



Adam Stiers  
Technical Manager  
Regulatory Applications  
Regulatory Affairs

Tel: (519) 436-4558  
Email: [astiers@uniongas.com](mailto:astiers@uniongas.com)  
[EGIRegulatoryProceedings@enbridge.com](mailto:EGIRegulatoryProceedings@enbridge.com)

Enbridge Gas Inc.  
P.O. Box 2001  
50 Keil Drive N.  
Chatham, Ontario, N7M 5M1  
Canada

December 11, 2020

BY RESS, AND EMAIL

Ms. Christine Long  
Registrar  
Ontario Energy Board  
2300 Yonge Street, 27<sup>th</sup> Floor  
Toronto, ON M4P 1E4

Dear Ms. Long:

**Re: Enbridge Gas Inc. (“Enbridge Gas”)  
Ontario Energy Board (“OEB” or the “Board”) File No.: EB-2020-0091  
Integrated Resource Planning Proposal  
Reply Evidence**

In accordance with the Board’s Procedural Order No. 4 dated August 20, 2020, and pursuant to Enbridge Gas’s letter of November 27, 2020, enclosed please find the responding evidence of Enbridge Gas to the expert evidence of OEB Staff and the joint evidence of the Green Energy Coalition (“GEC”) and Environmental Defence (“ED”).

Consistent with its letter of November 27<sup>th</sup>, Enbridge Gas has attached information at Appendices A and B, related to IRP (geo-targeted DSM) case/pilot studies conducted by Enbridge Gas,<sup>1</sup> which the Board has encouraged Enbridge Gas to provide in advance of the interrogatory phase of this proceeding.<sup>2</sup>

Enbridge Gas’s Reply Evidence is also accompanied at Appendix C by Form A’s signed by employees of ICF Canada that contributed to the development of Enbridge Gas’s IRP Study and IRP Jurisdictional Review,<sup>3</sup> acknowledging their expert duty to the OEB.

The above noted evidence has been filed electronically through the OEB’s RESS and will be made available on Enbridge Gas’s website at:  
<https://www.enbridgegas.com/Regulatory-Proceedings>.

If you have any questions, please contact the undersigned.

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<sup>1</sup> EB-2020-0091, Green Energy Coalition Letter – Interrogatory Process, October 23, 2020.

<sup>2</sup> EB-2020-0091, OEB Correspondence, October 26, 2020.

<sup>3</sup> EB-2020-0091, FINAL REPORT Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment, July 22, 2020; EB-2020-0091, Exhibit B, Appendix A, IRP Jurisdictional Review Report, October 14, 2020.

Sincerely,

Adam Stiers  
Technical Manager, Regulatory Applications

c.c.: D. Stevens (Aird & Berlis)  
M. Parkes (OEB Staff)  
M. Millar (OEB Counsel)  
EB-2020-0091 Intervenors

INTEGRATED RESOURCE PLANNING PROPOSAL – REPLY EVIDENCE

1. The purpose of this evidence is for Enbridge Gas Inc. (“Enbridge Gas” or the “Company”) to respond to the expert evidence of: (i) Guidehouse Canada Ltd. (“Guidehouse”) submitted by Ontario Energy Board (“OEB” or the “Board”) Staff on November 12, 2020; and (ii) Energy Futures Group (“EFG”) submitted jointly by the Green Energy Coalition (“GEC”) and Environmental Defence (“ED”) on November 23, 2020.
2. In accordance with the OEB’s Procedural Order No. 3 dated July 31, 2020 (“PO No. 3”), Enbridge Gas filed a letter with the OEB on August 12, 2020 indicating its intention to file responding evidence by December 11, 2020. In its letter, Enbridge Gas stated that it expected a need to file further evidence in response to the OEB Staff sponsored IRP Report and to GEC/ED’s evidence since Enbridge Gas anticipated that these respective submissions would go beyond the scope of the Additional Evidence that Enbridge Gas planned to file by October 15, 2020 (as described in the Company’s July 29, 2020 letter). Further, pursuant to the OEB’s Procedural Order No. 5 dated September 15, 2020 (“PO No. 5”), via letter to the OEB dated November 27, 2020 Enbridge Gas advised the Board that it intended to file responding evidence in support of continuing the constructive discussion that has begun to develop an Integrated Resource Planning (“IRP”) Framework for Enbridge Gas.
3. Similar to Enbridge Gas’s Additional Evidence, this Reply Evidence is intended to be supplemental to the evidence previously filed by Enbridge Gas: (i) as part of its 2021 Dawn Parkway Expansion Project and Integrated Resource Planning Proposal and

ICF's IRP Study;<sup>1</sup> and (ii) as Additional Evidence filed in this proceeding on October 15, 2020. Consistent with its Additional Evidence, with the benefit of having considered the expert evidence of OEB Staff and GEC/ED and consistent with its commitment to continuous improvement, Enbridge Gas hereby offers responding evidence for the Board's consideration in support of establishing an IRP Framework to guide Enbridge Gas's assessment of IRP alternatives ("IRPAs"), relative to other facility and non-facility alternatives, to serve the forecasted needs of Enbridge Gas customers.

4. Enbridge Gas's decision not to respond to each and every issue raised by Guidehouse and EFG should not be construed as either acceptance or opposition.
  
5. This evidence is organized as follows:
  - 1.0 Response to Guidehouse and EFG Evidence
  - 2.0 Economic Evaluation Analysis
  - 3.0 Stakeholder Consultation/Engagement
  - 4.0 Cost Recovery and Shareholder Incentives
  - 5.0 Project Screening
  - 6.0 Risk
  - 7.0 Pilot Programs

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<sup>1</sup> EB-2019-0159, 2021 Dawn Parkway Project, Exhibit A, Tab 13; EB-2020-0091, FINAL REPORT Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment, July 22, 2020.

## **1.0 Response to Guidehouse and EFG Evidence**

Guidehouse and EFG support certain aspects of Enbridge Gas' IRP Proposal as described in their respective evidence submissions. In addition, they have provided recommendations or proposals based on what they define as best practices in other jurisdictions and energy sectors. Enbridge Gas agrees with certain of these recommendations and proposals as discussed in further detail below.

### Guidehouse

6. Guidehouse's evidence focuses primarily on providing examples of best practices of utilities in New York State in support of its seven recommendations set out at pages 61-62.
  
7. Recommendation 1 states that "The OEB should encourage the development of a comprehensive Benefit Cost Analysis ("BCA") Handbook for Gas IRP, or supplemental guide to the approach outlined in E.B.O. 134, that evaluates infrastructure, supply-side, and demand-side solutions with a similar set of assumptions for costs and benefits." Enbridge Gas supports the concept of adding costs and benefits to the Board's E.B.O. 134 guidelines to create a modified E.B.O. 134 or staged Discounted Cash Flow ("DCF") Plus (DCF+) standard for the purposes of assessing IRPAs in Ontario. There is benefit to a staged approach that enables clear and transparent conclusions to be drawn at each stage of analysis and which is based foremost on an economic (DCF) analysis. Please see section 2.0 Economic Evaluation Analysis below for further detail.
  
8. Recommendation 3 states that "...the OEB should develop the gas IRP framework to be consistent with the regulatory framework for natural gas infrastructure

approvals.” Enbridge Gas interprets this recommendation to be aligned with its Additional Evidence where it stated,<sup>2</sup>

Enbridge Gas will apply to the OEB for approval to recover the costs associated with investment in any IRPA. Enbridge Gas presumes that such an application would, similar to applications for LTC facility alternatives, include an explanation of the system constraint/need, a summary of stakeholder engagement input, rationale for investment in the IRPA, the estimated individual and overall costs of investment, proposed cost allocation and recovery methodologies, proposed ownership and operationalization arrangements and a commitment to ongoing and annual monitoring and reporting on the relative effectiveness of the IRPA to relieve the identified constraint.

Enbridge Gas supports striving for consistency between future IRPA applications and leave-to-construct (“LTC”) applications and their underlying policy frameworks, to the extent reasonably possible. However, consistent with the Board’s repeated determinations in this proceeding that it is not appropriate to duplicate matters/efforts that have been or are anticipated to be dealt with in other proceedings,<sup>3</sup> the Board should remain focused on developing an IRP Framework for Enbridge Gas and not encourage re-hearing matters previously decided by or currently before the Board in other proceedings or that are more appropriately dealt with through forthcoming proceedings.

9. Recommendation 4 states that “To the extent that the OEB is providing direction that may influence or be impacted by provincial environmental and policy goals, the OEB should clearly define their underlying assumptions regarding applicable provincial policy goals.” Enbridge Gas accepts that provincial environmental and policy goals need to be considered in the development of an IRP Framework for Enbridge Gas.

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<sup>2</sup> EB-2020-0091, Enbridge Gas Additional Evidence, October 15, 2020, Exhibit B, para. 73.

<sup>3</sup> EB-2020-0091, OEB Procedural Order No. 2, July 15, 2020, pp. 6.

In the past, Enbridge Gas has proven itself to be responsive to major market trends, its customers' interests and governmental/regulatory policies and directives in its system planning and expansion processes. Any additional clarity and OEB direction on applicable provincial policy goals will also be considered in Enbridge Gas's IRP activities.

10. Recommendation 5 states that "The OEB should work to establish a common understanding amongst stakeholders for the gas IRP process and how benefits, costs, risks, and other parameters will be shared by shareholders, ratepayers, and other parties." Enbridge Gas has interpreted Guidehouse's recommendation as meaning that ratepayers and the utility should all clearly understand the extent to which they share the benefits, costs and risks of any investment by Enbridge Gas in IRP/IRPAs in the future. If Enbridge Gas's interpretation is accurate then it supports Guidehouse's recommendation.

11. Recommendation 6 states that "The OEB should develop the gas IRP framework to provide utilities with sufficient flexibility to quickly adjust program designs, budgets, implementation plans, and other processes to adapt the IRP programs to each situation." Consistent with various submissions and its Additional Evidence,<sup>4</sup> Enbridge Gas agrees that the IRP Framework should provide it adequate flexibility to adjust IRPAs as needed,<sup>5</sup>

Enbridge Gas has also proposed to report annually on the actual annual and cumulative effects of OEB-approved IRPAs relative to associated peak period demand reductions originally forecast (via an IRP report) and to seek OEB approval to adjust investments in such IRPAs as appropriate (e.g., to shift funding

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<sup>4</sup> EB-2020-0091, Enbridge Gas Submission on Draft Issues List, June 4, 2020, pp. 1-2; EB-2020-0091, Enbridge Gas Additional Evidence, October 15, 2020, Exhibit B, para. 31, 73, 80 & 95.

<sup>5</sup> EB-2020-0091, Enbridge Gas Additional Evidence, October 15, 2020, Exhibit B, para. 80.

to an alternate IRPA or to increase/decrease/cease investment in IRPAs accordingly).

Natural gas IRPAs are a relatively new concept. An approved IRP Framework for Enbridge Gas will need to allow for potential changes in the event that actual IRP experiences are different than what was planned by the utility and approved by the Board.

### EFG

12. EFG's evidence discusses best practices and recommendations based upon learnings from several US electric utilities and Vermont Gas Systems, Inc. ("Vermont Gas").
13. Regarding Cost Recovery and Financial Incentives, Enbridge Gas agrees with EFG's conclusion that it is reasonable to incent the utility to consider IRP investment.<sup>6</sup>
14. Regarding Value of Pilot Projects, Enbridge Gas supports EFG's recommendation that two pilot projects be developed by Enbridge Gas in 2021 and launched in 2022 to gain further experience and insights around planning, implementing and tracking IRPAs.<sup>7</sup>
15. Regarding Planning Horizon, Enbridge Gas agrees with EFG's assertions that the magnitude of the load reduction and size of the geographic area to be addressed might drive different lead times for IRPAs,<sup>8</sup> and adds that the types of IRPAs being

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<sup>6</sup> EB-2020-0091, Energy Futures Group Report: Best Practices for Gas IRP and Considerations of "Non-Pipe" Alternatives to Traditional Infrastructure Investments ("EFG Report"), November 23, 2020, Exhibit M2.GEC-ED, Section 4.5.

<sup>7</sup> EFG Report, Section 4.3.2.

<sup>8</sup> EFG Report, Section 4.

considered may also be a determining factor. Enbridge Gas also generally agrees that a ten-year time horizon for forecasting in-franchise system needs is appropriate to ensure adequate planning, deployment and adjustments (as needed) can be undertaken. However, the Board should also recognize that there is a great deal of uncertainty in forecasts that extend beyond the 3-5-year time period, including for Enbridge Gas's ex-franchise customers. Forecasting and projecting potential system capacity needs/constraints up to ten years in advance is inherently more likely to result in less reliable results (e.g., the identification of needs/constraints and potential IRPA investments that are not absolutely necessary) in the absence of heightened scrutiny.

16. Lastly, regarding Applicability of Lessons from Electric IRP to Gas IRP, Enbridge Gas recognizes there are some instances where electric Non-Wires Alternative (“NWA”) insights apply to natural gas IRP, such as the statement that pilot or demonstration projects can be helpful in learning about actual program operational processes, impacts, and program design features.<sup>9</sup> However, as noted by Guidehouse, dual fuel utilities interviewed (including Consolidated Edison Company of New York, Inc. (“ConEd”) and National Grid) have also “...found key differences relating to limitations around space heating end-uses, building codes, customers switching to fuel oil, and other issues that require separate sets of guidelines.”<sup>10</sup> EFG also finds that although there are similarities between Natural Gas IRP and Electric IRP “There are some differences between gas and electric utilities that could theoretically affect the average economic value and/or frequency of cost-effectiveness of non-pipe solutions relative to non-wires solutions.”<sup>11</sup> Fundamental differences between electric and natural gas infrastructure planning processes need

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<sup>9</sup> EFG Report, Section 4.3.

<sup>10</sup> EB-2020-0091, Guidehouse Report: Natural Gas Integrated Resource Planning in New York State and Ontario (“Guidehouse Report”), November 12, 2020, p. 2.

<sup>11</sup> EFG Report, Section 5.

to be recognized when comparing the two processes and developing an IRP Framework for Enbridge Gas. As outlined in the ICF IRP Study this may include differences such as: facilities planning requirements, cost structure, system outage risk, resource planning, and peak hour data availability.<sup>12</sup>

## **2.0 Economic Evaluation Analysis**

### Overview

17. Enbridge Gas is supportive of the Board's invitation to parties to bring forward IRP studies and evidence from other jurisdictions (both natural gas and electric) for consideration in this proceeding, including ConEd's BCA Handbook ("ConEd BCA").<sup>13</sup>

18. In its Additional Evidence, Enbridge Gas proposed that economic feasibility of IRPAs be assessed using a DCF methodology consistent with principles underpinning the Board's E.B.O. 134 and E.B.O. 188. The primary difference between Enbridge Gas's proposal and ConEd's BCA is one of perspective: Enbridge Gas's proposed DCF-based test being premised upon an economic assessment of impacts/benefits to Enbridge Gas's ratepayers as its starting point followed by secondary and tertiary objective assessments of distinct and quantifiable public interest costs and benefits,<sup>14</sup> and ConEd's BCA test being less focused on economic feasibility as all impacts/benefits to society are consolidated together.<sup>15</sup>

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<sup>12</sup> EB-2020-0091, FINAL REPORT Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment, July 22, 2020, pp. ES7 – ES9.

