



BY EMAIL and RESS

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2300 Yonge Street
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February 22, 2022
Our File: EB20200293

Attn: Nancy Marconi, Acting Registrar

Dear Ms. Marconi:

Re: EB-2020-0293 – St. Laurent Ottawa North Replacement Project – Interrogatory Responses

We are counsel to the School Energy Coalition (“SEC”). Attached, please find a copy of interrogatory responses in the above-captioned matter.

Yours very truly,
Shepherd Rubenstein P.C.

Fred Zheng

cc: Ted Doherty, SEC (by email)
Applicant and intervenors (by email)

**Answers to Interrogatories from
OEB STAFF**

Question

2.1-Staff-1

Topic: City of Ottawa corporate and community greenhouse gas inventories

Ref: Direct Evidence of Michael Fletcher and Daniel Dicaire pages 4-5, Climate Change Master Plan – Report to Standing Committee on Environmental Protection, Water and Waste Management pages 32-35

Preamble: The City of Ottawa staff report shows that corporate greenhouse gas emissions have decreased by 43% between 2012 and 2020, while community greenhouse gas emissions have decreased by 15%, based on annual corporate and community greenhouse gas emissions inventories.

Questions:

- a) Based on the data used to develop these greenhouse gas inventories, please provide annual corporate natural gas use for each of the years from 2012 to 2020.
- b) Based on the data used to develop these greenhouse gas inventories, please provide annual community natural gas use for each of the years 2012 to 2020.

Response:

- a) Ottawa has this data available in terms of emissions. See below:

Corporate

Emission Source	GHG Emissions (tCO ₂ e)					
	2012	2016	2017	2018	2019	2020
Natural Gas	30,667	41,433	37,350	39,925	41,532	37,877

- b) Ottawa has this data available in terms of emissions. See below:

Community

Emission Source	GHG Emissions (tCO ₂ e) ('000s)					
	2012	2016	2017	2018	2019	2020
Natural Gas	2,026		2,089	2,301	2,351	2,117

Question

2.1-Staff-2

Topic: City of Ottawa plans to reduce corporate natural gas use

Ref: Direct Evidence of Michael Fletcher and Daniel Dicaire pages 4, 7, Climate Change Master Plan – Report to Standing Committee on Environmental Protection, Water and Waste Management pages 64-65, Compiled List of City of Ottawa Facilities in St, Laurent Area and Natural Gas Usage, page 183

Preamble:

Mr. Fletcher indicates that the City’s Energy Evolution program aims to reduce corporate City of Ottawa emissions to zero by 2040, and notes actions taken under the City Buildings Renewal and Deep Retrofit program to reduce emissions in City owned buildings, including replacing gas heating systems with heat pumps,

Questions:

- a) Has the City of Ottawa developed a plan or forecast for how natural gas use in corporate City of Ottawa buildings is expected to decline over time in order to achieve the target of zero corporate City of Ottawa emissions by 2040? If so, please provide.
- b) Does the corporate City of Ottawa expect that it will no longer require natural gas distribution service from Enbridge Gas, in the area of the city currently served by the St. Laurent pipeline, at some time in the future? If so, by what date is this projected to occur?
- c) “The City Buildings Renewal and Deep Retrofit program calls for renewals and deep retrofits of city buildings, which will reduce thermal energy demand by 60 to 70% and replace most existing gas heating systems with heat pumps. Participating facilities of this program in the St. Laurent area will potentially result in 4,161,477 m³ annual natural gas reduction. Included at page 183 of the attached materials is a list of buildings subject to this program and relevant to the St. Laurent area, as well as their annual total potential reduction in natural gas use.” (p. 7 of evidence) Please confirm that the data presented on page 183 is actually the 2019 natural gas use of the listed buildings. In other words, would achieving the stated potential 4,161,477 m³ annual natural gas reduction require the complete elimination of natural gas use in these buildings?
- d) Please provide the City’s perspective on the technical and economic feasibility of achieving 60-70% reduction in thermal energy demand through deep retrofits, including learnings from any deep retrofits undertaken in corporate City of Ottawa buildings through the Municipal Buildings Renewal and Retrofit Program.
- e) Please provide the City’s perspective on the technical and economic feasibility of eliminating natural gas use entirely in corporate City of Ottawa buildings, including learnings from the completed projects that replaced fossil-fuel based heating systems with heat pumps.

f) In the City's completed and planned replacements of gas heating systems with heat pumps in corporate City of Ottawa buildings, are these buildings still requiring natural gas service from Enbridge as backup or supplementary energy sources, and if so, with the same level of firm service capacity?

g) Has the City of Ottawa assessed the risks to corporate City of Ottawa buildings if Enbridge's St Laurent pipeline is not replaced, and a leak causes it to be temporarily taken out of service? Please discuss.

Response

a) Ottawa buildings broadly speaking will have to follow the Energy Evolution high level plan, which calls for all City operations to be zero emissions by 2040. The overall plan will be to employ heat pumps or zero emissions-based district energy to the maximum extent possible, with renewable natural gas being employed where it's the feasible alternative. Currently our progress on detailed plans are as follows:

- New corporate buildings are being built with the understanding that they will be required to be zero emissions and have a thermal energy density (TEDI) in the range of 40-50 kw/m²/y by 2040. This direction is resulting in some new buildings in the design stage targeting to achieve these levels when they open in a few years.
- The city is planning an update to its green building policy to bring it in line with new High Performance Development Standards that are expected to come into effect in 2023.
- A deep retrofit pilot is underway at Hintonburg Community Centre, with ultra high-performance windows ordered.

b) The date that the City will cease to need natural gas distribution service in the St. Laurent area is not yet determined. The plans to use renewable natural gas (RNG) to achieve the net zero target means that the City is still open to using gas (as RNG only) and would prefer to make careful evaluation on gas continuance on a site-by-site basis in order to control costs and maintain energy security. It is also not clear that the City will rely on gas distribution pipelines to receive gas. Other transmission methods may become more viable and cost effective as volumes decline.

c) Please see page 7 of the evidence: "The City Buildings Renewal and Deep Retrofit program calls for renewals and deep retrofits of city buildings, which will reduce thermal energy demand by 60 to 70% and replace most existing gas heating systems with heat pumps. Participating facilities of this program in the St. Laurent area will potentially result in 4,161,477 m³ annual natural gas reduction. Included at page 183 of the attached materials is a list of buildings subject to this program and relevant to the St. Laurent area, as well as their annual total potential reduction in natural gas use."

d) The City believes that most of these reductions can come through replacement of windows with ones which are ultra-high performance (R-11 or greater), leak proofing, use of heat recovery

ventilation and targeted improvements in building envelopes. This is not technically a challenge (although the high-performance windows are a newer technology, but we have started to successfully employ them). Economically this is more of a challenge. It will take a combination of support from conservation programs, higher levels of government and a long-term financing commitment by all levels of government to see this through. Also, we will co-ordinate work with the life-cycle replacement group so that, to the maximum extent possible, upgrades in building components occur close to or at their end of service life.

More generally Energy Evolution is part of an effort to fight pollution, and the City has made investments of the magnitude in question to stop water pollution through its wastewater system as well. It is notable that despite financial challenges related to the pandemic, Ottawa City Council rejected a staff proposal to cut the climate mitigation plan's main source of funding in 2021.

e) The City is doubtful that this will be technically or economically feasible in all situations although it's notable that Ottawa is currently displacing or planning to displace most gas use with electric boilers in many class A electrical accounts. Requirements of standby generation, the difficulty of working in heritage buildings or buildings which are just difficult to modify means that some combustion-based systems will still be the practical alternative. The City is confident, however, that all combustion-based gas can be RNG and that the corporation will not have such large requirements for RNG so as to rob the rest of the community of this resource.

f) In many buildings, gas will not be required at all. Some buildings use gas to operate backup generators, and it's likely this usage will continue. Gas may be used to supplement renewable energy where it's feasible and advantageous to do so, but according to the model this will have to be the exception. Again by 2050 all gas in the city is required to be renewable natural gas.

g) The City has not assessed this with respect to St. Laurent specifically. The City believes that energy security is of paramount concern as we implement Energy Evolution and would not support any actions that would put such energy security at significant risk.

As to the requested discussion, it is interesting to note two salient points:

- Energy Evolution's focus on deep retrofitting will greatly improve building envelopes, and as a result should a prolonged winter interruption of energy supply occur, buildings will be able to stay above freezing for extended periods of time.
- It's also notable that with the move away from gas reliance towards electricity-based heating, the ramifications of an interruption of gas supply will be greatly reduced.

Question

2.1-Staff -3

Topic: City of Ottawa plans to reduce community natural gas use

Ref: Direct Evidence of Michael Fletcher and Daniel Dicaire pages 4-5, Climate Change Master Plan – Report to Standing Committee on Environmental Protection, Water and Waste Management page 33, 58-63, Energy Evolution – Ottawa’s Community Energy Transition Strategy 116,127.

Preamble:

Mr. Fletcher notes the intent of the City’s Energy Evolution program to reduce community emissions to zero by 2050, and discusses specific programs targeted at the buildings sector, including targets for these programs. The City staff report provides additional details on program achievements and milestones, while the Energy Evolution report provides additional data on the planned reduction in emissions from natural gas use through 2050.

The City staff report (p. 33 of evidence) notes that “Energy Evolution was only approved one year ago and that many of these policies, programs, and plans are still in development, it will take time for these initiatives to have an effect. Staff do not expect to see a significant reduction in the next two to three GHG inventories, particularly on the community side. This is due to the number, scale and complexity of the projects required to achieve Council’s targets, as well as factors outside the City’s control, including policy decisions by senior levels of government and the availability of funding and market solutions.”

Questions:

- a) Figure 10 of Energy Evolution (p. 116 of evidence) provides projected emissions by fuel source (including natural gas) through 2050. If possible, please convert the data in this figure to a table showing projected natural gas use by year through 2050.
- b) Figure 10 shows a small, but non-zero, role for natural gas from fossil fuels beyond 2040. What is the anticipated end use for this natural gas, and would this natural gas be delivered to end users by Enbridge Gas?
- c) Please comment as to whether the planned reductions in greenhouse gas emissions from natural gas use shown in Figure 10, and the reductions in the building sector in the first five years through 2025 shown in Table 15 (p. 127 of evidence), are a reasonable estimate of reductions that will likely be achieved, based on the City’s experience to date in implementing the community-based emissions reductions initiatives in the Energy Evolution plan, including the Residential Building Retrofit Accelerator Program and the Commercial Building Retrofit Accelerator Program.
- d) Has the City of Ottawa assessed the risks to the community if Enbridge’s St Laurent pipeline is not replaced, and a leak causes it to be temporarily taken out of service? Please discuss.

