ECoS Greenhouse Gas Inventory 2019

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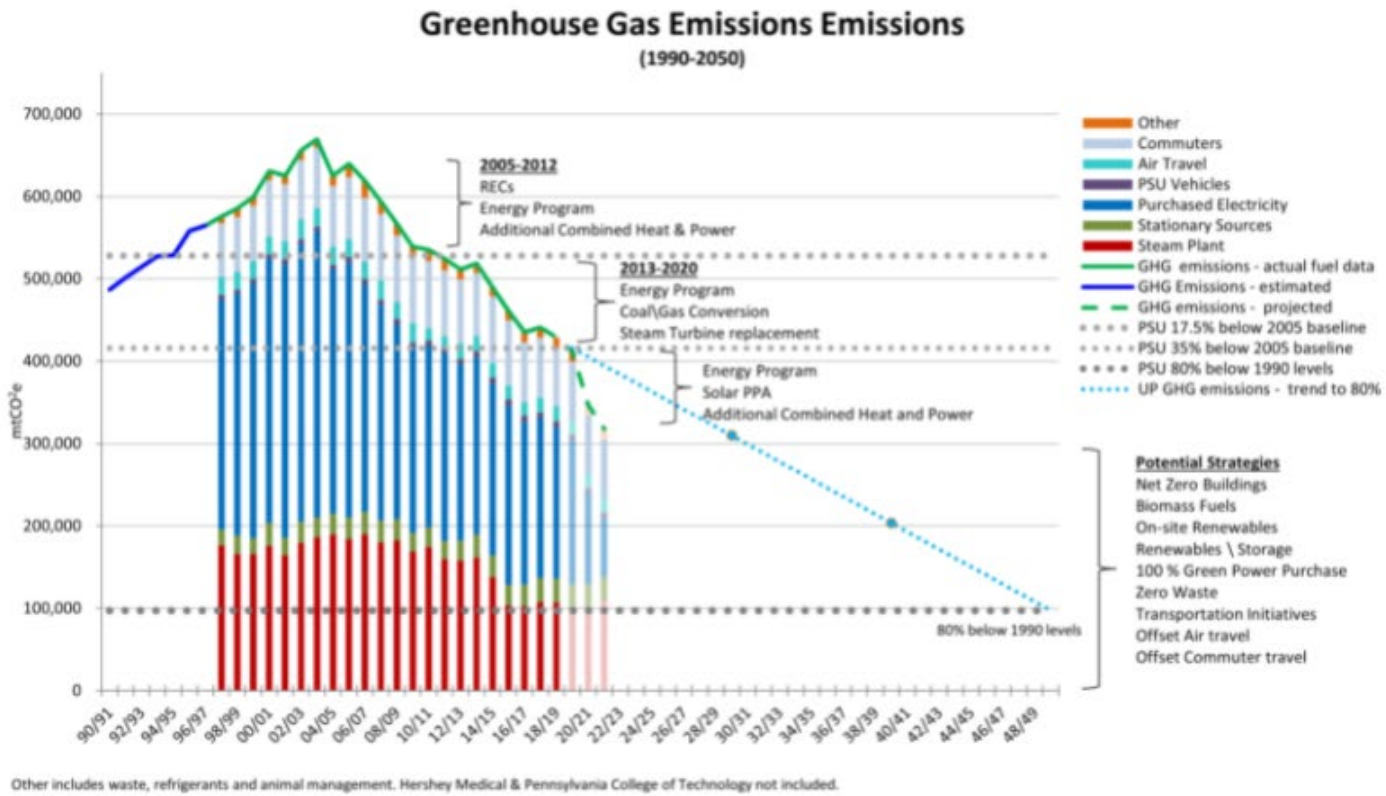
June 14, 2021

