Comments and opportunities for improvement on the document

"Guide méthodologique du bilan carbone de l'Université de Montréal

The basic principles of a GHG inventory are well respected. The methodologies and assumptions are adequately presented to allow the target user to perform the GHG calculations in a consistent manner.

The document could clearly present the consolidation approach used to define the organizational scope. On page 3, it is mentioned that "Scope 1 includes all emissions from sources over which the organization has control". Presumably, this refers to operational control.

The reference year is well defined and justified. The exact dates could be specified.

The right types of emissions are included in scope 2, but this category is not defined correctly (page 3). It is stated that "Scope 2 includes emissions generated by resources that it has consumed but does not control". It is more a question of indirect GHG emissions due to imported energy (electricity consumption, steam purchases, etc.).

A small clarification, the new version of the ISO 14064-1:2018 standard, separates the emissions as follows:

a) direct GHG emissions and removals;

b) indirect GHG emissions from imported energy;

c) indirect GHG emissions from transportation;

d) indirect GHG emissions from products used by the organization;

(e) indirect GHG emissions associated with the use of the organization's products;

f) indirect GHG emissions from other sources.

After reading the document, I conclude that the University of Montreal does not burn propane.

For all methodologies:

- GWPs could be updated. According to the "IPCC 2014, IPCC Fifth Assessment Report (AR5)" :
  - CO_2 : 1
  - CH_4 : 28
  - N_2O : 265

For natural gas :

- Methodology well explained and opportunities for improvement well targeted.

For steam generation :

- If the actual natural gas consumption is known, this already includes the steam production. Therefore, no additional calculations are required.

- On page 12, the following sentence is not accurate: "Steam is not included in the University's carbon footprint because it is not consumed by the University; in order to avoid double counting, it is therefore removed from the footprint." Emissions due to the production of steam (i.e., natural gas consumed) must be included and there is no double counting. In fact, the University of Montreal must include these emissions in its scope 1, while the buyer of this steam will include it in its scope 2.

For fuel oil:

- External raw data holders could also include the fuel oil supplier(s).
- The introduction to the document refers to fuel oil 5, while on page 15 it refers to fuel oil 6.

For diesel :

- External raw data holders could also include the diesel supplier(s).

For HFC leaks:

- Methodology well explained and opportunities for improvement well targeted.

For agriculture:

- It may be worthwhile to compare your emission factors to those in the national inventory (Environment Canada, 2021. National Inventory Report 1990-2019, Part 2). See Tables A3.4-8, A6.4-2, A6.4-6, A3.4-18.
- N_2 O emissions from manure management could be considered.

For mobile fuels:

- **Important**: All emission factors presented are in kg GHG / **liter of** fuel (not kg GHG / **m³** of fuel).
- If the vehicle types are known, it is possible to improve the accuracy of the calculation by considering the vehicle type and year (as mentioned in the document).
- Fugitive emissions from vehicle air conditioning systems could be considered.

For electricity consumption:

- External raw data holders could also include Hydro-Quebec bills (as mentioned in "Other remarks").
- The emission factors for CH_4 and N_2 O are very low, but not 0.
- **Important**: All emission factors presented are in kg GHG / **kWh** (not kg GHG / **m³** of electricity).

For commuting :

- The number of travel days to the University (335) does not appear to consider weekends.
- The following sentence is not consistent with the emission factor presented: "For carpooling, we assume 2 people per vehicle; the emission factor is therefore estimated to be half that of carpooling.

- In terms of public transit, in the OD survey, is there a "Metro" option? The emission factors of bus vs. subway are very different.

For business and student travel:

- Emission factors could be included in the guide.
- The emission factors for air travel are not the same for short, medium and long flights. Therefore, air travel could be quantified individually instead of as a total of annual km.
- Activity data related to business travel is actually obtained usually from expense accounts.

For paper consumption :

- No comment

For T&D loss:

- The emission factors for CH_4 and N_2 O are very low, but not 0.
- For electricity transmission, SF emissions$_6$ could be considered.

For wastewater :

- The GHG emissions calculation equation could be added to the document (in the "Calculation Methodology" section)

For food:

- The document "Food_Footprint.xlsx" is not in the appendix. The details of this reference could be given.

For sequestration:

- On page 47, line 3, it's not emissions, it's deletions
- On page 47, last line, this sentence is not accurate: "Only carbon sequestration from trees located in maintained forest areas can be deducted from the carbon budget." No removals can be deducted from the GHG inventory.

These sources could be added to scope 3:

- Production of different fossil fuels (natural gas, fuel oil, diesel, gasoline)
- Waste management (landfill, recycling, composting, etc.) - if not already included in some emission factors (e.g. food)
- Accommodation and meals during business trips
- Production of drinking water
- Production of other consumables
- Data storage