Response

a) In Energy Evolution’s 100% scenario model, emissions are grouped by emissions source, not energy type. Also, GHG emissions from combustion are multi-factorial in that they include un-combusted methane and nitrous oxide production. For these reasons. Ottawa does not have the time and budget to provide this information.

b) Correct, this is legacy consumption from the slow turn over of contracts for the consumption of natural (fossil) gas. It equivalent to 40 kt CO₂e of GHG emissions.

c) In the following table, Ottawa discusses this issue. As follows:

Program	Assessed Difficulty	Comments
Residential Building Retrofit Accelerators Program	High	We believe that the required rate of replacement or renovation would be the highest ever seen globally. On the positive we note: i) Good improvements in cold climate heat pumps, ii) Federal home incentive programs, iii) The municipal Residential Retrofit program is now funded, staffed and accepting applications, iv) Electricity rates have stabilized and v) carbon pricing is continuing to increase.
Commercial Building Retrofit Accelerator Program	Medium - High	As with residential retrofits the required replacement and renovation rate is very high. Here, however, we note that many institutions in Ottawa including federal government facilities, Hydro Ottawa and Ottawa Community Housing and other Community Housing entities have ESG goals which will drive replacements and retrofits. We also note that some large facilities are served by class A electrical accounts which gives access to low-cost electricity. Ottawa is aware of a class A commercial building which switched to electric heating recently.
Community Building Heating Strategy	Very Easy	We note that the federal district system alone may exceed this target. Additionally, we note several projects (Gladstone OCH development, the central library a large multi-residential building under construction and some recent planning applications) which are planning to have zero emissions heating.
Municipal Buildings	Medium	The challenge will be getting resources, especially City staff to undertake the work and to some extent

Renewal and Retrofit strategy		finance. Technically the target does not look too challenging. The new buildings aspect does not look overly challenging.
High-Performance Development Standard	Medium	The standard will be considered by council this spring. It is modeled on the Toronto Green Standard and we note the success this standard is starting to have in Toronto.

d) As with City buildings we have not assessed this, and we do not want to make our residents significantly energy insecure in any way. Further, we note a more varied set of infrastructure in the community than just City assets alone. Some of these assets are more critical to the community than city ones. Among these we would note Bruyère hospital and the RCMP headquarters, to name just two.

Although we know it's most important that critical assets have secure energy supply, we also know that managers of these assets have shown interest in Energy Evolution actions, which would improve these buildings and make them more able to hold heat in the event of an interruption of heating supply. This is a principle which will exist generally as more buildings improve their thermal performance.

With regards to the federal district energy system, we note that it will effectively become dual fueled with the work that is currently in construction phase. This will make the system more resilient to a gas supply interruption, if any, than is currently the case.

Question

2.1-Staff-4

Topic: Ottawa Renewable Natural Gas Strategy

Ref: Direct Evidence of Michael Fletcher and Daniel Dicaire page 5, Climate Change Master Plan – Report to Standing Committee on Environmental Protection, Water and Waste Management pages 71-72

Preamble:

Mr. Fletcher indicates that, based on the City of Ottawa’s Energy Evolution program, by 2050, “renewable natural gas is expected to provide approximately 12% of the city’s energy requirements, versus the 50% which is provided by fossil derived natural gas currently.” The City staff report provides an update on the City’s plans to develop and implement a Renewable Natural Gas strategy.

Questions:

- a) Based on the work done on the Renewable Natural Gas strategy to date, is it expected that Enbridge Gas’s natural distribution infrastructure would be used to distribute some or all of the planned renewable natural gas production to consumers?
- b) Would this natural gas distribution require the use of the current St Laurent pipe (or any replacement natural gas distribution infrastructure for this pipe that Enbridge might build)? Please discuss.

Response

- a) The Renewable Natural Gas strategy does not consider whether or for how long the existing natural gas distribution infrastructure will be needed to distribute renewable natural gas. The operating assumption has been that gas distribution infrastructure will continue to be in place and available for some period of time. However, it is clear that as volumes decrease, the economics of alternative distribution methods may become cost-effective relative to fixed infrastructure.
- b) As mentioned previously the use of the existing gas system has been the City’s default assumption, but as volumes decrease other options should be considered and employed should they be more feasible.

As for the request to discuss, the witnesses note that this discussion is not based on the Energy Evolution plan or the policies of the City of Ottawa.

The wider issue here is that an earnest attempt needs to be made at integrated energy planning. The fact that this hearing is taking place is an indication that this integrated planning is not

happening, as this hearing is narrowly focused on a binary decision about one set of assets. As a first timer at such a hearing, Ottawa notes that the process, although rigorous, and very well organized, is confrontational to a considerable degree.

Integrated energy planning would take advantage of the integrated nature of some of the excellent municipal energy and emissions plans which have been made in response to society's grave and legitimate concerns about the climate crisis.

In the case of meeting the thermal demands in a City such as Ottawa it would require the main energy suppliers (gas, electricity and district energy) to come to the table to help build an energy system which meets required climate goals while ensuring affordability and energy security. Each party would have to be transparent about what they can and cannot contribute and accept that to meet society's needs around energy security, affordability, and climate change mitigation their approach to doing business needs to change.

Focusing on the gas system, gas would supply much less total energy, but some of the positive attributes in the areas of energy storage and ability to meet demand peaks are very valuable. A rationalization approach might therefore be a good strategy for gas distribution, i.e. recognizing the need to fulfill a very different and, although critical, much smaller role..

Ottawa notes that Energy Evolution projections for greatly reduced gas usage started to be shared widely, including events with Enbridge officials present, roughly four years ago.

Question

2.1-Staff-5

Topic: Reduction in natural gas use in the federal district heating system

Ref: Direct Evidence of Michael Fletcher and Daniel Dicaire, page 4, Public Services and Procurement Canada Presentation 2019, pages 184-210

Preamble:

Mr. Fletcher notes that “the modernization of the downtown Federal district heating system will eliminate the vast majority of natural gas use on this system” and that conversion of the heating systems from steam to hot water at the Cliff Street heating and cooling plant in the St. Laurent pipeline area is projected to reduce GHG emissions for that plant by 87% by 2025, with almost all of this reduction coming from reductions in natural gas use. The presentation “Connecting to Ottawa’s Emerging Downtown Districts” provides additional detail on efforts to reduce the greenhouse gas emissions from the federal district heating system.

Questions:

- a) To the City of Ottawa’s knowledge, has the federal government developed a plan or forecast for how natural gas use (annual or peak) by the federal district energy system is expected to decline over time under the Energy Services Acquisition Program, in order to achieve the federal government’s stated GHG emissions targets for its district energy system (35% of baseline by 2025 and less than 10% of baseline by 2030)? If so, please provide.
- b) Please provide a source for the claimed 87% reduction in greenhouse gas emissions from the Cliff Street plant by 2025. To the City of Ottawa’s knowledge, has the federal government developed a plan or forecast for how natural gas use (annual or peak) at the Cliff Street plant is expected to decline over time in order to meet this target? If so, please provide.

Response:

a) City of Ottawa staff have been at presentations where the Energy Services Acquisition Program (ESAP) presentation has been presented to interested parties. The discussion at these presentations has been that the ESAP group has done a great deal of planning. Additionally, several years ago Ottawa gave heating and cooling data on City buildings to ESAP so that prospective expansion of the federal system could be considered. ESAP officials were advised of our plans to include the ESAP material in our submission and raised no objections.

The largest driver of reduced gas demand at Cliff St. is the plan to bring electrically heated hot water over from Gatineau. This project is under construction.

b) The source for the claimed 87% reduction is the ESAP program of Public Service and Procurement Canada.

At this stage a discussion of plans is likely moot as the important aspects of the plan are being executed. All projects which will reduce gas consumption and demand in the near term are currently under construction. City staff toured the well-advanced work at Tunney's Pasture and Cliff St in December 2021. City right of way personnel have been working with the ESAP project to bring electrically heated hot water over from Gatineau.

Note that a portion of the GHG reduction will come from the procurement of RNG. This gas will likely come through the gas distribution system, but annual volumes and peak demand requirements will be greatly reduced according to the material we provided.

Question

2.1-Staff – 6

Topic: Reduction in natural gas use by Ottawa Community Housing

Ref: Direct Evidence of Michael Fletcher and Daniel Dicaire, page 8, ProEng Consulting Inc Calculations Review Letter, pages 274-275

Preamble:

Mr. Dicaire notes that Ottawa Community Housing expects to reduce natural gas use to zero by 2040 through implementation of its current plan, including deep retrofits and phase-out of natural gas equipment, and that programs responsible for 25% of greenhouse gas reduction targets have already been funded. Calculations from ProEng support the conclusion that Ottawa Community Housing's planned projects will lead to a 25% reduction in energy use and greenhouse gas emissions on a portfolio basis.

Questions:

- a) Please confirm that the projects shown on pages 274-275 of the evidence are the source of the statement that "programs responsible for 25% of greenhouse gas reduction targets have already been funded", and that all of the listed projects are fully funded.
- b) By what year is this set of projects expected to completed?
- c) Has Ottawa Community Housing completed any projects to date that include deep retrofits and/or fuel switching to heat pumps, similar to the planned projects shown on page 275? If so, please provide the OCH's perspective on the technical and economic feasibility of such projects, based on learnings from the completed projects.

Response:

- a) Confirmed. These are the summary of the 150 page modeling/calculations to support the 25% reduction. The program is funded through the CMHC Co-investment Fund.
- b) 2028
- c) Yes. OCH has completed a deep energy retrofit of 197-203 Presland. The project involved pre-fabricating a new high insulated and air tight building envelope which was installed on the exterior of the building, replacing all natural gas mechanical equipment with heat pumps (furnace and domestic hot water tank) and installing a 35 kW solar array on the roof to make the project Net-Zero. The project was executed with a combination of in-house staff and local contractors, suggesting a high technical feasibility with currently available materials and trades. The financial

feasibility of the project was evaluated with a Total Cost of Building Ownership analysis for the next 60 years of operation which suggests it is financially viable.

**Answers to Interrogatories from
Enbridge Gas Inc.**

Question

1/2.EGL.1

Issue(s):

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), pp. 83, 120, 136, 158 & 164.

