



Utah State University
Greenhouse Gas Emissions

Faculty Senate Update
March/April 2023 for Fiscal Year 2022

Summary

Utah State University's greenhouse gas (GHG) emissions are complicated. From updates to our GHG calculation processes including the addition of fuel and energy related activities (FERA) emissions in our Scope 3 accounting, to changes in on-campus occupants and a return-to-work post COVID-19, our emissions increase should not come as a surprise, but rather a needed reminder that our work is only beginning.

This year's emissions inventory shows us room for improvement, and allows us to double down on efforts and planning processes we've been focused on for years. Although emissions rose by about 4%, missing the mark on the 2019 Faculty Senate Reduction Resolution, we saw an additional 6 million miles of faculty and staff air travel; this number is expected to grow. Additionally, we continuously streamline and fine-tune our emissions inventory procedures. Next year will be the first where we will document every step of the process to ensure institutional knowledge is carried on through interns and Program Managers. We also plan to include purchasing data from departmental budget estimations, bringing us that much closer to understanding the full picture of USU's contribution to carbon, methane, and nitrous oxide in our atmosphere.

Our inventory points us in the direction of large-scale Scope 1 and 2 energy efficiency and electrification measures, while drawing our eyes toward a growing Scope 3. Scope 3 emissions, indirect and therefore tricky to manage, are what we will begin to focus on moving forward. Decarbonization, while high-hanging fruit, is not only on our minds but a frequently discussed topic for campuses around the United States. We look forward to pursuing the actions outlined in the Central Energy Plant's Decarbonization Master Plan (completed in 2022), a plan that if implemented in full will slash USU's carbon emissions by 60% for the Logan campus.

In addition to measurable actions, we are also invested in engaging faculty, staff, and students along the way. Through deep relationships and collaborations with the Christenson Office of Social Action and Sustainability, direct mentorship in the Caine College of the Arts, and continued support of the Planetary Thinking Committee, USU's Sustainability Program will soar to new heights.

Key Recommendations

from the 2020 GHG Reduction Report, as recommended by the 2020 GHG Reduction Committee.

Each Recommendation is elaborated on in the following pages.

57k MTCO₂e

Scopes 1 and 2 - Direct Emissions & Indirect (Purchased) Electricity

- Pursue actions in the Decarbonization Master Plan for USU Logan's Central Utility Plant as they become financially viable (not authored at time of 2020 GHG Report).
- Work with Rocky Mountain Power (RMP) to purchase a renewable energy portfolio. Continue to engage Logan Light and Power (LL&P) and Price Public Utilities to develop similar opportunities to purchase renewable and carbon-free energy portfolios (KeyRec 2).
 - RMP rate no longer feasible due to rate negotiation fall through. USU Utilities continues to negotiate solar agreements with LL&P, and will investigate Price Public Utilities commitments and agreements.
- Increase investment in best available energy management technology and energy-saving HVAC commissioning projects for the next ten years (KeyRec 4).
- Continue to investigate opportunities to increase solar and wind energy on or near campus, beyond those provided in the renewable energy portfolios that we seek to purchase from public utilities (KeyRec 5).
- Improve fuel efficiency of fleet vehicles and conduct a pilot study of integrating electric vehicles in our fleet (KeyRec 6).

Scope 3 - Indirect Emissions

- Implement a non-binding 'shadow' price on carbon emissions for all major University expenditures (KeyRec 7).
- Establish a mandatory carbon offset fee of \$10 per round-trip for all University-sponsored air travel paid by the department, college, or index funding the trip. Use funds raised by that fee to pay for projects with the highest return on investment for reducing USU's GHG emissions and/or improving air quality on or near USU campuses (KeyRec 8).

Measurement

- Employ best practices to ensure we have a robust and consistent process for estimating USU's total GHG emissions, including both Logan and Statewide campuses, to serve as the key performance indicator for USU's progress (KeyRec 1).

