STATUS REPORT
FY 20-21

X. 45% REDUCTION OF GREENHOUSE GAS EMISSIONS BY 2030

SUSTAINABILITY ACTION PLAN

X. 45% REDUCTION OF GREENHOUSE GAS EMISSIONS BY 2030

Target Actions

- Electrify UW Transportation Services
- Plan to Repower the Seattle Campus
- Implement Campus Solar Plan

Sustainability Plan guiding principle

Decarbonize

AASHE STARS categories

OP 2 Student Orientation

OP 5 Building Energy Efficiency

OP 6 Clean & Renewable Energy

BASELINE METRIC(S):

- Percentage of UW fleet vehicles are electric
- Completion of each listed FY21 step serves as a measure of progress

Action Owner:	Mike McCormick
Target Team:	Marilyn Ostergren, Jan Whittington Norm Menter George Donegan

Q1 ACTIVITY:

- Analysis conducted of parking charging opportunities.
- Created new position description for a Energy Program Manager
-

ACTION STATUS:

Action: Electrify UW Transportation Services	✓
Action: Plan to repower seattle campus	✓
Action: Implement campus solar plan	✓

CHALLENGES:

- What challenges were encountered?
- What do you need to overcome them?

RISKS:

- What are the primary risks?

NEXT QUARTER ACTION:

The Urban Infrastructure Lab and UW Solar plans to incorporate comments and publish the report by Nov 2020

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STEPS STATUS:

Action 1: Electrify UW Transportation Services	**Step 1:** ✓ Convert to electric vehicles	**Step 2:** ✓ Develop vehicle charging infrastructure	**Step 3:** ✓ Develop solar canopy infrastructure
Action 2: Plan to repower seattle campus	**Step 1:** ✓ Hire energy program manager	**Step 2**: ✓ Bring on an owner's advocate	**Step 3:** ✗ WCUP pilot project
Action 3: Implement campus solar plan	**Step 1:** ✓ Complete solar plan	**Step 2**: ✓ Fund solar plan	

✗ ○ ✓

Note: Copy and Paste the appropriate 'status icon' into the upper right hand corner of each **step** above to complete the Steps Status.

ACTION:
Electrify UW Transportation Services

Steps we will take in FY 2021

1. Complete and approve a strategy for transitioning the UW Fleet to electric vehicles by 2030, excepting emergency maintenance vehicles. Anticipated completion: December, 2020.

2. Complete and approve a strategy, including funding mechanisms, to develop electric vehicle charging infrastructure across UW parking facilities by 2030. Anticipated completion: March, 2021.

3. (concurrent with Step 2) Review and approve a strategy and funding methodology for developing solar canopy infrastructure on campus parking assets by 2030. Anticipated completion: March, 2021.

Statuses and linkages

Analysis of the opportunity to electrify the UW Seattle fleet and parking services, and capacity for parking to house solar canopies, has been completed, and a report will be released for review in Fall, 2020. The same analysis can be applied to th Bothell and Tacoma campuses in Fall, 2020. There are linkages between these targets and actions, and the goal of reducing commuting to campus via single occupancy vehicle.

Financing

Electric vehicles will be gradually added to the UW Fleet as older vehicles are retired. Steps 2 and 3, the development of charging infrastructure and solar canopies respectively, will require capital investment, but can recover cost through surcharges on the electricity delivered to plugged-in EVs. Seed funding will be required for the first two biennia (four years), but thereafter electric sales revenue can be used to continue expanding buildout of chargers and canopies in the form of a revolving fund.

Full buildout of 14 MW of solar is estimated to require a total $28 - $30 million in capital expenditures plus an additional $438,000 for electrical distribution upgrades. Besides the funding stream from electric surcharges, we forecast $46 - 48 million in cost avoidance from vehicle fuels.

Metrics

Progress toward completion of the Action will be measured by:

- Percentage of UW fleet vehicles that are plug-in electric vehicles. Plug-in hybrid electric vehicles will be included in the count.
- GW of charger-connected solar capacity.
- Percentage of parking spaces having charger access.

This Action can gain points in STARS credits OP-6 *Clean & Renewable Energy* where UW shows a point gap of 3.93.

3.93 AAHSE STARS POINTS OPPORTUNITY

Electrify UW Transportation Services

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 1: Convert to electric vehicles

Complete and approve a strategy for transitioning the UW Fleet to electric vehicles by 2030, excepting emergency maintenance vehicles. Anticipated completion: December, 2020.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

- The Urban Infrastructure Lab and UW Solar have created a model and database for cost-effective selection of available vehicle electrification opportunities for UW Transportation at the Seattle Campus, and will be completing a draft report for circulation by October. They plan to request participation and collect data from UW Bothell and Tacoma in October.
- Fleet Services will identify the number of vehicle types needed for electrification (Sedans, Minivans, SUVs, Pickup Trucks, Medium and Large Cargo Vans, Box Trucks, and Refuse/Packer Vehicles) based on current fleet profile.
- Fleet Services will present an updated replacement cycle plan for conversion to electric (EV/PHEV) vehicles.
- Fleet Services will continue to collect data on current EV fleet assets.