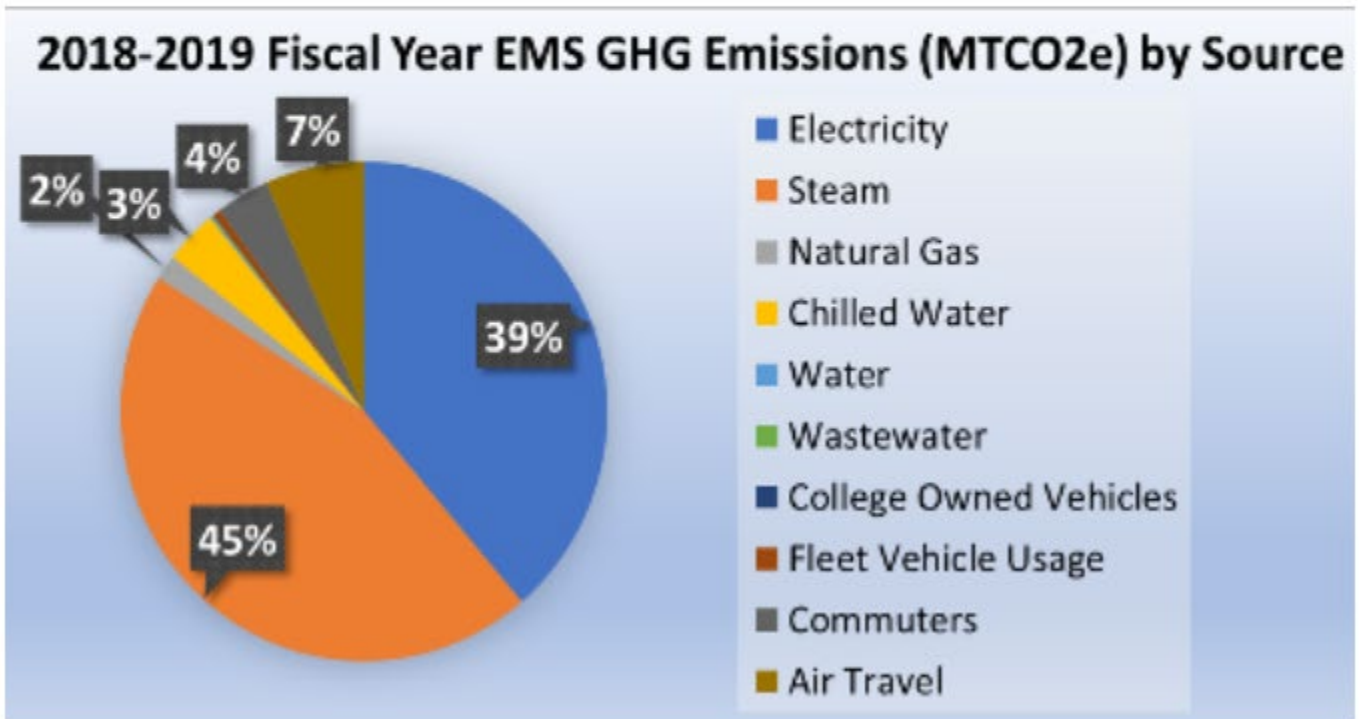
Inspiration

1. The University produces an annual GHG inventory



Inspiration

2. First unit to perform unit-level GHG inventory: **EMS**



Total ECoS Footprint

ECoS produced...

