

BOARD OF REGENTS MEETING

Sustainability Update

INFORMATION

This item is for information only.

BACKGROUND

UW Director of Sustainability, Lisa Dulude, will provide an update on key UW Sustainability Initiatives. Over the last year, the UW Sustainability Office has focused on accelerating and scaling-up the University's tri-campus sustainability efforts, namely the following projects:

- 1) Tri-campus greenhouse gas emissions inventory
- 2) Sustainability Action Plan Update
- 3) Green Building Standard Update
- 4) Zero Carbon Roadmap
- 5) Decarbonization Town Hall

The Sustainability Update Presentation is intended to provide supplementary information for the primary focus areas highlighted above.

This Sustainability Update brief provides more in-depth information on these priority projects.

*Attachments*

1. Sustainability Update (MS Word document)
2. Sustainability Update Presentation (slides)

## SUSTAINABILITY UPDATE

### INTRODUCTION

Over the last year, the university's sustainability initiatives have expanded in depth and breadth across all three campuses, making great strides towards achieving UW's goals in the Sustainability Action Plan. More specifically, addressing sustainability in campus operations has been and continues to be a key tri-campus focus. This report provides a progress update on key sustainability initiatives, and next steps for the 2024 fiscal year.

It is important to note that the progress outlined below has been accomplished through strong university-wide partnerships, including tremendous dedication and hard-work from the Environmental Stewardship Committee (ESC), the Sustainability Action Plan (SAP) Executive Committee, and many faculty, staff, and students who continue to engage in order to move the needle on these urgent issues.

### 1. Tri-Campus Greenhouse Gas Emissions Inventory Report

In the spring of 2022, the UW Sustainability Office identified the need to conduct a GHG Inventory Report as a critical first step before updating the UW's Sustainability Action Plan. Since then, Cascadia Consulting was hired to conduct a tri-campus Greenhouse Gas Emissions (GHG) Inventory and report. The inventory and report are nearly complete and will be published this Fall. This will be the university's first comprehensive GHG inventory since 2010, and is unique in that it is the first time that UW has inventoried emissions from goods and services purchased (i.e. consumption based emissions).

UW tracks and reports "Scope 1" emissions from combustion of fossil fuels (e.g. combustion of fuels in boilers, furnaces, and vehicles), and emissions from the generation of the electricity consumed on each campus (referred to as "Scope 2") annually, as required under State mandates. Scope 3 emissions are from indirect sources (e.g. commuting, air travel, waste, goods and services purchased, etc.), and often represent the majority of an organization's total emissions.

The final GHG Inventory Report will be published later this Fall, however some **key findings** are outlined below:

- UW's total 2022 emissions for all three campuses is 530,000 MT CO<sub>2</sub>e. For comparison, this annual emissions total is the annual equivalent emissions from 117,941 gasoline powered passenger vehicles, or the consumption of 1,225,855 barrels of oil.
  - This is a 13% increase from the baseline year (2005).
- The largest sources of UW e2022 missions include:
  - **Purchase of goods and services**, including professional/technical services, construction, and food—accounting for approximately 64%.

## SUSTAINABILITY UPDATE

- **Fossil Fuel Combustion**, namely from using natural gas, diesel, and fuel oil to heat and power buildings and facilities—accounting for approximately 18%.
- **University-sponsored air travel**, including for faculty/staff, athletics, and study abroad - accounting for approximately 7%.
- **Commuting of faculty, staff, and students** to the university campuses and medical facilities—contributing approximately 6%.