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

In this effort, the Urban Infrastructure Lab and UW Solar have not experienced challenges.

Current vehicle replacement plan is on hold due to the COVID pandemic.

PLAN FOR OCTOBER 2020-DECEMBER 2020:

- The Urban Infrastructure Lab and UW Solar plans to incorporate comments and publish the report by November.
- Fleet Services has no additional plans for the November to February timeframe at this point.

Electrify UW Transportation Services

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 2: Develop vehicle charging infrastructure

Complete and approve a strategy, including funding mechanisms, to develop electric vehicle charging infrastructure across UW parking facilities by 2030. Anticipated completion: March, 2021.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

- The Urban Infrastructure Lab and UW Solar have completed an analysis of parking charging opportunities for UW Transportation at the Seattle Campus, and will be completing a draft report for circulation by October. They plan to request participation and collect data from UW Bothell and Tacoma in October.
- Fleet Services will continue to work with the Western Washington Clean Cities Coalition to identify grant opportunities to fund EV infrastructure on campus.
- Fleet Services will determine the need for Level 1, 2, and 3 charging on campus.

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

In this effort, Fleet Services, the Urban Infrastructure Lab and UW Solar have not experienced challenges.

PLAN FOR OCTOBER 2020-DECEMBER 2020:

The Urban Infrastructure Lab and UW Solar plans to incorporate comments and publish the report by November.

Electrify UW Transportation Services

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 3: Develop Solar Canopy Infrastructure

(concurrent with Step 2) Review and approve a strategy and funding methodology for developing solar canopy infrastructure on campus parking assets by 2030. Anticipated completion: March, 2021.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

- Actions July-October: The Urban Infrastructure Lab and UW Solar have completed analysis of solar canopy infrastructure capacity and ROM cost for UW Transportation at the Seattle Campus, with more detailed analysis of the E18 lot and Portage Bay Garage, and will be completing a draft report for circulation by October. They plan to request participation and collect data from UW Bothell and Tacoma in October.

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

Challenges July-October: In this effort, the Urban Infrastructure Lab and UW Solar have not experienced challenges.

PLAN FOR OCTOBER 2020-DECEMBER 2020:

The Urban Infrastructure Lab and UW Solar plans to incorporate comments and publish the report by November.

METRICS & LINKAGES:

Analysis of the opportunity to electrify the UW Seattle fleet and parking services, and capacity for parking to house solar canopies, has been completed, and a report will be released for review in Fall, 2020. The same analysis can be applied to the Bothell and Tacoma campuses in Fall, 2020. There are linkages between these targets and actions, and the goal of reducing commuting to campus via single occupancy vehicle

METRICS:

Baseline Metric:

- Percentage of UW vehicles that are plug-in electric vehicles (includes plug-in hybrid electric vehicles): **12%** *(81 of 690 vehicles)*
- GW of charger-connected solar capacity: **0** *(There are 36 lots/garages on the Seattle Campus that UW Solar rates as "A", most suitable for solar canopies. These have an estimated potential of 13.6 MW of power, which is, conservatively, about 13.6 GWh of electricity per year.)*
- Percentage of parking spaces having charger access: **0.8%** *(we have 102 Level 2 chargers on campus in individual parking stalls out of 12,300 stalls on campus).*

Change in Baseline Metric:

- We are tracking annual travel and will report on changes in this metric at the end of the FY.

LINKAGES:

There are linkages between these targets and the goal of reducing commuting to campus via single occupancy vehicle.

ACTION:
Plan to Repower the Seattle Campus

Steps we will take in FY 2021

1. Hire an Energy Program Manager with the engineering and finance qualifications to oversee the heating plant and district energy renewal from start to finish.
2. Issue an RFP for, and contract, a consultant (owner's advocate) capable of helping UW select the best mix of technologies for the Seattle campus.
3. Develop engineering scope and funding pathway for a pilot project to use waste condenser heat from the West Central Utility Plant to reduce steam heating in nearby buildings.

Statuses and linkages

In March 2020, UW Facilities issued a Request for Information (RFI) to solicit ideas from experts around the country for planning, building, and financing a low-carbon energy system. These responses are currently being reviewed by the Energy Roadmap Team which includes support from the Engineering Services and UW Sustainability departments.

Several other universities have completed or launched similar projects. Stanford University recently completed a new combined heating and cooling plant that is perceived as a particularly successful example. The new Stanford plant, when combined with solar power procurement, reduced Stanford GHG emissions by about 72 percent from its peak levels.

