Portland State
UNIVERSITY

CLIMATE ACTION PLAN 2010

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A more printer friendly version is available at
http://www.pdx.edu/sustainability/climate-action-plan

This document is owned by the Portland State University (PSU) community; all pertinent information was compiled by the Campus Sustainability Office (CSO).

All suggestions and inquiries may be directed to GreenCampus@pdx.edu.

Acknowledgements

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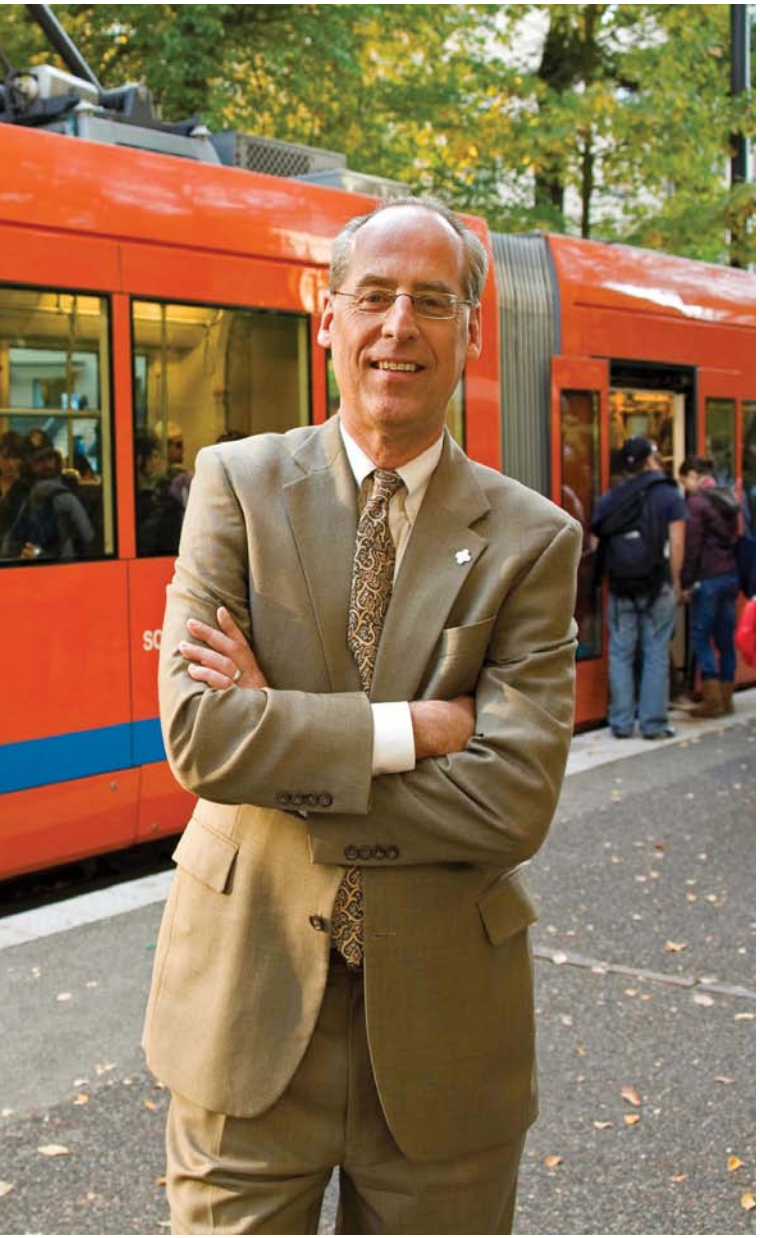
President's Message



Portland State University joined the American College & University Presidents' Climate Commitment (ACUPCC) in 2007. That commitment, which now numbers 685 signatories, challenged universities to take a leadership role in curbing greenhouse gas emissions.

Through a campus-wide effort, we have established an inventory of our greenhouse gas emissions, and developed strategies for achieving "carbon neutrality" by 2040.

Portland State is an urban university with a growing enrollment that today approaches 30,000 students. We have plans for additional on-campus housing and facilities, an aggressive research agenda and increasingly global profile.

Yet by thinking bigger, we can reduce our environmental footprint.

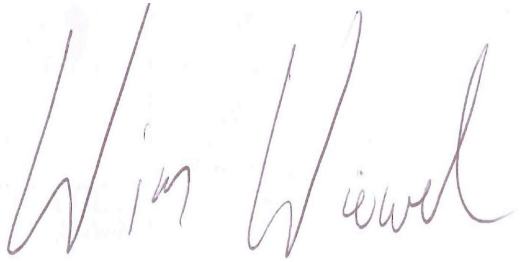
As the ACUPCC states: "We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality."

To accomplish this means finding ways of constructing greener buildings, as we have with the new Academic and Student Recreation Center, which earned LEED Gold certification from the U.S Green Building Council. It means establishing new standards of practice, as we will with the creation of a downtown ecodistrict anchored by the Oregon Sustainability Center, the world's first high-rise net-zero building.