<sup>13</sup> Consolidated Edison Company of New York, Inc. (State of New York Public Service Commission Case 19-G-0066) Gas Benefit-Cost Analysis Handbook, September 14, 2020: <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2CCB0D2A-183A-483B-9F56-87878E0471FA}>

<sup>14</sup> E.B.O. 134, Section 6.67 to 6.79.

<sup>15</sup> ConEd BCA, p. 8.

19. Enbridge Gas acknowledged in its Additional Evidence that,<sup>16</sup>

Although cost/economics is the primary factor with respect to alternative selection, as set out in the Guiding Principles underpinning Enbridge Gas's IRP Proposal (discussed in Section 2.0), there are other factors that may be considered.

Accordingly, Enbridge Gas supports the assessment of well-known and clearly quantifiable impacts to both ratepayers and society. That being said, Enbridge Gas also recognizes the challenges in assigning quantitative values to societal factors that offer indirect benefits. Therefore, Enbridge Gas supports the OEB's consideration of other costs and benefits similar and in addition to those set out in E.B.O. 134 as part of its development of an IRP Framework for Enbridge Gas. When assessing the feasibility of natural gas facility (pipeline) infrastructure and comparing them to IRPAs, the Board should establish a staged economic evaluation standard for IRPAs through this proceeding that ultimately resembles a modified version of the OEB's E.B.O. 134 guidelines or a DCF+ test.

Test Comparison:

20. The benefits of relying upon a method for determining the feasibility of IRPAs relative to facility alternatives, that is based on an economic evaluation followed by stages dedicated to considering customer and societal costs and benefits, include: (i) it ensures reasonable alignment with the established cost treatment for facility projects; and (ii) it provides more cost transparency than the ConEd BCA.

21. The use of a first phase economic evaluation, such as the DCF method, that applies a Weighted Average Cost of Capital ("WACC") discount rate, will help to drive objective understanding of the direct costs to deploy IRPAs compared to facility

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<sup>16</sup> EB-2020-0091, Enbridge Gas Additional Evidence, Exhibit B, para. 67.

alternatives. This test is well understood within E.B.O. 134 Stage I and E.B.O. 188 and is relied upon to provide value and cost security to ratepayers in Ontario.

The ConEd BCA Handbook:

22. Both Guidehouse<sup>17</sup> and EFG<sup>18</sup> highlight that additional system impacts should be considered, beyond DCF analysis, when assessing the cost-effectiveness of IRPAs and facility alternatives. Both point to the ConEd BCA as an example for the OEB to consider when establishing an IRP Framework for Enbridge Gas. While the ConEd BCA lays out a framework for calculating the benefits and costs of IRP projects in New York, its perspective, drivers and objectives are not entirely applicable to natural gas IRP for Enbridge Gas in Ontario.
23. Enbridge Gas supports a reasonable and practical approach to leverage existing and reliable methodologies as a base and to direct, as part of the IRP Framework for Enbridge Gas, that additional system impacts be considered when comparing IRPAs to facility alternatives. It is important to preserve symmetry of benefits and costs, and when comparing to real and direct costs incurred for a facility investment it is also important to ensure that estimates of other benefits and costs are reasonable and supported by quantifiable data. Forcing alignment where it may not be appropriate between natural gas planning policy frameworks should be avoided.
24. The ConEd BCA seeks to determine the economic, customer and societal costs/benefits of alternatives in a single step. The problem with this approach, aside from its relative novelty for natural gas IRP, is that it lacks the transparency of a staged approach like that of E.B.O. 134 which requires unique analysis and

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<sup>17</sup> Guidehouse Report, p. 4.

<sup>18</sup> EFG Report, p. 8.

conclusions to be drawn at each of its three stages: I (economic), II (customer) and III (societal).

25. Virtually every aspect of the ConEd BCA can be made to fit within the Board's E.B.O. 134 guidelines as they relate to the assessment and comparison of IRPAs and facility alternatives. In fact, the ConEd BCA includes quantitative and qualitative estimation of externalities in much the same way as E.B.O. 134 Stage III analysis.<sup>19</sup> While the ConEd BCA can be updated annually to adjust for changes in societal benefits/costs during the Distribution System Implementation Plan filing process,<sup>20</sup> E.B.O. 134 Stage II and III analysis can also be modified to achieve the same ends by directing that it consider a wider range of direct and indirect costs and benefits as part of the IRP Framework for Enbridge Gas.

26. Though the ConEd BCA uses the Societal Cost Test ("SCT") as the primary cost test, projects that pass the SCT are subject to further scrutiny using secondary cost tests including the Utility Cost Test ("UCT") and Ratepayer Impact Measure ("RIM") tests, to draw further conclusions regarding costs/benefits of alternatives such as ratepayer impacts.<sup>21</sup> In this way, these secondary tests, specifically the RIM test, serve a similar purpose as the various stages of the Board's E.B.O. 134 analysis.

27. The Board should be cautious to not simply accept the principles and magnitudes established for cost/benefits set out in the ConEd BCA as they may not reflect Ontario's market and regulatory realities. For example, the ConEd BCA states that peaking services are the marginal source of supply for ConEd, and only after

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<sup>19</sup> ConEd BCA, pp. 11-13.

<sup>20</sup> NYSDPS order "BCA order" (CASE 14-M-0101) page 22 says that these handbooks are intended to be updated annually with their Distributed System Implementation Plan (DSIP) filings which are annual as well. This was adopted in 2016.

<sup>21</sup> ConEd BCA, p. 8.

peaking services are reduced or eliminated can the utility avoid storage or pipeline costs.<sup>22</sup> Further, according to Guidehouse the proportion of ConEd's delivered services on peak day is 17% in 2020 and rising to 23% in 2023.<sup>23</sup> As such, the primary cost for ConEd is likely the cost of peaking services, due in large part to the various transmission and distribution system constraints within ConEd's service territory and New York State. Enbridge Gas and the province of Ontario do not operate in a comparably constrained environment and Enbridge Gas does not rely upon peaking services to a comparable extent. As noted elsewhere, Enbridge Gas's market penetration rate in proximate areas to a natural gas main is extremely high and the peak demand on the natural gas system is three (3) times that of the electrical system. Enbridge Gas's ratepayers have access to vast underground natural gas storage assets at the Dawn Hub and a means to transport natural gas supply across the province via the Dawn Parkway Transmission System. Peaking services tend to be short term in nature and inherently less reliable than facility (pipeline) infrastructure. Therefore, in contrast to New York State, Enbridge Gas does not consider peaking services as the marginal source of supply, nor a reasonable alternative for the vast majority of its facility needs in Ontario. Another obvious difference between Enbridge Gas and ConEd is that ConEd is a dual fuel (natural gas and electricity) utility while Enbridge Gas is a natural gas utility that also owns and operates ex-franchise natural gas transmission and storage assets.

28. Enbridge Gas reiterates that considering: (i) the many and varied differences between Ontario and New York State (natural gas markets, nature of utilities, regulatory environments); (ii) the common understanding in Ontario of the Board's E.B.O. 134 guidelines; and (iii) the similarity between the DCF analysis proposed by

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<sup>22</sup> ConEd BCA, p. 5.

<sup>23</sup> Guidehouse Report, p. 14.

Enbridge Gas and Stage I of E.B.O. 134 and E.B.O. 188, it is reasonable for the Board to direct that the IRP Framework for Enbridge Gas rely upon a modified version of E.B.O. 134 that considers materially quantifiable benefits and costs in stages II and III. The Board might call such a test the DCF+ test if it wishes to more clearly delineate this test for the purposes of natural gas IRP in Ontario.

### **3.0 Stakeholder Consultation/Engagement**

29. Enbridge Gas acknowledges the importance of obtaining stakeholder input ahead of developing IRPAs to address identified system needs/constraints and of establishing a feedback loop to keep stakeholders (including municipal and government representatives, First Nations, end use customers from all sectors, customer and business associations) informed of its investments in and the impact of their respective input into the development of IRPAs. As stated in its Additional Evidence,<sup>24</sup> the objectives of Enbridge Gas's proposed IRP Stakeholder Engagement process include: (i) ensure planned resources will meet Enbridge Gas's obligation to safely and reliably deliver firm contracted demands; (ii) gather ample geographically-specific information such that IRPAs can be adequately reviewed planned for and monitored; (iii) help inform the development of new or enhanced energy efficiency programming; and (iv) broadly inform Enbridge Gas's long-term strategic planning.

30. Enbridge Gas's proposed three component approach to stakeholder engagement, as set out in its Additional Evidence,<sup>25</sup> is meant to go beyond data collection in that it: (i) recognizes that each geographic area being consulted regarding an identified customer need or system constraint and relevant IRPA(s) will have unique attributes

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<sup>24</sup> EB-2020-0091, Enbridge Gas Additional Evidence, Exhibit B, para. 88.

<sup>25</sup> EB-2020-0091, Enbridge Gas Additional Evidence, Exhibit B, para. 89.

and stakeholders;<sup>26</sup> and (ii) seeks to solicit concrete input for Enbridge Gas planners to consider when assessing alternatives to resolve identified system capacity needs/constraints, through engagement with members of the public that are expected to be directly impacted.

31. During the first component of stakeholder engagement (gather and analyze data and insight from ongoing stakeholder engagement initiatives), Enbridge Gas will work within existing stakeholder engagement channels to inform regional growth projections, multi-year Demand Side Management (“DSM”) planning, municipal energy planning, and asset management planning efforts to understand the long term energy needs of its customers.<sup>27</sup> In addition, Enbridge Gas will also ensure that the second and third engagement components (discussion on IRP during Stakeholder Days and IRPA project geographically-specific stakeholder engagement) consider and reflect local municipal, First Nations, commercial (including builders and developers), and residential perspectives and feedback. It must not be lost, through these engagement activities, that Enbridge Gas remains accountable for the safe and reliable operation of its system and to ensure that ratepayers have firm access to natural gas supplies on a design day (the coldest day). The utility cannot abdicate this responsibility nor its contractual obligations to ex-franchise shippers on the Dawn Parkway system. For that reason, even while exploring the potential for investment in IRPAs, Enbridge Gas will also leverage its expertise in natural gas system planning in Ontario to put forward a facility alternative recommendation in case its investigations into IRPAs falls short and it is required to seek Board approval for LTC.

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<sup>26</sup> Examples of which may include local chambers of commerce and boards of trades and their members, local businesses owners and associations, and local LDC's.

<sup>27</sup> EB-2020-0091, Enbridge Gas Additional Evidence, Exhibit B, para. 89.

32. Enbridge Gas does not support EFG's recommendation that the OEB establish a planning committee, modeled on Vermont's System Planning Committee ("VSPC"), to secure input throughout the planning process from key stakeholders.<sup>28</sup> The VSPC is comprised of representatives of stakeholder groups with an interest in electric system reliability. While a formal consultative structure has been used by the OEB in the past for natural gas DSM processes (e.g., the Stakeholder Input and Consultation Process established as part of Board's DSM Guidelines for Natural Gas Utilities (EB-2008-0346)), when dealing with natural gas facilities planning where decisions to advance or delay projects are based on regularly updated growth projections, such a formal consultative structure may prove overly cumbersome to navigate given the complexities of system design and planning. Further, facilities planning process risks are not just financial, there is also potential for gas system outages if there are insufficient facilities in place. This is a risk that is not present for standard DSM programs, where the associated risks are financial. Having a consultative model in a process where the risks are much lower may have been appropriate for natural gas DSM in Ontario at one time, but it no longer reflects the norm for natural gas DSM in Ontario and is not appropriate for a process where the utility is ultimately responsible for ensuring it can meet the firm contracted needs of its customers on a design day. However, to be clear, Enbridge Gas strongly supports consultation, as evidenced by its Stakeholder Engagement plan.

33. Enbridge Gas's multi-component approach to Stakeholder Engagement is similar to the stakeholder engagements seen in the IESO Integrated Regional Resource Planning Process ("IRRP") in the sense that it seeks to be informed by public input, making it somewhat more familiar to Ontario stakeholders, and offering a balance of utility planning knowledge and external stakeholder input to inform natural gas IRPA

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<sup>28</sup> EFG Report, Section 4.2.4.

adoption in Ontario. However, unlike the IESO stakeholder model, Enbridge Gas proposes that development of natural gas IRPAs will be subject to OEB review and a litigated process following receipt of public input and consideration. This point is important as it offers an official and Board-led review of Enbridge Gas's IRPA projects and investments in a manner similar to facility infrastructure projects and investments in Ontario.

#### **4.0 Cost Recovery and Shareholder Incentives**

34. In its Report at page 51, Guidehouse recognizes the benefit of utilities being incentivized to invest in IRPAs above and beyond being allowed to capitalize the costs of and earn a regulated rate of return on investments in IRPAs similar to facility assets. Specifically, Guidehouse states:

By agreeing to EAMs, the utility is incentivized to achieve higher levels of performance in areas of interest beyond simply meeting baseline performance expectations, and often to achieve greater cost-effectiveness than required. A more traditional rate-recovery strategy does not provide the utility specific areas of focus, such as performance targets, or additional incentive to go beyond minimum savings or cost-efficiency requirements. The incentive theoretically provides more upside earnings potential to the utility to stimulate its efforts in meeting the established target.

35. EFG supports Enbridge Gas's proposal that the costs associated with an IRPA could be capitalized and rate based similar to the facility expansion/reinforcement projects that they serve to defer/reduce/avoid. In its Report, at page 47 EFG states:

However, the best incentive mechanism might be capitalizing and ratebasing non-pipe solution costs – or at least the costs associated with distributed energy resources, such as energy efficiency, demand response, and electrification.<sup>74</sup> That conclusion is based on three factors: (1) consistency with how utilities profit from traditional T&D investments; (2) experience with utilities that suggests this approach is most likely to result in senior management support for pursuing non-

pipe alternatives (when appropriate); and (3) simplicity – there is no need to perform calculations based on assumptions (e.g. changing avoided costs, savings lives, etc.) that can be debated, can fluctuate from year to year, and are often outside of the utility’s control. The specific details of this option would need to be designed to ensure that utilities have an incentive to implement the optimal solution (pipe or non-pipe) that it is the best solution for customers.

