net benefit or total benefit approach or a hybrid approach and of those that included energy savings targets, most were based on annual (or first year) savings.

Enbridge Gas determined that net annual cubic meters is a simpler, straight-forward metric, easily understood by the customer and potential business partners. A focus on annual energy savings also provides the simplest approach in exploring potential coordinated or collaborative program delivery for example with municipalities or the IESO.

Upon review of the proposed program offerings and measure mix as outlined in evidence, it is clear the Company has presented plans that continue to focus on longer life measures such as weatherization and envelope improvements, industrial process improvements, and space and water heating system upgrades. Further, the introduction of the hybrid shareholder incentive opportunity which includes a focus on an annual Net Benefits Shared Savings mechanism, ensures the Company remains incentivized on the implementation of longer-life measures.

b) The decision to allocate 1% of the DSMI to the Energy Performance Program is a consequence of its proportionally small allocation of the portfolio budget. The Energy Performance Program is a new program and is being rolled out on a small scale with a focus on schools initially where considerable work has been done on pilots and benchmarking allowing for a logical entry point for the program with a building set of relatively homogeneous archetypes.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 2, pp. 15-16
Exhibit D, Tab 1, Schedule 3, p. 12

Question(s):

Enbridge Gas has proposed a Long Term GHG reduction target to be measured at the end of the five-year term. It has allocated $5 million dollars to this target and it will only be earned if the target is achieved or exceeded.

a) Please confirm that the Long Term GHG reduction target is the projected 2023 gross annual natural gas savings (m3) multiplied by five (the number of years of the proposed term) multiplied by 15% (the proposed stretch factor).

b) Please confirm that in the event the annual natural gas savings targets for the approved DSM plan are revised, that there will need to be a corresponding revision to adjust the Long Term GHG reduction target.

c) Please confirm that once all targets are approved, including program scorecard and Long Term GHG reduction targets, the Long Term GHG reduction target is fixed and will not adjust even if annual program scorecard targets are adjusted.

d) Please discuss the impact of increasing the stretch factor to 25% or 50%.

Response

a) Confirmed. Please see Exhibit E, Tab 1, Schedule 1, pages 3-4.

b) Enbridge Gas presumes that will be a consideration and decision for the OEB.

c) See response to part b above.

d) Enbridge Gas has proposed a 15% stretch factor as a very aggressive target over five years. Given the budgets that have been proposed for Enbridge Gas are costed based on 100% target achievement, it will be exceedingly challenging to achieve a further 15% additional m3 (and in turn GHG) savings over and above the 2023 100% targets consistently over five years, across all sectors, particularly given the limitations tied to accessing additional budget through the DSMVA. Expectations for achievement of a stretch factor of 25% or 50% beyond the 100% result would make the Long Term GHG reduction target entirely out of reach and therefore negate the value of any incentive tied to this performance metric.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, p.1

Question(s):

Enbridge Gas notes that its annual targets have been based on a number of inputs, including its own analysis, and discussions with various stakeholders and market participants.

a) Please discuss Enbridge Gas's analysis of participation levels and provide any documentation developed internally or by an expert for Enbridge Gas, including models or regression analysis, studies or surveys that looked at past programs and future program projections, including population growth, building stock supply and degradation, new technologies, incremental costs.

b) Please discuss and provide Enbridge Gas's jurisdictional scans that were aimed at determining how key program elements related to targets compared with similar jurisdictions.

Response

a) Enbridge Gas leveraged internal and external data sources to pull together a master spreadsheet of commercial customer accounts incorporating key characteristics such as average consumption, market sector, square footage, historical participation and ownership information. The spreadsheet cannot be shared as it contains customer specific and commercially sensitive information, however key findings have been summarized in the commercial Market Overview – Exhibit E, Tab 1, Schedule 4, pages 1 to 6. One important finding associated with the participation analysis is highlighted in paragraph 15, "Although there are unique characteristics associated with commercial segments, one common element in analyzing historical results is the lower level of participation associated with customers who consume

less than 100,000 m^3/year."[1] In addition to the quantitative customer analysis conducted, Enbridge Gas also considered findings from the commercial qualitative customer survey (see Exhibit E, Tab 1, Schedule 4, Attachment 1 for survey report) in designing the program. For example, the prescriptive midstream offering, expansion of the Direct Install offering, and increased focus on working with Service Providers to support certain custom measures have all been identified as means of engaging a broader group of small commercial customers.

A similar approach to that of the commercial market was applied in analyzing the Industrial market. A master spreadsheet was created incorporating internal and external data sources to identify average consumption, market sector, square footage, historical participation and ownership information associated with each Industrial site. Furthermore, an analysis was conducted of manufacturing sites to identify those with seasonal vs. process load profiles, as sites with little to no process loads have similar heating requirements to commercial as opposed to industrial facilities. Although the spreadsheets cannot be shared, for the same reasons as noted above, key findings have been summarized in the Industrial Market Overview – Exhibit E, Tab 1, Schedule 5, pages 1 to 4. In terms of participation levels, as noted in Exhibit E, Tab 1, Schedule 5, page 4, paragraph 10, "Prioritization of Enbridge Gas resources has traditionally focused on the largest customers within the sector with the most savings potential, limiting broad awareness and participation to those customers targeted by ESAs."[2] For this reason, it was proposed that additional resourcing and renewed focus be placed on supporting customers who have not previously participated in DSM programming (i.e. smaller customers). Qualitative surveys were also conducted to inform the enabling and support initiatives proposed as part of the Industrial program. Please see Exhibit E, Tab 1, Schedule 5, Attachment 1 for survey report.

Similar to other sectors the development of the residential sector strategy used external and internal data sets to put together an overview of the Residential sector which included information on residential housing stock (age, size, equipment) and customer demographics. Data sets analyzed included: Enbridge Gas customer data, MPAC data and Environics Demographic data.

Enbridge Gas also looked at customer surveys conducted by the Market Insights team including the 2020 Residential Natural Gas End Use Survey, and the HER participant survey to better understand the market, and adapt our strategy based on previous participant feedback. In addition, Enbridge Gas conducted interviews with a select group of stakeholders to inform high level program concepts.

[1] EB-2021-0002, DSM Multi-year Plan and Framework Application (May 3, 2021), Exhibit E, Tab 1, Schedule 4, p. 5.
[2] Ibid, Schedule 5, p. 4.

The Low Income Offerings, utilized similar approaches listed above. For the single family residential offering, data gathered and analyzed included, but was not limited to, estimate of low income customers in Ontario, historical results, number of did not qualify customers and age of home. For the low income multi-residential offering, data gathered and analyzed included, but was not limited to, customer data list, past participation, past measure uptake, historical trends and annual consumption of gas. Analysis to filter for specific criteria to meet low-income eligibility and qualifications is more challenging.

Exhibit E, Tab 1, Schedule 3, page 1, paragraph 1, page 3, paragraph 8, and page 7, paragraph 16, provide some specific data points.

b) Please see response to Exhibit I.3.EGI.STAFF.1.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit E, Tab 4, Schedule 7, p. 2

Question(s):

Enbridge Gas notes that it retained Posterity to build a mirror model of the 2019 APS.

a) Please provide the Posterity model that was developed for Enbridge Gas.

Response

a) Enbridge Gas has provided OEB Staff with the excel files of the mirror model version of the 2019 APS that was developed in collaboration with Posterity Group.

   The updates that were incorporated into the mirror model were documented in the Exhibit E, Tab 4, Schedule 7, Attachment 1 – Demand Side Management Planning Support: Final Report Documenting Data Inputs, Assumptions and Method.

   While the changes more predominantly focus on updating measure level savings, there are some structural changes made to better align the mirror model to the manner in which Enbridge Gas views, plans for and reports on its sectors. Despite these changes, Enbridge Gas would submit that like many other APS models, the mirror model does not take into account the programmatic challenges that ultimately determine what potential is “achievable” in the real world. Further these models typically cannot accommodate the many sometimes competing policy objectives that govern the actual approach Enbridge Gas needs to consider in designing and delivering its programs.

   While this work effort has led to many learnings that should be considered for future APS development, Enbridge Gas maintains that even the mirror model was only directionally informative to the Company’s DSM planning efforts.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, p.1
Exhibit E, Tab 4, Schedule 7, p. 2

Question(s):

Enbridge Gas notes that it developed its annual scorecard targets with a number of inputs including broad consideration of the 2019 Achievable Potential Study. Enbridge Gas also notes that the 2019 APS does not directly align with Enbridge Gas's programs, which is why it had Posterity conduct additional analysis to help inform future planning activities, including the development of this application.

a) Please provide any analysis Enbridge Gas conducted, or was conducted for Enbridge Gas, that extracts information from the 2019 APS to applies it to Enbridge Gas's program structures. Within your response, please discuss and show how future potential identified in the 2019 APS, including measures, costs, budgets and natural gas savings were incorporated into Enbridge Gas's proposed program budgets, participation levels, and natural gas savings.

b) Please provide a working MS Excel file that documents all Enbridge Gas verified DSM results and program dollars spent, by program and in aggregate, from 2010 to 2020.

c) Please provide a working MS Excel file that compares, at the program and/or sector level, historical DSM natural gas savings from 2018-2020, draft/targeted results for 2021-2022 program years, and targets for the 2023-2027 program years with the constrained, semi constrained and max achievable scenarios in the 2019 APS for the years 2019-2027). In this response, please show the two data sets in one chart per sector so that it is clear how actual performance has compared to APS forecasted achievement levels.

Response

a) Enbridge Gas stipulated in Exhibit E, Tab 4, Schedule 7, page 1 of the application

> "In the OEB's DSM Letter Enbridge Gas was invited to develop and file a comprehensive DSM Plan starting in 2022[1], the 2019 APS was referenced as one of many inputs that the Company should consider when reviewing current and potential future suite of programs although the study itself was not "determinative" on its own.[2]
>
> In efforts to comply with that direction, Enbridge Gas sought to use as many 2019 APS data inputs and assumptions as possible to inform DSM planning, but found that adjustments to the 2019 APS dataset were required to better reflect the
> Company's knowledge and experience of the Ontario DSM market."

While these efforts allowed Enbridge Gas to better understand the underpinnings of the as filed 2019 APS, and allowed the Company to make modifications that Enbridge Gas and Posterity believed would enable the output from the 2019 APS to be more reflective at a measure savings level of what Enbridge Gas had experienced through the delivery of DSM programs, Enbridge Gas and Posterity were not successful in creating a tool from the mirror model APS that could be leveraged to supported program target development as referenced in Exhibit E, Tab 4, Schedule 7, pages 5 to 6.

> "The 2019 APS has proven useful as a reference tool for a high-level comparison of targets, and it has provided some confidence in the relative weighting of Enbridge Gas's sector targets. Enbridge Gas and Posterity have worked together to improve the PG model so it can begin to represent real world market realities, through updates to measure characterization, measure adoption and sector definitions. **Despite these best efforts, there remains a fundamental disconnect between the theoretical achievable potential and costs represented in the model, and how DSM programs operate in the Ontario market.**"

Please see Exhibit I.6.EGI.STAFF.13c where there is an analysis of the 2019 APS sectors that demonstrates a strongly non-linear relationship between budgetary levels and natural gas savings.

b) Please refer to Attachment 1.

c) In efforts to be responsive to the request, Enbridge Gas has provided the requested table in Attachment 2. That being said, as a result of several

[1] EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 2.
[2] Ibid, p. 5.

modifications made by the APS project team to the manner in which the sectors were treated in the APS from how Enbridge Gas has historically treated its sectors, a misalignment was created which does not allow for an apple to apple comparison between the data sets.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Attachment 1 and 2 have been provided in excel.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, p. 7

Question(s):

Enbridge Gas has listed its proposed scorecard metrics and targets for each program for the 2023 program year, or base year, of its multi-year plan.

a) Please provide a MS Excel file that shows Enbridge Gas's verified DSM results for 2015-2020, OEB-approved targeted results for 2021 and 2022 and proposed targets for each offering and scorecard for 2023. Please make best efforts to align previously approved OEB offerings/scorecards with newly proposed offerings/scorecards.

b) Please discuss, with greater detail and specificity, the process Enbridge Gas used to develop its proposed targets. In your response, please include a separate section that focuses on the development of targets for each individual offering and how those targets were rolled up into the scorecard target.

c) Please discuss and provide any sensitivity analysis Enbridge Gas conducted on what alternative natural gas savings targets could be achieved with varying program budget levels for the residential, commercial and industrial sectors. As part of your response, please separate out the impact of increased budgets on each scorecard and discuss where increasing program budgets would achieve greater natural gas savings.

d) Please discuss the areas of Enbridge Gas's DSM portfolio that it believes could benefit from greater funding levels due to high demand for programming, expert guidance and financial incentives to support efficiency upgrades

e) Please discuss the impact on Enbridge Gas's scorecard targets and overall natural gas savings if 50% of the residential budget was transferred to the custom Commercial and Industrial offerings.

f) Please discuss what additional resources would be required for Enbridge Gas to increase its proposed activity to meet the GHG reduction goals attributed to natural gas conservation programs as set out in the Government of Ontario's 2019 Environment Plan.

g) Please discuss how Enbridge Gas's proposal would need to be adjusted in the event the OEB determined either of the following:
   i. Each annual program scorecard had fixed targets that were set at the outset of the term and did not adjust based on previous year performance or future year budget.
   ii. That fixed 2027 natural gas saving target for each scorecard be set at the outset of the term with annual milestones that provided Enbridge Gas an ability to earn an annual shareholder incentive should it meet certain thresholds and an end-of-term incentive should the fixed targets be met and/or exceeded.

Please discuss in greater detail how Enbridge Gas developed its participant metrics included in the Energy Performance Program Scorecard and Building Beyond Code Program Scorecard.

Response

a) Please refer to Exhibit I.5.EGI.GEC.6 for the excel file containing results where best efforts were taken to align programs and offerings. Please also refer to Attachments 1 and 2 of the response to Exhibit I.5.EGI.FRPO.4 for the 2015-2022 Scorecards and metrics.

b) Please see response to Exhibit I.6.EGI.CCC.10a and b.

c) Please see response to Exhibit I.6.EGI.STAFF.13c.

d) In the commercial and industrial sectors, the direct install offer would most benefit from greater levels of funding over time. The traditional direct install offer, focused on a narrow set of its most cost-effective prescriptive measures, has proven to be effective at increasing participation and driving results from small volume customers through its turnkey nature and high cost-coverage. As noted in Exhibit E, Tab 1, Schedule 4, significant opportunity for participation exists - small accounts represent 95% of commercial accounts and only 2% of them participate. As noted in Exhibit E, Tab 1, Schedule 4, Attachment 1, "the level of support required would need to be much greater…in order to increase uptick in program participation."

e) Enbridge Gas is confused by OEB Staff's request to examine such a suggestion as this scenario would not be in line with the OEB's direction in its December 1, 2020 Letter for modest budget increases and the accompanying consideration of rate impact to customers. A budget reallocation of this order would mean an additional $20 million be allocated to the C/I rate classes or approx. 47% more budget over what has been proposed for the Commercial/Industrial sectors. Enbridge Gas's proposal reflects a 3.7% increase to Commercial/Industrial budgets compared to the OEB's 2022 approved budget. An additional $20 million directed to C/I programming would reflect a 53% increase in Commercial/Industrial budgets from 2022 which would result in significant rate impacts to those rate classes.

