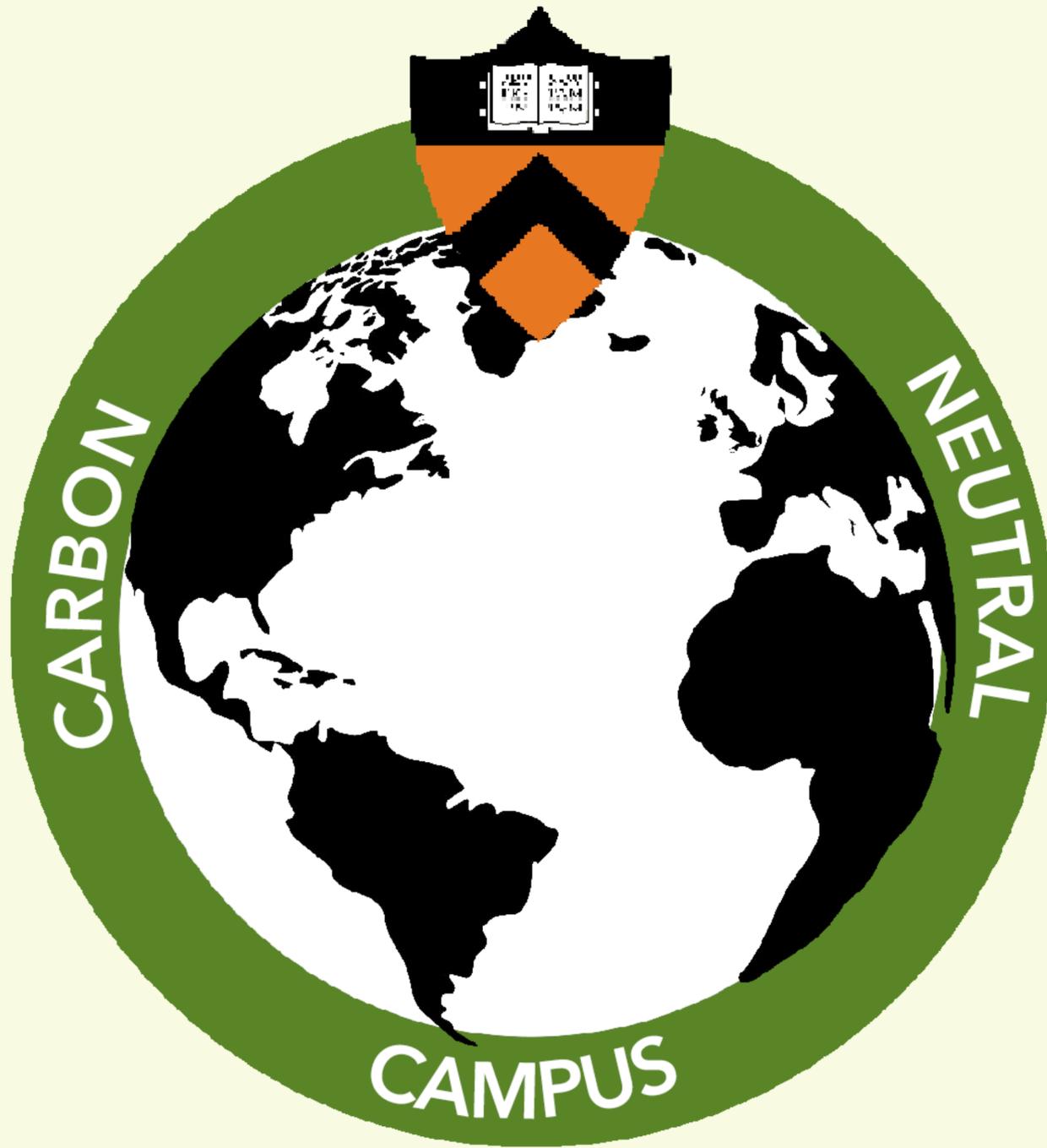


Princeton 2019 Climate Progress Report



December 2019

Introduction

Since the setting of its first greenhouse gas (GHG) emissions reduction goal in 2008, Princeton University has maintained a strong commitment to reducing its campus's carbon footprint to align with the intensified calls for decarbonization around the planet to keep global warming in check. The Princeton Student Climate Initiative, established in 2016, has been at the forefront of undergraduate advocacy and activism related to these emissions reductions efforts, launching a Carbon-Neutral Campus campaign in the spring of 2019 to call on the University to accelerate its actions toward carbon neutrality by 2046.

To illustrate the commitment by undergraduates to strong climate action, PSCI passed a referendum for swifter climate action through the Undergraduate Student Government with an overwhelming 95% student approval. Following the referendum's passage, PSCI has been dedicated to educating undergraduates about what the University is already doing to reach carbon neutrality and how students can contribute. In October 2019, a Princeton Student Climate Forum was held for students and the general public to learn from campus energy specialists how Princeton is transitioning away from fossil fuels.