### SOURCES OF GREENHOUSE GAS EMISSIONS 2022

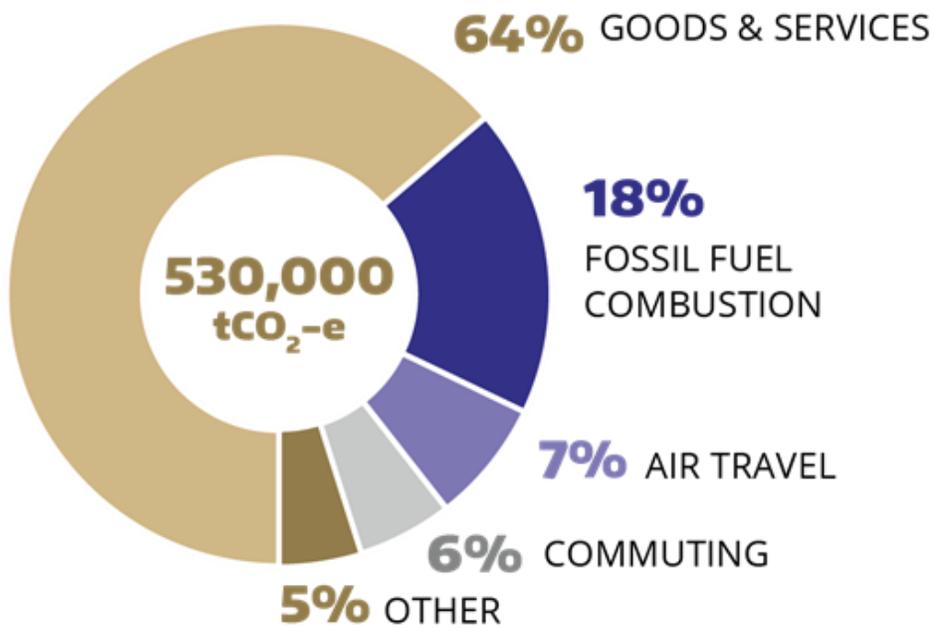


FIGURE 1. UW Overall GHG Emissions by Year and Category

# SUSTAINABILITY UPDATE

## UW UNIT EMISSION PROFILES, 2022

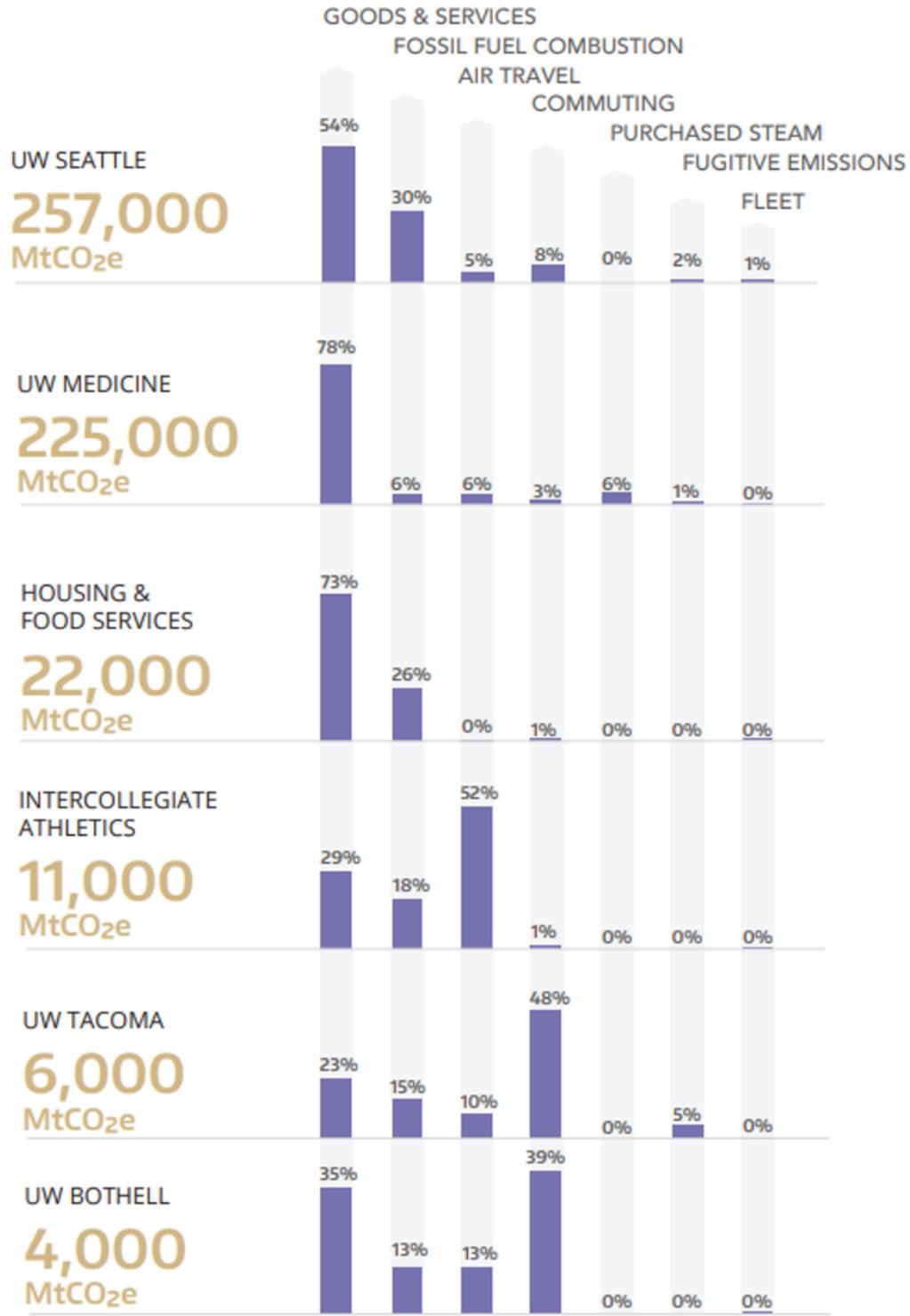


FIGURE 2. Distribution of emissions by unit (Purchased steam applies only to Harborview)

## SUSTAINABILITY UPDATE

Figures 1 and 2 are a snap-shot of the new information from the latest GHG inventory report. This inventory is foundational for updating the university Sustainability Action Plan, and helps identify where UW should focus our efforts and resources when it comes to reducing our carbon footprint.

### **2. Zero Carbon Roadmap**

The State of Washington has set mandatory requirements for state agencies to reduce GHG emissions by 45% by 2030, 75% by 2040 and 95% by 2050 (based on a 2005 baseline). To meet these requirements, UW will need to make substantive changes to how it manages its operations and assets across all three campuses and hospitals. It can achieve these goals only with an adaptive plan to guide the institution through a changing technical and regulatory landscape in the years ahead. The Zero Carbon Roadmap is intended to serve as a planning tool to facilitate reaching the State's and University's GHG requirements and goals by 2050 or sooner.

The Zero Carbon Roadmap utilizes data from the 2023 tri-campus GHG emissions Inventory across Scopes 1, 2 & 3 emissions categories to define 2030, 2040, and 2050 GHG reduction targets, with actions and resources to achieve them. The Zero Carbon Roadmap will be integrated into the 2025 update to the Sustainability Action Plan to ensure our five-year planning aligns with long range measurable strategies, targets, and actions for reaching net zero carbon by 2050 or sooner. We will utilize our GHG inventory to support this evidence-based approach to achieve science backed targets as defined by the Intergovernmental Panel on Climate Change (IPCC). The Zero Carbon Roadmap covers all three campuses and self-sustaining units, as well as Scope 1, 2, and 3 emissions.