36. As set out in its Additional Evidence, Enbridge Gas proposes that the costs associated with investments in IRP be included in its revenue requirement.<sup>29</sup> However, Enbridge Gas also agrees with the findings of Guidehouse, that there may be a benefit to developing an incentive mechanism that ensures the utility is adequately encouraged to pursue IRPAs. Consistent with its Additional Evidence, Enbridge Gas reiterates that should the Board wish to encourage Enbridge Gas to prioritize investments in IRPAs, in order to meet certain established targets, then it could consider adding an incremental incentive for such successful investments (e.g., an incentive based on the net benefits achieved).<sup>30</sup>

## **5.0 Project Screening**

37. Enbridge Gas’s proposed staged screening process to review qualifying identified customer needs and/or system constraints for potential IRPAs balances the needs of ensuring: (i) that an optimized and economic solution is proposed to meet the identified need or constraint; and (ii) that assets are in place to safely and reliably meet peak period customer demands. Enbridge Gas proposes that screening be undertaken to determine which forecasted needs/constraints will undergo an IRP assessment based on the following criteria: safety, timing, project-specific considerations, customer-specific builds, and community expansion and economic development. The screening of virtually all projects identified in the asset

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<sup>29</sup> EB-2020-0091, Enbridge Gas Additional Evidence, Exhibit B, para. 74.

<sup>30</sup> EB-2020-0091, Enbridge Gas Additional Evidence, Exhibit B, para. 75.

management plan, as suggested by EFG, is not reasonably possible without dedicating exponentially increased resources to such work and without incurring substantial incremental administrative costs. Accordingly, the Board should proceed cautiously with regard to establishing its expectations around project screening in order to avoid committing ratepayers to significantly increased cost at the outset of natural gas IRP in Ontario, especially as the relative value or return on investment for such cost burden remains uncertain and unproven at this time.

38. EFG's Report argues that the Board should err on the side of greater latitude for IRPAs to ensure screening criteria do not rule out potentially viable projects. If the Board wishes to consider such recommendations it must also consider the nature and severity of outage risks in the IRP Framework for Enbridge Gas, as discussed in Section 6.0 below.

## **6.0 Risk**

39. Risk is an important piece of the discussion in evaluating IRPAs to meet a capacity need. Much is made of the fact that forecasts are inherently uncertain within the evidence of EFG.<sup>31</sup> While Enbridge Gas recognizes that all forecasts contain a degree of uncertainty, the known ability for facility alternatives to meet natural gas load forecast needs in Ontario is much greater than the known ability for IRPAs to meet those same needs. Further, the uncertainties associated with IRPA forecasted potential demand reductions are additive to the existing uncertainties in natural gas load forecasting, and potentially add new risks to Enbridge Gas's ability to deliver a reliable supply of energy to its customers as the supplier of last resort.

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<sup>31</sup> EFG Report, Section 4.4.2.4.

40. EFG argues that the Board should monetize various economic risks including environmental regulation uncertainty; peak demand forecast uncertainty; gas market price uncertainty; investment cost forecast uncertainty; and stranded asset risk. Throughout its discussion of economic risk EFG appears to be asking the Board to speculate, in the absence of any detailed evidence to support, based on fluid government policy direction,<sup>32</sup> that Enbridge Gas facilities will experience dramatic de-contracting. EFG has oversimplified this speculation by framing it in three finite scenarios. In fact, there are innumerable potential scenarios and Enbridge Gas believes that, in the absence of quantifiable factors or clear policy direction, its OEB approved forecasting methodologies represent the most reasonable basis from which to develop an IRP Framework for Enbridge Gas. The Board has a long and successful history of assessing the need for proposed projects as part of its review of applications for LTC. As part of those assessments and subsequent OEB decisions the Board considers government policy, market conditions, the load forecasts underpinning requested approvals by utilities, contracted demands, system operations, and stakeholder consultation and makes a determination on the prudence and relative reasonability of such proposals. These processes remain sufficient. If the Board allows for the monetization of economic risk based on the subjective and hypothetical grounds proposed by EFG then it risks supporting the development of an IRP Framework for Enbridge Gas that could make it unreasonably challenging to justify investment in any facility projects in the future, regardless of their economic benefits and without regard for the best interests of ratepayers.

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<sup>32</sup> <https://news.ontario.ca/en/statement/59395/province-marks-second-anniversary-of-made-in-ontario-environment-plan>. By the Ontario Governments own account they consider the Made-in-Ontario Environment Plan a living document that enables the Government to modify their plans as new challenges arise, such as COVID-19, and as new data and innovative technologies emerge, like low-carbon hydrogen.

41. Enbridge Gas agrees that where risk can be objectively quantified, where it is based on best practices, clear regulatory directives and/or government policy and legislation, it should be considered and/or monetized as part of IRP analyses. To this end, Enbridge Gas supports the approach articulated by Guidehouse, on behalf of OEB Staff:<sup>33</sup>

To the extent that the OEB is providing direction that may influence or be impacted by provincial environmental and policy goals, the OEB should clearly define their underlying assumptions regarding applicable provincial policy goals.

42. Enbridge Gas has more than a century of experience safely and successfully planning for, constructing, implementing and operating natural gas facility (pipeline, compression and storage) projects across the province of Ontario. This has enabled the Company to forecast infrastructure needs and their related costs with a high degree of confidence. Comparatively, given the novelty of investments in IRPAs, Enbridge Gas has less confidence in the ability to forecast the effectiveness and related costs of such investments with certainty. Enbridge Gas anticipates that as with investments in any novel technology or service, its understanding of and confidence in IRPA investments to serve the needs of its customers will increase over time with the benefit of both direct (through its own investments in IRPAs) and indirect experience (through continued learnings from the experiences of natural gas utilities in other jurisdictions).

43. Enbridge Gas and Ontario natural gas ratepayers have witnessed and been subjected to rapid and meaningful environmental policy changes in recent years. In the past five years alone, there have been drastic changes in government policy, that make reliance on long-term impacts of those policies, difficult at best, and, more

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<sup>33</sup> Guidehouse Report, p. 61.

often than not high risk in nature. These policy changes also came at significant administrative and regulatory cost to ratepayers.

- In 2016, the Ontario Government put in place a Cap and Trade Program, which became effective starting January 1, 2017. The OEB developed a Cap and Trade Framework (EB-2017-0363) in response to this program, which required natural gas utilities to file Compliance Plans annually for OEB review. Accordingly, Enbridge Gas (formerly EGD and Union) developed and filed Compliance Plans for 2017 and 2018 with the OEB. Over that timeframe, Enbridge Gas developed proposals to procure renewable natural gas (“RNG”) and to deliver a geothermal program.<sup>34</sup>
- In 2018, with the change in provincial government leadership, Ontario’s Cap and Trade program was formally cancelled – together with associated in-market incentive initiatives - and the utilities (Enbridge Gas Distribution Inc. and Union Gas Limited) commenced proceedings to unwind their respective Cap and Trade programs (EB-2018-0331). Furthermore, these changes effectively paused Enbridge Gas’s RNG procurement and geothermal programs in short-order.
- In 2019, as a result of the Cap and Trade program cancellation, the Federal Carbon Pricing Program (“FCPP”) (under the *Greenhouse Gas Pollution Pricing Act*) became applicable to Ontario, which had no other carbon emissions pricing regime in place post Cap and Trade Program cancellation. The FCPP set out a price per tonne of carbon emissions from 2019 to 2022. Because of the application of the FCPP in Ontario, a constitutional challenge was set in motion between Ontario and the federal government. This challenge, along with

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<sup>34</sup> EB-2017-0319, Enbridge Gas Distribution Inc. Renewable Natural Gas Enabling Program and Geothermal Energy Service Program, January 17, 2018 (Updated May 24, 2018).

challenges from other provinces, as well as First Nations groups, are before the Supreme Court of Canada with resolution not anticipated for some time. Furthermore, even in the case of the FCPP, carbon prices are set only until 2022 with no clarity on what happens after that date. Considering this, together with the overall volatility of carbon emissions policies since 2016 summarized above it is not reasonable for Enbridge Gas, or any other party, to speculate on increases to the cost of carbon emissions going forward beyond 2022. In addition, the lack of certainty on future energy efficiency programming, and timelines for introduction of new commercialized lower carbon technologies make forecasting carbon reductions even more challenging and unreliable.

44. Looking forward, the governments of Ontario and Canada, as well as those of many other jurisdictions, have set targets to reduce greenhouse gas emissions (“GHG”) and are at various stages of developing and implementing plans intended to achieve these targets. These plans typically include a variety of measures, some of which may see an increased use of existing natural gas infrastructure such as through the increase in blending of clean fuels such as RNG and hydrogen, and increased throughput of natural gas and blended clean fuels for electricity production and compressed natural gas (“CNG”) refueling stations. These plans also consider other factors such as affordability and resiliency, whereby using existing infrastructure to achieve GHG emissions reductions may be preferable as opposed to solutions such as electrification, which may be more costly.

45. Despite the establishment of GHG emissions reductions targets by the governments of Ontario and Canada, the ultimate path to achieving such reductions remains uncertain at the time of this submission. EFG’s Report recommends that Enbridge Gas provide a long-term forecast requiring vast speculation concerning future

government policy, climate change regulations and carbon emissions pricing and how the OEB may ultimately opine on future applications dealing with solutions such as hydrogen blending, RNG, DSM, community expansion and low carbon solutions that may impact natural gas demand. Only where the information concerning such policy and initiatives is known to be certain is it reasonable to forecast. Doing so based on a variety of hypothetical assumptions at a certain point in time, as recommended by EFG, would not produce information that is helpful or relevant to the Board in its review of future applications by Enbridge Gas for approvals related to either IRP or LTC investments as it would be entirely unreliable. Developing forecasts requires an extensive investment of time and resources at a significant cost to ratepayers. It stands to reason that completing incremental forecasts based on such speculative scenarios, as recommended by EFG,<sup>35</sup> would cost ratepayers multiple times the cost of Enbridge Gas's current demand forecast which is based on OEB-approved methodologies.

46. Enbridge Gas's continued focus is to serve the firm demands of its customers, and ensure its assets are available to meet its customers' immediate and long-term demand requirements on an annual and Design Day basis. Enbridge Gas recognizes that those assets may evolve in nature from solely pipeline infrastructure to a combination of pipeline infrastructure and IRPAs. For either pipeline or IRPAs, Enbridge Gas must be conservative in its forecasts, especially when it comes to monetization of economic risks like climate policy beyond the next few years given the uncertainties summarized above.

47. While EFG's evidence focuses upon economic risks, it only briefly acknowledges reliability risk. One immutable aspect of reliability risk that EFG's evidence neglects

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<sup>35</sup> EFG Report, Section 4.4.2.4.2.

to adequately address is the difference between the nature of outage risk between electrical and natural gas systems. Electrical systems are designed with an acceptable level of system outage risk, while natural gas systems are designed with a higher degree of reliability. Additionally, electrical outages are typically short in duration and the system typically re-energizes itself almost immediately after the issue causing the loss of power is resolved. Further, electrical equipment can simply be restarted by end users upon resolution. In the case of the natural gas system, if system operating pressure falls below minimum customer requirements, there may be widespread uncontrolled outages, which may result in the utility having to physically shut off each customer's gas meter. Once system operating pressures return there would need to be a process whereby the utility must manually reactivate each gas meter and relight and inspect all natural gas appliances in customer buildings. Potentially re-lighting many pieces of equipment during a peak demand period (coldest day of the year) would take a significant amount of time resulting in extensive costs and potentially carry with it other very serious consequences.<sup>36</sup> This important aspect of natural gas system outages must be taken into account in the development of any IRP Framework, as it drives Enbridge Gas's fundamental obligation to serve the firm contractual demands of its customers.<sup>37</sup>

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<sup>36</sup> EB-2020-0091, FINAL REPORT Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment, July 22, 2020, p. ES-12.

<sup>37</sup> The Board has previously acknowledged this risk of outage for example in its Decision on Enbridge Gas's (Union) Parkway West Project (EB-2013-0074) through which the Company sought approval to construct an Loss of Critical Unit ("LCU") compressor at Parkway West citing the elevated risk/impact of an outage on the Dawn Parkway System compared to electricity systems that serve the GTA. In its January 30, 2014 Decision the Board found at page 7 that, "The evidence clearly shows that the lack of LCU capacity at Parkway West represents a system reliability weakness in the Union system...A compressor failure at Parkway, in the absence of adequate LCU capabilities at that point, could have profound ramifications for the provision of gas service to central and eastern Ontario, as well as Quebec and other markets."

48. In terms of the broader natural gas system, all indications in the foreseeable future are that Enbridge Gas's natural gas infrastructure in Ontario will remain used and useful and the price of natural gas commodity in Ontario will remain low. This is especially true considering that development of RNG and hydrogen in Ontario and in many other jurisdictions is linked to maintaining high utilization of natural gas systems. Over time, natural gas can be blended with renewable fuels like RNG and hydrogen and paired with carbon capture and utilization technologies until such time when all or a portion of the market may be ready for 100% hydrogen.

### **7.0 Pilot Programs**

49. In its Report, EFG states that "...the Board should require Enbridge to begin planning to deploy two such pilot projects in 2021 with actual deployment of IRPA resources beginning no later than January 2022."<sup>38</sup>

50. Enbridge Gas agrees in principle with EFG's proposal to develop and implement two pilot projects. Pilot projects would provide the opportunity to test a number of elements associated with IRP and Enbridge Gas's IRP Proposal/Processes, including but not limited to: the design, review and assessment of IRPAs (including new and emerging technologies); procurement methodologies/strategy for IRPAs sought from existing competitive markets; the proposed stakeholder engagement model; proposed screening mechanisms and cost-effectiveness tests; and the ability to effectively and accurately measure actual achieved results of investments in IRPAs. Enbridge Gas could then apply the learnings from those pilot projects to future IRPAs.

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<sup>38</sup> EFG Report, Section 4.3.2.

51. Enbridge Gas proposes that the pilot projects be selected and implemented following the development and issuance of an IRP Framework for Enbridge Gas. Having a fully developed and approved IRP Framework will allow Enbridge Gas to better determine what projects are eligible for an IRPA assessment and how those projects will be treated from both planning and cost recovery perspectives. The stakeholder engagement process to inform these IRPA pilots would be aligned with Enbridge Gas's proposed multi-component Stakeholder Engagement plan and would allow for fulsome stakeholder participation from a multitude of parties impacted by the pilot projects.
52. The ultimate timing of the IRP proceeding and an IRP Framework for Enbridge Gas could delay the deployment of such pilot projects. The time required to properly design and deploy pilot projects, to estimate peak period demand impacts (with the peak periods typically occurring during the winter months) and identify projects where IRPAs may be relevant, is anticipated to take up to several months. As such, it may be very challenging to deploy/design two IRPA pilot projects in 2021, and to deploy IRPA resources no later than January 2022. A more reasonable timeline is to deploy/design two IRPA pilot projects by Q2 2022 and to deploy IRPA resources no later than Q3 2022. This would also allow Enbridge Gas to move resources currently focused on the IRP proceeding into planning for pilots.
53. Enbridge Gas expects to request incremental funding for the pilot projects once the Board has approved an IRP Framework for Enbridge Gas and the pilot projects have been scoped and selected.

