

Energy Evolution Sounding Board Questions received on August 12, 2020

Please note: The questions and answers received in PolIEV have been themed to facilitate review, especially for Sounding Board members who did not attend the meeting on August 12. The order does not reflect the priority established by Sounding Board members who “upvoted” or “downvoted” questions, nor does it reflect the order in which questions were received or answered.

General Model questions

1. What assumptions are baked into the EE model regarding carbon pricing, community transition to EVs and community transition to net zero buildings?

Assumptions related to carbon and energy pricing:

- Carbon price projections are based on the Pan Canadian Framework until 2022 (reaching \$50/TCO₂) with an average 3% inflation thereafter.
- For various energy prices including fuel oil, natural gas, and electricity, data came from the 2019 National Energy Board Energy Futures Report until 2040, following which linear extrapolations were made.
- A Cost Catalogue listing all cost assumptions and the source data is available in Appendix H - Cost Catalogue.
- The assumptions in the Cost Catalogue have been vetted by internal and external stakeholders in each field to confirm their accuracy.

Assumptions related to community transition to EVs:

- The Business as Planned scenario is segmented by vehicle type as follows:
 - Personal EV's – 3.5% of vehicles on the road at 2035 and 5.5% at 2050,
 - Commercial and City Fleets: 0% at 2050. (note that for the gas and diesel vehicles, currently legislated improvements in fuel efficiency are assumed)
- In the 100% Scenario, the following assumptions are made:
 - For personal EV's, EV's are assumed to be 90% of sales at 2030 and 100% of sales by 2040.
 - For City Fleet 60% of vehicles are assumed to be zero emission by 2030 and 100% by 2040 and
 - For commercial fleet, 40% is assumed to be zero emission by 2030 at 100% by 2040.
 - Note that zero emission could be either battery electric or fuel cell powered.

Assumptions related to community transition to net zero buildings:

- The Business as Planned scenario assumes 10% improvement every 5 years for new construction, and allocation of building types based on new Official Plan intensification levels.

- 100% scenario assumes 100% net zero homes by 2030 and development standards near passive house levels by 2030 for commercial and multi-unit residential buildings and allocation of building types based on new Official Plan intensification levels.
- The city has a project underway called the high-performance development standards that intends to use the legislative tools available to advance these targets. This project recognizes that there are significant limitations of what the municipality can enforce with respect to new building performance.

2. What assumptions were made in the model regarding energy costs. Can the expected costs increase for energy sources be shared?

- Assumption about costs and escalation for all energy sources and forms are in Appendix A - Data, Methodologies and Assumptions (DMA) Report. The table below shows prices and escalation from the DMA report:

Energy costs (\$/MJ)		2016	2050	% +/- (2016-2050)
Residential	Natural_Gas	\$0.009	\$0.010	17%
Residential	Electricity	\$0.042	\$0.048	14%
Residential	FuelOil	\$0.029	\$0.037	28%
Commercial	Natural_Gas	\$0.006	\$0.008	23%
Commercial	Electricity	\$0.035	\$0.042	20%
Commercial	FuelOil	\$0.025	\$0.034	33%
Commercial	Propane	\$0.015	\$0.018	26%
Industrial	Natural_Gas	\$0.006	\$0.007	27%
Industrial	Electricity	\$0.032	\$0.039	20%
Industrial	Diesel	\$0.016	\$0.024	54%
Industrial	FuelOil	\$0.016	\$0.024	54%
Industrial	Propane	\$0.019	\$0.027	41%
Vehicles	Natural_Gas	\$0.009	\$0.010	17%
Vehicles	Electricity	\$0.042	\$0.048	14%
Vehicles	Gasoline	\$0.036	\$0.049	36%
Vehicles	Diesel	\$0.035	\$0.048	39%

3. Does Ottawa own the Energy Evolution model or do the consultants? Does Ottawa have to pay every time it is run?

- The consultants, Sustainable Solutions Group (SSG), developed the model and have made it publicly available for others to use under a creative commons license.
- Due to the complexity and volume of information of the model, it is difficult to use the model without training.
- Currently, the City must pay to make based layer changes to the model (ex. population projections).
- The Energy Evolution team has received an estimate from SSG on how much it would cost to train staff from both the Energy Evolution team and other departments on how to use the model.