Program Development & Impact

- Develop a fundraising campaign focused on advancing USU's efforts towards sustainability and carbon neutrality (KeyRec 9).
- Expand and Institutionalize USU's Planetary Thinking Workshop with a focus on general education courses to ensure all students graduate with an understanding of the causes, implications, and solutions to climate change (KeyRec 10).
- Expand adoption of climate and sustainability-related learning outcomes and assess students' attitudes and understanding of relevant content (KeyRec 11).

44k MTCO₂e

Highlights



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Greenhouse Gas Inventory

The FY 2021 greenhouse gas inventory showed a 4% increase in emissions compared to a 15% decrease from last year.



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Deep Efficiency

USU has successfully completed the Decarbonization Master Plan for the Central Utility Plant and is working on actions to reduce up to 60% of Logan campus emissions while pursuing other energy efficiency measures.



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Sustainable Transportation

We are actively working to limit and measure emissions from on and off-campus transportation, related to student, staff, and faculty commuting.



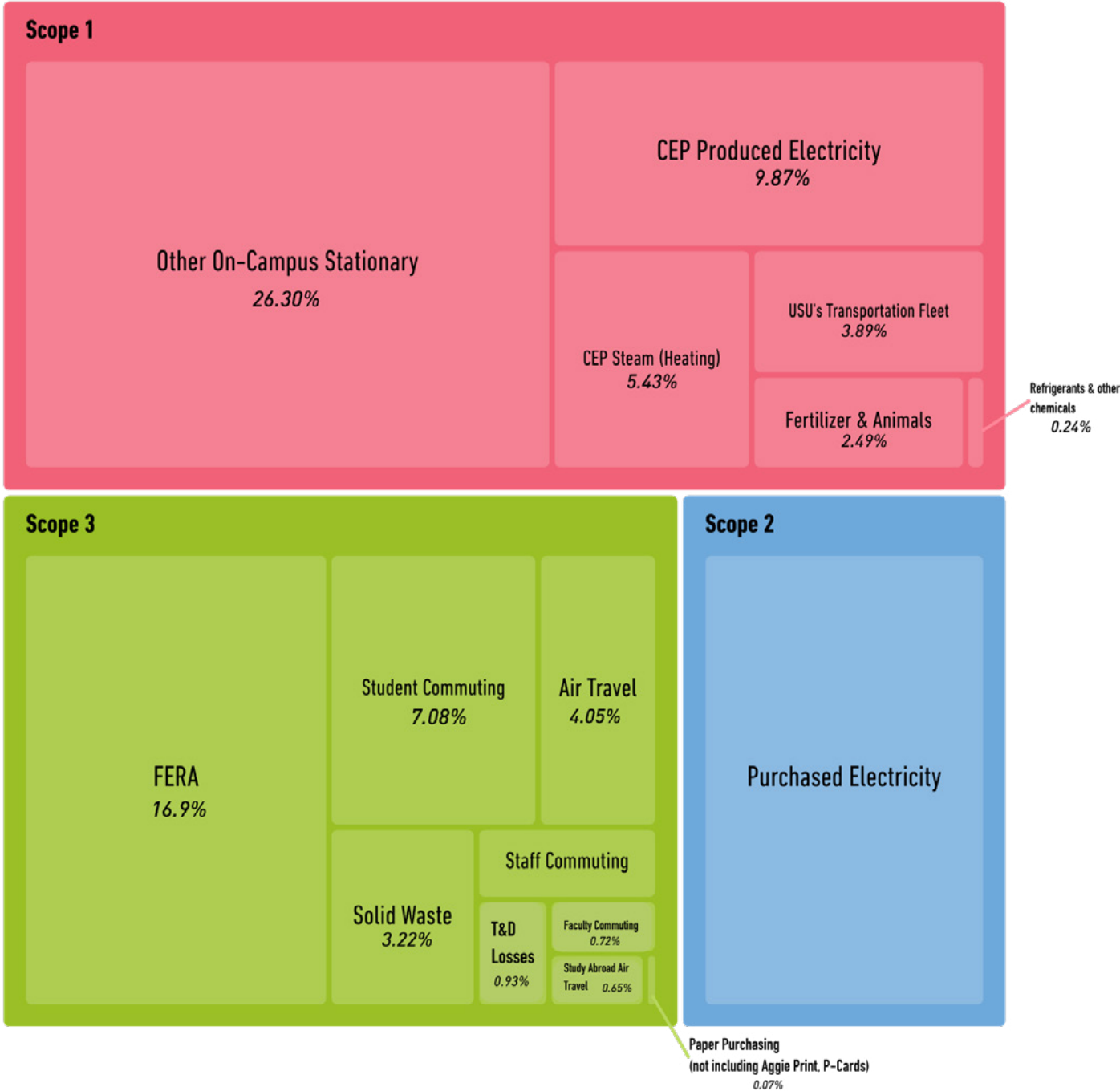
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Other Recommendations