This Roadmap is a public-facing document that summarizes UW's overarching goals and strategies to get to net carbon neutrality by 2050. A companion document to the Roadmap is a more detailed Zero Carbon Work Plan which will identify carbon reduction actions for carbon emission sources for the tri-campus (Seattle, Tacoma and Bothell) and for major business units (e.g. Housing and Food Services and UW Medicine). The Zero Carbon Roadmap and the associated Roadmap Work Plan will be monitored and coordinated by UW's Sustainability Office and governed by the Environmental Stewardship Committee (ESC). Both documents will be maintained and updated to ensure alignment with the Sustainability Action Plan (SAP).

### **3. Sustainability Action Plan (SAP) 2025 Update**

With the UW GHG inventory and report essentially complete, the Sustainability Office will hire a consultant this Fall in order to begin the strategic planning process for the SAP update. The SAP update will kick-off in the Fall of 2024 and is expected to take approximately 12 months before a new plan is finalized. Information from the GHG Inventory and Zero Carbon Roadmap will be

## SUSTAINABILITY UPDATE

integral to the new SAP, and help ensure that SAP goals, targets, and actions are SMART (i.e. Specific, Measurable, Achievable, Relevant, and Time-Based). The updated Plan will include several key topic areas that are absent in the current SAP, such as: purchasing, natural resources, green building, climate adaptation and resiliency, water conservation, and plastic consumption – especially single use plastics. In addition, the updated Plan will also provide rough estimates of resources needed, ideally at the action item level. An updated SAP will put UW in a better position to accelerate and scale-up our progress in addressing climate change and sustainability issues across campus operations and facilities, as well as in research and academics. The UW Sustainability Office will continue to publish an annual SAP Progress Report, and [you can read the 2022-2023 progress report here](#).

### 4. Green Building Standard (GBS) Update

The Sustainability Office is in the process of updating UW’s existing Green Building Standard in partnership with consultant O’Brien360; a project which will be complete this winter. This tri-campus effort has engaged all self-sustaining units and various subject matter experts including UW faculty, staff, students, and private sector stakeholders. Facilities recognized the need to update the existing Green Building Standard to be more robust, and specifically address building renovation and building system replacements in addition to new construction. More specifically, the updated Green Building Standard presents significant opportunity to reduce greenhouse gas emissions (both operational emissions and embodied emissions) through the Campus Asset Renewal Program (CARP), which is comprised of a building renewal program (BRP) and energy renewal program (ERP). A **snapshot of key changes** between the new Green Building Standard and Existing Standard are shown in Figure 3 summarized below:

#### 1. Institutional Requirements:

- a. No new fossil fuels except for emergency back-up power.
- b. Facilities must connect to a district energy system, where applicable, for Tier 1 and Tier 2 Projects.
- c. Projects must demonstrate alignment with the goals of UW’s Campus Asset Renewal Program (CARP), such as renovating existing facilities to the greatest extent feasible and targeting no net new growth.

#### 2. Applicability:

- a. The GBS applies to all space types in UW owned and leased buildings and facilities, included donor-funded projects.
- b. Projects involving ground leases are encouraged to comply.

#### 3. Rating Systems

- a. LEED Gold minimum
- b. New UW LEED Scorecard with minimum pre-requisites beyond the LEED pre-requisites.

## SUSTAINABILITY UPDATE

### 4. Life Cycle Cost Assessment (LCCA)

- a. A new LCCA Standard has been created and will be incorporated UW’s Facility Design Standards. An LCCA is required for project tiers 1-3 in the new GBS to assess capital costs, life-time operation and maintenance costs, energy efficiency, and greenhouse gas emissions.

### 5. Energy, Water, and Embodied Carbon

- a. Specific targets must be met in each of these categories for the four project tiers.

	NEW STANDARD	EXISTING STANDARD
<b>Project Tiers</b>	<ol style="list-style-type: none"> <li>1. New construction/major renovation</li> <li>2. Partial renovations and interior projects</li> <li>3. System upgrades</li> <li>4. Non-energy projects</li> </ol>	<ul style="list-style-type: none"> <li>• Major projects</li> </ul>
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• LEED Gold Certification</li> <li>• New UW LEED Scorecard with minimum pre-requisites beyond LEED pre-requisites.</li> <li>• No new fossil fuels</li> <li>• Life cycle cost assessment (LCCA) required</li> <li>• Must hit specific targets for energy, water, embodied carbon</li> </ul>	<ul style="list-style-type: none"> <li>• LEED Gold Certification</li> <li>• Energy Use Intensity-15% better than code</li> <li>• Water – 50% better than code for indoor and outdoor water use</li> </ul>

Figure 3. UW Green Building Standard – Key Changes between the new and existing standard.

The addition of embodied carbon target requirements is noteworthy, as it is a critical component in addressing the urgency of greenhouse gas emission reduction. **Embodied carbon** refers to the amount of GHG emissions associated with upstream—extraction, production, transport, and manufacturing—stages of a product’s life. **Operational carbon** is the carbon released from the ongoing operation of the building, such as burning fossil fuels for space heating, hot water, etc.

# SUSTAINABILITY UPDATE



Figure 4. Embodied carbon (yellow) and operational carbon (blue) across the key life cycle stages of a building. *Image copyright to the Carbon Leadership Forum (CLF).*

Research from UW’s Carbon Leadership Forum, a global leader on embodied carbon, confirms the significance and urgency with which embodied carbon needs to be addressed (Figure 5).

