



UNIVERSITY *of* WASHINGTON

# Climate Action Plan 2010 Update



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## **I. Introduction**

In September 2009, the University of Washington (UW) published the Climate Action Plan (CAP), which described the commitments being made by the UW to meet its obligations under the American College and University Presidents' Climate Commitment (ACUPCC). The primary focus of that document was to set broad goals and strategies, providing a number of proposed actions, in order to achieve a climate-neutral university having no net greenhouse gas (GHG) emissions. The first carbon reduction target is 15% below 2000 levels by 2020. Considering that the UW is expected to add approximately 2.1 million square feet of space (an increase of 13%) and 8,200 faculty, staff and students (an increase of 11.5%) in that time, the reductions required to fully offset growth and still meet absolute reduction targets require reductions of far more than 15%.

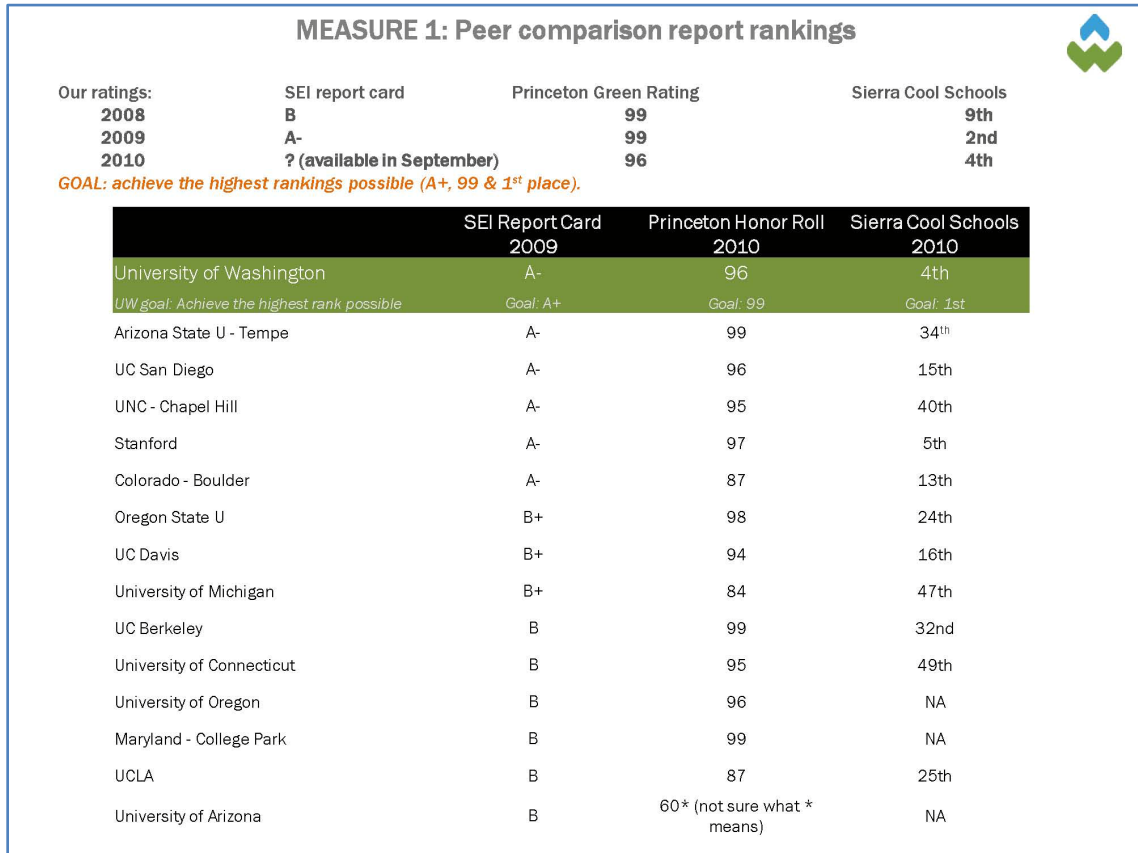
This document was prepared to update the campus-wide actions being taken toward the CAP commitment to reduce GHG emissions. While many of the actions are in early stages and are not yet measurable, they do align with the goals and strategies outlined in CAP, including:

1. Compliance with the No-Net Carbon goal, which presents opportunities for innovation and specifically, for the University of Washington to innovate and lead
2. Ensuring that University processes (teaching, research, administrative, and outreach), and those of its vendors and suppliers, are efficient and sustainable.
3. Designing sustainability into our products (educated students and research) and services we deliver (instruction and outreach)
4. Developing new ways of doing "business" that align with University activities and strategies
5. Creating the future capacity needed to manage sustainably, including skills, values and decision making models

Additionally, the UW is a global leader in environmental science research, education and technology transfer and is recognized nationally as a leader in reducing its carbon footprint, including wise use practices, energy conservation and innovative transportation alternatives. UW researchers are leading authorities on the impact of global warming and are at the forefront of developing new models that refine climate change predictions. In 2009, the UW received an A- on the College Sustainability Report Card and in 2010 received 96/100 on the Princeton Green Rating (highest of all public research universities) and ranked 4th overall on Sierra Club Magazine's Cool Schools list (See Figure 1). UW students recently voted to create a Campus Sustainability Fund, a nearly \$340K fund which will be used to finance projects that increase campus sustainability, prioritize student leadership and include outreach and education

components. And the first-ever Green Awards honored noteworthy environmental efforts by students, faculty and staff.

Figure 1



While the primary focus of the Climate Action Plan is substantive carbon reduction, others of these goals are part of a larger, more holistic set of strategies which include:

1. Moving forward toward climate neutrality
2. Engaging faculty and students in conservation and related behavior change
3. Integrating formal and informal learning on sustainability
4. Replacing the campus power plant
5. Moving students, faculty and staff to live near the UW
6. More walking/cycling, less reliance on motorized transportation
7. Becoming energy efficient

## II. Summary of Campus Accomplishments, Long Term and Short Term Initiatives

### A. Funding

Funding strategies enable and support University program goals, including carbon reduction.