The aim of this report is to summarize the information that was presented at the Climate Forum about Princeton's historic and future emissions and to provide Princeton students with the tools necessary to help with decarbonization efforts. To facilitate the navigation of this report, sections are centered around the following four questions:

Guiding Questions

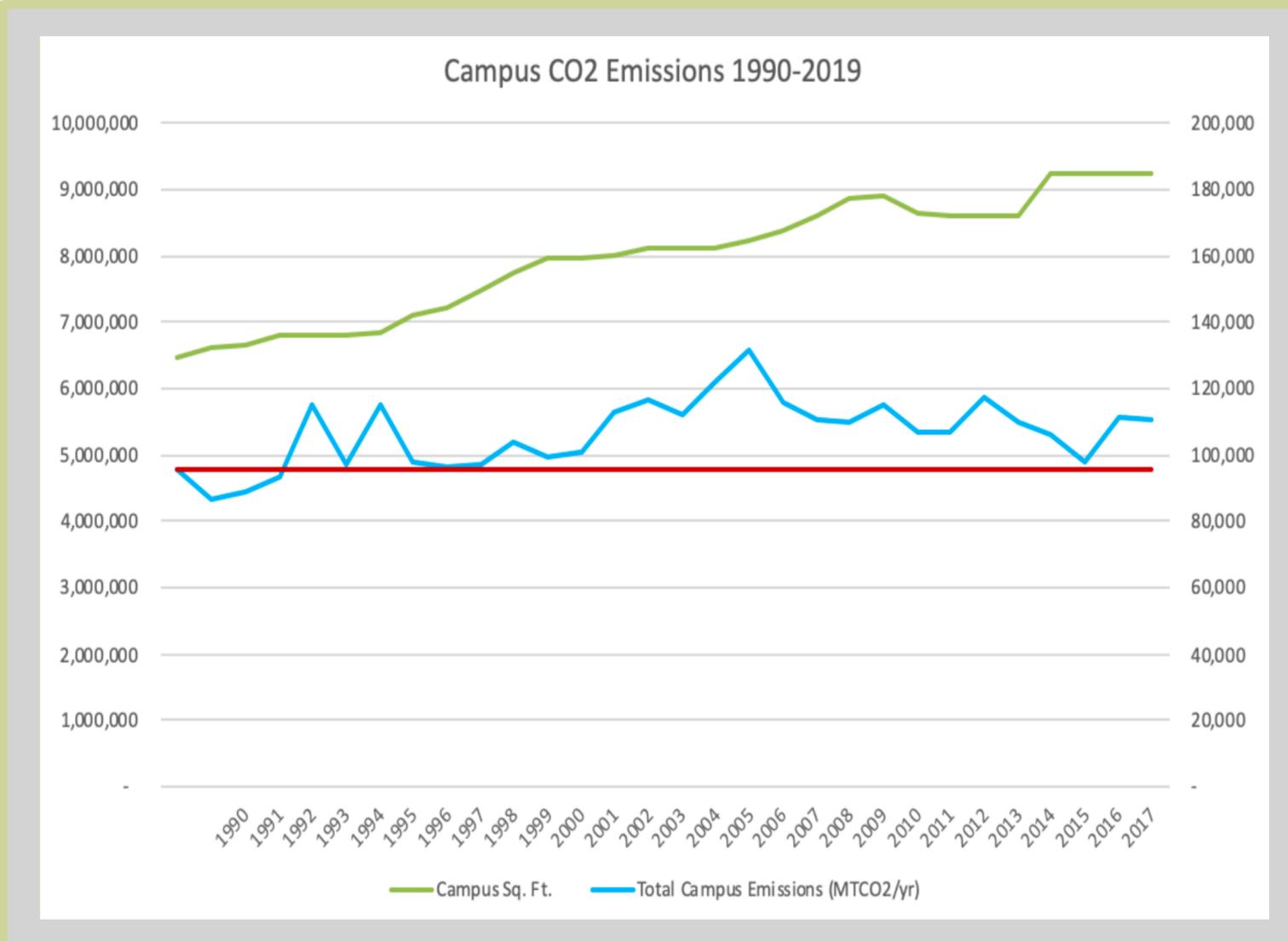
1. What are the university's emission trends? [p. 3]
2. What has been done to reduce emissions? [p. 4]
3. What steps will be taken in the future to fully decarbonize campus? [p. 5]
4. What can students do to get involved? [p. 6]



We hope you enjoy this report, and if you have any questions, please email Claire Wayner, PSCI President, at cwayner@princeton.edu.

Sincerely,
Carbon-Neutral Campus Team, Princeton Student Climate Initiative
Sustainability Task Force, Undergraduate Student Government

What are the University's emission trends?



Princeton University Campus Carbon Dioxide Emissions

The green line represents growth in campus square footage (left vertical axis).
The blue line represents campus carbon dioxide emissions in metric tons (right vertical axis).
The red line indicates our 2020 goal to reduce emissions to 1990 levels - see p. 4.