Preamble:

The Sponsors' evidence contains the City of Ottawa's "Energy Evolution - Ottawa's Community Energy Transition Strategy – Final Report", but excludes the supporting appendices dealing with project details, risks and financing.

Appendix F: Project Overviews

Appendix G: Summary of Energy Evolution Projects (2020-2025)

Question(s):

Please place Appendixes F and G from the City of Ottawa's Energy Evolution Plan, onto the record in this proceeding.

Response:

These documents are on the City's public facing web site. As follows:

Appendix F is [here](#).

Appendix G is [here](#).

Question

1/2.EGI.2

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 3

Preamble:

Mr. Fletcher: “While we both have expertise in our fields, our evidence here is not based on our expert opinions. Our role is to provide the Ontario Energy Board with information on the plans by major gas users in Ottawa to reduce their GHG emissions, and in order to do so to reduce their reliance on natural gas to a fraction of their current levels.”

Question(s):

- (a) Are the reductions in GHG emissions cited by Mr. Fletcher solely and directly related to natural gas consumption?
- (b) If so:
 - (i) What proportion are a result of natural gas consumption within the area of benefit of the proposed St. Laurent Replacement Project?
 - (ii) What proportion are Corporate City of Ottawa consumers of natural gas vs. all consumers of natural gas?
- (c) If not, please provide a detailed breakdown of the various sources of GHG emissions reductions according to source (e.g., natural gas, diesel, fuel oil, etc...).

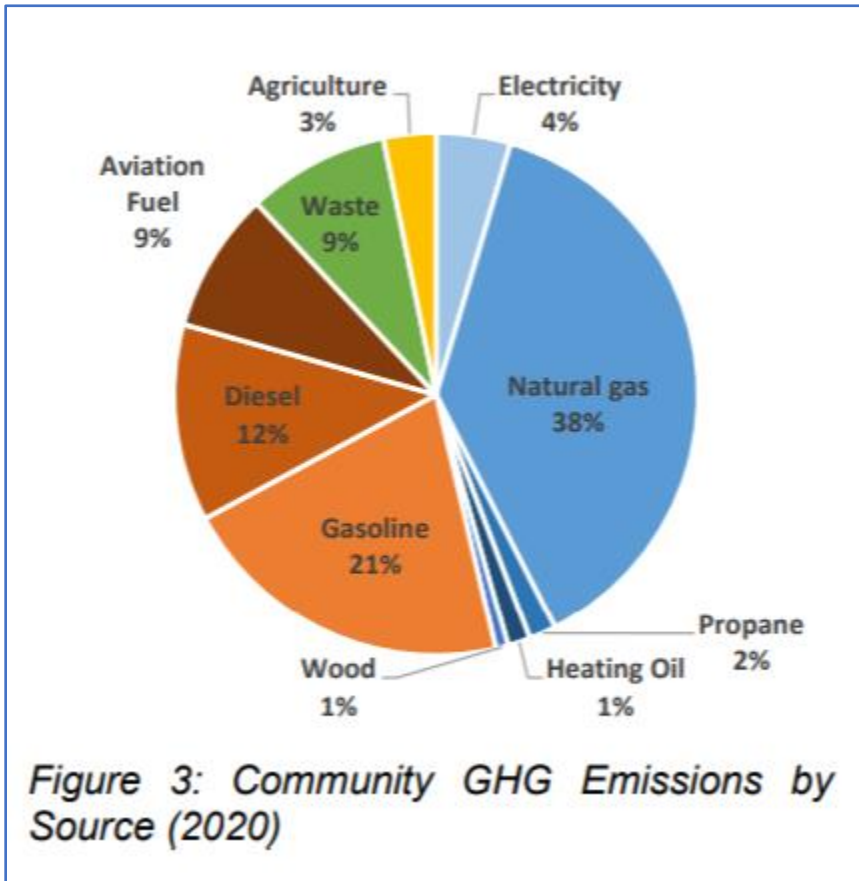
Response:

- (a) Almost all the GHG reductions detailed in the discussion from page 3 to 7 inclusive will come from reduced natural gas consumption. There will be some electrical conservation and given the low carbon content of Ontario electricity this will be minor. Also there will slight reduction in propane and fuel oil usage but this will be very small.

One point to clarify is that Mr. Fletcher refers to 39 reduction programs in the long run. This allies to all fossil fuels including gasoline and diesel, but as these programs are not relevant to gas consumption they are not discussed.

- (b) Ottawa does not believe it has the data to answer part i) of this question. As for part ii) Ottawa estimates that corporate gas consumption is between 3-4% of Ottawa community consumption.
- (c) Ottawa judged that obtaining this level of data granularity for the 2020-2025 timeline was not worth the effort to achieve it in terms of refining planned programs. As sober and responsible stewards of taxpayer dollars, we do not invest staff or consultant time in investigations which will not significantly enhance program objectives.

The chart below, from the 2020 emissions inventory is illustrative of the very dominant role of gas as the community's predominant heating fuel. Note that electricity serves many other energy needs in the community which handily exceed electricity use for heating.



Question

1/2.EGL.3

Issues:

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors’ Evidence (January 17, 2022), p. 4

Preamble:

Mr. Fletcher: The City's Energy Evolution program, which is included in the filed materials at page 80, was passed unanimously by Ottawa City Council in October of 2020. It aims to reduce corporate city of Ottawa emissions to zero by 2040 and community wide emissions – that is, emissions from all entities within the City of Ottawa - to zero by 2050.

Question(s):

What specific programs identified in the City’s Energy Evolution Program are directly intended to reduce GHG emissions and natural gas consumption by each of 2040 and 2050 for each of the Corporation of the City of Ottawa and all remaining entities within the City of Ottawa (please also provide a detailed breakdown of these remaining entities e.g., private property owners, federal government, institutions etc...)?

Response

The following shows the programs listed on page 5 and 6 and details to whom they could apply:

Program or Strategy	Entities Which Could Employ Them	Notes
Residential Building Retrofit Accelerator Program	All residential buildings	Program is pending
Commercial Building Retrofit Accelerator Program	Most commercial buildings in Ottawa	Program is pending
Local Improvement Charge Program	Residential buildings typically owner occupied	Program recently launched and is handling several hundred applications

Community Building Heating Strategy	All heated buildings	Current focus is district energy and zero emission heating in new construction. Progress is exceeding initial expectations with work on the Gladstone district energy system
Municipal Buildings Renewal and Retrofit Program	All existing City corporate building which will still be standing in 2040	Pilot deep retrofit is underway with materials ordered. A charter to direct how the work will proceed to the corporation's building stock is drafted
Update to the municipal Green Building Policy	All new City corporate buildings	Development of this policy is anticipated in 2022
High Performance Development Standard	New buildings in Ottawa except for those covered by the Green Building Policy	Program has been developed and discussed at public meetings. Implementation of this program is pending

Question

1/2.EGL.4

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 4

Preamble:

The City, part of the National Capital Region, acts in concert with the Federal Government's GHG reduction plan in the National Capital Region. Specifically, the Energy Services Acquisition Program (ESAP), sponsored by Public Services and Procurement Canada, is modernizing the District Energy System (DES), which provides heating services to over 80 buildings and cooling services to 67 buildings in the National Capital Region, accommodating more than 55,000 occupants.

Question(s):

- (a) Please provide all documentation showing that the City is working with the Federal government in the National Capital Region.
- (b) What is the nature of the agreement established for these purposes between the Corporation of the City of Ottawa and Federal government? If in writing, please provide a copy of the same and all supporting or related documentation.

Responses

- (a) The terms of agreements between the City of Ottawa and the federal government and its agencies, which for the most part relate to funding and mutual assistance, are not relevant and material to this proceeding. In addition, Ottawa would want approval to share such documentation with federal officials. This is a considerable effort.

However, to be of assistance Ottawa can confirm that some of the following discussions have taken place, and indeed Enbridge employees have been involved with some of the following:

- Discussions with ESAP about district energy including: i) a presentation to Ottawa infrastructure project manager about the federal district system ii) The provision of energy consumption data for Ottawa buildings in the vicinity of the federal district energy system. iii) High level discussions about district energy between federal and Ottawa subject matter experts iv) Sharing of information from a recently completed waste heat

survey undertaken by the City of Ottawa v) Assistance of City right of way officers in the installation of district heating infrastructure in Ottawa rights of way

- Discussions with National Capital Commission (NCC) officials about the LeBreton development
- Discussions with NCC officials on climate mitigation strategies
- Inclusion of National Research Council officials and subject matter experts in a recent biogas optimization study undertaken by Ottawa
- Cooperation with National Research Council on a study of biogas methanation
- Discussion with federal public works officials on installation of electric vehicle chargers
- Participation of federal officials in Energy Evolution workshops including federal officials giving presentations at said workshops
- Federal officials who are members of the Energy Evolution sounding board
- Ottawa successfully applying for financing for electric vehicle charging under the federal [Zero Emissions Vehicle Program](#) (ZEVIP) program
- Discussion with officials from the [Canada Infrastructure Bank](#) on the financing of carbon reduction initiatives
- Ottawa applying for the financing under the [Green and Inclusive Buildings Program](#) (GICB) and discussing progress using the program on an Infrastructure Canada call.
- Assistance by Natural Resources Canada technical experts on Ottawa's trial of ultra high-performance windows
- Discussions with and guidance from Natural Resources Canada on geo-exchange systems
- Letters by Ottawa Mayor Watson delivered last month to the federal ministers of i) Environment and Climate Change, ii) Natural Resources Canada and iii) Intergovernmental Affairs, Infrastructure and Communications on actions these departments could undertake support Energy Evolution.
- A company owned by Ottawa (Hydro Ottawa) have collaborated with Natural Resources Canada on a study of cold climate air source heat pumps.

(b) What is the nature of the agreement established for these purposes between the Corporation of the City of Ottawa and Federal government? If in writing, please provide a copy of the same and all supporting or related documentation.

There is no formal overarching agreement between the Ottawa and the federal government regarding Energy Evolution. Where federal programs are financially assisting Ottawa, projects transfer agreements are in place.