#### **Accomplishments:**

1. Funded a series of major planning studies that incorporated key CAP goals.
2. Established the student funded Campus Sustainability Fund.
3. Funded a new university architect position to support integrated capital planning.
4. Funded \$100,000 for the Environmental Stewardship and Sustainability Office to support CAP implementation planning efforts.
5. Obtained \$5 million DOE Smart Grid Grant with \$5 million UW matching funding.

#### **Short term (2 year) Goals:**

1. Coordinate the launch of the student funded Campus Sustainability Fund within a wider funding framework for the Climate Action Plan.
2. Develop a Conservation Resource Manager Program.
3. Secure permanent funding for ESS office.
4. Fund more detailed planning studies that follow-up on a series of major planning directions, including Green Streets/Clean storm water technology, and SMART Campus.

#### **Long-term Goals:**

1. Normalize Climate Action Plan goals and initiatives into overall UW strategic planning.
2. Include ~\$5,000,000 2011-13 capital budget request for development of an Energy Conservation Center.
3. Develop a strategic plan for identifying and funding energy saving projects.
4. Reorient capital funding process from building-centric to program and district-centric.
5. Retool the UW's infrastructure for a non-carbon future.
6. Help the West of 15<sup>th</sup> neighborhood realize its full potential as eco-district for low-carbon working, living, and recreation.

7. Effectively use life-cycle cost analyses in decision-making. Create an analytical basis for higher investments in CAP reduction initiatives.

## **B. Academic Engagement in Climate Change**

Our goal is to make the UW a sustainable and environmentally friendly institution while incubating interest and excitement for environmental studies in science, social policy, and technology for our students. Not only do attitudes and behaviors need to change, but exciting opportunities for involvement and commitment inside and outside the classroom must be planned and implemented. This will be achieved through:

1. Integrating our students, and faculty in many diverse disciplines traditionally spread across our colleges and campuses in local and campus-wide academic programs and summer research opportunities,
2. Engaging the community at large, through creating awareness,
3. Exploiting our new College of the Environment as the focal point for these activities, and
4. Building bridges of activism that connect our academic and administrative communities in common interests and challenges in the way we operate the University. Examples are as green office practices, spectrum of conservation programs, facilities evaluation and improvements, responsible housing and food service practices, and voluntary public outreach and education.

There are three ways in which to academically engage students in climate change: formal learning, extracurricular/informal learning, and research.

### **Accomplishments**

1. The UW College of the Environment was created in July 2009 in part to enable the University to provide unique, highly regarded, enhanced environmental degree programs that combine academic rigor and advanced learning methodologies. A permanent Dean has been hired and as of July 1, 2010, there are over 1400 majors in the College of the Environment (870 undergraduates, 535 graduate students) and many more majors across campus that have strong ties to sustainability and the natural and built environments.
2. Offered over 500 environmental courses annually.
3. The School of Forest Resources transformed its Paper Science and Engineering (PSE) undergraduate program into a broader Bioresource

Science and Engineering (BSE) program. The first phase of this effort will debut in Fall 2010.

4. The College of the Environment partnered with the Jessie and John Danz and Walker-Ames Lecture Funds administered by the Graduate School, the School of Public Health, the Center for Global Studies, the Jackson School of International Studies, and the UW Alumni Association (UWAA) to produce a public lecture series and a UW course that focuses on food production from the dawn of the human species through to the present from the field to the kitchen, from Seattle to the plains of Africa. (Fall Quarter 2010).
5. Co-hosting (with Oregon State University) the USGS Northwest Regional Climate Science Center. The center will support USGS workforce development through graduate student fellowships to work on regional climate research.
6. Developed new certificate programs in stream restoration, sustainable transportation, low impact development, and decision making for climate change (UW Educational Outreach).

#### **Short-term (2 year) Goals:**

1. Pursue new interdisciplinary training opportunities in climate and sustainability science, including increased support for existing and new National Science Foundation Integrative Graduate Education and Research Traineeship (NSF IGERT) programs. (e.g., Bioresource-Based Energy for Sustainable Societies program).
2. Continue planning for an undergraduate leadership minor, sponsored through the colleges of Arts & Sciences, Business, Social Work, Evans School of Public Affairs and the Law School, and designed to provide students with real world experience, as well as a sense of the kind of impact they can have in the future. This program has \$2 million dollars in funding, all of which has been raised through donations.
3. Connect with and prepare incoming freshmen and transfer students via continued work with new "Learning Links" advising structure and summer orientation sessions for pre-environment students.
4. Initiate a partnership between Housing and Food Services and the College of the Environment is underway to provide regular academic programming for residents of new undergraduate housing. This is planned to debut in the fall of 2011.
5. Develop a mechanism for connecting faculty and students in research projects of mutual interest, possibly for course credits in the Program on the Environment (PoE) within its new home in the College of the Environment. This will be needed so that students with capstone projects within the PoE and/or summer funding from the Student Green Fund can be

properly supervised and evaluated by faculty, many of whom are new in environmental activism and research themselves.

6. Host Sustainability Summit (see Behavioral Change).
7. Enhance the scope of extra-curricular participatory opportunities for motivated members across our campus community through existing student-led groups. For example, in the short term we are planning to expand the UW Farm, expanding production and increasing the numbers of UW faculty, students and staff who participate in it.
8. Hire and support new faculty who focus on environmental scholarship.