# Appendix A

## Case Study: Ingleside

Geo-targeted Demand Side Management (DSM) Project  
[April 2020]

## Executive Summary

This report references the pre-amalgamation utilities, Union Gas Limited (Union), and Enbridge Gas Distribution Inc. (Enbridge), to distinguish between the legacy franchise areas and existing programs in market.

In 2018, a joint Enbridge/Union Integrated Resource Planning (IRP) study was completed as per the study scope put forward by Enbridge in their multi-year DSM plan. ICF completed the study which provided an initial assessment of the integration of supply and demand side options with regards to the planning process for Gas Utilities, specifically focusing on the intersection of DSM and facilities planning. The IRP Study was completed in response to the Ontario Energy Board's request for "natural gas utilities to consider the role of DSM in reducing and/or deferring infrastructure investments far enough in advance of the infrastructure replacement or upgrade so that DSM can reasonably be considered as a possible alternative".<sup>1</sup> Specifically, the Board directed that the utilities conduct an IRP Study and propose a transition plan and file both during the DSM mid-term review process. "The Board is also of the view that the gas utilities should each conduct a study, completed as soon as possible and no later than in time to inform the mid-term review of the DSM framework. The studies should be based on a consistent methodology to determine the appropriate role that DSM may serve in future system planning efforts."<sup>2</sup>

ICF's review of industry experience across North America showed minimal gas utility understanding of the potential impacts of DSM programs on peak period demand, with no jurisdictions at that time using geo-targeted DSM programs to actively avoid investing in infrastructure. Recommendations from the IRP Study included that additional research and pilot studies would support further understanding of the cost-effectiveness and implementation potential of DSM programs before DSM could be integrated into the standard utility facilities planning process. This report outlines the findings from a pilot study completed to better inform consideration of geotargeted DSM.

### Case Study Objective & Overview

Union selected the town of Ingleside Ontario to geo-target and designed the case study to explore two areas with regards to DSM programs:

1. Assessment of the impacts of geo-targeted DSM programs on reducing peak hour demand.
2. Assessment of the costs of geo-targeted DSM program implementation.

The following activities were undertaken to support the completion of this case study:

- Automated Meter Reading (AMR) technology was installed throughout Ingleside to allow for the collection and evaluation of hourly demand data and a baseline was established using Winter 2017 – 2018 data.
- A customized geo-targeted DSM program design and marketing strategy was developed to maximize market penetration of DSM program offerings within the town of Ingleside. Increased incentive levels and aggressive marketing tactics were used to increase awareness and in turn, drive incremental participation in DSM programs. These efforts were implemented in a phased approach based on gauging customer engagement and uptake in the program over

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<sup>1</sup> OEB, Report of the Board: Demand Side Management Framework for Natural Gas Distribution (2015-2020), pg.36, Dec. 22, 2014, available at: [https://www.oeb.ca/sites/default/files/uploads/Report\\_Demand\\_Side\\_Management\\_Framework\\_20141222.pdf](https://www.oeb.ca/sites/default/files/uploads/Report_Demand_Side_Management_Framework_20141222.pdf)

<sup>2</sup> OEB, Report of the Board: Demand Side Management Framework for Natural Gas Distributors (2015-2020), page 36

time. It was felt that increasing the number of participants would provide a larger dataset for analysis of DSM's impact on peak hour.

- Installation of energy efficient measures and DSM upgrades were completed before the end of 2018 to allow for the collection of data over the Winter 2018 - 2019 period and for comparison against the baseline from the previous winter.

### **Geo-targeted Program Results**

The influence of the geo-targeted campaign on DSM awareness and participant uptake in Ingleside was analyzed through a franchise-wide market research study that included an oversampling of Ingleside and the selected control city, Chesterville Ontario. The results from the survey showed an overall greater awareness of energy conservation and DSM programs in Ingleside (69%) relative to Chesterville (37%) and the Eastern District (54%).

In order to provide additional motivation for the residential Home Reno Rebate (HRR) offering, Union doubled the incentive for furnace and boiler replacements, which has been found to be one of the primary drivers of the program in general. Uptake of the HRR offering increased from 7 participants in Ingleside during the 2017 – 2018 program year (pre geo-targeted efforts), to 17 participants during the 2018 – 2019 geo-targeted program year; representing a 142% increase of participation. Results directionally demonstrated that the geo-targeted efforts increased awareness and participation in the residential DSM offering.

Low Income (LI) uptake increased from 2 Home Weatherization Program (HWP) participants from 2012 to 2018 (pre geo-targeted efforts), to 6 HWP qualified participants during the 2018-2019 geo-targeted program year, representing a 200% increase in participation. No additional incentives were provided to motivate potential customers since incentives for LI are essentially direct install.

Commercial uptake has seen 2 participants from 2009 to 2018, and with the geo-targeted campaign, only 1 customer showed interest. The offerings were adjusted to an increased incentive of up to 90% of total project cost (equipment and installation), but further uptake was not achieved. Various barriers to additional participation were identified including traditional equipment sales cycles, lack of available resources to investigate energy efficiency opportunities, and importantly, lack of available capital to invest in energy efficiency upgrades for small businesses.

There was no DSM activity with the single industrial contract customer, which accounts for approximately 70% of the peak hourly load on the Ingleside system. The customer has actively participated in the Custom program offering; with 9 capital/retrofit projects since 2009. However, they did not express interest in pursuing any energy efficiency projects for the year.

### **Geo-targeted DSM Impact on Peak Hourly Demand**

Key assumptions were used to process the hourly data and develop the various load profiles.

- The data was weather normalized, and the analysis was completed for peak design hourly loads.
- The sample size used in each analysis was derived from the removal of outliers and customers with missing data.
- Participants who completed upgrades in 2019 were not included, as a full set of winter data would not be available for comparison.

Between Winter 2017/2018, and Winter 2018/2019, the data showed a combined peak hour consumption increase of 2.3%, equivalent to 19m3/hr. The peak hour percent change for all DSM

participants showed an overall increase of 11.2%. This value is skewed by the one commercial customer who had an increase in peak hourly load of 19.7% in comparison to the previous year.

With a small sample size of participants and limited insight into the natural gas usage within the remaining homes, it is difficult to establish whether the peak hour changes can be attributed to typical fluctuations in data, behavioral changes, or other potential factors that impact gas usage.

The overall magnitude of the change from a peak load (19 m<sup>3</sup>/hr) perspective between the two winters is small and is insignificant in comparison to the single industrial customer's contracted peak hourly load. The disparity in overall consumption between the sectors indicates that in this instance, a focus on large volume customers would have been needed to facilitate a significant reduction in peak hourly demand. The risk of not realizing any industrial or commercial participation should be factored into the geo-targeted strategy. Additionally, the results from this case study only illustrate the impacts geo-targeted DSM had on the town of Ingleside and although informative and directional, the results cannot be generally applied due to the specific nature of customer composition.

### **Cost of Geo-targeted DSM Program Implementation**

ICF estimated that the cost per participant of implementing a geo-targeted DSM program would be estimated to be 1.5 to 2 times higher than typical DSM program costs.<sup>3</sup> The costs from the case study were compared against Union's broad-based DSM program costs. The magnitude of these costs would determine whether or not geo-targeted DSM programs can be considered cost-effective. The total cost of the geo-targeted DSM program in Ingleside for marketing and incentives was \$67,684. This cost does not include the ERTs and AMR installations, market research penetration study or the administrative time various teams spent supporting the case study.

From a marketing perspective, the spend in promoting the two residential programs (HRR and HWP) was 12 times more expensive than Union's traditional broad-based marketing. For the commercial prescriptive program, the spend was 99 times more expensive. This was a result of aggressive marketing tactics used to drive incremental DSM participants. From an incentive perspective, the incentive per incremental HRR participant was 2.2 times more expensive than the average incentive per mass-market participant. For the HWP program, there were no incremental costs associated as the existing incentives already cover the full cost of the upgrade for customers.

The tailored nature of the marketing and incentives for this case study resulted in significantly higher costs and could be considered to be prohibitively expensive given low percentage uptake compared to the population size and lack of incremental benefit generated.

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<sup>3</sup> *Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment page 147 - 148*

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## 1 Case Study Overview

Integrated Resource Planning (IRP) refers to a multi-faceted planning process that includes the identification, implementation, and evaluation of realistic natural gas supply-side and demand-side options (including the interplay of these options) to determine the solution that provides the best combination of cost and risk for our customers. The Ontario Energy Board has asked “natural gas utilities to consider the role of Demand Side Management (DSM) in reducing and/or deferring infrastructure investments far enough in advance of [the need for] infrastructure replacement or upgrade so that DSM can reasonably be considered as a possible alternative”.<sup>4</sup>

A joint Enbridge/Union IRP Study was completed by ICF to assess the extent to which DSM could be leveraged by the Gas Utilities to reduce future gas facility investments, and the associated strategies and barriers to doing so. ICF explained that additional research and hourly data by way of advanced meter reading, as well as pilot studies would be necessary to determine the cost-effectiveness and implementation potential of DSM programs before gas utilities would be able to rely on DSM as a potential means to reduce new infrastructure investments.

### 1.1 Objective

This case study was designed to explore two areas of DSM programs:

1. **The impacts of geo-targeted energy efficiency programs on natural gas use, specifically the impacts on peak hourly demand.** The peak hour for the Gas Utilities is typically from 7 a.m. to 8 a.m.; this is the period at which the maximum peak demand occurs at a utility system-wide level. The facilities for hydraulic pipe network are sized to ensure adequate system pressure and capacity on a peak hour at design temperatures, where design temperatures are based on the coldest historic winter conditions.
2. **The cost of geo-targeted DSM programs implementation.** ICF indicated in the IRP report that, based on available information, and on their experience with DSM program implementation, the costs for a geotargeted DSM program could be estimated at 1.5 to 2 times higher than typical DSM program costs.<sup>5</sup> These additional costs of geo-targeted DSM programs are a function of smaller program scale, the tailored nature of program offerings, and need for additional monitoring and evaluation.

### 1.2 Methodology

Automated Meter Reading (AMR) technology was installed throughout Ingleside to allow for the collection of hourly data. The evaluation of measured hourly demand data at a customer level allows for a better understanding of a customer’s hourly profile and the potential impacts of DSM on peak hourly demand.

Existing gas meters were retrofitted with Encoder Receiver Transmitter (ERT) meters with Itron enabled AMR technology in fall of 2017. This allowed for collection and storage of customer’s gas

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<sup>4</sup> OEB, *Report of the Board: Demand Side Management Framework for Natural Gas Distribution (2015-2020)*, pg.36, Dec. 22, 2014, available at: [https://www.oeb.ca/sites/default/files/uploads/Report\\_Demand\\_Side\\_Management\\_Framework\\_20141222.pdf](https://www.oeb.ca/sites/default/files/uploads/Report_Demand_Side_Management_Framework_20141222.pdf)

<sup>5</sup> *Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment* page 147 - 148

usage data on an hourly basis providing much greater data resolution than existing meters. Post ERT installation, a baseline was established from winter 2017 – 2018 data.

A customized, geo-targeted DSM program design and marketing strategy was implemented in efforts to increase the awareness of the energy efficiency programs within Ingleside and ultimately to drive incremental participation in DSM programs. This would allow Union to observe the impact DSM activity could potentially have on the peak hour.

Installation of energy efficient measures and DSM upgrades were completed before the end of 2018 to allow for the collection of data over the winter 2018- 2019 period for comparison against the baseline.

To understand whether the geo-targeted campaign had an impact on DSM uptake, awareness and customer’s attitude towards energy conservation, market research analysis was conducted via a Natural Gas Penetration Study that included an oversample of customers in Ingleside and a selected control city, Chesterville. Marketing analytics from the geo-targeted campaign were considered for Ingleside, relative to Chesterville and the surrounding district.

Using the hourly data obtained from the AMR, the impact on the peak hour demand was determined by comparing the peak hourly loads across the two winter periods. The analysis was completed at a customer level, as well as at an aggregate level since individual customers may not peak at the same time or day.

The cost effectiveness of the geo-targeted campaign was determined via the spend on marketing as compared to Union’s typical DSM marketing costs, as well as the cost per incremental DSM participant.

**Table 1: Ingleside Case Study Timeline**

<b>TIMEFRAME</b>	<b>ACTIVITY</b>
<b>Fall 2017</b>	AMR Installation
<b>Winter 2017 / 2018</b>	Hourly gas usage data collection to form a baseline
<b>Spring – Fall 2018</b>	Geo-targeted marketing campaign on existing DSM programs DSM installations & upgrades
<b>Winter 2018 / 2019</b>	Hourly gas usage data collection post geo-targeted campaign & DSM upgrades
<b>Spring – Winter 2019</b>	Analysis of results of DSM impacts on peak hour and costs of geo-targeted DSM implementation

## 2 Ingleside Overview

### 2.1 INGLESIDE DEMOGRAPHICS

The case study was conducted in Ingleside, in the Township of South Stormont, Ontario. Ingleside was selected after consideration of various factors including size and infrastructure.

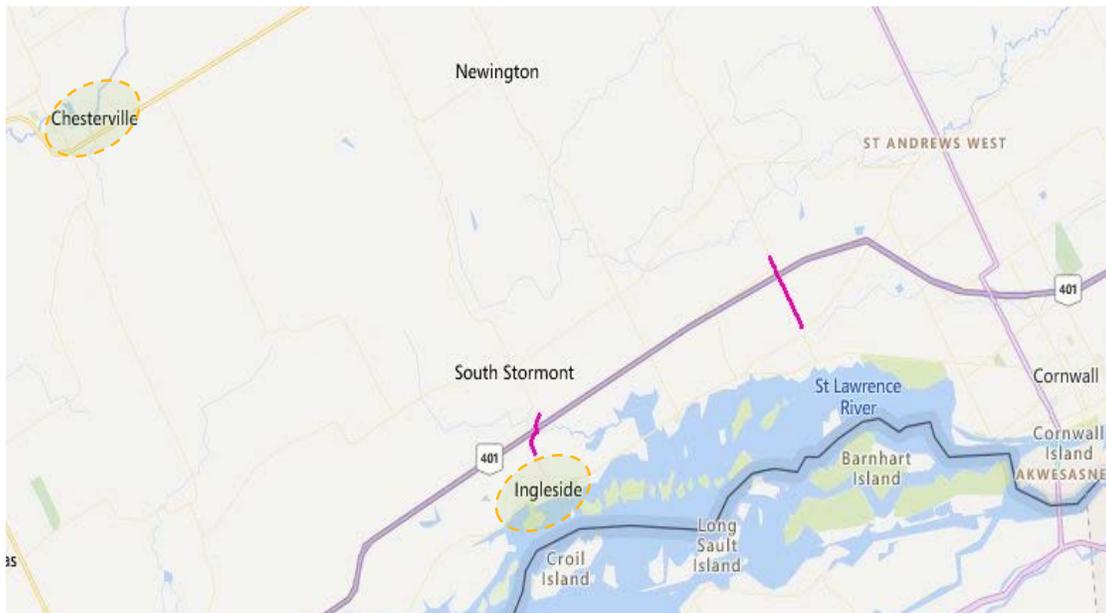
- A total of 748 customers are in the town of Ingleside. Within the customer base, there is a mix of residential (710), commercial (37), and industrial (1) customers.