Question

1/2.EGL.5

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 4

Preamble:

The City, part of the National Capital Region, acts in concert with the Federal Government's GHG reduction plan in the National Capital Region. Specifically, the Energy Services Acquisition Program (ESAP), sponsored by Public Services and Procurement Canada, is modernizing the District Energy System (DES), which provides heating services to over 80 buildings and cooling services to 67 buildings in the National Capital Region, accommodating more than 55,000 occupants. The modernization of the downtown Federal district heating system will eliminate the vast majority of natural gas use on this system.¹

Question(s):

- (a) Is the City of Ottawa an active and official participant in the ESAP? If so, what authority or accountability over ESAP decisions does the City have?
- (b) Is the City specifically involved in the planning and execution of ESAP programs? If so, what authority or accountability over such ESAP decisions does the City have?

Responses

(a) ESAP is an activity of the federal government and while the City liaises with ESAP, and is aware of its activities, it is basically independent of the City. However, the federal government must follow City -bylaws and planning approvals as applicable.

(b) Ottawa is supporting ESAP's Infrastructure efforts. ESAP is working with Ottawa right of way officials as they locate infrastructure in Ottawa rights of way.

¹ PSPC Presentation, p. 184

Question

1/2.EGL.6

Issues:

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 4

Preamble:

Translating those GHG reduction targets to natural gas usage reductions means that, by 2050, renewable natural gas is expected to provide approximately 12% of the city's energy requirements, versus the 50% which is provided by fossil derived natural gas currently.²

Question(s):

Please set out all calculations used to derive these conclusions and if based on a model please produce the model with all formulae intact (e.g. a working Microsoft Excel document)?

Response:

The RNG production percentage was partially based on the use of the model. As follows:

- Currently community organics conversion to RNG could displace 5% of natural gas use (Ottawa assumption).
- Building TEDI efficiency is required to increase 60-70% according to the model.
- Ottawa therefore divided 5% by $(1-0.4) = 12.5\%$. We used the lower building TEDI improvement rate (60%) and rounded down to be conservative to arrive at 12%.

² Figure 9 and Figure 10 of Energy Evolution, p. 121

Question

1/2.EGL.7

Issues:

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors’ Evidence (January 17, 2022), p. 5

Preamble:

Between 2012 and 2020, corporate emissions decreased by 43%, already exceeding the short-term target to reduce emissions by 30 per cent below 2012 baseline levels by 2025. (Figure 6, P20-21 of CCMP).

Question(s):

Please provide a breakdown of GHG emission reductions making up the 43% cited by source (e.g., natural gas, diesel, fuel oil, etc...).

Response:

This is extensively discussed in Ottawa’s 2020 GHG inventory ([link here](#)). The corporation is discussed starting on page 16 and this graph provides something in the way of a summary related to City facilities:

Emissions Source	GHG emissions (tonnes of CO ₂ e) ('000s)			Contribution to achieving GHG targets (%)
	2012	2019	2020	
Electricity	30.5	8.7	7.8	-11%
Natural Gas	30.7	41.5	37.9	3%
Propane	0.3	0.6	0.6	0%
Heating Oil	0.2	0.08	0.06	0%

Question

1/2.EGL.8

Issues:

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 5

Preamble:

The following table is a reproduction of Table 15 from Energy Evolution, which shows the programs that are already or will be undertaken from 2020 to 2025 in the building sector.

Question(s):

Please provide an amended version of the table cited within the Sponsors' evidence with additional columns breaking out the Cumulative GHG Reductions into each of 2020-2022 (actuals) and 2023-2025 (forecasted) and further broken down according to source (e.g., natural gas, diesel, fuel oil, etc...).

Response

The Sponsors are unable to produce the additional breakdown within the time and resources available to them.

Question

1/2.EGL.9

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 6

Preamble:

In long run the City of Ottawa has identified and adopted 39 GHG reduction programs in order to achieve the 100% reduction objective.

Question(s):

Please provide a list of the 39 programs:

- (a) identifying programs that have been implemented and their current status including actual GHG reductions achieved;
- (b) identifying, for those programs not yet implemented, the City's expected implementation date (as approved by Ottawa City council);
- (c) identifying which of the programs (either previously implemented or not yet implemented) are forecasted to reduce natural gas consumption volumes;
- (d) identifying the volume of GHG emissions reductions forecasted for each program according to source (e.g., natural gas, diesel, fuel oil, etc...); and
- (e) identifying the specific nature and street addresses of buildings targeted by each program.

Response

The Sponsors are unable to produce the level of detail requested within the time and resources available to them.

However, the following information is offered to be of as much assistance as possible.

Because of the overlapping nature of the work all actions were summarized in 20 project overviews ([link here](#)) which was part of the Energy Evolution package which was unanimously approved by Ottawa City Council in the Fall of 2020. Project overviews can be described as pre-charters or the first step in aligning the Ottawa departments behind a plan. Developing them forced Ottawa staff in the Climate Change and Resiliency Section to liaise with key staff in other departments which control resources, plans and policies. These needed to be aligned with the Energy Evolution planning to insure that goals can be realised.

This internal discussion was very useful. In many cases staff around the City identified which actions would not be feasible, but suggested alternative actions to see goals realized by other means.

Currently, actions and progress are being made in all 20 project overviews. The City's Energy Evolution [web page](#) details progress on many of them.

As for item (e) above, the resources which would be required to answer such a question would be considerable. No citizen or business would want to see their hard-earned tax dollars spent attempting to answer such a question.

Question

1/2.EGI.10

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 6

Preamble:

Among the top five actions include retrofitting residential buildings, which includes retrofitting pre- and post-1980 homes, low rise residential and apartment building heat pumps buildings, and retrofitting commercial buildings, which includes retrofitting commercial, office, residential buildings and commercial building heat pumps.

Question:

Please provide additional details regarding this program:

- (a) When was the program approved by Ottawa City council and was that approval for the full program scope contemplated herein?
- (b) What is the full budget of the program? How much of this budget has been funded to date? How much has been spent on this program to date?
- (c) When was the program implemented?
- (d) Please provide any and all progress reports related to this program.
- (e) Please provide all corporate memos, correspondence and/or presentations that provide an indication of results.

Response

Actions have been organized into project overviews. Progress is as follows:

Program or Strategy	Entities Which Could Employ Them	Notes
Residential Building Retrofit Accelerator Program	All residential buildings	Program is pending
Commercial Building Retrofit Accelerator Program	Most commercial buildings in Ottawa	Program is pending
Local Improvement Charge Program	Residential buildings typically owner occupied	Program recently launched and is handling several hundred applications
Community Building Heating Strategy	All heated buildings	Current focus is district energy and zero emission heating in new construction. Progress is exceeding initial expectations with work on the Gladstone district energy system
Municipal Buildings Renewal and Retrofit Program	All existing City corporate building which will still be standing in 2040	Pilot deep retrofit is underway with materials ordered. A charter to direct how the work will proceed to the corporation’s building stock is drafted
Update to the municipal Green Building Policy	All new City corporate buildings	Development of this policy is anticipated in 2022
High Performance Development Standard	New buildings in Ottawa except for those covered by the Green Building Policy	Program has been developed and discussed and discussed at public meetings. Implementation of this program is pending

Also, an additional activity is the City’s Race to Zero Challenge. This is a voluntary pledge program to get organizations to work towards zero emissions. So far four organizations in the city have signed up to it ([link here](#) under News and Engagement Opportunities). Another challenge promotion will be held close to the Conference of the Parties conference in the fall of 2022.

Question
1/2.EGL.11

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors’ Evidence (January 17, 2022), p. 7

Preamble:

Lastly, the City of Ottawa has also applied for and received COVID stimulus funding, which will be used to improve energy the performance of city buildings. Related to gas consumption, we will be installing ultra-high-performance windows as part of this project.

Question(s):

- (a) Has the City received the funding cited?
- (b) Please provide details of the funding, including any conditions placed upon the City in relation to how funds are spent?
- (c) On how many buildings will the windows be replaced and what is the ratio of window replacement to the relative reduction in natural gas use?

Responses

- (a) Yes.
- (b) Funding transfer agreements are in place. Further detail is not relevant to the issues in this proceeding.
- (c) The following table indicates all high-performance window replacements (to an R value of 11 or greater) under way and indicates which replacements are related to Covid stimulus funding. Ottawa conservatively estimates that the window replacements will reduce gas consumption by 25%. This has not been modeled because doing so is moot. The required 60-70% drop in in thermal energy density values in the City’s building stock cannot be achieved without improving windows from an average R value of 2-4 to R values of 11 and greater (up to R-18).

Site	Windows Ordered	Project Status	Estimated Completion Date	Project Cost	Project Estimate	COVID Relief Funding?
Billings Estate Museum	17	Construction	May-22	\$ 56,994.00	N/A	Yes
Overbrook Community Centre	140	Design Phase	N/A	N/A	\$ 450,000.00	Yes
Glebe Community Centre	29	Procurement	Jun-22	\$ 128,358.82	N/A	No
Fire Station 24	18	Procurement	Jun-22	\$ 74,289.71	N/A	No
City Hall (Teacher’s College)	5	Procurement	Jun-22	\$ 23,865.56	N/A	No
Hintonburg Community Centre	31	Procurement	Oct-22	N/A	\$ 195,000.00	No

Question

1/2.EGL.12

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors’ Evidence (January 17, 2022), p. 9

Preamble:

Within the area serviced by the St. Laurent Pipeline, OCH operates 78 buildings consisting of 5,974 units. The total current consumption of natural gas by these units is 7,924,281, and OCH expects to reduce that to zero by 2040 through aggressive implementation of its current plan.

Question(s):

- (a) Please specify the units of natural gas that OCH is referring to in the above noted quote.
- (b) Please provide the street addresses for each of the 78 buildings cited.

Response

- a) Cubic meters of natural gas
- b) List of addresses Attached. To make sense of the list, it will be crucial to address the miswording of “Buildings” when it should have been “building/property/community” as some of these addresses have multiple buildings.

Question

1/2.EGL.13

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors’ Evidence (January 17, 2022), p. 183

Question(s):

- (a) Please provide the street addresses for each of the buildings cited by the City.

Response

The Sponsors do not understand the relevance of the request.

Question

1/2.EGL.14

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 9

Preamble:

Mr. Fletcher: Bruyere Continuing Care is a healthcare organization with three sites providing continuing care, palliative care, and other health care and assisted living services to almost a thousand patients/residents at any given time. They have more than 875,000 square feet of space under their management, more than two thousand staff and six hundred volunteers. They are a major natural gas user for space and water heating. In their letter, they confirm that they are in line with the City's plans to reduce emissions and reduce natural gas use.