Continued recommendations and initiatives the team is pursuing to draw-down emissions.

GHG INVENTORY FY23

USU produced **88,089 MTCO₂e** in FY22. This is **3,587.41 MTCO₂e** increase from FY21. Scope 1 and 2 numbers varied as the University Energy Management team purchased more electricity than they typically do due to fluctuating market increases.



88089MTCO₂e

DATA COLLECTION



Data was collected by Energy Manager Zac Cook and Energy Management Intern Raiden Lambson. Data management and collection followed the GHG Inventory Protocol for Higher Education. Employee and student commuting was estimated using an informed baseline from last year's in-person and hybrid course offerings. We have begun the process of releasing a Commuter Survey during the 23/24 academic year, which will more accurately inform our transportation related emissions reporting. This survey will then be distributed every two years in collaboration with the Parking & Transportation Department.

Moving into FY 2023, we will begin compiling the data collection and reporting process in a narrative report to inform future interns and Sustainability Managers on historical collection processes undertaken, assumptions made, and relevant information to give contacts during collection, ensuring seamless communication. The University of New Hampshire's SIMAP emissions reporting tool was also updated to reflect FERA emissions, known as fuel- and energy-related activities related to the production, transportation, and utilization of energy systems, in addition to more robust transportation and demand losses. This contributes an additional approximate 15,000 MTCO₂e to our emissions inventory for this and past reporting years, giving USU a more accurate picture of upstream energy-related emissions. Moving forward, we will also make efforts to quantify our purchasing emissions, involving the University Procurement Office in not only authoring USU Sustainable Procurement guidelines but implementing more robust benchmarking by including emissions related to purchased materials such as construction materials for capital development, or typical purchases like cleaning products, electronics, and paper.