28,152 $MtCO_2e$

... of greenhouse gas emissions during 2019

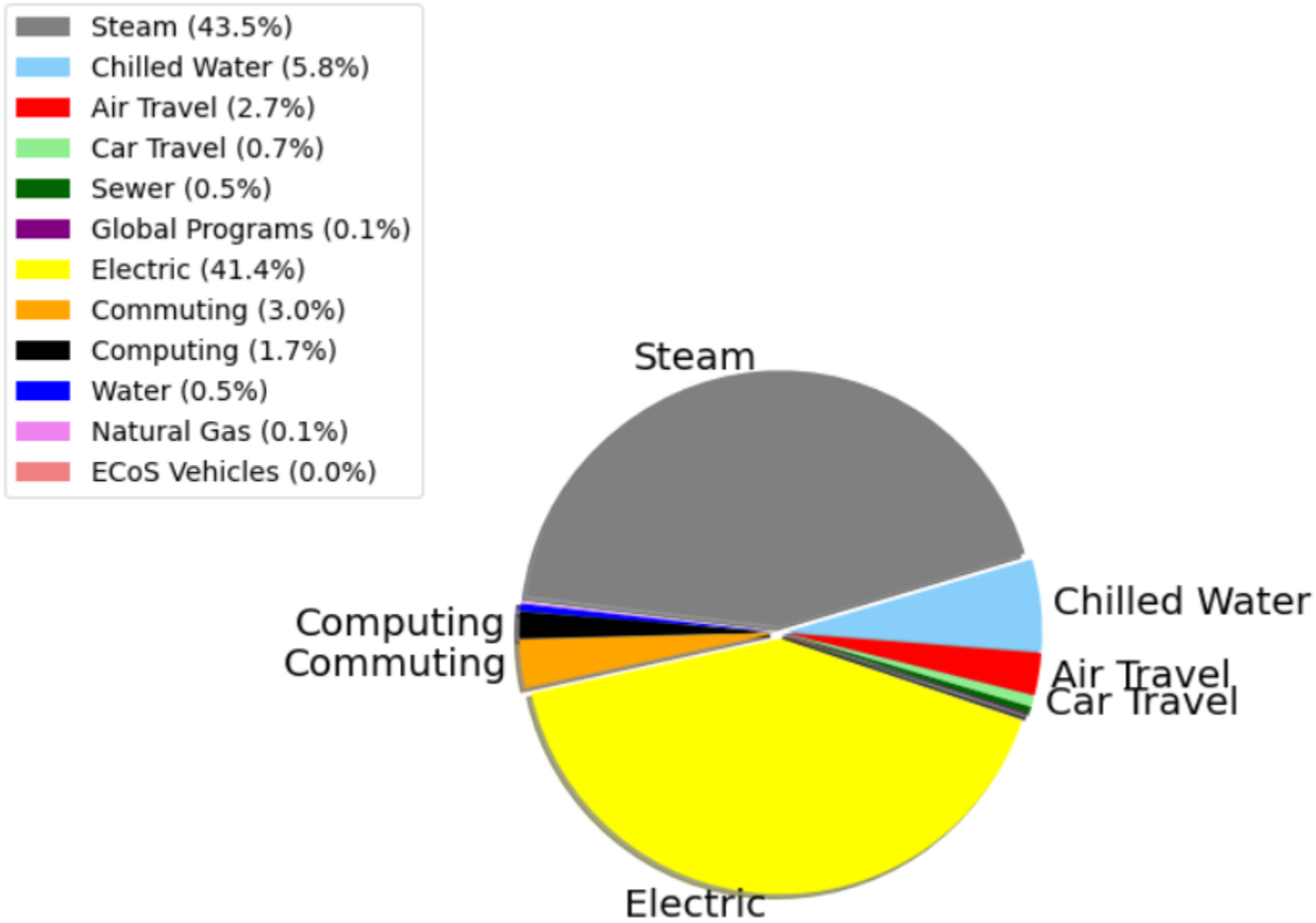
That's equivalent to:

- Driving $\mathbf{6,100}$ **passenger vehicles** continuously for a year
- The carbon sequestered in $\mathbf{34,500}$ **acres of forest** over a year
  - $\approx \mathbf{50}$ Stone Valleys

GHG Emissions Sources

- **Utilities**
  - Steam
  - Electric
  - Chilled Water
  - Water
  - Sewer
  - Natural Gas
- **Mobile Combustion**
  - Air Travel
  - Global Programs
  - Car Travel
  - Commuting
  - ECoS Owned Vehicles
- **High Performance Computing**
- **Procurement**