#### **Long-term Goals:**

1. Connect with and prepare incoming freshmen and transfer students via autumn “Exploring Environmental Majors Seminar,” and events similar to Engineering’s bridge programs and “Discovery Days.”
2. Spread environmental research and scholarship across its traditional campus boundaries in fields such as law and political science, business and economics, basic science and technology, public policy, and public health and environmental safety by engaging deans and new or existing faculty in new constellations of activity.
3. Develop a tri-campus strategy for hiring, support, promotion and tenure, and merit criteria for faculty who focus on environmental scholarship, but reside in departments outside the environmental sciences.
4. Develop new or expanded course offerings that explore the environmental challenges and opportunities that exist at the boundaries between the many disciplines represented within the University.
5. Garner high-level support for broadening the scope of activities within colleges and campuses through strategic investments in environmental and climate-related hires and centers to be proposed by deans and chancellors.

### **C. Encouraging Behavior Changes to Reduce Carbon Emissions**

Another important feature of creating a sustainable University is to encourage behavioral changes to reduce carbon emissions. Sustainability guidelines and education/outreach programs for faculty, staff and students need to be created and then implemented.

#### **Accomplishments:**

1. Created a UW Home Page featuring [Sustainability](#); launched an online [sustainability pledge](#); and utilized social media including Facebook and Twitter as well as an e-mail newsletter.
2. Ranked #4 in Sierra Club “Cool Schools.” UW is the leading large public research university in the rankings.



3. Sponsored “Green Bag Networking Lunch” events for staff on voluntary green teams.
4. Co-hosted “Pacific Northwest Sustainability Roundtable” event with U.S. Postal Service (including Starbucks, Boeing, Costco, Nordstrom, 16 other NW companies).
5. Adopted [Green Purchasing Policies](#).
6. Launched first-ever [Husky Green Award](#) to recognize efforts on UW sustainability.
7. Received A- on Sustainable Endowment Institute’s “2010 College Sustainability Report Card.”
8. Included in Princeton Review’s Guide to 286 Green Colleges” released in April 2010.
9. Created the [Husky Green Fund](#), a staff, faculty and alumni donor fund for sustainability.

**Short term (2 year) Goals:**

1. Create and implement guidelines and education/outreach program for faculty, staff and students on sustainability.
2. Engage Certificate Program in Environmental Management Keystone (masters student's final project) to explore options and research what other universities are doing, including a survey/report card to learn about best practices in schools, colleges, units.
3. Launching a network of UW sustainability coordinators.
4. Launch and manage the student-funded [Campus Sustainability Fund](#).
5. Hold a University sustainability summit in Fall 2010.
6. Conduct behavioral audits in buildings as part of the Smart Grid Demonstration Project.
7. Create a robust set of sustainability-related metrics.
8. Create framework for and begin vetting a set of policies for UW decision makers to consider regarding CAP and sustainability, linked to Office of Planning & Budgeting activities.

**Long term goals:**

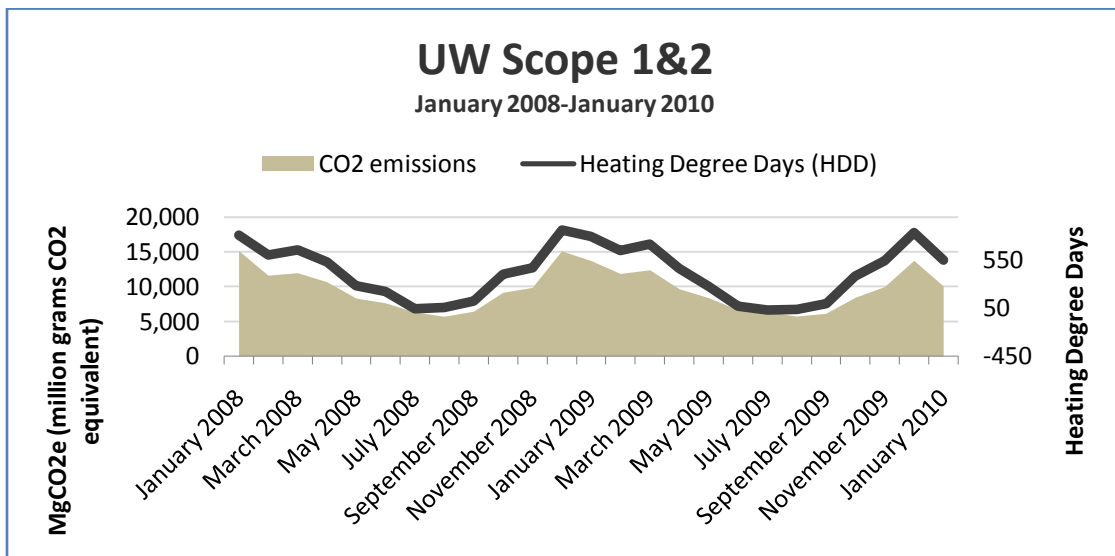
1. Engage students to work with UW Administration on climate reduction behaviors and strategies.
2. Develop a plan to reduce carbon emissions caused by professional travel.
3. Promote sustainable behavior as a cultural norm in Human Resource practices; new student orientation; faculty and staff; and in office and other work environments.

## D. Buildings: New Construction & Existing Buildings

In order to achieve zero carbon by 2050, major investments in the infrastructure of the University are required. Analysis is currently underway on existing legacy buildings that will provide information to set broader policies where individual building projects can contribute to overall carbon reduction.

The largest source of Scope I & II emissions comes from the power plant, which heats the buildings on the Seattle campus (see figure 2). While replacing the Central Utility Plant is a long term goal, in the interim the focus should be on heating and cooling buildings more efficiently and sustainably, including reducing energy demand and looking for alternative sources of energy.