4. Will the EE model be used to test proposed policy, plan and project actions of the City? eg for transportation and infrastructure plans? City budget, etc. Will EE model runs be done to assess possible future actions?

- Assuming the Energy Evolution team is trained on how to use the EE model, we should be able to test different scenarios to see what kind of impact they have relative to the current 100% scenario.
- The Energy Evolution team has offered to rerun the model if it would be helpful to other city departments who are doing concurrent projects which may have GHG implications, like the Official Plan, Transportation Master Plan, Solid Waste Master Plan and OC Transpo Alternative Fuels for Transit project.
- The Energy Evolution team has also made the Energy Evolution model available to internal staff and to consultants supporting concurrent projects which may have GHG implications, like the Official Plan, Transportation Master Plan, Solid Waste Master Plan and OC Transpo Alternative Fuels for Transit project.
- Note that except for electricity, only scope one and two emissions are considered in the model. Scope three emissions for carbon that's embedded or embodied in materials of construction for instance is not in the current model. Scope three emissions modeling is a newer science and could be consider as part of the planned 5-year update.

Land Use

5. Given that sprawl is a major source of emissions, especially if uptake of EVs and net zero buildings is slow, are there any land use recommendations?

- All possible emissions reductions contribute to achieving the 100% GHG reduction targets. Many will be costly. Many are not within the authority of the municipality. Land use does fall within the regulatory jurisdiction of the municipality.

- The emissions analysis done by the consultants compared the impact of the urban boundary expansion in the business as planned scenario as well as the 100% scenario. In both of these scenarios, the incremental GHG emission reductions from urban expansion were found to be relatively minor compared to the other factors driving emissions from urban expansion, namely gas vehicle use and building energy. This evaluation did not include scope 3 emissions.
- Since electrification of private vehicles makes up 20% of the carbon reductions needed, and car dependence is the most impacted by land use, meeting electric vehicle targets in Energy Evolution should be a top focus to offset any expansion scenario. The 15-minute neighbourhood concept, as proposed in the new Official Plan, is a key component of addressing car dependence and achieving the GHG reductions.
- The high performance development standard will also reduce emissions from buildings.

Electric Vehicles (EVs)

6. What's the plan for encouraging, investing and building charging infrastructure for private EVs?

- One of the 21 proposed projects is called Personal Vehicles Electrification Strategy. The purpose of the Personal Vehicle Electrification Strategy is to support the transition to personal EV adoption in Ottawa through increasing charging infrastructure, education and outreach, and advocacy. The City has direct roles to play in this sector with respect to charging infrastructure ownership and enabling policies, right of way legislative tools, education, and advocacy work. The scope of this work includes:
 - Investigating programs to financially and technically support installation of residential charging.
 - Working with community partners to encourage the installation of demonstration EV charging projects in existing multi-unit residential buildings.
 - Exploring the installation of public charging in right-of-ways in areas where residences are less likely to be easily equipped with charging.
 - Update the existing Corporate Electric Vehicle Charging Station Policy to include existing municipal facilities and public right-of-way infrastructure
 - Investigate regulations to enable residential EV owners to publicly make available their household charging infrastructure to other residential EV owners.
 - Electrical grid constraint issue are addressed in the Electricity Resource Strategy
 - Monitor EV charging use and assist in ensuring that there does not become a shortage of EV charging or line-ups at charging area

- Subject to budget approval, the Energy Evolution team
 - Has proposed \$300,000 annually until 2025 as funding for public EV charging. To establish good places for investment, we will monitor usage. A key metric we will employ will be to watch for, and take action to alleviate line-ups for charging should it occur. We will leverage funds from senior levels of government as it is available.
 - Will explore installing more wayfinding signage to charging stations. This should help to assure prospective EV buyers that public charging is available.
 - Is encouraging a visit from a mobile EV discovery centre in Ottawa in the fall of 2020 and will consider investment in a permanent center.

7. 90% of sales to be EV in 2030 requires a large increase in supply of EVs from manufacturers. Is this something that is included within the existing project, or are there ongoing discussions with the Federal Government to support the increase in supply options for consumers?

