

K1.2

EB-2017-0224  
EB-2017-0255  
EB-2017-0275

**ONTARIO ENERGY BOARD**

**IN THE MATTER OF** the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15, Schedule B, as amended;

**AND IN THE MATTER OF** an Application by Enbridge Gas Distribution Inc. for an order or orders approving and/or accepting its 2018 Cap and Trade Compliance Plan and approving or fixing rates and/or charges to recover the costs incurred undertaking its Cap and Trade Compliance Plan;

**AND IN THE MATTER OF** an Application by Union Gas Limited for an order or orders approving and/or accepting its 2018 Cap and Trade Compliance Plan and approving or fixing rates and/or charges to recover the costs incurred undertaking its Cap and Trade Compliance Plan;

**AND IN THE MATTER OF** an Application by EPCOR Natural Gas Limited Partnership for an order or orders approving and/or accepting its 2018 Cap and Trade Compliance Plan and approving or fixing rates and/or charges to recover the costs incurred undertaking its Cap and Trade Compliance Plan.

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**COMPENDIUM OF THE SCHOOL ENERGY COALITION**

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**Counsel for the School Energy Coalition**

**ONTARIO ENERGY BOARD**  
**IN THE MATTER OF** the Ontario Energy Board  
Act, 1998, S.O. 1998, c.15 (Sched. B);

**AND IN THE MATTER OF** an Application by  
Union Gas Limited, pursuant to section 36(1) of the  
*Ontario Energy Board Act, 1998*, for an order or  
orders approving rates resulting from the 2018 Cap-and-  
Trade Compliance Plan.

**APPLICATION**

1. Union Gas Limited (“Union”) is a business corporation incorporated under the laws of the province of Ontario, with its head office in the Municipality of Chatham-Kent.
2. Union conducts both an integrated natural gas utility business that combines the operations of distributing, transmitting, and storing natural gas, and a non-utility storage business.
3. On September 26, 2016, the Ontario Energy Board (the “OEB”) issued the Regulatory Framework for the Assessment of Costs of Natural Gas Utilities’ Cap-and-Trade Activities (the “Framework”). The OEB noted that the natural gas utilities are expected to file applications with their Compliance Plans by August 1<sup>st</sup> annually in order for the OEB to set rates to allow for the recovery of Cap-and-Trade compliance costs. In a letter dated July 27, 2017 the OEB stated that the natural gas utilities may file their 2018 Compliance Plans three weeks following the issuance of the OEB’s Decision and Order on the 2017 Compliance Plans, and in the event that a natural gas utility requires additional time prior to filing its 2018 Compliance Plan, it may request a further extension. In a letter dated October 3, 2017, Union requested a further extension for filing its 2018 Compliance Plan to November 9, 2017. In a letter dated October 11, 2017 the OEB granted Union an extension to file its 2018 Compliance Plan by November 9, 2017.
4. Accordingly, Union hereby applies to the OEB, pursuant to section 36 of the Act and pursuant to the Framework, for an order or orders approving or fixing just and reasonable rates and other charges for the sale, distribution, transmission, and storage of gas effective January 1, 2018. To meet this effective date, Union respectfully requests the OEB approve Union’s interim rates proposal as filed no later than November 30, 2017. Final rates will be filed with the OEB following the issuance of the OEB’s Decision and Order for this application.

5. Union further applies to the OEB for the following:
  - a. A determination that the cost consequences of Union's 2018 Compliance Plan are just and reasonable;
  - b. Approval of up to \$2 million in cost consequences associated with the Low Carbon Initiative Fund in Union's Greenhouse Gas Emissions Impact Deferral Account ("GGEIDA");
  - c. Approval of the Renewable Natural Gas mechanism and associated cost consequences no later than the end of January 2018; and,
  - d. Final approval of the 2016 balance in the GGEIDA.
6. Union further applies to the OEB for all necessary orders and directions concerning prehearing and hearing procedures for the determination of this application.
7. This application is supported by written evidence that has been filed with this application and may be amended from time to time as circumstances may require.
8. The persons affected by this application are the customers resident or located in the municipalities, police villages, and First Nations Reserves and Métis organizations served by Union, together with those to whom Union sells natural gas, or on whose behalf Union distributes, transmits, or stores natural gas. It is impractical to set out in this application the names and addresses of such persons because they are too numerous.
9. The address of service for Union is:  
Union Gas Limited  
P.O. Box 2001  
50 Keil Drive North  
Chatham, Ontario  
N7M 5M1  
  
Attention: Adam Stiers  
Manager, Regulatory Initiatives  
Telephone: (519) 436-4558  
Fax: (519) 436-4641

- and -

Torys  
Suite 3000, Maritime Life Tower  
P.O. Box 270  
Toronto Dominion Centre  
Toronto, Ontario  
M5K 1N2  
  
Attention: Crawford Smith

1 **1. OVERVIEW OF THE 2018 COMPLIANCE PLAN**

2 Union's 2018 Compliance Plan adheres to the Framework and is focused on achieving  
3 compliance with Cap-and-Trade regulations at a reasonable and prudently incurred cost for  
4 ratepayers while adhering to the Framework. Union's 2018 Compliance Plan reflects the  
5 September 22, 2017 announcement of the Ontario government's intent to link Ontario's Cap-  
6 and-Trade program with the WCI, effective January 1, 2018. While certain implementation steps  
7 remain outstanding to finalize linkage of Ontario with the WCI (as described in Section 2.1),  
8 Union's 2018 Compliance Plan reflects the assumption that linkage will proceed as announced.

9  
10 Union's 2018 Compliance Plan for customer and facility-related obligations is largely based on  
11 purchasing compliance instruments; [REDACTED]

12 [REDACTED]

13  
14 Union recognizes the importance of abatement in contributing to provincial GHG emission  
15 reduction targets, and that in the Framework Utilities are expected to contemplate abatement in  
16 their long-term plans. In completing the 2018 Compliance Plan Union has expanded its  
17 consideration about customer and facility abatement measures. Union has evaluated incremental  
18 energy efficiency opportunities, facilities abatement initiatives, as well as new technologic.  
19 Generally, these opportunities cannot be advanced, because they are not cost-effective at this  
20 time. Given that cost recovery within the existing regulatory mechanisms (whether that be DSM,  
21 gas supply procurement, or carbon procurement) is largely predicated upon prudence and cost-  
22 effectiveness, this represents a barrier to advancing these measures.

1 compliance plans. What initiatives fill the funnel, and move through its various stages, will  
2 ultimately be informed by market signals, policy, MACC, LTCPF, customer acceptance, and  
3 technology development status, among other inputs.

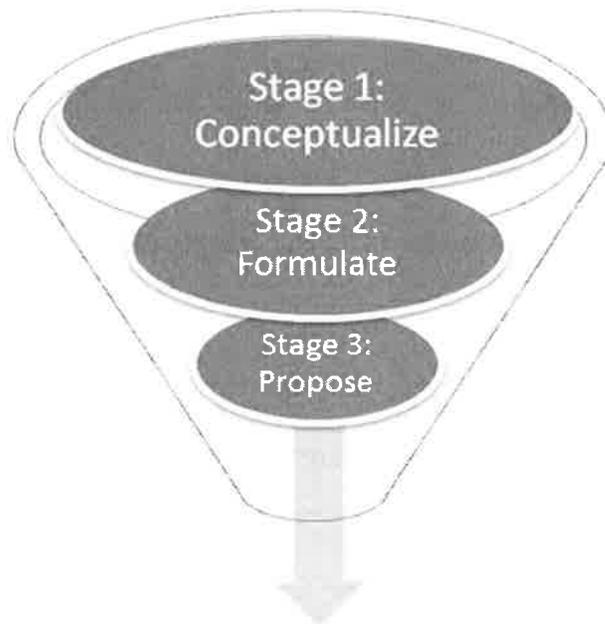
4

5 Initiative funnel activities are depicted in Figure 1 below.

6

Figure 1

### **Initiative Funnel**



7

8

Implementation

1 As ideas flow through the funnel, more details become known about a particular opportunity  
2 which then informs the utility to possible next steps to proceed.

- 3 • *Stage 1: Conceptualize* – In this stage, technology and/or abatement ideas are first  
4 identified and then explored for better understanding and applicability.
- 5 • *Stage 2: Formulate* – In this stage, ideas are taking shape and it is becoming clearer  
6 what the options may be for technology applications and/or programs. Pilot programs  
7 or targeted development tests may be completed to prove the technology or its possible  
8 applications. At this stage, the size of the opportunity, a range of costs, any funding  
9 requirements, and potential barriers to its development are initially investigated and  
10 quantified.
- 11 • *Stage 3: Propose* – In this stage, there is a clear understanding of the technology, how  
12 it can be applied, what the estimated costs and benefits are, and what GHG reductions  
13 may result. The utility has advanced the opportunity to a specific project for  
14 advancement.
- 15 • *Implementation* – Finally, the project is able to proceed to market. Results are  
16 monitored and reported, and the program may adjust based on learnings or changing  
17 conditions.

18  
19 Each stage of funnel activity will have associated resourcing requirements. In general, Union  
20 expects that the following considerations would be applied for determining recovery of prudently  
21 incurred costs related to the initiative funnel:

UNION GAS LIMITED

Undertaking of Ms. Flaman  
To Mr. Rubenstein

Reference: Tr.1, p.103

TO PROVIDE THE INTERNAL DOCUMENT SETTING OUT THE ABATEMENT  
CONSTRUCT, IF IT EXISTS.

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Response:

The development of the Abatement Construct (“AC”) was the result of a series of discussions in the months following Union’s 2017 Compliance Plan proceeding (May 2017) leading up to the completion of Union’s 2018 Compliance Plan (August 2017). The filed version of the AC represents the entirety of the AC; there are no other internal documents, meeting minutes or presentations that provide further detail.

UNION GAS LIMITED

Undertaking of Ms. Flaman  
To Mr. Quinn

Reference: Tr.1, p.104

TO PRODUCE FINAL MEETING MINUTES OF MEETINGS BETWEEN UNION AND ENBRIDGE TO DEVELOP AN ABATEMENT CONSTRUCT, INCLUDING ANY PRESENTATIONS USED TO FACILITATE THE MEETING OR MEETINGS.

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Response:

There are no minutes of meetings between Union and EGD related to the development of an Abatement Construct. Please see the response to JT1.19.

UNION GAS LIMITED

Answer to Interrogatory from  
School Energy Coalition ("SEC")

Reference: Exhibit 3, Tab 4, p. 13

Question: With respect to the proposed Low Carbon Initiative Fund:

- a) Please provide a breakdown of the proposed \$2M in 2018.
- b) Enbridge has proposed a similar fund. Please explain what type of coordination will be undertaken regarding the use of each utility's fund.
- c) Please discuss Union's position regarding a potential condition of approval that all research activities undertaken using these ratepayer funds should be made available to the public.
- d) Please confirm that there would be no subsequent review for prudence of the amount spent up to \$2M.

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Response:

- a) Please see the response at Exhibit B.Staff.21 b).
- b) Please see the response at Exhibit B.Staff.14 a).
- c) Union expects that initiatives that proceed to proposal for inclusion in the utility's Compliance Plan will be subject to the OEB process, and will therefore become public record as part of the regulatory filing. Therefore, such a condition of approval is not necessary.
- d) Union must have certainty of recovery in order to pursue new technology initiatives that serve to reduce future GHG emissions and related costs on behalf of ratepayers. Union seeks assurance from the OEB in this proceeding that actual LCIF costs will be deemed reasonable and consistent with the expectations established in the Framework if executed on the basis outlined in Union's application. Union expects that these amounts will not be subject to further review unless there is a change in circumstances that warrants review as determined by the OEB when they are filed for disposition.

UNION GAS LIMITED

Answer to Interrogatory from  
Ontario Energy Board Staff ("Staff")

Reference: Exhibit 3, Tab 4, pp. 10-12  
Exhibit 3, Tab 4, p. 14

Preamble: Union Gas states that each stage of Initiative Funnel activity will have associated resourcing requirements.

Union Gas also states that a Low Carbon Initiative Fund (LCIF), consisting of available funds of up to \$2 million per year, will provide funding to identify abatement ideas and move them through the stages of the Funnel, as well as enable the development of ideas that may require multiple years to reach commercialization. Union Gas indicates that the LCIF will be used for activities such as consulting, pilot programs, testing, data analysis, and measurement and verification.

Question:

- a) How does Union Gas currently identify abatement activities to pursue? What would change if the LCIF is approved? Please explain.
  - i. In 2017, did Union Gas undertake any activities that would, in 2018, fall within the ambit of the LCIF?
    1. If yes, please provide: a description of each activity; amounts spent on each activity in 2017; and whether those amounts are included in Union Gas' 2017 admin costs.
- b) Please explain what work Union Gas intends to undertake in 2018 with the LCIF, if approved.
  - i. Please explain how this work is related to the abatement activities proposed in the Initiative Funnel.
- c) Please provide details of expected resourcing requirements and costs associated with each stage of the Funnel, including implementation, for 2018.
  - i. Please explain whether these costs are incremental to Union Gas' forecast 2018 administrative costs.
  - ii. Please explain whether these costs are included in the proposed \$2M LCIF.
- d) Enbridge Gas and Union Gas filed a MAAD application (EB-2017-0306) with the OEB. Please explain whether, and if so how, Union Gas will realize any economies of scale in relation to resourcing requirements for activities being undertaken in relation to GHG abatement and activities funded by the LCIF.
- e) Please explain what will happen if the OEB does not approve the \$2M LCIF that Union Gas is requesting.

- f) Please provide references to specific cases and/or policy from the OEB and from any other authorities where research and development activities such as consulting, pilot programs, testing, market research, and data analysis is funded by ratepayers.
- g) In the event that Union Gas' research undertaken through the LCIF leads to new technologies that could be marketed resulting in a financial value, would that financial value be shared with ratepayers?
  - i. If yes, please explain how.
  - ii. If no, please explain why not.

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Response:

- a) Union is committed to supporting Ontario's transition to a low-carbon economy by developing integrated energy solutions that balance emissions reductions with affordability at the customer level.

Consistent with this, Union has developed the Abatement Construct and the Initiative Funnel, as described in Union' application at Exhibit 3, Tab 4. In order to facilitate the development of ideas through the Initiative Funnel, Union has developed rigorous selection and project management approach. The selection approach applies to "Stage 1: Conceptual" of the Initiative Funnel and the project management phase applies to "Stage 2: Formulate". Steps within each phase may vary depending on whether it is a customer or facility abatement opportunity.

Selection starts with a market scan of emerging technologies enabling the identification of potential technologies and services aligned with the guiding principles. Selection is a stepped process which begins with pre-screening of technologies assessed against criteria such as environmental performance and GHG emissions, energy efficiency, market segments, economics and more. Potential technology providers are also assessed against established criteria including financial viability, design capability, management experience, etc. The selection concludes with a go/no-go decision regarding which technologies will be pursued for further development and implementation, initiating the project management phase for Stage 2 for each technology and/or abatement opportunity selected.

Project management begins with a project specific feasibility assessment during which a project execution plan is developed, which addresses the different phases of the project. Phases include planning, design and procurement through to construction and installation, measurement, verification, close-out and recommendation. This recommendation concludes the project management phase and constitutes the trigger that would move the opportunity to the Stage 3 of the funnel.

If the LCIF is approved, Union will be in a position to increase the number and the diversity of projects it pursues and accelerate the transition to a low-carbon economy.