Figure 2

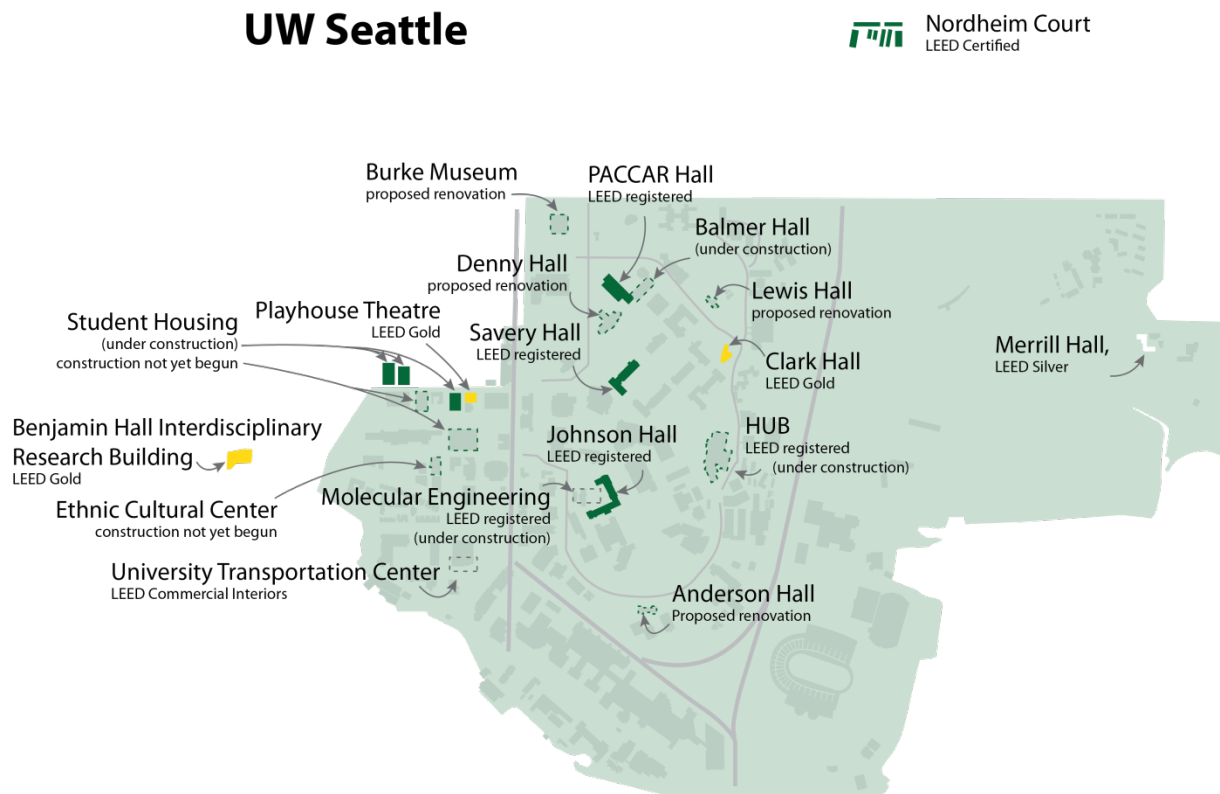


### Accomplishments:

1. In the process of delivering 20 registered [LEED® projects](#) on all three campuses that are in various stages of design, construction and pending certification. Certified USGBC LEED projects include 7 Gold, 3 Silver, and 1 Certified. Recent renovations result in energy efficiency savings of 30% higher than the ASHRAE 90.1 [standard](#).
2. UW Tacoma replaced an inefficient boiler with two energy efficient units to service existing facilities and the new Joy Building, and students installed a prototype Rain Garden.

3. UW Bothell purchased Midwest Independent System Operator Renewable Energy Certificate (MISO REC's) for a total reduction of 4,324 metric tons of CO<sub>2</sub>, in order to reduce Scope 2 emissions.

Figure 3



 Nordheim Court  
LEED Certified

### Short term (2 year) Goals:

1. Manage growth issues and space conservation.
2. Continue implementation of Smart Grid Demonstration Project,<sup>1</sup> which will enable measurement and digital communication of electrical consumption

<sup>1</sup> **Smart Grid Demonstration Project**- the UW-Seattle City Light (SCL) Smart Grid Demonstration Project is one of 12 site-specific subprojects within the "Pacific Northwest Smart Grid Demonstration Project." The project was awarded an American Recovery and Reinvestment Act (ARRA) matching grant by the US Department of Energy (DOE) in November 2009. The project will enable measurement and digital communication of electrical consumption while implementing demand response strategies at various university facilities. This will facilitate the reduction of energy consumption during both peak and off-peak times. It will also deploy smart meters and related electrical infrastructure in campus buildings.

information while implementing demand response strategies at various university facilities.

3. Create a policy for high efficiency energy targets for renovations and new construction.
4. Expand Energy Audits and tune-ups for existing buildings.
5. Continue implementation Solar Photovoltaic (PV) demonstration projects, including a 35 KW roof-top solar PV project on top of the University's central steam plant.
6. Target LEED gold (Silver minimum) for Phase 3A and 3B projects under construction/in design; continue to review ESCO opportunities for development of a geothermal central plant; and work with City of Tacoma on possible storm water collection/purification swale for the Hood Corridor pathway (UW Tacoma).

**Long term Goals:**

1. Continue the visionary exploration of development scenarios for the West Campus eco-district that aligns with 21st Century green-technology opportunities, such as analyzing alternatives and approaches for replacing the Central Utility Plant and/or exploring alternative energy sources.
2. Connect capital investments with related process improvements that innovatively and aggressively link capital and operating budgets.
3. Develop a prioritized capital investment approach for UW infrastructure as a component of UW's One Capital Plan.

**E. Transportation/Commuting**

A major source of GHG emissions is transportation. Cutting greenhouse gas emissions will require reductions in emissions related to transportation to, from, and around campus, as well as professional travel.

**Accomplishments:**

1. Preserved 126 secure bicycle parking stalls displaced by capital projects; added 100 new secure bicycle parking stalls; completed development of secure bicycle parking prototype design; developed concept plan for Burke Gilman Trail improvements.