- The existing project works to increase consumer demand. To the extent that this can increase supply it can help with availability. Discussions with the federal or provincial governments for something along the lines of a zero emission vehicle mandate could be considered.

Buildings

8. Were any assumptions made about the adoption of retrofit building codes for existing buildings currently under development by Codes Canada?

- The model does not make assumptions about retrofit building codes.
- The model does make assumptions about the number and degree of renovations required to achieve the GHG emission reduction targets.
- The Energy Evolution team recognizes that retrofit building codes may be one tool to help achieve these goals.
- The federal government is working on a model retrofit code that the province could adopt some day, but even this has limitations on the level of influence it will have.
- While retrofit codes could be a powerful tool, additional tools and programs will be necessary for achieve our climate change mitigation targets.

9. Investing in new buildings and planning for it is much easier than retrofitting existing buildings. Who is responsible for putting a 10-year plan for energy evolution targets to track new buildings added in Ottawa area and to make sure they are energy efficient like adding a new Civic Hospital?

- We do not yet have a 10-year plan for tracking new building energy performance.
- The High-performance Development Standard will play a role in tracking and advancing the as-designed performance of applicable projects.
- With respect to the new Ottawa Hospital building, we cannot speak specifically to this and are unsure if its timelines will make it fall under the High-performance Development Standard.
- One sounding board member advised via PolLEV that preliminary conversations have taken place with respect to the hospital connecting to the federal district energy system (see comment below).

10. Question regarding slide 15 (slide with table on financial implications of several key actions). My understanding from the table is that retrofitting of buildings does not produce positive payback over the life of the investment. LIC aren't enough. Are regulatory measures planned?

- Commercial and residential building retrofit measures are all included in the existing buildings line on slide 15. Over the life of the assets, retrofits have a positive return on investment, as shown on that slide. It is important that property owners implement all the required measures in their retrofits, however, because if property owners “cherry pick” the easiest actions, it makes the deeper measures harder to achieve and Ottawa will not achieve the emissions reductions required. Also, given the timeframe remaining to achieve the target, there will not be time for public programs to “touch” each building multiple times.
- Looking at that action with more granularity, we see that some measures are more cost effective than others, which informs where public programs can be most effective. Commercial building retrofits, for example, have a faster return on investment than residential building retrofits. Within the residential building stock, there are some measures that have fast paybacks such as air sealing and attic insulation.
- With the projected cost of natural gas remaining low and the modest increase in carbon pricing, some buildings will find heat pumps to have a slow return on investment. As such, public programs to drive down the cost of heat pumps are being considered under the retrofit projects. Also, a financing program using the Local Improvement Charge mechanism is being pursued for residential buildings currently. Ontario municipalities have limited regulatory options to mandate building energy performance, but all options are currently under consideration.

Budget and Revenue

11. How is the EE strategy roll-out aligned with the municipal budget cycle? Will the Oct 20 Environment Committee meeting also have the draft budget 2021 on the agenda?

- Energy Evolution is currently an unfunded strategy.
- Independent of COVID-19, no municipality in Canada, including Ottawa, is in a financial position to fully implement climate mitigation strategies without the support of senior levels of government. Given COVID-19, the City of Ottawa is not in a position to make financial commitments at this time.
- The City requires additional clarity and direction from the federal and provincial government about funding to address municipal financial gaps before financial commitments of any kind, including those associated with the municipal budget.
- In terms of feeding into relevant municipal budget processes, the Energy Evolution team will develop three separate deliverables:
 - A proposed Hydro Ottawa Dividend Surplus spending plan – Council directed staff to develop a proposed Hydro Ottawa Dividend Surplus spending plan in January as part of the status update on Energy Evolution; however, Council has not yet decided how the Hydro Ottawa Dividend Surplus will be allocated. The Energy Evolution team is developing a proposed spending plan in case the opportunity arises.
 - Capital request for 2021 budget – The Energy Evolution team is developing a capital request for the draft 2021 municipal budget. It is not anticipated that the Oct. 20 Environment Committee meeting will have the draft budget 2021 on the agenda. Typically, budget discussions happen at Committee in November.
 - 10-year spending plan – The Energy Evolution team is developing a 10 year spending plan that can be considered in annual municipal budget cycles and feed into the City’s Long-Range Financial Plan.