Union undertook the following activities in 2017:

Activity	Overview of 2017 Work	Approximate Spend	Included in GGEIDA Costs
<u>Carbon Capture</u>	Technology demonstrating GHG reduction, energy recovery and savings and overall performance of system. The work completed included a technology scan, pre-screening and assessment, initial risk assessment, lessons learned review and residential stakeholder identification.	N/A	No
<u>Building Skins</u>	Working with MaRS Advanced Energy Center to develop a workshop around creating a building envelope system for retrofit application on low-income housing. The work included planning of workshop, preliminary energy modeling and the execution of the workshop and the development of the RFP.	\$90,000	No
<u>Integrated ASHP/NG Solution</u>	Two pilot projects to demonstrate hybrid heating efficiencies and optimal switch-points for GHG savings and cost savings. Pilots will also include a study of home energy management system (“EMS”) for integrated control.	\$10,000	No
<u>Ground Source Heat Pump</u>	Technology demonstrating GHG reduction, energy savings and overall performance of system. The work included a technology scan, pre-screening and an initial risk assessment.	\$31,000	No
<u>Micro Generation</u>	Pilot projects demonstrating hybrid heating efficiencies, GHG savings, system resilience, integration with net-zero homes and customer cost savings. Technology Scan, pre-screening, assessment and installation of 2 units at pilot sites M&V for both units.	\$117,500	No

b) In 2017, Union was able to leverage a modest existing budget and incremental FTE in order to initiate work on new technologies.<sup>1</sup> Specifically, Union was able to initiate work advancing the Abatement Construct and Initiative Funnel. As such, Union established its selection and project management approach, developed relationships with key stakeholders

<sup>1</sup> 3.0 incremental roles for Technology and Innovation were identified in the Cap-and-Trade forecast administration costs for 2017 and 2018. Actual costs for these roles are captured in the GGEIDA.

(e.g. industry, technology partners, and academia) and began the identification of potential technologies and services aligned with the guiding principles. This budget allows for early and lower cost activities such as limited technology scans, early stage development of roadmaps, and identification of technology providers. However, the existing budget is not adequate to fully develop existing initiatives, to initiate new initiatives, or to pursue pilot projects at the level necessary, please also see Union’s response at part e) below. Therefore, approval of the LCIF is needed to enable Union to advance new and existing initiatives in 2018 not limited to the following:

<b>Union Gas Breakdown of Proposed 2018 LCIF Budget of up to \$2 million</b>			
<b>Stage 1 - Conceptualize</b>			
<b>Initiative</b>	<b>Description of work</b>	<b>2018 Estimate</b>	<b>Reference to evidence</b>
<u>Building Skins</u>	Working with MaRS Advanced Energy Center to develop a workshop around creating a building envelope system for retrofit application on low-income housing. Planned work: Pilot Project Initiation, execution, M&V*	\$100,000	Exhibit 3, Tab 4 Page 35-36
<u>Micro Generation</u>	Pilot projects demonstrating hybrid heating efficiencies, GHG savings, system resilience, and customer cost savings. Planned work: Pre-screening and Assessment of new technologies	\$192,000	Exhibit 3, Tab 4 Page 32-34
<u>Biomass Conversion (Thermochemical) to RNG</u>	Understand technologies and feedstocks converting biomass to RNG, through the completion of a Technology Scan. Planned work: Technology scan and feedstock studies	\$110,000	Exhibit 3, Tab 4 Page 36-37
<u>Automatic Meter Reading</u>	Exploring integration with technologies to collect and utilize customer data in support of future developments which drive abatement opportunities	N/A	Exhibit 3, Tab 4 Page 37-38
<u>Portable Blowdown Recovery</u>	Exploring applicability to Union’s facilities and refining economic and GHG emissions reduction estimates	N/A	Exhibit 3, Tab 4 Page 53
<u>Federal Methane Regulations (possible projects)</u>	Exploring possible projects to Union’s facilities and refining economic and GHG emissions reduction estimates	N/A	Exhibit 3, Tab 4 Page 54-56

<b>Union Gas Breakdown of Proposed 2018 LCIF Budget of up to \$2 million</b>			
<b>Stage 2 - Formulate</b>			
<u>Residential scale Carbon Capture</u>	Pilot project demonstrating GHG reduction, energy recovery and savings and overall performance of system. Planned work: Commercial pilot project initiation and execution	\$51,000	Exhibit 3, Tab 4 Page 35
<u>Ground Source Heat Pump</u>	Pilot project demonstrating GHG reduction, energy savings and overall performance of system. Planned work: Development of GSHP Roadmap and MURB Pilot Project Initiation (site selection and assessment)	\$71,000	Exhibit 3, Tab 4 Page 27-28
<u>Hydrogen and Power to Gas</u>	Completion of P2G technology roadmap Planned work: Monitoring of Enbridge's Power to Gas pilot project and a pre-feasibility assessment and studies of potential demonstration concepts	\$100,000	Exhibit 3, Tab 4 Page 30-31
<u>Micro Generation</u>	Pilot projects demonstrating hybrid heating efficiencies, GHG savings, system resilience, integration with net zero homes and customer cost savings. Planned work: Pilot Project Initiation and phased execution (9 sites) M&V	\$535,000	Exhibit 3, Tab 4 Page 32-34
<u>Fugitive Emissions Management</u>	Exploring applicability to Union's facilities and refining economic and GHG emissions reduction estimates	N/A	Exhibit 3, Tab 4 Page 51-52
<u>Station Heating Equipment (London North Gate Station)</u>	Evaluation of newer and more efficient technology improving fuel consumption on a cost effective basis.	N/A	Exhibit 3, Tab 4 Page 52-53

- c) Please see the response to part b) above.
- d) Please see the response at Exhibit B.Staff.14 a).
- e) The existing budget is limited and does not adequately support next-level investigation or pilot demonstrations across a range of initiatives. For example, Union may be in a position to conduct a pilot at a single site, but not multiple pilots which are required to prove the technology for different applications and market segments (such as residential vs. commercial, new home vs. existing home, or multi-family vs. single family homes).

Union cannot commit to incurring costs to pursue new technologies without OEB approval. If the OEB does not approve Union's proposed LCIF, this will impact Union's ability to pursue new technologies and could result in certain initiatives not being pursued or taking longer to develop, depending on the availability of alternative funding. As outlined in the response at Exhibit B.Staff.18 c)-d), Union is in a unique position to leverage its expertise and relationships with customers to advance new technologies for abatement. Union feels that if the LCIF is not approved this will be a missed opportunity to align with other jurisdictional leaders (as outlined in the response at part f) below) in the interest of supporting the government's policies related to GHG reduction.

If the LCIF is approved, it will provide for a consistent, stable, and sufficient budget for Union to pursue a range of abatement initiatives and gather meaningful data to support deployment of such initiatives within its franchise.

- f) Union is aware of the following instances where utilities are evaluating new technologies to support potential abatement initiatives:
- In the 2015-2020 DSM Plan proceeding (EB-2015-0029), the Collaboration and Innovation Fund was approved by the OEB to promote innovation or collaborative research and pilots within the realm of energy efficiency.
  - In 2012, the California Public Utilities Commission approved the establishment of the Electric Program Investment Charge ("EPIC") to assist the development of non-commercialized new and clean emerging technologies in California. All EPIC activities are to provide ratepayer benefits for San Diego Gas & Electric, Pacific Gas & Electric and Southern California Edison customers.
  - In its Energy Efficiency and Conservation Application (May 28, 2008), Terasen Gas and Terasen Gas Vancouver Island applied for spending related to Innovative Technologies, Natural Gas Vehicles ("NGV") and Measurement. Terasen was ultimately approved for Energy Efficiency and Conservation funding amounts for innovative technologies of \$2.3 million for 2010 and \$4.669 million for 2011. Terasen's Energy Efficiency and Conservation program is their energy conservation program.
  - In 2008, the Louisiana Public Service Commission approved the development of a funding mechanism for natural gas utilities for research and development programs. The Louisiana Research and Development Committee ("RDC") was created and tasked with selecting and reviewing projects while determining which projects would have a reasonable chance to benefit Louisiana natural gas customers. The selected projects would be funded via a \$0.90 per meter per year surcharge.
  - Union is also aware of a discussion paper prepared by Concentric Energy Advisors that, based on analysis of utility innovation models from around the world, recommended that

Canadian utilities and regulators establish an innovation model for utilities that authorizes multi-year funding (at least three years), and is fully ratepayer funded.<sup>2,3</sup>

- g) The purpose of Union's LCIF is to support the advancement of new technologies that contribute to future customer and facilities abatement initiatives. Currently, Union has no Initiative Funnel Stage 3 projects which represent a financial value. Union's RNG proposal, which is dependent on government funding, is a cost pass-through to ratepayers which leaves them indifferent.

Other initiatives at the earlier stages of the Initiative Funnel are still under development and it is too soon to determine if there is any financial value that will result. The treatment of any financial value associated with an initiative will be determined at the time the initiative is brought forward for OEB review.

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<sup>2</sup> Stimulating Innovation on Behalf of Canada's Electricity and Natural Gas Consumers, August 21 2014, Concentric Energy Advisors Inc., p. 9, [http://44f0gi3luy7z39sz523bbcjn.wpengine.netdna-cdn.com/wp-content/uploads/2015/10/CGA\\_CEA-Report.pdf](http://44f0gi3luy7z39sz523bbcjn.wpengine.netdna-cdn.com/wp-content/uploads/2015/10/CGA_CEA-Report.pdf)

<sup>3</sup> Stimulating Innovation on Behalf of Canada's Electricity and Natural Gas Consumers, August 21 2014, Concentric Energy Advisors Inc., p. 16, [http://44f0gi3luy7z39sz523bbcjn.wpengine.netdna-cdn.com/wp-content/uploads/2015/10/CGA\\_CEA-Report.pdf](http://44f0gi3luy7z39sz523bbcjn.wpengine.netdna-cdn.com/wp-content/uploads/2015/10/CGA_CEA-Report.pdf)

UNION GAS LIMITED

Undertaking of Mr. Trofim-Breuer  
To Mr. Rubenstein

Reference: Tr.1, p.99

TO PROVIDE ANY WORK PLAN DOCUMENTS FOR ALL STAGE 2 INITIATIVES IN  
THE FUNNEL.

WITH REFERENCE TO EXHIBIT B.STAFF.21.

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Response:

This Undertaking includes the work plans for all Stage 2 Initiatives. Additionally, it also provides insight for all initiatives identified in the 2018 Initiative Funnel described in Exhibit B. Staff 21 in terms of deliverables, costs, year-to-date spend and related schedules. This additional information is requested in Undertaking JT 1.33 and has been consolidated here. Stage 3 Propose and Implementation Stage related initiatives are not funded by the LCIF and therefore are not included.

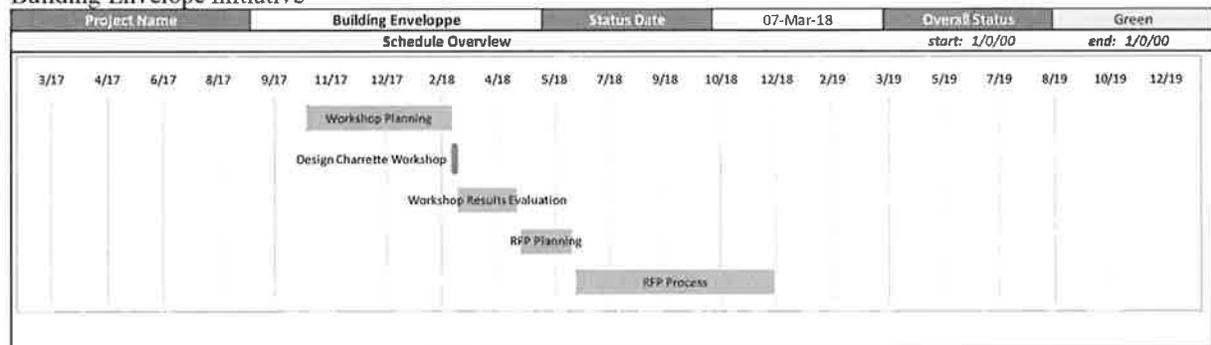
**Stage 1 Initiatives - Work Plan, Costs, Year-To-Date (YTD) Spend**

Stage:	Funnel Item:	Task	Workplan Deliverables	Cost	Sub Total	2018 Year To Date Spend	YTD Subtotal
Stage 1 Customer Abatement	Building Skins	Pilot Project Preparation	Consulting Services, MaRS design workshop preparation & execution for affordable building envelope retrofit, RFP preparation & process	\$100,000		\$35,000	
			See schedule for high level timelines		\$100,000		\$35,000
	Micro Generation	Pre-screening and Assessment of new technologies	Consulting Services (Evaluation of micro-generation technologies)	\$125,000		\$16,800	
			Consulting Services (Evaluation of potential pilot projects)	\$65,000		\$0	
	Biomass Conversion (Thermo-Feedstock Study)	Technology Scan	On-going activity		\$191,000		\$16,800
			Consulting Services (Government Research Agency to identify technologies and assess technology readiness levels)	\$100,000		\$0	
		Research and Demonstration Project (Academia-led research to evaluate methane potential of a specific biomass feedstock.) Project is pending Government Funding approval.	\$10,000		\$0		
		See schedule for high level timelines		\$110,000		\$0	
	Automatic Meter Reading	Technology identification and integration assessment.	Union Gas employees to identify relevant technologies and assess potential.	\$0			
			Assessment of potential customer abatement opportunity through technology application.	Union Gas employees to assess potential customer abatement opportunities of technologies.	\$0		
Stage 1 Facilities Abatement	Portable Blowdown Recovery	Assessment of equipment applicability to Union facilities.	Schedule under development		\$0		\$0
			Union Gas employees to identify relevant technologies and assess potential.	\$0			
			Union Gas employees to assess emission reductions and cost effectiveness.	\$0			
	Federal Methane Regulations	Identification and assessment of potential projects for facilities abatement	See schedule for high level timelines		\$0		\$0
			Union Gas led program to measure actual emissions for specific equipment.	\$0			
	Assessment of GHG emission reduction and project economics	Union Gas employees to assess emission reductions and cost effectiveness.	\$0				
Total Stage 1			See schedule for high level timelines		\$401,000		\$51,800

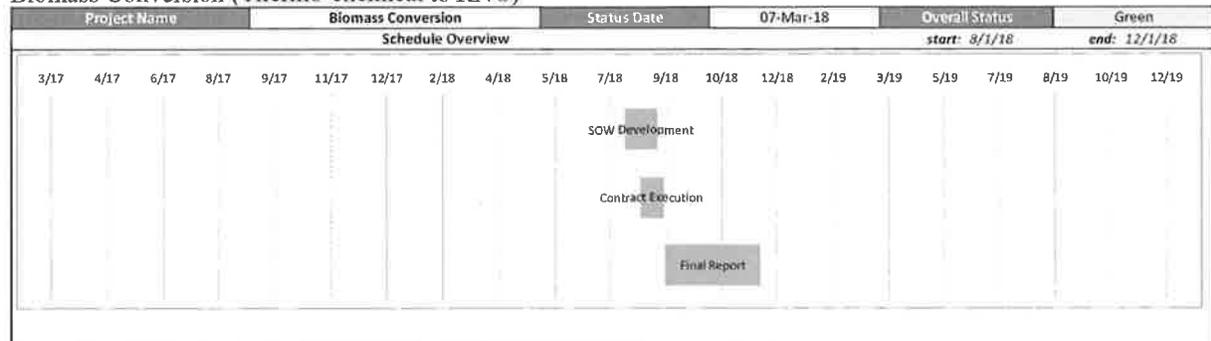
**Stage 2 Initiatives - Work Plan, Costs, Year-To-Date (YTD) Spend**