In addition, if $20 million were removed from the residential budget and scorecards, only $20 million or just 16% of the 2023 overall program budget would be allocated to residential customers who make up 3.4 million of the Company's customer base. Further a reduction in the order of $20 million from the proposed residential budget would unquestionably jeopardize the ongoing negotiations underway with NRCan to coordinate with the Canada Greener Homes Grant on a province-wide residential effort.

Enbridge Gas has provided, in a scenario analysis detailed in the response to Exhibit I.6.EGI.STAFF.13, the budget/target impact of increasing both of the Commercial and Industrial budget by 10% and 20%.

e) In the December 1, 2020 DSM Letter, the OEB requested that

> Enbridge Gas's DSM plan application should be informed by "the government's policies and commitments in the Environment Plan as they continue to evolve, including as expressed in the November 27, 2020 letter from the Associate Minister of Energy and the Minister of the Environment, Conservation and Parks to the OEB regarding the Ontario government's current policy objectives related to DSM.[1]

As noted in the referenced November 27, 2020 Ministry's Letter

> The Environment Plan also acknowledges the important role of natural gas conservation programs in achieving our provincial GHG emissions reduction target. To that end, the plan includes an estimate of the potential for actions related to natural gas conservation, **with ratepayer-funded natural gas DSM being one component of this**. We are therefore writing to clarify that **this estimate is not intended to be a prescriptive target** that the OEB would be required to facilitate through ratepayer-funded natural gas DSM programs.[2] ***[emphasis** added]*

[1] EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 2.
[2] MC-994-2020-1084, Ministry of Energy, Northern Development and Mines, Office of the Associate Minister of Energy Letter to the Ontario Energy Board (November 27, 2020), p. 1. https://www.oeb.ca/sites/default/files/ENDMMECP-letter-to-OEB-20201127.pdf

The DSM Letter later continues with, "

> Over the course of the 2015-2020 term, annual OEB-approved natural gas conservation budgets have doubled from the previous levels approved for the 2012-2014 term, up to approximately $140 million per year by the end of the current term. With COVID-19 creating many financial hardships, energy conservation has a role in helping to reduce energy costs and assist customers in managing their energy bills. **The OEB anticipates modest budget increases to be proposed by Enbridge Gas** in the near-term…[3] ***[emphasis** added]*

Enbridge Gas believes the direction the Company was given prior to development of the DSM Plan in both the government's November 27, 2020 correspondence to the OEB and the December 1, 2020 DSM Letter from the OEB is both clear and unambiguous and in no way suggests natural gas DSM program activity is expected to meet the GHG reduction goals forecast for broad natural gas conservation in the Made-In-Ontario Environment Plan.

The Company would like to be responsive to inquiries wherever reasonable, so as stated in Exhibit I.1.EGI.ED.1g, "the 2019 Auditor General's Reports on the Environment stated "the Ministry estimated the additional required funding for this scenario from 2021 to 2030 would be $6.6 billion."[4]" The Company does not have the details as to how this estimate was developed but does note that it implies an extremely large increase in gas conservation budgets. Enbridge Gas is uncertain as to how much of this increase would be related to DSM specifically. Very large budget increases would need to be phased in over time to be effectively deployed and would likely entail correspondingly but not necessarily linear staff additions, investments in additional systems and processes, marketing, research and communications, expanded delivery channels along with significantly increased program incentives. It is not possible for the Company to respond thoroughly to such an inquiry in the limited time afforded for interrogatories and such an inquiry is beyond the scope of the DSM Plan as filed.

g)

i. In the last DSM plan proceeding (EB-2015-0029/0049) the OEB Decision found, "Setting firm targets for the 2016 to 2020 period is particularly challenging given the dramatic increase in program funding and the introduction of new programs"[5] and went to describe why a number of market and policy related challenges, "make it difficult to forecast customer

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[3] EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 2.

[4] 4 Annual Report 2019 Reports on the Environment Volume 2, Office of the Auditor General of Ontario (Fall 2019), p. 151. https://www.auditor.on.ca/en/content/annualreports/arreports/en19/2019AR_v2_en_web.pdf

[5] EB-2015-0029/EB-2015-0049, OEB Decision and Order, Application for approval of 2015-2020 demand side management plans (January 20, 2016), p. 69.

adoption rates of the proposed DSM programs."[6] The market and policy environment are just as challenging today, with a number of codes, standards and potential funding for conservation or emission related programming from various levels of government. The OEB found, "For these reasons, the OEB supports the use of an adjustment mechanism to revise the targets continually for the 2017 to 2020 period relative to results."[7] Setting fixed annual targets would be exceedingly challenging, particularly in the later years of the plan term, and would likely effectively lead to a shortening of the term, with a resultant increase in regulatory costs. The intent of having a performance metric tied to an incentive such that it provides effective guidance is completely lost if a target is set at a level that is effectively unachievable, which undermines the structure of the set of performance metrics as originally approved.

ii. The Company does not see, with the limited description of an incentive structure, how this is in effect different from the question above. The challenges noted above remain on how to forecast appropriate targets given the uncertainties, with a likely impact of either inadvertently and inappropriately disincentivizing a portion of the portfolio or increasing regulatory costs through having to revisit targets.

[6] Ibid.
[7] EB-2015-0029/EB-2015-0049, OEB Decision and Order, Application for approval of 2015-2020 demand side management plans (January 20, 2016), p. 69.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Ontario Energy Board (STAFF)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, pp. 11-12

Question(s):
Enbridge Gas outlines the process for developing its Low Carbon Transition Program targets.

a) Please provide all jurisdictional scans, or other research, completed by Enbridge Gas to inform its program scorecard targets.

b) Please discuss in greater detail how Enbridge Gas developed its proposed 2023-2024 targets for the various metrics included in the Low Carbon Transition Programs.

c) Please discuss any considerations or sensitivity analysis conducted in development of the proposed Low Carbon Transition Program metrics and targets.

Response

a) Enbridge Gas conducted research through consultations with key stakeholders to inform its scorecard targets. This included:

- the IESO regarding GreenOn offer for heat pumps
- HVAC manufacturers to understanding sales volumes necessary to influence distribution and pricing
- Equipment distributors to understand the potential for influencing specifying engineers

In addition to the consultations mentioned above, Enbridge Gas conducted a jurisdictional scan and review of past and present heat pump offers available across Canada. In particular Enbridge reviewed:

1. CleanBC central air source heat pump rebates offer (Link)
2. Efficiency Nova Scotia heat pump offer (Link)
3. FortisBC heat pump rebate (Link)

The following conclusions were determined from the jurisdictional scan:

Hybrid heating:

- No other jurisdiction offered a similar hybrid/electric hybrid heating with smart control offer. The smart control system proposed as part of the low carbon offer has not been offered anywhere else in North America. This was confirmed with all major manufacturers Enbridge Gas consulted as part of the on-going pilot incentive program in London [1]
- Incentive levels varied due to different geographic factors such as utility costs and natural gas penetration for home heating. A direct correlation of incentive levels was not conclusive but informative for setting a target range.

Gas heat pumps:

- Residential gas heat pumps are not commercially available so there are no equivalent offers for this technology at this time in North America.
- Excluding Enbridge Gas there are 3 Canadian utilities currently researching gas heat pumps
- There are currently 14 North American utilities taking part in a collaborative looking into gas heat pumps with a mission to develop and implement activities to accelerate the adoption of gas heat pump technologies in North America

b) Please see response to Exhibit I.6.EGI.CCC.10a for rationale on how budget/targets were set.

c) No sensitivity analysis was conducted, however, some key considerations in setting the Low Carbon Transition targets include the following:

- Limited market awareness by participants of heat pump technology
- Public perceptions and attitudes towards electric prices as compared to natural gas
- The importance of having sufficient volumes to drive down distribution and installation costs
- The importance of building capacity and acceptance with a broad range of designers and installers to ensure its supports market actors large and small and to ensure that early adopters have a good customer experience
- Experience gained with gas heat pumps through its Energy Leaders offer

[1] Sutherland, Marek, Pilot program encouraging switch to hybrid heating, CTV News London, (September 16, 2021).
https://london.ctvnews.ca/pilot-program-encouraging-switch-to-hybrid-heating-1.5588436

ENBRIDGE GAS INC.

Answer to Interrogatory from
Consumers Council of Canada (CCC)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, page 1

Question(s):

The evidence indicates that the DSM Plan annual scorecard targets were informed by a number of inputs including jurisdictional scans to determine how key program elements compared with similar jurisdictions. Please file all of the jurisdictional scans that have not been included in the evidence.

Response:

Please see response to Exhibit I.3.EGI.STAFF.1.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Consumers Council of Canada (CCC)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, page 1

Question(s):

The evidence indicates that the DSM Plan annual scorecard targets were informed by a number of inputs including market research with customers to further understand opportunities and barriers. Please explain why type of market research was done and file all documents produced as a result of that market research.

Response:

Exhibit I.8.EGI.CCC.22 explains the context under which Enbridge Gas developed the DSM Plan, with the specifics with respect to timing and what was understood to be covered in the DSM Framework consultation. As such Enbridge Gas did not conduct any specific market research in respect of annual scorecard targets.

For market research and stakeholder consultation that was done please see response to Exhibit I.17.EGI.PP.48.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Consumers Council of Canada (CCC)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3, page 3, Table 1

Question(s):

For the period 2015-2021 please provide the scorecard targets and the actual results in the same format as Table 1.

Response:

Please see response to Exhibit I.5.EGI.FRPO.4.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Consumers Council of Canada (CCC)

Interrogatory

Issue 9

Reference:

Exhibit D, Tab 1, Schedule 3

Question(s):

Please provide a detailed description as to how the annual scorecard targets were determined for each program and how the weightings were determined.

Response:

For a description of how targets were established please see response to Exhibit I.9.EGI.STAFF.25b. For a response to how weightings were determined please see response to Exhibit I.9.EGI.EP.8a.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Consumers Council of Canada (CCC)

Interrogatory

Issue 9

Reference:

Exhibit C, Tab 1, Schedule 1, page 13

Question(s):

EGI is continuing to employ a Target Adjustment Mechanism to establish metric targets for years subsequent to the metric targets approved for the first year of the plan. Did EGI consider other methodologies for establishing the targets? If not, why not? If so, please identify the options considered. Please explain why the alternative approaches were rejected.

Response:

Please see response to Exhibit I.5.EGI.STAFF.25g.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Energy Probe Research Foundation (EP)

Interrogatory

Issue 9

Reference:

Exhibit D Tab 1 Page 7 Table 5: 2023 Annual Scorecards; Exhibit D Tab 1 Schedule 3

Question(s):

a) In designing the 2023-2027 Portfolio Scorecards how did EGI establish
   - The Metric Weights
   - DSMI Allocation and DSMI Range

b) Please discuss and illustrate the process and criteria used for each of the RA and MT programs

c) Please provide the 2021 Scorecard and provide a variance report to 2023.

d) Confirm the DSMI amount ($) EGI receives is a direct function of the target achievement and the weighting of the DSMI? Please illustrate the calculation.

Response:

a – b)

The Company first determined the allocation of Maximum DSMI to Annual scorecards as per Exhibit D, Tab 1, Schedule 2, paragraph 3, Table 1.

The Annual Scorecards Maximum Incentive ($13.26 million from Table 1 in 2023 as an example) would equate to 100% of the weights of the Annual Scorecards. Annual Scorecards were assigned a fixed weighting (DSMI Allocation) and the pro-rata share of the 100% Annual Scorecards Maximum Incentive was then assigned to each individual scorecard as the DSMI at 150% score. This can be seen for 2023 in Exhibit D, Tab 1, Schedule 2, Table 5, where the right most column shows the DSMI at 150% Score and the column totals $13.26 million and the fourth column is the DSMI Allocation for each scorecard.

Continuing with Table 5 as an example, the Residential program was assigned a 22% DMSI Allocation. 22% of the total $13.26 million is the $2.917 million shown under DSMI at 150% score for the Residential program. This represents the maximum achievement available for the Residential Program. All of the scorecards are proposed with an asymmetrical shareholder incentive opportunity that starts at 50% of the weighted performance and runs through 150% of the weighted performance of the scorecard, where the target performance is at the mid-point of this range. These are the 3 columns on the right of Table 5. Effectively, the structure proposes that scorecards target a DSMI opportunity of half of the maximum incentive, with a DSMI starting threshold of 50% and a cap of 150%. Each scorecard would be measured using the weighted performance shown in the middle column labelled Metric Weight. As shown, Residential has a single metric at 100% while Low Income has two metrics weighted at 50% each. Each scorecard is calculated in this fashion for 2023 as shown in Table 5. Tables 6 to 9 are calculated in an identical fashion, while it should be noted that each year has a unique Annual Scorecards Maximum Incentive from Table 1.

Additional information on the development of the performance metrics follows:

The proposed DSM Plan has eight programs, primarily divided by sector, as follows:

- Residential Program
- Low Income Program
- Commercial Program
- Industrial Program
- Large Volume Program
- Energy Performance Program
- Building Beyond Code Program
- Low Carbon Transition Program

With the exception of the Low Carbon Transition Program which, due to the multi-year longer term objective of the program, has been designed with a separate and distinct long term shareholder incentive opportunity, there is an annual scorecard with an associated annual performance incentive for each of the remaining seven programs. The Company first determined weightings between the Annual Scorecards. The programs that are traditionally referred to as Resource Acquisition (RA) type programs (Residential, Low Income, Commercial, and Industrial Programs) have been allocated an equal weighting of 22% each of the total annual scorecard shareholder incentive opportunity. The even weighting across each of the four sectors is intended to ensure Enbridge Gas maintains a balanced focus across the four major customer sectors and the combined 88% weighting is intended to illustrate the importance of these programs. The remaining three programs, Large Volume, Energy Performance, and Building Beyond Code Programs, have weightings of 3%, 1%, and 8%, respectively. The weightings are intended to reflect reasonable allocation to reflect the resources and effort allocated to these programs.

The scorecard design includes metrics to ensure all segments of the market are reached, in line with the OEB's direction in the DSM Letter. For example, the commercial scorecard has separate equally weighted metrics for each of the small and large volume customers to ensure the often harder to reach small volume customers are not overlooked and the Low Income scorecard has differentiated metrics for single family and multi-residential efforts.

c) Please see the tables below for the 2021 DSM Scorecards for the Union Gas and EGD rate zones respectively. The two separate annual scorecards for the 2021 program year, approved as part of the 2015-2020 DSM Plan (extended until 2022) in comparison to the single combined 2023 DSM scorecard as proposed in the Application are substantially compositionally and structurally different. Therefore, a 2021 scorecard to 2023 scorecard comparison (i.e. variance report) cannot be completed as requested.