12. How much budget do you estimate the City would need to commit in order to achieve your targets? Will the City be using its powers to encourage private and commercial buildings in the City to build to zero carbon standards?

- The plan calls for a rapid increase in spending on low carbon infrastructure across the community. Community emissions make up 95% of all GHGs. Corporate emissions account for about 5%. According to the Federation of Canadian Municipalities, municipal activities affect approximately 50% of community emissions since they influence the daily choices of local residents and businesses. Therefore, the Energy Evolution Strategy calls for spending on both municipal infrastructure as well as programs to catalyze community emissions reductions.
- For the municipality, the most costly item in the model is the expansion and electrification of the transit network at \$513M per year for the next ten years. This is incremental to OC Transpo’s current plan.
- Other municipal costs total \$110M per year until 2030; this includes active transportation networks, building retrofits, converting all vehicles to zero-emissions, organics diversion, and biogas generation.

13. Does Energy Evolution consider and propose revenue tools that would also reduce emissions (e.g., congestion pricing with funds going to transit)?

- There are some economic behaviour change tools in the EE model. These include a congestion charge for downtown as well as increased parking fees. These are both included to decrease vehicle use. Along with other departments, the Energy Evolution team is assessing alternative approaches to congestion charges and parking fees, as there are many different ways to discourage car usage.
- Municipalities face many regulations regarding revenue generation that need to be considered along with societal impacts and implementation realities.
- Beyond car user fees, the Energy Evolution team is also considering revenue tools used by other municipalities including environmental fines such as for idling, blocking bike lanes, and putting organics in the garbage.

General Project questions

14. Can you provide a bit more details on the three most impactful "projects" based on GHG emissions reductions? Assuming that Committee will approve, when do you foresee implementation?

- It's hard to say what the most impactful "projects" are because the model is based on ~35 actions. These actions have been bundled into "projects" because the actions are related technically or strategically and should be considered simultaneously in implementation efforts.
- A total of 21 projects have been identified over the next five years (2020-2025) to accelerate action and investment towards achieving the 100% scenario. Appendix F: Project Overviews includes 21 project overviews that describes what each project could entail. This includes the Standing Committee the project will be considered by, a brief description of what the scope of the project will include, co-benefits, risks, key departments and community partner as well as estimated project milestones, resources, and delivery mechanisms. Appendix G: Action and Investment Plan (2020-2025) provides a high-level summary of those projects. Appendix F provides further details as to what each project will entail.
- The top 5 actions in the Energy Evolution model and their associated proposed projects are included in the table below:

Top 5 Actions	Proposed project	Focus
Electrify personal vehicles	Personal Vehicles Electrification Strategy	Community Focused
Retrofit existing residential buildings	Residential Building Retrofit Accelerator Program	Community Focused
	Local Improvement Charge Program	Community Focused
Retrofit existing commercial buildings	Commercial Building Retrofit Accelerator Program	Community Focused
	Community Building Heating Strategy	Community Focused
	City building renovation and energy efficiency retrofit program	Municipal Focused
Electrify commercial fleets	Zero Emissions Commercial Vehicles Strategy	Community Focused
	Municipal Green Fleet Plan Update	Municipal Focused
	Alternative Energy Transit Program	Municipal Focused
Divert organics and create renewable natural gas	Renewable Natural Gas Strategy	Community Focused
	Eliminate Organics from Landfill	Municipal Focused

- All proposed projects will be contingent on future Standing Committee and Council approval as well as future staff and budget (capital and operating).

Sounding Board Feedback and Roles

15. Are you looking for project and program suggestions from partners as well as feedback on those proposed?

- Absolutely! The 21 proposed projects are based on what is required to meet the 100% scenario under the energy and emissions model.
- The metrics are aggressive, and they require far reaching implementation across all aspects of society. The Energy Evolution team acknowledges the magnitude of change required to meet the 100% scenario is difficult to achieve.
- If you have additional ideas, we want to hear them! The [feedback form](#) has been structured so that you can provide feedback on any of the projects.

