<u>**Report Review:**</u> **FY2018 GHG Emissions Inventory for Loyola University Chicago**

<u>Description:</u>

This report provides the results of an internal review of the FY2018 Greenhouse Gas Inventory for Loyola University Chicago. Assessment materials and findings were shared by Director of Sustainability, Aaron Durnbaugh, with the Internal Reviewers through digital files. The three reviewers then provided questions about the process and the materials providing their observations, critiques and recommendations for future inventories in the Summary and Comments listed below. Aaron Durnbaugh responded to comments, where appropriate, and those are included in Responses below. Overall the reviewers stated that the results are "as detailed and thorough as necessary."

<u>Internal Reviewers:</u>   Dr. Brian M. Ohsowski, Teaching Faculty at Loyola University Chicago
Expertise: Biostatistics and Restoration Ecology

Zach Waickman, MBA, Biodiesel Lab Manager at Loyola University Chicago
Expertise: Green Business Management and Alternative Fuels

Ping Jing, Ph.D., Associate Professor at Loyola University Chicago
Expertise: Atmospheric science

Summary:

Dr. Brian Ohsowski Comments:

The following are my comments as an internal reviewer for the FY2018 Greenhouse Gas Inventory STARS credit. This audit is a process of collecting data from across the university, applying it to emissions factors, and then calculating emissions for public reporting.

Dr. Ping Jing's Comments:

In the 2018 annual report, the calculation of Loyola's carbon footprint is more complete than earlier reports. Both the carbon emissions and the carbon offsets are calculated in more detailed categories. It is encouraging to see that Loyola has made efforts to reduce its net carbon footprint. The results provided are mainly for the Lake Shore and Water Tower Campuses. I would be interested to know if improvements have been made on our Maywood Campus, which has a lot of medical facilities.

Zach Waickman Comments:

I have read through the responses. They thoroughly address my comments.

Comments:

Sheet: Campus Carbon Calculator

1. Row 33 and Row 34: Sources for on-campus composting and on-campus trees should be cited (BO).
    a. I **will provide citations and links to student/faculty projects**. Add to spreadsheet and include in memo. (AD)
2. Cell C23: FY17 value needs to be updated (BO)
    a. **I updated this information with FY18 data**. Thanks for catching that. (AD)

3. Rows 37-43: References are missing for the data. Update or delete. (BO)
   a. **Deleted.** (AD)
4. Faculty/Staff Commuter Rail: The miles is entered as zero. I know folks take Metra, so is this zero because we don't have data on their usage? (ZW)
   a. Yes, When we surveyed the employees we only listed "Rail". Those responses were entered as CTA since that is a much larger proportion compared to Metra. In subsequent surveys we will split this between CTA and Metra. (AD)
5. Faculty/Staff Air Travel: Less of a calculation question and more of a commentary: why is faculty/staff air travel (teaching, conferences, etc) SO much higher than all of our students who go study abroad? (ZW)
   a. I don't have a complete answer because we derive this information from two different methods. Students are actual individuals (#796) travelling to actual locations (#51), which are then calculated as miles and emissions for a single round-trip. Employees are calculated from a business report of costs to Loyola from airlines ($1.4M), travel agents ($135K) and individual reimbursements ($1.6M). We estimate that 50% of travel agent charges, and 30% of reimbursement is for flights. We then remove 20% for associated fees and taxes and attribute 85% to the Lakeside Campuses. Miles per dollar are generated from airlines.org data table. Avg of 15.27 cents per air mile or just under 13 M Miles.
6. Refrigerants and Chemicals: Why do we not have any data on refrigerants, chemicals emission, or hazardous chemical waste generated? The Chemistry Department (as well as Biology, IES, and Photography) generate a fair amount of chemical waste, and I imagine Facilities has to recharge refrigerants around campus from time to time.
   a. When we started tracking our GHG inventory we researched the emissions from refrigerants. At the time we decided not to report these for two reasons. One, most of the materials are managed by a third party so we don't have ownership of how they are dealt with. Two, some simple calculations suggested they would be well under our 5% threshold to do aggressive data tracking. This was only looking at refrigerants in Facilities Department so perhaps Chemical use by academic departments should be studied? I think either of these topics (Chemicals or Refrigerants) would make excellent student research projects. (AD)