Union Gas 2021 Resource Acquisition Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
Home Reno Rebate Residential Adaptive Thermostat Commercial & Industrial Custom Commercial & Industrial Prescriptive Commercial & Industrial Direct Install	Cumulative Natural Gas Savings (m3)	75%	$6,562,712	62.8%
Home Reno Rebate	Home Reno Rebate Participants (Homes)	25%		

Union Gas 2021 Low Income Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
Home Weatherization Furnace End-of-Life Aboriginal	Cumulative Natural Gas Savings (m3)	60%	$2,604,447	24.9%
Multi-family	Social and Assisted Multi-Family Cumulative Natural Gas Savings (m3)	35%		
	Market Rate Multi-Family Cumulative Natural Gas Savings (m3)	5%		

Union Gas 2021 Large Volume Rate T2/Rate100 Scorecard				
Program	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
Large Volume Program for T2/R100 customers	Cumulative Natural Gas Savings (m3)	100%	$694,265	6.6%

Union Gas 2021 Market Transformation Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
Optimum Home	Homes Built (>20% above OBC 2017) by Participating Builders	50%	$405,810	3.9%
Commercial New Construction	New Developments Enrolled by Participating Builders	50%		

Union Gas 2021 Performance-Based Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
RunSmart	Participants	10%	$182,765	1.7%
	Savings (%)	40%		
Strategic Energy Management (SEM)	Savings (%)	50%		
Total Portfolio - UGL Rate Zone			**$10,450,000**	**100.0%**

Enbridge 2021 Resource Acquisition Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
Home Energy Conservation (HEC) Residential Adaptive Thermostats Commercial & Industrial Custom Commercial & Industrial Prescriptive Commercial & Industrial Direct Install Run-it-Right Comprehensive Energy Management (CEM)	Large Volume Customers Cumulative Natural Gas Savings (m3)	40%	$7,012,787	67.1%
	Small Volume Customers Cumulative Natural Gas Savings (m3)	40%		
Home Energy Conservation (HEC)	Residential Deep Savings Participants (Homes)	20%		

Enbridge 2021 Low Income Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
Home Winterproofing	Cumulative Natural Gas Savings (m3)	40%	$2,263,561	21.7%
Low-Income Multi-Residential	Cumulative Natural Gas Savings (m3)	40%		
Low-Income New Construction	Number of Project Applications	20%		

Enbridge 2021 Market Transformation & Energy Management Scorecard				
Programs	**Metrics**	**Metric Weight**	**Maximum DSMI**	**DSMI Weight**
School Energy Competition	Schools	10%	$1,173,652	11.2%
Run-it-Right	Participants	20%		
Comprehensive Energy Management (CEM)	Participants	20%		
Residential Savings by Design	Builders	10%		
	Homes Built	15%		
Commercial Savings by Design	New Developments	25%		
Total Portfolio - EGD Rate Zone			**$10,450,000**	**100.0%**

d) Confirmed.

For illustrative purposes using the 2023 Commercial Program annual scorecard, if 110% is achieved for the Large Customer Gas Savings metric and 100% is achieved for the Small Customer Gas Savings metric, the weighted annual scorecard will achieve a scorecard score of 105%. The 2023 DSMI achieved in the Commercial Program annual scorecard would be $1,604,460. See illustrative calculation below.

Metric	Metric Weight	Metric Score
Large Customer Gas Savings (m3)	50%	110%
Small Customer Gas Savings (m3)	50%	100%
Weighted Score	= (50% * 110%) + (50% * 100%)	= **105%**
Maximum DSMI Allocation to the 2023 Commercial Program Annual Scorecard		$2,917,200
DSMI Achieved in the 2023 Commercial Program Annual Scorecard	= (**105%** - 50%) * $2,917,200	= $1,604,460

ENBRIDGE GAS INC.

Answer to Interrogatory from
Green Energy Coalition (GEC)

Interrogatory

Issue 9

Question(s):

Regarding Table 2 in Exh. D, Tab 1, Schedule 3, p. 4:

a) To the extent not provided in response to 5.GEC.6, please provide all assumptions, down to the measure level wherever available, underpinning each of the 100% targets for each of the performance metrics. Please provide the requested information in an Excel file with formulae intact.

b) Are the 100% targets for savings and other metrics tied to exactly the same number of participants for each measure and program as was assumed in developing the budget presented in Table 4 in Exhibit D, Tab 1, Schedule 1, p. 11? If not, please explain both differences in participation assumptions by measure or program and the rationale for such differences.

c) For each metric for which performance is measured in net annual gas savings (m3), please provide the 100% metric if it was instead expressed in net lifetime gas savings (m3).

Response:

a) Please see response to Exhibit I.5.EGI.GEC.7.

b) Budgets are set to match the target achievement set out in the application. Although it is true that the 100% targets are reflective of the assumed participants for each measure and program, the accuracy of forecasting results based on the relationship between participant and targets varies between offerings. This is because assumptions are formulated using average incentive costs and savings at a participant level. Therefore, offerings where savings and incentives per unit of participation are relatively fixed, such as TRM based offerings, have participation levels that more accurately tie into targets. Conversely, tying participation to targets for offerings where participation is measured at a project level, such as the Custom and Direct Access offerings can be less reliable, as each project is unique in size and scope. In these examples, budgets are built around segment- or sector-level savings targets, and participation levels (the number of projects) are estimated to

inform the adequacy of delivery resources, since, as stated in Exhibit D, Tab 1, Schedule 1, pages 23 to 24, paragraph 28, "The resources required to support the custom program in these markets is correlated to the number of projects, not the savings attributed to the project…".

c) Please see table below expressing the annual scorecard metrics in terms of net lifetime gas savings (m^3).

Offering(s)	Metric	Metric Weighting	Lower Band (50%) [1]	2023 100% Target	Upper Band (150%) [1]
Residential Program Scorecard					
Residential Whole Home Residential Single Measure Residential Smart Home	Net ~~Annual~~ Lifetime Gas Savings (m^3)	100%	154,217,742	308,435,483	462,653,225
Low Income Program Scorecard					
Home Winterproofing	Single Family Net ~~Annual~~ Lifetime Gas Savings (m^3)	50%	33,044,613	66,089,226	99,133,840
Affordable Housing Multi-Residential	Multi-Residential Net ~~Annual~~ Lifetime Gas Savings (m^3)	50%	49,412,876	98,825,752	148,238,628
Commercial Program Scorecard					
Commercial Custom Prescriptive Downstream Direct Install Prescriptive Midstream	Large Customer Net ~~Annual~~ Lifetime Gas Savings (m^3) [2]	50%	140,493,051	280,986,103	421,479,154
	Small Customer Net ~~Annual~~ Lifetime Gas Savings (m^3) [2]	50%	67,905,158	135,810,316	203,715,474
Industrial Program Scorecard					
Industrial Custom	Net ~~Annual~~ Lifetime Gas Savings (m^3)	100%	383,278,159	766,556,319	1,149,834,478
Large Volume Program Scorecard					
Direct Access	Net ~~Annual~~ Lifetime Gas Savings (m^3)	100%	46,499,998	92,999,997	139,499,995

1. The calculation of the Upper and Lower Bands of the 100% Targets result in non-integer amounts and the Scorecard Incentive will be calculated based on these precise thresholds.

2. Large commercial customers have a 3 year average annual consumption greater than/or equal to 100,000 m3/yr. Small commercial customers are below 100,000 m3/yr.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Green Energy Coalition (GEC)

Interrogatory

Issue 9

Question(s):

On p. 12 of Exh. D, Tab 1, Schedule 2, Enbridge states that the Company developed a shared savings performance metric "in response to stakeholder feedback".

a) To which stakeholder(s) is Enbridge referring?

b) What was the specific feedback to which Enbridge is referring?

c) How did Enbridge determine what the appropriate shared savings percentages should be for each tier of net benefits?

Response:

a - b)

GEC is referencing a sentence describing the Annual Net Benefits Shared Savings. The stakeholder feedback Enbridge Gas is referring to includes, but is not limited to, the following examples:

- Mid-Term Review of the Demand Side Management (DSM) Framework for Natural Gas Distributors (2015-2020) (EB-2017-0127/EB-2017-0128)
    - A presentation delivered on September 7, 2018 by Environmental Defence (ED) and the Green Energy Coalition (GEC) titled "Mid-Term Review Stakeholder Meeting. (see relevant slides included at Attachment 1 to Exhibit I.8.EGI.STAFF.18b) wherein GEC/ED proposed performance incentives be revised such that all or a portion of incentives be paid as a growing percent of net benefits.
- Post-2020 Natural Gas Demand Side Management Framework (EB-2019-0003), Intervenor written comments, June 27, 2019, wherein intervenors included the following example commentary:
    - "Shareholder incentives should align consumer and utility interests and encourage maximizing total net benefits for consumers
    - The fundamental purpose of incentives are to align consumer and utility interests. That should be reflected in this principle.

- The reference to maximizing net benefits provides important further high-level guidance. This guidance is appropriate because maximizing net benefits necessitates the achievement of the greatest energy savings at the lowest possible cost."[1]
- "Support continuation of this principle and improvement to recognize broader net benefits created (TRC or SCT). Assess opportunity for improving scorecard."[2]
- "Support amendment of this principle such that it reads "Shareholder incentives should align consumer and utility interests and encourage maximizing total net benefits for consumers." "[3]

c) Please see response at Exhibit I.8.EGI.STAFF.18b for a full discussion on Enbridge Gas's shareholder incentive design.

[1] EB-2019-0003, Joint Comments of Environmental Defence and the Green Energy Coalition Re Phase I of the Post-2020 DSM Framework Consultation (June 27, 2019), p. 4.
[2] EB-2019-0003, Pollution Probe Comments in Regard to the Ontario Energy Board's Phase 1 for the Post-2020 Demand Side Management Framework (June 21, 2019), p. 5.
[3] EB-2019-0003, Phase 1, Post-2020 DSM Framework Joint Letter of Comment (June 27, 2019) p. 9.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Green Energy Coalition (GEC)

Interrogatory

Issue 9

Question(s):

On p. 15 of Exhibit D, Tab 1, Schedule 2, Enbridge states that its long-term GHG reduction incentive would be tied to the "summation of annual gross natural gas savings targeted in the first year of the DSM plan with an additional 15% stretch target." In table 14 on p. 16 the Company appears to suggest that 100% of the allocated performance payment be provided if the Company achieves 100% of the target.

a) Why is Enbridge proposing that the metric be based on gross savings rather than net savings, particularly since all of its other metrics are based on net savings? What is the rationale for this metric being different?

b) What is the basis for the 15% "stretch" adder to 2022?

c) Why has the Company suggested that 100% of the payment be earned for just reaching the target when it has proposed that it only earn its full incentive for other metrics for significantly exceeding the target? Why should this metric be different?

Response:

a) Please see Exhibit I.8b.EGI.OSEA.2

b - c) Please see Exhibit I.8b.EGI.EP.6.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Green Energy Coalition (GEC)

Interrogatory

Issue 9

Question(s):

Please provide all communications, documents or presentations prepared by of for the company or its parent company in the last 3 years that discuss or interpret the impacts of *Federal* government climate policy (i.e. GHG related policy) on gas use. Please include all communications with the Federal government in this regard.

Response:

Please see response to Exhibit I.2.EGI.GEC.1.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Pollution Probe (PP)

Interrogatory

Issue 9

Question(s):

a) How many residential customers does Enbridge have?

b) What portion of the Enbridge residential customers could be eligible for an air source heat pump under the Low Carbon program?

c) How many commercial customers does Enbridge have?

d) What portion of the Enbridge commercial customers could be eligible for an air source heat pump under the Low Carbon program?

Response:

a) Enbridge Gas has 3,500,826 active residential customers as of October 26,2021
Note: Residential customers include single family residential customers.

b) Eligibility criteria for the Low Carbon Residential Program is listed in Exhibit E, Tab 3, Schedule 1, page 5, paragraph 16. In addition to that criteria, homes eligible for the Program must have a gas boiler with air handler or gas furnace with a ducted air distribution system. Using the 2020 “Residential Single Family Natural Gas End Use Study” (provided in response to Exhibit I.10.EGI.ED.22o), 79% of residential single family customer homes have a forced air natural gas heating system and could be eligible for the Low Carbon program.

c) Enbridge has approximately 280,000 commercial customers as of October 26,2021
Note: Commercial customers include MURB and MUSH customers and excludes industrial customers

d) All Enbridge commercial customers using gas for space and/or water heating could be eligible for a natural gas air source heat pumps under the Low Carbon Program.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Pollution Probe (PP)

Interrogatory

Issue 9

Question(s):

a) Please provide the annual estimated natural gas savings, electricity savings and TRC Plus test results/calculations based on achieving the 2023-24 target of 2123 residential air source heat pump installations.

b) Please provide the annual estimated natural gas savings, electricity savings and TRC Plus test results/calculations based on achieving the 2023-2024 target of 86 commercial air source heat pump installations.

c) Based on Enbridge's proposal, when would the OEB review and approve Low Carbon program scorecard metrics and specific budgets for 2024-2027?

Response:

a) Based on the 2022 gas savings and electrical penalty scenarios in Table 1 for hybrid heating and in Table 3 for gas heat pumps provided in Exhibit I.10h.EGI.STAFF.77b the following values were calculated for the TRC Plus test.

It is worth noting, that based on the response to Exhibit I.10.EGI.ED.36b, the hybrid heating savings are dynamic and change each year. In order to assist the reader to get a sense of the values, a static base year of annual savings was used.

2023

Annual Natural Gas Savings	Annual Electrical Savings	TRC Plus Ratio	TRC Net Benefits
646,380	-1,969,920	-0.22	-$3,820,508

2024

Annual Natural Gas Savings	Annual Electrical Savings	TRC Plus Ratio	TRC Net Benefits
911,952	-2.361,600	0.10	-$5,968,311

b) Commercial gas heat pumps are not a mass market application. Each application is unique and will have different savings and installed costs. Providing accurate estimated natural gas and electricity savings for achieving the 2024 target is not feasible, however, to assist the reader Enbridge Gas has calculated the TRC Plus test using the commercial gas heat pump savings from a previous pilot over the full target of 86 installations.

Assumptions:

Gas savings: 10,195m3

Electricity Savings: -3,188kWh

Incremental cost: $92,000

2023

Annual Natural Gas Savings	Annual Electrical Savings	TRC Plus Ratio	TRC Net Benefits
397,605	-124,332	0.61	-$1,461,452

2024

Annual Natural Gas Savings	Annual Electrical Savings	TRC Plus Ratio	TRC Net Benefits
479,165	-149,836	0.61	-$1,728,997

c) Please see response to Exhibit I.4.EGI.CME.6a.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Pollution Probe (PP)

Interrogatory

Issue 9

Reference:

Municipal Engagement Budget - Exhibit E, Tab 4, Schedule 1, Page 5 of 5

Question(s):

a) Please provide the actions and outcomes proposed for each of the budget amounts outlined in the municipal engagement budget.

Response:

a) The actions and outcomes that Enbridge is proposing to undertake for each amount outlined in the municipal engagement budget can be found in Exhibit E, Tab 4, Schedule 1, pages 4 to 5.

ENBRIDGE GAS INC.

Answer to Interrogatory from
Pollution Probe (PP)

Interrogatory

Issue 9

Question(s):

Please provide a copy of the final (actual or forecast) Enbridge DSM scorecard results for 2015 to 2021.

Response:

Please see response to Exhibit I.5.EGI.FRPO.4.

ENBRIDGE GAS INC.

Answer to Interrogatory from
School Energy Coalition (SEC)

Interrogatory

Issue 9

Reference:

[Ex. D/1/2, p. 7]

Question(s):

Please add tables, similar in form and detail to Table 5, for 2020 and 2021 actual scorecards and 2022 forecast scorecards.

Response:

Please see response to Exhibit I.5.EGI.FRPO.4.

ENBRIDGE GAS INC.

Answer to Interrogatory from
School Energy Coalition (SEC)

Interrogatory

Issue 9

Reference:

[Ex. D/1/3, p. 1, 11]

Question(s):

Please provide the jurisdictional scans referred to.

Response:

Please see response to Exhibit I.3.EGI.STAFF.1.

ENBRIDGE GAS INC.

Answer to Interrogatory from
School Energy Coalition (SEC)

Interrogatory

Issue 9

Reference:

[Ex. D/1/3, p. 4]

Question(s):

Please add tables, similar in form and detail to Table 2, for 2020 and 2021 actual scorecards and 2022 forecast scorecards.