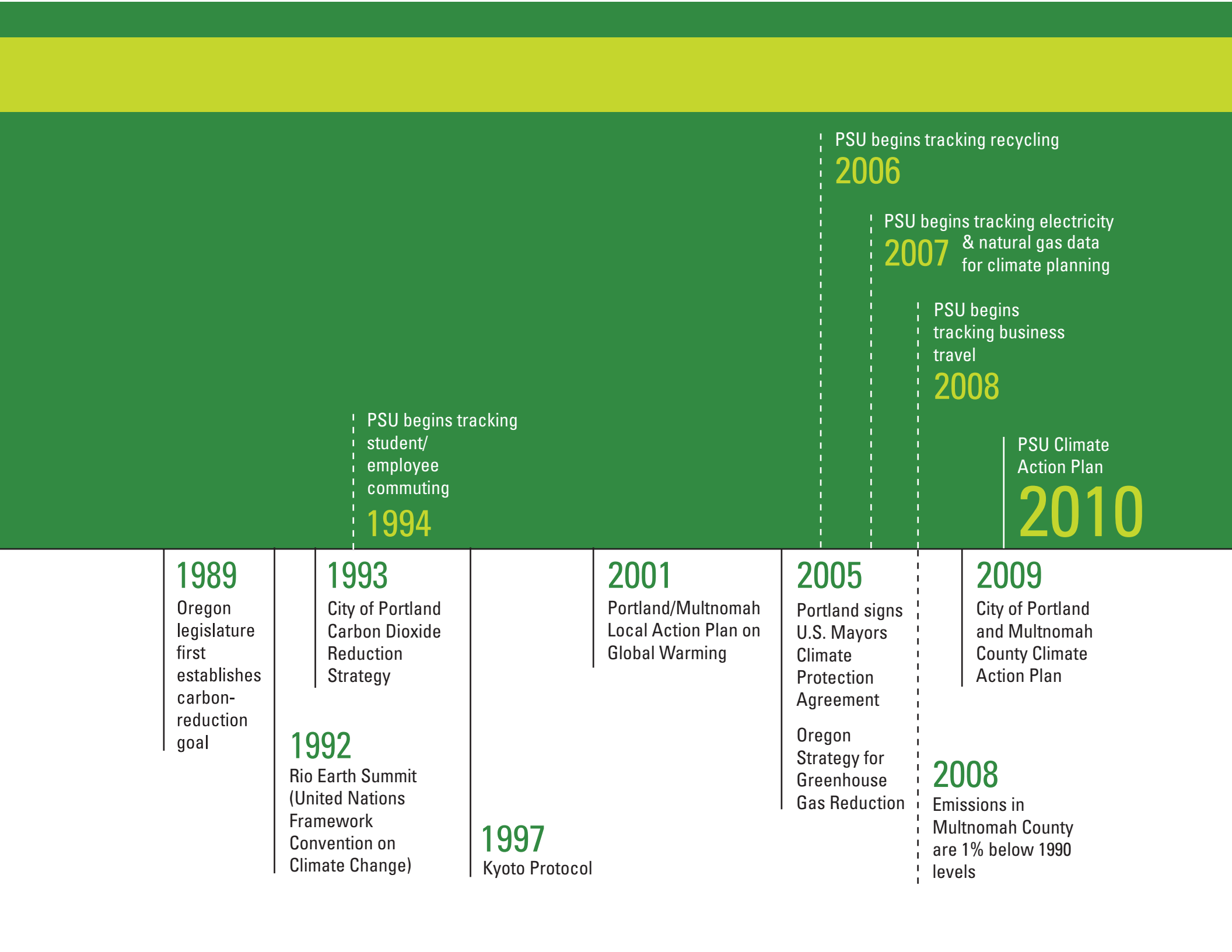
It means reducing waste, finding greater efficiencies in energy usage, and creating smarter travel and commuting options. And it requires that we continue to do what we do best, bringing excellence in teaching and research to partnerships that span disciplines, industry, government, and citizenry.

In short, this climate commitment embodies Portland State University's core values of engagement, and of our motto, "Let Knowledge Serve the City."

This Climate Action Plan illuminates the enormous potential of a truly integrated approach: engaging students, faculty, staff, and our community in solving one of the pressing issues of our time, and in doing so, creating a more livable, sustainable future.



Wim Wiewel, President
Portland State University
Signed 24th of May, 2010


PSU begins tracking recycling
2006
PSU begins tracking electricity
2007
& natural gas data
for climate planning
PSU begins
tracking business
travel
2008
PSU begins tracking
student/
employee
commuting
1994
PSU Climate
Action Plan
2010
1989
Oregon legislature first establishes carbon-reduction goal
1993
City of Portland Carbon Dioxide Reduction Strategy
1992
Rio Earth Summit (United Nations Framework Convention on Climate Change)
1997
Kyoto Protocol
2001
Portland/Multnomah Local Action Plan on Global Warming
2005
Portland signs U.S. Mayors Climate Protection Agreement
Oregon Strategy for Greenhouse Gas Reduction
2008
Emissions in Multnomah County are 1% below 1990 levels
2009
City of Portland and Multnomah County Climate Action Plan

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PSU Goal:
80% below
2008 levels

2030

PSU Goal:
Carbon Neutral
Campus

2040

2030

Portland/Multnomah
Target: 40% below
1990 levels

2050

Portland/Multnomah goal:
80% below 1990 levels

State of Oregon goal: 75%
below 1990 levels

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Executive Summary

Climate change is the biggest challenge 21st century college graduates will tackle in their lifetimes. The concentration of carbon dioxide in Earth's atmosphere is higher than at any time in the history of human existence. This has already begun to destabilize systems that support our civilization through fresh water, food, and health. Because the risks associated with business as usual are high, governments, institutions, corporations, and individuals are taking steps to dramatically reduce greenhouse gas (GHG) emissions.

In June 2007, Portland State University (PSU) joined this effort by signing the American College and University Presidents Climate Commitment (ACUPCC). The commitment challenged PSU to form a committee to oversee climate efforts, track carbon emissions, and develop a Climate Action Plan (CAP) to move toward carbon neutrality. This document fulfills the final requirement for ACUPCC and supports regional climate goals of partner agencies, such as those described in the 2009 City of Portland and Multnomah County Climate Action Plan.

In fiscal year 2008 PSU generated approximately 106,000 Metric Tons of Carbon Dioxide equivalent (MTeCO2). This equates to 3.85 metric tons for every student and employee, or the equivalent annual emissions from 20,000 passenger vehicles[1]. The largest portion of PSU's emissions was associated with goods and services purchased by the University. Utilities to operate buildings (heating, cooling, lighting, powering electronics, and appliances) were the next largest source of emissions.

PSU's goal is to neutralize carbon emissions by 2040. In order to achieve this goal, the CAP outlines long-range targets and near-term actions that align with the State goals found in OR HB 3543, the State mandates OR HB 3612 and EO98-07, and the City of Portland and Multnomah County Climate Action Plan. In order to track performance and ensure PSU is making incremental steps towards carbon neutrality, near-term (one to three-year) actions and 2030 Targets have been identified for each of six sectors: Buildings, Materials, Travel, Commuting, Research and Education, and EcoDistrict Development.

The University's general approach to emissions reduction is as follows:

1. Reduce emissions through resource conservation and efficiency improvements of campus systems. This will reduce University utility expenditures and decrease the flow of Oregon tax dollars to other regions where fossil fuels are extracted; additionally, retrofits will support local jobs.
2. Choose less-harmful goods, services, and energy sources. Savings from conservation efforts may be redirected toward purchasing healthier products and forms of energy. The premium for less carbon-intensive items will change when the market attaches a dollar value to carbon emissions.
3. When all other options have been exhausted, PSU will invest in the region through locally generated offset projects.

Cultivating non-traditional partnerships and harvesting local sources of intellectual capital will be important for achieving PSU's 2040 carbon neutrality goal. Wherever possible, University facilities and operations will be used as learning tools and research topics for students. Students are fascinated by research questions about the merits of hand dryers versus paper towels or, "How much energy is used by the student union?" In response to this interest the CAP has identified a series research opportunities for integrating the academic and operational sides of the University.

PSU will know if it is meeting CAP targets and goals by tracking data about natural resource flows in and out of the University. This is also a key to success of the budding EcoDistrict Initiative – an attempt to bring an entire neighborhood into alignment with local environmental goals. This initiative also represents partnerships between public, private, academic, and non-profits interests, and it can serve as a platform for overcoming traditional barriers and accelerating progress towards regional climate goals.