Stage	Funnel Item	Task	Workplan Deliverables	Cost	Sub Total	2018 Year To Date Spend	YTD Subtotal
Stage 2	Residential Scale Carbon Capture	Commercial pilot project initiation and execution	Purchase and technical evaluation of small-scale carbon capture unit	\$51,000		\$0	
Customer Abatement			See schedule for high level timelines		\$51,000		\$0
Stage 2	Ground Source Heat Pump	GSHP Road Map	Union Gas employees to consult with Enbridge team members.	0		\$0	
Customer Abatement			Consultant Services (Geographical, Geological and GHSP Market Assessments)	\$50,000			
		MURB Pilot Project Initiation	Consultant Services (Demonstration Project Scope of Work)	\$21,000		\$0	
			See schedule for high level timelines		\$71,000		\$0
Stage 2	Hydrogen and Power to Gas	Monitoring of ENB PtG Pilot	Union Gas employees to consult with Enbridge team members.	\$0		\$0	
Customer Abatement		Potential Demonstration Concept Studies	Consultant Services (Site locations, plant sizes and configurations: identification and evaluation of demonstration concepts)	\$50,000		\$0	
		Pre-feasibility assessment of Demonstration Concept	Consultant Services (Technical and Economic Assessment of Demonstration Project Concept)	\$50,000		\$0	
			See schedule for high level timelines		\$100,000		\$0
Stage 2	Micro Generation	Pilot Project Initiation and Monitoring and Verification	Existing Net-Zero Pilot Demonstration (Micro Generation - Belle River)	\$165,000		\$55,709	
Customer Abatement			New Build Net-Zero Pilot Demonstration (Micro Generation - Chatham)	\$165,000		\$0	
			Older Home (70's era) Pilot Demonstration (Micro Generation - Collingwood)	\$205,000		\$0	
			See schedule for high level timelines		\$535,000		\$55,709
Stage 2	Fugitive Emissions Management	Assessment for incremental opportunity.	Union Gas employees to identify incremental opportunity and assess potential applicability.	\$0			
Facilities Abatement		Assessment of GHG emission reductions and project economics.	Union Gas employees to assess emission reductions and cost effectiveness.	\$0			
			Yearly Recurring Activities		\$0		\$0
Stage 2	Station Heating Equipment (London North Gate Station)	Evaluation of energy efficiency of newer technology.	Union Gas employees to identify relevant technologies and assess energy efficiency.	\$0			
Facilities Abatement		Assessment of GHG emission reductions and project economics.	Union Gas employees to assess emission reductions and cost effectiveness.	\$0			
			Yearly Recurring Activities		\$0		\$0
Total Stage 2					\$757,000		\$55,709
Total Stage 1 & 2					\$1,158,000		\$107,509

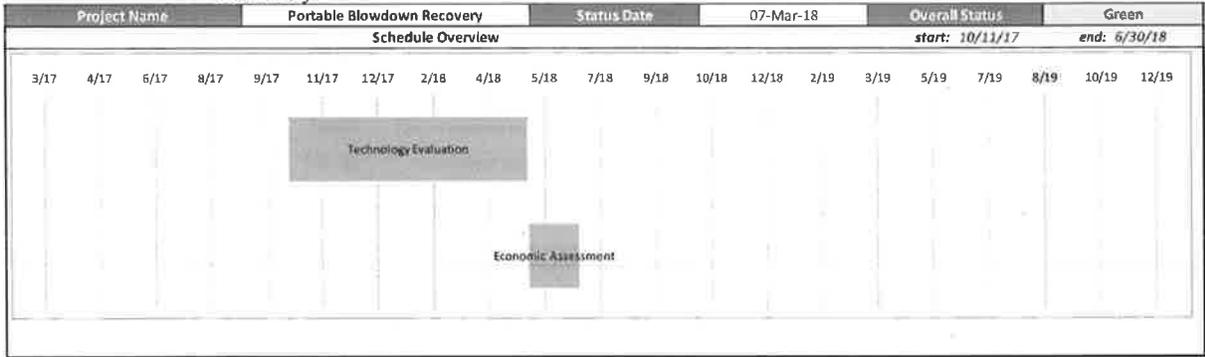
**Stage 1 Initiatives - Schedules**  
**Building Envelope Initiative**



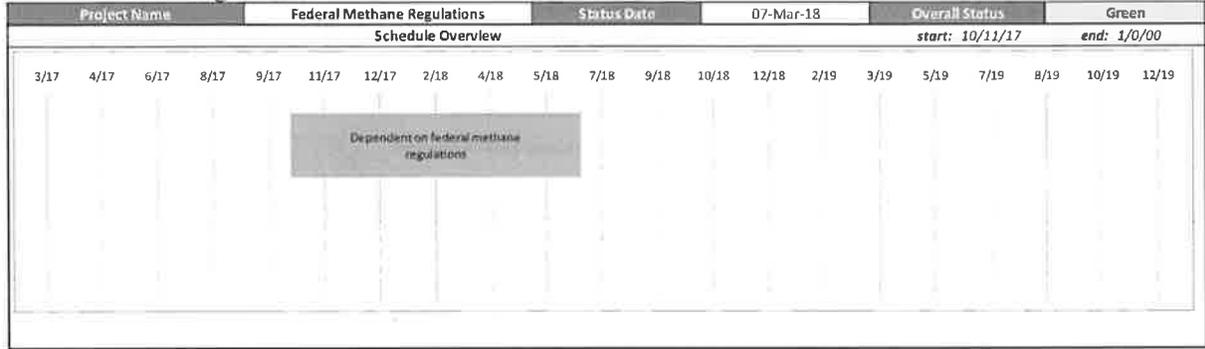
**Biomass Conversion (Thermo-chemical to RNG)**



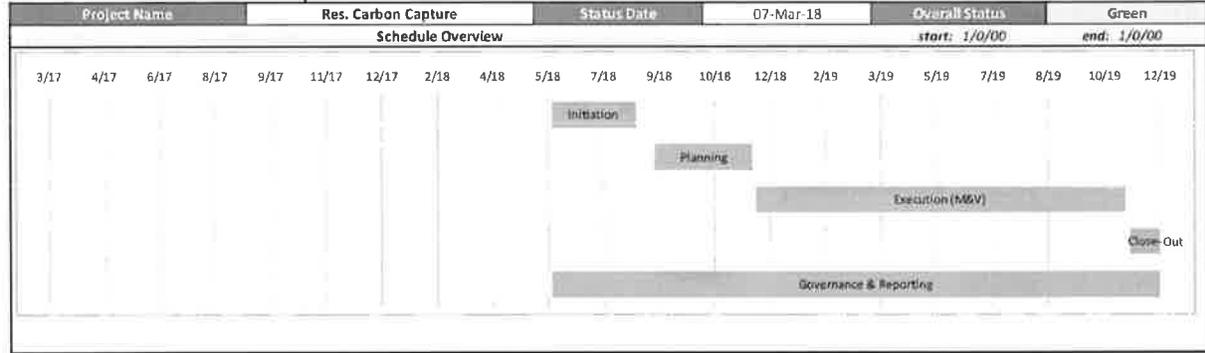
**Portable Blowdown Recovery**



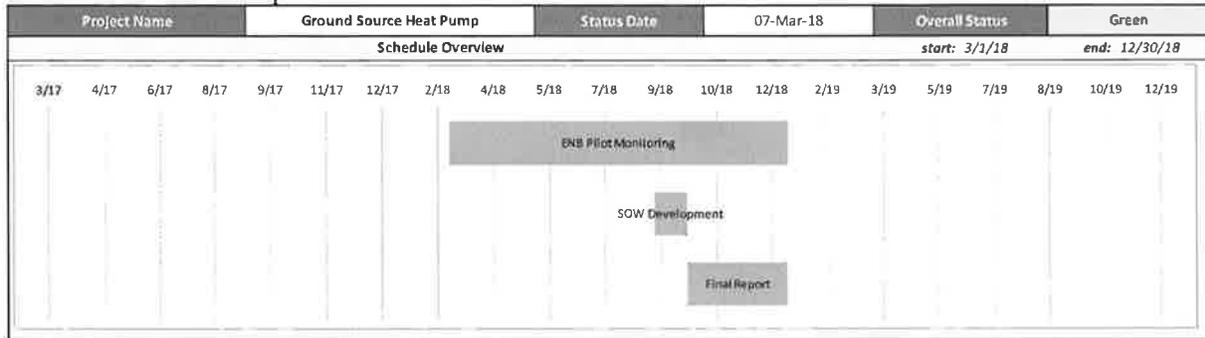
**Federal Methane Regulations**



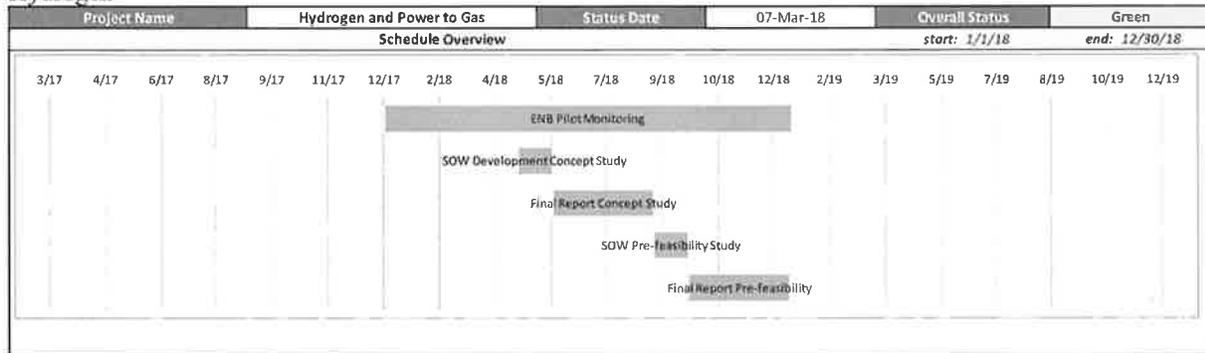
**Stage 2 Initiatives - Schedules**  
**Residential Scale Carbon Capture**



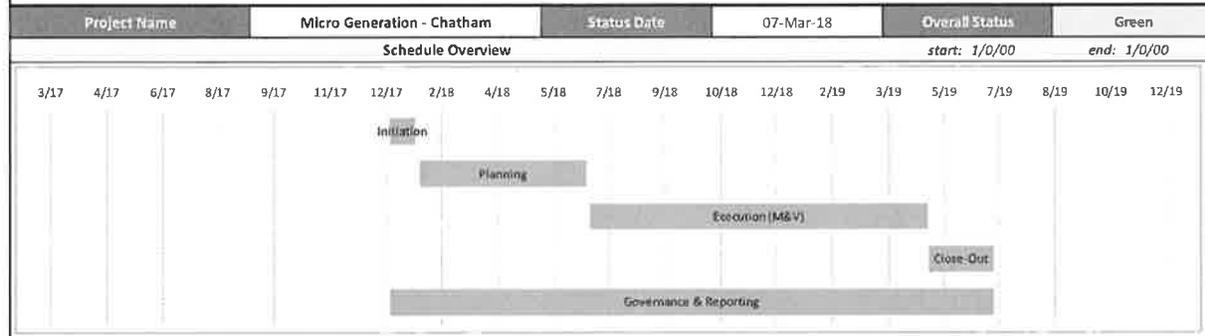
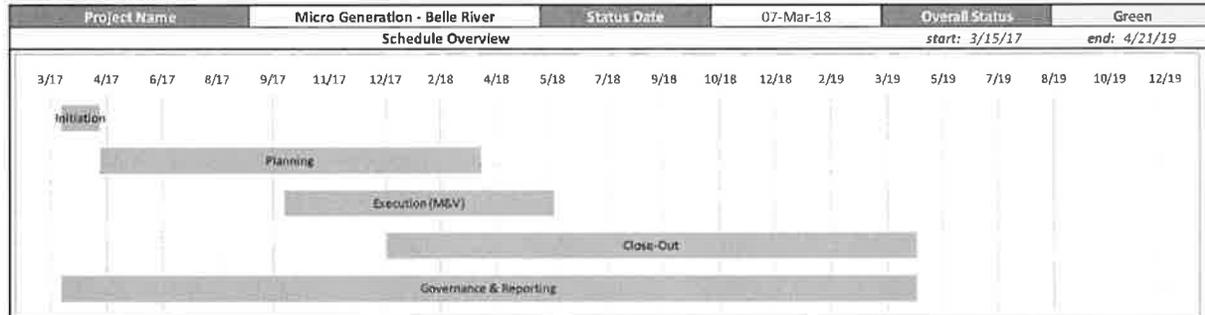
Ground Source Heat Pump

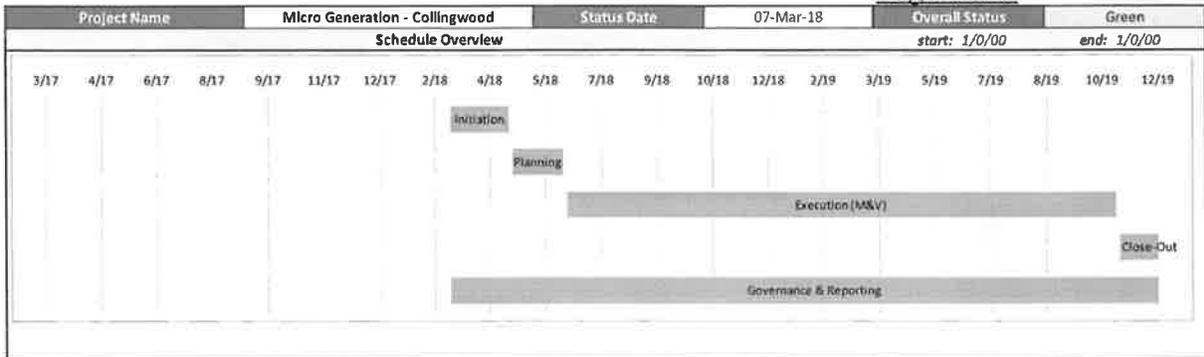


Hydrogen and Power to Gas



Micro Generation





# Power-to-Gas Initiative

April 12, 2018 Public Webinar

## Engagement Principles and Process

- Engagement is an essential part of the IESO decision making process
  - Part II 18(1) of the *Electricity Act, 1998* states, “The IESO shall establish one or more processes by which consumers, distributors, generators, transmitters and other persons who have an interest in the electricity industry may provide advice and recommendations for consideration by the IESO”
- The IESO’s process to engage with the public before a decision is made or before a change occurs is guided by the IESO Engagement Principles to provide:
  - Opportunities for engagement with inclusive representation
  - Effective communication and information in an open and transparent manner
  - Effective facilitation
  - Communicate outcomes and measure satisfaction in the process

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## Webinar Overview

### Purpose:

- Provide an overview of the Power-to-Gas (P2G) hydrogen initiative
- Initiate public input into the development of a P2G Request for Expression of Interest (RFEI)

### Agenda:

1. Introduction (definition of P2G, Minister of Energy’s Directive)
2. Overview of market research findings
3. RFEI and research themes/Questions
4. Next steps for providing input to the draft RFEI
5. Questions

## What is Power-to-Gas?

- Power-to-gas refers to the process of converting electrical energy to a gaseous fuel – in this case hydrogen - through the electrolysis of water
- P2G capabilities are of interest to the IESO and the Province of Ontario:
  - Electrolyzers can act as a flexible load, varying electricity consumption in response to electricity prices or for the provision of electricity system services
  - P2G projects can include flexible generation, using stored hydrogen to produce electricity
  - P2G can be deployed and operated to optimize existing electricity system assets, allowing for load growth without a proportional increase in infrastructure
  - By producing fuel through clean electricity, P2G can result in GHG emissions reductions - notably in sectors that are difficult to address with more mature technology

## LTEP Directive Initiative

### The October 26, 2017 Directive to IESO respecting the Implementation of the LTEP Long-Term Energy Plan states:

#### Encouraging an Innovative Sector

With respect to the Government of Ontario's objectives of modernizing the energy system and removing barriers to innovation, the IESO shall:

Identify options for pilot projects that evaluate the electricity system benefits, costs and GHG emissions reductions of using electricity to create hydrogen.