16. Good job everyone. Lots of good work has been going on behind the scenes despite COVID. I look forward to seeing the details. But am encouraged by the level of professionalism and scope of thinking and work to date. Now needing political and public buy-in. How can we help?

- Everyone has a role to play in figuring out how to move Energy Evolution beyond planning and into implementation. The City needs partners across all aspects of society to achieve the 100% scenario.
- Currently, the Energy Evolution team is focused on incorporating feedback on the draft strategy, moving projects forward, and preparing for the Oct 20 Committee meeting.
- In the short term, we encourage members of the Sounding Board and Environmental Stewardship Advisory Committee to review the strategy and complete the [feedback form](#) by August 30. One of the questions asks you which projects you are interested in to support implementation. Let us know so we can follow up with you. We also welcome letters of support and can provide a template if that would be helpful for you or your organization.
- To help us in the longer term (after October), we will need to:
 - Continue developing the projects for implementation
 - Identify funding to support project implementation
 - Revisit our governance structure
 - Refine our communication and engagement efforts
- If you are interested in funding, governance or communication and engagement, please let us know in the [feedback form](#) so we can follow up.

COVID Considerations

17. The past few months have seen a dramatic change in energy use across the city - less energy used at work, more energy use at home, and big changes in commuting and transportation patterns. Does this affect your long-term models? Are these changes trends you'd like to encourage for carbon reduction?

- Energy Evolution is a long-term plan, spanning the next 30 years. Although we expect that there will be ripple effects in the short term, we don't anticipate that there will be major changes to what's required to reduce GHG emissions over the long-term.
- The Energy Evolution team expects that the most acute changes will be felt over the next five years. COVID-19 implications and other technical, political, and legislative considerations will be assessed for individual projects as part of future

recommendation that will go to Standing Committee and Council for consideration.

- The model is just a scenario and a forecast – although it will become stale dated, it serves as a useful reference point for informing strategic discussion, policy development, and program design. Even if we redid the model with COVID-10 considerations, that model would eventually be wrong as well.
- Re-modeling is important when we need to re-evaluate our focus and efforts. Small changes in how our actions are translating into results likely won't merit re-modeling. Give that resources are limited, we are focused on moving towards implementation rather than trying to re-model as circumstances, technology and COVID-19 evolve.
- The Energy Evolution team plans to rerun the full model in 5 years and has offered to rerun the model for concurrent projects like the Transportation Master Plan and Solid Waste Master Plan if it is helpful.
- In the interim, there are obviously a number of trends that could impact both the financial and emissions model including reduced transit ridership, changes in energy usage in both residential and commercial buildings, etc. The Energy Evolution team will continue to monitor trends and consider their impact as projects are developed and proposed.

18. There is a lot of pressure on the feds to build back better with their COVID recovery. This could align with Energy Evolution and OCAF. Is there any indication that they will move before winter as otherwise this season will be lost?

- Unfortunately, the Energy Evolution team does not have any information about the timelines for Federal stimulus funding.
- Like many other teams across the City, the Energy Evolution team has provided input into candidate project lists, should Federal or Provincial stimulus funding be released.
- Several projects that have risen to the top of this list have GHG emission reduction associated with them.
- Staff are waiting for further direction and details from the federal and provincial government on next steps.

OCAF

19. OCAF sounds like a great initiative; are there similar models in existence in other jurisdictions or are there metrics to be used to monitor the success of the investment projects?

- The LC3 model is based on The Atmospheric Fund (TAF) in Toronto.

- TAF and the other LC3 Centres are figuring out how to move from project-level investments to scaled-up, community-wide, long-term impact.
- Project investments can be evaluated in terms of GHG performance, social impact and financial return.
- The big question is how do you measure scale up -- What are the signals that show you're on the right path?
- A critical indicator is how we are spending money. (Per my slide 5, Ask the Climate Question.)
- We need the majority of public and private investment directed toward low-carbon, resilient solutions.

20. Would OCAF be open to pooling capital with other community investors to increase the size of projects and impacts?

- Definitely. We will seek partnership with a variety of investors to maximize environmental and community benefits.
- We are fortunate to have a generous endowment from the Federal government and look forward to deploying it impactfully. And it's relatively modest in comparison with what's needed. Partnering with other investors will be key for OCAF.