CY2019 ECoS GHG Emissions by Source

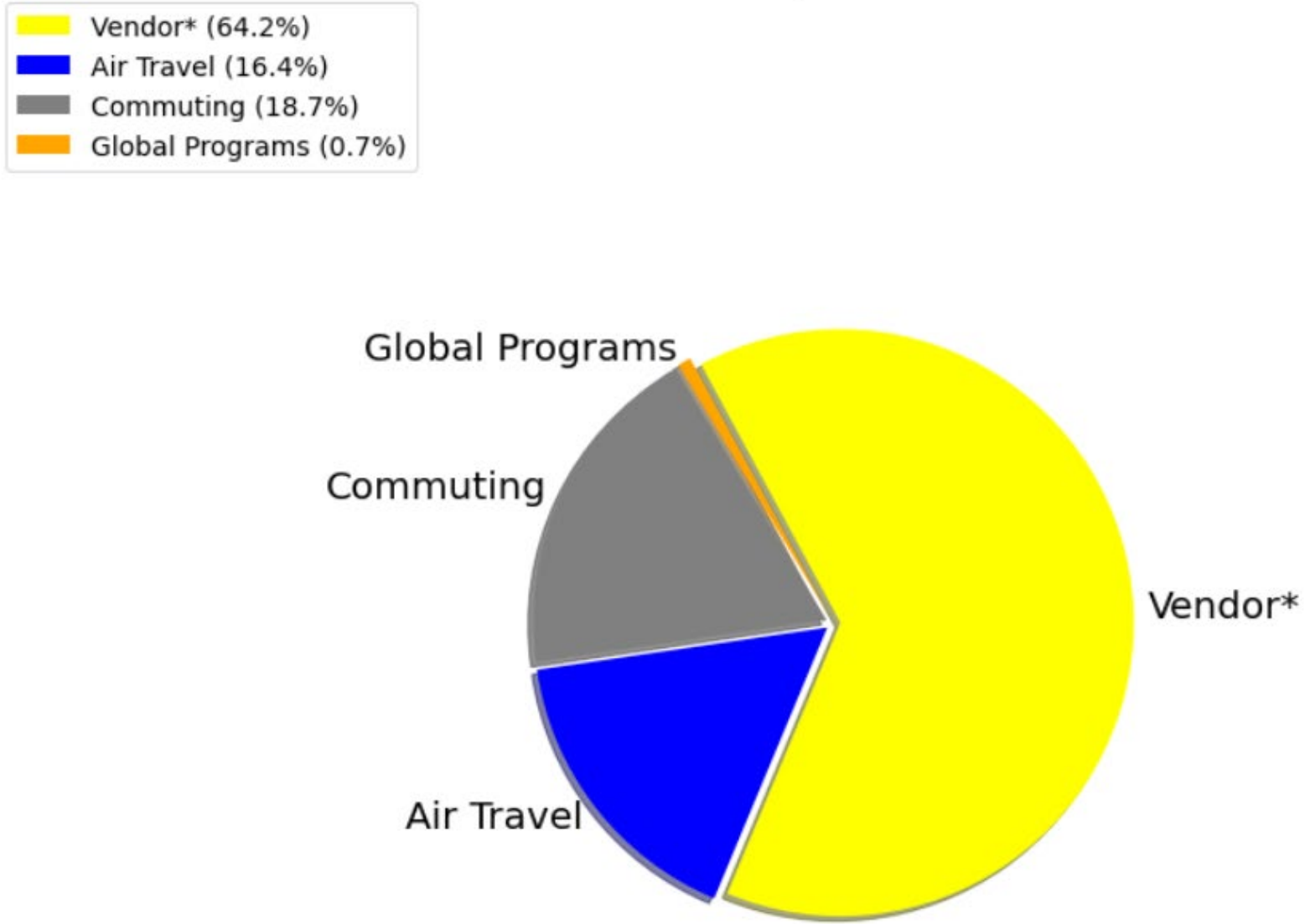


ECoS Scope 3 Emissions

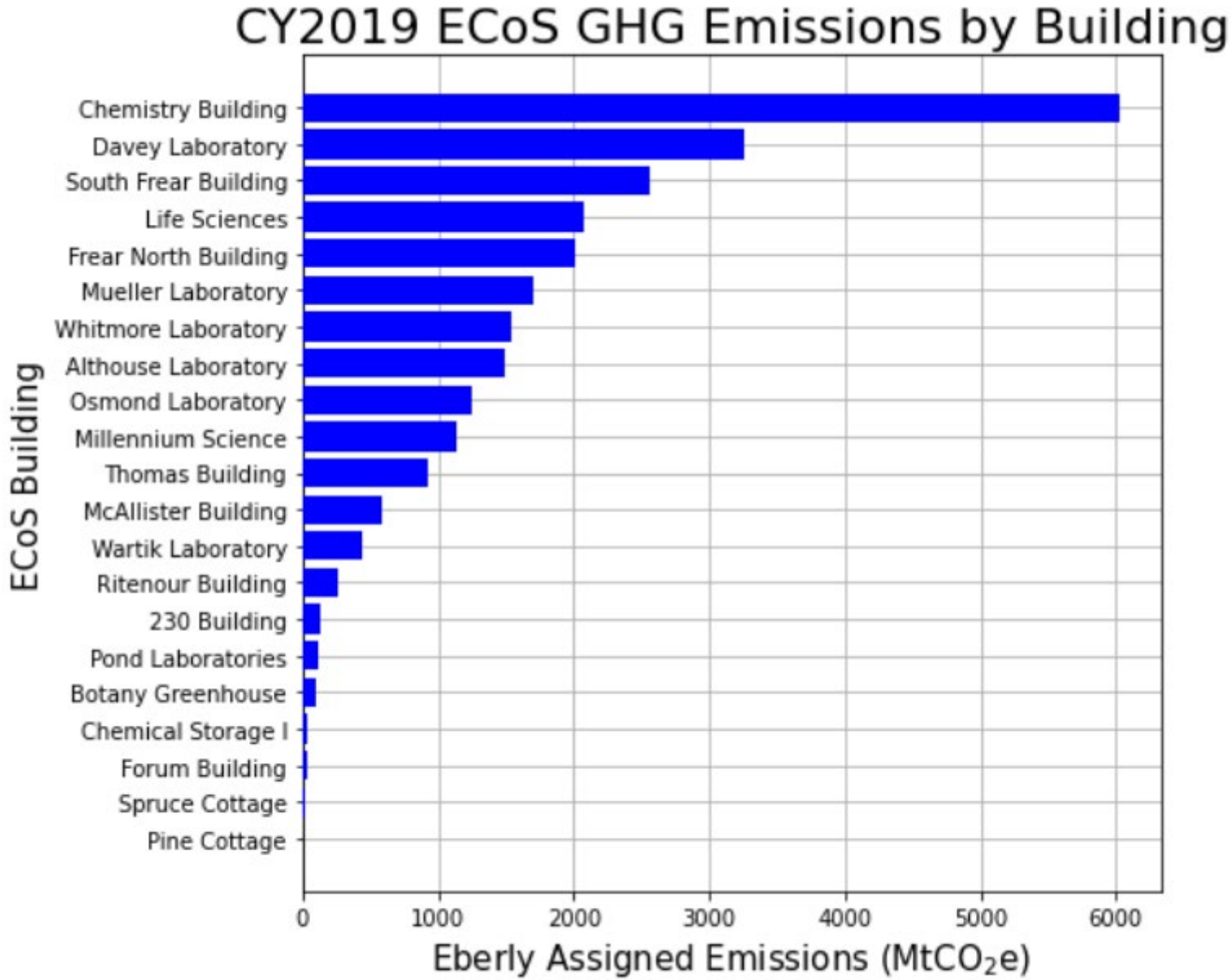
Scope 3 Emissions:

- Indirect
- Assets not owned nor controlled by ECoS
- "Value Chain Emissions"
- "Someone else's direct emissions"