## Power-to-Gas Initiative Scope

Per IESO's LTEP Implementation Plan, *Putting Ontario's Long-Term Energy Plan Into Action*, as approved by the Minister of Energy on February 8, 2018:

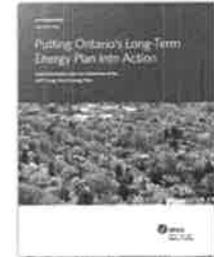
#### Scope:

IESO will examine, with input from the public, different power-to-gas technologies available and their applications, as well as their associated technical and operational characteristics. It will also identify pilot project opportunities that may be available in the province.

This initiative will culminate in the identification of options for pilot projects and does not include implementation of these options.

#### IESO Actions:

- Issue an RFEI to gather information from the public
- IESO will undertake market research on technical applications of power-to-gas, including a review of respective regulatory requirements.
- Potential pilot project initiatives will be identified to evaluate opportunities for power-to-gas applications



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## Timelines for Power-to-Gas Initiative per approved 2017 LTEP Implementation Plan

Q1 2018	Market research on power-to-gas, including a review of regulatory requirements
Q2 2018	Draft Request for Expression of Interest is issued for feedback
Q3 2018	Final Request for Expression of Interest is issued
Q4 2108	Options for pilot projects identified

Comments due back on draft RFEI on **May 4<sup>th</sup>**

## Key Market Research

- Market research focused on understanding the:
  - technology
  - market viability
  - value streams
- Information gathered from a number of sources, such as:
  - Public reports, such as Metrolinx's Hydrail Feasibility Study
  - Proprietary reports
  - Industry groups (Hydrogen Council, European Power to Gas)
  - U.S. Department of Energy
  - Project examples / case studies

## Key Market Research Findings

- Interest in P2G is growing rapidly, owing to:
  - The need to integrate a growing supply of renewable electricity resources
  - The need to manage and utilize an increasing availability of clean electricity surpluses
  - Falling capital and operating costs
  - Imperatives around GHG mitigation, where H<sub>2</sub> may provide deep decarbonization in challenging sectors (e.g. heavy transportation, chemical processes, process heat, etc.)

Right now, South Australia is considering several P2G proposals, including one for a 50 MW electrolyzer that would help manage wind and solar generation and produce hydrogen that could potentially be exported.

## Key Market Research Findings

- Technical and market challenges remain:
  - Electrolyzer and fuel cell efficiencies make it hard to compete against battery storage
    - Electrolyzer efficiencies vary by technology and by how they are operated
      - Alkaline electrolyzers efficiencies ~ 50–55 %<sup>1</sup>
      - Proton Exchange Membrane electrolyzer efficiencies ~ 60–70 %<sup>2</sup>
    - Fuel cells can operate at up to 60% efficiency<sup>3</sup>
    - P2G for electricity generation has a roundtrip efficiency of < 40%
    - Low natural gas prices depress the value of hydrogen - value varies based on end-use
    - Value of hydrogen as a transportation fuel far exceeds use as industrial / chemical feedstock
  - Electricity system and environmental benefits not fully valued / undervalued

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## Regulatory requirements

- Review ongoing and includes the following:
  - OEB licensing requirements for such facilities
  - Hydrogen production
  - Storage and transportation of hydrogen
  - Use of hydrogen in vehicles, including refuelling
  - Regulations pertaining to injection of hydrogen into the natural gas system
- Results of review will be shared prior to issuance of the final RFEI

## RFEI Overview

### What will we be looking for?

The RFEI questionnaire structure will ask respondents to provide:

- **Specific information relating to a particular pilot project concept:**  
Respondents that have a specific application or project concept can provide information on how it can provide grid services and achieve reductions in GHGs; what research questions the project would address and what it would take (financially, technically, other) to implement the pilot?
- **General information:**  
If the respondent does not have a particular pilot project in mind, they can provide general information on the application of power-to-gas technologies; what value do they provide and what challenges are associated with capturing this value (including any challenges specific to applications within Ontario)?

## RFEI Overview

How does IESO intend to use the responses?

- To support the identification of options for possible future pilot projects that could aid the IESO and participants in understanding potential costs, benefits and impacts of P2G technologies and applications in Ontario

How will the IESO share the information it receives?

- Respondents will have the ability to deem responses or portions of their responses confidential
- Non-confidential information may be shared publicly

## Goals for RFEI

The IESO wants to accomplish the following:

1. Enhance the technical understanding of power-to-gas technologies
2. Understand the viability of P2G projects under existing market and regulatory conditions and structures
3. Understand the value streams P2G can provide



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## Enhance the technical understanding of power-to-gas technologies – potential research questions

IESO is seeking to better understand the technical details and parameters of these technologies, including:

- What types of facilities there are? What are the key differences in these technologies?
- How responsive or flexible can the electricity load (or generation) associated with these facilities be?
- What potential benefits/challenges do these technologies pose from an electricity system operation perspective?
- Other infrastructure / input requirements?
- Compression, storage, and transportation requirements and parameters?



## Viability of P2G projects under existing market and regulatory conditions and structures – potential research questions

- How do existing regulatory structures impact hydrogen facilities?
  - Are existing regulatory systems equipped to deal with novel application of hydrogen?
- What economic factors drive viability of P2G projects?
  - How impactful is competition from low cost natural-gas (i.e. from steam methane reforming or SMR) derived hydrogen?
  - How critical are electricity prices as a determinant of cost of H<sub>2</sub> production?



## Understand the value streams P2G can provide – potential research questions

- What are the value streams associated with P2G and what are the barriers to harnessing these value streams?
  - Additional demand to soak up surplus electricity?
  - Ease of congestion issues?
  - Ancillary services to the grid? What level of temporal granularity can these services be provided with?
  - GHG and air pollution mitigation?
  - Other by-products (heat, oxygen)?

## Feedback requested

- Are the research questions in the draft RFEI the right questions to ask? Are the questions clear and comprehensive? Are there any other/different issues that should be explored? Is there any additional information IESO should collect?
- Does the format of the RFEI allow you to submit the information you want to convey?
- Do the research questions allow respondents to submit information at a level of detail they are comfortable with?
- Are there any concerns with the privacy and confidentiality provisions?

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## Next steps

- Written feedback is requested by May 4 and can be submitted to [engagement@ieso.ca](mailto:engagement@ieso.ca)
- Non-confidential feedback and IESO responses will be posted on the [P2G RFEI engagement webpage](#)
- Materials, timelines, and updates related to this initiative will also be posted on the P2G RFEI engagement website
- The final RFEI is intended to be posted in Q3

## Questions?



UNION GAS LIMITED

Answer to Interrogatory from  
School Energy Coalition ("SEC")

Reference: Exhibit 3, Tab 5

Question: Please work with Enbridge to provide a single response to this interrogatory:

- a) Please provide a table showing a comparison broken down by common categories of the 2016 actual administrative costs. Please provide an explanation of any differences +/- 10% between utilities per category.
- b) Please provide a table showing a comparison broken down by common categories of the 2017 actual administrative costs. Please provide an explanation of any differences +/- 10% between utilities per category.
- c) Please provide a table showing a comparison broken down by common categories for the 2018 administrative costs. Please provide an explanation of any differences +/- 10% between utilities per category.

---

Response:

a) – c)

Although Union and EGD (collectively the "Utilities") have made efforts to be responsive to this question, each entity developed their Cap-and-Trade programs independently to meet their individual requirements. Accordingly, there are differences in the incremental costs associated with facilitating Cap-and-Trade. Further, the Utilities continue to operate separately, please see the response at Exhibit B.Staff.14 a).

The response to this interrogatory corresponds with SEC #20 for EGD and SEC #15 for Union.

	2016 EGD	2016 Union	% Δ	2017 EGD	2017 Union	% Δ	2018 EGD	2018 Union	% Δ
	Actuals (\$000s)	Actuals (\$000s)		Actuals (\$000s)	Actuals (\$000s)		Forecast (\$000s)	Forecast (\$000s)	
IT Billing System (Revenue Req't on capital)	(99.5)	(4)	96%	97.6	90	-8%	191	193	1%
Staffing Resources	533.3	1,682	215%	694.6	2,437	251%	1,500	2,598	73%
Market Intelligence & Consulting Support	268.2	264	-2%	156.8	236	51%	400	420	5%
Customer Education & Outreach	44.8	50	12%	12.9	2	-84%	0	8	
External Legal Counsel	93.5	135	44%	363.6	40.8	-89%	400	150	-63%
Incremental C&T Framework related GHG Reporting and Verification Audit	0	35		9.5	63	563%	40	100	-60%
Bad Debt Provision	-	-	n/a	600	141.4	-76%	960	425	126%
Low Carbon Initiative Fund ("LCIF")	-	-	n/a	-	-	n/a	2,000	2,000	0%
OEB Cap & Trade related Consultations (e.g., LTCPF, MACC, working group)	-	-	n/a	318	112.3	-65%	100	50	100%
Other	0	63		20.7	96	364%	60	60	0%
<b>Total</b>	<b>840.3</b>	<b>2,225</b>	<b>165%</b>	<b>2,273.7</b>	<b>3,218.5</b>	<b>42%</b>	<b>5,251</b>	<b>6,004</b>	<b>14%</b>

To more efficiently respond to this question, the Utilities have addressed parts a) - c) in the response following, as rationale for cost differences were similar on a year to year basis.

Incremental requirements related to Cap-and-Trade differed in several areas for each company,

and the primary differences have been highlighted below.

**IT Billing Cost/Revenue Requirement**

The variances in each company’s IT billing system revenue requirements are primarily driven by differences in the total installed system costs, existing systems’ adaptability to changes, and respective company’s accounting policies and assumptions.

**Staffing Resources**

The Utilities incurred incremental staffing requirements as a result of the Ontario government’s implementation of a Cap-and-Trade program. Each company independently assessed the program and in turn identified the number of staff necessary to successfully implement the program and sustain its operation.

EGD’s incremental Full Time Equivalent (“FTE”) are dedicated staff to support implementation of Cap-and-Trade. Additional EGD staff provides support to the Cap-and-Trade function, in addition to the roles that those staff members play in other areas of EGD’s operations. Given that these staff members are partly performing roles that were contemplated at the time that EGD’s Custom incentive regulation (“IR”) model was approved, and therefore their costs are included in the Custom IR model, EGD is not seeking recovery for their costs through the Greenhouse Gas Emissions Impact Deferral Account (“GGEIDA”).

Union, operating under a different IR model (40% of inflation price cap), is appropriately treating all eligible Cap-and-Trade resources as incremental.

Table 1 below highlights both the Utilities average incremental staffing requirements from 2016 through to 2017. Staffing requirements for 2018 are forecasted as per each company’s respective Compliance Plan.

**Table 1: Union and EGD 2016-2018 Average Incremental Staffing Requirements**

Company	2016 average incremental staffing requirements	2017 average incremental staffing requirements	2018 incremental staffing requirements (forecasted)
EGD	2.8	4.4	8.0
Union	8.0	10.0	12.5

A detailed breakdown of Union’s 2016 actual and 2018 forecast staffing requirements can be found in Union’s application at Exhibit 6, p. 6, and Exhibit 3, Tab 5, Schedule 2, respectively.

In 2016, Union’s costs were comprised of 13 FTE new roles and portions of existing roles totaling 0.5 full time employees. The new roles were added throughout the year, and the average incremental FTE for the year was 8.0. In addition to resources required to administer the Cap-and-Trade program (e.g. procurement, GHG reporting, compliance planning), Union forecasted up to 5.0 FTE of business development and technology and innovation roles in 2016, and began

to ramp up these activities through 2017, continuing into 2018. These resources have supported the development of the methodologies that facilitate the Initiative Funnel and pursue the technologies listed in Union's response at Exhibit B.Staff.21 a) & b).

In 2017, Union forecast that a similar 13.5 FTE roles would be required. In actuality, Union's average incremental FTE for the year was less, due to changes in Customer Contact Centre requirements (please see the response at Exhibit B.Staff.11 b)), two unfilled vacancies, and the incremental workload for one Finance role distributed across multiple roles in Finance, with no individual committing more than 25% of their time to Cap-and-Trade activities.

For 2018 Union's forecast includes one less FTE than forecast for 2017. The difference is due to the Finance role that was expected to be allocated to Cap-and-Trade on a permanent basis.

As outlined in Union's application at Exhibit 6, Union uses a decision tree and process to evaluate the requirement for FTEs on an annual basis and ensure that salaries and wage costs related to Cap-and-Trade accountabilities are properly accounted for. If an employee will not be committing greater than 25% of their time to Cap-and-Trade activities, then an allocation of that FTE is not included in the staffing costs.

EGD's 2018 forecast, 2017 forecast and 2016 actual staff costs are available at EB-2017-0224 Exhibit D, Tab 1, Schedule 1, EB-2016-0300, Exhibit C, Tab 3, Schedule 6 and Exhibit D, Tab 1, Schedule 2, respectively.

In 2016, EGD's Cap-and-Trade team consisted of approximately 2.8 FTE with a new FTE beginning in Q1. An average of 4.4 FTEs were included on EGD's Cap-and-Trade team in 2017. As noted in EB-2016-0300, Exhibit C, Tab 3, Schedule 6, paragraph 11, EGD will draw on experience from other parts of the business to assist with the implementation and sustainment of the Cap-and-Trade program.

### **Market Intelligence and Consulting Support**

The actual costs incurred in 2016 and forecasted 2018 costs for market intelligence and consulting support are similar between the two companies.

Due to the level of support deemed necessary by each company, market intelligence and consulting support costs differed in 2017.

### **External Legal Counsel**

Differences in external legal costs between the Utilities can be attributed to each company's respective legal counsel providers and the individual requirements of each company. The Utilities continue to engage external legal counsel in respect of each company's Compliance Plan.

EGD's external legal costs are inclusive of all legal costs related to OEB regulatory proceedings, which include, but are not limited to, evidence review, witness and argument preparation.

Additionally, EGD's legal costs also would include costs incurred for external regulatory interpretation and assistance.

Union's legal costs are related to interpretation of climate regulations and to ensure Union's compliance with regulatory requirements and legislation. Legal costs associated with regulatory proceedings, similar to those noted for EGD above, are included in Union's existing rates. Please also see Union's response at Exhibit B.Staff.12.

**Incremental Cap-and-Trade Framework related GHG Reporting and Verification Audit**  
Beginning in 2016 Union incurred costs related to GHG Reporting and Forecasting in order to meet new regulatory GHG emissions reporting requirements associated with the implementation of Cap-and-Trade in Ontario, including O. Reg. 452. In 2016, Union's incremental costs were directly attributed to the development of new reporting tools to facilitate reporting and forecasting of GHG emissions for a natural gas distributor, critical review of calculation methodologies, and assistance with submissions in response to the Greenhouse Gas Reporting Guideline.<sup>1</sup>

In 2017, Union initiated a voluntary pre-audit verification process for GHG reporting related to Cap-and-Trade to assess calculations of ON.400 emissions to ensure compliance with the regulations. Union also incurred incremental consulting costs to support the consultation process for changes to the GHG Reporting Regulation and Guideline. Union plans to continue engagement of consultants to complete incremental work related to GHG reporting and forecasting in 2018.

