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UMN Morris Carbon Footprint Calculations (2005 - 2020)

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UMN Morris Carbon Footprint Calculations (2005 - 2020)

Anneliese Tatham

GOAL

The overall goal of this project was to calculate annual UMN Morris campus carbon footprints for the past 15 years (2005-2020) using a new carbon calculator while refining data collection methods and expanding the number of variables included in the calculations. The UMN Morris Office of Sustainability tracks the campus' carbon footprint to fulfil reporting commitments to Second Nature and to further UMN Morris' goals to reduce its carbon footprint. The [Sustainability Indicator Management and Analysis Platform](#) created by the University of New Hampshire was used for the calculations and the results were reported to [Second Nature](#).

METHODS

Institutional Data and Normalizations: Data related to the number of students, faculty and staff and the physical size of the campus was retrieved from the UMN Morris [Institutional Data Books](#) and Andrew Bjur, Planning and Project Manager at Facilities Management, respectively.

Scope 1: Distillate oil data was collected from the boiler logs provided by the Heating Plant. Natural gas data was collected from Kinect/Centerpoint bills provided by Lisa Harris, Director of Facilities Management. Any biomass used at the boiler plant (2009-2013) was collected from the boiler logs. Solar electric generation on campus currently occurs in two locations but the solar array near the water treatment plant is expected to begin production this year, 2021. Data from the 3kW panels at the Science Building is collected through [Enphase Enlighten](#). Data from the 20kW panels near Green Prairie has been estimated using [PVWatts](#). Solar thermal production was estimated using the placeholder MMBtu production per year suggested by the system manual. Data on wind production and usage from the two turbines is collected from the "UMM Electrical - Otter Tail and WCROC" spreadsheet from Lisa Harris. Transportation fuel data (gasoline and diesel) used by the UMN Morris Fleet and equipment on campus is provided by Stacy Richards, Executive Accounts Specialist at UMN Morris Facilities Management. Fertilizer use is also provided by Lisa Harris.

Scope 2: Electricity purchased from Otter Tail Power Company is collected from the "UMM Electrical - Otter Tail and WCROC" spreadsheet from Lisa Harris. Carbon intensity factors (MT/MWh) were found in the [OTPCO Sustainability Quantitative Report](#) and entered under "Utility Emission Factors." Renewable Energy Credits (RECs) purchased by UMN Morris were obtained from bills provided by Troy Goodnough, Director of the Office of Sustainability.

Scope 3: Scope 3 emissions are the hardest to track and calculate. Our campus' commuting data is calculated using parking pass data collected by UMN Morris Campus Safety and assumptions about the habits of students, faculty and staff at UMN Morris. Due to these assumptions, this data is listed as "Low confidence." Directly Financed Outsourced Travel (air, train and ground) methodology is in progress. Cathy Solvie, Principal Accounts Specialist for the Welcome Center was consulted for obtaining data from Chrome River about university spending for travel in the

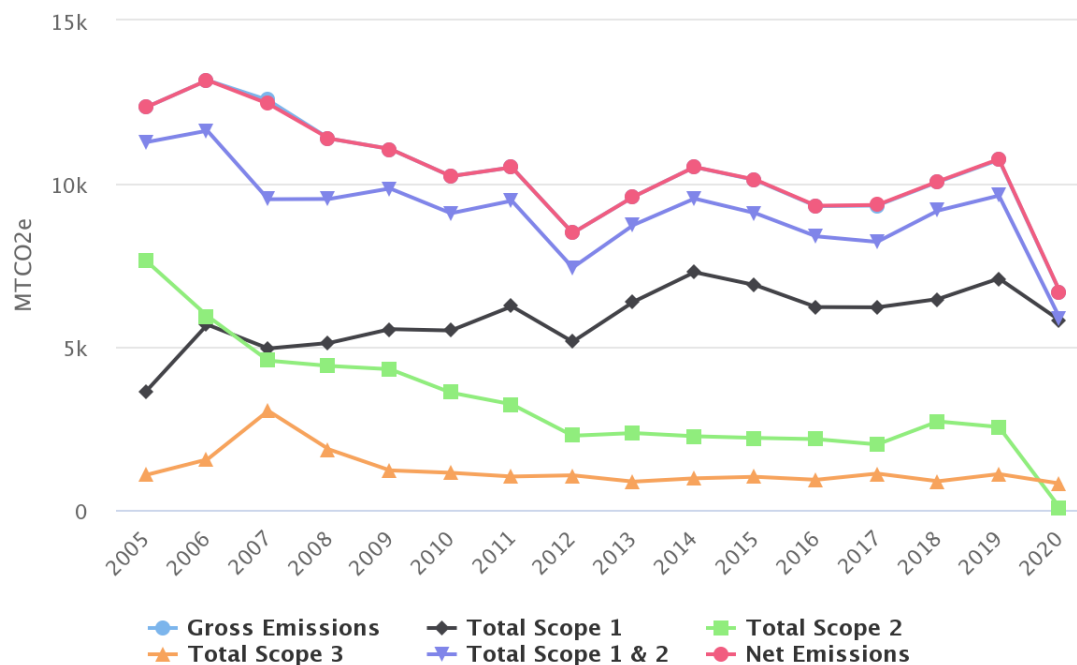
past 3 years for five campus departments assumed to spend the most on travel (not including use of Fleet Services): Grants Management, Admissions, Athletics, Dean's Office and Science & Math Discipline. Study abroad air travel was obtained from Stephanie Ferrian, Academic Center for Enrichment. Solid waste and wastewater produced by the UMN Morris Campus was obtained from Lisa Harris.

Offsets: Composting data was obtained from Lisa Harris.

RESULTS

Carbon footprints were successfully calculated in SIMAP and submitted to the Second Nature Reporting Platform by May 1, 2021. An overview of MTCO₂ emissions per year is provided below. Scope 2 emissions have been falling steadily, presumably due to implementation of various renewable electricity projects in the past 10 years including the second wind turbine in 2011, the science solar panels in 2011 and Green Prairie solar array in 2014. The notable decline in emissions between 2019 and 2020 for Scope 2 is due to the purchase of wind RECs in 2020. Scope 1 emissions have been trending upwards, presumably due to the campus' steadily increasing use of natural gas. Pursuing new methods of heating the campus will be necessary to further reduce greenhouse gas emissions at UMN Morris. Gasoline usage (for fleet vehicles) and the rare use of distillate oil at the boiler plant demonstrate no upward or downward trend. Scope 3 emissions have remained relatively stable. Overall net emissions on the University of Minnesota Morris campus have fallen by about 50% over the past 15 years.

EMISSIONS MTCO₂E



These Second Nature reports, as well as those for other higher education institutions, are publicly available at: <https://reporting.secondnature.org/institution/detail!2105##2105>.

RESOURCES AND FURTHER INFORMATION

For questions or further information about this project please contact Anneliese Tatham (tatha004@morris.umn.edu) or Troy Goodnough (good0044@morris.umn.edu).