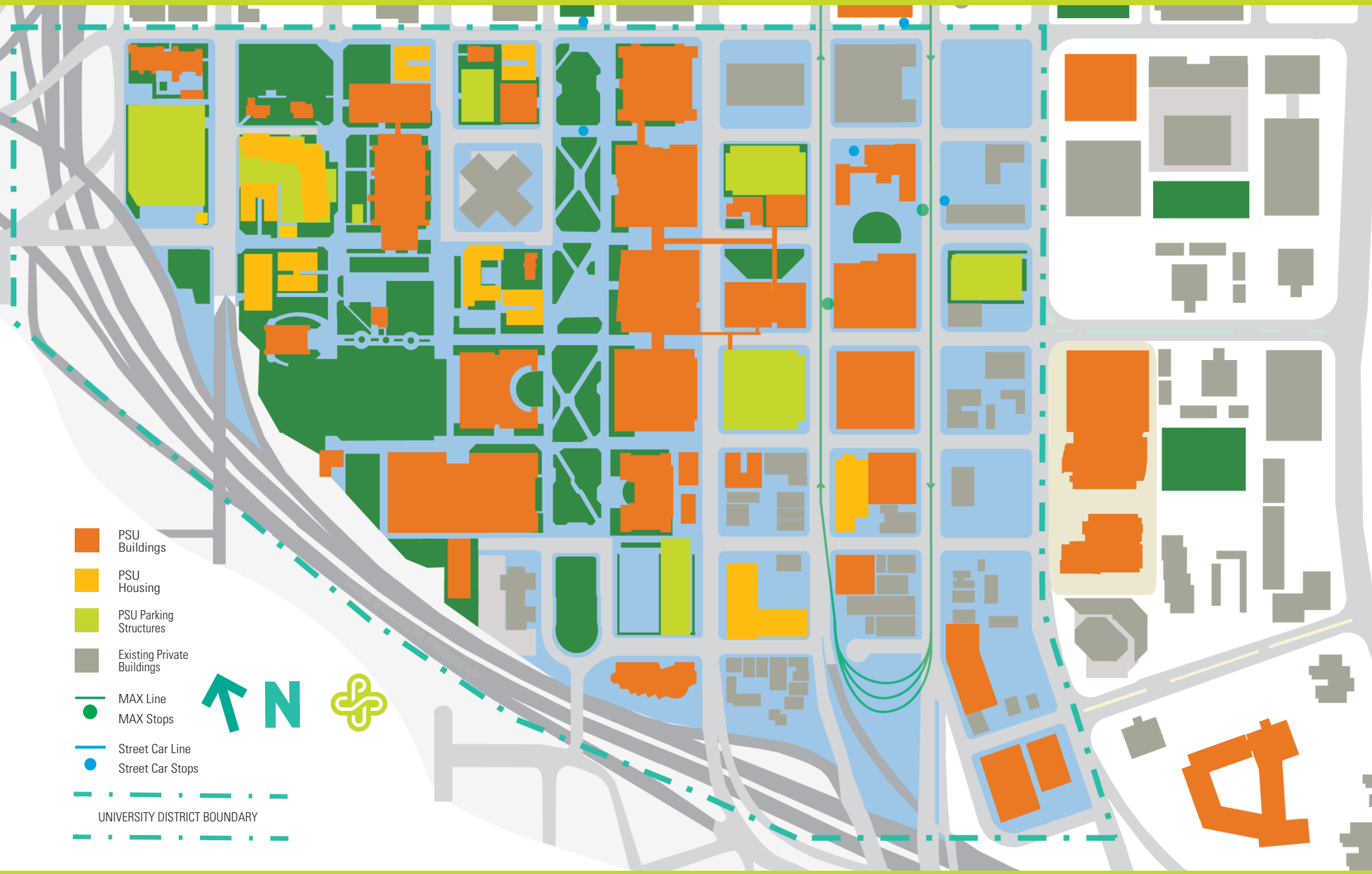
Financial capital will also be essential for meeting emissions targets. To date, PSU has successfully leveraged state funds and Energy Trust of Oregon dollars for major capital construction projects. In order to achieve the goals and targets in the CAP, PSU will investigate partnerships with the Climate Trust and leverage bonds and funds from the State Energy Loan Program. The University will also investigate internal financial strategies to incentivize conservation, design an energy fund to fuel small conservation projects, and consider innovative means to fund personnel in traditionally understaffed areas.

The actions in this plan will result in direct emissions reductions while also supporting PSU's educational mission and strengthening its role as an anchor institution in the heart of Portland. By integrating this Plan into the day-to-day operations and activities of the University, PSU will:

- Create a rich learning environment that supports the next generation of leaders, designers, engineers, and entrepreneurs who will help transition our region into a carbon-light economy.
- Ensure that students are equipped with basic ecological literacy to inform their civic engagement activities.
- Test existing sustainability practices and bring new technologies to the market through collaborative research.
- Identify and implement local projects to offset PSU's unavoidable carbon generation practices.
- Make strategic investments in energy conservation to keep campus utility bills in check so PSU can continue to offer affordable higher education opportunities in an environment of rising energy costs.
- Leverage PSU's bonding capacity and considerable buying power to finance meaningful projects with local partners that make our region more energy sufficient.
- Increase workforce training opportunities for under-represented groups in green jobs.

Guided by the Climate Action Plan, PSU will join leaders around the region in creating a vibrant carbon-light future. Engaging all aspects of the University in pursuit of carbon neutrality will foster a culture of innovation and educational inquiry, create a leaner and more adaptable organization, and guide and shape PSU as it strives to increase academic prominence in a rapidly changing world.

PORTLAND
STATE


PSU Buildings
PSU Housing
PSU Parking Structures
Existing Private Buildings
MAX Line
MAX Stops
Street Car Line
Street Car Stops
UNIVERSITY DISTRICT BOUNDARY
N

In June 2007, Portland State University (PSU) joined the American College and University Presidents Climate Commitment (ACUPCC). The commitment challenged the University to begin tracking greenhouse gas emissions (GHG) and develop a climate action plan to reduce emissions. PSU's most complete emissions inventory was for fiscal year 2008 (July 2007-June 2008). Using this 2008 data as a baseline, this Climate Action Plan (CAP) aims to provide a framework for advancing PSU's climate stewardship over the next 30 years.

