

# Commission Meeting #15 1/24

24 January 2020 /1:30 PM/ NORTH CONFERENCE ROOM, GRAHAM

## ATTENDEES

*In Person:*

Liz Barry, Andrew Berki, Anthony Denton, Stephen Forrest, Austin Glass, Jennifer Haverkamp, Brandon Hofmeister, Andrew Horning, Greg Keoleian, Larissa Larsen, Jonathan Overpeck, Barry Rabe, Camilo Serna, Anna Stefanopoulou, Logan Vear, Lisa Wozniak

*By Phone (for part or all of the meeting):*

Valeria Bertacco

*Regrets:*

Hank Baier, Barry Rabe, Missy Stults

## NOTES

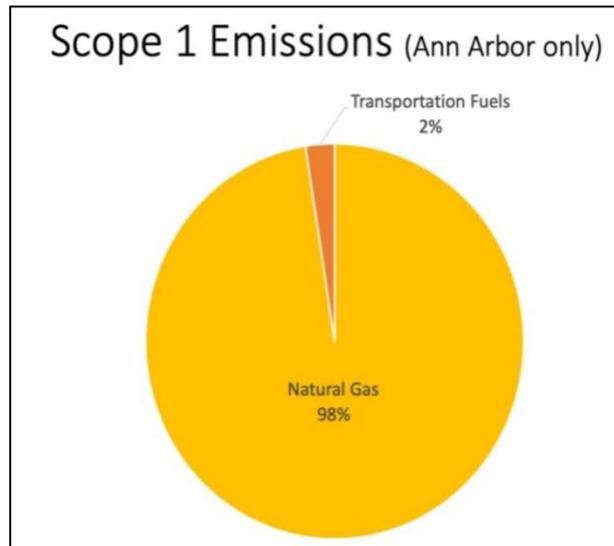
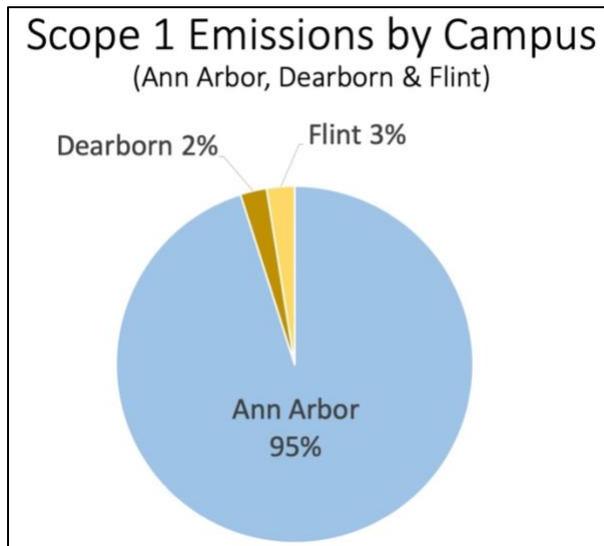
### Updates

#### **Energy Audit Case Studies**

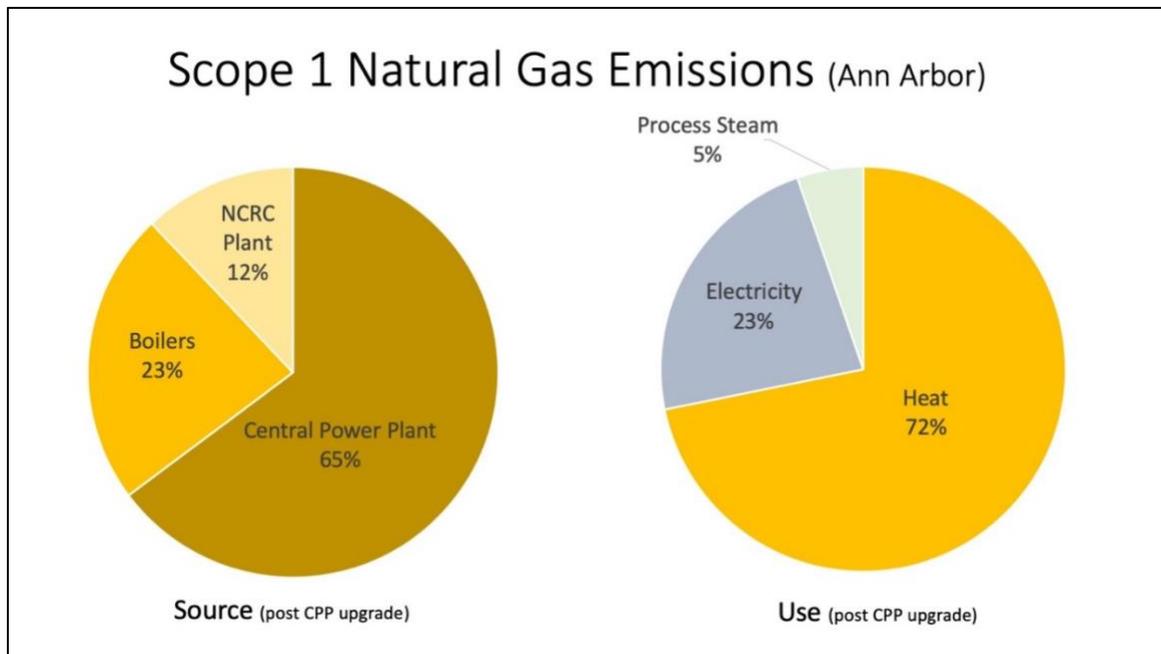
To better understand U-M's potential for energy efficiency improvements, the Commission is engaging an external consultant to generate energy audit case studies of a representative sample of buildings across five different building categories: clinical, athletics, research, academic space and residential. The work will assess technical aspects of the buildings related to energy demand, and provide specific recommendations for demand reduction. The project is expected to be completed by August 2020.