2. Returned to model of increasing parking rates faster than U-PASS rates in order to encourage the use of public transportation over single occupancy vehicles.
3. Updated Commuter Services (U-PASS) business plan (charting a path for continued financial viability over the next 5 years).
4. Completed pedestrian mode needs assessment and programming plan in conjunction with Feet First.
5. Entered strategic partnership with Cascade Bicycle Club, doubled the number of major cycling events each year, and implemented a regular series of cycling workshops.
6. Increased the cost for parking single occupant vehicles at UW Bothell from \$380 per year to \$505. Also, decreased pricing for the UWB U-Pass.

**Short-term (2 year) Goals:**

1. Encourage ownership of low-emission vehicles by individual commuters and transit agencies.
2. Establish a clearinghouse with information about greener vehicle purchase incentives and savings.
3. Expand programming, infrastructure and support for walkers and cyclists.
4. Improve off-campus parking management.
5. Identify and implement alternative funding model for U-PASS.
6. Maintain high parking rates as compared to alternatives; suppress transit rates as compared to the cost of driving; increase transit rates, as compared to active transportation.
7. Increase programming and support for ridesharing.
8. Increase use of telework and compressed work weeks; establish a telework toolkit and policy clearinghouse.
9. Prioritize use of fleet vehicles (UCAR) over use of private vehicles for business travel;

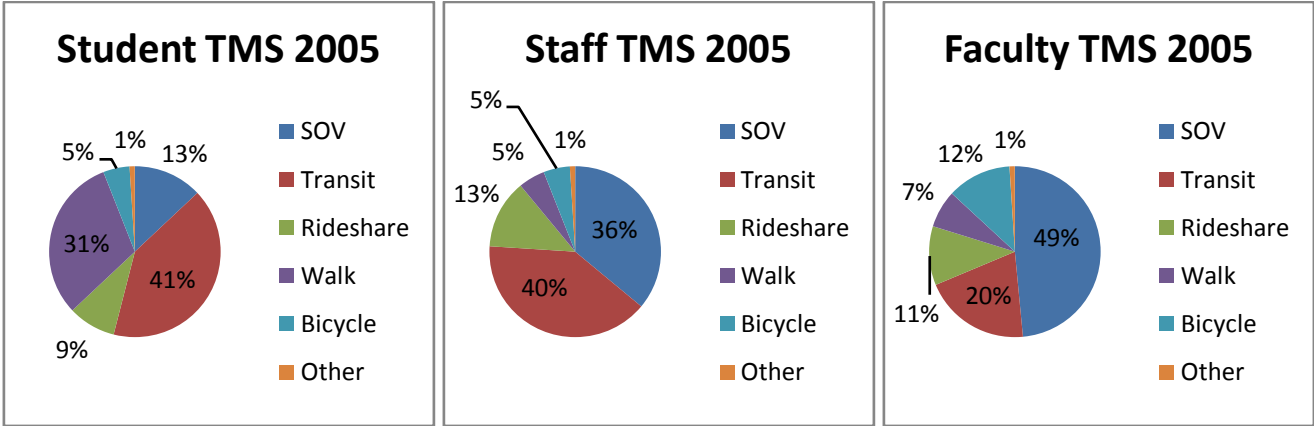
**Long Term Goals:**

Tactics to address CO<sub>2</sub>e from commuting attack one of three primary factors, vehicle emission factors, vehicle miles traveled, and transportation mode split. The University's greatest influence and our best opportunity for substantive results over the long term lies in Transportation Mode Split (TMS). Much of our past success has come from shifting commute activity from the highest impact mode (drive alone) to lower impact modes (primarily transit). The UW's future

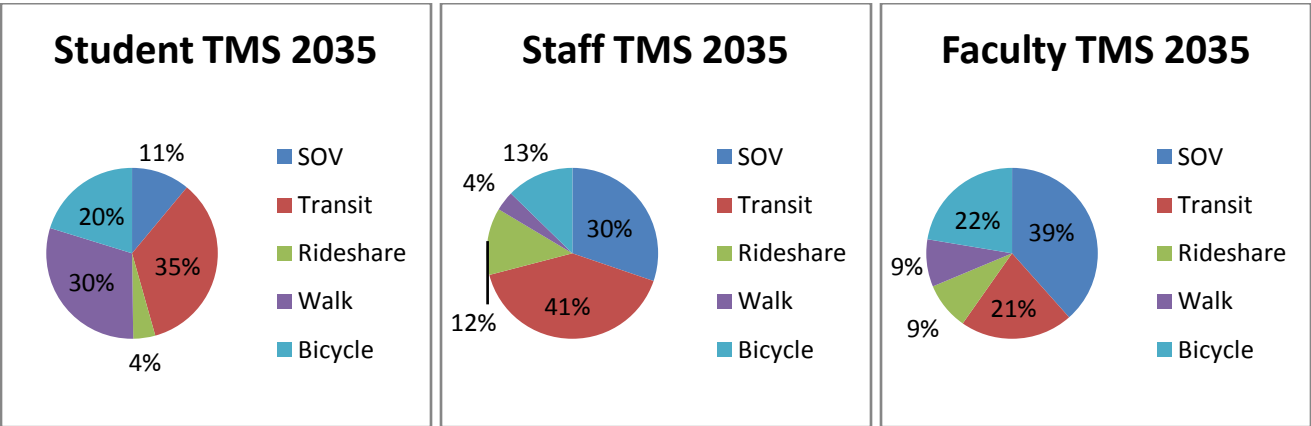


success will hinge on continued incremental reductions in drive alone rates while shifting significant numbers of commuters from motorized modes (including transit) to active transportation (walking and bicycling). Another long term goal is to develop campus infrastructure to support private electric vehicle charging.