The CAP describes a path to transform PSU into a carbon neutral campus by 2040 through medium-term targets and short-term actions. It outlines PSU's institutional capacities and acknowledges current initiatives for which ongoing support is necessary for success. Additionally, the Plan outlines actions essential for building PSU's capacity to effectively prepare for, implement, and track progress of emissions reductions projects. These efforts include improving data collection systems, cultivation of faculty/student/staff resources, and gathering of monetary support. Lastly, the Plan outlines specific carbon reduction actions, such as installing high-efficiency boilers, initiating waste reduction campaigns, and developing on-site renewable energy technology.

At the start of the CAP planning process, the Campus Sustainability Office (CSO) took a leadership role in drafting the Plan, including gathering data, setting goals and targets, and identifying mitigation actions. Gradually, natural leaders emerged within each mitigation area and began to shape the content of their respective sections of the Plan with the support of the planning team. As the Plan transitions from development to implementation, CSO's role will be one of support, facilitation, and integration for the working groups who are leading the bulk of the action items. Although CSO's role will be increasingly behind-the-scenes, the office will continue to be a primary steward of capacity-building and data collection over the next three years.

To ensure that the Plan responds to changing conditions at PSU, in the region, and in the world, it will be a living document, reviewed and revised every three years. The focus of the first three years will be communicating, integrating, and supporting the good work already being done on campus, developing the capacity to effectively enact and track the results of emission reduction projects, and implementing a targeted set of new emissions reduction programs and projects. As internal capacity for implementing and tracking projects increases, the Plan will shift the bulk of its focus to building new, and expanding existing, emissions reduction projects and programs.

Central to the overall vision presented in this document is a deliberate effort to think systematically, test new strategies, and cultivate unconventional approaches to problem solving. This Plan outlines numerous projects that take a systematic approach to problem solving, such as researching the technological and behavioral efficiencies that could be achieved through collaboration with university neighbors, or developing new methods for better connecting the everyday work of faculty and students to university operations. These seedling projects will hopefully grow into an ongoing, campus-wide dialogue about creative solutions to climate problems. In addition to playing a leadership role in developing local solutions to global problems, PSU also aspires to integrate ideas and approaches from other institutions and organizations. Therefore, it is vital that PSU pursues collaborative projects with local, regional, and global partners.

Context

Federal, State, and local legislation, as well as best practices in climate planning, were used to guide and compel PSU's climate action planning process. This backdrop of policy and research provided a reference for setting emissions reduction targets and goals. The bulk of the planning work consisted of evaluating current conditions at PSU and adjusting the targets and actions to reflect the operating context and intellectual resources available to a state-funded urban research university. This section describes the context behind the Plan and establishes a basis for future evaluation, review and adjustment cycles.

Climate Change and Emissions

The Rio Summit in 1992 was a major step toward bringing climate change and the impact of greenhouse gas (GHG) emissions onto the global stage. Since that summit, there has been a steady increase in awareness and action around climate issues. Climate stewardship is becoming a competitive advantage for large corporations; governments (local, state and federal) are analyzing the risks and opportunities associated with climate mitigation; and an increasing number of universities are realizing the potential for education and workforce training in a carbon-constrained world.

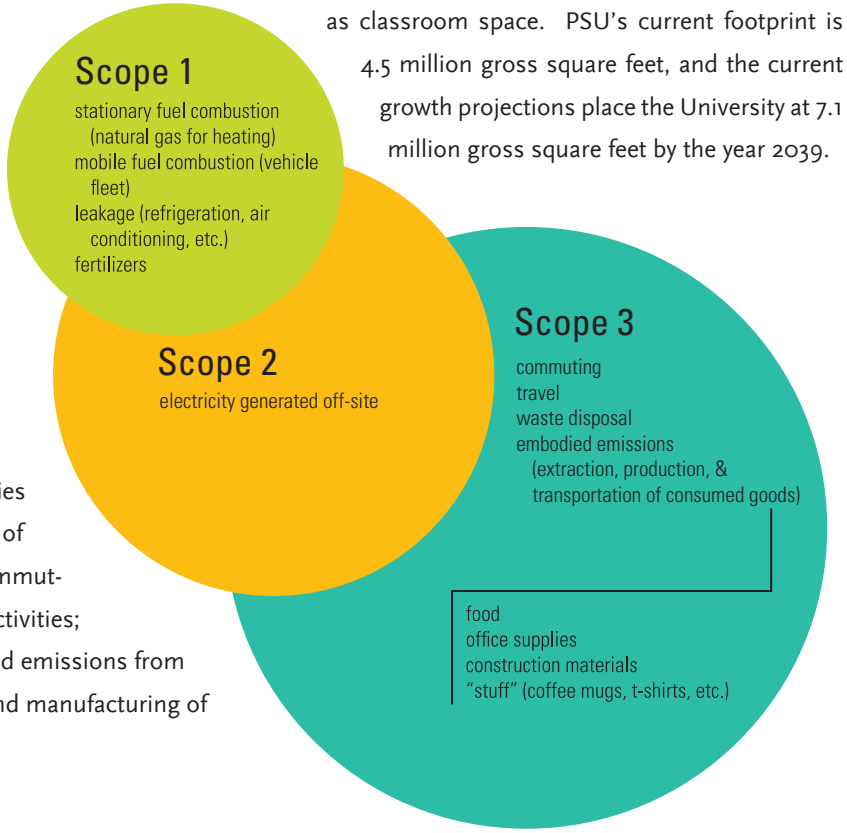
Standards and Conventions

To better comprehend PSU's role in climate-altering fossil fuel consumption, it helps to understand the international framework used to describe greenhouse gas emissions. The World Resources Institute's Greenhouse Gas Reporting Protocol divides emissions into three categories[2]:

Scope 1 emissions are those GHGs that are directly released on-site, such as combustion of fuels and the application of fertilizers on campus.

Scope 2 emissions result from energy purchased from off-site sources where fuels are burned. PSU currently purchases electricity that is generated off-site.

Scope 3 emissions include all other GHG-producing activities associated with the activities of an institution, including: commuting; air travel for university activities; waste disposal; and embodied emissions from the extraction, production, and manufacturing of purchased goods.



PSU is a center of opportunity for 28,000 undergraduate and graduate students. The University's 49-acre campus is located in the southern portion of downtown Portland, Oregon. The University is expected to have significant growth over the next 30 years. Conservative projections estimate adding 500 students per year, totaling 12,500 additional students by the year 2039. In order to accommodate this growth, PSU plans to increase on-site housing as well as classroom space. PSU's current footprint is 4.5 million gross square feet, and the current growth projections place the University at 7.1 million gross square feet by the year 2039.

Current Resources

The Campus Sustainability Office (CSO) is located within PSU Finance and Administration (FADM). The CSO currently has on full time manager, one part-time undergraduate assistant, an AmeriCorps members, and a temporary planner. CSO personnel frequently partner with staff in other units, such as Auxiliary Services, the Transportation Options program, PSU Recycles!, the Office of Sustainability Leadership and Outreach, Residence Life, Campus Recreation, student government and the Center for Sustainable Processes and Practices (on academic, research issues, and major events).