Financing

A thorough review of the engineering and financial options is needed before assigning a budget estimate to such a large scale project. UW is targeting development to start in 2023, with first phase completion in 2028.

Metrics

- Completion of each listed FY2021 Step shall serve as the measure of progress during FY2021.

Decarbonization (whether partial or total) of the Seattle campus central heating & cooling system will gain points in STARS credits OP-2 *Greenhouse Gas Emissions* where UW shows a point gap of 3.91. Depending on the fuel used for energy generation, the project may also gain points toward OP-6 *Clean & Renewable Energy* where UW shows a point gap of 3.93.

3.91	AAHSE STARS POINTS OPPORTUNITY
3.93	AAHSE STARS POINTS OPPORTUNITY

Plan to Repower the Seattle Campus

STATUS

NO PROGRESS | ON TIME | SOME PROGRESS

STEP 1: Hire Energy Program Manager

Hire an Energy Program Manager with the engineering and finance qualifications to oversee the heating plant and district energy renewal from start to finish.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

- Facilities senior executives created a position description
- A recruitment team was brought on board. The team conducted interviews with relevant stakeholders
- The position was posted August 7, 2020.

PLAN FOR OCTOBER 2020-DECEMBER 2020:

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

We anticipate that this position will be filled by December 2020. Our goal is complete the following tasks to set the Energy Program Manager up for success:

- Create an Energy Leader Readiness Plan
- Conduct current utilities/energy systems analysis data gathering
- Complete an analysis of previous efforts/reports
- Create a spending plan for on-boarding needs
- Conduct a Stakeholder identification & early engagement
- Conduct a regulatory review
- Create a UWF Utilities Future Roadmap

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 2: Bring on an owner's advocate

Issue an RFP for, and contract, a consultant (owner's advocate) capable of helping UW select the best mix of technologies for the Seattle campus.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

This is a step that will be lead by the new Energy Program Manager (who will come on board late 2020).

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

NA

PLAN FOR OCTOBER 2020-DECEMBER 2020:

TBD

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 3: WCUP Pilot Project

Develop engineering scope and funding pathway for a pilot project to use waste condenser heat from the West Central Utility Plant to reduce steam heating in nearby buildings.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

This Step overlaps with Target VIII, Action 1, Step 2 we haven't fully decided how we want to address this in these reports.

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

PLAN FOR OCTOBER 2020-DECEMBER 2020:

METRICS & LINKAGES:

In March 2020, UW Facilities issued a Request for Information (RFI) to solicit ideas from experts around the country for planning, building, and financing a low-carbon energy system. These responses are currently being reviewed by the Energy Roadmap Team which includes support from the Engineering Services and UW Sustainability departments. Several other universities have completed or launched similar projects. Stanford University recently completed a new combined heating and cooling plant that is perceived as a particularly successful example. The new Stanford plant, when combined with solar power procurement, reduced Stanford GHG emissions by about 72 percent from its peak levels.

METRICS:

- Completion of FY 2021 shall serve as the measure of progress during FY2021.

LINKAGES:

There is a linkage between this target and target VIII “15% LOWER ENERGY USAGE INTENSITY BY 2025.” A lower energy demand from buildings translates into the need for smaller and therefore less expensive energy infrastructure.

ACTION:
Implement Campus Solar Plan

Steps we will take in FY 2021

1. UW Solar Group will complete a plan and strategy for developing solar assets on the buildings of the three campuses by 2030. Anticipated completion: December 31, 2020.
2. Review and approve the strategy, with funding mechanisms, for developing solar assets on campus buildings by 2030. Anticipated completion: March 31, 2021.

Statuses and linkages

Solar installations on UW campuses also reduce building energy usage intensity, and can be integrated into thermal systems for compounded savings. On the Seattle campus, solar energy reduces the peak load demand for electricity, buying time to make larger scale investments needed to decarbonize the power plant. UW hosts solar photovoltaics developed by the UW Solar Group, part of the UW Clean Energy Institute, on the Mercer A Apartments (35 kW), Alder Hall (50 kW), Elm Hall (25 kW), Maple Hall (25 kW), the Life Sciences Building (105 kW), in rooftop and solar shading fins). In addition, research and student projects have resulted in arrays on the IMA Building, Merrill Hall, Power Plant roof, and the Mechanical Engineering Building. University of Washington's Bothell campus also hosts 122 kW of solar photovoltaic, on the library building and parking garages.

Financing

The capital cost of systems envisioned for the Campus Solar Plan is estimated to be $26-28 million, while the cost savings from avoided utility payments are estimated to be $55 million over the 25 years of the warrantied life of these solar assets. Solar, with reduced utility costs as returns on investment, fit the parameters for finance with a revolving fund. There is also potential for investments from local utilities, the U.S. Department of Energy, donors, or other parties.