- The University began tracking its GHG emissions in 1990. Since then, emissions have generally increased in response to a growing campus size (43% increase in campus footprint since 1990).
- Major emissions reductions occurred in 1996-7 with the construction of the campus's cogeneration combined heat and power plant, which recovers waste heat for a final efficiency of 80% (as compared to the 1996 plant's efficiency of 33%).
- Of the emissions reported above, approximately 67.9% of emissions come from the energy plant's burning of natural gas and heating oil, 1% come from campus-operated transit vehicles (e.g., TigerTransit buses), and the remaining 31% come from electricity purchased from the local electric grid.
- The campus currently tracks only Scope I and II GHG emissions (i.e., those directly associated with the burning of fossil fuels). PSCI is actively working with the Office of Sustainability to begin tracking Scope III emissions.

What have we done to reduce emissions?

Emissions Reductions Goals at Princeton

- Princeton's first emissions reduction goal was set in 2008 to **reduce GHG emissions to 1990 levels by 2020**. Campus emissions have gone up since 2017, however, and student support will be required to reach this target (see p. 6 for how you can help).
- In 2017, a group of faculty and administrators known as the CO2 Task Force set an additional goal to **reach carbon neutrality by 2046** (the University's 300th anniversary). This is the long-term goal driving all emissions reductions activities at the University.

Actions Taken Thus Far

- \$40.1 million in building efficiency upgrades have been done, including retrofitting over 102,000 lighting fixtures to be LEDs (capital cost of \$15.1 million, saving **6080 Mt of CO2 per year** and \$1.7 million per year in energy costs)
- Energy plant went through another round of efficiency upgrades, saving **7160 Mt of CO2 per year** and \$1.5 million per year in energy costs (\$4.1 million in capital costs)
- Princeton has a 27 acre solar field, which provides 4.5 MW of electricity (up to 5% of the University's total electricity demands), resulting in **3100 Mt of CO2 saved per year**.



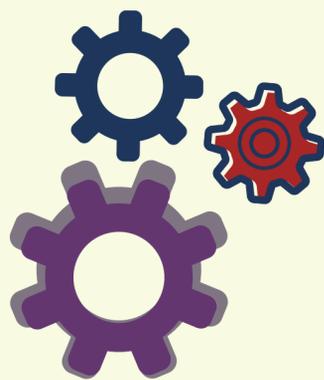
Above: The Princeton Solar Field, located south of campus across Lake Carnegie. The grass is maintained by a flock of sheep! Photo courtesy of Princeton Facilities.

What are we doing now to reduce emissions?

While the 2046 goal may seem far away, the University recognizes that action must be taken **today** to begin the decarbonization process. Emphasis is being put on reducing fossil fuel consumption in favor of renewable energy.

Projects being started now or within the next few years include:

- Converting all buildings to a hot water heating system coupled with geothermal storage and electric heat pumps for maximum efficiency
 - Current heating system runs on fossil fuels burned at the campus energy plant
 - Princeton Facilities is currently drilling test wells for this geoexchange system and is designing a new heat pump plant
- Installation of an additional 13 MW of solar panels (3 times what is currently installed), both on campus parking lots and south of campus on new land acquisitions (construction underway)
- Continuing to improve building efficiency by investing \$50 million over the next 10 years into better insulation and heating/cooling systems
- Begin purchasing off-campus renewable energy through the electric grid (Princeton engineers are currently working to identify potential purchasing options)



Left: Drilling of a test geothermal borehole on campus.

Right: Installing a geothermal system at Lakeside Graduate Apartments in 2014.

What can you do?

In order to reach both the 2020 and 2046 climate goals, Princeton will need the support of its undergraduates to **reduce our campus energy usage**. Here's how you can help:

Your Dorm Room



- Turn off the lights in spaces once you are done.
- Close dorm windows when heating or A/C is on! If your room is too hot/cold, call [609-258-5890](tel:609-258-5890) or email CSCS@princeton.edu.
- If your room has a thermostat, set it to the "Tiger Zone" -- 68°F in the winter and 78°F in the summer. Dress for the weather instead of turning the heat or A/C up/down dramatically. Turn thermostat down during breaks.
- Use power strips, light timers, and other energy conserving devices in your room.
- Unplug chargers and personal devices (printers, appliances) when not in use, or put them on a power strip.
- Wash your clothing using cold water, and air/line dry clothing whenever possible (or use dryer on low/no heat setting for <30 minutes).
- Do you really need that mini fridge? Try to reduce the number of appliances you use.



Communal Spaces

- If you see a room that is being lit or heated/cooled and no one is using the space, call [609-258-5890](tel:609-258-5890) or email CSCS@princeton.edu to ask Facilities to turn the lights and heating/cooling off.
- Honor your room reservations. If you end up not using a space you reserved, call [609-258-5890](tel:609-258-5890) or email CSCS@princeton.edu to let them know to turn the lights and heating/cooling off.
- Try to study in communal spaces to reduce your personal energy usage in your dorm room.

Report compiled by Claire Wayner '22 and Amy Torres '22 in partnership with the Princeton Student Climate Initiative and Undergraduate Student Government. Content contributed by Princeton Office of Sustainability and Princeton Facilities Engineering & Campus Energy.

For more information, please contact Claire Wayner at cwayner@princeton.edu.