In 2017, EGD also incurred incremental GHG reporting costs relating to a pre-audit verification process for GHG reporting related to natural gas distribution. The costs of this audit were \$9,500. These costs were incremental to the pre-existing facility related GHG verification costs, which are charged to EGD's Operations and Maintenance budget. For additional information, please refer to EB-2016-0300, Exhibit C, Tab 3, Schedule 6.

For 2018, EGD anticipates that it will incur \$40,000 related to incremental GHG reporting and verification audit costs as a result of the implementation of the Cap-and-Trade program. Please refer to EB-2017-0224, Exhibit D, Tab 1, Schedule 1.

### **Customer Education and Outreach**

Prior to the Board's direction to develop consistent messaging between the Utilities, Union and EGD worked together to ensure messaging was available to customers across the Utilities' respective service areas. However, differences existed in research undertaken, communication tactics, customer numbers and frequency of communications.

EGD completed one focus group and a standalone bill insert in 2016. In 2017, the majority of

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<sup>1</sup> Guideline for Quantification, Reporting And Verification Of Greenhouse Gas Emissions-2017, <https://www.ontario.ca/page/report-greenhouse-gas-ghg-emissions>

the costs incurred in this component were associated with training requirements for the call centre staff. Throughout 2017, EGD relied primarily on non-cost communication methods, such as website, call centre, on-bill message and social media tools, to communicate with customers about Cap-and-Trade.

In 2016, Union incurred incremental costs related to the development of customer communications material including design and content for the new Cap-and-Trade section of its website, as well as two customer research studies. The first study included focus group sessions to assess general awareness of the government's Cap-and-Trade plan, reactions to the plan and to Cap-and-Trade costs, and preferences related to how Cap-and-Trade costs might appear on natural gas bills. In the second study, Union engaged a consultant to conduct customer surveys among Residential and General Service business customers to evaluate the effectiveness of Union's Cap-and-Trade customer communications.

### **Bad Debt**

As explained in Union's application at Exhibit 3, Tab 5, Union used a simplified method to estimate Cap and Trade related bad debts for 2017, assuming that a 10% increase in customer bills as a result of Cap and Trade costs would result in a 10% increase in bad debt. This simplified method was employed because Union had no previous experience with bad debt in a Cap-and-Trade environment. For the 2018 forecast, Cap-and-Trade related bad debt is estimated using Union's corporate bad debt forecast methodology, and is calculated by taking Union's forecast compliance obligation costs for General Service customers and applying Union's average actual write-off factor from the past five years.

As outlined in Union's 2017 Compliance Plan interrogatory response at EB-2016-0296, Exhibit B, FRPO 1, the actual incremental bad debt amount directly related to Cap-and-Trade in 2017 was expected to be lower than the estimate in 2017 due to the implementation of Cap-and-Trade commencing January 1, 2017 and the lag time before Cap-and-Trade amounts would be included in customer accounts that were written off. Only the actual costs will be captured in a deferral account for future disposition; the forecast for 2017 of \$0.6 million was not in rates and was not in a deferral account. The amount of bad debt recognized in actuals is included in the GGEIDA. For 2017 the actual amount of bad debt included in the GGEIDA is approximately \$141,000. Union's actual bad debt write-offs are lower in 2017 due to the time lag described above, which results in only partial year impacts in 2017. For 2018, Union will realize a full year of bad debt write-offs in the GGEIDA.

As identified in paragraphs #27 through 30 of EB-2017-0224, Exhibit D, Tab 1, Schedule 1, EGD utilized the Company's total revenue requirement, total forecasted cost of compliance and corporate bad debt forecast to calculate a forecasted cost of bad debt associated with EGD's Cap-and-Trade program. In 2017, EGD forecasted \$0.9 million. Based on the actual bad debt realized in 2017, EGD incurred \$0.6 million associated with the Cap-and-Trade program.

### **OEB Cap and Trade Related Consultations**

Both EGD and Union incurred costs related to the OEB Cap-and-Trade related consultations in

2017. The costs were allocated as per the Board's methodology. The difference between the Utilities stems from the assignment of consultation costs. EGD included the costs of the "Report of the Board – Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities" (EB-2015-0363) ("Framework") and "Marginal Abatement Cost Curve for Assessment of Natural Gas Utilities' Cap and Trade Activities" ("MACC") (EB-2016-0359) in the 2017 OEB Cap & Trade related consultation costs component.

Union's costs incurred for the Framework and MACC were included in Union's existing rates and 2017 Cap-and-Trade related consultation costs, respectively.

Each company forecasted different amounts related to the upcoming Long Term Carbon Price Forecast refresh and any other related stakeholder work. Costs associated with the OEB Cap-and-Trade related consultations will be allocated to each company based on the Board's methodology.

In 2018, Union has forecast its portion of OEB costs to be approximately half of the cost charged in 2017 as a MACC refresh is not within scope. Similarly, EGD's forecast is based on 60% of 2017's consultation costs.

UNION GAS LIMITED

Answer to Interrogatory from  
School Energy Coalition ("SEC")

Question: With respect to Union and Enbridge:

- a) Please confirm that Enbridge and Union are affiliates.
  - b) If (a) is confirmed, please explain why Enbridge and Union require separate cap and trade groups within their companies considering they are now affiliates.
  - c) Please confirm that subsection 65(3) and (4) of O.Reg 144/16 has been revoked.
  - d) If (c) is confirmed, please explain any changes in how Enbridge and Union plan to participate in allowances auctions compared to 2017 when the provisions were in force.
- 

Response:

- a) Confirmed.
- b) Union and EGD are affiliates, but continue to operate as separate legal entities. Each utility has its own compliance obligations, and in late 2017 filed their respective 2018 Compliance Plans in relation to satisfying those obligations, since subsection 65(3) and 94) of O.Reg 144/16 was in place during the development of these plans in 2017. Please also see the response at Exhibit B.Staff.14.
- c) Confirmed.
- d) The Climate Change Mitigation and Low-carbon Economy Act, 2016 ("Climate Change Act") outlines prohibitions on the disclosure of certain information. These prohibitions are reflected in Section 4 of the OEB's Cap-and-Trade Framework. This question refers to information that has been classified as Strictly Confidential. In keeping with the legislation and with the best interests of ratepayers in mind, such information must remain Strictly Confidential in order to maintain the ability to effectively execute on Compliance Plans.

Union has provided content related to this question to the OEB in its 2018 Cap-and-Trade Compliance Plan.<sup>1</sup>

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<sup>1</sup> Exhibit 3, Tab 3, and Exhibit 3, Tab 6.

# Integration of Renewable Natural Gas

—  
A Plan to Harness RNG for Ontarians

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**Enbridge Gas Distribution / Union Gas Limited**  
For Discussion

UNION GAS LIMITED

Answer to Interrogatory from  
Environmental Defence (“ED”)

Reference: Exhibit 3, Tab 4, Appendix A, pp. 1-7

Question: Please provide a copy of any reports or presentations related to the same topics discussed in ICF, *Impacts of Ontario’s Proposed Climate Policy*, dated July 7, 2015. Please include any reports or presentations by ICF providing updated or revised information following its July 7, 2015 report.

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Response:

Please see updated information completed by ICF as follows:

- Attachment A – Completed November 2015 for Union and EGD jointly
- Attachment B – Completed April 2016 for Union, following the release of the draft Cap-and-Trade Regulations

UNION GAS LIMITED

Answer to Interrogatory from  
Ontario Energy Board Staff ("Staff")

Reference: Exhibit 3, Tab 5, pp. 8-9  
Exhibit 3, Tab 2, pp. 8-9

Preamble: Union Gas states that in 2018, it will continue to use external consulting to support the development of its Compliance Plans and the ongoing sustainment of the cap-and-trade program. Union Gas also states that these consulting services "are forecast to cost \$670,000 in 2018 for work supporting the development and execution of Union Gas' Compliance Plan, in a similar manner to 2017.

Union Gas indicates that it will continue to retain ClearBlue and it has also engaged other consultants for various other Cap-and-Trade related services, including BlueSource, ICF and Ortech Environmental.

Question:

a) Please complete the table below:

<b>Consultant</b>	<b>2018 Costs</b>
ClearBlue	
BlueSource	
ICF	
Ortech Environmental	
Other	
<b>Total</b>	<b>\$670,000</b>

- b) Has Union Gas engaged additional consultants than the ones listed above? Please explain.  
i If so, please provide the 2018 costs
- c) Please explain whether Union Gas used a competitive procurement process when selecting BlueSource, ICF and Ortech Environmental?
- d) Please explain the scope of work for each of the consultants listed in a). Please compare their scope of work with ClearBlue's scope of work.
- e) Enbridge Gas and Union Gas filed a MAAD application<sup>1</sup> with the OEB. Please explain whether, and if so how, Union Gas will realize any economies of scale in relation to external consultants working on issues related to cap and trade.

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Response:

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<sup>1</sup> EB-2017-0306

a) & b)

The table provided in part a) above presumes that Union will use all previous consultants in 2018. While that is possible, it has not been confirmed. Union has provided below the 2018 forecast cost by type of consulting,<sup>2</sup> and identified consultants that have previously completed such work. Actual costs for 2018 will be recorded in the GGEIDA for future disposition.

<b>Particulars</b>	<b>2018 Cost Forecast (\$000)</b>	<b>Previous Consultant</b>
Compliance Planning/Implementation	200	ClearBlue Markets
Carbon Strategy and Analysis	120	ICF, Torys LLP
GHG Reporting and Forecasting	100	ORTECH Environmental, GHD
Offset Consulting	100	BlueSource
Legal Interpretation and Review	150	Torys LLP
<b>Total</b>	<b>670</b>	

c) Union used a competitive procurement process when selecting BlueSource and ClearBlue Markets. Due to tight timelines, unique requirements and proven pre-existing service agreements, Union did not use a competitive procurement process for ICF or ORTECH Environmental. Additionally, ORTECH Environmental has been completing emissions-related work for a number of years and is uniquely familiar with Union's specific operations and emission sources.

d) The following table lists the scope of work for each consultant listed in part b) above.

<b>Consultant</b>	<b>Scope of Work</b>
GHD	Completion of Verification Audits in accordance with GHG Reporting Regulation.
ORTECH Environmental	Provide technical support for GHG emission measurements and calculations in order meet GHG Reporting compliance requirements.
BlueSource	Provide expertise on the offsets market, interpretation of offset protocols and regulations, and insights with respect to the developing offset market in Ontario and WCI.
Torys LLP	Legal support to interpret climate regulations and ensure Union's compliance with regulatory requirements and legislation.
ClearBlue Markets	Advise on procurement strategy including analysis of instruments, risks, and benefits.
ICF	Provide analytics on supply, demand, and pricing as well as electrification impacts and customer cost impacts.

<sup>2</sup> Exhibit 3, Tab 5, Table 2

ClearBlue costs relate directly to the ongoing development of Union's Cap-and-Trade strategy with direct input to Union's Compliance Plans. Union hired ClearBlue in late 2016 to aid in the development of its compliance instrument procurement strategy for 2017. ClearBlue has supported Union through 2017 by providing ongoing regulatory and market updates, assessment of Ontario public auction results, assessment of Union's 2017 Compliance Plan (including recommendations to adapt to changing market conditions) and assistance with the development of the 2018 compliance instrument procurement strategies.

e) Please see the response at Exhibit B.Staff.14 a).

UNION GAS LIMITED  
 Cap-and-Trade Deferral Account Balances  
Year Ending December 31, 2016

<u>Line</u> <u>No.</u>	<u>Account</u> <u>Number</u>	<u>Account Name</u>	<u>Balance (1)</u> <u>(\$000's)</u> (a)
1	179-152	Greenhouse Gas Emissions Impact Deferral Account	2,232
2	179-154	Greenhouse Gas Emissions Compliance - Customer-Related Deferral Account	-
3	179-155	Greenhouse Gas Emissions Compliance - Facility-Related Deferral Account	-
4	Total Cap-and-Trade Deferral Account Balances		<u>2,232</u>

Notes:

(1) Account balances include interest to December 31, 2016.

charges over and above those set pursuant to Enbridge's Custom IR plan and the 2018 Rate Adjustment Application.

7. Enbridge hereby applies to the Board for a determination that the Company's Compliance Plan is compliant with the Framework and is accepted by the Board because:

- a. The term of the Compliance Plan, being one-year, is appropriate;
- b. It is reasonable and has prudently optimized decision-making to achieve efficiency and to reasonably manage risk given the legislative framework, the tools available at this time, and evolving nature of Ontario's carbon market (including the pending linkage with Quebec and California);
- c. It demonstrates that Enbridge's proposed abatement activities and planned investment decisions have been prudently prioritized and paced including proposed long-term investments;
- d. It will result in reasonable, predictable rates arising from Enbridge's Cap and Trade activities as much as is reasonable;
- e. It includes an appropriate degree of transparency and documentation;
- f. It provides for the appropriate levels of flexibility which will allow Enbridge to adapt to changing market conditions;
- g. It includes an appropriate Customer Outreach and Communication Plan;
- h. It includes appropriate monitoring and reporting mechanisms and requirements; and,
- i. It provides for continuous improvement over time.

8. Enbridge further applies to the Board pursuant to Section 36 of the *Ontario Energy Board Act, 1998*, as amended (the "Act") for such final, interim or other orders or accounting orders or determinations as may be necessary or appropriate to approve the following:

- a. 2018 Customer-related and Facilities-related Tariffs or Charges (referred to in this Application as the "Cap and Trade Tariffs") to recover the costs of meeting Enbridge's obligations related to GHG emissions from relevant customers and Company facilities;
- b. Interim Cap and Trade Tariffs, to be approved on or before December 1, 2017 in order that the Interim Cap and Trade Tariffs can be included with Enbridge's Quarterly Rate Adjustment Mechanism (QRAM) Application and implemented as of January 1, 2018. In the event that Interim Cap and Trade Tariffs for 2018 cannot be approved on this timeline, then Enbridge requests that the 2017 Cap and Trade Tariffs be declared as interim for 2018 as of January 1, 2018, with any necessary adjustments to be made later in the 2018, after the 2018 Cap and Trade Tariffs are approved;
- c. The establishment of a 2018 Greenhouse Gas Emissions Compliance Obligation – Customer-related variance account ("GHG-Customer VA") and a 2018 Greenhouse Gas Emissions Compliance Obligation – Facility-related variance account ("GHG-Facility VA") to record the differences that occur in 2018 between the actual revenues received from the Cap and Trade Tariffs and the actual costs Enbridge incurs to meet its 2018 obligations related to GHG emissions from relevant customers and Company facilities. These variance accounts will ensure that the Company neither over or under-recovers its Customer and Facility-related obligation costs;

- d. The amounts recorded in the 2016 Greenhouse Gas Emissions Impact Deferral Account (“GGEIDA”) and an order approving the clearance of such amounts to customers at the next practical QRAM;
  - e. The illustrative bill impacts of a typical residential customer that include the sum of Cap and Trade charges for Customer-related and Facility-related costs found at Exhibit G, Tab 1, Schedule 1 and appendices;
  - f. The RNG procurement model set out in Exhibit C, Tab 5, Schedule 2. Enbridge requests approval of the RNG procurement model as early as possible, and no later than the end of January 2018, so that important local sources of RNG can be procured for the longer term benefit of Ontarians; and,
  - g. The forecast costs associated with Enbridge’s planned abatement activities as set out in Exhibit C, Tab 5, Schedule 1, which are comprised of the cost for two additional full-time equivalent (“FTE”) employee resources and available funds of up to \$2 million in the Low Carbon Initiative Fund (“LCIF”) that will be tracked through the 2018 GGEIDA.
9. Enbridge requests confidential treatment of documentation, data and information (“Documents”) pursuant to the Board’s Rules of Practice and Procedure and the Practice Direction on Confidential Filings in respect of Documents marked “Auction Confidential”, “Market Sensitive” or “Confidential” or as specified in the Confidentiality exhibit in this filing at Exhibit A, Tab 3, Schedule 1, and in accordance with the Climate Change Act, O. Reg. 144/16: The Cap and Trade Program (“Cap and Trade Regulation” or “the Regulation”), and the Framework.