Within each emissions sector, PSU Climate Action Plan working groups were formed to develop action items that can be achieved based on the resources outlined within the Plan. As time goes on, CSO will help increase the capacity of these groups by: increasing the quality of data being used for tracking emissions, facilitating coordination and integration with research and curriculum projects, and securing additional funding for the action items in the plan.

Finally, PSU's motto, "Let Knowledge Serve the City," is a message that seeps into the operations, curriculum, and research of the University. Operations staff collaborate with city and regional government around sustainability efforts, such as increasing transit access to campus. PSU faculty conduct cutting-edge research on issues critical to the Pacific Northwest and beyond, including sustainable urban communities, climate change, ecosystem services, and renewable energy. PSU's academic structure does not confine sustainability to a single department or discipline. Faculty work across traditional boundaries to bring multiple perspectives to real-world problems, and students are exposed to a range of sustainability issues that extend beyond the boundaries of their field of study.

The scope of action identified in the plan is contingent upon resource allocation assumptions and may expand or contract throughout the three-year updating cycle. Additionally, CSO and the working groups will continue to search for new resources that can support and or help expand the work in the CAP.

Prior Efforts

Tracking GHG is a fairly new practice for the University, and record-keeping is evolving to keep pace with new demands. In fiscal year (FY) 2008, PSU invested in a single database to track utility bills seamlessly among three departments. Consequently, digital data quality for Scope 1 and 2 emissions is accurate for FY 2006-2009. FY 2008 marks the first year that University-sponsored travel was included in PSU's carbon inventory.

In 2009, the Oregon University System (OUS) Chancellor's Office funded a study by the McKinstry consulting firm to quantify emissions reduction potential and costs in key building performance areas. McKinstry performed an analysis of several buildings and extrapolated their findings to the rest of campus. Many of the actions outlined in the McKinstry study are already underway or completed. The CAP has used some of the remaining recommendations from the study to guide action items in the Buildings section. To view a full report of the McKinstry study findings and recommendations, please contact greencampus@pdx.edu.

The following represents a timeline of carbon emissions studies.

1994

PSU begins tracking commuting mode splits.

2003

First carbon inventory by a class of students with CSO.

2004

First carbon inventory for OUS system by Good Company(consulting firm)[3].

2006

PSU begins tracking recycling rates.

2008

Carbon capstone class completes inventory for FY07 emissions with CSO.

2009

Sightlines (consulting firm) produces a preliminary carbon estimate for FY 2008.

McKinstry (consulting firm) produces a report for PSU that identifies emissions reduction projects for campus buildings and estimates the costs associated with those projects.

Good Company (consulting firm) provides a lifecycle greenhouse gas analysis for PSU's purchased goods, food, and services in FY 2008.

Good Company (consulting firm) estimates a 1990 baseline for PSU emissions associated with energy consumption at 23,342 metric tons of CO_2 ($MTeCO_2$).

PSU begins tracking travel emissions.

2010

Using the Sightlines FY 2008 estimate as a base, CSO calculates a total emissions estimate that includes all categories of emissions.

Mandate

Climate Tracking and Planning

By signing the American College and University Presidents Climate Commitment (ACUPCC) in 2007, PSU agreed to begin tracking greenhouse gas emissions (GHG) and develop a plan to reduce emissions. The Association for the Advancement of Sustainability in Higher Education (AASHE) tracks the completion of tracking and planning efforts for universities that have signed the commitment. Universities are given a deadline (based on when they signed the commitment) for completing their climate action plan. Universities that have not completed the plan by the deadline are shown as delinquent in AASHE's yearly report.

State Legislation

PSU is also acting within the context of two laws passed by the Oregon legislature in 2007 and 2008:

HB 3543: Sets statewide goals to stabilize emissions in 2010, reduce emissions 10% below 1990 levels by 2020, and reduce emissions 75% below 1990 levels by 2050[4].

HB 3612: Oregon State agencies are directed to reduce energy consumption 20% below 2000 levels by 2015.

PSU's progress toward these statewide goals is highlighted in the "Emission Profile" section of the introduction.

Other Relevant Efforts

The Portland Metro area is a hub of interest for climate planning and sustainability initiatives. To prevent redundant work, the CAP attempts to align with and be aware of numerous activities. The plans and initiatives referenced in this document include PSU's Framework Plan, the Multnomah County and City of Portland's Climate Action Plan, the Portland Bike Master Plan for 2030, the EcoDistrict Initiative, the Multnomah County Food Initiative, Metro's Regional Inventory[5] and the national Climate Prosperity Project. These activities are referenced to varying degrees within the Plan; in many cases, further coordination with these interests is necessary. Due to time and resource constraints, some regional climate activities were not included in this version of the plan.

The EcoDistrict Initiative, a regional effort led by the Portland Sustainability Institute, is referenced throughout the Plan and highlighted in the EcoDistrict section. This initiative is focused on developing and implementing five pilot "EcoDistricts" throughout the Portland area, including one in the University District. An EcoDistrict, as defined by Portland Sustainability Institute, is: "A neighborhood or district with a broad commitment to accelerate neighborhood-scale sustainability. EcoDistrict members commit to achieving ambitious natural resource performance goals, guiding district investments and community action, and tracking progress over time."[6]

Welcome!
Tomatoes + Basil
Student Grown
$2.00 - 4" pot

Plan Development

Widespread participation and ownership in the planning process is vital for creating a Plan that people believe in and support. On January 15th, 2010, PSU submitted a discussion draft of the Climate Action Plan (CAP) to the Association for the Advancement of Sustainability in Higher Education (AASHE). The initial draft was written by the planning team and approved by administrators. On January 16th, the Campus Sustainability Office (CSO) began an intensive effort to communicate and solicit feedback on the discussion draft of the Plan.

This version of the Plan reflects input from a variety of faculty, staff, students, partner institutions, and community members. CSO engaged with an undergraduate class taught by Dr. Barry Messer called "Urban Planning: Environmental Issues" for the entire winter term (2010) to solicit input and conduct research on CAP goals and action items. During the winter term, CSO also made presentations to over 15 other classes (which equates to over 500 students) and held a campus town hall meeting (40 attendees) to present the draft Plan, answer questions, and solicit feedback. Additionally, the planning team has done targeted outreach to professors and staff and administered a campus survey to solicit responses to the goals, targets and actions presented in the initial draft of the CAP.