Response:

Please see response to Exhibit I.5.EGI.FRPO.4.

ENBRIDGE GAS INC.

Answer to Interrogatory from
School Energy Coalition (SEC)

Interrogatory

Issue 9

Reference:

[Ex. D/1/3, p. 5]

Question(s):

Please confirm the Applicant is proposing that, if a NTG study shows that Enbridge is not influencing customers as much as it had planned or expected, its scorecard targets should be reduced by the difference.

Response:

Confirmed for 2023 targets. DSM targets are derived based on a series of input assumptions and adjustment factors.[1] Target changes for the first year of the Plan (2023) are described at Exhibit D, Tab 1, Schedule 3, pages 5 to 6. For the first year, Enbridge is proposing a symmetrical adjustment to targets based on a potential 2021 or 2022 NTG study in which a decrease in NTG would reduce 2023 targets and an increase in NTG would increase 2023 targets.

Target changes following the first year use the Target Adjustment Mechanism described at Exhibit C, Tab 1, Schedule 1, pages 12 to 13.

[1] Input assumptions and adjustment factors are described throughout Section 9 of Enbridge's Proposed DSM Framework (Exhibit C, Tab 1, Schedule 1).

ENBRIDGE GAS INC.

Answer to Interrogatory from
School Energy Coalition (SEC)

Interrogatory

Issue 9

Reference:

[Ex. D/1/3, p. 11]

Question(s):

Please provide details of the heat pump experience referred to.

Response:

Enbridge Gas has undertaken heat pump research projects to understand the applicability of the products in the Ontario climate zone, assess performance, installation challenges and savings potential. The Energy Leaders offer has supported a small number of gas heat pump customer projects within the commercial multi-residential sector. Enbridge Gas has also been working proactively with market actors to raise awareness on the benefits of gas heat pumps for the commercial sector and address barriers to customer adoption. This includes the development of a calculator and working with WSP Engineering to develop a guide for the proper installation of gas heat pumps for hot water applications. The installation guide is appended to this response, see Attachment 1.

For the residential sector Enbridge Gas has previously completed several demonstration projects[1] for hybrid heating with smart controls. More recently, Enbridge Gas is conducting a pilot incentive program in London to create awareness, better understand costs, performance and market barriers and promote greater acceptance of the concept with the HVAC industry.

[1] See, for example, Rad, Farzin M., et al. "Smart Control for Optimum Residential Fuel Switching between Natural-Gas and Electricity." *ASHRAE Transactions*, vol. 126, no. 1, Jan. 2020, pp. 21+. *Gale Academic OneFile*, link.gale.com/apps/doc/A627513872/AONE?u=mars16900&sid=googleScholar&xid=9c6a08a8. Accessed 30 Oct. 2021.

ENBRIDGE

DOMESTIC HOT WATER SYSTEM RETROFITS WITH GAS ABSORPTION HEAT PUMPS

DESIGN GUIDELINE

JUNE 04, 2021



wsp



TABLE OF CONTENTS

1 EXECUTIVE SUMMARY 1

2 BACKGROUND 2

2.1 Heat Pump Cycle 2

2.2 GAHP Characteristics 3

3 DOMESTIC HOT WATER SYSTEMS 5

3.1 System Design 5

3.2 DHW Supply Temperature 7

3.3 Domestic Hot Water Storage Temperature 8

4 GAHP RETROFIT 9

4.1 System Layout A 9

4.2 System Layout B 10

4.3 System Layout C 11

4.4 Savings Analysis 13

4.5 Design Recommendations 17

APPENDICES

A GAHP RETROFIT LAYOUT A

B GAHP RETROFIT LAYOUT B

1 EXECUTIVE SUMMARY

WSP was contracted by Enbridge to develop a design guideline for retrofitting multi-unit residential building domestic hot water systems with gas absorption heat pumps. As traditional boilers are reaching their theoretical limit in energy efficiency, gas fired heat pumps provide an opportunity to further increase the efficiency at which natural gas can be utilized for heating domestic hot water. Enbridge is attempting to launch a program for ten customers over the next year and a half as a trial for this technology. A design guideline is desired to provide customers and design teams a reference for integrating this technology into the existing domestic hot water systems. A key factor would be to keep installation costs down as much as possible to make the technology as financially feasible as possible. The design should also attempt to maximize the use of the heat pump and use the existing boilers for "top-up" as required.

WSP visited a Toronto Community Housing building, Arleta Manor, where the Toronto Atmospheric Fund (TAF) and project partners recently completed a domestic hot water system retrofit that included two gas absorption heat pumps. WSP reviewed the case study report published by TAF, and incorporated the findings and best practices into this guideline.

This guideline focused on the Robur GAHP-A model, the only gas absorption heat pump available in Canada for domestic hot water applications when this project began. It was noted that other manufacturers are seeking to enter the Canadian Market in 2021. WSP worked with Robur's sales representative, HTS Engineering, to determine pricing and optimal layouts of a retrofitted domestic hot water system.

This guideline includes an overview of the GAHP-A product and its design constraints. An overview of domestic hot water system design, relevent Ontario Building Code regulations, and ASHRAE guidance on storage temperatures is reviewed. These details have implications on how GAHP techonology can be best implemented within existing DHW systems. Three different layouts are proposed and evaluated for their effectiveness in retrofit applications. Robur representatives reviewed and endorsed two, and the third was the layout implemented by TAF at Arleta Manor. Finally, GAHP retrofits are modelled for existing buildings which WSP has 15 minute usage data available through a previous project with Enbridge. This analysis allows gas and cost savings to be estimate for actual buildings. Costing and simple paybacks are included.

2 BACKGROUND

2.1 HEAT PUMP CYCLE

Gas absorption heat pumps (GAHP's), like electric heat pumps, use a refrigeration cycle to transfer heat. Unlike their more efficient counterparts however, GAHP's rely on the combustion of gas to drive the cycle. The common working fluid in GAHP's is an ammonia-water solution as opposed to hydrofluorocarbons (HFC's).

Like typical heat pumps, the output occurs when ammonia is condensed, releasing heat. However, absorption heat pumps do not rely on a compressor to increase the pressure of the evaporated ammonia. They absorb the ammonia into water. At that point, the solution can be pumped to a higher pressure with relatively little pumping power. At that point the ammonia can be boiled with a heat source, gas, and return to the condenser. Simultaneously, boiled off water is re-used in the absorption process, increasing overall efficiency. The process is illustrated in Figure 1. GAHP's can be used for both heating and cooling, relying on air, ground, or water sources of energy. This report focuses on air source, heating only heat pumps.

Image courtesy of the Toronto Atmospheric Fund (http://taf.ca)

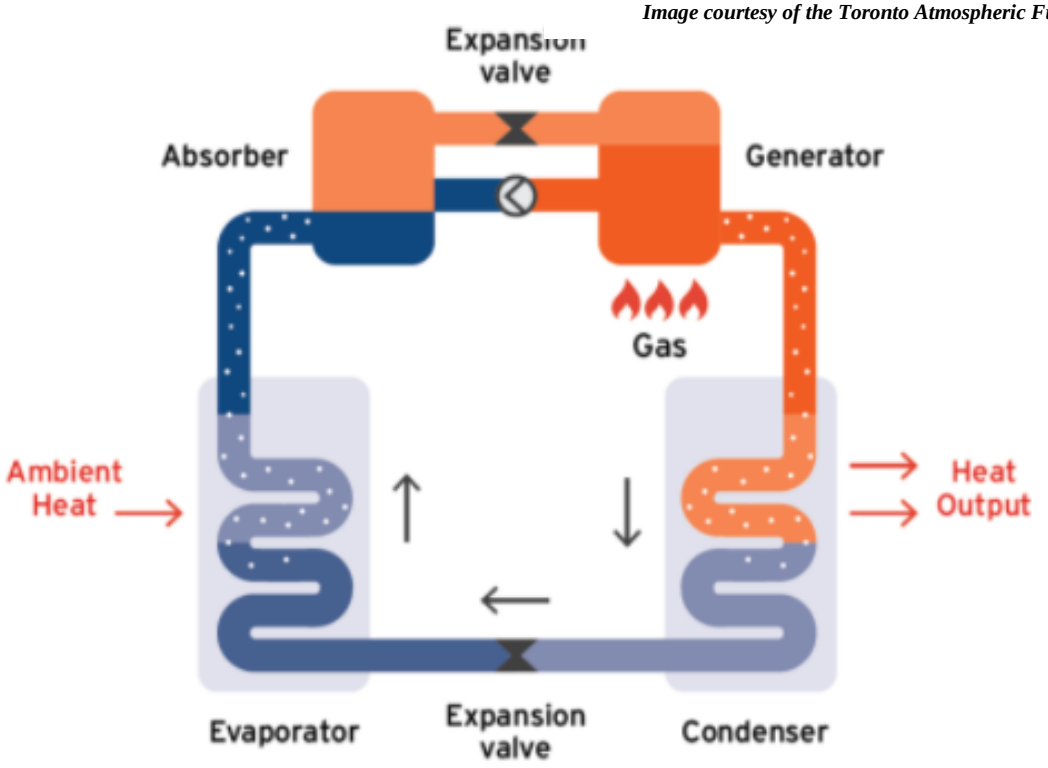


Figure 1: Gas Absorption Heat Pump Cycle

2.2 GAHP CHARACTERISTICS

Robur Corporation is currently the only manufacturer of GAHP's available in Canada. The Robur product this report deals with exclusively is the GAHP-A. It is a heating only, air source unit. Because the unit is air source, it can only be installed in an outdoor space. Units are of standard size and construction, making them a readily available stocked product. They can be shipped in skid packages of up to 5 units, and require single phase 230V power.

The units are capable of efficiencies up to 164%, with a maximum output of 41.3 kW. Although the units can produce hot water up to 60°C, they are more efficient operating with lower return water temperatures. Efficiency also decreases as outdoor air temperature drops below 25°C. The units can operate in outdoor air temperatures down to -30°C. Minimum operating efficiency is approximately 90%, similar to a condensing product. The nominal flow for per unit is 2500 L/hr (11 gpm), minimum flow is 1400 L/hr (6 gpm), and maximum flow is 4000 L/hr (17.6 gpm).

Although actual performance curves could not be provided by the sales rep, a curve was extrapolated from the heating capacity data included in the Installation and Maintenance Manual. Data is available for different outlet water temperatures, and temperature rises across the unit. Calculations for this report were done with the more conservative estimate of a slightly higher outlet water temperature and lower delta-T. The extrapolated curve is shown below in Figure 2.

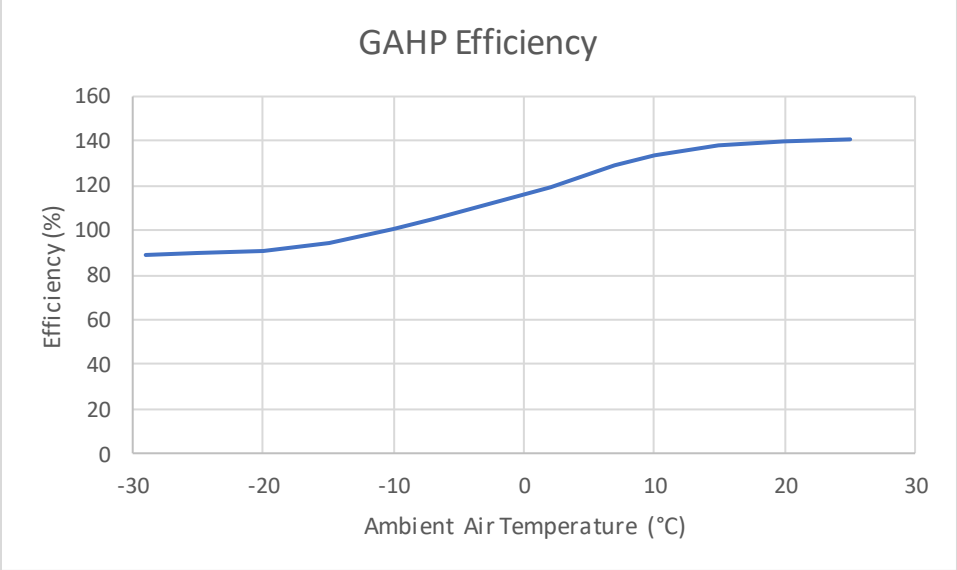


Figure 2: GAHP Efficiency Curve

The most significant constraint designers must be aware of when implementing GAHP's in domestic hot water systems is the maximum return water temperature of 50°C. A detailed background on the building code requirements and ASHRAE recommendations for system storage and supply temperatures is provided in Section 3. It was noted in the TAF case study that high supply and return water temperatures led to significant downtime in the GAHP's due to the layout of the overall system. This report includes recommendations for reducing the likelihood of this issue.

Individual unit operating weight is 350kg. Units are 1536mm in height and have a footprint of 1260mm X 1003mm. The minimum clearance around units is shown below. Note that the clearance between units in multi-unit installations is half. The total footprint required for two units is shown in Figure 3.

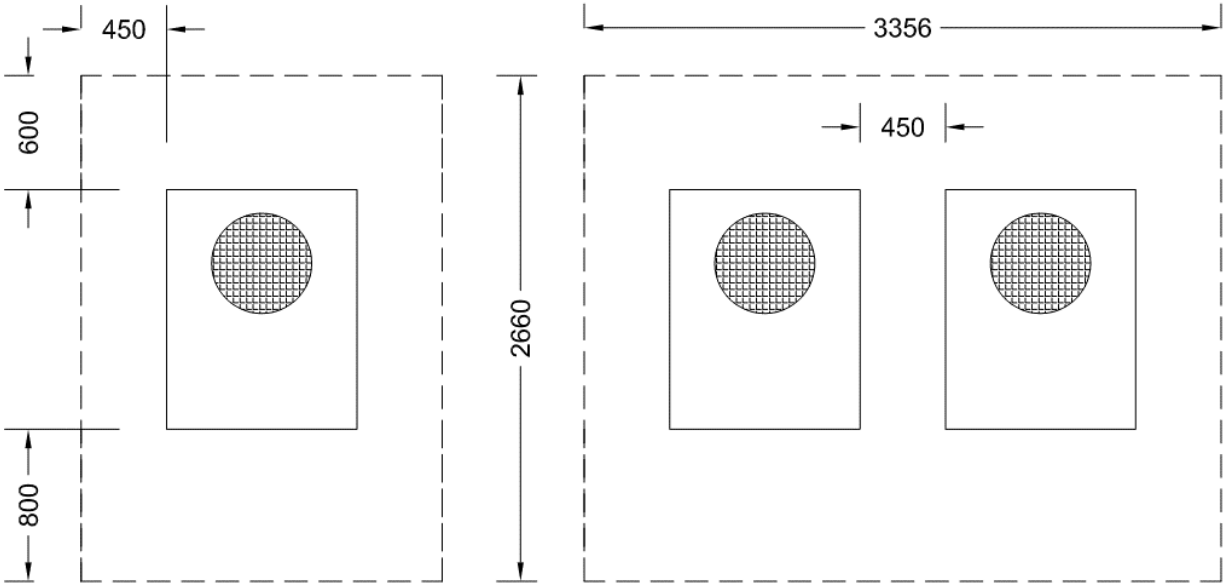


Figure 3: GAHP Footprint & Clearances

Units must be installed in a location with no structures or overhangs above, which can result in recirculation of condenser airflow and hinder performance. When installed in close proximity to buildings, ensure units are located away from the roof edge and drip line. They must not be within 1.8m (6 feet) of any external air intakes. When installed on rooftops, ensure they are located a minimum of 2.4m (8 feet) from chimney flues, outlets and any other vents.