AASHE STARS Scoring

This Action may impact STARS credit OP-5 *Building Energy Efficiency* where UW shows a points gap of 2.16.

2.16 AAHSE STARS POINTS OPPORTUNITY

Implement Campus Solar Plan

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 1: Complete Solar Plan

UW Solar Group will complete a plan and strategy for developing solar assets on the buildings of the three campuses by 2030. Anticipated completion: December 31, 2020.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

- UW Solar, part of the Urban Infrastructure Lab, has completed analysis of solar infrastructure capacity and ROM cost for the buildings of the Seattle Campus, and will be completing a draft plan and strategy for circulation by December 31, 2020.
- They plan to request participation and collect data from UW Bothell and Tacoma in October.

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

In this effort, the Urban Infrastructure Lab and UW Solar have not experienced challenges.

PLAN FOR OCTOBER 2020-DECEMBER 2020:

The Urban Infrastructure Lab and UW Solar - UW Campus Solar Plan - will be expanded to include Bothell and Tacoma, with a complete draft of the plan ready for review and comment by December 31, 2020.

Implement Campus Solar Plan

STATUS

NO PROGRESS

ON TIME

SOME PROGRESS

STEP 2: Fund Solar Plan

Review and approve the strategy, with funding mechanisms, for developing solar assets on campus buildings by 2030. Anticipated completion: March 31, 2021.

ACTIONS THAT OCCURRED/ONGOING JULY-SEPTEMBER 2020:

The Urban Infrastructure Lab and UW Solar, working in concert with UW Facilities and UW Treasury, developed a financial model for implementing a green revolving fund, suitable for solar investments as well as resource conservation and other projects whose effects include reducing utility costs, greenhouse gas emissions, and building energy use intensity. This and other funding mechanisms are to be noted in the Campus Solar Plan and strategy for implementing solar assets on campus buildings (all 3 campuses) by 2030.

CHALLENGES ENCOUNTERED JULY-SEPTEMBER 2020:

To date, the Urban Infrastructure Lab and UW Solar have not experienced challenges. However, it is important to note that development and implementation of a plan and strategy should be strengthened through more formal working partnerships within the UW administration, such as UW Office of Sustainability, UW Facilities, and self-sustaining units across the campuses.

PLAN FOR OCTOBER 2020-DECEMBER 2020:

The Urban Infrastructure Lab and UW Solar will support the UW Office of Sustainability, UW Facilities, and all other interested campus organizations in the review and approval of the Campus Solar Plan, strategy, and proposed funding mechanisms for developing solar assets on the buildings of the three campuses by 2030

METRICS & LINKAGES:

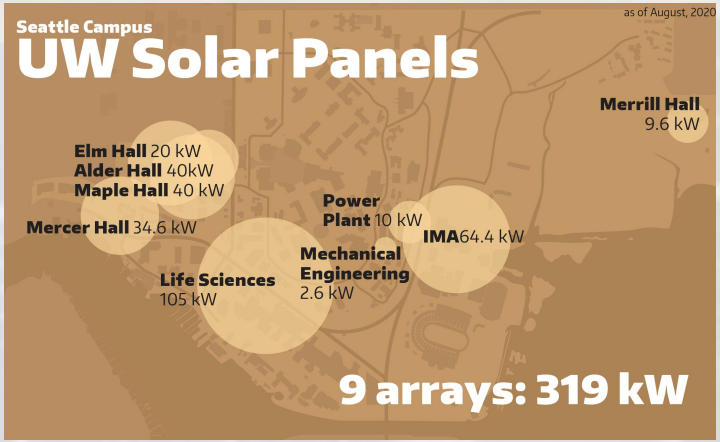
Solar installations on UW campuses also reduce building energy usage intensity, and can be integrated into thermal systems for compounded savings. On the Seattle campus, solar energy reduces the peak load demand for electricity, buying time to make larger scale investments needed to decarbonize the power plant. UW hosts solar photovoltaics developed by the UW Solar Group, part of the UW Clean Energy Institute, on the Mercer A Apartments (35 kW), Alder Hall (50 kW), Elm Hall (25 kW), Maple Hall (25 kW), the Life Sciences Building (105 kW), in rooftop and solar shading fins). In addition, research and student projects have resulted in arrays on the IMA Building, Merrill Hall, Power Plant roof, and the Mechanical Engineering Building. University of Washington's Bothell campus also hosts 122 kW of solar photovoltaic, on the library building and parking garages.

METRICS:

There is no baseline metric for FY 21 defined in the SAP for this action. The installed solar capacity on the 3 campuses as of August, 2020 are as follows:

Seattle: 319 kW

Bothell: 122 kW



LINKAGES:

There is potential linkage between this action and "Plan to Repower the Seattle Campus" since repowering will involve addressing and managing electrical loads. There is also linkage with the "Electrify UW Transportation Services" action since step 3 involves solar canopies on parking structures.