COMPLIANCE PLAN – ABATEMENT OVERVIEW

1. The Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities (the "Framework") recognizes that the natural gas utilities ("Utilities") have a number of compliance options available to meet their obligations under Ontario's Cap and Trade program. In addition to purchasing financial instruments, including allowances and offset credits, natural gas utilities can undertake GHG abatement measures to meet their compliance obligations.
2. Enbridge recognizes that Utilities are under a legal obligation to cover their emissions through the Cap and Trade program. The Utilities are statutorily mandated to procure allowances and offsets as part of regular business operations. Utilities are encouraged to take steps to reduce (abate) the emissions from their customers and from their own operations. This mandate is further articulated by the Framework which outlines several ways in which the Utilities may propose to meet their obligations which include: financial instruments (e.g. allowances, offsets), customer abatement (e.g. renewable natural gas ("RNG"), energy efficiency, fuel switching, new technologies), and facilities abatement (e.g. leak repairs, capital upgrades). In particular, at Table 2 of the Framework as shown below, the Board lists a number of Potential GHG Abatement Measures for consideration including:

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

Measure	Applicability to Utilities
Customer abatement activities	Customer emissions
Renewable energy and fuel switching	Facility and customer emissions
New technologies	Facility and customer emissions
Building retrofits	Facility and customer emissions
Measures to mitigate and reduce fugitive emissions	Facility emissions
Biogas, renewable natural gas <sup>1</sup>	Facility and customer emissions

3. Furthermore, in the Board's EB-2016-0300 Decision and Order on Enbridge's 2017 Compliance Plan (p. 27), the Board encouraged Enbridge to consider abatement activities in future Compliance Plans.
  
4. In the Framework, the Board states that in its evaluation of the cost consequences of the Utilities' Compliance Plans it will consider whether the Utility has "engaged in strategic decision-making and risk mitigation," "whether the Utility has considered a diversity (portfolio) of compliance options" and "whether a Utility has selected GHG abatement activities and investments that, to the extent possible, align with other broad investment requirements and priorities of the Utility in order to extract the maximum value from the activity or investment."<sup>2</sup>
  
5. Given that the applicable costs of a Utility meeting its carbon obligations are included in the distribution costs of customers' bills, Enbridge has a responsibility to manage costs where possible, and provide cost effective service. This will become increasingly important as the cost of carbon inevitably increases due to the deliberate manner in which the Cap and Trade program has been structured. With

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<sup>1</sup> Enbridge notes that biogas and renewable natural gas should be broadened to include renewable hydrogen and other renewable content as applicable for natural gas pipelines.

<sup>2</sup> Ontario Energy Board - Report of The Board: Regulatory Framework for the Assessment of Costs of Natural Gas Utilities' Cap and Trade Activities, September 16, 2016, at page 21.

Witnesses: S. McGill  
 J. Murphy  
 F. Oliver-Glasford

the increasing cost of carbon and the increasing recognition of the value of avoiding GHG emissions, attractiveness of GHG abatement will evolve.

6. Enbridge is committed to providing solutions to help the Company and its customers reduce their emissions and thereby help Ontario reach its GHG emissions targets. Enbridge has developed and is implementing an Abatement Construct through which the Company is developing a number of GHG abatement opportunities. Some of the plans are ready for implementation, while others are still being investigated and formulated. As well, Enbridge's DSM activities will continue to make meaningful contributions to GHG abatement.
7. This evidence sets out the Abatement Construct approach that Enbridge is using to assess and implement these activities as well as the Company's related incremental resource requirements. Then the exhibit provides an overview and discussion of the Board's Marginal Abatement Cost Curve for Assessment of Natural Gas Utilities' Cap and Trade Activities (the "MACC") and the Board's Long-Term Carbon Price Forecast Report (the "LTCPF"). Enbridge's planned customer-related abatement activities are described in Exhibit C, Tab 5, Schedule 2. Enbridge's planned facilities-related abatement activities are described in Exhibit C, Tab 5, Schedule 3.

#### The Abatement Construct

8. As explained in the Compliance Plan Overview (Exhibit C, Tab 1, Schedule 1), Enbridge worked collaboratively with Union Gas Limited to outline an Abatement Construct to guide abatement initiatives which is expected to be subject of continuous improvement.
9. As outlined in Exhibit C, Tab 1, Schedule 1, the Abatement Construct outlines the sustainment model by which low carbon initiatives are sought, vetted, categorized

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

and advanced with the ultimate goal of broad based implementation. Enbridge believes this construct will better enable abatement through setting common language and consistency in processes around which abatement initiatives can progress. This Abatement Construct in its entirety should increase the generation and implementation of abatement initiatives and therefore ultimately assist the Province in meeting its objective of a lower-carbon economy in a cost-effective, and economically sustainable manner. Enbridge believes the Abatement Construct is consistent with the Guiding Principles in the Framework, and with the stated GHG emissions reductions goals of the Government.

10. The Abatement Construct includes the following elements:

- Abatement program selection and screening criteria
- A four-phased “Initiative Funnel”
- A Low Carbon Initiative Fund (“LCIF”)

#### Abatement Screening Criteria

11. The Framework identifies “Guiding Principles” for the Compliance Plan. It also recognizes, as noted above, that longer term investments should be aligned with broader priorities. Therefore, Enbridge observes that abatement investments require complementary criteria to be applied in the assessment and selection of abatement programs that would be put forward as part of a Compliance Plan. Suggested abatement program selection and screening criteria for the Abatement Construct are outlined below:

- *Funding:* Abatement programs should be able to draw on a variety of funding sources, including Climate Change Action Plan (“CCAP”) funding, incremental amounts tracked through the Greenhouse Gas Emissions

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

Impact Deferral Account (“GGEIDA”) and other Government funding (provincial or federal). Where appropriate, an abatement program proposal will be supported by an assessment which may use a range of funding models and appropriate valuations and assumptions. The assessment would use the best available information at the time but it is important that such information would not be reconsidered on a retrospective basis at the time cost recovery is determined.

- *Timely advancement of technology:* There must be recognition of the role natural gas utilities play in advancing the adoption of new technology over extended periods of time.
- *Support government targets:* Abatement programs will contribute towards the achievement of GHG emission reductions and/or meet the goals of related regulations.
- *Efficient and rational development:* Abatement programs should balance customer cost impacts by leveraging existing infrastructures (particularly utility infrastructure, including physical, brand, billing, program delivery) where appropriate and by not duplicating existing frameworks (e.g. DSM).
- *Respect appropriately modified regulatory constructs:* Abatement programs should manage customer cost impacts; adhere to cost causality (no undue cross-subsidization); use applicable valuations and appropriate costing (including marginal cost allocation where appropriate); and align with procurement and compliance guiding principles.

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

12. In addition, when considering which initiatives should be pursued (and where the opportunities fit within the Initiative Funnel described more fully below), the following considerations may also be used:

- Market size – how meaningful can the technology/program be in reducing GHG emissions – both near and long term?
- Technological maturity – how quickly can the technology be brought to market?
- Market acceptance – What is the expected market uptake?
- Cost effectiveness – Do the current and projected costs of the technology/program compare favourably with or operate in conjunction with other options?
- Local content – Does the technology support or leverage Ontario's technology entrepreneurs?

13. Enbridge recognizes that abatement initiatives will develop, evolve and mature over time, particularly given the reliance on new and emerging technologies. In addition, there may be many concepts or ideas that Enbridge will investigate as abatement opportunities, with only some coming to ultimate fruition.

#### Abatement Initiative Funnel

14. Enbridge is using an "Initiative Funnel" approach to investigating, planning and implementing abatement activities through its Compliance Plan. The four-stage Initiative Funnel is depicted below and provides the basis under which abatement initiatives are categorized for purposes of discussion within the Company and in compliance planning.

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

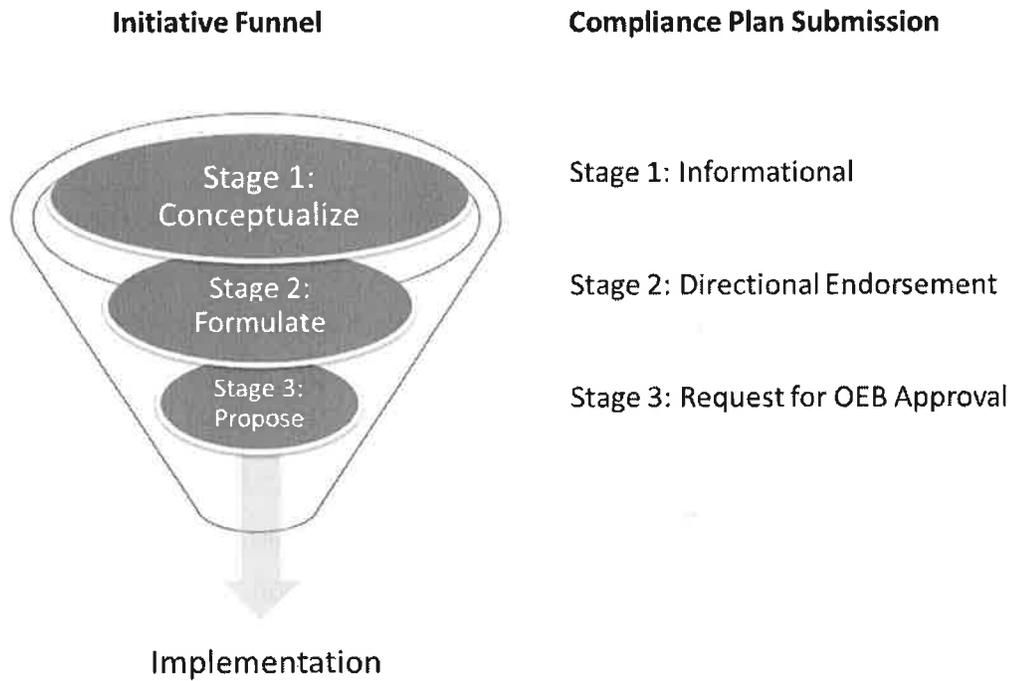


Figure 1: Compliance Plan Initiative Funnel

15. Enbridge's Initiative Funnel is comprised of four stages that initiatives will pass through. These stages are:

- Stage 1: Conceptualize – In this stage, technology and/or abatement ideas are identified and explored to determine applicability;
- Stage 2: Formulate – In this stage, technology and/or abatement ideas have received directional endorsement from the Company. Pilot programs or small scale development tests may be completed to prove the technology and its applications;
- Stage 3: Propose – In this stage, technology or abatement ideas and its applications have been identified along with the GHG reduction potential, and the Company is requesting specific approvals from the Board in the Compliance Plan or through other proceedings.

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

- Stage 4: Implementation– This stage is the implementation of abatement initiatives and also captures existing abatement activity being undertaken by Enbridge including the Green Investment Fund (“GIF”) program.
16. It is possible that only some abatement initiatives would progress through the funnel to reach the Propose or Implementation stages. Progression of technology through the funnel will depend on a variety of factors such as commercial viability, technical feasibility and consideration of screening criteria listed above.
17. Initiatives that have received approval from the Board in Stage 3 will then proceed into the Implementation phase. Initiatives that have been implemented will be monitored and reported on through the Compliance Plan.
18. Enbridge’s Compliance Plans will provide details about the outcomes resulting from this “Initiative Funnel”, from concept through to specific proposals that require a decision from the Board in order to proceed. This type of presentation provides the Board with an indication of the state of advancement of each initiative and a reasonable expectation of the implementation timeframe associated with each potential opportunity.
19. Even where abatement program and implementation costs will not be incurred during the term of a specific Compliance Plan, providing information about prospective abatement activities in a Compliance Plan filing will offer the Board and stakeholders an opportunity to consider the direction of the Company’s future plans and to provide comments. This will provide Enbridge with input as plans evolve and greater certainty as to the acceptability of moving forward with the various abatement options. The scope and details of the initiatives that will fill the Initiative

Witnesses: S. McGill  
J. Murphy  
F. Oliver-Glasford

SEC INTERROGATORY #9

INTERROGATORY

[C-1-1, p.10] Please provide the internal memorandum, guide, and/or other document that sets out in detail the Abatement Construct.

RESPONSE

The details related to the Abatement Construct are outlined in evidence found at Exhibit C, Tab 5, Schedule 2. There is no further internal guide detailing the Abatement Construct.

Witness: F. Oliver-Glasford

SEC INTERROGATORY #17

INTERROGATORY

[C-5-2] With respect to the Stage 2 of the Abatement Construct:

- a. Please provide a work plan for 2018 regarding each of the listed initiatives.
- b. For each listed initiative, please provide a copy of any memorandum, concept outline, and/or other internal document describing in full the potential initiative, costs, benefits and work that should be undertaken before it can be considered for Stage 3.

RESPONSE

- a. and b. An outline of the activities associated with each of the listed initiatives is set out in response to Board Staff Interrogatory #23b, filed at I.1.EGDI.STAFF.23. Detailed work plans for each of these initiatives will be developed by the incremental FTEs requested in this proceeding "to support investigation, planning and project management activities" (Exhibit C, Tab 5, Schedule 2, page 3, Table 1).

Witness: R. Sigurdson

STAFF INTERROGATORY #23

INTERROGATORY

Ref: Exhibit C / Tab 5 / Schedule 1 / pp. 9-10  
Exhibit C / Tab 5 / Schedule 1 / p. 11

Preamble:

Enbridge Gas proposes a \$2 million annual "Low Carbon Initiative Fund" (LCIF) to enable the identification and development of GHG reducing technologies to progress into future abatement opportunities.

Enbridge Gas indicates that "the LCIF will initially provide funding for Enbridge Gas to better define each opportunity in order to successfully qualify for government grants." It will also provide the means to accelerate innovative technologies necessary for the Province to meet its renewable energy and emissions reduction targets."

Enbridge Gas also indicates that it will require two additional full time equivalent ("FTE") employees to support its efforts to identify, formulate and begin to implement on new or expanded abatement activities within the Initiative Funnel.

Questions:

- a) How does Enbridge Gas currently identify abatement activities to pursue? What would change if the LCIF is approved? Please explain.
  - i. In 2017, did Enbridge Gas undertake any activities that would, in 2018, fall within the ambit of the LCIF?
    1. If yes, please provide: a description of each activity; amounts spent on each activity in 2017; and whether those amounts are included in Enbridge Gas' 2017 admin costs.
- b) Please explain what work Enbridge Gas intends to undertake in 2018 with the LCIF, if approved.
  - i. Please explain how this work is related to the abatement activities proposed in the Initiative Funnel.
- c) Please provide details of expected resourcing requirements and costs associated with each stage of the Funnel, including implementation, for 2018.
  - i. Please explain whether these costs are incremental to Enbridge Gas' forecast 2018 administration costs.
  - ii. Please explain whether these costs are included in the proposed \$2M LCIF.