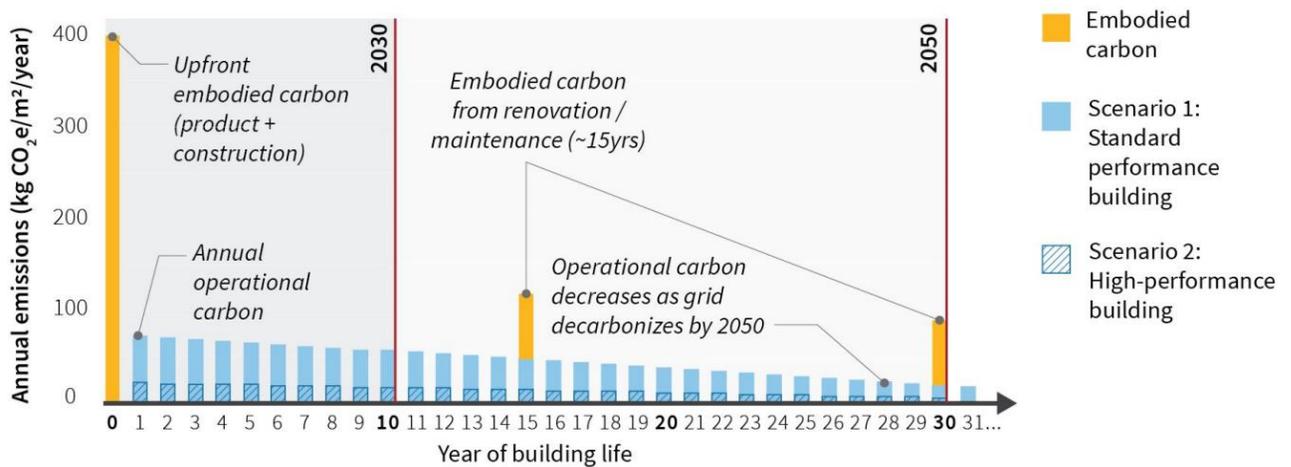


Figure 5: Relative impact of embodied and operational carbon of a new building from 2020-2050. Data sources: Embodied Carbon Benchmark Study and Commercial Buildings Energy Consumption Survey (CBECS), assuming a medium-sized commercial office building. Assumes gradual grid decarbonization to zero by 2050. *Image copyright to the Carbon Leadership Forum (CLF).*

Addressing embodied carbon is an area where we can make a substantial impact on GHG emissions, particularly as we address energy and building renewal through the Campus Asset Renewal Program (CARP).

## SUSTAINABILITY UPDATE

### **5. Decarbonization Town Hall**

Over the last year, there has been overwhelming interest in how UW will decarbonize our operations particularly at the Seattle campus which comprises approximately 84% of university-wide Scope 1 emissions. Recognizing the strong desire from our UW community to engage on this topic, the Faculty Senate hosted a Decarbonization Town Hall event on October 25<sup>th</sup> at the Seattle Campus. UW Sustainability Office provided support for this event. The Decarbonization Town Hall provides an organized platform and an opportunity for UW leadership to inform, educate, and update our community on UW's decarbonization efforts in our operations and in our research/academics/learning. More information about the Town Hall can be found [here on the Faculty Senate website](#).

# Sustainability Update

Board of Regents  
November 9, 2023

***BE BOUNDLESS***



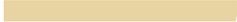
An aerial photograph of a university campus, showing various buildings, green spaces, and a central walkway. The image is overlaid with a semi-transparent dark grey rectangle containing white text.

**Sustainability permeates our teaching, guides our research and fuels our service to the community.**

**We will create a campus environment that elevates social, environmental, financial and operational responsibilities.**

**The Campus Asset Renewal Program (CARP) will enable UW Facilities to put into practice the principles of sustainability.**

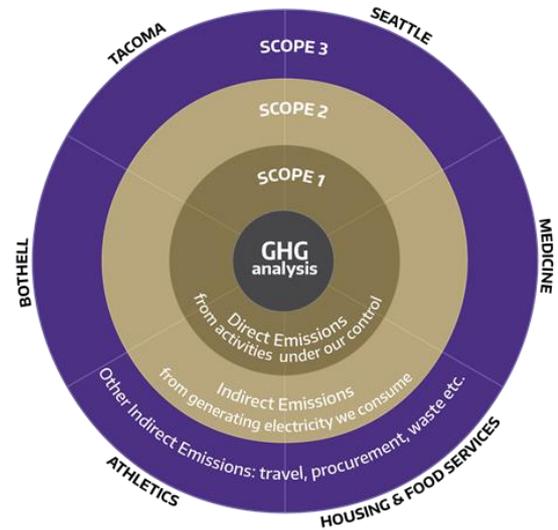
# UW Sustainability Progress Update



1. **Tri-Campus Greenhouse Gas Emissions Inventory**
2. **Sustainability Action Plan Update**
3. **Green Building Standard Update**
4. **Zero Carbon Roadmap**
5. **Decarbonization Town Hall**
6. **Key Take-Aways**

# Tri-Campus GHG Inventory: Key Findings

- This fall, we will publish UW's first comprehensive GHG inventory report in over a decade
  - Includes Scope 1, Scope 2, and Scope 3
  - **For the first time ever, UW measured its emissions from 'Goods and Services Purchased', or 'Consumption Based Emissions'**
- Moving forward, we will publish a biennial\* GHG Inventory Report to track and monitor UW's progress in meeting our goals



*\*Progress on Goods and Services Purchased will be published every four years in the GHG Inventory Report*