Finally, CSO coordinated with several PSU administrative offices to ensure interdepartmental agreement around the targets and actions outlined in the Plan. These offices include: Auxiliary Services, Facilities and Planning, Business Affairs Travel Office, Finance and Administration, and Academic Affairs. In addition, the Portland Bureau of Planning and Sustainability, Portland Metropolitan Regional Government (Metro), the Oregon Department of Environmental Quality and TriMet all provided input on discussion drafts of the Plan.

PSU emitted approximately **106,000 metric tons of CO_2** in financial year 2008

PSU's greenhouse gas (GHG) inventory for fiscal year (FY) 2008 provided a starting point for developing goals and setting targets. The FY 2008 inventory used previous data gathering by consultants and expanded on this data by working with administrative offices and local utilities companies to expand the scope of emissions included in the inventory. The final FY 2008 GHG estimate produced by the Campus Sustainability Office represents the planning team's best effort to gather accurate and detailed data about university emissions. Data sources for each of the sections in the plan are described below.

Buildings

- University electricity usage for 2000 and 2008 was estimated through utility bills in the archives of PSU Facilities and Planning (FAP), data from Portland General Electric, and the University's billing system.
- University gas usage numbers for 2000 and 2008 were estimated through utility bills in the archives of PSU FAP, data from Northwest Natural Gas, and the University's billing system.

Materials

Emissions associated with waste disposal were estimated using data from PSU's waste hauler, TrashCo, for total landfill tonnage produced by PSU. The Materials section also includes embodied, or "life cycle," emissions from the University's purchased goods, foods and services in FY 2008. These calculations were performed by the Good Company consulting firm in 2009.

Travel section

The Business Affairs Office produced data for PSU travel by going through old bills and tracking miles traveled and mode. These data were used to calculate carbon estimates based on the emissions associated with each travel mode.

Commuting section

The Transportation and Parking Services office (TAPS) conducts commuting mode split surveys for students and staff on a biennial basis. These survey data were used to calculate carbon estimates based on the emissions associated with each commute mode.

Limitations

Throughout the planning process, a variety of limitations and barriers related to availability and scope of emissions data were identified. Some of these limitations were addressed through the planning process, but others will require on-going efforts. These on-going efforts are discussed in the body of the Plan.

Data

Like many other institutions, PSU has only recently begun to gather data to track greenhouse gas (GHG) emissions. This lack of complete historic data contributes to a wide margin of error in estimates of 1990 and 2000 benchmarks. Oregon climate legislation is based on emissions levels from these years; however, 2008 was the first year PSU completed a comprehensive GHG inventory. Partial utility data sets are available, but it has been difficult to retrieve and compile complete datasets for past energy usage. In addition, data related to University-sponsored travel are difficult to access; multiple agencies outside of PSU must be contacted to gather information on chartered busses, van rentals, and car-sharing miles.

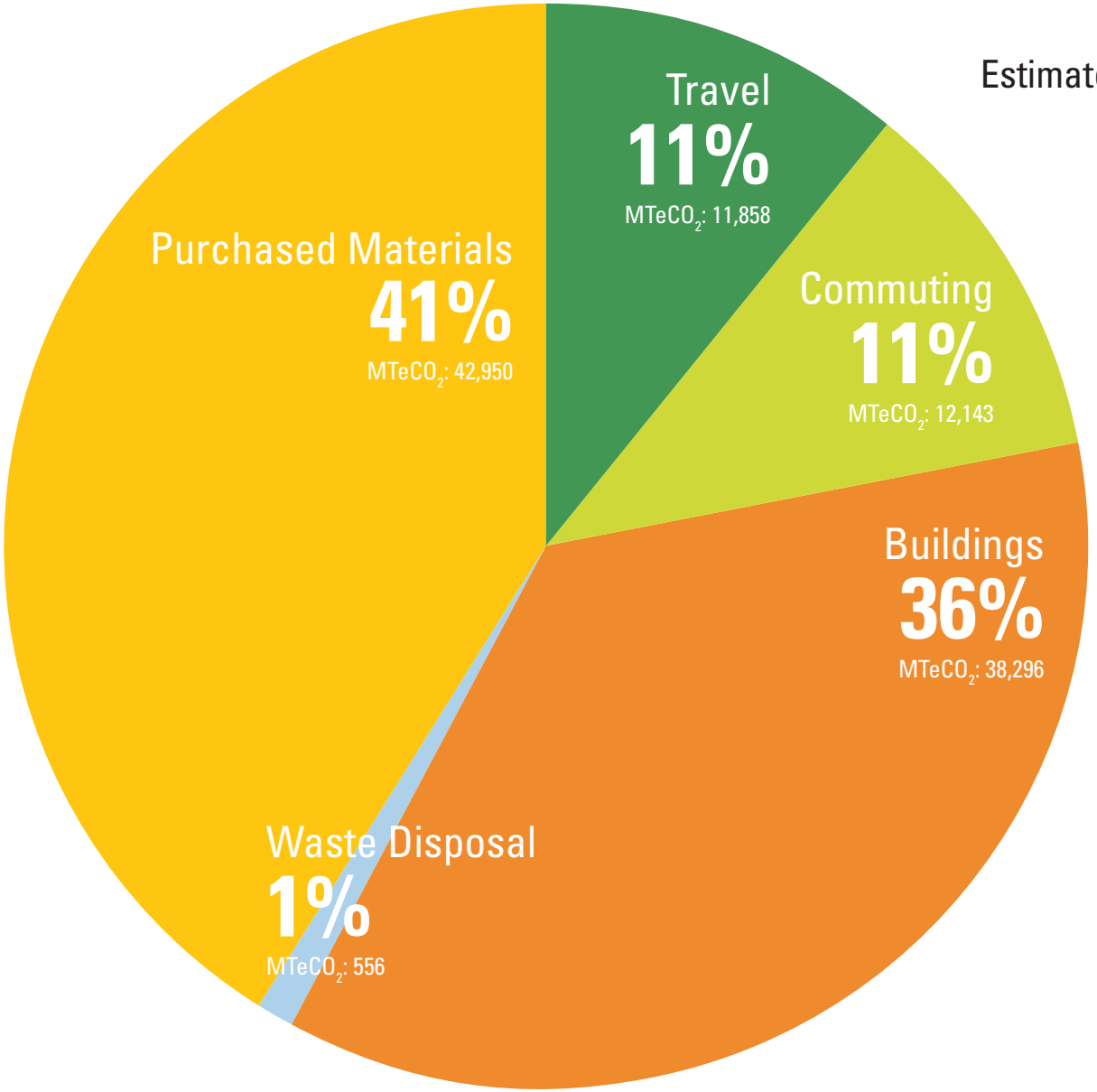
The data for the Buildings, Travel and Commuting sections only include the direct combustion emissions, and not the full fuel life-cycle emissions. The Materials section provides an estimate for the full fuel life-cycle emissions, which includes raw material extraction, production, transportation of goods and services consumed by PSU in FY 2008; however, this number is still an extremely rough value for the full fuel life-cycle emissions from Materials consumption.