Question(s):

- (a) Please describe the relationship between Bruyere Continuing Care ("BCC") and the City of Ottawa as it relates to energy consumption and managing emissions reductions.
- (b) What authority or accountability over BCC decisions regarding natural gas consumption does the City have?
- (c) Is the City specifically involved in the planning and execution of BCC programs? If so, what authority or accountability over such BCC decisions does the City have?
- (d) Is there additional information available to confirm the current status of the BCC's natural gas reduction plans (such as, timing of implementation, funding sources, programming details, etc...)? If so, please provide that information.

Responses

- (a) BCC is independent of the City, although BCC and the City often work together on energy consumption issues.
- (b) Except for the City's general legislative authorities, none.

(c) See (a).

(d) BCC did not provide evidence in this proceeding. Their letter and the description of their plans was provided as an example of the work entities other than the City are carrying out.

Question

1/2.EGL.15

Issues:

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 9

Preamble:

The University of Ottawa is another such organization. I am aware that their GHG and fossil fuel reduction plans, while still evolving, are in line with the targets and directions of the City.

Question(s):

- (a) Please describe the relationship between the University of Ottawa and the City of Ottawa as it relates to energy consumption and managing emissions reductions.
- (b) What authority or accountability over University of Ottawa decisions regarding natural gas consumption does the City have?
- (c) Is the City specifically involved in the planning and execution of University of Ottawa programs? If so, what authority or accountability over such University of Ottawa decisions does the City have?
- (d) Is there additional information available to confirm the current status of the University of Ottawa's natural gas reduction plans (such as, timing of implementation, funding sources, programming details, etc...)? If so, please provide that information.

Responses

(a) to (d) See answers to Enbridge Question 14.

Question

1/2.EGL.16

Issues:

1.0 – Need for the Project

2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 4

Preamble:

Mr. Fletcher: The City's Energy Evolution program, which is included in the filed materials at page 80, was passed unanimously by Ottawa City Council in October of 2020. It aims to reduce corporate city of Ottawa emissions to zero by 2040 and community wide emissions – that is, emissions from all entities within the City of Ottawa - to zero by 2050.

Question(s):

- (a) Please provide in detail the specific contingency plans the City of Ottawa has to ensure the continued safe, reliable and sufficient delivery of energy to meet the needs of its residents, businesses, and all other buildings currently served by the St. Laurent pipeline system if the targets set out in the city's "Energy Evolution - Ottawa's Community Energy Transition Strategy – Final Report" are not achieved as planned?
- (b) Have these contingency plans been reviewed and approved by Ottawa City council? Please provide all corporate memos, correspondence and/or presentations that detail the contingency plans.

Responses

(a) and (b) Please see responses to OEB Staff Questions #2 and #3.

Question
1/2.EGL.17

Issues:

- 1.0 – Need for the Project
- 2.0 – Project Alternatives

Reference:

EB-2020-0293 Sponsors' Evidence (January 17, 2022), p. 4

Preamble:

Mr. Fletcher: The City's Energy Evolution program, which is included in the filed materials at page 80, was passed unanimously by Ottawa City Council in October of 2020. It aims to reduce corporate city of Ottawa emissions to zero by 2040 and community wide emissions – that is, emissions from all entities within the City of Ottawa - to zero by 2050.

Question(s):

- (a) Please detail the specific contingency plans the City of Ottawa has put into place to ensure the continued safe, reliable and sufficient delivery of energy to meet the needs of its residents, businesses, and all other buildings currently served by the St. Laurent pipeline system in the event that the existing St. Laurent pipeline system experiences a serious failure and prolonged outage during peak winter design conditions (or the coldest period of the year)?
- (b) Have these contingency plans been reviewed and approved by Ottawa City council? Please provide all corporate memos, correspondence and/or presentations that detail the contingency plans.

Responses

- (a) and (b) Please see response to Enbridge Question #16.

Answers to Interrogatories from Energy Probe

Sponsors-1.1-Energy Probe-1

Reference: Sponsors' Evidence, page 3 and OEB Section 90 Issues List

Preamble: Energy Probe would like to understand the purpose of the Sponsors' evidence and its relevance to the issues in this proceeding.

Question(s)

a) Are the Sponsors' aware of the Issues List for Leave to Construct applications under section 90 of the OEB Act? If the answer is yes, please identify the issue or issues that the Sponsors' evidence deals with. If the answer is no, please explain why not.

b) What are the Sponsors asking the OEB to decide in this case? Please provide reference to the specific approvals requested by Enbridge in its Leave to Construct application under sections 90 and 97.

c) What is the position of the Sponsors on the use of natural gas by residents of the City of Ottawa? Specifically, do the Sponsors believe that Ottawa residents should be prohibited from using natural gas by some future date? If the answer is yes, what is that date. If the answer is no, please provide the annual volume of natural gas that Sponsors believe residents of Ottawa should be allowed to use for the foreseeable future.

Responses

(a) This evidence relates to, among other things, the need for the project, the cost effectiveness of alternatives to the project, and the conditions the OEB may put on the project. The Sponsors note that the OEB granted its approval to file this evidence, and therefore the relevance of the evidence has already been determined.

(b) As this is fact-based evidence, not opinion evidence, the witnesses are not stating any positions on the Application. The positions the Sponsors may take in Final Argument is not a proper interrogatory. The Sponsors will determine what positions to take when the evidentiary record is complete. In the meantime, this evidence was provided to ensure that the OEB has a full evidentiary record.

(c) The OEB does not have jurisdiction to prohibit the future use of natural gas by residents of the City of Ottawa, and therefore this interrogatory is out of scope for this proceeding. See also question (b) above.

Sponsors-1.1-Energy Probe-2

Reference: Sponsors Evidence, page 4

Preamble: *“It aims to reduce corporate city of Ottawa emissions to zero by 2040 and community wide emissions – that is, emissions from all entities within the City of Ottawa - to zero by 2050. Translating those GHG reduction targets to natural gas usage reductions means that, by 2050, renewable natural gas is expected to provide approximately 12% of the city’s energy requirements, versus the 50% which is provided by fossil derived natural gas currently.”*

Questions

- a) Please explain what is meant by the term “all entities within the City of Ottawa”.

- b) Please explain what in Sponsors’ understanding is “renewable natural gas”, how and where will it be produced and delivered to customers. Please explain if the existing system of distribution pipelines in the City of Ottawa owned by Enbridge Gas will be used.

- c) Is renewable natural gas pure hydrogen? If the answer is yes, will it be necessary to convert appliances and equipment that currently burn natural gas to enable them to burn pure hydrogen? If the answer is no, please explain why not.

Responses

- (a) “All entities within the City of Ottawa” means all individuals or groups which have or have the potential to create greenhouse gas emissions.

- (b) Energy Evolution defines renewable natural gas as being either purified biogas derived from waste organic material or green hydrogen typically produced through the hydrolysis of water. Biogas is produced at the City’s wastewater treatment plant, and from harvesting landfill gas. Green hydrogen could be produced at the City’s wastewater facility, and we have examined, and reported to the province, the potential benefits of producing green hydrogen at a large wastewater treatment plant. At such a location there is access to low-cost electricity and all products of an electrolyzer (hydrogen, oxygen and heat) can be gainfully utilized.

It is not clear whether RNG will be delivered in the future through distribution pipelines, or through other means. That will depend on the total amount to be delivered, which could be materially smaller than the amount of natural gas being delivered today. If that is the case, it may not be cost effective to maintain distribution lines for smaller quantities, and other shipment methods may be preferred.

(c) As discussed above renewable natural gas as used in Energy Evolution can be green hydrogen or biogas. The Energy Evolution model limits hydrogen to a 15% concentration in a hydrogen and a purified biogas mixture, to reflect the practical eventual limits of the use of hydrogen in existing natural gas infrastructure. This is to ensure that existing end use and other hardware does not have to be replaced prematurely.

Sponsors-1.1-Energy Probe-3

Preamble: *“Most prominent in these changes is the Cliff St heating and cooling plant, which is located in the St. Laurent area. At this location, conversion of the heating systems from steam to hot water is projected to reduce GHG emissions by 87% by 2025, with almost all of this reduction coming from reductions in natural gas use.”*

Questions

- a) What is the current peak energy output of the Cliff St. heating and cooling plant?
- b) Will the peak energy output be the same after conversion? Please explain your answer.
- c) Will natural gas be used by the Cliff St heating and cooling plant after conversion from steam to hot water? If the answer is no, please explain what source of energy will be used to heat the water. If the answer is yes, what annual volume of natural gas will be used after conversion?

Responses

(a) From the graph at page 199 of the Sponsors’ evidence, it appears the peak is roughly 90MW.

(b) Assuming conversion means all activities as shown on page 204 of the Sponsors’ evidence, the peak for the Cliff plant appears to be roughly 50 megawatts, as our understanding is that the LC source (large), is hot water being brought over from Quebec. It is our understanding that the electric boiler which will supply this hot water is nearing completion

(c) We are unsure of the specific timing of the steam to hot water conversion for the federal district energy system. However, assuming it will be a portion of the work represented by the graph at

page 204, we can see that only renewable natural gas indicated as RNG, will be employed at Cliff St. This will presumably be supplied by the existing gas distribution network. We are unsure of the annual volume but as can be seen by the graph on page 204 the RNG is only employed for peak periods, which might last for roughly 400 hours per year.

Question

Sponsors-1.1-Energy Probe-4

References: Sponsors Evidence, pages 4 and 5

Questions

- a) What was the total number of residential and commercial buildings in the City of Ottawa as of January 1, 2020? Please give the number of each category.
- b) What was the number of residential and commercial buildings in the City of Ottawa that used natural gas for space heating and for water heating respectively as of January 1, 2020?
- c) How many residential and commercial buildings were converted from natural gas for space and water heating to other sources of energy for space and water heating between the following:
 - i. January 1, 2020, and December 31, 2020, and
 - ii. January 1, 2021, and December 31, 2021?
- d) Of the buildings identified in response to question c, how many were converted from natural gas to heat pumps during 2020 and during 2021 respectively?
- e) What are the “non emitting resources” for water heating how many buildings were converted to these resources for water heating during 2020 and 2021 respectively?
- f) Did any buildings that were converted from natural gas to other forms of energy for space and water heating retain natural gas as backup or for other uses such as cooking?
- g) What is the total number of schools in the City of Ottawa? Of that number how many used natural gas for space and water heating as of January 1, 2020?
- h) Have any schools converted from natural gas to electricity during 2020 or 2021. If the answer is no, please explain why not. If the answer is yes, please provide the names of the schools that

have converted and indicate if they have had their gas connection removed. Also please identify the energy source that has replaced natural gas.