- The system is single fed by a 3", 6895kPa Maximum Operating Pressure (MOP) line from a TC Energy tap, which provides an isolated system to observe the impacts of the geo-targeted DSM.
- Historical measurement data is available at the gate station, which allows for comparison of load observed on the system.



**Figure 1: System map of Ingleside**

A control city, Chesterville, was selected as part of the market research penetration study. Chesterville is located 30km north-west of Ingleside with similar demographic attributes, Table 2.



**Figure 2: Map of Chesterville and Ingleside**

**Table 2: Demographic Comparison of Ingleside & Chesterville <sup>6</sup>**

	<b>Ingleside</b>	<b>Chesterville</b>
Postal Code	K0C 1M0	K0C 1H0
Prizm5 Segment	47	47
Prizm5 Segment Name	Traditional Town Living	Traditional Town
Population (2016)	1384	1677
Average Age of the Population	48	43.6
Median Age of the Population	51.4	45.2
Total private dwellings	635	699
Single-Detached House	515	530
% Single-detached house	81%	76%
Average household size	2.2	2.4
<b>Household characteristics</b>		
Owner	76%	69%
Renter	25%	31%
Condos	5%	2%
<b>Period of Construction</b>		
Before 1960	31%	40%
1961 to 1980	40%	32%
1981-1990	10%	13%
1991-2016	17%	15%
Median total income of household	\$ 65,344	\$ 68,267
Citizenship (Canadian)	98%	100%
Visible minority population	1%	1%
Distance to Ingleside (km)	0	30

## 2.1.1 Ingleside Sector Potential

### Residential

There are 710 residential customers identified in the town of Ingleside. The mix of private dwelling homes include mostly single-detached homes, with 30 row homes and 70 apartment units. Approximately 80% of the homes were built pre-1990.<sup>6</sup>

### Low Income

Based on a study conducted in 2016, the low-income potential was found to be approximately 20% of the total amount of residential customers within Union's franchise area.<sup>7</sup> With respect to Ingleside, 27% of the residential market would be assumed to meet the Home Weatherization Program (HWP)

<sup>6</sup> Statistics Canada Census Profile, 2016 Census

<sup>7</sup> 2018 Residential Single Family Penetration Study

income requirements. After consideration for homes that are likely in need of energy efficiency upgrades, approximately 10% of the total population is expected to qualify for HWP.

**Commercial**

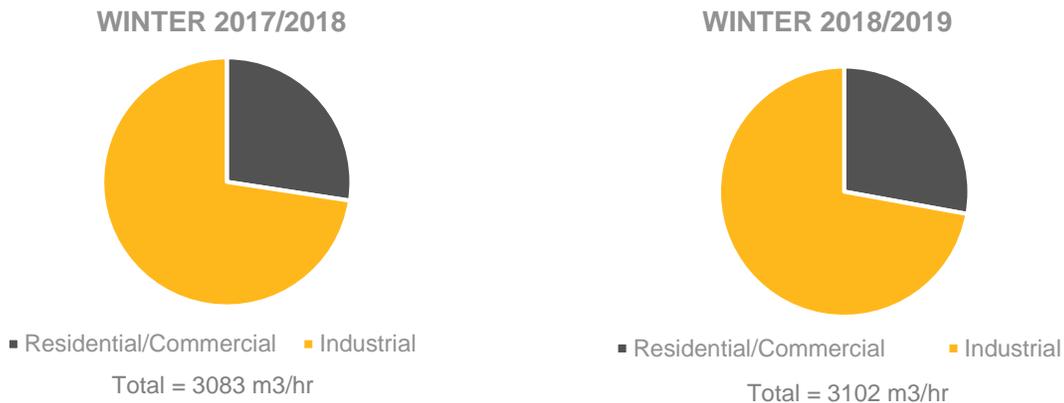
There are 37 commercial customers identified in Ingleside, ranging from the local school board, municipal buildings, and churches, to small retail businesses. Their consumption ranges from 1,000 to 40,000 m3/year, with an average consumption of 10,600 m3/year.

**Industrial**

There is one large industrial customer identified in the town of Ingleside. The customer has a firm contract load on the system, with existing hourly meter readings.

**2.1.2 Peak Hourly Load Breakdown**

The total system peak hourly load as based on information available at the gate station is approximately 3,100 m3/hr, with approximately 70% of this load consumed via the single industrial customer. There is minimal fluctuation in total load between winter 2017-2018 and winter 2018-2019 (Figure 3).



**Figure 3 - System Peak Hour Usage (m3/hr)**

**3 Geo-Targeted DSM Program & Marketing Strategy**

The geo-targeted DSM strategy was developed to provide full-access across all offerings and maximize market penetration of DSM program offerings to the town of Ingleside in order to drive incremental participation within one year. Each existing program on the market and their corresponding eligibility criteria was reviewed against the demographic and sector breakdown to identify which programs could be targeted in Ingleside. For instance, programs like Runsmart and Commercial Savings by Design would not see any eligible customers fit the program requirements. Four programs offerings had viable DSM opportunity, including: Residential, Low Income, Commercial & Industrial (CI) Prescriptive and Commercial & Industrial (CI) Custom.

Within each program offering, spend was allocated between incremental incentives and geo-targeted marketing. In terms of marketing, aggressive marketing efforts were used to target the Ingleside community in order to promote and generate greater awareness of energy efficiency and DSM programs. In terms of program design, there were no changes to the existing suite of DSM measures offered as part of the geo-targeted strategy. Instead, an increase in incentives/rebates for existing measures were offered where possible in order to drive an increase in participation.

The program design and marketing efforts were implemented in a phased approach based on real-time feedback from the uptake observed in the town. A strategic approach in spending between the two components was considered in order to provide an all-encompassing geo-targeted strategy with an overall focus of generating incremental uptake in the DSM programs, which would provide a larger dataset for subsequent peak hour analysis.

### **3.1 RESIDENTIAL PROGRAM**

#### **3.1.1 Program Design**

Union introduced the Home Reno Rebate (HRR) offering for its residential customers in 2012. HRR focuses on whole home energy savings by helping homeowners understand improvement opportunities throughout their home and encouraging them to install measures that generate long-lived energy savings. Union has partnered with third-party Service Organizations (SOs) to deliver the HRR offering across its program area and regularly conducts training sessions with SOs to provide updates about program eligibility, rebates and requirements, as well as training for using the proprietary software for submitting HRR applications. Certified Energy Auditors (CEAs) have been certified by Natural Resources Canada (NRCan) and leverage NRCan software to calculate homes' energy consumption. SOs also work with channel partners, such as HVAC contractors, to increase awareness of HRR and generate program leads.

#### **Incentives / Rebates**

HRR offers prescriptive rebates for upgrades in order to simplify marketing communications and to provide certainty to homeowners about their expected rebate payments. In addition to upgrade rebates, participants can earn a \$250 bonus rebate for each upgrade installed beyond the first two upgrades. Successful participants also receive up to \$600 for the energy assessments, which covers the full cost.

Rebates are capped at \$5,000 per home, which includes the rebates for energy assessments, upgrades, and bonuses. In addition to the \$5,000 maximum rebate, at the time, participants were eligible to receive rebates from IESO for electric appliances and heating and cooling equipment.

#### **Geo-targeted Program Design Strategy**

To increase demand for the HRR offering in Ingleside, a limited-time offer was introduced that doubled the incentive from \$1,000 to \$2,000 for replacing a natural gas furnace or boiler. This offer was available exclusively to the residential customers residing in the town of Ingleside who completed a pre-renovation energy assessment by December 31, 2018.

The furnace/boiler upgrade was selected for the rebate enhancement for the following reasons:

- The furnace represented a key lead-in entry point to the offer for participants both directly and via HVAC contractors. HVAC contractors represented a key referral source for the offering, and they could in turn leverage this enhanced rebate to further entice homeowners to select high-efficiency equipment and participate.

- The offer was launched in June 2018 to run until the end of December 2018, such that the enhanced furnace rebate would allow adequate lead time to develop marketing materials to build awareness in Ingleside prior to the fall season, which is the key timeframe for furnace replacement.
- The significant dollar value and simplicity of the furnace rebate was considered to be an attractive marketing tool to entice homeowners to participate in the offering.

### 3.1.2 Marketing

Broad-based marketing campaigns for the HRR offering are aimed at targeting residential customers aged 35-60 who have incomes that are considered to be middle class or upper middle class. Union employs a mix of digital media channels (paid search, display ads, Facebook ads) and traditional media channels (radio ads, newspaper ads, bill inserts) to promote the HRR offering. Digital media is targeted to all areas in the Union franchise area, whereas traditional media focuses on the larger metropolitan areas.<sup>8</sup>

Union also executes HRR marketing campaigns targeted to contractors, who have consistently been identified as a key referral source for the HRR offering. Union uses mainly digital ads for this segment (paid search, display ads, Facebook ads, LinkedIn ads), but also supplements this with some traditional advertising (trade magazines).

### Geo-targeted Marketing Strategy

Traditional marketing tactics were used for promoting HRR, including:

- Digital Ads/ Paid Search  
Targeted digital marketing tactics, including paid search, display ads, and Facebook ads, were deployed to Ingleside residents between September 3 and December 31, 2018. The timeframe was selected because it aligned with the heating season. This is the most common time for homeowners to make energy-efficient upgrades, such as replacing their furnace or boiler, as they get ready for the coldest months of the year. The digital and Facebook ads emphasized the limited-time offer of a \$2,000 heating system rebate.

Digital ads have the ability to geo-targeted only Ingleside residents, which allows the ad to be tailored specifically for them, (Appendix 8.1, Figure 7). Although the demographics show the older population in Ingleside, digital ads can target the more tech-savvy residents at a lower cost compared to other media channels.

Additional geo-targeted marketing efforts towards Ingleside residents were also considered, with direct mail being the primary source for promoting the enhanced HRR incentive offering for heating systems:

- Direct Mail  
All residential customers in Ingleside received direct mail to promote the HRR offering, (Appendix 8.1, Figure 6). This marketing was completed in conjunction with the Low Income offering, which together targeted all residential customers within Ingleside.

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<sup>8</sup> These include Brantford, Burlington, Chatham, Hamilton, Kingston, London, Milton, North Bay, Oakville, Sarnia, Sudbury, Thunder Bay, Waterloo, and Windsor.

Although direct mail is a more expensive marketing tactic and not typically used for mass marketing, it was considered an effective method to deliver the customized Ingleside offer to the entire residential market. Direct mail is considered a more effective method for targeting customers aged 55-74 when compared to customers aged 18-54.<sup>9</sup> Customers with lower household incomes (less than \$40,000) are more likely to prefer direct mail than those with higher household incomes (greater than \$80,000).<sup>10</sup> These preferences align with the demographics of Ingleside where the median age of Ingleside residents is 10 years older than the median for Ontario, and where median total household income is approximately \$9,000 less in Ingleside compared to Ontario.<sup>11</sup>

- Local Community Event

To promote the DSM programs within the Ingleside community, Union set-up a promotional booth at the annual Firefighter's Association community event on Saturday, July 21, 2018 to promote the available DSM program offerings. In addition to a representative from Union's Residential Sales team, three representatives from the SOs were in attendance to promote the offer and answer questions. Union distributed an HRR flyer promoting the limited-time \$2,000 heating system rebate exclusive to Ingleside residents (Appendix 8.1, Figure 8). The primary call to action was to phone the SO to book a pre-renovation energy assessment. The secondary call to action was to visit the dedicated Ingleside HRR webpage to learn more about the pilot and rebates available. Approximately 50 people engaged with the booth to learn more about the programs.

## 3.2 LOW INCOME PROGRAM

### 3.2.1 Program Design

Union introduced the Home Weatherization Program (HWP) offering in 2012. The program offers free energy assistance upgrades to income eligible customers in need of home efficiency upgrades. Applicants are required to have an active natural gas account, be responsible for paying the gas bill, and meet household income requirements.

The HWP offers free insulation for basement, attic, and walls to meet the building code. Other basic energy savings measures are also offered, including: draft sealing, low flow shower heads, smart thermostats, basin aerator, pipe insulation and CO monitors. The program is administered by a third-party service provider, which handles the various steps of the program process.

To qualify for the HWP, a household must meet the income criteria based on the Low Income Cut Off (LICO) as outlined by Stats Canada.<sup>12</sup> Customers receiving certain government assistance programs automatically qualify for the program as well.

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<sup>9</sup> 2017 PMG Syndicated Study on Consumers Views on Energy Conservation

<sup>10</sup> 2009 Union Gas Residential DSM Segmentation Study

<sup>11</sup> Statistics Canada Census Profile, 2016 Census

<sup>12</sup> Statistics Canada. Table 11-10-0241-01. Low income cut-offs (LICOs) before and after tax by community size and family size, in current dollars

### Geo-targeted Program Design Strategy

There was no incremental incentive offering included as part of the geo-targeted strategy as the HWP is already offered at no cost to customers.

### 3.2.2 Marketing

Union employs a mix of digital and traditional media channels for marketing the HWP offering across the franchise area. Digital channels include social media, display ads, and paid searches. Traditional channels include newspaper ads, bill inserts, and radio. Targeted marketing also occurs through direct mail at postal codes where residents are likely to meet income and home criteria for HWP and is one of the main methods of lead generation.

### Geo-targeted Marketing Strategy

Additional geo-targeted marketing efforts towards Ingleside residents were considered to increase awareness of the HWP program.

- Direct Mail

All residential customers in Ingleside received direct mail to promote the HWP offering, (Appendix 8.1, Figure 9). This marketing was completed in conjunction with the Residential HRR offering, which together targeted all residential customers within Ingleside to ensure the full market was captured. The direct mail was sent with a promotional letter and a brochure, which explained the eligibility requirements and application process of the HWP offering.

- Firefighters Association of Ingleside Launch Event

To promote the DSM programs within the Ingleside community, Union set-up a promotional booth at the annual Firefighter's Association community event on Saturday, July 21, 2018. Informational brochures on all the programs were available and third-party community engagement representatives were present to answer questions.

## 3.3 COMMERCIAL AND INDUSTRIAL PRESCRIPTIVE PROGRAM

### 3.3.1 Program Design

Union offers a prescriptive program for Commercial and Industrial (CI) customers that provides a list of recommended efficient technologies and equipment that have a pre-determined incentive. Measure incentives are available on a variety of space heating, water heating, and food service technologies. All CI customers are eligible to participate in this offering.