The 2005 baseline UW TMS consists of:



The UW CAP target of a 15% reduction from 2005 emission levels by 2020 has already been exceeded, with a 23% reduction from 2005 levels achieved by 2010. As a result, 2035 behavioral targets are being set to meet the University’s goal of a 30% reduction in commuting emissions by that date. To attain a 30% reduction in CO2e from commuting the UW is targeting the following 2030 TMS goals:

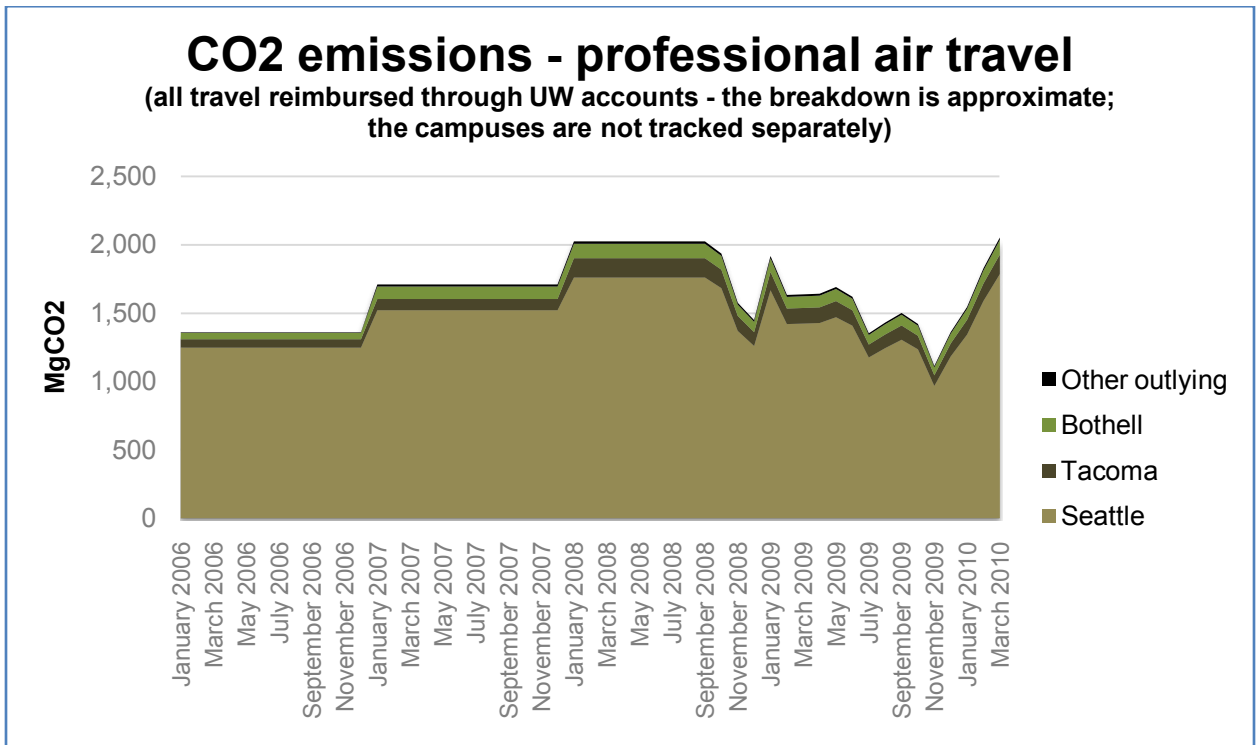


**F. Professional Travel**

Professional travel, a significant contributor to transportation-related GHG emissions, includes air or vehicle travel to and from conferences, typically a longer distance than commuting to and from work, in addition to being less frequent. That said, such travel also plays a vital role in research, teaching, and

administrative activities at the UW. Professional travel also includes fleet and other local business transportation. Reduction targets will have to be carefully balanced against the UW's research and educational mission. (See Figure 4).

Figure 4



**Accomplishments:**

1. The UW fleet size has been reduced by 5.9% since September 2009 and seen a .7% increase in fuel economy, resulting in a 4.4% reduction in total fleet emissions.
2. UW Shuttle has seen a 7.6% increase in ridership.

**Short-term (2 year) Goals:**

1. Enhance tele/videoconference infrastructure and encourage institutional support.
2. Focus fleet purchasing on electric vehicles and partial electric vehicles; centralize management of compliance reporting for fleet and non-fleet UW

- vehicles; develop minimum efficiency requirements for department-owned vehicles, prioritize shared vehicles (U-Car, D-Car) over assigned vehicles.
3. Develop efficiency and occupancy incentives tied to mileage reimbursements.
  4. Encourage walking for on-campus and campus adjacent travel.

**Long term Goals:**

1. Improve monitoring of air travel emissions.
2. Develop and implement professional travel policies.
3. Purchase offsets for professionally-funded travel (air and vehicle).
4. Establish department and public bike sharing programs.

**G. Information Technology/Computing**

**Accomplishments:**

1. Completed an ESCO Project at the UW's primary on campus data center (4545) to increase use of free cooling and to facilitate heat capture from the data center to heat the office tower of the building. The building is on track to save an estimated 4.2 million kWh of electricity, 601 kW of demand, 529 cubic feet (CCF) of water consumption, and 3,713 CCF of sewer consumption annually.
2. Completed construction of data center in UW Tower to provide opportunities for consolidation of campus computing assets from campus buildings to central conditioned computer space. Construction included installation of energy efficient lighting and lighting controls and enables the use of free cooling during the cooler months to reduce energy cost (both dollars and tons of carbon).
3. Installed Building Management Systems (BMS) in the data centers to control, monitor and measure facilities equipment operation and energy utilization
4. Converted approximately 10% of UW-IT managed servers to virtual servers per year, and migrated older, power-hungry systems to more power-efficient hardware platforms.
5. Identified and completed evaluation of vendors who can provide a scalable and flexible approach to desktop power management.