Response

(a) Energy Evolution’s model base year was 2016. In this year we established that Ottawa had 385,074 dwelling units and 23,697,909 square meters of non residential floor space. This was used in Energy Evolution modeling and has not been re estimated since.

(b) to (f) We do not have detailed information available to respond to these questions. To seek to be helpful, please be advised that in 2016, the model assumed gas consumption as follows: i) All low rise residential 15,281 TJ, ii) Apartments: 1949 TJ, iii) Commercial space: 12,552 TJ, iv) All hot water heating 8,628 TJ. Further, two programs designed to impact gas use, the Residential Retrofit Program and the Race to Zero Challenge, have just kicked-off, and the Gladstone District Energy Plan and the Commercial Buildings Benchmarking Program are in development.

(g) and (h) [Answer supplied by SEC] This interrogatory is not requesting further information relating to the Sponsors’ evidence, and so is out of scope for a proper interrogatory. To be helpful, SEC has advised the witnesses that more than 95% of Ottawa-area publicly-funded schools use natural gas for at least some of their space and/or water heating, although all school boards in the area have active plans to reduce natural gas use. As new schools are built and older schools are refurbished, it is expected that the percentage of schools relying on natural gas will decline, and the total natural gas use from gas and non-gas schools will also decline.

Sponsors-1.1-Energy Probe-5

Reference: Sponsors Evidence, page 6

Preamble: *“In long run the City of Ottawa has identified and adopted 39 GHG reduction programs in order to achieve the 100% reduction objective. Among the top five actions include retrofitting residential buildings, which includes retrofitting pre- and post-1980 homes, low rise residential and apartment building heat pumps buildings, and retrofitting commercial buildings, which includes retrofitting commercial, office, residential buildings and commercial building heat pumps.”*

Questions

- a) Please specify the time period referred to “in the long run”.
- b) Please explain what is meant by the 100% reduction objective.
- c) Apart from age, what is the difference between pre- and post-1980 homes?

- d) How many commercial buildings now have heat pumps and why do they need to be retrofitted?

Responses

(a) In this case, in the long run means by 2050

(b) 100% reduction objective means the complete elimination of scope one greenhouse gas emissions and all scope two electrical greenhouse gas emissions in the community of Ottawa by 2050.

(c) An important difference between pre and post 1980 homes is the thermal insulation values of their building envelopes. Post 1980 homes generally are significantly better insulated and therefore require significantly less energy for heating.

(d) Ottawa does not have an inventory of the number of commercial buildings which currently are served by heat pumps. These buildings may need to be retrofitted if they have a high thermal energy demand even if they are already heated by a heat pump system. This is because high thermal energy demand in buildings served with heat pumps will translate into high electrical demand, which as more of the city is electrified will cause expensive distribution system upgrades if efforts are not made to reduce electrical demand for heating. The cost of rendering buildings zero emissions took into account the optimal trade-off between building retrofit costs and cost to reinforce the electricity system.

Sponsors-1.1-Energy Probe-6

Reference: Sponsors Evidence, page 8

Preamble: *“Within the area serviced by the St. Laurent Pipeline, OCH operates 78 buildings consisting of 5,974 units. The total current consumption of natural gas by these units is 7,924,281, and OCH expects to reduce that to zero by 2040 through aggressive implementation of its current plan.”*

Questions

a) How many of the 78 buildings have been converted from natural gas for space and water heating to another source of energy for space and water heating? If the answer is none, please explain the reasons. If the answer is some, please provide the number of buildings and describe the energy sources and the cost of energy compared to natural gas.

b) Will the buildings that are converted to other sources of energy retain natural gas as backup or will they be completely disconnected from the gas distribution system?

c) What are the units of the 7,924,281 number?

d) Please describe what is meant by “aggressive implementation”.

Responses

(a) One building, a 4 units townhome block, has been converted from natural gas furnaces and domestic hot water tanks to heat pump furnaces and domestic hot water tanks. A Total Cost of Building Ownership analysis over the next 60 years was performed for the 4 units which determined that doing a deep energy retrofit of the 4 units combined with electrification of mechanical systems and on site solar generation would save \$500,000 over that period of time compared with the natural gas base case while also eliminating the GHG emissions for those 4 units.

(b) For larger buildings, OCH anticipates that the converted buildings will retain natural gas connection for peaking and backup in the short term (10 years). In the long term (past 2040), we anticipate those connections will no longer be necessary. Smaller buildings will not retain natural gas for backup.

(c) Cubic meters of Natural Gas

(d) OCH has secured funding for capital repairs which is tied to large reduction of GHG emissions and energy. The funding requires a reduction of over 7,000 tons of GHG emissions by end of 2028.

Sponsors-1.1-Energy Probe -7

Reference: Sponsors Evidence, page 8, “Natural Gas Usage Projections” graph

Questions

a) What are the units of natural gas usage shown in the graph? If they are not in units of volume, please convert them to volume units such as m³.

b) Does the graph represent annual total natural gas consumption of all buildings in the city of Ottawa? If the answer is no, please explain.

c) What is the source of information presented in the graph?

d) What volume reduction in natural gas usage was achieved during 2020 and during 2021 on a weather and COVID normalized basis?

e) Please describe the weather and COVID normalization methodology used by the City of Ottawa in its analysis of energy use?

f) Please file a graph of Electricity Usage Projections of the City of Ottawa over the same period.

Responses

(a) Cubic meters of natural gas

(b) No, it is annual consumption of cubic meters of natural gas for the 5,974 OCH units serviced by the St Laurent Pipeline.

(c) OCH utility bills

(d) Reduction of volume in natural gas usage achieved during 2020 and during 2021 on a weather and COVID normalized basis is negligible, if any.

(e) This is not relevant and material to the questions in this proceeding.

(f) This information is not readily available in a form appropriate for filing in this proceeding.

Sponsors-1.1-Energy Probe-8

Reference: Sponsors Evidence, page 9

Preamble: *“There are places where we don’t know what the specific solution will be, or we know the possible solutions but not how to finance the cost. On the other hand, it is the City’s plan to get there anyway, and over the past decade we have demonstrated that we can meet and exceed the goals we have set, despite the challenges.”*

Questions

a) How many residential and commercial buildings are expected to convert from natural gas to electric space and water heating during the City’s plan forecast period per year and in total?

b) Why should the OEB have confidence in the City’s plan if the possible solutions and financing are not known?

c) Please confirm that the City of Ottawa is proceeding with its plan no matter what the cost to City’s taxpayers and energy users? If the answer is yes, please describe how the city has informed its residents that it is proceeding with a “cost is no object plan”. If the answer is no, please provide the upper limit on the cost of the plan that would cause the City of Ottawa to abandon it.

Responses

(a) We do not have this data. This data from the Energy Evolution model which shows the required conversion rate of heat pumps is illustrative:

Action #	Description	2030 Assumptions, Inputs and Required Actions	2050 Assumptions, Inputs and Required Actions
Demographics			
Building Equipment			
14A	Low-rise residential heat pumps in existing buildings	117,209 heat pumps installed by 2030 (72%/28% air/ground)	255,808 heat pumps installed by 2050 (72%/28% air/ground)
14B	Low-rise residential heat pumps in new buildings	47,451 heat pumps installed by 2030 (77%/23% air/ground)	158,883 heat pumps installed by 2050 (77%/23% air/ground)
15A	Apartment heat pumps in existing buildings	44,322 heat pumps installed by 2030 (72%/28% air/ground)	82,728 heat pumps installed by 2050 (72%/28% air/ground)
15B	Apartment heat pumps in new buildings	19,663 heat pumps installed by 2030 (77%/23% air/ground)	62,931 heat pumps installed by 2050 (77%/23% air/ground)
16A	Commercial heat pumps in existing buildings	38% of heat load served by heat pumps by 2030	73% of heat load served by heat pumps by 2050
16B	Commercial heat pumps in new buildings		
42	Electric water heaters in residential and commercial buildings	Residential: 331,660 on-demand electric water heaters by 2030	Residential: 516,913 on-demand electric water heaters by 2050

(b) Like governments at all levels, the City develops plans that consist of goals, methods of achieving those goals, and financing of those methods. Some of the goals in the City’s plan already have methods and financing identified, as set forth in the plan as filed. Others will have more detailed implementation plans developed as time goes on. It would be unusual for any government to delay establishment of goals to be achieved over decades until all implementation plans have been developed, costed, and financed. The OEB should take confidence in the City of Ottawa plan for many reasons. Among them are the following:

- Although all required actions are not currently financed, the energy evolution study found that all measures required across the community taken together have a financial net positive value. This strongly suggests that although all measures are not currently financed, they are likely *financeable*.
- The fact that all required actions do not have specific solutions applied to them is actually a credit to the Energy Evolution plan. This plan wisely recognizes that technology and the

business environment will evolve as the community endeavors to implement the plan. This being the case, it is wise to take this flexible approach to the solutions which will be applied.

- Its notable that the Better Homes Loan program, a renewable natural gas feasibility more replacements of windows with ultra-high performance ones and the building envelope portion of the deep retrofit pilot are full financed. Some projects related to the installation of electric vehicle charging, heat pumps and electric vehicle purchases are complete.

More generally, it is important to note a variety of factors which are serving to support the implementation of the Energy Evolution plan. Included among these are increased public concern about the climate crisis, improving renewable technology in areas such as solar PV and in heat pumps, direct federal support programs, federal carbon pricing, utility-based conservation programs, corporate and federal ESG targets, and personal GHG reduction actions being undertaken by citizens in the community of Ottawa.

(c) At no time has the City suggested that it will achieve the goals set out in its plan no matter what the cost. The cost to achieve the goals is expected to evolve over time, and the reasonableness of the cost will be tested regularly by the City government during the course of implementation. Factors such as the cost of alternatives, the costs associated with fossil fuels (including their GHGs), and technological advances, will all be relevant to the City's ongoing legislative and administrative determinations. There is insufficient information at the present time to establish an estimate, or an upper or lower limit. Since the city of Ottawa's Energy Evolution study determined that the energy transition in Ottawa will have a positive net present value, we believe that a discussion of it being cost prohibitive is not constructive, nor consistent with the basis on which it was developed.