### Geo-targeted Program Design Strategy

An additional incentive offer was provided in an effort to increase program uptake from the commercial customers identified in the area. A 50% incremental incentive on top of the standard offer was implemented. The offer was available on any C/I prescriptive equipment installation, up to a maximum of \$3,000 per building.

Initial uptake for the offer was not as expected and did not generate action. In response to the lack of uptake, a second offer was developed in October 2018 to target a specific measure that was broadly applicable. A third-party vendor was deployed to visit each customer site to extend the offer, assess

measure opportunities and provide a quote. This second offer included Pedestrian and Shipping Door Air Curtains with a rebate of up to 90% of the total project cost (equipment cost and installation).

### 3.3.2 Marketing

All CI customers are eligible to participate in the prescriptive offering, but a segmented approach to market is used to target similar business profiles with customized communications on the most relevant measures to each segment. Within each segment, Union identifies and targets customers through direct and indirect delivery models. Traditional marketing tactics include large-scale media campaign such as bill insert communications, digital advertising (i.e. online ads, utility website), or via local service providers.

#### Geo-targeted Marketing Strategy

Additional marketing and outreach were deployed to reach the business decision makers directly with more lucrative offers to breakdown financial barriers to participation, as well as to create a turn-key solution to encourage action. Due to the small number of eligible customers, marketing efforts were highly targeted via direct mailings, one-on-one interaction with an Account Advisor and a third-party vendor. A variety of communication and outreach tactics were deployed to engage decision makers at each of the businesses and to promote the limited time, increased incentive offering:

1. Direct Mail:

The first direct mail was sent in late May 2018 to all eligible commercial customers. The package included a customized letter that highlighted the incremental offer, and a brochure that detailed all the prescriptive technologies included in the offer and the available incentive for each technology. The letter also informed recipients of the September 30, 2019 registration deadline. The registration deadline was implemented to measure customers' engagement with the offer.

2. Direct promotion via Union Account Advisor

Following the mailing of the first direct mail package, the local area Account Advisor contacted each commercial customer and promoted the offer, as well as assessed the energy efficiency needs of each individual customer.

3. Direct Mail #2

A second direct mail was sent in late July 2018. This direct mail consisted of a multi-panel insert that served as a reminder to customers of the offer and the registration deadline.

4. Direct promotion via Third-party Vendor

Following the development of the second offer, each customer received a visit from a third-party vendor to promote the updated offer of up to 90% of the total project costs for Pedestrian and Shipping Door Air Curtains.

## 3.4 COMMERCIAL & INDUSTRIAL CUSTOM PROGRAM

### 3.4.1 Program Design

Union offers a custom program for large commercial and industrial (CI) customers that funds eligible studies, meters, and training to identify energy-saving opportunities and includes incentives to implement proven measures that reduce energy use and increase business efficiency. Equipment and process optimization projects, including new and retrofitted applications, are funded based on the

natural gas savings specific to each project. Each customer in this portfolio is assigned an Account Advisor, who then works with each of these key accounts individually to promote available DSM incentives and provide support on any energy efficiency projects.

### Geo-targeted Program Design Strategy

There was only one industrial customer located within Ingleside that was eligible under the CI Custom program. The Account Advisor reached out on various occasions to engage the customer; however, the customer did not express interest in participating in any energy efficiency projects for the year. Large industrial customers typically have longer planning and budget cycles that make it difficult to move projects earlier even with increased incentives and funding. As a result, there was no geo-targeted DSM activity for this program offering.

## 4 Market Analytics & Geo-targeted DSM

### 4.1 MARKET RESEARCH

Union solicited feedback from Ingleside residents and program partners throughout the case study to better understand the influence of the geo-targeted marketing campaign. This feedback was collected in various ways to allow Union to better understand customers' decisions and satisfaction with the program offerings.

#### 4.1.1 Natural Gas Penetration Study

Union conducted an annual Natural Gas Penetration Study that identifies the type and fuel source of equipment and appliances in homes in Ontario. This study was conducted among single family customers across the entire Union franchise area, and was last completed in November 2018, following the geo-targeted DSM campaign. Customers in the towns of Ingleside and Chesterville were included as an oversample in this study in an effort to better understand the equipment within their home, as well as their attitudes towards energy conservation, and awareness of Union's DSM programs. Chesterville was selected as part of the oversample because it showed similar demographic characteristics to Ingleside and could be used as a control city. All Ingleside and Chesterville customers were contacted to participate in the research. In Ingleside, 62 customers participated in the telephone survey, and in Chesterville, 43 customers participated, however not all customers were willing to be identified alongside their results.

Some specific results related to awareness of energy conservation and DSM programs from the survey indicate the following:

- Customers in Ingleside are significantly more likely to have plans to make their home more energy efficient in the next 2 years.

Plans to make home more energy efficient in the next 2 years? (% yes)	
Ingleside (n=62)	34%*
Chesterville (n=43)	28%
Eastern District (n=93)	25%
Union Gas (n=1,217)	23%

\* Indicates a statistically significantly result in comparison to the total (Union Gas)

- Awareness that Union offers energy conservation and efficiency programs is higher in Ingleside compared to both Chesterville and the Eastern District. Depending on the program, awareness is slightly higher in Ingleside compared to Chesterville and the district.

Aware that Union Gas offers Energy Conservation & Efficiency Programs (% yes)		
Ingleside (n=62)	69%	
Chesterville (n=43)	37%	
Eastern District (n=93)	54%	
Union Gas (n=1,217)	65%	
Among customers aware of programs, specific programs aware of ...		
	HWP	HRR
Ingleside (n=43)	58%	77%
Chesterville (n=16)	44%	75%
Eastern District (n=50)	50%	67%
Union Gas (n=796)	59%	70%

## 4.2 RESIDENTIAL PROGRAM

### 4.2.1 Geo-targeted Marketing Results

#### Direct Mail

Union sent direct mail to all residential customers in Ingleside in September 2018. The call to action on the mailer was to visit the dedicated Ingleside HRR webpage.<sup>13</sup> There were 128 visitors who directly typed the URL from the mailer into their web browser indicating that these visits were generated through the direct mail. These visitors spent an average of 4 minutes and 34 seconds on the Ingleside HRR webpage compared to an average session duration of 27 seconds for the mass market campaign. This high average time on the webpage for the fall digital Ingleside campaign suggests that the direct mail more successfully piqued homeowner's interest in the HRR offering and that these leads were more engaged with the web content.

#### Digital Marketing

The results of the geo-targeted fall digital marketing campaign between the different ad formats were compared, Table 3. The paid search campaigns performed the best with the highest click-through rate of all the digital tactics; however, the amount of overall traffic was small due to the limited target size. The display ads generated the largest number of impressions and had the lowest cost per click of all the digital tactics. However, the low click-through rate indicates that some users were being served multiple instances of the Ingleside ads. The Facebook ads had fewer impressions than display ads but yielded a better click-through rate.

<sup>13</sup> [www.uniongas.com/ingleside](http://www.uniongas.com/ingleside)

**Table 3: Digital Marketing Campaign Results**

Ad Format	Impression	Engagement	Clicks	Click-Through Rate			Cost Per Click		
				Ingleside	Mass * Campaign	Benchmark **	Ingleside	Mass * Campaign	Benchmark **
Paid Search	8,852	N/A	57	0.64%	6.53%	1.00%	\$3.64	\$2.73	\$2.50
Display Ads	2,637,584	N/A	2,509	0.10%	0.19%	0.08%	\$2.68	\$1.17	\$0.63
Facebook Ads	392,811	17,945	1,289	0.51%	0.81%	0.90%	\$2.82	\$1.00	\$1.71

\*Digital tactics in Union’s mass market HRR campaign from Sept 4 - Dec 31, 2018

\*\* Benchmark data as provided by Ad agency based on industry guidelines for campaign performance

### Home Reno Rebate Past Participant Survey

Union conducts a monthly survey with customers who participated in the HRR program. All customers from Ingleside who participated in the program were included in this survey, and two interviews results were available, Table 4. These customers in Ingleside report high satisfaction with the program, and indicated they were aware of the limited time bonus offer.

**Table 4: Responses from HRR Participants in Ingleside**

Month of Interview	Customer Type	Main Heating Source	Aware of limited time bonus offer	Importance of bonus offer	Would have participated without bonus offer?	Overall experience with program	Likelihood to Recommend
Jan 19	Customer	Natural Gas	Yes	Very important	No, I would not have participated in the program	8	8
May 19	Customer	Natural Gas	Yes	Very important	Yes, I would have participated within the same time frame	8	9

### 4.2.2 Geo-targeted Uptake & Participant Results

The number of pre- and post-renovation energy assessments that were completed for customers in Ingleside during the same timeframe were compared across the two years, Table 5. In total, 17 homes in Ingleside qualified for the enhanced \$1000 geo-targeted offer by completing a pre-renovation energy assessment before the December 31, 2018 deadline. Post-assessments were to take place between June 1, 2018 and May 31, 2019, where two homes out of 17 were granted exceptions to be completed by August 30, 2019. In comparison to the previous program year (June 2017 to May 2018), 7 homes completed a pre and post-assessment. The doubling in participation would help support the notion that the geo-targeted efforts had an impact on the residential DSM offering.

**Table 5: Pre- and Post-Assessments Completed for HRR**

Timeframe	# of Pre- & Post- Assessments
2017 – 2018	7
2018 – 2019	17

Typical barriers and challenges residential customers face for participation in the HRR include:

1. Timing of heating equipment replacement  
 Replacement of failing or under-performing heating equipment is a major entry point to the HRR program, as HVAC contractors are a significant lead generator. If a homeowner is not planning to replace their heating equipment in a given year, then they are less likely to be aware of or participate in the program.
2. Competing home renovation priorities  
 Energy-efficient home upgrades, which are typically unseen (behind walls or in basements), compete with other design-focused priorities in the home, such as kitchen or bathroom renovations.
3. Upfront cost and perceived value of audit  
 The upfront cost of the energy assessments (typically \$600 for both assessments) is a barrier for some homeowners who are not in the financial position to wait months to recoup these costs in the form of a rebate cheque. Some homeowners do not perceive the value of the energy assessments to be worth the costs. Additionally, some homeowners may be concerned that they will not successfully complete the HRR program (due to eligibility issues or contractor delays), and therefore will not receive a rebate to offset the costs of their energy assessments.

### 4.3 LOW INCOME PROGRAM

#### 4.3.1 Geo-targeted Uptake & Participant Results

During the geo-targeted program year of 2018-2019, 10 homes in Ingleside completed the pre-assessment, where 6 of those customers were reviewed to be eligible. Since the launch of the HWP in 2012, only 2 customers have completed the program in Ingleside. This increase in uptake would help support the notion that the geo-targeted marketing efforts had an impact on the low-income DSM offering.

**Table 6: Pre-and Post- Assessments Completed for HWP**

Timeframe	# of Pre- Assessment	Qualified
2012 - 2018	2	2
2018 – 2019	10	6

## Home Weatherization Program Past Participant Survey

Similar to the HRR program, Union conducts a monthly survey with customers who participated in HWP to receive feedback on the program, Table 7.

**Table 7: Responses from HRR Participants in Ingleside**

Month of Interview	Customer Type	How did you first learn about the program?	Overall experience with program	Likelihood to Recommend
June 19	Customer	Bill insert	10	10 – extremely likely
August 19	Customer	Friend/ neighbor/ family member	10	10 – extremely likely

## 4.4 COMMERCIAL & INDUSTRIAL PRESCRIPTIVE PROGRAM

### 4.4.1 Geo-targeted Uptake and Participant Results

During the geo-targeted program year of 2018-2019, only 1 commercial customer participated in the Commercial and Industrial Prescriptive Program. Prior to 2018, two commercial customers had participated in DSM projects. The two projects consisted of two Condensing Boilers and a Demand Control Kitchen Ventilation (DCKV) system.

**Table 8: Customer Participation for CI Prescriptive**

Timeframe	# of Participants
2009 - 2018	2
2018 – 2019	1

The initial offer was launched at 50% additional incentive up to \$3000 per building and generated no uptake. As an attempt to overcome the barriers, the offer was redesigned to included up to 90% of the total cost of pedestrian or shipping door air curtains. Various barriers to participation were identified based on existing program experience and via the Union Account Advisor. Despite the attempt to address these barriers, the lack of participation could be attributed to one or a combination of the following challenges:

1. Equipment sales cycle:

Typical commercial sales cycle is approximately 6 to 9 months or longer depending on the procurement and approval process at each organization. This timing does not include awareness of the offer and generating interest to act.

To help overcome this, the marketing strategy consisted of multiple points of communication and promotional tactics to improve the sales cycle timeline and generate action. Tactics were monitored closely and adjusted when uptake was not evident.

2. Lack of available resources to investigate energy-efficiency opportunities

The prescriptive offers are not self-serve which means a customer must take action to engage a qualified service provider for purchase and installation, assessment for proper equipment size and installation to achieve savings.

To help overcome this, site visits were completed by Union Account Advisors (who can help direct customers to service providers in their area for the initial offer) and a third-party vendor (who provided a full-service solution for the second offer).

3. Lack of capital

A large portion of the commercial customers were small businesses that typically have minimal capital for unplanned upgrades that are not critically impacting day to day operations.

To help overcome this, a second offer was developed for Air Curtains that included a more lucrative incentive, delivered by a vendor who provided sale and installation – turnkey solution with high incentive. This second offer lead to one DSM participant.

## 5 Hourly Data Analysis

The facilities in a natural gas hydraulic pipe network are sized to ensure adequate system pressure and capacity on a peak hour at design temperatures, where design temperatures are based on the coldest historic winter conditions. The collection and evaluation of measured hourly demand data at a customer level, through the installation of AMR technology, allows for the analysis of customer profiles over the two winter periods. The granularity of the data also facilitates the assessment of the impact DSM programs may have on peak hourly demand.