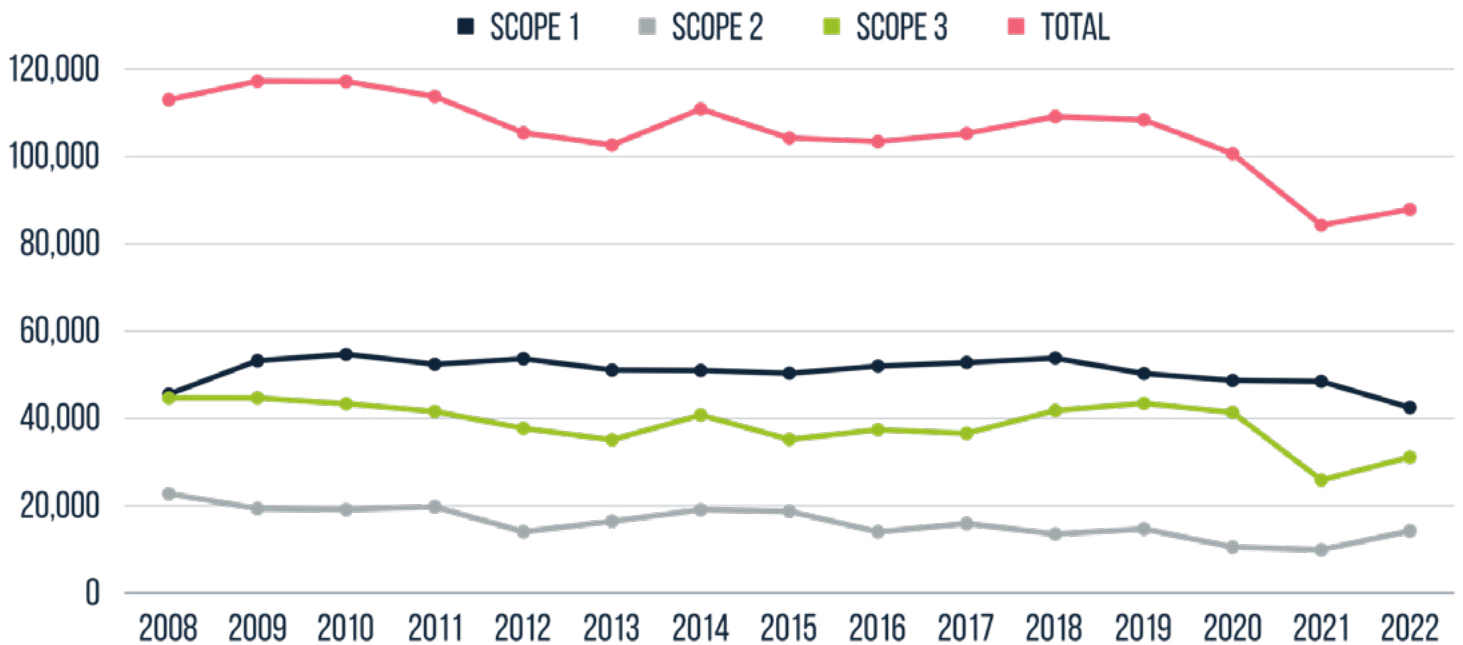
Above all, this information is used to understand where and how emissions contribute to USU's overall GHG footprint. With every improvement, we revise historical data and pursue more robust reporting. By investing in a complete emissions inventory, we get that much closer to understanding where we can implement high-impact sustainability initiatives that move USU closer to carbon neutrality.

Sources included in the USU inventory are:

- Student, staff, and faculty FTE populations.
- The entirety of the USU Logan and statewide campuses energy and purchased energy emissions, including support facilities and farms.
- Animal husbandry from USU farms.
- Commuting estimates from Logan and statewide campuses.
- USU-funded air travel and fuel purchasing from the USU travel office.
- Study abroad data based on student destinations.
- Waste, wastewater, recycling, and composting data from Logan campus only as other campuses do not weigh or track this data.
- USU Fleet data from all campuses.
- Refrigerants and chemical usage.

Utah State University produced 88,089 MTCO₂e in FY 2022

USU Emissions (by scope) 2011-2022



scope 1

- Electricity
- Steam
- Fuels
- Aggie Shuttle
- USU vehicles
- Aviation
- Animals
- Fertilizer

scope 2

- Purchased electricity

scope 3

- Commuting
- Business & Research Travel
- Purchased goods
- Paper
- Waste
- FERA
- T&D losses

scopes 1 & 2

PURSUE DEEP EFFICIENCY & ELECTRIFICATION

key recs. 4, & 5 + newly released CEP Decarb. Plan

1. *Pursue actions in the Decarbonization Master Plan for USU Logan's Central Utility Plant as they become financially viable (not included in 2020 GHG Report).*
4. *Increase investment in best available energy management technology and energy-saving HVAC commissioning projects for the next ten years (KeyRec 4).*
5. *Continue to investigate opportunities to increase solar and wind energy on or near campus, beyond those provided in the renewable energy portfolios that we seek to purchase from public utilities (KeyRec 5).*