**Short-term (2 year) Goals:**

1. Improve data center power utilization efficiency (PUE) by decreasing the ratio between total power delivered and power directed to computing work accomplished. Ideal ratio is 1.0. Current data center PUE in the UW's primary data center is estimated at 2.0. An attractive pricing structure has been created to incentivize relocation of department server equipment into

data centers. Data center clients will be required to replace non-rated server equipment with Energy Star and EPEAT certified equipment.

2. Replace end-of-life servers managed by UW-IT with either a virtual or physical server, depending on the customer's requirements.
3. Investigate a campus-wide approach to provide a way for systems administrators to better understand and manage power usage of desktop computers.

**Long term Goals:**

1. Install Building Management Systems (BMS) equipment in the remaining data centers and mission critical facilities to control, monitor and measure energy utilization.
2. Install and integrate a power monitoring system to provide metrics and opportunities to perform better power management in all data centers and mission critical facilities.
3. Achieve 50% virtualization over the next 3 years. Currently, about 20% of the servers managed by UW-IT are virtual servers.
4. Utilize a power management software solution to gather power usage statistics on desktop systems, provide reports and customization of power management per desktop and provide a simple way to better manage and reduce desktop power consumption.

## **H. Select Examples of Other UW Sustainability Efforts**

**Housing and Food Services (HFS) Accomplishments:**

1. Increased the amount of total materials sent to local composting facility to over 600 tons in 2009 (increased from about 500 tons in 2008). Increased the percentage of compostable service ware in HFS restaurants from 89 to 100 percent.
2. Sent 1,100 gallons of cooking oil to be recycled for biofuels.
3. Sent 60+% of all disposables from HFS facilities to recycling or composting facilities.
4. Modified Summer Scram locations for the collection of reusable items during residence hall move-out. At the end of spring quarter 2010, 75 tons of reusable items were diverted from the waste stream.
5. Allotted about 27 percent of food expenditures toward local or sustainable products (organic, fair trade, Monterey Bay Aquarium-approved seafood, etc).

6. Initiated a logistics plan to reduce deliveries from outside vendors as well as on campus.
7. Continued to provide ongoing compost program information to other institutions.
8. Continued to collaborate with local partners such as Cedar Grove Commercial Composting and the City of Seattle in developing local programs, and with national manufacturers, such as International Paper, to develop new products.

**Short term (2 year) goals:**

1. Improve landfill avoidance from 60 to 65 percent.
2. Complete one LEED Gold-accredited Residence Hall and one LEED Silver-accredited apartment building.

**Long term goals:**

1. Improve landfill avoidance to 80 percent.
2. Complete ten additional LEED-accredited residence hall projects, adding 2,500 additional beds on campus (impact to transportation carbon).
3. Create a theme community in one residence hall focused on sustainability.
4. UW Bothell: ban all water purchased in plastic bottles.

**Paper Reduction Project**

This project was undertaken, in part, to comply with the 2009 Washington State Substitute House Bill 2287, which directed state government agencies, including the University to use 100% recycled paper and reduce paper use by 30%.

**Short-term (2 year) Goals:**

1. Make 100% Post Consumer Recycled Paper the default paper for cut sheet bond paper for copiers and printers
2. Develop and implement a paper conservation program that will reduce cut sheet bond use by 30%
3. Increase recycling of 100% of all copy and print paper
4. Encourage users to print on both sides of the page; to purchase Energy Star equipment with accountability meters; use scan-to-email.
5. Monitor quarterly progression of increase in purchase of 100% recycled paper.