### 5.1 ASSUMPTIONS & ANALYSIS METHODOLOGY

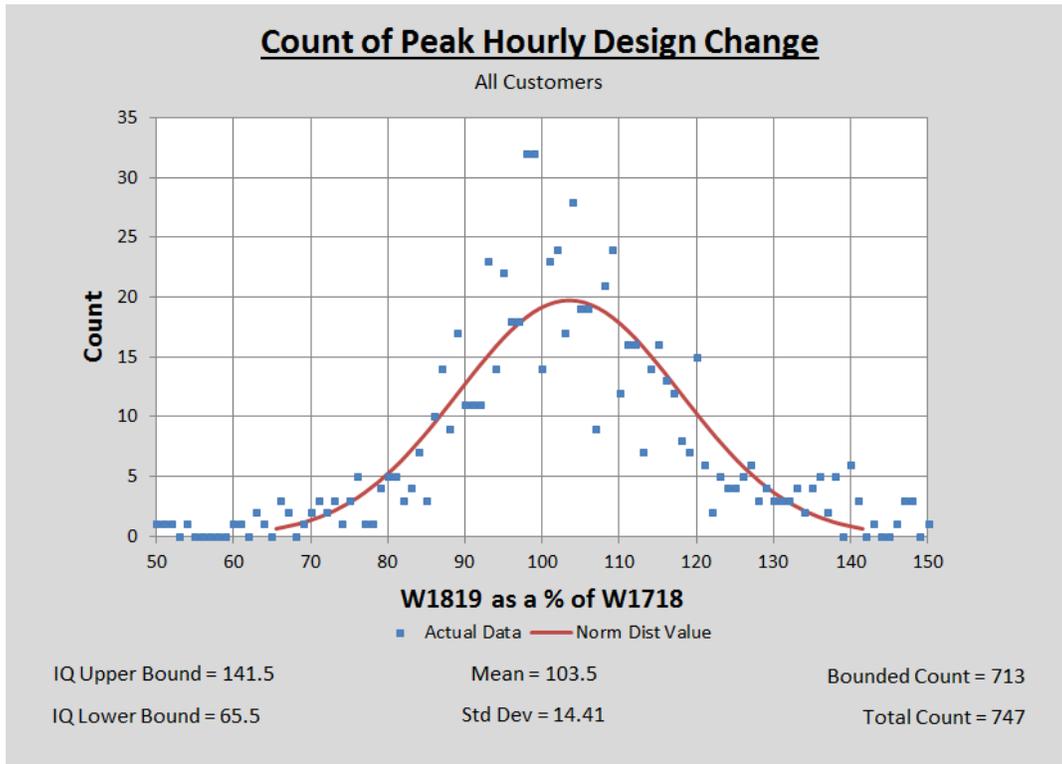
Gas utilities typically use actual monthly or daily consumption and the corresponding heating degree days (HDDs) to extrapolate and predict consumption on a design day. This design day value is then converted to a peak hourly value by a generic factor or a normalized hourly profile. Existing industry software is available to perform linear regression analysis on daily data. However, various assumptions were required as hourly data is not used in the industry, and existing industry software does not have the capability to handle hourly data.

A daily base temperature is used to calculate degree days and a design day temperature for facility sizing. They are typically based on the average temperature for the day which can range significantly from the warmest hour to the coldest hour. Since actual hourly flows and temperature were available, a design hour and a base hour temperature were needed. In order to ensure an unbiased comparison, the same hourly weather assumptions were used for both winter datasets.

Due to the lack of industry software, the hourly data captured in Ingleside was manually manipulated to so it could be processed as daily data. This involved slicing each customer's hourly usage into 168 virtual daily customers representing each hour of each day of the week (24 hr/day x 7 days/week). Once dissected, each actual hourly flow was plotted against the corresponding hourly temperature and linear regression was used to predict gas requirements at the design temperatures for each individual slice (every hour of each day).

Once all customers were reassembled, their Winter 2018/2019 (W1819) usage was expressed as a percent of their W1718 and was rounded to whole numbers to allow them to be grouped and counted,

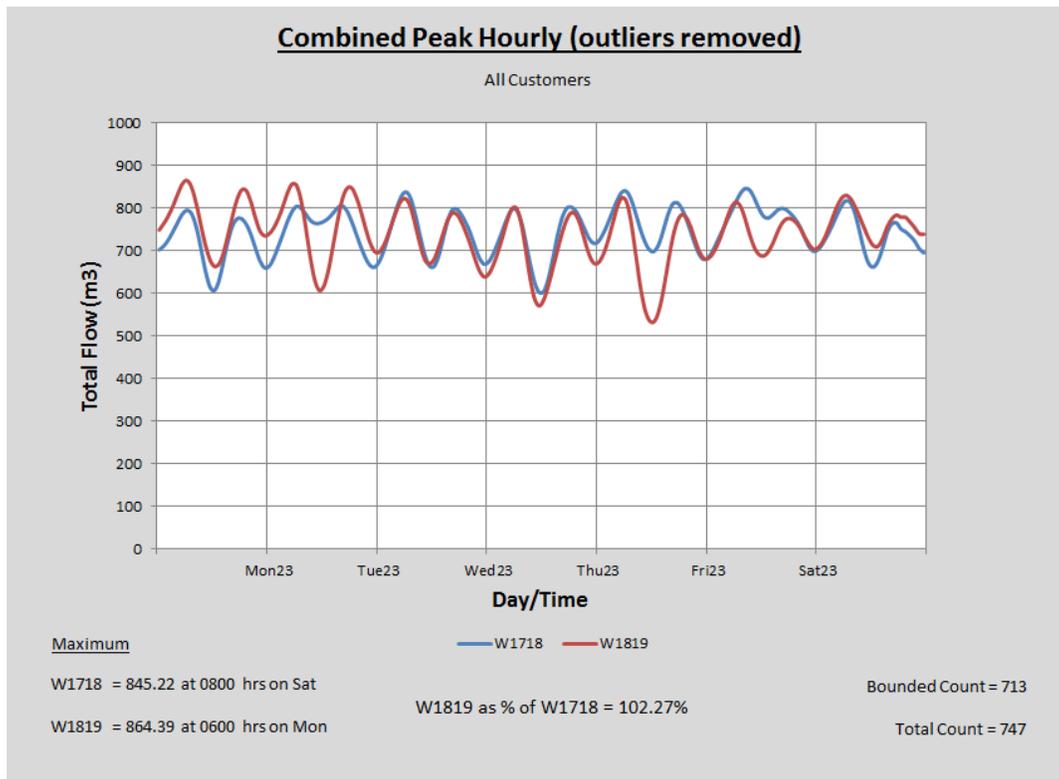
Figure 4. The comparison between both datasets (W1718 vs W1819) was performed using an interquartile range statistical method of removing outliers. The customers that remained after the removal of outliers were averaged to determine the overall change from one year to the next. This method was chosen to ensure impartial results based on the normal distribution of the data. Additionally, DSM participants who completed upgrades in 2019 were not included, as a full set of winter data would not be available for comparison.



**Figure 4: Count of Peak Hourly Design Change**

The combined peak hourly change was observed since individual customers may not peak at the same time or day. The combined peak hourly usage for W1718 & W1819 was plotted to observe the trends across the week, Figure 5.

Complete system verification was intended to help validate the various assumptions used in this study but unfortunately a low meter resolution at the large contract customer meter and missing data on their second large meter resulted in too wide of a possible error band to conclusively confirm the methodology. However, there were no red flags indicating the assumptions were significantly out of tolerance.



**Figure 5: Combined Peak Hourly (Week)**

## 5.2 PEAK HOUR DEMAND ANALYSIS

Ingleside customers were grouped together in several different combinations to observe the results of the geo-targeted efforts, Table 9. The combined peak hour consumption of all customers increased by 2.3%, equivalent to 19m<sup>3</sup>/hr.

The peak hour percent change for all customers who participated in DSM shows an overall increase of 11.2%. This value is skewed by the one commercial customer who showed an increase in peak hourly load of 19.7% in comparison to the previous year.

Due to the small sample size of DSM participants and lack of insight into natural gas usage and equipment within the remaining homes, it is difficult to draw conclusions as to whether these changes can be attributed to typical fluctuations in data (i.e. noise), behavioral changes, or other factors impacting gas usage.

The overall magnitude of the change from a load perspective is small, with an increase of 19m<sup>3</sup>/hr between the two winters and is insignificant in comparison to the single industrial customer's contracted peak hourly load.

**Table 9: Peak Hourly % Change**

Scenario	Peak Hourly Bounded Count (analysis sample size)	Combined Peak Hour % Change
<b>All Customers</b>	<b>713</b>	<b>2.3%</b>
All DSM Customers	6	11.2%
All non-DSM Customers	707	2.5%
<b>All Residential</b>	<b>679</b>	<b>4.1%</b>
All DSM Residential	5	4.0%
All non-DSM Residential	674	4.2%
<b>All Commercial</b>	<b>36</b>	<b>-12.9%</b>
All DSM Commercial	1	19.7%
All non-DSM Commercial	35	-11.3%

## 6 Cost of Geo-targeted DSM Implementation

ICF indicated in the IRP report that the costs for a geo-targeted DSM program could be estimated at 1.5 to 2 times higher than typical DSM program costs.<sup>14</sup> To determine the cost effectiveness, the costs from the case study were bucketed into either marketing or incremental costs, which was then compared to Union’s typical DSM program costs. The total cost of the geo-targeted DSM program in Ingleside for marketing and incentives was \$67,684. This cost does not include the ERTs and AMR installations, market research penetration study or the administrative time various teams spent supporting the case study.

### 6.1 GEO-TARGETED MARKETING COST COMPARISON

From a marketing perspective, the total marketing spend was divided by the available customer base to determine the marketing cost per customer. For the residential sector in Ingleside, promoting the HRR and HWP programs was 12 times more expensive than Union’s traditional broad-based marketing. This increase in cost per customer can be attributed to the geo-targeted direct mail strategy, although considered an effective marketing tactic, is more costly and would not typically be used on a larger scale.

For the commercial sector in Ingleside, promoting the commercial prescriptive program was 99 times more expensive than Unions’ traditional broad-based marketing. This significant increase in cost was due to the tailored approach of having an Account Advisor and Service Provider reach out to every commercial customer in the area to assess the energy efficiency opportunities. This was an attempt to address one of the barriers of participating in DSM programs, where customers may lack support and technical resources.

For both sectors, incremental costs were incurred to develop promotional material identifying the enhanced incentive offers. The costs for developing marketing material for a relatively small target size lends to overall higher costs when averaged per participant.

<sup>14</sup> *Natural Gas Integrated Resource Planning: Initial Assessment of the Potential to Employ Targeted DSM to Influence Future Natural Gas Infrastructure Investment* page 147 - 148

As the key focus of the marketing campaign was to increase awareness of DSM programs in order to generate incremental uptake in DSM programs for subsequent peak hour data analysis, highly aggressive marketing strategies were selected in order to maximize market penetration. This targeted marketing strategy was tailored to the sector breakdown specific to Ingleside, where this strategy cannot be generalized and could be even less cost-effective on a larger scale.

## 6.2 GEO-TARGETED INCENTIVE COMPARISON

From an incentive perspective, the total incremental incentive spend was divided by the incremental DSM participants achieved to determine the incentive cost per customer. For the HRR program, an incremental of 10 participants was achieved which translated to an incremental incentive of \$1550 per incremental participant; 2.2 times more expensive than the average incentive per mass-market participant. For the HWP program, there were no incremental incentives associated as the program is already offered at no cost.

For the commercial prescriptive program, only one customer participated; totaling \$1750 in incremental incentives for the one customer. Incentives were adjusted when uptake was not evident in an attempt to overcome barriers involving lack of capital, thus resulting in high incremental costs for this single participant. Offering up to 90% of costs would not be a cost-effective solution on a larger scale, but for the purpose of the case study and analysis of peak hour load, participation was the primary focus.

A cost per peak hour demand reduction (\$ per m<sup>3</sup>/h) could not be calculated as an increase was observed in the combined peak hour consumption.

## 7 Conclusions

At the request of the OEB, natural gas utilities were asked to consider the role of DSM in reducing or deferring infrastructure investments. Through that lens, Union designed the Ingleside case study to explore the potential impact of DSM programs on peak-hour demand and to understand the costs associated with geo-targeted DSM.

Automated Meter Reading (AMR) technology was installed in Ingleside as the existing system design was not capable of reading and collecting hourly data. Hourly data is integral for determining the impacts of the geo-targeted energy efficiency programs on natural gas use and allows for analysis on the impacts on the peak hour demand. At an industry level, there are currently no systems in place to process hourly data, so a manual regression analysis was designed and completed by utility staff. The findings from Ingleside suggest that advanced metering technology is a requirement for peak hour data and more work needs to be done to develop efficient systems for processing this data.

Though a small sample size, the data suggests that the geo-targeted marketing efforts did have an impact on program awareness. Through the design of aggressive marketing plans and increased incentives that targeted each market segment, a significant increase in customer awareness of energy efficiency and DSM programs within Ingleside was observed when compared to the control groups in Chesterville and the Eastern district. Additional uptake for both residential programs (HRR and HWP) programs offerings occurred when compared to previous years and could be attributed to the efforts of the geo-targeted campaign.

### **Geo-targeted DSM Impact on Peak Hourly Demand**

The peak hour demand impacts observed for all customers in Ingleside between the two winter periods showed an overall increase of 2.3%, which equated to 19 m<sup>3</sup>/hr. An overall increase in peak hour was observed for customers that participated in the DSM Program. The analysis involved a small sample size, and there is not robust enough data to understand whether changes to the peak hourly demand resulted from DSM activity or was due to behavioral and other influences. The combined magnitude of change from a peak hourly load perspective is small and is insignificant in comparison to the industrial customer's contracted peak hourly load.

The results from this case study only illustrate the impacts geo-targeted DSM had on the town of Ingleside and although informational and directional, the results cannot be generalized or extrapolated due to the variations and differences in customer base across the franchise. The small sample size of DSM participants, coupled by the small impact of the residential and commercial sector, makes it difficult to draw significant conclusions from these peak hour demand models. The difference in overall consumption between customers classes indicates that a more targeted approach to large volume customers is required to see meaningful changes in peak hour consumption

Future geo-targeted projects should include consideration for potential of not realizing any industrial or commercial participation, or potential changes in behavior of non-participants that could offset any expected load reductions. The risks of these projects need to be better quantified and evaluated in the process of determining whether non-pipe solutions are reasonable alternatives.

### **Cost of Geo-targeted DSM Program Implementation**

The geo-targeted approach when compared to traditional broad-based DSM offered by Union was significantly more expensive. In the IRP report completed by ICF, it indicated that the costs for a geo-targeted DSM program could be estimated at 1.5 to 2 times higher than typical DSM program costs. Based on the spend from the case study, geo-targeted marketing of the programs resulted in being 12 times and 99 times more expensive per customer for residential and commercial respectively. This was a result of highly aggressive marketing strategy with a focus on capturing the entire target market in an effort to increase awareness and drive incremental participation. The incremental incentive cost was \$1,550 per incremental HRR participant and \$1,750 for the single commercial participant in the commercial prescriptive program. It is difficult to tease out whether the incremental participation was driven by the targeted marketing efforts and/or by incremental incentives. Overall, the tailored nature of the marketing and incentives for this case study resulted in higher costs and would be prohibitively expensive given the low uptake generated relative to the population size.

Geo-targeted residential programing was a cost driver and the relative impact on demand was dwarfed by the lack of changes to the large industrial customer's demand. Large industrial customer's participation in a geo-targeted case study should be a key consideration to allow for more effective spend as there would be greater impacts to the system load.