Sheet: Emiss Factors_Communting

1. Yellow highlighted cells are assumed data. What is the confidence-level of this assumption? (ZW)
   a. These are derived from survey data. Only conducted every few years. They are highlighted to display that they push forward or backward that assumption. (AD)
2. Faculty/Staff Vehicle Miles: Do we have data on the vehicles driven to/from campus or just the miles traveled? Is the DOT efficiency of light vehicles broken down by geography or just national numbers? (ZW)
   a. We do not ask about vehicle type. We only use a national average fuel efficiency of U.S. Light Duty Vehicles (Bureau of Transportation Statistics https://www.bts.gov/archive/publications/national_transportation_statistics/table_04_23).

3. Sheet: Emission Factors Commuting: Why are vehicles miles broken down up until 2018, but not in 2018 (no miles for bus etc)? Why did the automobile miles jump so dramatically (well above the cumulative miles of previous years from all forms of transit)? (ZW)
   a. New survey method. (AD)

Sheet: SolidWaste

1. The EPA WARM calculations on this sheet is comparing our diverted waste footprint to an unrealistic scenario of all waste going to the landfill. Is this appropriate? Should this comparison be assessed against the 2008 benchmark like previous calculations? (BO)
   a. I agree. This is confusing having a negative value in the total emissions category. I felt I was using the best standard following the EPA's WARM tool however it is more of a scenario building tool, compared to an emissions calculation tool. **Next year I will not utilize WARM.** This is less of an issue as a Scope 3 emission, plus all our landfill waste goes to a facility that has waste to energy capabilities. (AD)

2018 LUC Carbon Footprint GlossyFINAL.doc

1. Slide 4: "Commuting" Do these symbols imply that among the emissions caused by students commuting (blue colored), 1/3 was from taking the train, 1/3 from taking the bus, and 1/3 from driving alone? Did Staff/Faculty only drive and didn't use other forms of transportation? (PJ)
   a. They are just visual not representations. Not proportional. (AD)
2. Slide 5: I am having trouble understanding this pie chart. How is possible that lawncare fertilizers contribute to 39% of the footprint while in the previous slide they contributed little amounts? Are they different? Does the green color represent Scope 3 or Lawndale fertilizers? Does the blue color represent natural gas or Scope 1? Is it possible to use two different sets of colors to present the inside pie and the outside circle? (PJ)
   a. Color problem. The green for "lawncare fertilizers" is the very small 0% sliver you see at the top of the chart. Internal chart is scopes, not sectors. **I adjusted these.** (AD)
3. Slide 7: This slide needs clarification. (a) I understand the first three bullet points but not the fourth and last bullet point. Different homes' energy use would result in different CO2 emissions, if they use different energy sources. Do wind turbines release that much CO2 emissions? (b) I would add "consumed" to the first and third bullet points. (PJ)
   a. The bottom two are "offsets". **I can clarify**. (AD)
4. Slide 8:
   In the red box: "by area", is the area measured by the acre of land or by the living space? For example, the "footprint" of BVM is very different from the total living space of BVM? Is it "37% per acre of land" or "37% per sq ft of living space"? (PJ)
   In the blue box: Are we comparing the annual total carbon emission per student in 2018 with the national per capita carbon emission in 2018, or comparing to the national average among college students?
      a. I can clarify the area (it is facility gross square footage data) and where the national avg. # comes from (it is the cumulative of the data reported to Second Nature). (AD)

5. Slide 9: "What you can do"

Perhaps, we could add a slide that address what Loyola plans to do to continue cutting our carbon footprint. (PJ)

   a. **I will consider this**. (AD)

6. Do we have a way to estimate the GHG emissions caused by LUC people's diet? (PJ)

   a. No. There was a tool but it was so flawed it doesn't seem to be in use anymore. The issue is that we purchase food from everywhere in the world and most food is highly processed combining many products. Attempting to just evaluate the life cycle emissions of a single cereal or baked good would be an undertaking. You could use some very simple assumptions (like this example from TNC https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/ but I'm not sure that is very satisfactory. (AD)

I would like to thank the three reviewers for their thoughtful review and helpful comments. I have bolded the actions in my response above.