- Continue deep energy efficiency efforts in existing buildings, like updating exterior lighting fixtures to LEDs (95% of interior fixtures have been replaced) and installing heat recovery air source heat pumps in mechanical rooms.
- Continue investigating opportunities to install solar panels on our Logan and statewide campuses.
 - A request for proposals has been authored and authorized by our energy management team, and we anticipate an additional 3MW of solar will be installed on the Logan campus by 2030. This would eliminate approximately **4,806 MTCO₂e** of USU's emissions per year, which is a low-end estimate (using the eGrid emissions factor data for the Rocky Mountain subregion, and then estimating CH₄ and N₂O emissions based on EPA emissions factors).
- Continue to work with Logan Light and Power to investigate opportunities to purchase renewable energy from the City through a mutually agreed on Power Purchasing Agreement (PPA). This will depend on the City's capacity to locate and purchase renewable energy, but will assist USU in transitioning away from polluting energy sources.
- Convert from natural gas heating sources to electric heat pumps for domestic hot water heating, reducing our dependence on natural gas heating sources.

scope 3

IMPLEMENT SUSTAINABLE TRANSPORTATION

key recs. 6 & 8

Employee and student commuting, air travel, and study abroad account for **12,665 MTCO_{2e}** of USU's total emissions, in addition to contributing to harmful PM 2.5 in our winter inversion. The \$10 carbon offset fee assists USU in funding work related to air quality improvements. Initiatives to encourage remote work and active commuting like bicycling or walking make up much of USU's work to reduce these emissions. To better understand our total commuting emissions, we must be able to measure our communities' travel annually, therefore we will continue to attempt to launch a biennial commuter survey with the Parking & Transportation Department to inform emissions reduction opportunities. Additionally, as travel ramps up post COVID-19, we work to engage our community in alternative

- Explore ride-share and car-share program with Aggie Blue Bikes and Parking & Transportation Department.
- Attempt to launch 23/24 commuter survey in collaboration with Parking & Transportation Department.
- Revive Aggie Commuter Club and build out events and opportunities related to it, including the already successful semiannual Bike to Breakfast.
- Explore demand for EV charging stations across campus and in existing parking infrastructure, creating strict policies for EV-only parking.

scope 3 OTHER RECOMMENDATIONS

key recs. 1, 7, 9, 10, & 11

1. Employ best practices to ensure that we have a robust and consistent process for estimating USU's total GHG emissions.

In FY23 and for all years following, USU will compile and/or update a narrative document to ensure consistency and reliability from year to year for our GHG inventory. This will include information about assumptions made during calculations, provided data from contacts for verification, and any relevant information to ensure seamless communication with data contacts.

7. Implement a non-binding 'shadow' price on carbon for all major University expenditures.

Due to turn-over of the Sustainability Program Manager position, progress on a non-binding shadow price on carbon has been delayed. In tandem with investigating options for a USU-wide purchasing policy, investigating the appropriate social cost of carbon calculation tool, or "shadow" carbon price, will be a priority to assist departmental purchasers with understanding true costs of materials. Priority will be given to calculating the carbon cost of capital development projects.

9. Develop a fundraising campaign focused on advancing USU's efforts towards sustainability and carbon neutrality.

Where grants are pursued as opportunities arise, USU's Sustainability Council is invested in developing a sustainable fundraising and funding stream to assist in investing in essential carbon-saving technologies, supporting curriculum integration, reducing waste, and more. Currently, the Council is funded in whole through USU's Facilities Department. With the dissolution of the Blue Goes Green fee, funding streams are also needed to reinvigorate the sustainability grant program that would enable the USU community to pursue sustainability projects as they see fit. Additionally, funding is needed to ensure the implementation of the Logan Campus CEP Decarbonization Plan.

10. Expand and institutionalize USU's Planetary Thinking in the Curriculum Workshops with a focus on general education courses to ensure that all students graduate with an understanding of the causes, implications, and solutions to climate change.

The Planetary Thinking Committee has shifted towards thinking more holistically, about curriculum integration and is pursuing program development through the establishment of permanent sustainability support structures to ensure this work continues.

11. Expand adoption of climate and sustainability-related learning outcomes and assess students' attitudes and understanding of relevant content.

The Sustainability Council will pursue opportunities to assess students understanding of sustainability and climate change literacy as they arise.



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