# Greenhouse Gas Emissions '101'

**SCOPE 2**  
**ELECTRICITY GENERATION EMISSIONS**



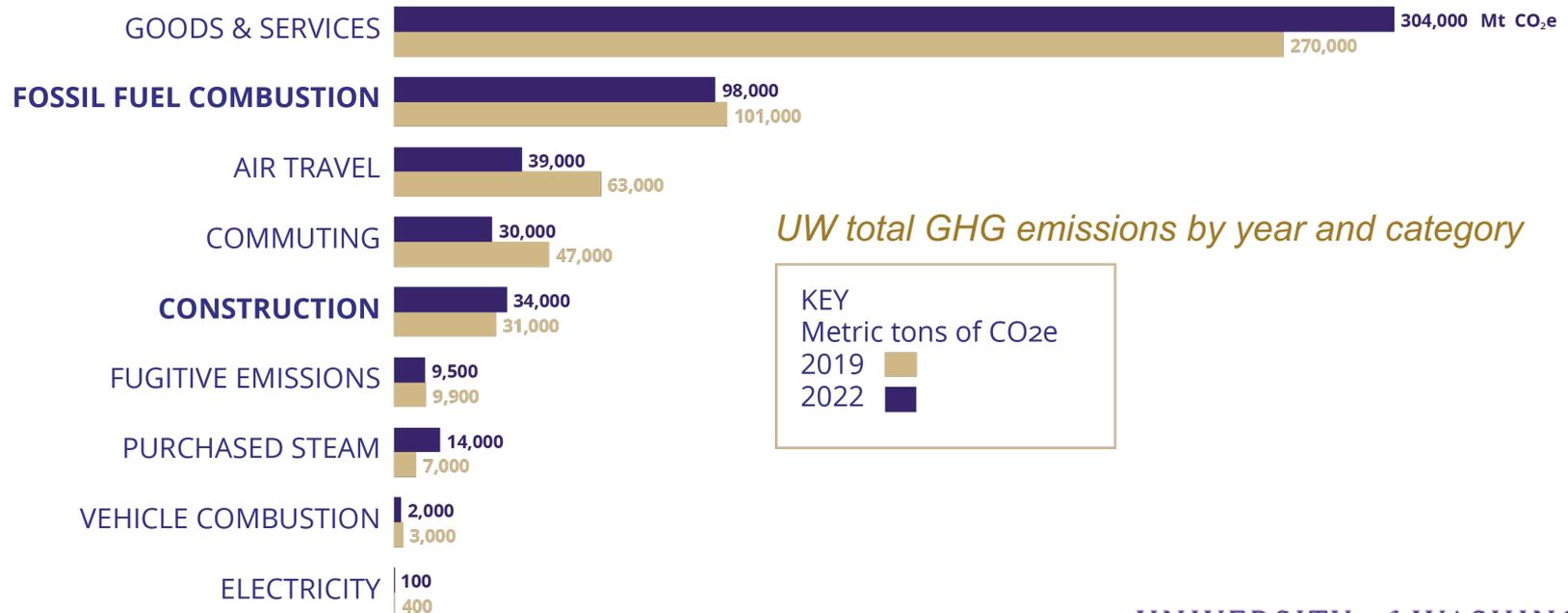
**SCOPE 1**  
**DIRECT EMISSIONS**



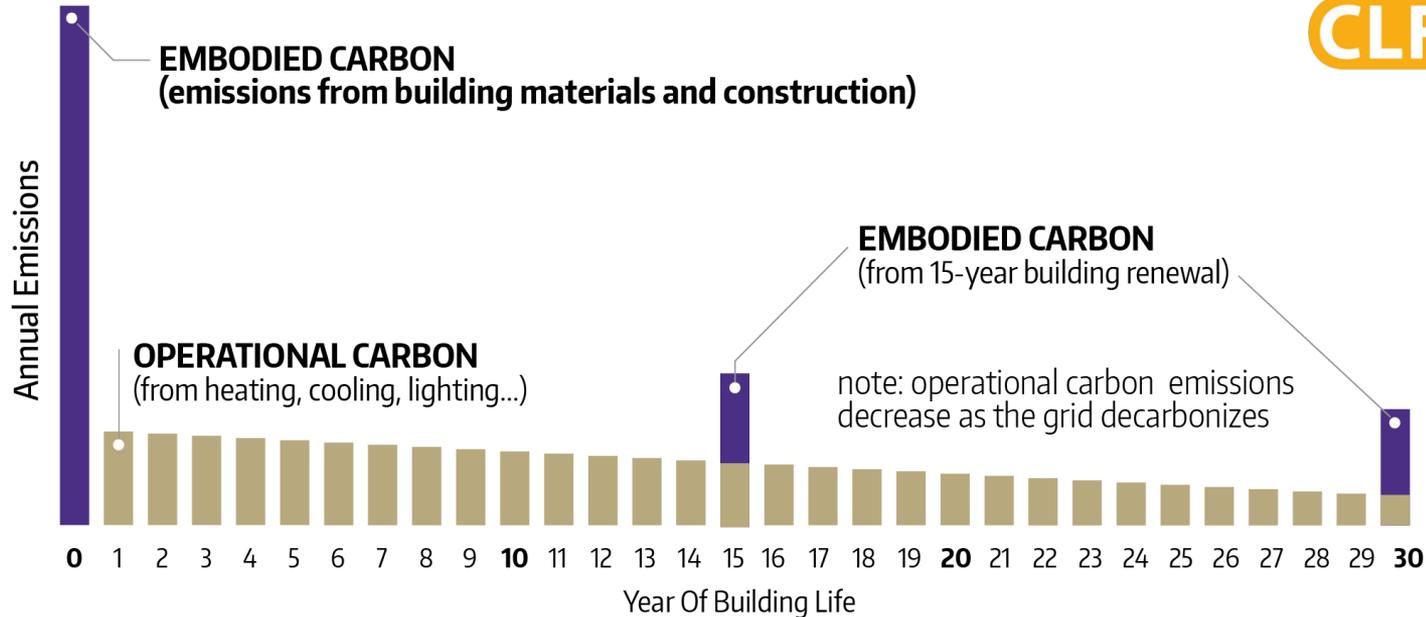
**SCOPE 3**  
**INDIRECT EMISSIONS**



# Tri-Campus GHG Inventory: Key Findings



# Significance of Embodied Carbon



# Updating the Sustainability Action Plan

- ✓ **Now that GHG Inventory is complete, we can begin updating the Plan**
- **Sustainability Action Plan (SAP) due to be updated in 2025**
  - RFP for consultant to be issued this winter

## **Key components of the SAP Update**

- Informed by data and climate science
- Assertive targets for conservation and emissions reduction
- Inclusive Tri-Campus plan
- SMART goals
- **New topic areas** such as: Purchasing, Climate Resilience, Water, Green Buildings, etc.