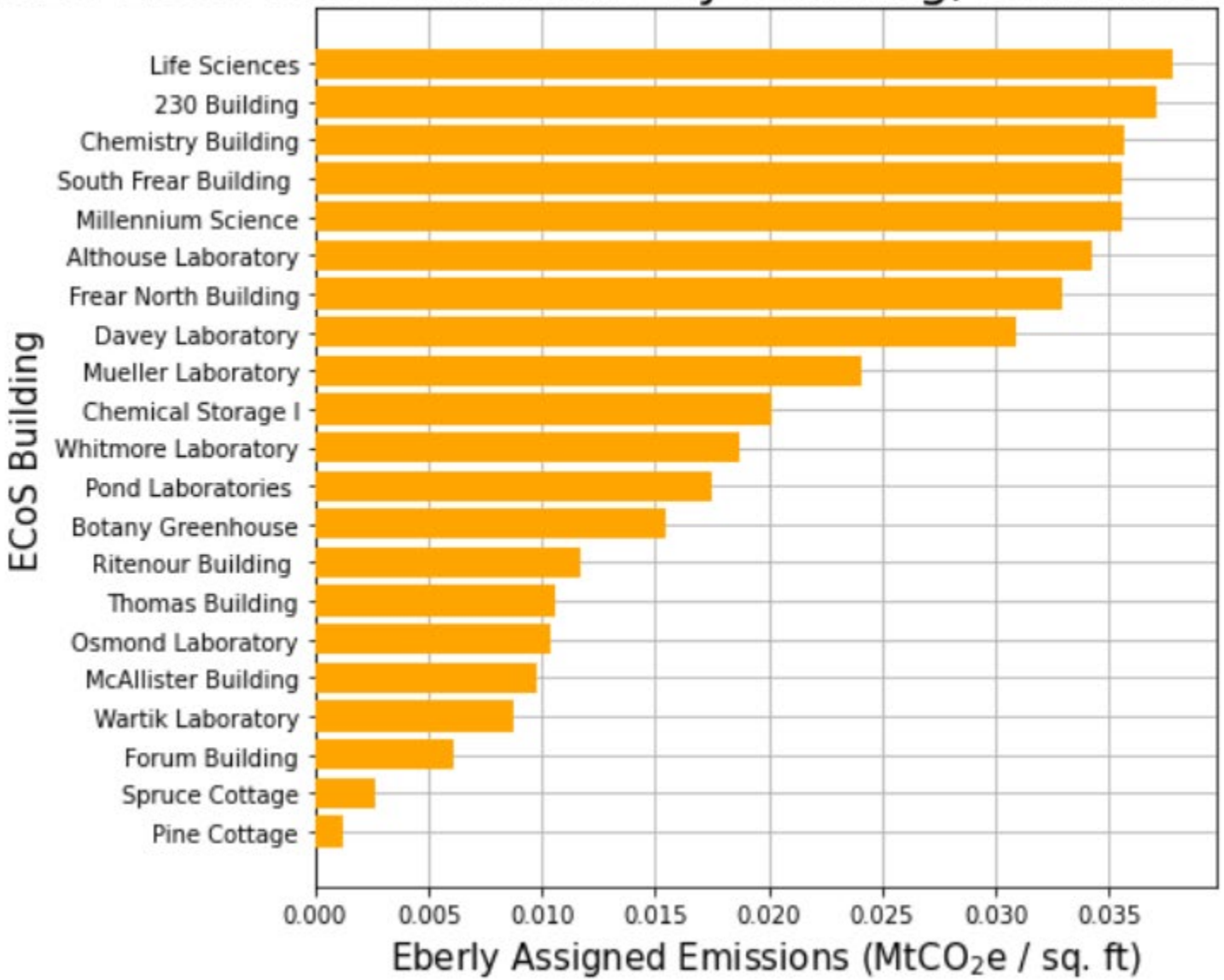
CY2019 ECoS Scope 3 GHG Emissions



Comparison of ECoS to University Emissions				
Source	**University Emissions**	**ECoS Emissions**	**Units**	**ECoS Percentage**
Steam Plant	107143	12257	$MtCO_2e$	11.4%
Purchased Electricity	184199	13882		7.5%
Stationary Sources	28797	379		1.3%
Campus Vehicles	7220	1		0.0%
Commuting	70716	853		1.2%
Air Travel	19220	781		4.1%
Waste	2558	N/A		N/A
Synthetic Chemicals	7640	N/A		N/A
Animal Management	2467	N/A		N/A
Other	12665	N/A		N/A
Total	442625	28152		6.36%