21. OCAF is prioritizing smart intensification but this concept hasn't been mentioned as part of Energy Evolution planning or investment. What explains this disparity between the City and one of its trusted partners for climate action?

City's response:

- It's true that there is no project called "Smart intensification". This is because land use assumptions are embedded throughout the model. The land use assumptions related to the new Official Plan's intensification targets are foundational to the model.
- One of the projects is called "Integration of energy and climate mitigation priorities into the new Official Plan and supporting master plans". Under this project, the Energy Evolution model and actions are being used to guide a policy framework that addresses climate and energy resiliency priorities with implementation tools like community improvement plans (which are identified as a separate project), secondary plans, zoning, and site plans to achieve targets.
- The Official Plan will also inform the supporting master plans including Transportation, Infrastructure, and Solid Waste.

OCAF's response:

- I don't see a conflict here. The EE modeling assumes significant intensification. But those won't happen by themselves.

- And we need to hedge our bets. What if the EV market doesn't evolve as quickly as we hope? We need to work to make the intensification happen.
- I actually don't love the term "intensification". I prefer to frame it as 15-minute communities-- focus on solutions such as 613 flats, walkability and access (to services, jobs, recreation, shopping).
- There may be a convening role for OCAF to explore and pursue solutions. What are best policy practices for fostering successful business models for private developers and honouring priorities of neighbourhood groups?
- And it's not just about climate change. As I documented in the book, *Growing Wealthier: Smart Growth, Climate Change and Prosperity* (and summarized in a recent [blog](#)), good planning and compact, walkable and transit-oriented development can bring multiple benefits to people, businesses and government agencies (health, quality of life, cost savings, increased ROI...).

22. Please provide Steve's contact info. Thanks.

Starting in late fall, Steve Winkelman will be the Executive Director of the Ottawa Climate Action Fund. Until then, he can be reached via LinkedIn <https://www.linkedin.com/in/steve-winkelman-8ba4352/>, or email: swink@greenresilience.com.

Housekeeping

23. Will a copy of the presenters' speaking notes be provided?

Yes – a copy of the presentation and speaking notes was provided in a follow up email, sent to the Sounding Board Aug. 14.

24. Will you provide the questions asked during the meeting with the answers after the meeting?

Yes – this document includes the full list of questions and comments submitted through the online app PollEverywhere (PolIEV). Unfortunately, we learned after the Sounding Board meeting that PolIEV had a limit of 25 questions. If you were not able to submit your question on Aug. 12, we encourage you to submit your question using a new online poll tool called [Slido](#). We will accept questions until Monday, August 24. You will also have the opportunity to ask questions during the Sounding Board meeting on August 26. We will provide a copy of all questions and answers after the meeting as well.

25. Will the presentation videos be made available? Some parts are hard to hear.

No. The presentation was not recorded. At this time, we do not plan to record the Sounding Board meeting on Aug. 26. In the future, we will look into creating a pre-

recorded public presentation that can be shared on our webpage and meets the City of Ottawa's accessibility and bilingualism requirements.

26. I can't hear the presenter, shall we call or use the computer audio? I just want to say that there is technical difficulties in the webinar today by zoom in audio and tracking the speaker?

We apologize for any technical difficulties you have experienced. In the future, we will request that all presenters use a hard wire internet connection.

General Comments Received (no response required)

27. Big round of applause to the Energy Evolution team! Very happy with the scale of the plan and hope we can find clever ways to address all the risks that might impinge implementation. The financial model is uplifting in showing the potential benefits. Big amounts needed up front! We can do it!

28. PSPC has talked to the Ottawa Hospital to see if they would be interested in connecting to our district energy system. As a note we are on track to have carbon neutral heating by 2030.

29. Mike obviously has a modelling background. Look at those fantastic cheek bones! (Note: for those of you that made it all the way to the bottom of this Q&A, you might appreciate that this cheeky comment was the most popular comment or question of the Q&A session. Clearly Sounding Board members agree – Mike has fantastic cheek bones.)