# Green Building Standard Update – Key Changes

	NEW STANDARD	OLD STANDARD
Project Tiers	<ol style="list-style-type: none"><li>1. New construction/major renovation</li><li>2. Partial renovations and interior projects</li><li>3. System upgrades</li><li>4. Non-energy projects</li></ol>	<ul style="list-style-type: none"><li>• Major projects</li></ul>
Requirements	<ul style="list-style-type: none"><li>• LEED Gold Certification</li><li>• New UW LEED Scorecard with minimum pre-requisites beyond LEED pre-requisites.</li><li>• No new fossil fuels</li><li>• Life cycle cost assessment (LCCA) required</li><li>• Must hit specific targets for energy, water, embodied carbon</li></ul>	<ul style="list-style-type: none"><li>• LEED Gold Certification</li><li>• Energy Use Intensity- 15% better than code</li><li>• Water – 50% better than code for indoor and outdoor water use</li></ul>

# UW's Path to a Carbon Neutral Future by 2050

## Sustainability Action Plan (SAP)

*Tri-Campus 2050 goals, interim targets, and strategies for energy, emissions, water, waste, learning and research, public service and more.*

- Summary level/public facing document
- Updated every 5yrs
- Managed by ESC
- Detailed work plan at unit level
- Updated regularly
- Managed by the Sustainability Office

Zero Carbon Roadmap



Zero Carbon Work Plan

Align actions with SAP

# Decarbonization Town Hall

## TOWN HALL ON DECARBONIZATION

Wednesday, October 25

4:30 p.m. | Kane Hall 110 or Online Livestream

A panel discussion on the UW's efforts to address climate change in our operations, research and academics.

### Panelists will include:

David Woodson  
Executive Director of Campus Energy, Utilities, and Operations

Frank Hodge  
Dean of the Foster School of Business

Jan Whittington  
Faculty Council on Campus Planning and Stewardship Co-chair

Lela Corson  
Institutional Climate Action student group

Lisa Dulude  
UW Sustainability Director



[bit.ly/decarbUW](https://bit.ly/decarbUW)

**Who?** Sponsored by the Faculty Senate and FCCPS. UW Facilities/UW Sustainability providing support.

**What?** Panel discussion to update the community on our progress, inform, educate, and engage through discussion.

**Where?** Kane Hall 110 or Live Stream

**When?** October 25<sup>th</sup> 4:30pm

**Why?** Respond to this strong and growing interest from our UW community.

UNIVERSITY *of* WASHINGTON

# Key Take-Aways

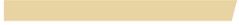
---

- UW's current reduction efforts align with our top five sources of emissions.
  - **'Goods and Services Purchased' is our largest source of emissions.** This area will be a key focus in coming years to identify the most impactful opportunities in UW Purchasing.
- The updated **Green Building Standard** presents tremendous opportunity to reduce UW operational and embodied emissions (and address other sustainability areas), especially through the Campus Asset Renewal Program (CARP).
- The **updated Sustainability Action Plan (SAP)** and **new Zero Carbon Roadmap** will position UW well to be bold, strategic, and act with urgency.
- Our UW community expects **UW to lead and move the needle** in our operations, as well as our research and academics.
- We will continue to provide opportunities for engagement, discussion, and informing the community of UW's progress.

# Discussion & Questions



# APPENDIX

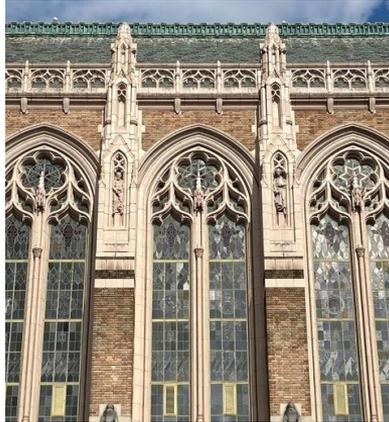


# Campus Asset Renewal Program – the 3 R's



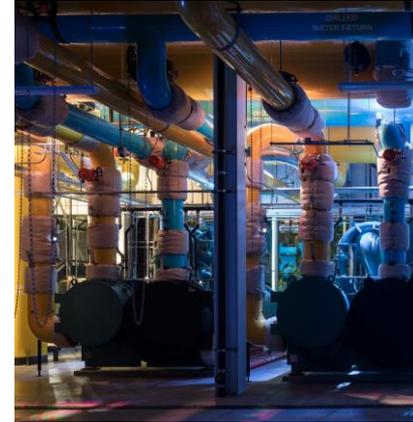
## Responsible

Improve planned maintenance, efficient occupancy, predictable and reduced O&M costs