CY2019 ECoS GHG Emissions by Building
ECoS Building
Chemistry Building
Davey Laboratory
South Frear Building
Life Sciences
Frear North Building
Mueller Laboratory
Whitmore Laboratory
Althouse Laboratory
Osmond Laboratory
Millennium Science
Thomas Building
McAllister Building
Wartik Laboratory
Ritenour Building
230 Building
Pond Laboratories
Botany Greenhouse
Chemical Storage I
Forum Building
Spruce Cottage
Pine Cottage
0
1000
2000
3000
4000
5000
6000
Eberly Assigned Emissions (MtCO2e)

CY2019 ECoS GHG Emissions by Building, Normalized by Floor Area



Procedural

- Procurement
- Scope 3 Guidance
- Pandemic Comparison

Collaboration

- Sustainable Operations Council
- Drawdown Scholars
- Improved Record Keeping

Evaluation and Action

- Make this inventory an annual action
- Tie specific actions to the outcomes of future inventories
- Task the ECoS Sustainability Council to guide our actions

Emissions Reductions

- **Utilties** comprise 91.8% of our footprint
    - Perform space evaluation & survey
    - Should expect this sector to partially reduce over time "for free"
- Scope 3 emissions are smaller, but
    - **Persist** even if UP goes fully renewable
    - Can avoid with better practices
- Sustainable Corporate Engagment
    - Decarbonize our procurement supply chain
    - Partner in drawdown **projects** (like the PPA)
- Encourage **remote/hybrid** work and events

Emissions Offsets

Carbon offsets: a cheap option to offset emissions by funding carbon mitigation projects

- **EMS will be purchasing carbon offsets** to eliminate its carbon footprint
- **ECoS should consider purchasing offsets** related to its Utilities, Air Travel, and Car Travel emissions
- ECoS could **offset** its annual carbon footprint paying just

$140,000 – $560,000*

*assuming $5-$20 per tonne

Green Labs

- **Purpose**: encourage sustainable literacy and operations across PSU's labs
- Labs are significantly more energy intensive than office space
- ECoS has the opportunity to pilot this program
- Kristin Dreyer (MRSEC) and Lydia Vandenbergh (SI)
- All are welcome to join the meeting tomorrow at 1:00PM

Sustainable Corporate Engagement

- ECoS spent over $11,000,000 on supplies and equipment in 2019
- Suppliers have only just started evaluating their environmental and social impacts
- ECoS should **request sustainability snapshots** from its top vendors
- ECoS should strategically **build relationships with suppliers**

Advocacy at the University Level

- We have varying levels of **control** over our emissions
- Univeristy has greater control over emissions factors (Scopes 1 & 2)
- ECoS **cannot wait** for the University to act
- The University acts when it is held accountable

Education and Leadership

- Student-led initiatives calling for **sustainable education**
- ECoS Sustainability Council mapped SDGs to course syllabi
- Need **guidance** for incorporating sustainability into courses
- Assist other units and institutions with performing their own sustainability snapshots