3 DOMESTIC HOT WATER SYSTEMS

3.1 SYSTEM DESIGN

In order to understand the implications of retrofitting a multi unit residential building domestic hot water system with GAHP technology, it is important to understand several aspects of domestic hot water systems. This includes system design, domestic hot water supply temperature requirements, and domestic hot water storage temperature requirements. These are key aspects which drive how GAHP technology can be incorporated, and how it will perform.

Domestic hot water system design is based on 2 key factors:

1. Heating capacity
2. Storage volume

Apartment systems typically include a combination of heating and storage, as opposed to relying entirely on instantaneous water heating. Although ASHRAE provides several methods for sizing the combined heating capacity and storage volume, in practice mechanical engineers tend to rely heavily on experience.

System design must address equipment efficiency and reliability, insulation and losses, supply temperature, recirculating pump control, and pipe sizes. A key factor that must be addressed in any retrofit project is the types of fixtures in the building. Many older buildings were designed to meet the hot water demands of fixtures with higher flows than might be found in the units currently. This may result in a significant change in both the heating capacity and storage volume requirements from the original design. Buildings that include dishwashers or washing machines in individual suites, or common laundry facilities may have significantly different capacity and volume requirements.

Another key aspect of system sizing is the occupant demographics. ASHRAE defines three main profiles associated with peak hot water consumption as shown below in Table 1:

Table 1: Domestic Hot Water Load Profiles

Low-Use	Medium-Use	High-Use
• All occupants working • One person working, one at • Seniors • Couples • Middle Income	• Families • Singles • On public assistance • Single-parent households	• High percentage of children • Low income • No occupants working • Families • Single-parent households

The data presented in Section 4.2 illustrates how the number of suites in a building is not necessarily a strong indicator of hot water use. When systems are analyzed for potential retrofits, it is important these aspects of the building are considered. Ideally, a typical profile of hot water use over the course of a week would be established in order to accurately size and predict cost savings.

Domestic hot water systems are generally designed with some level of redundancy to accommodate equipment failure and regular maintenance. Multi-unit residential buildings typically arrange heating equipment in parallel flow with the same heating capacity and design characteristics to simplify flow and energy balancing, including run time. Domestic hot water heating may be done by the same boilers used for space heating, or as a separate system with its own boilers. Heat may also be provided from alternative sources such as heat exchangers paired with district energy systems. When multiple storage tanks are incorporated, these are also arranged in parallel fashion. Refer to Figure 4 below for a simplified schematic of a typical MURB domestic hot water system layout. There are many variations of this system, which may be influenced by the type of space heating equipment in the building, pre-heat systems, and the location of thermostatic mixing valves (TMV's). Refer to Section 3.2 for additional information on TMV's.

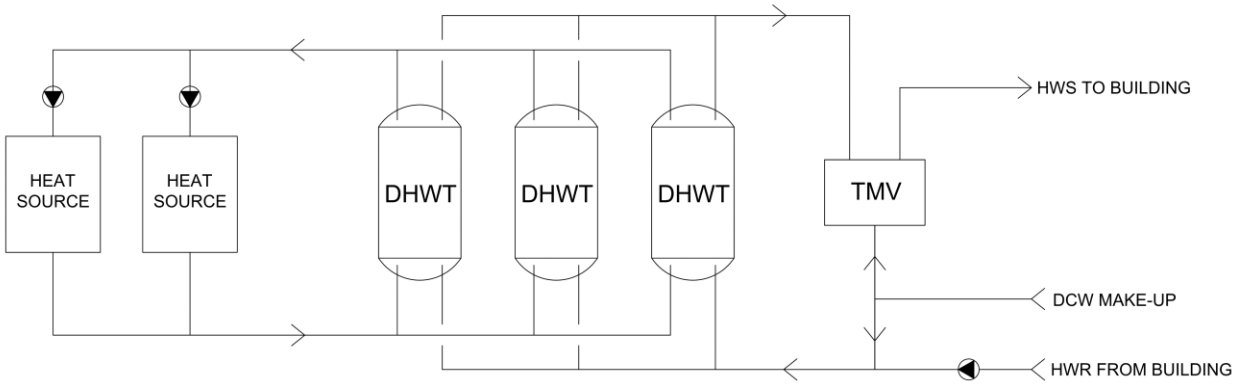


Figure 4: Typical Multi-Unit Residential Building Domestic Hot Water System Layout

It should also be noted that the exact location of the domestic cold water make-up connection to the hot water loop can vary.

3.2 DHW SUPPLY TEMPERATURE

The Ontario Building Code includes several important requirements concerning domestic hot water supply temperatures. These requirements include:

7.6.5 Water Temperature Control

7.6.5.1 Maximum Temperature of Hot Water

(1) Except as provided in Sentences (2) and 7.6.5.3.(1), the maximum temperature of hot water supplied by fittings to fixtures in a residential occupancy shall not exceed 49°C. *(Note that this exception applies to non-residential buildings, group homes, homes for special care, or residences for adults with developmental disabilities).*

(2) Sentence (1) does not apply to hot water supplied to installed dishwashers or clothes washers.

7.6.5.2 Showers

(1) Except as provided for in Sentences (2) and (3), all valves supplying fixed location shower heads, shall be individually pressure-balanced or thermostatic-mixing valves, conforming to ASME A112.18.1 / CSA B125.1, “Plumbing Supply Fittings”.

(2) An individually pressure-balanced or thermostatic-mixing valve is not required for shower heads having a single tempered water supply that is controlled by an automatic compensating valve conforming to CSA B125.3, “Plumbing Fittings”.

(3) Deck-mounted, hand-held, flexible-hose spray attachments are exempt from the thermal shock requirements of Sentences (1) and (4).

(4) Pressure-balanced, thermostatic-mixing or combination pressure-balanced and thermostatic-mixing type valves shall be,

(a) capable of limiting thermal shock, and

(b) designed so that the outlet temperature does not exceed 49°C or equipped with high-limit stops which shall be adjusted to a maximum hot water setting of 49°C.

9.31.4.3. Hot Water Supply

(1) In a dwelling unit with a water distribution system, a hot water supply shall be provided.

(2) A water distribution system supplying hot water to plumbing fixtures shall conform to the requirements in Subsection 7.6.5.

9.31.6.1. Hot Water Temperature

(1) Where a hot water supply is required by Article 9.31.4.3., equipment shall be installed to provide to every dwelling unit an adequate supply of service hot water with a temperature range from 45°C to 60°C.

(2) An electric storage-type service water heater shall have a minimum set storage temperature of 60°C.

Requirements for showers to have individual devices that limit hot water temperatures were introduced in 1993. The legislation for any new or replacement water heater installation to require a thermostatic mixing valve was introduced in 2004.

A survey of WSP multi unit residential projects concluded that centralized thermostatic mixing valves is the standard method for limiting hot water supply temperatures at fixtures. These are typically set to the threshold of 49°C to limit supply temperatures at the fixtures at the beginning of a supply loop, while ensuring fixtures at the end of the loop receive sufficiently warm water after losses.

3.3 DOMESTIC HOT WATER STORAGE TEMPERATURE

Due to the variability of domestic hot water storages temperatures found in buildings, a brief overview of the key driver of storage temperatures is presented here; legionella.

The United States Centers for Disease Control (CDC) stated that 66% of all waterborne disease outbreaks associated with potable water were attributed to Legionella between 2011 and 2012. Due to the environmental characteristics under which legionella bacteria grow, storage temperature setpoints are often selected based on the criteria established by ASHRAE to reduce or eliminate the risk of bacterial growth in domestic hot water systems.

Legionellosis as defined as any disease caused by Legionella bacteria. Legionaires' diseases, a form of legionellosis, is a potentially fatal pneumonia-like illness cause by Legionella pneumophila serogroup 2, one more than 50 known species of Legionella. It is caused by the inhalation of aerosolized water droplets containing the bacteria. Individuals with compromised immune systems are at greater risk of contracting the disease at lower exposure levels. Building hot and cold water systems are at increased risk of legionella bacteria growth under optimal growth temperatures, locations where water is stagnant such as pipe dead legs, pipe sections with low or now flow, or other areas where circulation is an issue. ASHRAE notes that the optimum temperature range for growth is 32°C to 41°C. Growth slows and bacteria begin to die at temperatures between 45°C - 49°C. As water temperatures increase above 49°C, bacteria begin to die more quickly, and die rapidly at temperatures above 70°C.

In order to eliminate the risk of bacteria growth in domestic hot water systems, storage temperatures are often set at 55°C to 60°C. Water is then mixed at the thermostatic mixing valve to a temperature setpoint of not more than 49°C in accordance with building code requirements. ASHRAE points out that to eliminate the risk of bacteria growth within a recirculation system, it would be necessary to ensure water temperatures are not less than 49°C at all points, which is not actually possible with a TMV setpoint of 49°C.

4 GAHP RETROFIT

4.1 SYSTEM LAYOUT A

In order to maximize run time of the GAHP in a domestic hot water system, the unit(s) must be located so as to minimize the return water temperature. There must also be sufficient heating capacity, or water volume, available to ensure the minimum flow requirements can be satisfied. Figure 6 below illustrates the optimal layout for retrofitting a typical domestic hot water system with GAHP(s). A larger version of the layout is provided in Appendix A.

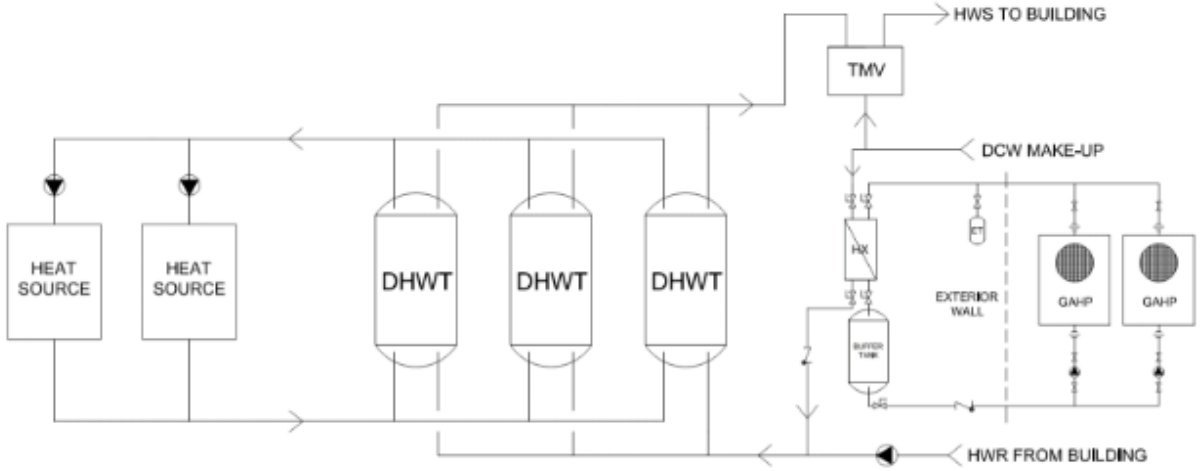


Figure 5: GAHP Retrofit Layout A

Layout A includes a plate and frame heat exchanger to separate the glycol GAHP loop from the building domestic hot water loop. All incoming domestic cold water make-up flows through the heat exchanger prior to mixing with the building return hot water and flowing back to the storage tanks. A storage (buffer) tank is included on the glycol side of the heat exchanger to increase the amount of energy available as the load increases. Robur/HTS recommend approximately 300L (75 gallons) for a single GAHP, and increasing the volume to scale with additional units. Sizing may be done more accurately if the typical usage profile is known. The system can be implemented with a single or multiple GAHP's equipped with individual circulators allowing units to stage on and off as the load changes. Check valves are included to maintain flow direction as well as isolation valves, drains, and pump bypasses. It is understood that the controller supplied with the Robur units is capable of controlling the circulators, so no additional controls are required for these pumps.

4.2 SYSTEM LAYOUT B

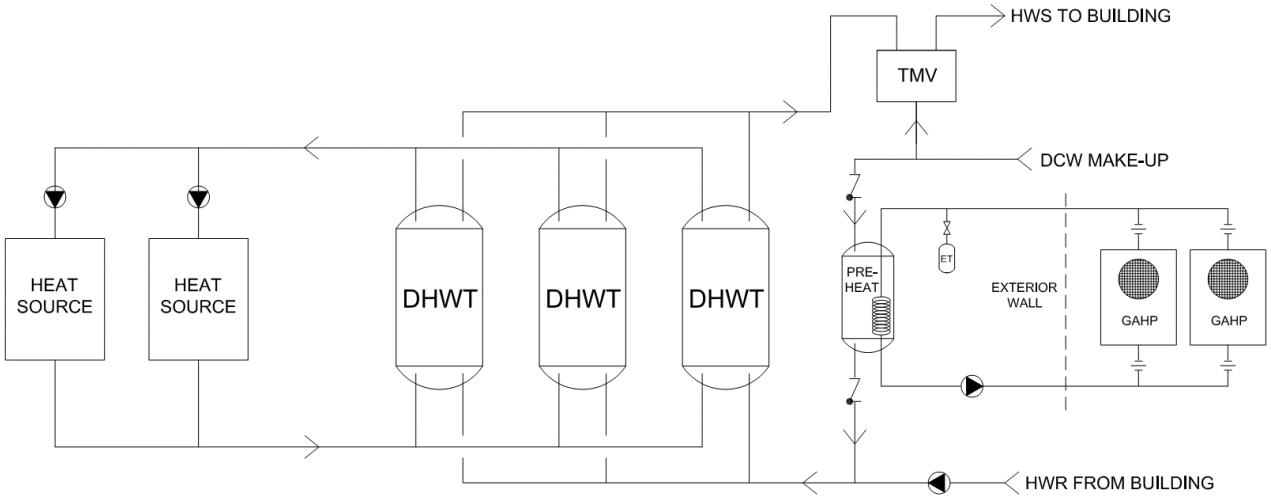


Figure 6: GAHP Retrofit Layout B

Layout B employs a buffer tank with an internal heat exchanger, effectively incorporating the functions of both the buffer tank and heat exchanger into one piece of equipment. This layout is common in European applications where storage tanks with internal heat exchangers are more readily available. These tanks are available in North America through A.O. Smith and NST (Niles Steel Tank) in both single and double wall models. HTS recommends premium PVI tanks which include a full 15-year warranty. Like layout A, the GAHP's are on a secondary glycol loop with individual circulators for each GAHP. The preheat tank is sized sized to allow the heat pumps to heat as much of the water as is economical during periods of high draw down. HTS recommends approximately 300L (75 gallons) for a single GAHP, and increasing the volume to scale with additional units. Sizing may be done more accurately if the typical usage profile is known. Check valves are included to maintain flow direction as well as isolation valves, drains, and pump bypasses not shown on the schematic for simplicity.

Note that the recommended layouts A and B above differ from that of the case study conducted by TAF. The layout of that system is illustrated in he following section.