#### **Greenhouse Gas Inventory Context**

Commissioners received a brief overview of UM's scope 1 emissions (i.e., those generated by UM activity), to help set the context for the presentation given by Integral Group, the firm



conducting the external analysis of UM's heat and power infrastructure. See below for figures representing UM's scope 1 emissions across campuses and emissions sources. More information on UM's environmental metrics, as well as projected scope 1 and 2 emissions out to FY 2040, can be found [here](#).



### Integral Group Interim Presentation

In October 2019, the Commission selected [Integral Group](#) to perform an analysis on how UM could transition its heat and power infrastructure to a carbon neutral system. Integral Group has completed several similar studies at a campus- and city-scale in locations within and outside the United States. For more background information on this project, see [here](#).

The project will follow a four-stage process:

1. Developing in-depth knowledge about historic energy consumption, and campus infrastructure characteristics;
2. Leveraging information to create a dynamic, iterative process to explore and analyze a range of strategies;
3. Selecting several options for conceptual design; modeling pinpoint emissions reductions; and financial analysis;
4. Delivering a plan that provides a roadmap for decarbonizing UM's heat and power infrastructure.

Since the project began in October 2019, the team has been working through the first stage of the process. To start, Integral Group broke up the university geographically into eight different campuses based on their existing heating and cooling infrastructure:

1. Ross Athletic Campus,
2. Central Campus,
3. Medical Center,
4. North Campus,

5. North Campus Research Complex (NCRC),
6. East Medical,
7. U-M Flint, and
8. U-M Dearborn.

Across all of these campuses, Integral Group has been utilizing the data provided by UM Facilities and Operations to map their existing thermal infrastructure, and perform thermal energy demand intensity (TEDI) analyses and cooling energy demand intensity (CEDI) analyses.

The TEDI and CEDI analyses are expected to provide a high-level idea of the potential to reduce energy demand across the campuses and to prepare the campuses for carbon neutral infrastructure upgrades.

Integral Group is also conducting preliminary analyses for each of the campuses to inform which carbon neutral infrastructure strategies would be complementary with the existing heating and cooling demand. Integral's work is showing that each campus is vastly different in its needs, meaning that there is not a one-size-fits-all solution. Instead, the transformation towards carbon neutrality will likely require segmenting the campuses into various heating and cooling districts and employing different and diverse solutions based on their specific characteristics and needs. Among others, high-level potential strategies include: geo-exchange, high-, mid- and low-temperature hot water systems, thermal energy storage, solar thermal heat recovery, sewage heat recovery, biofuels/biomass, and sequestration.

As Integral Group continues its work, the team will continue exploring macro-level potential strategies, and then will refine the potential strategies with robust carbon modeling and analysis, financial modeling, and life cycle cost analysis.

A key component of Integral Group's charge is to not only produce potential solutions of how UM could evolve its heat and power infrastructure, but to focus on identifying potential solutions that are scalable and transferable to other institutions and organizations.

During their presentation, Integral Group was asked about the length of time associated with efforts similar to UM's. In their previous experience, much smaller projects to convert infrastructure on university campuses of the scale of UM Dearborn usually take around 15 years, due to the complexity of modifying existing buildings and the logistical challenges associated with making major changes to an up-and-running operation. For context, a similar effort on a "greenfield" with no existing infrastructure would take approximately 5-6 years with an aggressive schedule.

The time estimates cited by Integral Group prompted a brief discussion on the possible role of offsets during the transition period. The Commission is planning an in-depth level-setting discussion on potential offset use and associated criteria in the coming months.

Integral Group will deliver its final report and recommendations to the Commission in the spring of 2020, with a public version of their report being made available sometime thereafter.