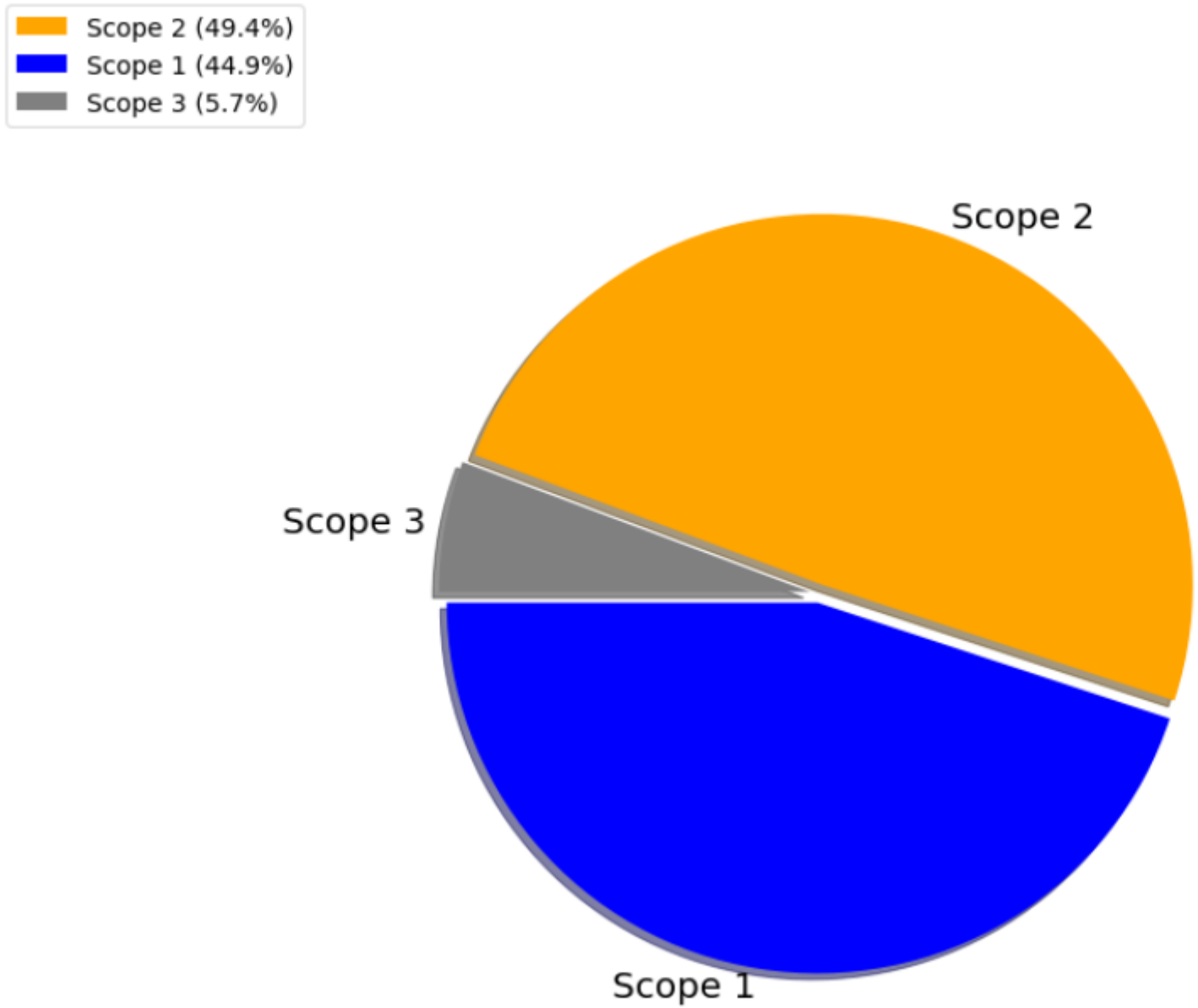
GHG Emissions Scopes

- **Scope 1**
  - Direct
  - Burning onsite
  - E.g., Steam, Natural Gas, Reimbursed Car Travel

- **Scope 2**
  - Indirect
  - Purchased utilities
  - E.g., Purchased Electricity, Chilled Water

- **Scope 3**
  - Indirect
  - Everything else
  - E.g., Air Travel, Commuting, Vendor Emissions

CY2019 ECoS GHG Emissions by Scope



ECoS Top Vendors

In [2]:

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cells = ipysheet.cell_range([[col[i] for col in data] for i in range(1, len(da

sheet
```

Vendor	Subtotal
AGILENT TECHNOLOGIES	$1,835,195.51
SIGMA	$150,3160.20
ILLUMINA INC,GE HEALTHCARE BIO SC	$404,755.56
PRAXAIR DISTRIBUTION	$343,305.88
BRUKER BIOSPIN CORP	$302,067.10
JANIS RESEARCH COM	$272,835.12
General Stores (OPP)	$265,480.79
SHIMADZU S	$207,996.00