4.3 SYSTEM LAYOUT C

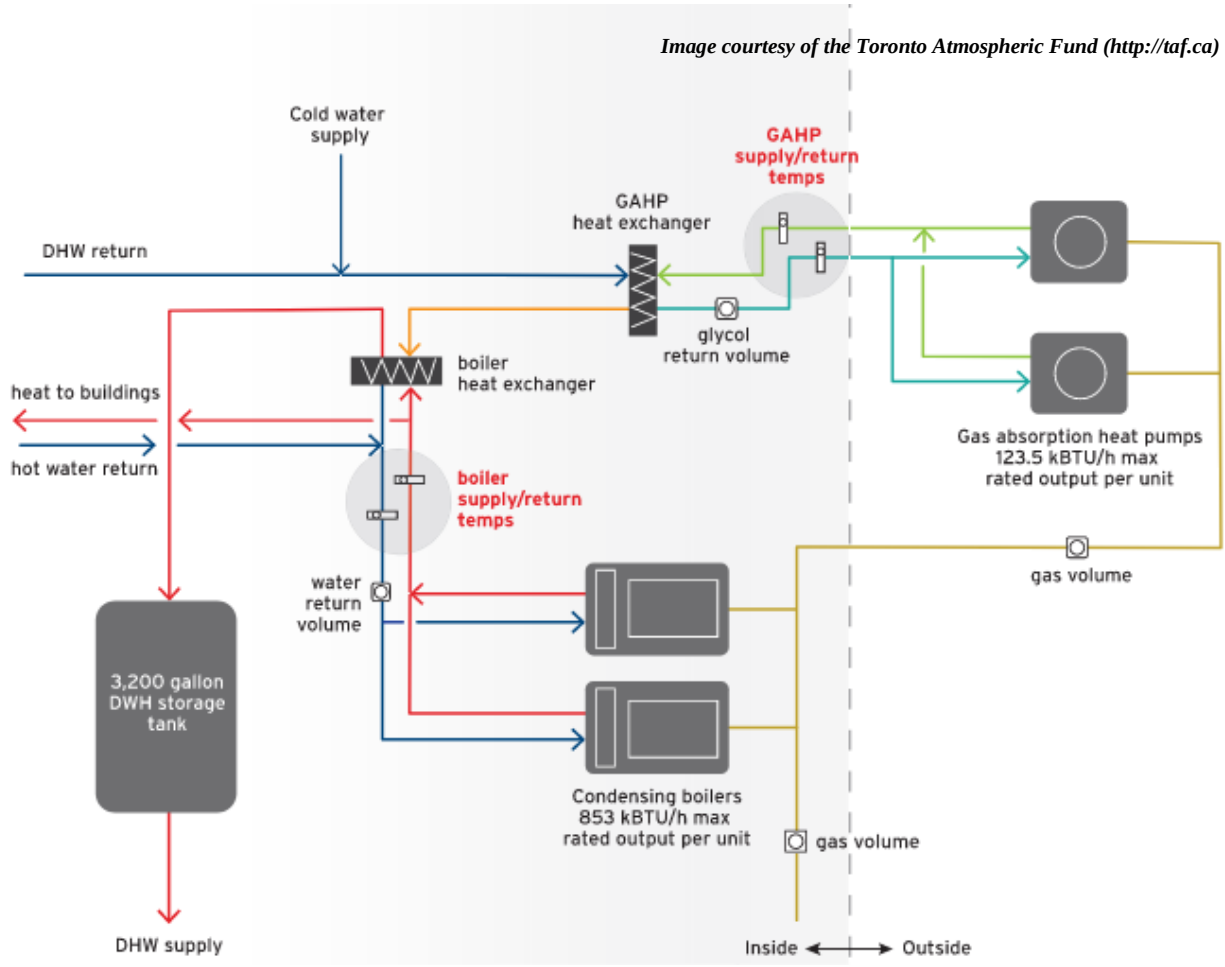


Figure 7: TAF Case Study Retrofit Layout C

The TAF retrofit included the installation of 2 new condensing boilers intending to replace the existing atmospheric boilers to provide building heating and domestic hot water heating when the GAHP's are unable to satisfy demand. This design has domestic hot water return from the building mixed with make-up water flowing through the GAHP heat exchanger. This results in higher temperature water entering the GAHP's, and reduced efficiency. In the TAF case study, engineers found that the GAHP's shut down for extended periods of time when the return water temperature to the units exceeded the 50°C operating limit.

The benefits and drawbacks of each system layout are outlined in Table 1 below.

Table 2: GAHP Supply & Installation

Layout	Pros	Cons
A	• Lower cost • Readily available equipment • Minimizes GAHP return water temperature, maximizing efficiency • Includes capacity to increase GAHP output during high draw-down • Simple control	• GAHP's heat make-up water only • Alternative or existing heat source is required for tank losses • Alternative or existing heat source is required for line and circulation losses
B	• Minimizes GAHP return water temperature, maximizing efficiency • Includes capacity to increase GAHP output during high draw-down • Simple control	• GAHP's heat make-up water only • Alternative or existing heat source is required for tank losses • Alternative or existing heat source is required for line and circulation losses • Higher cost for internal heat exchanger • Few North American suppliers of internal heat exchangers
C	• Lowest equipment cost • Readily available equipment • GAHP's heat make-up water and return water from the building	• Higher GAHP return water temperature reduces operating efficiency • No capacity for periods of high draw-down • Additional controls/temperature monitoring may be required

4.4 SAVINGS ANALYSIS

Accurately estimating the gas savings from GAHP retrofits is difficult in the absence of the actual domestic hot water use profile for a given building. Not only is the total volume of domestic hot water required, but how quickly it is drawn over time, particularly during periods of peak use. As discussed in Section 3.1, there are many factors which can affect both the total and peak consumption beyond the number of units in a building.

WSP recently completed a study of several CityHousing Hamilton buildings located in Hamilton, Ontario. As part of this study, 15-minute domestic hot water consumption data was collected over more than a year. This data provides a vivid profile of the actual hot water consumption for buildings of different size. GAHP retrofits were modelled for 4 of these buildings with data available over a 12-month period. The models were completed for retrofits of 1, 2, and 3 units, and incorporate Robur's GAHP seasonal efficiency data. Calculated baseline gas consumption used in this savings analysis for the domestic hot water load was calculated based on the actual volume of water heated to a setpoint. This allows savings to be calculated although the baseline does not include tank or line losses.

Estimated costs include demolition, gas connections, flue installation, additional plumbing and valves, recirculation pumps, expansion tanks, glycol fill stations, pre-heat tanks, and the GAHP skid packages. Much of the installation cost is relatively fixed and does not increase significantly with multi-unit installations. It is also worth noting that the amount of gas and plumbing work may vary significantly depending on the location of existing utilities and piping. Depending on the intended location of the GAHP's, e.g. rooftop, input from a structural engineer may be required. Architectural or landscape finishes may also be needed for rooftop or on grade installations such as a concrete pad, fencing or screening. These costs are location specific and have not been included in this analysis.

The estimated construction costs as well as GAHP supply and start-up costs for layouts A and B are provided in Table 3 below:

Table 3: GAHP Supply & Installation Costs

# GAHP	GAHP Supply and Start-Up	Installation & Accessories	Total Cost
1 Unit	$19,700.00	$12,375	$32,075
2 Units	$29,500.00	$16,830	$46,330
3 Units	$42,000.00	$22,138	$64,140

The estimated gas savings and simple payback for the installation of 1 GAHP are shown in Table 4 below. It should be noted that the design consistent with Layout A was assumed for the analysis due to the relatively low capital cost and simple control.

Table 4: Estimated Savings with 1 GAHP

Building	430 Cumberland Ave.	226 Rebecca St.	801 Upper Gage Ave.	30 Sanford Ave. S.
Number of Units	152	199	244	350
Current Gas Useage (m3)	46,990	28,513	29,624	73,299
Useage with 1 GAHP (m3)	37,276	20,695	22,058	61,782
Percent Savings	21%	27%	26%	16%
Cost Savings	$2,817	$2,267	$2,194	$3,801
Simple Payback (years)	11.4	14.1	14.6	8.4

Note the difference in current domestic hot water gas usage between 430 Cumberland, 226 Rebecca, and 801 Upper Gage, verses the number of suites in each of these buildings. The payback for each of these buildings is similar due to the amount of run time one GAHP can provide. The payback is significantly better in a larger building like 30 Sanford where the load profile has domestic water consumption over a greater portion of the day. The estimated gas savings and simple payback for the installation of 2 GAHP's is shown in Table 5 below:

Table 5: Estimated Savings with 2 GAHP's

Building	430 Cumberland Ave.	226 Rebecca St.	801 Upper Gage Ave.	30 Sanford Ave. S.
Number of Units	152	199	244	350
Current Gas Useage (m3)	46,990	28,513	29,624	73,299
Useage with 2 GAHPs (m3)	37,276	19,300	20,156	54,516
Percent Savings	21%	32%	32%	26%
Cost Savings	$4,015	$2,672	$2,746	$6,198
Simple Payback (years)	11.5	17.3	16.9	7.5

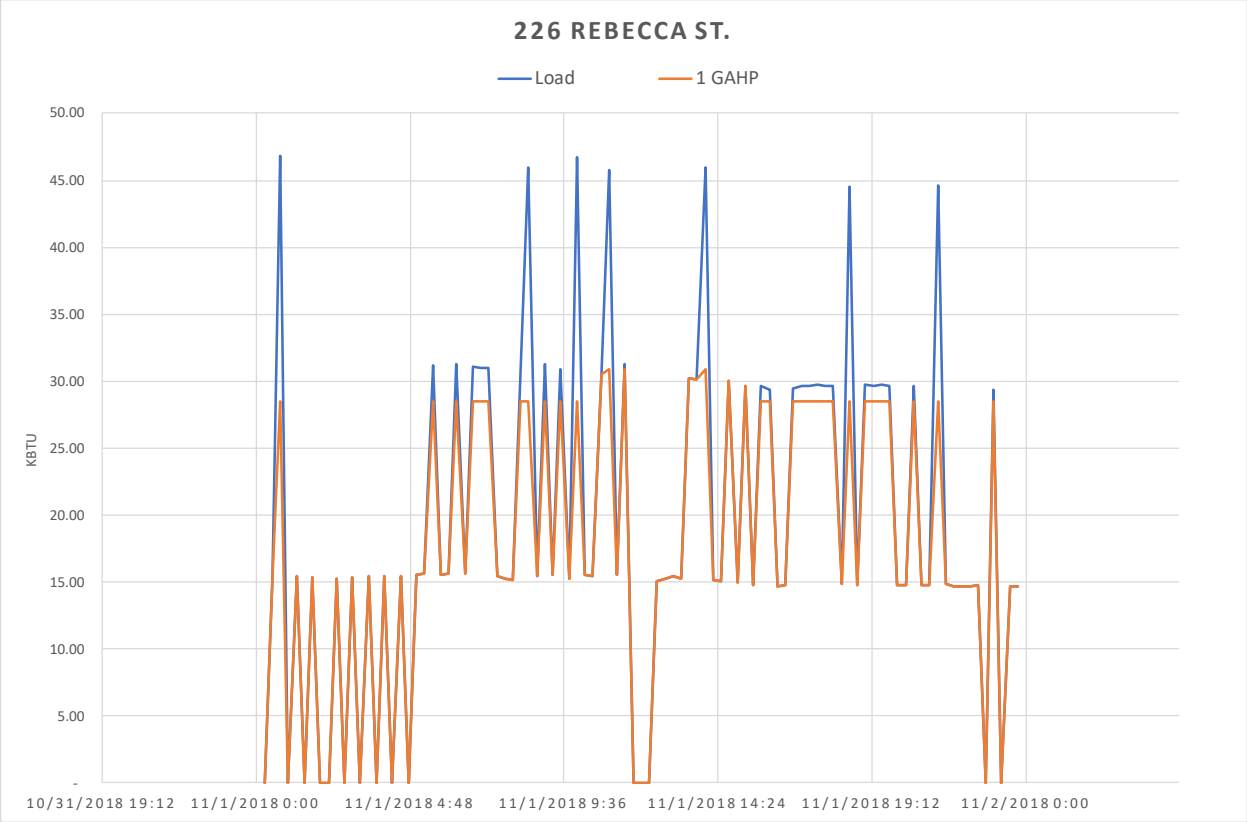
The estimated gas savings and simple payback for the installation of 3 GAHP's is shown in Table 6 below:

Table 6: Estimated Savings with 3 GAHP's

Building	430 Cumberland Ave.	226 Rebecca St.	801 Upper Gage Ave.	30 Sanford Ave. S.
Number of Units	152	199	244	350
Current Gas Useage (m3)	46,990	28,513	29,624	73,299
Useage with 3 GAHPs (m3)	31,944	19,154	19,861	51,351
Percent Savings	32%	33%	33%	30%
Cost Savings	$4,363	$2,714	$2,831	$9,297
Simple Payback (years)	14.7	23.6	22.7	6.9

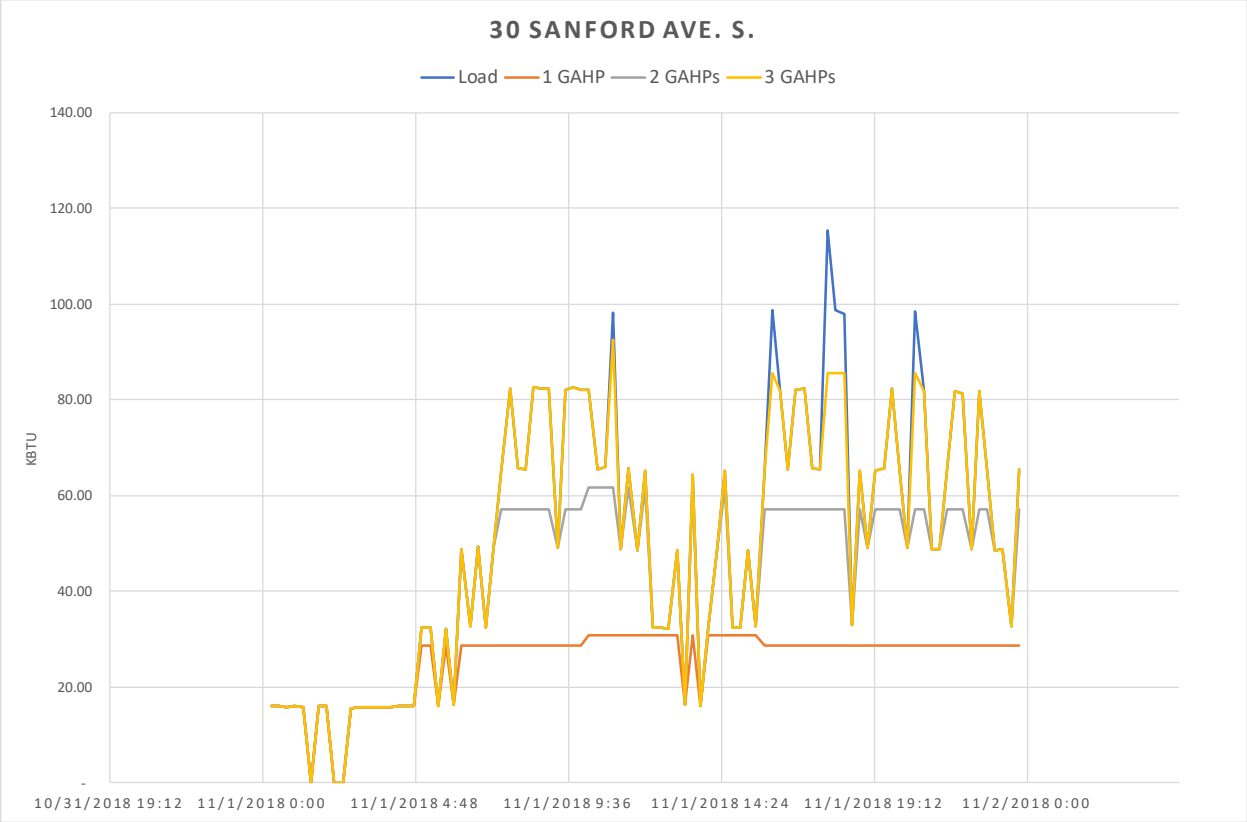
It is clear from these estimates that the potential savings from GAHP retrofits is tied directly to the amount of domestic hot water used, as well as the time over which consumption takes place. The importance of knowing the actual hot water use in a building is illustrated in the following images. Consider the buildings 430 Cumberland and 226 Rebecca. The former has 152 suites while the later has 199 suites yet uses significantly less hot water. Figure 8 below shows the hot water heating load over the course of an average weekday along with the portion of that load which a single GAHP could support. It's clear that a single GAHP can support the majority of the load, and that a 2nd GAHP would have minimal benefit. This is also illustrated in the previous Tables.