## Renewal

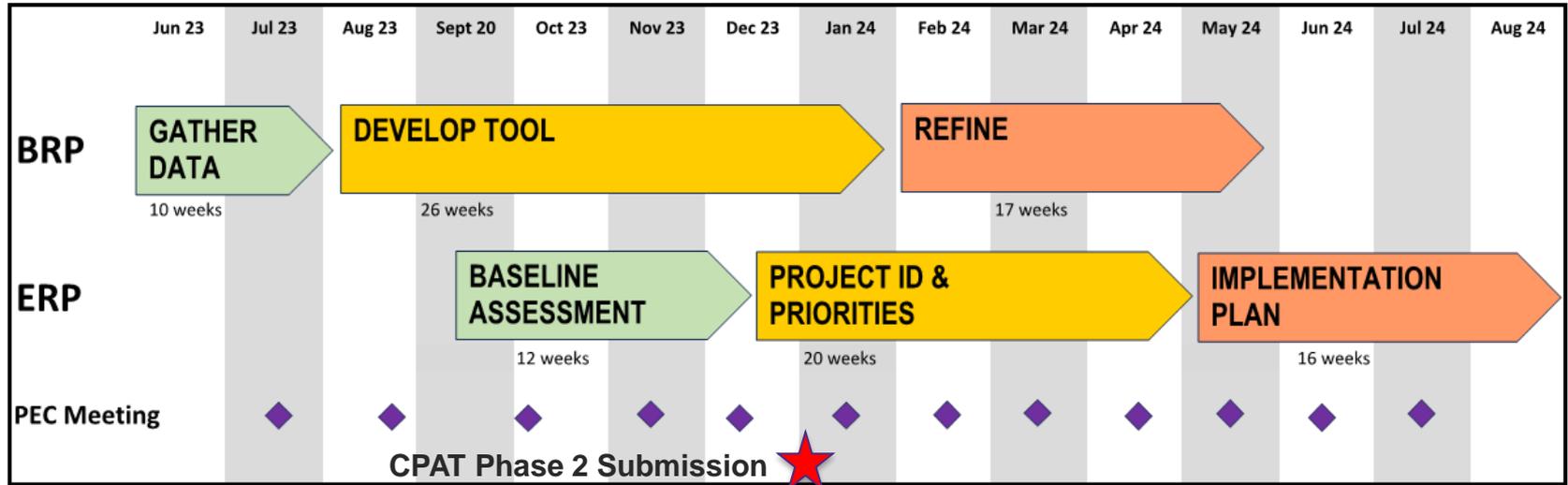
Address deferred maintenance to improve performance and extend useful life



## Resilience

Switch to sustainable energy source; improve building and system operational reliability

# CARP Schedule



# Building Renewal Program (BRP)

- **Building Scale Approach**

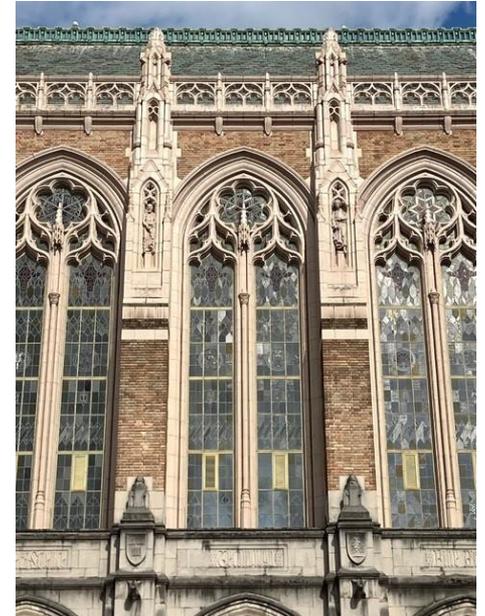
- "Bottom 10" Buildings = 31% of total ten-year deferred maintenance needs
- Magnuson Health Sciences = 7 out of Bottom 10

- **System Scale Approach**

- HVAC + Electrical + Plumbing (MEP) = 64% of ten-year deferred maintenance
- Exterior upgrades (primarily windows and roofs) = 8% of total ten-year deferred maintenance needs

- **Space Management Approach**

- Renewed buildings must be occupied at a different density to allow no net footprint growth- *"not more space, but better space"*
- *Data on actual occupancy and use will be critical to planning and implementation*

