2020 Community Energy Use and Greenhouse Gas Emissions Inventory
EEPAC Working Group Comments

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Although the Energy Use and Greenhouse Gas (GHG) Emissions Inventory has been finalized by the City, the EEPAC working group has organized its comments into the following categories, which we believe to be helpful: a) questions for the City regarding methodology in 2020 reports or general questions to the City, and b) proposed refinements/methodological changes for future inventory updates.

Questions for the City of London

1. Impact of bicycles - The City notes that bicycle use increased 20% in 2020, due to the COVID-19 pandemic. Are there any estimates of the breakdown in commuting vs. leisure usage? The use of bicycles for commuting which have directly replaced personal vehicles should result in measurable decreases in GHG emissions.
2. Impact of bus ridership - Neither trends in bus ridership over the past several years nor bus ridership in 2020 were discussed in the report. Do increases (or decreases) in bus ridership have a measurable impact on fuel consumption, and therefore GHG emissions? If so, how measurable (e.g. for every 100 people who ride the bus instead of driving their personal vehicle, how many kg of GHG emissions are avoided?).
3. On-road vs off-road gasoline usage - With respect to gasoline use and its impact on GHG emissions, does the city have an estimate of the share of contribution coming from small engines (e.g. gas lawn mowers, gas leaf blowers, etc.)? Small engines typically cause more air pollution than vehicles burning a similar amount of fuel.
4. Landfill methane utilization at W12A landfill - Has the City of London studied generating usable energy from the gas currently flared at the W12A landfill? Landfill gas to electricity would displace some grid-based natural gas generation. Landfill gas converted to pipeline quality natural gas would directly replace fossil fuel based natural gas.
5. Reduction targets - Does the City plan to achieve the Province of Ontario's GHG reduction targets or the more aggressive reduction targets from the Government of Canada?
6. Definition of 'average household' - The document sometimes describes energy use or GHG production on a per capita basis. Frequently, however, it refers to an average house or household without defining what an 'average household' is. The 'average household' probably varies considerably between neighborhoods, due to differing household sizes, lifestyles, and home construction characteristics. Is the 'average household' definition from Statistics Canada, or calculated by the City of London?

Proposed Refinements/Changes for Future Inventory Updates

1. New category: consider adding medical waste incineration - Due to the COVID-19 pandemic, the use of masks, gloves, and other single use items have increased, likely increasing the generation of regulated medical waste as well. Has an increase

in non-biogenic medical waste feedstock been quantified? If so, how much have GHG emissions from medical waste incinerators servicing healthcare facilities within the City of London increased? If the City hasn't considered medical waste in terms of direct emissions, it should consider doing so in future inventories, since both municipal solid waste and sewage sludge direct emissions are considered. Adding additional categories will increase total GHG emissions in the inventory but will also more accurately quantify progress in reducing emissions.

2. New category: consider adding refrigerant emissions - Refrigerants should be factored into the inventory, since they are directly related to energy use within the City of London. Examples of usage include air conditioning systems, refrigerators/freezers and heat pumps - systems which require the transfer of heat between two spaces. An estimated 29% of global GHG emissions from refrigeration systems are from refrigerant emissions (while the other 71% are from direct energy use). Since Ontario's electricity grid is largely decarbonized, this share is likely far higher. While CFCs, which are damaging to the ozone, were replaced by HFCs, HFCs still have very high global warming potential (GWP), often in the thousands. For example, commonly used R-134a (tetrafluoroethane) has a GWP of 1,300. While HFCs are being phased out for more climate friendly refrigerants such as R-744 (CO2), R-1234yf, R-290 (propane), and R-600a (isobutane), HFCs and other high-GWP refrigerants are still widely in use. As older systems which use refrigerants are replaced with newer systems, the GHG emissions from refrigerants in the City of London should be expected to decrease, and a rate of replacement can be calculated based on the service life and replacement rate of various systems which use refrigerants.

3. Closed landfills represent a unique opportunity to address GHG emissions - As per Table 14 of the Inventory, closed landfills contribute 30 kT/yr of GHG emissions vs. 90 kt/yr from the W12A Landfill and 20 kT/yr from IC&I waste disposed outside of London. No methodology is given for calculating closed landfill emissions. There appear to be dozens of closed landfills in London, as per the London City Map, but it is not clear how methane emissions were estimated. Methane emissions from closed landfills are a function of many factors including the amount of putrescible waste disposed of, stage of the landfill, and gas collection and treatment systems in place. This could be a potential area of study (perhaps even a thesis or dissertation) to better understand the extent of methane emissions from a variety of different closed landfills. Such research could be informative at an international level. Additionally, closed landfills with the highest amount of emissions could be targeted for alternative methane destruction technologies.

4. GWPs should be taken from IPCC's Fifth Assessment Report - The IPCC's Fifth Assessment Report (AR5) should be used in place of the AR4 to determine GWPs. Methane has a GWP of 28 in AR5, vs. 25 in AR4, which was used in the documents. Therefore, CO2eq emissions of methane are likely underestimated.

5. Quantified impact of coal plant closures - London's GHG emission targets seem to be on track based on the chart on page 13. How much reduction in GHG emissions has been due to the closure of coal power plants in Ontario between 2003 (when emissions in London seemed to have peaked), and 2014, when the last coal plant was shut down? I think it would be useful to have this impact quantified as the GHG

benefit from shutting down coal generation was significant but cannot be repeated/ act as a source of reduction going forward.

6. Land use and development and urban design unaddressed - Under the section "Factors that influence how much energy a modern city uses", Land Use and Development and Urban Design are listed as top two factors. However, these two factors were not addressed in the report.

7. Describe different scopes for 'average CO2eq emissions' - Page 44 of the agenda (p. 17 of the report) mentions the 'average' household emits 9.3 tonnes of CO2eq from burning fuel and waste but earlier (p. 43 agenda, p. 16 report - right column) mentions that total emissions per household is 18 tonnes of CO2eq. While this appears to be based on considering Scope 1 vs. Scope 1-3 emissions, this is not explicitly mentioned, and can confuse the reader. The different Scopes should be mentioned here.

8. Discussing 'ton' in definitions - Consider removing the reference to 'ton' and just describe 'metric tonne'.

9. Discussing 'terajoules' in section 2.1 - Because the table in section 2.1 lists percentages and not absolute values, there is no need to mention terajoules in the column headings (or define just yet what a terajoule is).