Figure 8: 226 Rebecca St. DHW Load Profile



In a building with a greater hot water demand such as 30 Sanford Ave. S., a 2nd and 3rd GAHP can result in significant savings. The plot in Figure 9 illustrates how much of the total load can still be offset by additional GAHP's.

Figure 9: 30 Sanford Ave. Load Profile



4.5 DESIGN RECOMMENDATIONS

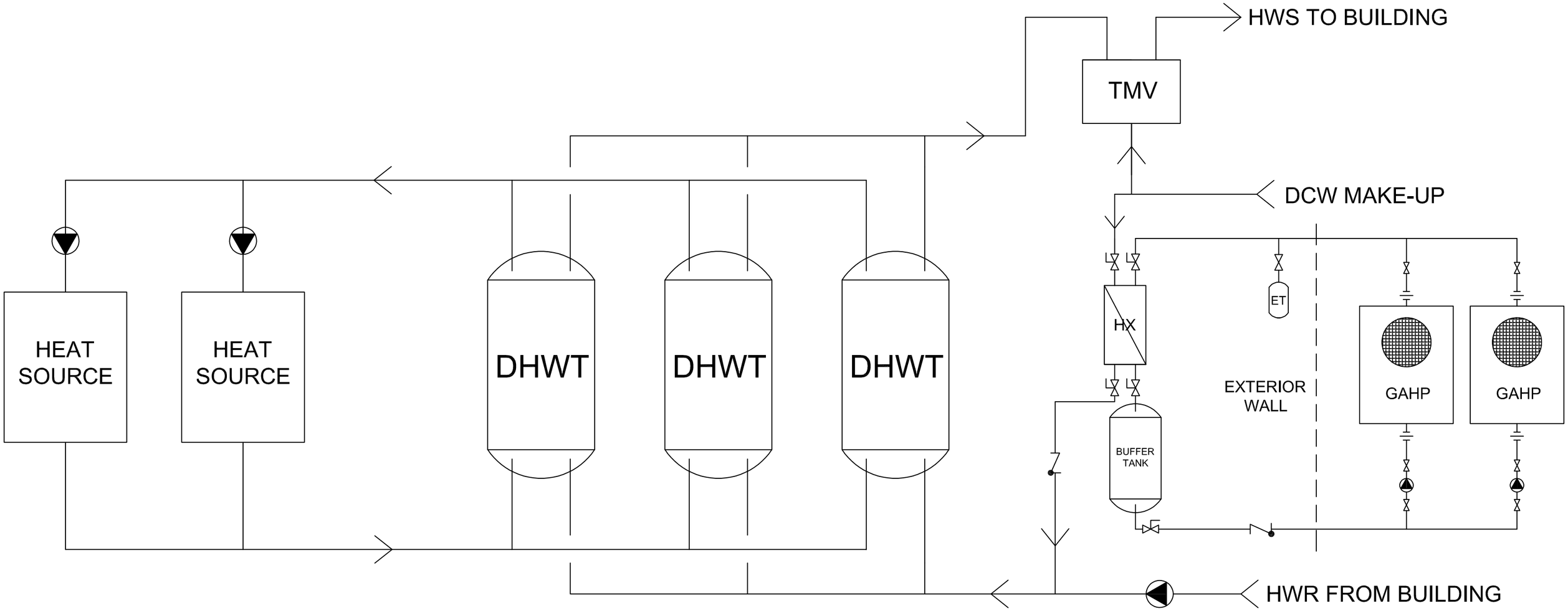
The following is a summary of the considerations which should be accounted for when designing a GAHP retrofit:

1. Locate the GAHP on the cold water make-up side of the domestic hot water system. As shown in Figure 6, this should be upstream of the domestic hot water return line to minimize the return water temperature to the GAHP.
2. Domestic hot water storage temperature setpoint may be set as low as 50°C to reduce reliance on existing heating equipment. In this case, ensure there is adequate circulation to avoid stagnation and/or locations within the system where temperatures may fall below 45°C.
3. Ensure the GAHP recirculation pump is sized to fall within the flow range of the GAHP(s).
4. When possible, obtain the domestic hot water consumption over time, and peak flows. This may be done by installing a temporary ultrasonic meter and data logger, depending on the pipe diameter, thickness and accuracy/turndown ratio of the meter. Equipment may be rented for a nominal fee.
5. Review the condition of the existing heating equipment. It is important to consider the impact of supplemental heating on the primary equipment. If the GAHP(s) are estimated to satisfy much of the load, it is possible that this could lead to a considerable amount of cycling of the existing equipment which may increase maintenance costs.
6. Ensure GAHP's are installed according to manufacturer specifications. Robur requires installation with the minimum clearances, in a location with no structures or overhangs above, away from the roof edge and drip line. They must not be within 1.8m (6 feet) of any external air intakes. When installed on rooftops, ensure they are located a minimum of 2.4m (8 feet) from chimney flues, outlets and any other vents.

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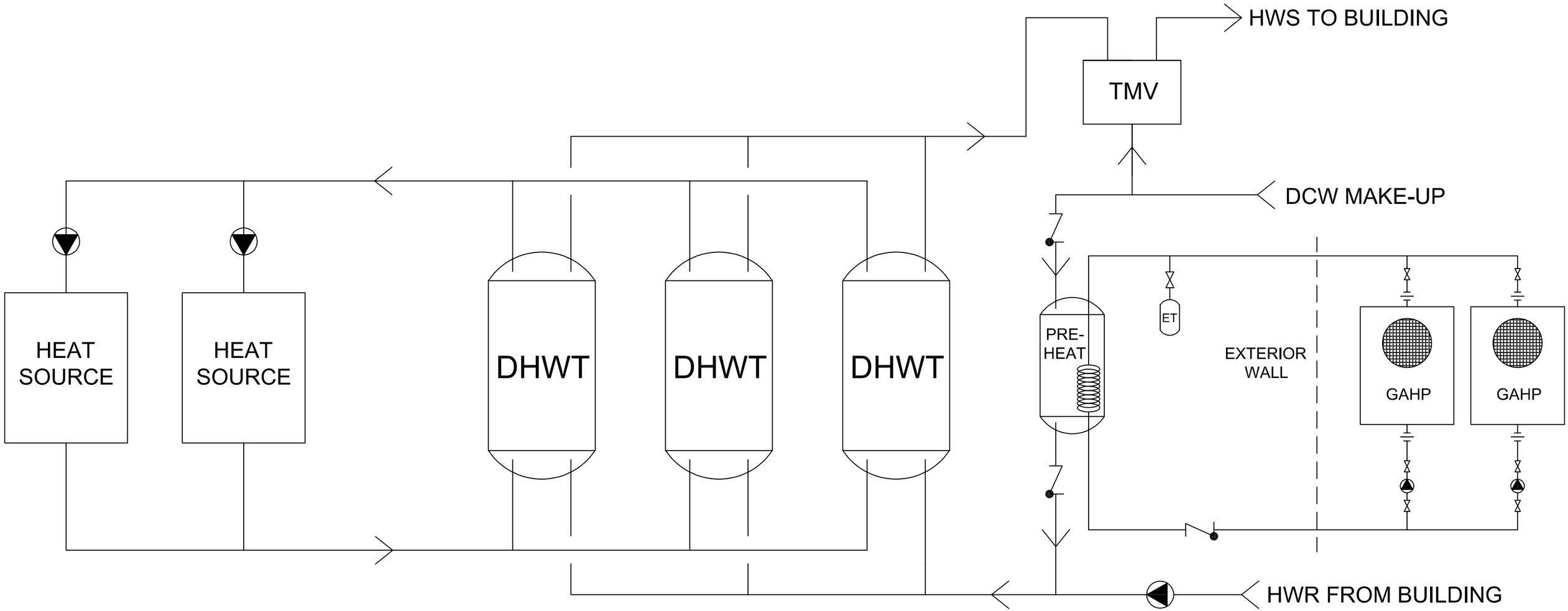
APPENDIX

A GAHP RETROFIT LAYOUT A


HWS TO BUILDING
TMV
DCW MAKE-UP
HEAT SOURCE
HEAT SOURCE
DHWT
DHWT
DHWT
HX
ET
EXTERIOR WALL
GAHP
GAHP
BUFFER TANK
HWR FROM BUILDING

APPENDIX

B GAHP RETROFIT LAYOUT B


HWS TO BUILDING
TMV
DCW MAKE-UP
HEAT SOURCE
HEAT SOURCE
DHWT
DHWT
DHWT
PRE-HEAT
ET
EXTERIOR WALL
GAHP
GAHP
HWR FROM BUILDING

ENBRIDGE GAS INC.

Answer to Interrogatory from
Energy Probe Research Foundation (EP)

Interrogatory

Issue 9a/b

Reference:

Exhibit D Tab 1 Schedule 3 Pages 2-4 Table 3

Preamble:

The annual scorecards are divided into categories:

i. Scorecards whose base year 2023 targets have been proposed by Enbridge Gas, with consideration for the inputs described above. Subsequent, 2024- 2027 year-over-year targets will be determined by way of a formulaic Target Adjustment Mechanism ("TAM"). These scorecards are based on Resource Acquisition type programs who metrics are primarily natural gas savings reductions (m3). Base year, 2023 targets have been proposed by Enbridge Gas. The TAM methodology will be applied to determine subsequent year targets. The TAM approach is detailed in the Proposed Framework, Exhibit C, Tab 1, Schedule 1, Section 5.2

Question(s):

a) Has the TAM Methodology been reviewed by the EAC?

b) Has the TAM Methodology been approved by the OEB? Please provide references.

c) If a Target, for example the Residential Sector Programs, is/is not met please provide illustrative examples of the TAM for 2023/2024.

Response:

a - b)

The TAM was directed by the OEB in its Decision on the 2015-2020 DSM Plans. The targets determined utilizing the methodology including calculations are reviewed each year as part of the annual audit. Enbridge Gas has proposed the continued use of a TAM and has outlined an enhanced methodology in this proposal to include

an inflation factor. This updated TAM approach, as outlined in the Proposed Framework, forms part of this application and has not yet been reviewed by the OEB or the EAC.

c) Please see the tables below for two illustrative examples: if target is met where the program budget is fully spent, and if target is not met where the program budget is underspent.

Program (Metric)	2023 Results: Achieve 100% of 2023 Target	2023 Spend: Spend 100% of 2023 Budget	Cost Effectiveness (result / spend)	2024 Budget	Productivity Factor	Inflation Factor	2024 OEB 100% Target
	a	b	c = a / b	d	e	f	g = c * d * e / f
Residential Program Scorecard (Net Annual Gas Savings (m3))	**14,757,274**	**39,224,577**	**0.38**	**40,150,856**	**1.02**	**1.02**	**15,105,763**

Program (Metric)	2023 Results: Achieve 90% of 2023 Target	2023 Spend: Spend 90% of 2023 Budget	Cost Effectiveness (result / spend)	2024 Budget	Productivity Factor	Inflation Factor	2024 OEB 100% Target
	a	b	c = a / b	d	e	f	g = c * d * e / f
Residential Program Scorecard (Net Annual Gas Savings (m3))	**13,281,546**	**35,302,119**	**0.38**	**40,150,856**	**1.02**	**1.02**	**15,105,763**

ENBRIDGE GAS INC.

Answer to Interrogatory from
London Property Management Association (LPMA)

Interrogatory

Issue 9a

Reference:

Exhibit C, Tab 1, Schedule 1, pages 12-13

Question(s):

a) The formula shown on page 12 is not consistent with the numerical example that follows. Specifically, the formula shown on page 12 indicates an adjustment of "x productivity x inflation factor" whereas the example shows a division by the inflation factor. Which is correct?

b) Is the inflation factor used in the formula the same inflation factor used to set the budget (excluding overheads)? If not, please explain fully the difference in the inflation rates used.

Response:

a) The formula outlined at Exhibit C, Tab 1, Schedule 1, page 12 inadvertently stated a "productivity factor x inflation factor" instead of "productivity factor ÷ inflation factor". The example provided on page 13 reflected the correct formula and remains correct.

   For clarity, the corrected formula is stated below.

   Year 2 100% Metric Target =

   (Year 1 Performance [(i)] ÷ Year 1 Spend [(ii)]) x Year 2 Budget [(iii)] x productivity factor ÷ inflation adjustment

   (i) Performance is the audited metric achievement in the given year. For natural gas savings (m3) metrics, the formula utilizes the LRAM natural gas savings achievement that calculates savings using best-available assumptions.
   (ii) Spend is the spend attributable to the respective metric excluding overheads.
   (iii) Budget is the approved next year budget (escalated for inflation) attributable to the respective metric excluding overheads.

b) Confirmed

ENBRIDGE GAS INC.

Answer to Interrogatory from
Energy Probe Research Foundation (EP)

Interrogatory

Issue 9b

Reference:

Exhibit E, Tab 4, Schedule 7, Attachment 1, Page 19 of 62 Posterity Report

Preamble:

15. The 2019 APS has proven useful as a reference tool for a high-level comparison of targets, and it has provided some confidence in the relative weighting of Enbridge Gas's sector targets. Enbridge Gas and Posterity have worked together to improve the PG model so it can begin to represent real world market realities, through updates to measure characterization, measure adoption and sector definitions.
Despite these best efforts, there remains a fundamental disconnect between the theoretical achievable potential and costs represented in the model, and how DSM programs operate in the Ontario market.

Question(s):

a) Please confirm that Posterity used the following EGI assumptions for the Air Sealing Measure:
   -Savings 315 m3/household
   -Added Electricity Savings (specify) for inclusion in the TRC calculation;

b) Please provide the Working Papers for the basis of these assumptions

c) Please confirm that Posterity used the following EGI assumptions for the Whole Home Envelope Measure:
   -Lifetime 30 years
   -Savings 447 m3/yr
   -Average Incentive Payment $1800

   Please provide the Working Papers for the basis of these assumptions

d) Please confirm that Posterity used the following EGI assumptions for the Attic Insulation:
-Adjusted Savings 296 m3/ home

Please provide the Working Papers for the basis of these assumptions

Response:

The proposed values in 2019 APS were not reflective of estimated savings levels Enbridge Gas experienced through the delivery of its Whole Home Program and in some cases were believed to be significantly different.

In working with Posterity to better understand the 2019 APS at a granular level, and in efforts to create a mirror model that reflected more realistic measure level savings values, Enbridge Gas undertook an exercise to roughly estimate individual measure savings through leveraging previous whole home participant data, knowing there would be limitations with this approach.