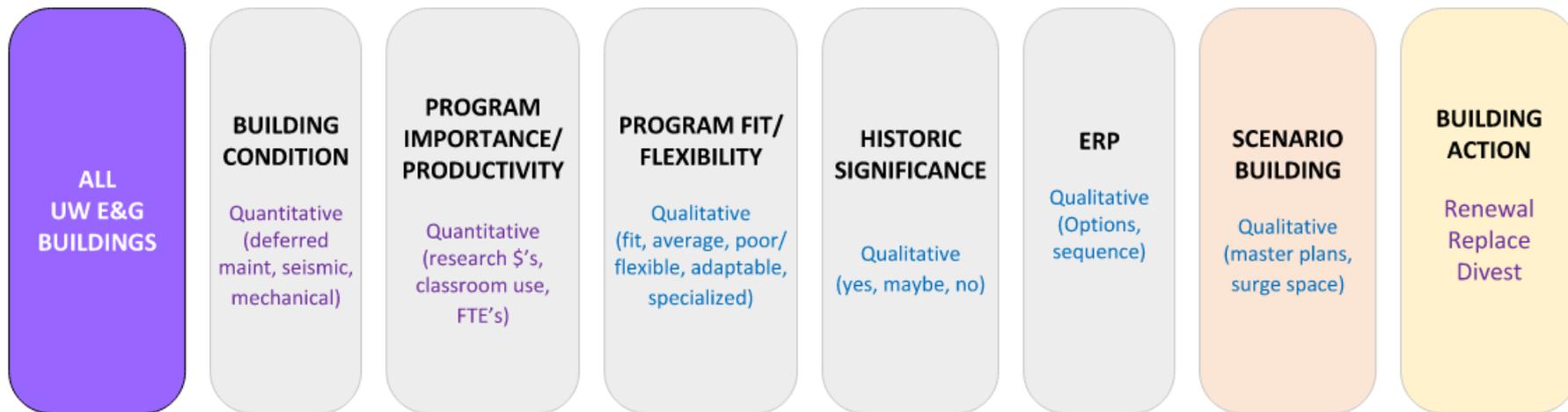


# Building Renewal Program (BRP)

## Planning Tool Workflow

Facility Assessment Filters

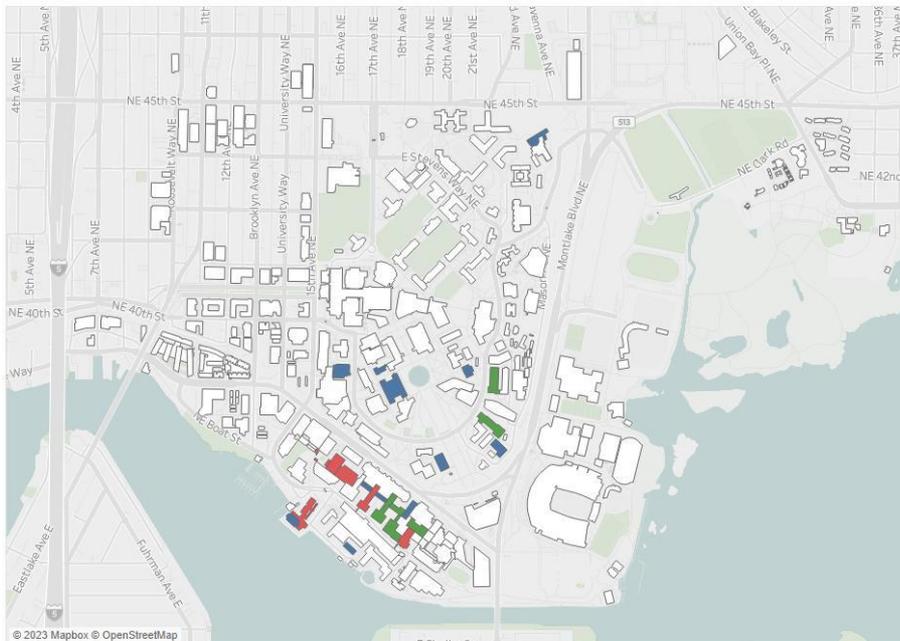
Implementation



# Building Renewal Program (BRP)

## UW SCENARIO VIEWER (costs shown for demonstration only)

Not in Phase 
  Demolish 
  Renovate 
  Replace



**Bagley Hall - Priority**  
 Renovate

**Bagley Hall - Phase**  
 1/1/2027

**Magnuson J-Wing - Priority**  
 Demolish

**Magnuson J-Wing - Phase**  
 1/1/2033

2027	Aerospace and Engineering Research Building	CENTRAL	Renovate	
	Atmospheric Sciences-Geophysics Building	CENTRAL	Renovate	
	Bagley Hall	CENTRAL	Renovate	
	Magnuson Health Sciences Center A	SOUTH	Renovate	
	Magnuson Health Sciences Center E	SOUTH	Renovate	
	Magnuson Health Sciences Center F	SOUTH	Demolish	
2029	Guthrie Hall	CENTRAL	Renovate	
	Marine Sciences Building	SOUTH	Renovate	
	Mechanical Engineering Building	CENTRAL	Replace	
	Oceanography Building	SOUTH	Renovate	
	Oceanography Teaching Building	SOUTH	Demolish	
2031	Magnuson Health Sciences Center B	SOUTH	Replace	
	Magnuson Health Sciences Center I	SOUTH	Demolish	
	More Hall	CENTRAL	Replace	
	North Physics Laboratory Van de Graaff Accelerat.	CENTRAL	Renovate	
2033	Magnuson Health Sciences Center BB	SOUTH	Replace	
	Magnuson Health Sciences Center G	SOUTH	Renovate	
	Magnuson Health Sciences Center J	SOUTH	Demolish	
2035	Magnuson Health Sciences Center C	SOUTH	Replace	
	Magnuson Health Sciences Center D	SOUTH	Replace	
	Magnuson Health Sciences Center RR	SOUTH	Demolish	
	Wilcox Hall	CENTRAL	Renovate	
	Winkenwerder Forest Sciences Laboratory	CENTRAL	Renovate	

**2027**  
 Cost: \$148,174,000  
 New: None  
 Reno: \$117,482,250  
 Demo: \$30,691,750

**2029**  
 Cost: \$125,933,250  
 New: \$73,326,000  
 Reno: \$39,719,250  
 Demo: \$12,888,000

**2031**  
 Cost: \$196,137,500  
 New: \$149,094,000  
 Reno: \$9,284,000  
 Demo: \$37,759,500

**2033**  
 Cost: \$245,402,000  
 New: \$186,573,750  
 Reno: \$16,148,500  
 Demo: \$42,679,750

**2035**  
 Cost: \$226,199,250  
 New: \$174,197,250  
 Reno: \$16,874,000  
 Demo: \$35,128,000

Deferred: **-\$199,772,906**  
 Delta: *-\$51,538,906*

Deferred: **-\$131,932,680**  
 Delta: *-\$5,999,430*

Deferred: **-\$195,820,551**  
 Delta: *-\$316,949*

Deferred: **-\$224,259,333**  
 Delta: *-\$21,142,667*

Deferred: **-\$194,139,626**  
 Delta: *-\$32,059,624*

For Demonstration Only

# Energy Renewal Program (ERP)

## Legislative requirement

- UW's decarbonization plan must be approved by 6/2025 to comply with the State's Clean Buildings Act.

## Wise investment

- Keeping the status quo (natural gas to generate steam) is more expensive.
- Aging steam plant requires investment – best to convert to electricity & hot water now.

## New funding sources are available now

- CCA auction proceeds higher than anticipated
- CCA funding requests will become increasing competitive
- IRA funds fit select energy projects
- IRA funds sunset in 12/31/2032