The actions and timelines contained in this Plan are based on the data and resources available to the planning team. As new resources, such as life cycle analysis tools, become more available, the goals and actions in the CAP will be refined to reflect improved knowledge about emissions. There are several opportunities for improvement in data collection[7], and these are documented throughout the plan. As CSO develops its analytical capacity, the University will be in a position to move toward continuous improvement in climate stewardship.

Scope

Many Scope 3 emissions, which consist of indirect GHG emissions, are not easy to track accurately, although methods do exist for estimating their rough magnitude so they can be included in an institution's total inventory. While relatively accurate data for commuting and travel emissions and emissions from waste disposal were included in the Plan's estimates, embodied emissions associated with extracting, manufacturing, and transporting goods to campus are more difficult to track. Tracking embodied emissions is challenging due to: (1) the relative newness of methods of life cycle analysis and (2) PSU's decentralized purchasing structure. Considerable institutional changes need to occur before the University can effectively track and understand and the scope of impact related to its material consumption.

In addition, PSU's GHG inventory does not include Scope 1 emissions from heating and cooling leased spaces; Scope 1 emissions are limited to PSU-owned buildings.

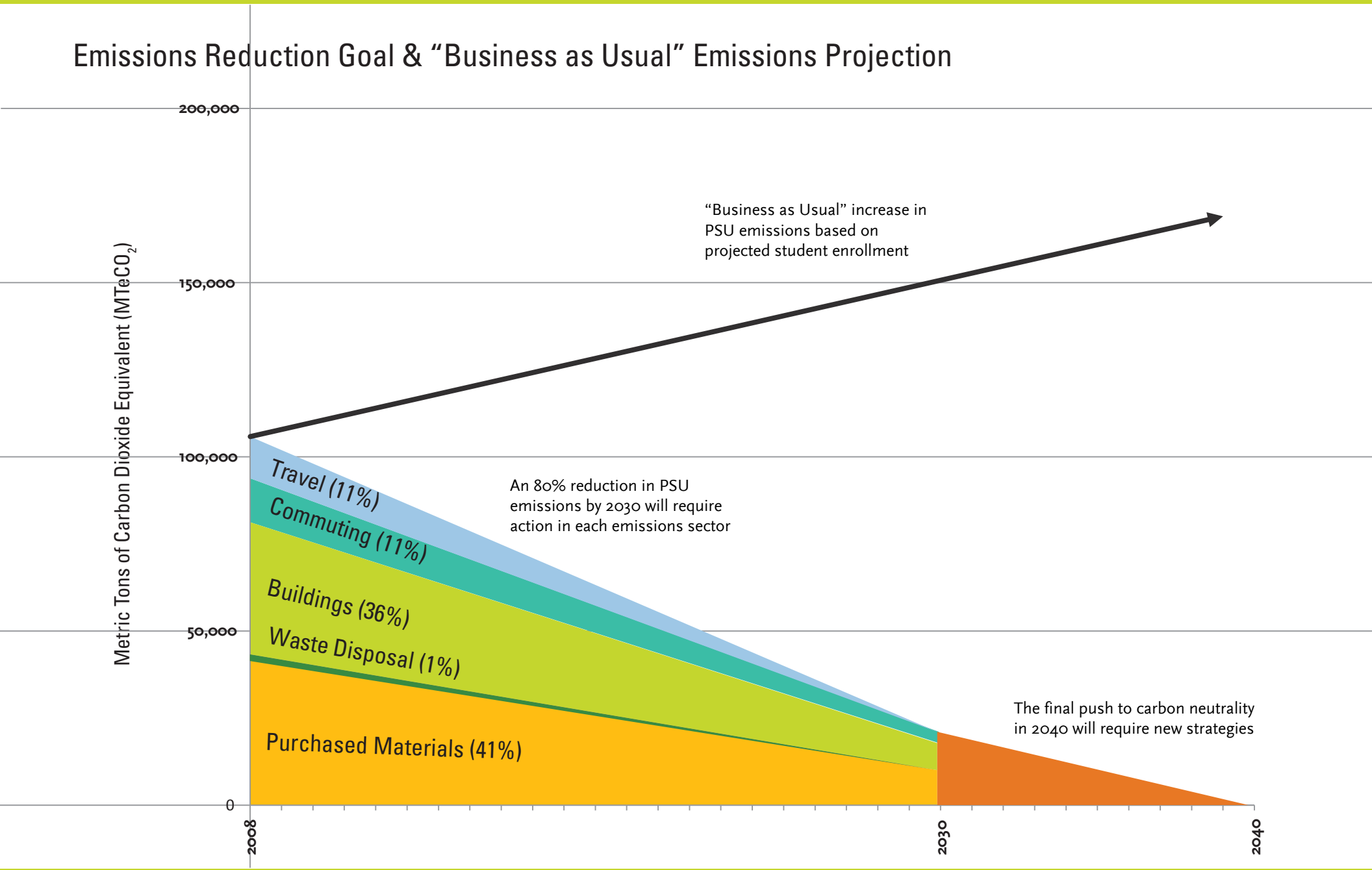


Portland State University
Estimated Greenhouse Gas Emissions
Fiscal Year 2008

Total $MTeCO_2$:

105,803

Emissions Reduction Goal & "Business as Usual" Emissions Projection



Establishing goals and setting targets will be an iterative and continuous process. The Climate Action Plan (CAP) will be adjusted and refined to reflect emerging knowledge and new resources that become available. Initial goals call for an 80% reduction in campus emissions by 2030 and carbon neutrality[8] by 2040 using 2008 as the baseline year.

The PSU Climate Action Plan calls for an **80% reduction** in campus emissions by 2030 and **carbon neutrality by 2040**.