As it relates to the measures specified in the interrogatory, Enbridge Gas is providing the following approach and calculations to explain how it came to these values.

This work was conducted for estimation purposes only, and only as a result of the Company's concern that the 2019 APS was at risk of overestimating residential savings. As outlined in further detail below, Enbridge Gas uses HOT2000 software which calculates savings for the whole home and not by measure. The Company's attempt to break these whole home savings into individual measures is not expected to produce accurate results. While the analysis attempts to account for challenges like interactive effects, there is limited ability to do so. Enbridge Gas believes the results below should help provide a high-level comparison to the 2019 APS but the results still have a fair degree of uncertainty. For example, if the savings for an individual measure were within 25% of the 2019 APS, this could be a result of inaccuracy in the analysis. The Company is trying to draw attention to those cases where the differences were very significant and not explainable and not by the Company's inability to accurately breakdown whole home savings.

a) Confirmed.

b) Provided below.

c) Confirmed and provided below.

d) Confirmed and provided below.

Description of approach to develop savings estimates below:

Table 1 presents a comparison between the values on 2019 APS and ENBRIDGE GAS updates based on historical data analysis.

Table 1 2019 APS Measure characterization vs ENBRIDGE GAS proposed values

2019 APS MEASURE CHARACTERIZATION		ENBRIDGE GAS ASSESSMENT	
MEASURE	AVE. NAT. GAS SAVING (M3/UNIT)	AVE. NAT. GAS SAVING (M3/UNIT)	% DIFFERENCE
Air sealing	320	315	5%
Attic insulation	1,137	296	287%
Whole home		447	-100%

Challenges and Assumptions

1. HER is a whole home program and savings are calculated using the outputs of the HOT2000 software. The HOT2000 software allows users to model the home as a system and takes into consideration interactive effects between different elements of the building. Since Enbridge Gas' offer design does not support single measure upgrades, its previous participant data does not have a sample where single measures can be absolutely separated from the whole home.

2. Given this, the data was filtered to a minimum of two measures and one of these measures was the furnace/boiler upgrade, for example:
   - Air sealing filters: 2 measures (Air Sealing + Furnace/Boiler)
   - Attic insulation filters: 2 measures (Attic Insulation + Furnace/Boiler)

3. Please note that Enbridge would have preferred to pair the APS measure in question with a water heater as a second measure to limit the impact from interactive effects, however the sample size of those participants was far too small to be statistically significant, see Table 2 below.

Table 2 Comparison of assumptions used to filter the historical data

MEASURE	FILTER (MEASURE + FURNACE/BOILER)	FILTER (MEASURE + DHW)	DHW FILTER COMPARE TO SPACE HEATING
Air sealing	19,827	140	1% of sample size
Attic insulation	651	33	5% of sample size

Air Sealing and Attic Insulation

The following procedure was followed to estimate Air Sealing and Attic Insulation savings input assumption for the APS.

1. Filter historical program data (2018 & 2019 program year) as explained above. Tables 3 - 4 below present a summary of this step.

Table 3 Air Sealing data summary (filter applied: 2 measures Air sealing + Furnace/Boiler)

PROGRAM YEAR	# PARTICIPANTS	SUM. OF GROSS NATRUAL GAS SAVINGS (M3/YR)	SUM. OF GROSS ELETRICITY SAVINGS (KWH/YR)
2018	11,450	4,512,198	4,558,995
2019	8,377	3,419,049	3,148,607

Table 4 Attic Insulation data summary (filter applied 2 measures Attic Insulation + Furnace/Boiler)

PROGRAM YEAR	# PARTICIPANTS	SUM. OF GROSS NATRUAL GAS SAVINGS (M3/YR)	SUM. OF GROSS ELETRICITY SAVINGS (KWH/YR)
2018	341	138,957	121,263
2019	310	110,791	121,346

2. Determine Average Natural Gas and Electricity savings from step 1. Tables 5 presents a summary of this step.

Table 5 Air Sealing and Attic Insulation gross average savings (filter applied: 2 measures Air sealing + Furnace/Boiler)

MEASURE	# PARTICIPANTS	AVE. OF GROSS NATRUAL GAS SAVIGNS (M3/YR)	AVE. OF GROSS ELETRICITY SAVIGNS (KWH/YR)
Air Sealing	19,827	400	389
Attic Insulation	651	384	373

3. Develop adjustment factors: baseline adjustment from 90% to 95% AFUE[1].
    a. Apply baseline adjustment algorithm to 2019 gross sample data for 90% and 95% AFUE furnace baseline.
    b. Find the difference
    c. Determine adjustment factor. Table 6 presents a summary of steps 3a. to 3c.

[1] Including impact of baseline change as a result of Canada Increasing Minimum Efficiency Performance Standards (MEPS) for residential furnace in 2020

Table 6 Air Sealing single measure adjustment factor[2]

SCENARIO	ANNUAL NATRUAL GAS SAVINGS (M3/YR) AIR SEALING	ANNUAL NATRUAL GAS SAVINGS (M3/YR) ATTIC INSULATION
2019_90% AFUE	1,803,440	62,190
2019_95% AFUE	1,420,776	47,917
Baseline adjustment factor	0.788	0.770

4. Apply factor from step 3 to adjust average savings in step 2. Table 7 presents a summary of this step and Table 8 presents a summary of Air Sealing and Attic insulation measure characterization proposed by Enbridge Gas for the APS.

Table 7 Air Sealing and Attic Insulation savings input assumption for APS

MEASURE	SINGLE MEASURE ADJUSTMENT FACTOR	ADJUSTED NATRUAL GAS SAVINGS (M3/YR PER HOME)	ADJUSTED ELETRICITY SAVINGS (KWH/YR PER HOME)
Air Sealing	0.788	315	306
Attic Insulation	0.770	296	287

Table 8 Air Sealing and Attic insulation measure characterization summary proposed by ENBRIDGE GAS

COMMON MEASURE NAME	REPLACEMENT TYPE	UNIT BASIS	M3 SAVINGS	KWH SAVINGS
Res | Air Sealing	RET Only	per house	315	306
Res | Attic Insulation	RET Only	per house	296	287

Whole home analysis

Please note that this analysis includes all measure mixes: envelop insulation, space & water heating, windows, and doors. The following procedure was followed to estimate Whole home savings input assumption for APS.

1. Filter historical program data (2018 & 2019 program year) as explained above. Table 9 below presents a summary of this step.

[2] Estimate only, intended for use in Program potential estimate only. Not to be used for other purposes.

Table 9 Whole home data summary

PROGRAM YEAR	# PARTICIPANTS	SUM. OF GROSS NATRUAL GAS SAVINGS (M3/YR)	SUM. OF GROSS ELETRICITY SAVINGS (KWH/YR)
2018	32,578	17,137,226	12,753,498
2019	20,790	11,815,663	6,450,887

2. Determine Average Natural Gas and Electricity savings. Table 10 presents a summary of this step.

Table 10 Whole home gross average savings

MEASURE	# PARTICIPANTS	AVE. OF GROSS NATRUAL GAS SAVINGS (M3/YR)	AVE. OF GROSS ELETRICITY SAVINGS (KWH/YR)
Whole home	53,368	543	360

3. Develop an estimate for the saving adjustment factors.
    a. Apply baseline adjustment algorithm to 2019 gross data for 90% and 95% AFUE[3] furnace baseline.
    b. Find the difference
    c. Determine adjustment factor. Table 11 presents a summary of steps 3a. to 3c.

Table 11 Whole home adjustment factor

SCENARIO	ANNUAL NATRUAL GAS SAVINGS (M3/YR)
2019_90% AFUE	5,392,342
2019_95% AFUE	4,447,308
Whole home adjustment factor	0.825

4. Apply factor from step 3 to adjust average savings in step 2. Table 12 presents a summary of this step and Table 13 presents a summary of Whole home measure characterization proposed by ENBRIDGE GAS for the APS.

Table 12 Whole home average savings input assumption for APS

MEASURE	ADJUSTMENT FACTOR	ADJUSTED NATRUAL GAS SAVINGS (M3/YR)	ADJUSTED ELETRICITY SAVINGS (KWH/YR)
Whole home	0.825	447	297

[3] Including impact of baseline change as a result of Canada Increasing Minimum Efficiency Performance Standards (MEPS) for residential furnace in 2020

Table 13 Whole home measure characterization summary proposed by ENBRIDGE GAS

COMMON MEASURE NAME	REPLACEMENT TYPE	UNIT BASIS	M3 SAVINGS	KWH SAVINGS
Res | Whole home	RET Only	per house	447	297

ENBRIDGE GAS INC.

Answer to Interrogatory from
Energy Probe Research Foundation (EP)

Interrogatory

Issue 9b

Reference:

Exhibit E Tab 5 Schedule 1 Page 1

Preamble:

For measures that do not exist in the TRM, for example, for commercial custom projects or residential whole home projects (excluding the new measures described below), Enbridge Gas used best available input assumptions at the time of the submission of this Application for the purposes of forecasting DSM results and proposing targets. In order to claim energy savings results, Enbridge Gas will use project specific input assumptions to estimate savings.

Question(s):

a) Please provide the complete list of assumptions and supporting Working Papers for the Residential Whole Home Program/projects.

b) How much does this program contribute to the residential Sector Targets in 2023?

c) Provide a breakdown by Program of the Residential Sector 2023 Targets and the contribution of each to the Targets M3 and %

d) Provide the Working Papers that support the proposed Residential Sector 2023 Targets

Response:

a) Please see response to Exhibit I.10.EGI.STAFF.29b.

b) The Whole Home offering contribution is 53%of the Residential Target.

c) Please see table below:

	Target net m3 (2023)	% of Residential Target (2023)
Whole Home	7,759,125	52.58%
Single Measure	826,549	5.60%
Smart Home	6,171,600	41.82%

d) Please see response to Exhibit I.10.EGI.STAFF.29b

ENBRIDGE GAS INC.

Answer to Interrogatory from
Energy Probe Research Foundation (EP)

Interrogatory

Issue 9d

Reference:

Exhibit D Tab 1 Schedule 3 Pages 2-4 Table 3; Exhibit E Tab 1 Schedule 4: Commercial Custom-Prescriptive Downstream and Direct Install Prescriptive Midstream Offers

Preamble:

Energy Probe has previously made several submissions critical of the effectiveness of certain Market Transformation programs Run it Right and MT offers. EGI has responded to these submissions that this was a matter to be addressed in this EB-2021-0002 Proceeding. The Board agreed with EGI in its EB-2020-0072 Decision.

Question(s):

a) Please provide a complete response that addresses the reasons that these two MT programs have been dropped and replaced by the proposed prescriptive offers.

b) Who was consulted in preparing these offers?

c) Has EGI piloted these new offers? If so please provide the results.

d) Will EGI focus delivery using ESAs? Are ESAs EGI employees? If so, how many full and part time. If not, how many ESA consultants are qualified by EGI?

e) Will EGI pay ESAs a fee or commission? Please provide details

Response:

a) The decision to discontinue Run it Right and RunSmart was independent of the decision to introduce any prescriptive offerings. Each offering introduced was meant to address a market need to help customers overcome participation barriers and optimize Commercial Program reach and results.

The Run it Right and RunSmart offerings both leveraged metered data to capture savings. Based on lessons learned associated with Run it Right and RunSmart as well as a variety of pilot initiatives outlined,[1] a new Whole Building P4P offering was proposed. The Whole Building P4P offering applies a holistic approach to energy management, incorporating metered data to capture savings associated with capital, operational and/or behavioural opportunities within a building over a defined period of time.

An expansion of the Direct Install offering is being proposed to allow more access to turnkey solutions for small customers who otherwise would not have the means to engage in energy efficiency opportunities.[2]

A new Midstream offering was introduced to drive influence and adoption of high efficiency measures at a distributor and contractor level, minimizing the effort required by customers to benefit from participating in DSM.[3]

b) Much of the research done to support the direction of the proposed commercial offerings was based on reviewing plans and third-party reports associated with small business offerings in other jurisdictions, as well as primary research with representatives of customers (i.e. property management) and customer associations/groups. Please see the Ipsos report filed as Attachment 1 to Exhibit E, Tab 1, Schedule 4.

In addition, discussions with representatives from School Boards as well as service providers were held to inform elements of the Whole Building P4P offering.

c) The Whole Building P4P offering is a new offering however it was developed based on lessons learned from a variety of pilot initiatives.[4]

The Direct Install offering was first introduced in 2016 with limited measures. An expansion of the Direct Install offering is being proposed to allow more access to turnkey solutions for small customers who otherwise would not have the means to engage in energy efficiency opportunities.[5] The decision to expand the Direct Install offering was in part influenced by the presentation by Environmental Defence and the Green Energy Coalition at the Midterm Review Stakeholder Meeting, where the emphasis on the need to expand Direct Install was articulated.[6] Historical results

[1] EB-2021-0002, DSM Multi-year Plan and Framework Application (May 3, 2021), Exhibit E, Tab 2, Schedule 1, pp. 1-2.
[2] Ibid, Exhibit E, Tab 1, Schedule 4, p. 11.
[3] Ibid.
[4] Ibid, Exhibit E, Tab 2, Schedule 1, pp. 1-2.
[5] Ibid, Exhibit E, Tab 1, Schedule 4, p. 11.
[6] Chris Neme and Kent Elson, Energy Futures Group, Mid-Term Review Stakeholder Meeting, Presentation by Environmental Defence and the Green Energy Coalition (September 6, 2018), slide 25.

associated with this offering can be found in the 2019 DSM Annual Report for both the EGD rate zone[7] and the Union rate zones[8].

As outlined in the 2019 Annual Report, in June 2019, Enbridge Gas launched a new midstream initiative through a third-party delivery agent, branded as the Distributor Discount Program,[9] partly in response to the presentation by Environmental Defence and the Green Energy Coalition at the Midterm Review Stakeholder meeting which specified to look at an upstream approach for certain measures.[10] As a result, HVAC equipment and food service equipment were transitioned from a downstream customer incentive to the midstream initiative.

Results of the initiative were captured under the Prescriptive offering, and include the following:

Offer & Year	Quantity	Total Net Cumulative Natural Gas Savings
2020		
HVAC Equipment	685	5,028,927
Food Service Equipment	375	5,159,443
2019		
Food Service Equipment	89	1,375,834
TOTAL	1149	11,564,204

d) Enbridge Gas will not focus delivery using ESAs for the proposed Prescriptive Midstream, Direct Install and Whole Building P4P offerings.

Commercial offerings targeting large customers will continue to be delivered by ESAs, working directly with them to identify, quantify and prioritize efficiency opportunities.[11]

ESAs are employees of Enbridge Gas. Both the DSM Plan Headcount breakdown and the Energy Conservation and Marketing Organizational Structure breakdown can be found at Exhibit D, Tab 1, Schedule 1 page 18, Table 11 and page 19, Figure 1 respectively.

e) ESAs are salaried employees.

[7] EB-2021-0072, 2019 DSM Deferral and Variance Account Disposition Application (March 10, 2021), Exhibit A, Tab 4, Schedule 1, p. 36.
[8] Ibid, p. 52.
[9] Ibid, p. 51.
[10] Chris Neme and Kent Elson, Energy Futures Group, Mid-Term Review Stakeholder Meeting, Presentation by Environmental Defence and the Green Energy Coalition (September 6, 2018), slide 23.
[11] EB-2021-0002, DSM Multi-year Plan and Framework Application (May 3, 2021), Exhibit E, Tab 1, Schedule 4, p. 10.