



# Lab Energy Use and Recommendations



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How can the University of Chicago improve energy efficiency in campus labs to help meet its ambitious goal to reduce carbon emissions 50% by 2030?



# Lab buildings are energy intensive...

- 10 total lab buildings on campus<sup>1</sup>
- **38% of building energy use**, only 10% of building area<sup>2</sup>
- 6 of the top 10 most energy intensive buildings are labs<sup>3</sup>
- About half of energy consumed as **heating & cooling**, and half as **electricity**

# Because...

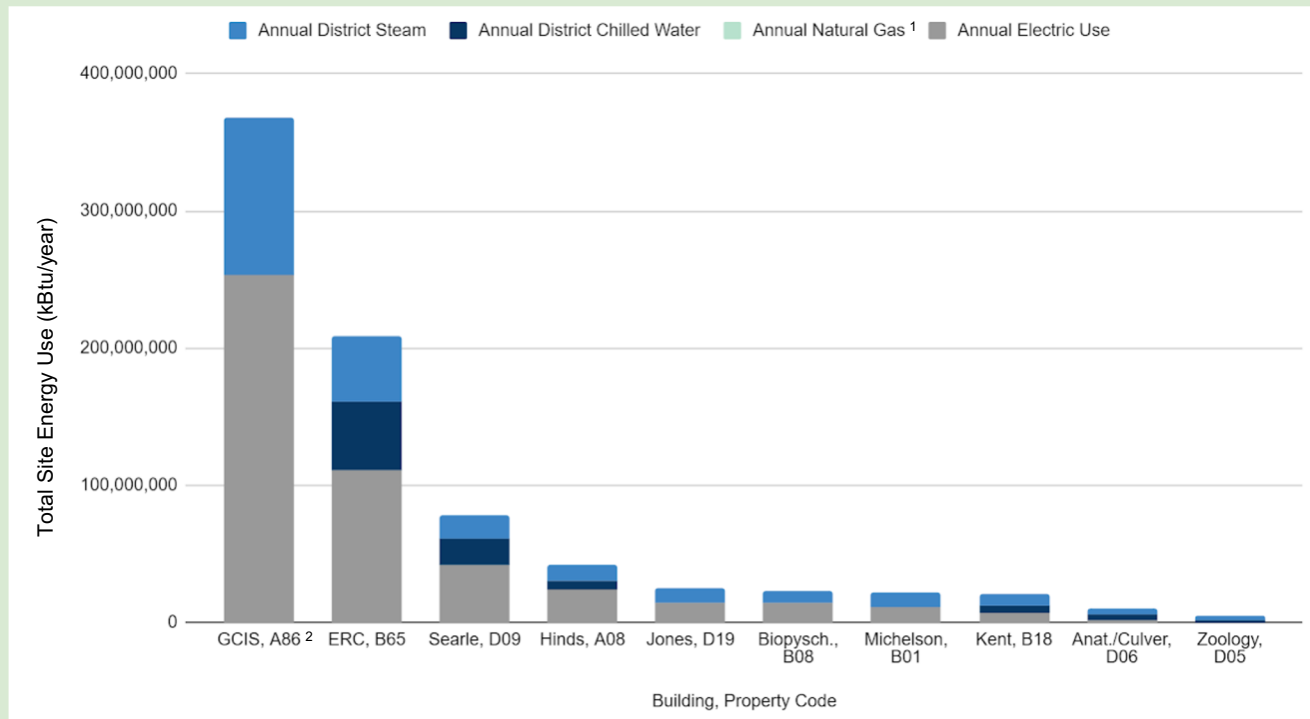
- **High ventilation** (air change rate) requirements increase heating and cooling load
- **Fume hood** ventilation is nearly half of electric consumption
- **Energy intensive equipment** and **cold storage** also increase electricity use

1. Excluding lab buildings affiliated with University of Chicago Medicine.

2. Based on University of Chicago FY 2019 metered utilities data from ENERGY STAR Portfolio Manager.

3. Top 10 energy intensive buildings include Searle (D09), GCIS (A86), ERC (B65), Anatomy/Culver (D06), Biopsychological (B08), and Hinds (A08). This statistic omits the Mitchell Tower and the Cochrane Woods Art Center—two buildings which would otherwise fall within the top ten energy intensive campus buildings due to their small floor area (not their high energy use).

# GCIS, ERC, and Searle are the biggest energy consumers across campus lab buildings.



GCIS (A86), ERC (B65), and Searle (D09) are also among top five **highest energy consumers** and top five **most energy intensive** across all campus buildings, not just lab buildings.<sup>3</sup>

1. GCIS (A86) has its own chilled water plant that operates using electricity.

2. Natural gas comprises a minute fraction of energy use in Searle (D09), Jones (D19), Kent (B18), and the Biopsychological Building (B08), but the amount is so small that it is not visible on the graph at this scale.

3. Based on University of Chicago FY 2019 metered utilities data from ENERGY STAR Portfolio Manager.

# Recommendations

1

Conduct lab ventilation risk assessments in GCIS (A86), ERC (B65), Searle (D09), and Hinds (A08) to determine if it is safe to reduce minimum ventilation rates to 6 air changes per hour (ACH) occupied, and 4 ACH unoccupied.

2

Convert fume hoods in Kent (B18) from constant air volume to variable air volume, and expand the “Shut the Sash” program to GCIS (A86).

3

Provide researchers with additional resources to help them learn about best practices for equipment plug loads, and make informed decisions that save electricity and reduce costs in the lab.

4

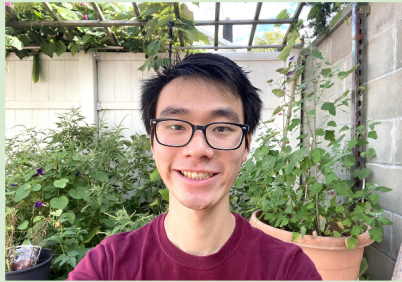
Raise ultra low temperature freezer set points from -80 °C to -70 °C in lab buildings such as GCIS (A86) and Zoology (D05) when possible.

# About the Environmental Frontiers team

Environmental Frontiers (EF) is a new initiative that brings together University of Chicago students, faculty, and staff to pursue joint research and educational opportunities toward building a more sustainable campus, with the goal of giving students a scientific and practical understanding of sustainable urban development. The students on the labs project team are...



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