## 8 Appendix

### 8.1 GEO-TARGETED MARKETING MATERIAL

Figure 6: HRR Direct Mail Material

Warm up this winter with the Home Reno Rebate program and **get up to \$5,000 back**

home reno rebate

In Ingleside, it pays more to get your home ready for winter

Union Gas offers the Home Reno Rebate program in partnership with the Government of Ontario and Save on Energy. Get up to **\$5,000 back** on energy saving upgrades, including a limited time offer of a **\$2,000 rebate** for upgrading a natural gas furnace or boiler.

**How to take advantage of the Home Reno Rebate:**

- 1 Call Eco Advantage Energy Advisors at 1-855-449-2387 before starting your reno.
- 2 Complete your pre-renovation energy assessment.
- 3 Review your assessment and renovation options with your energy advisor.
- 4 Complete at least two of the eligible renovations.\*
- 5 Call Eco Advantage Energy Advisors to complete your post-renovation assessment. They'll collect and submit all the necessary paperwork.

\*When hiring contractor, we recommend that you get at least three quotes.

A quick call is all it takes—call Eco Advantage Energy Advisors at 1-855-449-2387 to get started.

<p><b>Save money now</b>        Improve the energy efficiency of your home and get up to \$5,000 back for your renovations, plus electric appliance rebates.</p>	<p><b>Save money later</b>        Use less energy and save up to 50 per cent on your energy bill every year.</p>	<p><b>Boost your home's value</b>        Improving your windows, insulation and more make your home more attractive to buyers.</p>
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Including a limited time offer of a **\$2,000** natural gas furnace or boiler rebate for Ingleside residents

Don't miss out on this limited time offer, Ingleside  
 These savings are only available until December 31, 2018.

Take advantage of the Home Reno Rebate today  
 Call Eco Advantage Energy Advisors at 1-855-449-2387 for your energy assessment.

Visit [uniongas.com/amr](http://uniongas.com/amr) to learn more about eligible upgrades.

Figure 7: Sample HRR Display Ads

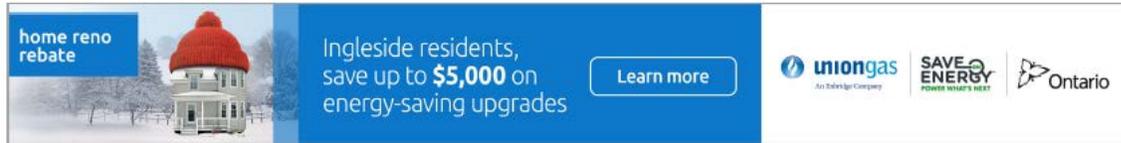


Figure 8: HRR Flyer at Ingleside Community Event

**home reno rebate**

**Bonus offer exclusively for Ingleside**  
 For a limited time, Ingleside residents can get \$2,000 back for upgrading their natural gas furnace or boiler

**Stay warm with heating system upgrades**

Union Gas offers a Home Reno Rebate program in partnership with the Government of Ontario and Save on Energy. With the bonus offer exclusively for Ingleside residents, customers participating in the program can get up to \$5,000 for energy-saving upgrades, including \$2,000 back for upgrading a natural gas furnace or boiler. Visit [uniongas.com/amr](http://uniongas.com/amr) to learn more.

**How do I get a reno rebate?**

- 1 Call to get a pre-renovation energy assessment.
- 2 Complete at least two eligible renovations.
- 3 Get a post-renovation assessment.

Call Eco Advantage Energy Advisors at 1-855-449-2387 to get started.

FIG- Limited time offer. Your pre-renovation energy assessment must be completed by Dec. 31, 2021. Some conditions apply. Please go to [uniongas.com/amr](http://uniongas.com/amr) for complete terms and conditions. This program is available to Union Gas in partnership with Save on Energy and the Government of Ontario. Available to all eligible homeowners whether they heat their home with gas, electricity, oil, propane or wood.

Printed on recycled paper using environmentally friendly inks. © Union Gas Limited 06/2019 10064

Figure 9: HWP Direct Mail Material

Brochure

**home weatherization program**

**At home**

Now's the time to take advantage of **FREE** home weatherization from Union Gas.

The program that has already helped more than 10,000 Ontario homeowners save money and energy can do the same for you — all absolutely no cost.

**Apply now. It's easy!**

Call our authorized contractor **GreenSaver** toll-free at 1-888-855-3106. To pre-qualify and apply to the program, you will need your Union Gas account number and a copy of your last income tax assessment or benefit statement.

OR

Visit [uniongas.com/weatherizehome](http://uniongas.com/weatherizehome) to complete the online application. More than 10,000 Ontario homeowners have already participated in the Free Home Weatherization Program from Union Gas.

**uniongas | home**  
An Enbridge Company

**Why not live where the climate is perfect all year round?**

**Are you eligible?**

Find out if you qualify for Free home improvements that will help you warm in winter, cool in summer, with lower energy bills all year round.

**Qualification requirements**

Household Size	Annual Household Income
One person	\$33,801 or less
Two people	\$41,932 or less
Three people	\$51,049 or less
Four people	\$60,166 or less
Five people	\$70,887 or less
Six people	\$80,000 or less
Seven people or more	\$98,136 or less

**Home eligibility**

Your home must be built before 1978, meet energy standards, and have a natural gas furnace that you pay the bill for.

You may also qualify if you receive assistance from any of the following programs:

- Ontario Works
- Ontario Disability Support Program (ODSP)
- U.S. Emergency Financial Assistance Grant
- Home Assistance Program (Electric Utility Partnership)
- Government Home Support (GHS)
- Allowance For Seniors
- Allowance For Survivors
- Health Credit
- Ontario Electricity Support Program

**What's in it for you?**

Greater home comfort, lower utility bills, and healthier air quality, all at no cost to you. Union Gas pays all costs associated with this program.

**What's in it for us?**

Insulate the walls after Ontario energy board, Union Gas is working to help the province meet carbon dioxide emissions reductions goals. See other a range of programs to help Ontario households save money and energy.

**What you get...**

- Free installation
- Free motivation
- Increased comfort year-round
- Energy savings up to 30%
- No cost to you

**home weatherization program**

Promotional Letter & Case Study

**home weatherization program**

**uniongas | home**  
An Enbridge Company

Dear Union Gas Customer,

If your home is wasting energy, we'd like to fix it. And pick up the bill.

Is your house cold and drafty in winter? Hard to keep cool in the summer? Are energy costs taking a big chunk out of the household budget? Homes that aren't well insulated place an unfair burden on the person who pays the bills. We can make your home more comfortable and reduce those energy bills by up to 30 per cent. And we can pay for it too.

**Home improvements that save you money without costing you any.**

In support of Ontario's energy conservation efforts, Union Gas is working with partners throughout the province to reduce residential energy use and lower costs. Through our Home Weatherization Program, we're helping income-eligible households install energy-saving upgrades, free of charge.

**The home weatherization program covers the costs of:**

- A Home Energy Assessment by a Certified Energy Auditor
- Insulation as needed, in your basement, walls and attic
- Water-saving products to lower your hot-water costs
- A programmable thermostat that adjusts the temperature when you're asleep or away
- A carbon monoxide detector to protect your family

Find out if you're eligible for the program that provides — and pays for — upgrades that will maintain the value of your home and save you hundreds of dollars in energy costs every year: the Home Weatherization Program from Union Gas.

Call our authorized contractor **GreenSaver** at 1-888-855-3106.  
 Or apply now at [uniongas.com/weatherizehome](http://uniongas.com/weatherizehome).

Yours truly,  
 Union Gas Limited

Please Note: This program will not affect income from government assistance programs. Union Gas pays all costs associated with this program.

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**Home Weatherization Program helps local family stay warm**

When Hamilton resident Paul found out that he could insulate his home free of charge through the Union Gas Home Weatherization Program, he didn't hesitate. "The house gets really hot in the summer and really cold in the winter, so I hoped it would help my heating bill in the long run," he explained.

Taking advantage of the program, which he learned about through a Union Gas community service partner, was a painless process for the homeowner. After meeting the Home Weatherization Program's eligibility criteria, he was put in touch with an authorized Union Gas contractor "They got the ball rolling," said Paul. An energy assessment of his house was scheduled, and a certified energy adviser confirmed that the attic, exterior walls and

basement of his home were under-insulated.

Within days, the team arrived to insulate the home. From start to clean-up, the work was completed in a single day. There was no charge for any part of the program — energy assessment, labour or materials. And the difference in home comfort was felt almost immediately. For Paul, living on a tight budget in an older home, the no-cost improvements were more than welcome, and he has already recommended the program to a friend.

**"I am going to be more comfortable but I am also going to save money, so it's kind of a double offer."**

"I couldn't believe this program. I am going to be more comfortable but I am also going to save money, so it's kind of a double offer."

To find out more about the Union Gas Home Weatherization Program go to [uniongas.com/weatherizehome](http://uniongas.com/weatherizehome).

# Appendix B

## Case Study: Deep River

Interval Data Analysis Project  
[November 2020]

## Introduction

This report references the pre-amalgamation utilities, Union Gas Limited (Union), and Enbridge Gas Distribution Inc. (Enbridge), to distinguish between the legacy franchise areas and existing programs in market.

In 2018 a joint Enbridge/Union Integrated Resource Planning (IRP) study was completed as per the study scope put forward by Enbridge in their multi-year DSM plan. ICF completed the study which provided an initial assessment of the integration of supply and demand side options with regards to the planning process for Gas Utilities, specifically focusing on the intersection of DSM and facilities planning. The IRP Study was completed in response to the Ontario Energy Board's (OEB or Board) request for "natural gas utilities to consider the role of DSM in reducing and/or deferring infrastructure investments far enough in advance of the infrastructure replacement or upgrade so that DSM can reasonably be considered as a possible alternative".<sup>1</sup> Specifically, the Board directed that the utilities conduct an IRP Study and propose a transition plan and file both during the DSM mid-term review process. "The Board is also of the view that the gas utilities should each conduct a study, completed as soon as possible and no later than in time to inform the mid-term review of the DSM framework. The studies should be based on a consistent methodology to determine the appropriate role that DSM may serve in future system planning efforts."<sup>2</sup>

ICF's review of industry experience across North America showed minimal gas utility understanding of the potential impacts of DSM programs on peak period demand, with no jurisdictions at that time using geo-targeted DSM programs to actively avoid investing in infrastructure. Recommendations from the IRP Study included that additional research and pilot studies would support further understanding of the cost-effectiveness and implementation potential of DSM programs before DSM could be integrated into the standard utility facilities planning process. This report outlines the findings from a pilot study completed to better inform consideration of geotargeted DSM.

The Ingleside Case Study outlines the findings from a pilot study completed to better inform consideration of geotargeted DSM, the findings of which are attached as Appendix A. While the Ingleside Case Study looked to investigate and further inform the understanding of the cost-effectiveness and implementation potential of DSM programs, Enbridge designed the Deep River case study to inform the understanding of peak hour consumption impacts. With Deep River Enbridge sought to further understand how individual customer demands on hourly intervals is reflected as gate station demands, and how individual metered consumption compares to estimated customer demand at the same temperature.

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<sup>1</sup> OEB, *Report of the Board: Demand Side Management Framework for Natural Gas Distribution (2015-2020)*, pg.36, Dec. 22, 2014, available at:

[https://www.oeb.ca/sites/default/files/uploads/Report\\_Demand\\_Side\\_Management\\_Framework\\_20141222.pdf](https://www.oeb.ca/sites/default/files/uploads/Report_Demand_Side_Management_Framework_20141222.pdf)

<sup>2</sup> OEB, *Report of the Board: Demand Side Management Framework for Natural Gas Distributors (2015-2020)*, page 36

## Collection of Hourly Interval Data

To support the scope of the case study, Enbridge installed encoder receiver transmitters (ERT) onto the existing natural gas meter sets in Deep River. ERTs are used to transmit data from the natural gas meters over a short range so a utility vehicle can collect meter data without a worker physically reading each meter, allowing for the collection of interval metering data. In total over 1550 ERTs (Itron 100G model) were installed in-field on existing customer meters via in-situ retrofit or during a standard meter exchange (MXGI/MXOT), as well as additional Meter Reading Hardware (MCLite/FC300) for in-field reading, and software configuration changes to allow for the collection and integration of the datasets.

Due to installation and software integration challenges the Deep River study was delayed to early 2020. As a result, the data that has been analyzed is from the period of mid-February to October 2020 capturing part of the 2020 peak load period but not its entirety.

## Preliminary Learnings

ERTs only transmit data on an hourly basis. More frequent data collection may be required to accurately assess and evaluate the impact of certain technologies on peak hourly consumption.

The installation and ongoing management of ERTs, or other smart technologies, is a significant endeavor in terms of the physical installations and the management of the collected data. And, given that the effort is considerable, and the information is only flowing one-way – which does not enable demand response type programming, Enbridge sees ultrasonic meters and automated meter infrastructure as highly preferable to enable future IRPAs.

## Next Steps

More consumption data and analysis are needed before drawing conclusions and applying learnings from Deep River to larger populations or network systems in the Enbridge franchise area.

Enbridge will continue to collect and analyze Deep River data over the winter 2020 / 2021 to develop an understanding of peak hour consumption impacts.

**FORM A**

Proceeding: EB-2020-0091

**ACKNOWLEDGMENT OF EXPERT'S DUTY**

1. My name is Michael Sloan .....(name). I live at Great Falls (city), in the .....state ..... (province/state) of .....Virginia..... .
2. I have been engaged by or on behalf of Enbridge Gas Inc. .... (name of party/parties) to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.
3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
  - (a) to provide opinion evidence that is fair, objective and non-partisan;
  - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
  - (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date November 17, 2020 .....

\_\_\_\_\_  
Signature 

**FORM A**

Proceeding: EB-2020-0091

**ACKNOWLEDGMENT OF EXPERT'S DUTY**

1. My name is Duncan Rotherham.....(*name*). I live at Toronto..... (*city*), in the province..... (*province/state*) of Ontario.....
  
2. I have been engaged by or on behalf of Enbridge Gas Inc...... (*name of party/parties*) to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.
  
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  - (a) to provide opinion evidence that is fair, objective and non-partisan;
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  - (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.
  
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date November 17, 2020.....



\_\_\_\_\_  
*Signature*

**FORM A**

Proceeding: EB-2020-0091

**ACKNOWLEDGMENT OF EXPERT'S DUTY**

1. My name is John Dikeos (name). I live at Ottawa (city), in the province (province/state) of Ontario .
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  - (a) to provide opinion evidence that is fair, objective and non-partisan;
  - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
  - (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date November 17, 2020



Signature

**FORM A**

EB-2020-0091  
Proceeding:.....

**ACKNOWLEDGMENT OF EXPERT'S DUTY**

1. My name is Vincent Dufresne.....(name). I live at Montreal..... (city), in the province..... (province/state) of Quebec..... .
  
2. I have been engaged by or on behalf of Enbridge Gas Inc. .... (name of party/parties) to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.
  
3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
  - (a) to provide opinion evidence that is fair, objective and non-partisan;
  - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
  - (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.
  
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date November 17, 2020.....



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Signature