Sponsors-1.1-Energy Probe – 9

Reference: Section 2.1.4 “Energy Security and Resiliency, page 107

Preamble: *“Managing the uninterrupted availability of energy sources at an affordable price is fundamental to ensuring sustainable development, as well as protecting the well-being of residents and the bottom line for businesses.”*

Questions

a) Please explain how the City of Ottawa is managing the uninterrupted availability of energy sources at an affordable price.

b) Do the energy sources include natural gas? If the answer is no, please explain why not. If the answer is yes, please explain how the City of Ottawa is ensuring uninterrupted availability of natural gas at an affordable price.

Responses

(a) The comment referred to in this question was made as a general observation and not intended to confer absolute responsibility to any particular organization. With the inclusion of this comment in the Energy Evolution report, it may be inferred that Ottawa takes seriously its role in the areas of energy affordability and security.

The City's plan sets this out in detail.

(b) The plan assumes a phase out of natural gas by 2050, with thermal being provided by heat pumps and renewable natural gas. The cost for these energy sources have the same level of uncertainty in 2050 as the cost of fossil derived natural gas at that time. The solutions proposed by Energy Evolution are more secure as they are from renewable as opposed to exhaustible energy sources.

The City's plan sets this out in detail.

Sponsors-1.1-Energy Probe-10

Reference: Section 2.1.4 "Energy Security and Resiliency, page 107,

Preamble: *"By diversifying local renewable energy sources, Ottawa decreases its reliance on the unpredictability of energy supply from outside the city boundary while boosting local economic growth."*

Questions

a) Please explain the concern of the City of Ottawa regarding the unpredictability of energy supply from outside the city boundary.

b) Would construction of the St. Laurent Ottawa North Replacement Project increase or decrease unpredictability of energy supply?

Responses

(a) Ottawa does not have a specific concern regarding energy supply predictability at this time. The comment simply points out that longer supply lines generally involve some elevation in the risk of supply. It's notable that most natural gas does not come from places where Ottawa or Ontario has jurisdictional authority.

(b) The comment regarding the advantages of local energy supply was a general one. It is not contextual to the issue of the St. Laurent replacement project. The witnesses are expressing no opinion on the proposed pipeline or its impact on unpredictability of energy supply. With respect to the positions of the Sponsors, please see response to Sponsors-1.1-Energy Probe-1(b).

Sponsors-1.1-Energy Probe-11

Reference: Section 4.5.4 “Achieving 100% Scenario”, pages 135-136

Preamble: *“The model projects that making the local electricity supply zero emission could contribute roughly 8.5% of total GHG emission reductions required to achieve the 100% scenario. To realize this target, electricity would need to become the dominant energy source, supplying 88% of the total energy required in Ottawa. As a result, the electricity supply will need to increase by 127% and the local electricity supply will need to become entirely emission free, even with significant increases in electricity use for the electrification of transportation and heating. This kind of energy transition is only possible if conservation and efficiency in the building and transportation sectors greatly reduces energy demand in concert with a move to electrification. As electricity demand is expected to increase over the next 30 years, discussions with Ottawa’s local distribution companies, the Independent Electricity System Operator and the Ontario Energy Board, are already underway. Proactive demand forecasting and frameworks to allow more distributed energy resources are being explored. The model indicates that the minimum results required to meet the 100% scenario under the electricity sector are:*

- *Solar photovoltaic (PV) reaches 1,060 MW by 2050 (approximately 36 km² of solar PV mostly on rooftops)*
- *Wind generation reaches 3,218 MW by 2050 (approximately 710 large scale turbines)*
- *310 MW of local energy storage by 2030 and 612 MW by 2050 (122 large shipping containers of lithium batteries) approximately.”*

Questions

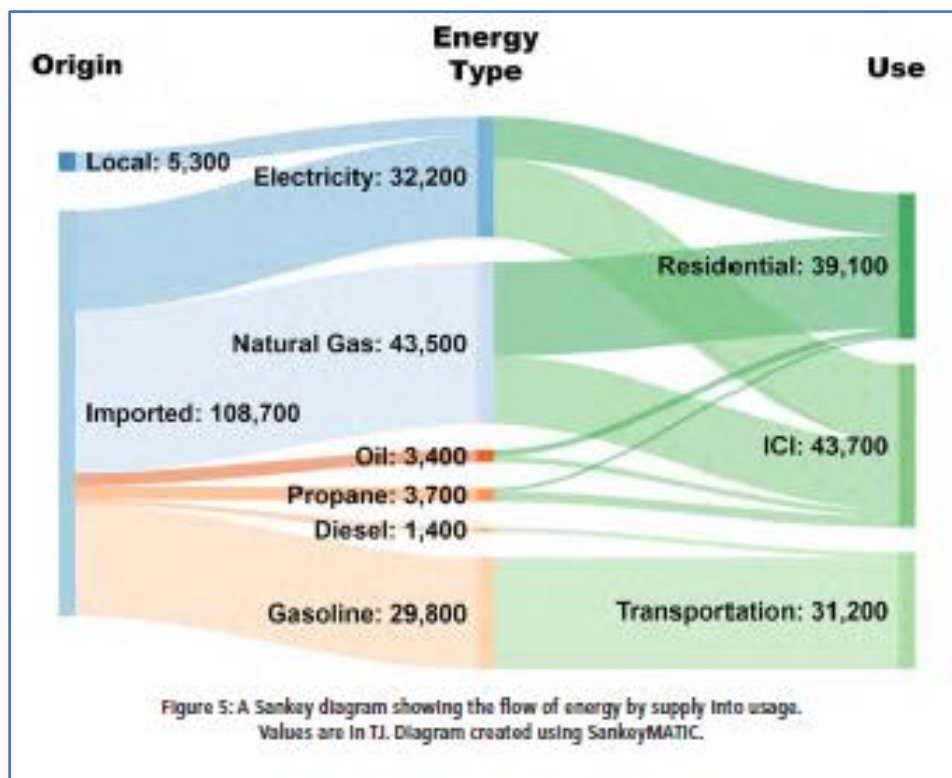
- a) Please list the current energy sources used in the City of Ottawa giving percentage of each source and the explanation how the percentages were derived.
- b) Has the City consulted with Enbridge Gas regarding City's plan? If the answer is no, please explain why not. If the answer is yes, please file copies of all communications between the City and Enbridge Gas regarding the plan.
- c) Has the City consulted with Hydro Ottawa regarding the need for the 127% increase in electricity load that will be needed to meet City's plan? If the answer is no, please explain why not. If the answer is yes, please file copies of all communications between the City and Hydro Ottawa regarding the plan.
- d) Please explain why there is no mention of the City's plan in Hydro Ottawa's 2021-2025 Load Forecast, or in its Long-Term Electric Energy and Demand Forecast, or in its Distribution System Plan 2021-2025 presented by Hydro Ottawa to the OEB in the EB-2019-0261 proceeding for approval of its 2021-2025 rates.
- e) When did the meeting (either in person or on-line) with the Ontario Energy Board take place? Please provide the date, the names and titles of persons who were at the meeting, and copies of all documents, presentations, and e-mails related to the meeting.
- f) Of the total number of buildings in the City of Ottawa how many would need to have rooftop solar panels?
- g) Apart from rooftops where else would the solar panels need to be in the City of Ottawa?
- h) Please describe a "large scale wind turbine" giving its height, blade diameter and land requirement.
- i) Where in the City of Ottawa would the 710 large scale wind turbines be located?
- j) Have the residents of the City of Ottawa been informed of the plan to build 710 large scale wind turbines in their city? If the answer is yes, please file copies of all such communications. If the answer is no, please explain why not.
- k) Where in the City of Ottawa would the 122 shipping containers of lithium batteries be located?

- l) Have the residents of the City of Ottawa been informed of the plan to locate 122 shipping containers in the city? If the answer is yes, please file copies of all such communications. If the answer is no, please explain why not.

- m) In case of a power outage, for how many hours would 312 MW of storage and 612 MW of storage be able to supply electricity needs of the residents of the City of Ottawa? Please file calculation on which your answer is based.

Responses:

(a) An Energy Evolution progress report develop in 2017 included a review of local energy origins and uses represented by the Sankey diagram below. The data was developed with input from the electrical utilities, Enbridge, and a fuel marketing survey purchased by the City. Intercity rail and aviation energy use are not part of the World Resources Institute modeling protocols for community GHG emissions, so they were not included. Also, fuel consumption from vehicles which do not stop in Ottawa was not included, and neither were transfers of steam and hot water over two of the bridges linking Gatineau and Ottawa. Since this data was collected another Chaudière Falls generating station has been energized, and this has likely pushed local generation up to close to 6,000TJ (based on 29 MW of capacity and 6000 hours per year annual use). Note that ICI in this context means “Industrial, Commercial and Institutional”.



(b) Ottawa has liaised extensively with Enbridge about the plan since 2016. Enbridge supported the development of the plan through its Municipal Energy Plan which made a contribution to Energy Evolution's development.

The City also had consultations with Enbridge regarding the plan. The record of those consultations is too voluminous to compile and file on the record in this proceeding.

More recently, Enbridge has participated in an Energy Evolution prescribed initiative. This is the High-Performance Development Standard. Enbridge participated in a stakeholder consultation workshop for this plan in the spring of 2021. In the fall of 2021 Enbridge contributed to support the development of the Community Energy Plan portion of the High-Performance Development Standard.

(c) Ottawa has liaised extensively with Hydro Ottawa and its affiliate Envari and Portage power. There have been at least 31 Hydro Ottawa employees involved in this since the beginning of 2019. Hydro Ottawa employees are included in a monthly Energy Evolution planning meeting. Hydro Ottawa was a partner with a contribution to the original Municipal Energy Plan which supported Energy Evolution's development. The communications between the City and Hydro Ottawa with respect to the plan are too voluminous to be compiled and filed in this proceeding.

(d) Hydro Ottawa's rate application was filed in February, 2020 whereas Energy Evolution was unanimously passed by Ottawa City Council in October of 2020. Hydro Ottawa explained this in response to interrogatories during their rate application (EB-2019-0261) that they were not taking Energy Evolution into account as it had yet to be formally approved.

(e) Ottawa attended and presented at the OEB Stakeholder Meeting on Utility Remuneration and Responding to DERs on September 19th, 2019. The meeting had many participants, including Energy Probe, and extended over three days. Ottawa does not have a copy of the list of participants. A copy of Ottawa's presentation is on the record in that proceeding. We also participated in the OEB's Stakeholder Meeting on COVID-19 and DER Impact Studies on Feb 3rd, 2021, and subsequently filed a letter of comment which is on the record in that proceeding.