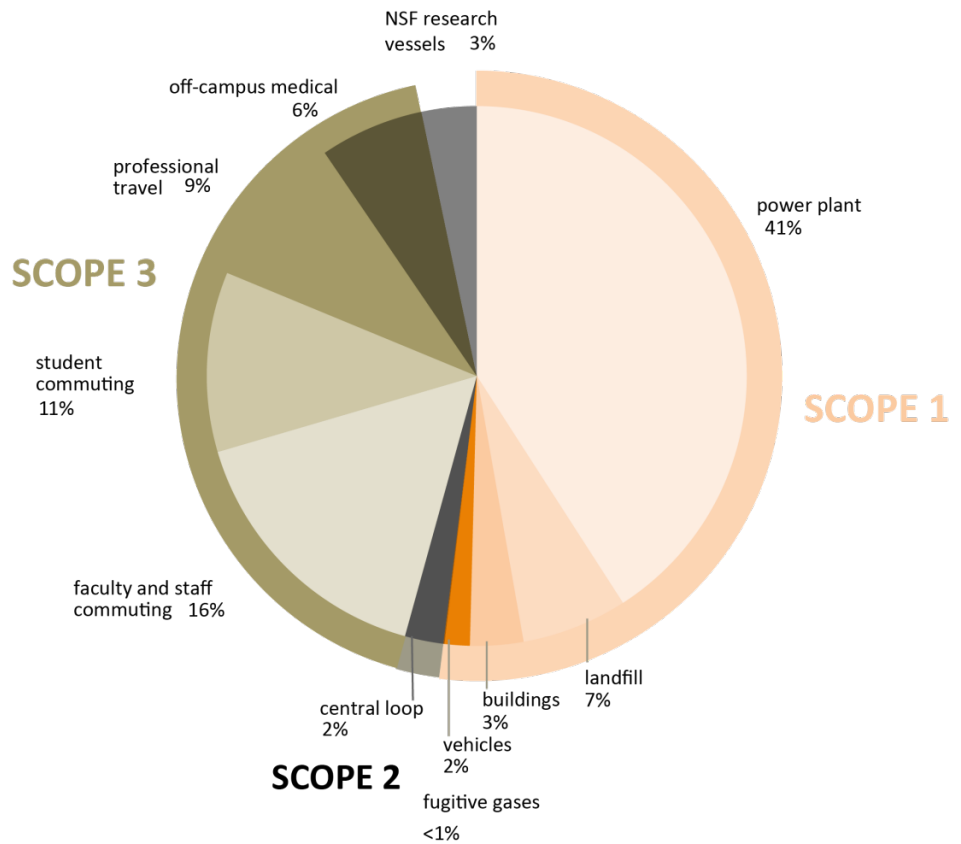


### III. APPENDIX

#### A. Carbon reduction by Scope

15% carbon reduction by 2020

		2005 (emissions - MG CO2e)	15% (amount to reduce by 2020)
Scope 1 - direct emissions	power plant	82,700	12,405
	landfill	12,800	1,920
	buildings	6,440	966
	vehicles	3,040	456
Scope 2 - electricity	fugitive gases	136	20
	central loop	4,670	701
Scope 3 - other emissions	faculty/staff commuting	32,700	4,905
	student commuting	21,800	3,270
	professional travel	18,700	2,805
	off-campus medical	12,600	1,890
Optional Information	NSF research vessels	6,640	996
	campus waste	(6,240)	
	forest carbon sequestration	(16,400)	
<b>University-wide total</b>		<b>188,000</b>	<b>159,800</b>



## **B. Gaining Efficiency**

The following are more specific ways in which the University has become more efficient with its consumption of energy and use of natural resources. For some of these projects, it is unclear how much carbon reduction these current projects or analyses will provide, given the short time that has passed since the CAP was published. For other projects, the information provided is quite detailed and technical and thus provides further explanation and support of initiatives discussed in the document.

### **Facilities and New Building Construction**

One of the easiest ways to reduce emissions is to make affordable housing available to faculty, staff and students closer to campus.

#### **Savery Hall (Completed)**

##### **SUSTAINABLE FEATURES--ENERGY:**

1. Through the use of demand control ventilation with CO<sub>2</sub> sensors, the system is able to identify the present occupant needs and adjust the ventilation accordingly.
2. High efficiency glazing on windows prevents daytime glare and reduces cooling needs.
3. Occupancy sensors reduce lighting energy throughout the building and average lighting power density of offices and other occupied spaces.
4. Increased efficiency of insulation contained in the building envelope also further serves to reduce both heating, ventilation, and cooling costs.

##### **INNOVATIONS:**

1. Mechanical equipment has improved energy efficiency beyond ASHRAE 90.1. Variable Frequency Drives (VFD) to reduce energy consumption.
2. The Variable Refrigerant Flow System transfers energy through refrigerant which results in significant fan and compressor energy savings.
3. Water use reduction of 30% in water savings achieved through the use of low flow water fixtures, toilets, and shower heads.
4. Pre-existing unusable building materials were diverted as recycled construction waste resulting in 96% construction waste recycling and 32% recycled content in building materials, low VOC material finishes, 40% of materials from within 500 miles.

## **Clark Hall (Completed)**

### **SUSTAINABLE FEATURES – ENERGY:**

1. Energy efficiency rating of 50% better than ASHRAE 90.1-2004 standard.
2. New operable energy efficient windows, ceiling fans, and skylights with rain sensors.
3. Naturally ventilated building, with no additional cooling provided in occupant use spaces and met the 2030 Challenge.

### **INNOVATIONS:**

1. Recycled Building Materials of 28%, regional materials, either produced or constructed within 500 miles, of 50%, and 94% (192 tons) of the pre-existing unusable building materials were diverted as recycled construction waste.
2. Water use reduction of 38.4% was achieved through the use of low flow water fixtures, toilets, and shower heads.

## **Husky Union Building (Planned)**

1. Green roof on the south end of the building.
2. Low flow toilet fixtures and natural ventilation in the atrium and meeting rooms.
3. Air conditioning is limited to part of the kitchen, the bowling alley to preserve the lanes, and the ballrooms and the new multipurpose room, formerly the auditorium.
4. Heating provided by the UW's Central Cooling Water (CCW) loop.

## **Intramural Activities Building (Planned)**

1. Potential for power producing plant to be placed on the roof.

## **Expanded Energy Audit for Existing Buildings (Planned)**

1. Examine existing building's systems and performance
2. Identify possible energy (electrical power and gas), resource conservation (water savings and sustainable concepts), and operation and maintenance measures
3. Quantify each measure's potential benefit and apply measures to reduce campus energy demand and reduce carbon footprint.

## IV. Glossary

<b>ABB</b>	Activity Based Budgeting
<b>CO<sub>2</sub></b>	carbon dioxide
<b>CO<sub>2</sub>-equivalent</b>	the equivalent mass of CO <sub>2</sub> required to have the same global warming effect as an identical mass of any other greenhouse gas
<b>CO<sub>2</sub>e</b>	CO <sub>2</sub> -equivalent
<b>ESAC</b>	University of Washington Environmental Stewardship Advisory Committee
<b>GHG</b>	greenhouse gas – the two that are most abundant in the UW inventory are CO <sub>2</sub> and methane; 1 unit of methane has the warming potential of 23 units of CO <sub>2</sub>
<b>LEED</b>	Leadership in Energy and Environmental Design, a certification program of the U.S. Green Building Council
<b>Offset</b>	a reduction of GHGs attributable to a particular project that can be sold to a party other than the owner of the project
<b>Submetering</b>	measuring electric, steam or other energy use on a building-by-building basis, even when energy is supplied by a central utility plant
<b>University Advancement</b>	the fundraising arm of the UW administration
<b>UWESS</b>	the UW Environmental Stewardship and Sustainability Office
<b>Virtualization</b>	the practice of executing computing processes that normally require different pieces of equipment on a single piece of equipment, or enabling a computing process that normally requires a specific piece of equipment to operate on multiple pieces of equipment

## V. Contact Us

This document was prepared by the University of Washington Climate Action Plan [Oversight Team](#). Please direct any related comments and questions to the UW's Environmental Stewardship and Sustainability Office at [smhelp@u.washington.edu](mailto:smhelp@u.washington.edu).