Witnesses: S. McGill  
F. Oliver-Glasford  
R. Sigurdson

- d) Please explain why it is appropriate for Enbridge Gas to receive additional ratepayer funding so that it can qualify for government grants.
- e) Please explain why it is appropriate for Enbridge Gas to obtain ratepayer funding to accelerate technologies to help the Province meet its renewable energy and emissions reduction targets.
- f) Please explain what will happen if the OEB does not approve the proposed \$2M LCIF.
- g) Enbridge Gas and Union Gas filed a MAAD application<sup>1</sup> with the OEB. Please explain whether, and if so how, Enbridge Gas will realize any economies of scale in relation to activities being undertaken in relation to GHG abatement.
- h) Please provide details of the activities and work that Enbridge Gas' proposed two new FTEs would undertake in 2018.
  - i. Given the Enbridge Gas and Union Gas MAAD application<sup>2</sup> with the OEB, please explain whether, and if so how, Enbridge Gas has considered any economies of scale in relation to resourcing requirements.
- i) Please provide references to specific cases and/or policy from the OEB and from any other authorities where research and development activities such as consulting, pilot programs, testing, market research, and data analysis is funded by ratepayers.
- j) In the event where Enbridge Gas' research undertaken through the LCIF leads to new technologies that could be marketed resulting in a financial value, would that financial value be shared with the ratepayers?
  - i. If yes, please explain how.
  - ii. If no, please explain why not

## RESPONSE

- a) Enbridge has put into place an Abatement Construct and Initiative Funnel as described in Exhibit C, Tab 5, Schedule 1. The Company uses the outlined abatement principles (please see the response to Board Staff Interrogatory #21, filed at Exhibit I.1.EGDI.STAFF.21) as a supplement, or complementary to the Board's Guiding Principles and considers a range of factors (please see the response to

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<sup>1</sup> EB-2017-0306

<sup>2</sup> Ibid

Witnesses: S. McGill  
F. Oliver-Glasford  
R. Sigurdson

BOMA Interrogatory #1, filed at I.C.EGDI.BOMA.1) when identifying abatement activities to pursue. If the LCIF is approved, Enbridge will be in a position to rely on a reliable and steady flow of funding to support its abatement planning.

- i. Yes, Enbridge did engage in some activities during 2017 that would be expanded with the benefit of the incremental LCIF funding. Please see the table below for the requested information:

Activity	Description of 2017 Work	Approximate 2017 Spend	Included in EGD 2017 GGEIDA Costs
Net Zero/micro generation	Development of equipment integration strategies between electricity and gas systems, including acquisition of equipment for integration testing before larger-scale field deployments in customer homes.	\$70,000	No
Natural gas heat pumps	Two pilot projects – 1. Heat pump field demonstration: Quantify the energy savings of an air source natural gas absorption heat pump (GHP) in a domestic hot water application. The heat pump has been providing domestic hot water to two TCHC buildings served by a common boiler plant. 2. Monitoring the space heating performance of a NGASHP and estimate its GHG reduction in a controlled setting at the Kortright Center.	\$30,000	No
Hydrogen	Participation in European and Canadian technical task forces that are evaluating the requirements for gas utility blending of hydrogen in the networks. Information to be used by Enbridge to finalize detailed work plans for the implementation of a hydrogen blending initiative and to confirm budget requirements	\$30,000	No

Further to the table above, work that Enbridge has supported through the Canadian Gas Association may also be considered to be in the scope of the LCIF.

- b) Please see table below for the customer-related abatement initiatives. For a list of facility-related abatement initiatives and associated costs, please refer to the response to Board Staff Interrogatory #27c, filed at Exhibit I.1.EGDI.STAFF.27.

Witnesses: S. McGill  
 F. Oliver-Glasford  
 R. Sigurdson

<b>Breakdown of proposed \$2M 2018 LCIF Budget - Customer-Related Abatement Initiatives</b>				
<b>Stage</b>	<b>Initiative</b>	<b>Targeted / Applicable Sectors</b>	<b>Description of work under consideration</b>	<b>2018 Estimate</b>
<b>Stage 1:</b> Conceptualize	Smart Metering	Residential/ Small Commercial	Pilots to demonstrate the integration of hybrid heating (dual-fuel) appliance control that leverages new meter functionality to minimize carbon emissions	\$ 100,000
	RNG - Gasification	Residential/ Commercial/ Industrial	Research Projects to investigate biomass conversion to RNG through gasification	\$ 200,000
	Carbon Capture	Residential/ Commercial/ Industrial	Pilots in Ontario demonstrating potential for 2 carbon capture technologies. Market scan of existing technologies/limitations, development/leveraging of strategic partnerships as well as financial support for vendors to develop new technologies that can achieve up to 100% carbon capture.	\$ 250,000
<b>Stage 2:</b> Formulate	Hydrogen (Power to Gas)	Residential/ Commercial/ Industrial	Technical due diligence and planning, specific to Enbridge's gas distribution system, to establish the initial guidance and capabilities for blending hydrogen into the natural gas pipeline network as means of diversifying how Ontario can meet provincial and federal renewable content requirements. This work is required as a prerequisite before proceeding with an actual field trial of hydrogen blending in a segment of Enbridge's pipeline network.	\$ 500,000
	Net-Zero Homes/ Micro-Generation	Residential/ Small Commercial	Implementation of Net Zero Energy Emissions pilot project for residential homes to build on the earlier 2017 technology integration assessments and planning. The pilot will be implemented in partnership with electric LDC(s) and Municipalities. The objective is testing, optimization and monitoring of variations in the hybrid heating solutions, as well as distributed power generation platforms like solar PV and mCHP. The objective is to fully assess the GHG reduction potential, costs and potential for cost reductions. This results of the multi-home pilot would help inform energy planners and the HVAC industry on the development priorities to accelerate measures that advance higher-value GHG abatement.	\$ 449,000
	Expanded NGV Program	Commercial	Demonstration projects with small fleets. Focus on developing the large transport truck market within Ontario.	\$ 300,000
	Natural Gas Air-Source Heat Pumps	Residential/ Commercial	Conduct field tests to quantify actual savings and provide performance data vs. energy efficient furnaces as well as electric heat pumps. Aim to develop competitively priced natural gas heat pumps specifically for the residential market.	\$ 150,000
<b>Total Estimated 2018 Cost</b>				<b>\$ 1,949,000</b>

Witnesses: S. McGill  
 F. Oliver-Glasford  
 R. Sigurdson

- c) Enbridge requires two incremental FTEs to support activities related to the Initiative Funnel.
- i. The two incremental FTEs are included in the 2018 Administrative Costs outlined in Table 1 in Exhibit D, Tab 1, Schedule 1. This is further illustrated through the detailing of the Staffing Resources found in Exhibit D, Tab 1, Schedule 1 in Table 2.
  - ii. The costs associated with the two incremental FTEs are in addition to the \$2 million LCIF.
- d) The proposed LCIF is to help ensure the Company has the ability to work through the implications and data related to abatement opportunities. In completing research or a pilot, it may be determined that a next step is to seek government funding where available noting this isn't the principal purpose for LCIF. Where government funding is available and can be obtained that would be to the benefit of ratepayers.
- e) The ratepayers will benefit from the LCIF where it promotes the development and ultimately implementation of cost effective abatement technologies.
- f) Should the \$2 million LCIF fund not be approved, Enbridge's ability to adequately review, assess and develop low carbon abatement opportunities is lessened. To develop abatement opportunities Enbridge needs access to certain and steady funding.
- g) Please refer to the response to Board Staff Interrogatory #16a, filed at Exhibit I.1.EGDI.STAFF.16.
- h) The two incremental resources would be responsible to support the Company's efforts in identifying, formulating and implementing initiatives related to the LCIF. Please see Exhibit C, Tab 5, Schedule 1, page 11 of 15 for areas of responsibilities.
- i. Please refer to the response to Board Staff Interrogatory #16a, filed at Exhibit I.1.EGDI.STAFF.16.
- i) In the DSM multi-year filing, the Collaboration and Innovation Fund was approved to promote innovative or collaborative research and pilots within the realm of customer related energy efficiency.

Witnesses: S. McGill  
F. Oliver-Glasford  
R. Sigurdson

- j) As stated in Exhibit C, Tab 5, Schedule 1, page 9, paragraph 23 “The Low Carbon Initiative Fund (“LCIF”) is proposed to enable the identification and development of GHG reducing technologies to progress into future abatement opportunities”. It is premature to consider how unknown future benefits from proposed LCIF technology projects would be treated.

Witnesses: S. McGill  
F. Oliver-Glasford  
R. Sigurdson

SEC INTERROGATORY #15

INTERROGATORY

[C-2-2, p.3] With respect to the proposed Low Carbon Initiative Fund:

- a. Please provide a breakdown of the proposed \$2M in 2018.
- b. Union has proposed a similar fund. Please explain what type of coordination will be undertaken regarding the use of each utility's fund.
- c. Please discuss Enbridge position regarding a potential condition of approval that all research activities undertaken using these ratepayer funds should be made available to the public.
- d. Please confirm that there would be no subsequent review for prudence of the amount spent up to \$2M.

RESPONSE

- a) Please refer to the response to Board Staff Interrogatory #23b, filed at Exhibit I.1.EGDI.STAFF.23.
- b) Please see the responses to Board Staff Interrogatory #16a, filed at I.1.EGDI.STAFF.16 and APPRO Interrogatory #4b filed at Exhibit I.1.EGDI.APPRO.4.
- c) Enbridge is supportive of making final report findings available to the public.
- d) LCIF amounts will be recorded in the 2018 GGEIDA. LCIF amounts recorded in the 2018 GGEIDA will be brought forward for clearance in future proceedings.

Witnesses: S. McGill  
R. Sigurdson

SEC INTERROGATORY #8

INTERROGATORY

With respect to Union and Enbridge:

- a. Please confirm that Enbridge and Union are affiliates.
- b. If (a) is confirmed, please explain why Enbridge and Union require separate cap and trade groups within their companies considering they are now affiliates.
- c. Please confirm that subsection 65(3) and (4) of O.Reg 144/16 has been revoked.
- d. If (c) is confirmed, please explain any changes in how Enbridge and Union plan to participate in allowances auctions compared to 2017 when the provisions were in force.

RESPONSE

- a. Confirmed.
- b. Although Enbridge and Union are affiliates under the Cap and Trade regulation, the companies are still operating as separate entities. Once the decision on the amalgamation of the Utilities is confirmed, a go forward plan can be developed/implemented.
- c. Confirmed.
- d. Until the amalgamation between Enbridge and Union is approved by the Board, the companies continue to keep their procurement strategies separate. Please see response to Board Staff Interrogatory #16a found at Exhibit I.1.EGDI.STAFF.16.

Witnesses: A. Langstaff  
J. Murphy  
F. Oliver-Glasford

STAFF INTERROGATORY #16

INTERROGATORY

Ref: Exhibit C / Tab 3 / Schedule 1 / p. 8-9

Preamble:

In the WCI linked market, Enbridge Gas states that it is considered a related person with two entities: Union Gas and Gazifère Inc.

Enbridge Gas and Union Gas also filed a MAAD application<sup>1</sup> with the OEB.

Questions:

- a) For 2018, please explain whether, and if so how, Enbridge Gas will realize any economies of scale in relation to the following cap and trade activities:
  - i. Research and development, including RNG research and development
  - ii. Back office functions
  - iii. FTEs related to cap and trade
  - iv. Cap and trade consultants
  - v. Abatement activities
  
- b) Do Enbridge Gas and Union Gas intend to file individual and separate compliance plans for 2019-2020? Please explain.

RESPONSE

- a) Enbridge and Union Gas will continue to operate as separate utilities until they have received all necessary OEB approvals to amalgamate. Only after the decision is made to proceed with the amalgamation will an integration plan be developed. If there is a decision on amalgamation within a reasonable timeframe before the year ends, the Utilities will work together to determine if and how economies of scale can be realized.
  
- b) Enbridge recognizes the confluence of timelines between the MAAD application and related process and the current August 1, 2018 filing date of the 2019/2020 Compliance Plan. Although Enbridge notes that submitting a joint 2019/2020 Compliance Plan with Union Gas is an option, the Company must still determine if it is practically feasible to do so particularly given the above noted filing deadline.

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<sup>1</sup> EB-2017-0306

Witnesses: A. Langstaff  
J. Murphy  
F. Oliver-Glasford

APPrO INTERROGATORY #4

INTERROGATORY

Reference: i) EB-2017-0224 Exhibit C Tab 1 Schedule 1  
ii) EB-2017-0224 Exhibit C Tab 1 Schedule 2  
iii) EB-2017-0255 Exhibit 3 Tab 4

Preamble: Enbridge Gas Distribution Inc. ("**Enbridge**") is seeking ratepayer funding for a Low Carbon Initiative Fund ("**LCIF**") in the amount of \$2 million.

Questions:

- a) Has Enbridge sought funding for this LCIF from the Climate Change Action Plan ("**CCAP**")? If not, please explain why.
- b) Please confirm that many of the same initiatives being proposed by Enbridge (Table 1 Schedule 2), are also being evaluated by Union Gas Limited ("**Union**") as outlined in reference iii).
- c) For projects funded by Enbridge, will Enbridge share the results with Union?
- d) In light of the common ownership of Enbridge and Union, and the highly similar nature of the two utility's operations, please explain why a single LCIF with coordinated prioritizing of projects would not be a more efficient method of investigating new technologies.
- e) How is Enbridge coordinating its activities with other Canadian and international utilities?
- f) Please explain if any of the activities proposed to be funded from the LCIF could be funded from the DSM budget?

RESPONSE

- a) Enbridge has had discussions with the Government to fund specific abatement initiatives, however the Company has not had any indication from the government that they are prepared to financially support a natural gas utility led fund.
- b) Enbridge and Union have both proposed similar technologies, however they anticipate pursuing separate projects. Where overlap is identified, the utilities intend to continue to collaborate.

Witnesses: D. Johnson  
F. Oliver-Glasford  
R. Sigurdson

- c) Yes, Enbridge anticipates that results will be shared with Union.
- d) Please refer to the response to Board Staff Interrogatory #16a, filed at Exhibit I.1.EGDI.STAFF.16.
- e) Enbridge actively participates in a number of industry associations, including the Canadian Gas Association, Gas Technology Institute, and The Energy Solutions Centre, amongst others. Enbridge has been actively engaged in discussion with utilities from Québec and California, through conferences, associations, and other channels as applicable. These same associations as well as the consulting firms with which the Company has worked with have provided insights from other jurisdictions.
- f) Enbridge's low-carbon strategy includes three pillars: a) energy efficiency, b) low-carbon technology innovation, and c) greening the grid. The LCIF is intended to broadly capture ideas and projects not covered through DSM, including facility-related projects.

Witnesses: D. Johnson  
F. Oliver-Glasford  
R. Sigurdson

APPrO INTERROGATORY #6

INTERROGATORY

Reference: i) EB-2017-0224 Exhibit C Tab 5:

Preamble: Enbridge is investigating the potential to use surplus electricity to produce hydrogen for storage and subsequent injection into its natural gas system. APPrO would like to understand the implications of injecting hydrogen into the natural gas system.

Questions:

- a) Please describe the status of this potential project.
- b) Union Gas is also investigating this opportunity. Please describe if Enbridge is pursuing this independently or in cooperation with Union. Please explain.
- c) Please indicate if Enbridge has developed a maximum hydrogen content for its natural gas supply. If so, please specify the maximum percentage.
- d) Please indicate if Enbridge has had consultations with large volume customers, including gas-fired generators, on the potential changes to the composition of the natural gas stream and the potential implications to their combustion equipment.
- e) Hydrogen has been known to migrate through steel and impact the integrity of steel pipelines. Has, or will Enbridge investigate the risks of injecting hydrogen into pipelines to ensure that there are no unintended consequences from this initiative prior to the implementation of this initiative? If a study has been undertaken, please provide a copy of the study.