(f) The pathway documents in phase one of Energy Evolution extensively discussed siting and area requirements for solar PV. These documents can be found [here](#). Apart from roof mounted solar, Energy Evolution calls for 140 MW of utility scale solar PV by 2050. This would likely be ground mounted and, assuming each MW requires 10 acres, roughly 1400 acres, or 0.2% of Ottawa's land area.

(g) Please see response to (f) above.

(h) There are no impending plans to install large scale wind turbines in Ottawa. As such any discussion of wind turbine dimensions is premature.

(i) The City's plan does not propose to install 710 large scale wind turbines in the City of Ottawa. Any Ottawa wind turbines of any size that were built would be located in appropriately zoned areas of the community respecting required setbacks.

(j) There are no impending plans to install 710 turbines. Currently, there is no pathway to market the power this number of turbines would produce.

(k) As discussed in the phase two Energy Evolution pathway document, energy storage is technology agnostic. It is therefore not clear that lithium batteries would be the only technology employed. The City's plan does not propose to locate 122 shipping containers of lithium batteries within the City of Ottawa. While there are ample locations available to locate storage facilities – whether lithium batteries or newer technologies, and whether in buildings or elsewhere – the use of electrical storage for the needs of City of Ottawa residents will evolve over time with the general evolution of distributed energy resources in Ontario.

(l) Please see response to (k) above. There is no imminent plan for the installation of 122 shipping containers of batteries.

(m) The purpose of electricity storage is to avoid capacity-forced curtailments of renewable generation during periods of surplus baseload generation. This currently occurs periodically and it notable that the IESO tracks surplus baseload generation. Electricity storage is not intended as some type of community-wide emergency power supply back-up in the Energy Evolution plan. Its purpose is to ensure that non-peak energy is not wasted.

Answers to Interrogatories from Environmental Defence

Interrogatory # Sponsors' Evidence-1-ED-1

Reference: Evidence, p. 4 & 97 & 119

Questions:

(a) Please describe the role that renewable natural gas (“RNG”) is expected to play in meeting Ottawa’s energy needs by 2050, including high-level estimates of the RNG (m3) to be used for (i) directly heating buildings, (ii) industrial uses, and (iii) power generation.

(b) Please comment on whether the RNG expected to be used in Ottawa in 2050 would likely be transported in the provincial pipeline (vs. truck or short local pipelines from production facilities to end-uses).

(c) Please comment on whether it is likely more cost-effective to meet the space and water heating needs in Ottawa’s buildings via the combustion of RNG versus an optimal combination of ground-source heat pumps, thermal energy storage, and air-source heat pumps.

(d) Page 6 of Energy Evolution (evidence p. 97) describes a reduction in GHGs of 12% attributable to RNG. Please provide a breakdown of these reductions between (i) reductions in fugitive emissions and (ii) displacing consumption of fossil gas.

(e) Page 28 of Energy Evolution (evidence p. 119) describes a reduction in GHGs attributable to “waste and renewable natural gas.” How much of this is attributable to displacing the consumption of fossil fuels with RNG (versus, for example, avoiding fugitive emissions or electrifying the waste disposal fleet).

Responses

(a) to (c) Please see responses to OEB Staff Questions #1 - #3.

(d) The figure of 12% is reductions related to the consumption of fossil gas. Fugitive emissions have not been included.

(e) See response to (d) above.

Interrogatory # Sponsors' Evidence-1-ED-2

Reference: Evidence, p. 4 & 183

Question:

- (a) Please compile a list of addresses of buildings owned by the City of Ottawa and ask Enbridge to calculate the gas demand (m³) from those buildings (e.g. from billing data) that are served by the St. Laurent pipeline in terms of design day demand (m³/d), peak hour (m³/h), and annual demand.

Response

The time and resources involved to provide this information (which involves the City and many other related agencies) is beyond the City's ability to produce this in this proceeding.

Interrogatory # Sponsors' Evidence-1-ED-3

Reference: Sponsors Evidence

Question(s):

- (a) Please respond to Enbridge's description of the Sponsors' evidence as containing "aspirational plans."
- (b) Municipal climate plans are sometimes criticized as being merely aspirational because they do not include sufficient concrete plans and investments to be realized. Please respond to that potential criticism as it relates to Ottawa's plans to the extent that there is anything to add in addition to the response to (a).
- (c) When will the next major status reports or updates be published that could help assess whether Ottawa's climate plans are or are not being realized?

Responses

(a) The City has provided information on its plans, and responded to questions to provide further details. It cannot comment on whether those plans are real or aspirational. That will be a matter for argument, and is for the OEB to determine in the context of this proceeding.

(b) Ottawa has provided extensive information on the current and future steps in this plan, including funding, specific programs, etc. Further information is provided in a number of interrogatory responses. It would be unusual for a thirty-year plan to have everything mapped out, costed, and financed at the outset. Neither municipalities, nor utilities, commonly approach planning in that way.

(c) The City produces annual reports on the Energy Evolution plan. The next such report is expected to be December 2022 as part of the Climate Change Master Plan update. There are also periodic reports on the various subcomponents of Energy Evolution, both to the City and to the public at large. Those reports are too numerous to list.

Interrogatory # Sponsors' Evidence-1-ED-4

Reference: Sponsors Evidence

Question(s):

(a) Please comment on Enbridge's assertion under the heading "feasibility of electrification" that "The equivalent amount of energy from electricity required to replace the energy provided by the proposed Project over the course of 1 hour is approximately 1.64 GW" and that "electricity generation, transmission and/or distribution infrastructure amounting to up to double the current peak demands for the City of Ottawa (served via Hydro Ottawa) or more than half of the generation capacity of the Pickering Nuclear Generating Station would need to be built and placed into service in order to eliminate the St. Laurent pipeline system." Please address the following factors in your response:

- i. At footnote 6 Enbridge cites 155,300 m³/h but notes on page 3 that the peak design day demand is 139,800 m³/h;
- ii. Enbridge's calculations do not appear to account for
 - A. Ottawa's plans to improve efficiency in buildings, and the impact this would have on the load for electrically-heated homes;
 - B. The efficiency of gas equipment and the fact that less than 100% of the energetic value of fossil gas is converted into heat;
 - C. The efficiency of heat pumps and the fact that 1 watt of electricity can produce considerably more than 1 watt of heat via a heat pump;1
 - D. Thermal storage and battery storage can shift load from peak to off-peak times;
 - E. Ground-source heat pumps maintain efficiency levels despite outdoor air temperatures;3 and
 - F. The existing electrical capacity in place to meet the peak summer demand when air conditioners are running.

(b) If possible, please recalculate the peak electrical needs accounting for (i) planned building envelope improvements, (ii) the differential in efficiency between existing gas equipment and heat pumps, (iii) the potential use of thermal storage and/or battery storage to shift load from peak to off-peak times, (iv) the electricity capacity in place, and (v) any other relevant factors.

Responses

(a) and (b) The Sponsors provided fact-based evidence related to plans to reduce and eventually eliminate the use of natural gas for space and water heating in Ottawa. The Sponsors' evidence does not engage in a debate with respect to the feasibility of electrification. While many of the statements and assumptions of Environmental Defence in the question are likely true, it is not appropriate in an interrogatory response to engage in a detailed debate on a matter that was not the subject of the Sponsors' evidence.

If the quoted statements by Enbridge are intended to allege that the Energy Evolution plan of the City of Ottawa is not achievable, and Canada's federal and provincial goals to reduce GHG emissions to net zero, which are heavily reliant on electrification, are not achievable, then those statements will be challenged by other parties and will ultimately be for Enbridge to support in their arguments to the Ontario Energy Board. The City of Ottawa does believe that the Energy Evolution plan can and will be achieved, and is intensely engaged in achieving the results set out in that plan. The City is confident that it will phase out the use of natural gas within the time frames cited in the plan.

Interrogatory # Sponsors' Evidence-1-ED-5

Reference: Sponsors Evidence

Question(s):

- (a) Please describe any additional technologies and/or programming being considered for future phases of Energy Evolution aimed at reducing consumption of fossil gas for space and water heating.

Response

The public information available on the Energy Evolution plan, and the technologies and programming that have been presented to the City for consideration, has been filed in the evidence. There are many additional technologies that could be considered, and many program approaches that are possible, but until those technologies and program approaches have been developed and reviewed sufficiently by the City, they cannot be listed as being part of the Energy Evolution plan. Those will, necessarily, include technologies and program approaches that are known today, others that are nascent today, and still others that will be discovered/invented in the future.

**Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario**

Interrogatory # Sponsors' Evidence-1-FRPO-5

ISSUE 2: Project Alternatives

REF: Sponsoring Parties Evidence and EGI Responding EVID

Preamble: From our read of the Sponsoring Parties Evidence and the Responding Evidence of EGI, EGI indicates that the projected savings would not make a difference on the sizing of the proposed replacement project.

We would like to understand the Sponsoring Parties knowledge of other local initiatives that may affect peak natural gas demands for the St. Laurent project.

Question

1) Please provide information the Sponsoring Parties may have on initiatives in the Ottawa area of the project and potentially, those in Gatineau area where Gazifere demands affect the sizing of the pipeline.

Response:

Gatineau has a climate plan, developed and published in Canada's first official language. The plan has been ratified by council and calls for a 50% drop in GHG emissions by the City corporation and a 35% drop in community by 2030 from a 2015 base ([link here](#)). The plan proposes an expenditure of \$105 million over the next 5 years but this has yet to be budgeted. Approval of the first expenditure for the plan is being fast tracked ([link here](#)).

The province is starting to restrict natural gas installations. Start in 2023 it will be illegal to replace oil heating systems with any type of fossil fuel based system ([link here](#)).

Finally, with respect to renewable natural gas (RNG), Quebec has regulations with a 2025 timeline ([link here](#)) requiring a 5% blend of RNG and targets with a 2030 timeline ([link here](#)) recommending a 10% blend of RNG. With respect to Gatineau, if any renewable natural gas is fed into the Gazifere network, it will directly reduce the amount of gas that must be fed in from Ontario. This gas already started with the installation of a green hydrogen facility ([link here](#)). Remediation work is being discussed at the Cook landfill which could be another RNG source ([link here](#)).

Returning to the Ottawa side of the region, the University of Ottawa has a goal to become a carbon neutral campus by the year 2040 and reduce direct greenhouse gas emissions (scope 1 emissions) by 2040 ([link here](#)).

Note the some of the links go to publications which are in French. In these cases, a search could not find English publications with the complete level of detail of the French ones.