RESPONSE

- a) Enbridge is in the process of commissioning a utility scale Power to Gas plant to produce and store hydrogen. The Company is at the preliminary stages of its research, planning, investigating and analyzation of the injection phase of the project.
- b) Enbridge is pursuing this project independently, but will share any results of this with Union where appropriate.
- c) The Company has not yet determined a maximum hydrogen content for its natural gas supply.

Witnesses: S. McGill  
D. Teichroeb

- d) The project is not at the stage to engage in consultations with specific user groups; however this has been identified as an important part of the process described in response (a)
  
- e) The investigation into the potential perceived risks associated with injecting hydrogen into Enbridge's distribution system to ensure that there are no unintended consequences is a key component of the planned investigation as stated in response (a). Maintaining the safety and integrity of the distribution system is paramount. Studies will be undertaken in this regard, but they are at a very early stage.

Witnesses: S. McGill  
D. Teichroeb

STAFF INTERROGATORY #13

INTERROGATORY

Ref: Exhibit D / Tab 1 / Schedule 1 / p. 6-7

Preamble:

Enbridge Gas notes that it receives support from experts and consultants for development and execution of its Cap and Trade activity. It also notes that consulting and market intelligence costs are forecasted to be approximately \$400,000, which includes expert insights and support related to Enbridge Gas' development and implementation of its Compliance Plan; Specific offset market insight to build an effective offset strategy as well as help support development of an active offset market; Carbon market and related climate policy insight and analysis; and Legal and/or technical review of regulation amendments and commercial contract support where required.

- a) Please explain how many consultants Enbridge Gas is using or intends to use to fulfill all of the support activities described.
- b) Please complete the table below:

<b>Consultant</b>	<b>2018 Costs</b>
<b>Total</b>	<b>\$400,000</b>

- c) Please describe whether Enbridge Gas undertook or will undertake a competitive procurement process when selecting each of its consultants.
- d) Enbridge Gas and Union Gas filed a MAAD application<sup>1</sup> with the OEB. Please explain whether, and if so how, Enbridge Gas will realize any economies of scale in relation to external consultants working on issues related to cap and trade.

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<sup>1</sup> EB-2017-0306

RESPONSE

- a) For 2018, Enbridge has not finalized the totality of its consultant requirements or selection but recognizes that the Company will need third party support. Enbridge anticipates that it will require support towards the development of the 2019/2020 Compliance Plan and continuing support in reviewing and responding to various regulatory updates and/or offset protocols.
- b) The table referenced below was generated for forecasting purposes. As identified in part a) of this question, Enbridge has not finalized its full complement of consultants for 2018.

<b>Component</b>	<b>Consultant</b>	<b>2018 Forecast</b>
Compliance Plan Consulting and Implementation Support	TBD	\$150,000
Offset Market Consulting Support	TBD	\$100,000
Carbon Market and Related Climate Policy Support	Associations	\$20,000
Carbon Market and Related Climate Policy Support	Market Intelligence	\$30,000
Carbon Market and Related Climate Policy Support	Offset protocol response	\$50,000
Compliance Enabling Legal Support	McCarthy Tetrault and Aird & Berlis	\$50,000

- c) To the extent possible, Enbridge will undertake a competitive bid process. It must be recognized that the pool of carbon market consultants and experts is small; however, Enbridge will evaluate the cost of any proposal against costs quoted by other consultants, or through historical experience where possible.
- d) Please refer to Board Staff Interrogatory #16a, filed at Exhibit I.1.EGDI.STAFF.16.

APPrO INTERROGATORY #7

INTERROGATORY

Reference: i) EB-2017-0224 Exhibit C Tab 5:  
ii) EB-2017-0255 Exhibit 3 Tab 5

Preamble: Enbridge and Union each are proposing to use significant consulting resources to augment their internal expertise. In light of the common ownership of the two companies and the formal merger application that is underway, APPrO would like to understand if there are synergies in the consulting budgets between the two companies that could reduce the burden on ratepayers.

Questions:

a) In reference i) Enbridge notes that it has a \$400,000 consulting budget for "support and Market Intelligence". Similarly, Union has \$670,000 for a variety of work. Table 3 in reference i) outlines the specific consulting work that is proposed by Enbridge and there appears to be a high degree of correlation with the consulting work proposed by Union in Table 2, reference ii). Please indicate why this consulting work between Enbridge and Union cannot be coordinated to reduce the ratepayer burden?

RESPONSE

a) Please refer to response to Board Staff Interrogatory #16 filed at Exhibit I.1.EGDI.STAFF.16.

Witnesses: A. Langstaff  
F. Oliver-Glasford

STAFF INTERROGATORY #12

INTERROGATORY

Ref: Exhibit D / Tab 1 / Schedule 1 / p. 1, #1  
 Exhibit C / Tab 5 / Schedule 2 / p. 3  
 Exhibit C / Tab 5 / Schedule 1 / p. 11, #28  
 Exhibit D / Tab 1 / Schedule 1 / p. 2, Table 1

Preamble:

Enbridge Gas states that it forecasts its 2018 Administrative Costs to be captured in the 2018 GGEIDA to be a total of \$5.2 million; of that amount, \$2.0 million is related to the Low Carbon Innovation Fund. Enbridge Gas also states that it is requesting approval of two new FTEs to support investigation, planning and project management activities, to be funded through the GGEIDA.

Enbridge Gas estimates that the 2018 cost associated with the two additional FTEs will be approximately \$350,000.

Enbridge Gas has provided the following Table 1 as a summary of its 2018 Forecasted Administrative Costs:

Table 1: 2018 Forecasted Administrative Costs

<b>Cost Element</b>	<b>Forecasted Amount</b>
Revenue requirement implications of IT billing system upgrades	\$191,000
Staffing Resources	\$1,500,000
Low Carbon Initiative Fund ("LCIF")	\$2,000,000
Consulting Support and Market Intelligence	\$400,000
OEB Cap and Trade related Consultation	\$100,000
Incremental Cap and Trade related GHG Reporting and Verification Audit	\$40,000
Bad Debt Provision	\$960,000
Other Miscellaneous Costs	\$60,000
Applicable Compliance Plan Proceeding Costs	TBD
<b>Total 2018 Forecast Administrative Costs for GGEIDA</b>	<b>\$5,251,000</b>

Witnesses: T. Bruckmueller  
 A. Langstaff  
 D. McIlwraith  
 F. Oliver-Glasford

a) Please complete the table below. For the 2017 Actual column, please provide year-to-date actuals and the remainder of the 2017 year as a forecast.

<b>Administrative Cost Item</b>	<b>2017 Forecast</b>	<b>2017 Actual</b>	<b>2018 Forecast</b>
Staffing Resources (Salaries and Wages)	\$1,120,000		\$1,500,000
Consulting	\$561,000		\$400,000
Bad debt related to cap and trade	\$900,000		\$960,000
IT Billing System Updates	\$76,100		\$191,000
Customer Education and Outreach	\$115,000		
External Legal Counsel	\$125,000		
OEB Costs			\$100,000
C+T GHG reporting and verification costs	\$20,000		\$40,000
Other (travel expenses, market research and communications)			\$60,000
<b>SUB-TOTAL</b>	<b>\$2,917,100</b>		<b>\$3,251,000</b>
Low Carbon Initiative Fund	n/a		\$2,000,000
<b>TOTAL</b>			<b>\$5,251,000</b>

- b) Please explain why Enbridge Gas' customer education and outreach costs went from \$115,000 in 2017 to \$0 in 2018.
- c) Please discuss the rationale and appropriateness of the difference in bad debt related to cap and trade costs proposed by Enbridge Gas (\$960,000 in 2018) and Union Gas (\$425,000 in 2018).
- d) Please explain why Enbridge Gas' forecast bad debt related to cap and trade for 2018 is \$60,000 more than its forecast bad debt for 2017, while Union Gas' forecast

Witnesses: T. Bruckmueller  
 A. Langstaff  
 D. McIlwraith  
 F. Oliver-Glasford

bad debt related to cap and trade for 2018 is \$175,000 less than its forecast bad debt for 2017.

- e) Please explain whether the 2018 cost associated with the two additional FTEs that Enbridge Gas has requested is included in Exhibit D / Tab 1 / Schedule 1 / p. 2, Table 1.
- f) Enbridge Gas and Union Gas filed a MAAD application<sup>1</sup> with the OEB. Please explain whether, and if so how, Enbridge Gas will realize any economies of scale in relation to FTEs that are working on cap and trade.
- g) For the table in a), please provide an explanation for any line item where:
  - i. The cost difference between 2017 Forecast and 2017 Actual is greater than 10 percent.
  - ii. The cost difference between 2017 Actual and 2018 Forecast is greater than 10 percent.

## RESPONSE

- a) Enbridge notes that Table 1 shown above, and in the evidence at Exhibit D, Tab 1, Schedule 1 did not include forecast costs for external legal counsel. As external counsel costs associated with Cap and Trade are an incremental cost, it is appropriate to include in the 2018 administrative cost forecast. External counsel costs have been included in the table below.

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<sup>1</sup> EB-2017-0306

Witnesses: T. Bruckmueller  
A. Langstaff  
D. McIlwraith  
F. Oliver-Glasford

<b>Administrative Cost Item</b>	<b>2017 Forecast</b>	<b>2017 Actual</b>	<b>2018 Forecast</b>
Staffing Resources (Salaries and Wages)*	\$1,120,000	\$694,590	\$1,500,000
Consulting	\$561,000	\$156,772	\$400,000
Bad debt related to cap and trade	\$900,000	\$600,007	\$960,000
IT Billing System Updates	\$76,100	\$97,600	\$191,000
Customer Education and Outreach	\$115,000	\$12,881	\$0
External Legal Counsel	\$125,000	\$363,648	\$400,000
OEB Costs		\$317,968	\$100,000
C+T GHG reporting and verification costs	\$20,000	\$9,500	\$40,000
Other (travel expenses, market research and communications)		\$20,736	\$60,000
<b>SUB-TOTAL</b>	<b>\$2,917,100</b>	<b>\$2,273,702</b>	<b>\$3,651,000</b>
Low Carbon Initiative Fund	n/a	0	\$2,000,000
<b>TOTAL</b>		<b>\$2,273,702</b>	<b>\$5,651,000</b>

- b) In 2018, Enbridge intends to use existing communication methods as ensure that customers remain informed on the aspects of Cap and Trade, at no additional cost.

Enbridge has been leveraging existing customer communication methods (i.e., no or low incremental cost communication methods) since the inception of the program. A summary has been provided below.

In January 2017, the Company used an on-bill envelope message to direct customers to Enbridge's Cap and Trade website to obtain additional information about the Cap and Trade program. A sample of this on-bill envelop message was filed at EB-2016-0300, Exhibit E, Tab 1, Schedule 1, Appendix D. For detailed information on Enbridge's Cap and Trade website, please refer to Board Staff interrogatory 29 a) filed at Exhibit I.3.EGDI.STAFF.29. Enbridge did not incur any incremental costs for the inclusion of this on-bill envelope message.

Witnesses: T. Bruckmueller  
 A. Langstaff  
 D. McIlwraith  
 F. Oliver-Glasford

Throughout 2017, upon request, Enbridge continued to communicate with customers about Cap and Trade through various non-cost platforms such as Twitter, the call centre and the Ombudsman's office. For additional information, please refer to Board Staff interrogatory #29 filed at Exhibit I.3.EGDI.STAFF.29.

- c) As identified at Exhibit D, Tab 1, Schedule 1, paragraphs 27 through 30, Enbridge utilized the Company's total revenue requirement, total forecasted cost of compliance and corporate bad debt forecast to calculate a forecasted cost of bad debt associated with Enbridge's Cap and Trade program. Enbridge is not aware of the specific details of Union Gas Limited's methodology for forecasting bad debt associated with Cap and Trade.
- d) Enbridge is maintaining the same methodology of attributing a fixed share of bad debt to Cap and Trade based on the percentage of billed revenue. The increase in Enbridge's Cap and Trade bad debt forecast in 2018 is a result of an increase in the forecast total cost of compliance between 2017 and 2018.
- e) The costs associated with the two new FTEs for the implementation and sustainment of the abatement construct are included in the staffing resources costs in Table 1 filed at Exhibit D, Tab 1, Schedule 1.
- f) Please refer to Board Staff interrogatory #16a, filed at Exhibit I.1.EGDI.STAFF.16.
- g)
  - i) Enbridge's external legal counsel costs exceeded the Company's budget by greater than 10%. At the time the 2017 Compliance Plan was filed, the Company did not have a complete understanding of the intricacies and effort involved in the preparation and defense of the Company's first Cap and Trade Compliance Plan.

In Enbridge's 2017 Compliance Plan, the Company did not forecast any 'Other' expenses or OEB costs. As noted in the Board's table, 'Other' would include such expenses as travel, market research and communication. Such costs have been forecasted in Enbridge's 2018 Compliance Plan.

In regards to the IT billing system updates, the actual 2017 revenue requirement was greater than the 2017 forecast revenue requirement provided in EB-2016-0300, primarily as a result of higher than forecast actual billing system update costs (\$564K versus \$516K) and a slightly earlier than forecast in-service date

Witnesses: T. Bruckmueller  
A. Langstaff  
D. McIlwraith  
F. Oliver-Glasford

(December 2016 versus January 2017), which resulted in higher than forecast depreciation and cost of capital revenue requirement amounts.

- ii) The difference in staffing costs are attributed to the continued development of Enbridge's Cap and Trade team, recognizing the increased complexity of the market and evolution of the Company's abatement processes. Enbridge's anticipated 2018 staffing requirements are set out in Table 2 of EB-2017-0224, Exhibit D, Tab 1, Schedule 1.

The higher forecast consulting costs for 2018 (over Enbridge's 2017 actual costs) are also a result of the increased complexity of the Cap and Trade market. Enbridge anticipates that it will require support towards the development of the 2019 / 2020 Compliance Plan and continuing support in reviewing and responding to various regulatory updates and/or offset protocols.

It should be noted that Enbridge's bad debt forecast from 2017 to 2018 increased by approximately 7%. The actuals recorded in 2017 were lower than forecasted due to the Company's actual overall bad debt being lowered than forecasted. As discussed in response to CME Interrogatory #5, filed at Exhibit I.1.EGDI.CME.5, Enbridge continues to use the same methodology to forecast bad debt. The 2018 forecast bad debt related to Cap and Trade is only a forecast. Enbridge will only seek clearance of the actual bad debt incurred.

The forecast 2018 revenue requirement related to the Cap and Trade billing system updates is greater than the 2017 actual revenue requirement primarily due to higher forecast income taxes. The increase in 2018 income taxes is a result of lower Capital Cost Allowance tax deductions attributable to the billing system updates capital cost, which were utilized within the determination of 2016 and 2017 actual revenue requirements.

An increase in Cap and Trade GHG reporting and verification is noted as it is mandatory that the Company undergo a complete audit and verification on its customer-related emissions. This is a new requirement based on the implementation of the Cap and Trade program. In 2017, the costs of this incremental audit and verification were less as the Company completed only a pre-verification audit to ensure readiness for 2017.

The increase in 'Other' is primarily due to the growth in the Cap and Trade team. For example, this will result in higher costs for conferences and forums. As detailed in paragraph 31 of EB-2017-0224, Exhibit D, Tab 1, Schedule 1,

Witnesses: T. Bruckmueller  
A. Langstaff  
D. McIlwraith  
F. Oliver-Glasford

Enbridge recognizes that these conferences and forums provide invaluable learning and networking opportunities. Additionally, it is noted that Enbridge included Communication in the 'Other' cost components. Enbridge may consider alternate forms of Cap and Trade communication or research, should they be considered necessary.

Witnesses: T. Bruckmueller  
A. Langstaff  
D. McIlwraith  
F. Oliver-Glasford