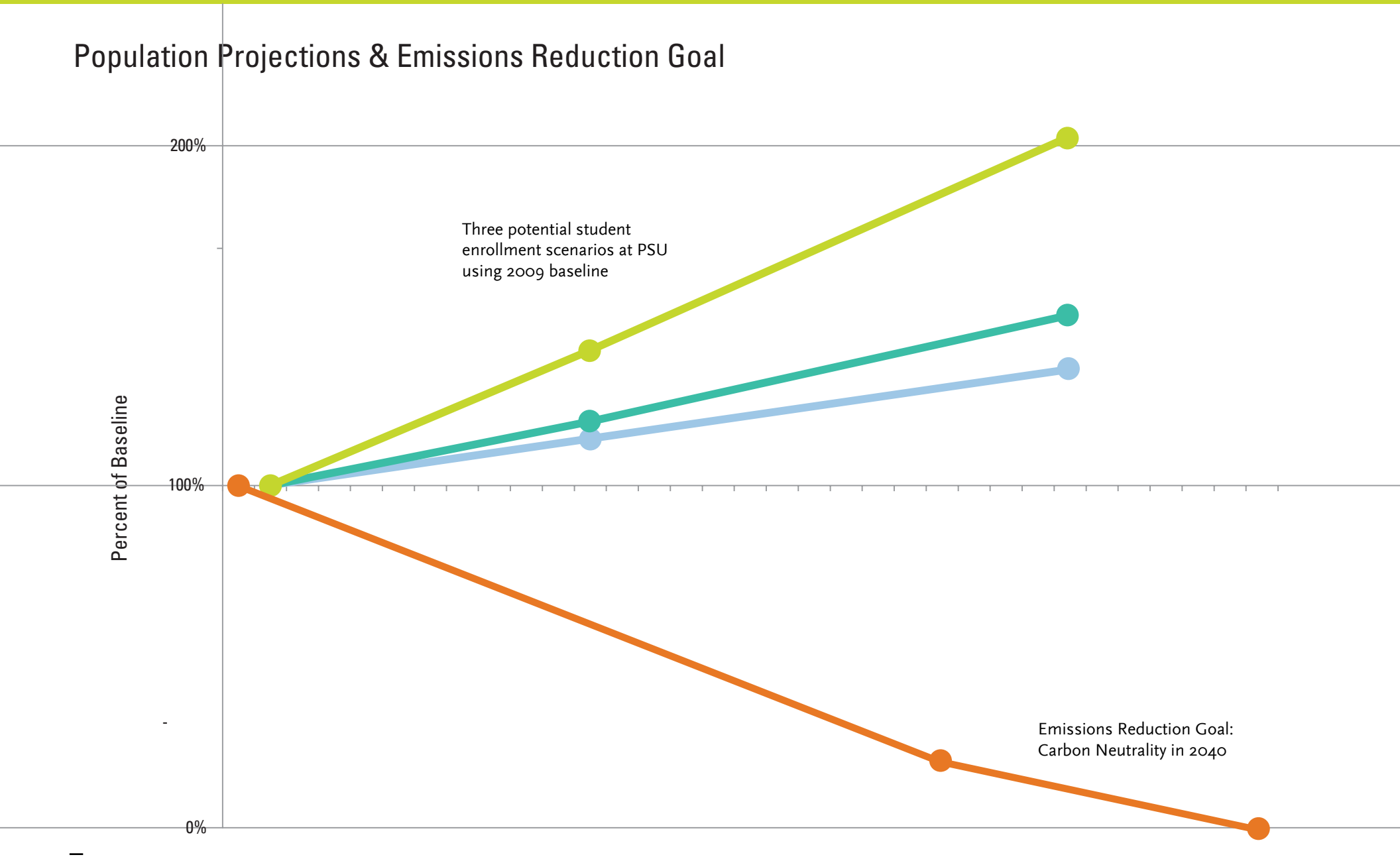
The process of establishing initial goals and targets involved several considerations. At the highest level, the Plan mirrors many of the timetables set out in the City of Portland and Multnomah County's Climate Action Plan, which has medium term climate objectives for 2030 based on a 1990 baseline. Additionally, many of the targets in the Materials section echo the city's goals for waste reduction and diversion.

The planning team also looked at climate action plans from other universities to set goals and targets that would be achievable for PSU. For example, Oregon State University (OSU) sets out 2025 as the date to achieve carbon neutrality. This timetable is aggressive compared to many other plans; in large part, because it reflects OSU's ability to install a new combined heat and power[9] engine, which has led to a dramatic reduction in campus emissions. A goal of carbon neutrality by 2050 is common among universities that do not have the immediate capacity to implement major carbon reduction projects.

Major emissions reductions projects are more difficult to achieve at PSU, compared to a traditional university, due to the structural and political implications of being embedded in an urban context. However, the campus still does have some important infrastructural assets (such as a district energy system) and also a significant amount of momentum from students, staff and faculty to support emissions reductions projects.

Finally, PSU's goals and targets reflect the fact that PSU is a growing university, expected to increase by 12,500 additional students by the year 2039. Given growth projections, per capita emissions will need to decrease at a rate that exceeds the rate of reduction in total emissions.

Population Projections & Emissions Reduction Goal



The Climate Action Plan (CAP) will be updated every three years to adapt its approach in light of technological, political, economic, and social changes in the region and world. Additionally, updated versions will reflect increased capacity and accountability within the PSU community. The updating process is designed to ensure that PSU's efforts around climate stewardship are never stagnant and continue to capitalize on new collaboration opportunities that fit within the scope of the Plan.

Future Tracking

The Campus Sustainability Office (CSO) will produce new greenhouse gas inventories for PSU for each fiscal year moving forward. The report for each fiscal year will be completed and presented in the following September. The one exception to this will be September 2010, when two inventories will be presented – FY 2009 and 2010.

Evaluation and Review

Progress Reports

CSO will be responsible for producing annual progress reports, which will evaluate actions taken in the previous year and suggest options for improvement or adjustments in resource allocation. The first of these reports will be completed in June 2011. Throughout the implementation process, some actions will be deemed more effective than others, and individual strategies will be refined based on successes and failures. Yearly progress reports will provide CSO with a platform for suggesting the incremental changes necessary to keep PSU on-track for hitting the 2030 Targets within the Plan.

Three-Year Planning Cycles

A short planning cycle is essential to keep up with rapid change in the fields of energy and climate mitigation. It also provides an opportunity for PSU to adjust to changing internal conditions related to fiscal climate, personnel capacity, and academic and funded research opportunities. During the third year, CSO will evaluate: actions completed and their impacts, actions not completed and barriers to completion, and changes in data gathering methods used on campus. By responding to these factors, CSO will be able to adjust goals and targets, as well as formulate new short- and mid-term (1-3 years) action items.

Collaboration

Throughout the planning process, CSO engaged individuals and groups across the organizational chart. As a result, the leaders of this Plan come from a range of PSU departments and academic disciplines. In order to assure short- and long-term progress toward emissions goals, it will be essential to provide ongoing support to the climate actions being taken by these groups.

Successful implementation of the Plan will require that members of the PSU and the University District communities are directly engaged in the actions of the Plan and have avenues for learning about and supplying feedback on strategies. CSO will take responsibility for ensuring ongoing participation within the PSU and Portland communities.

Resources

The major focus for this three-year planning cycle is to build the internal capacity necessary to effectively develop, implement, and track emissions reductions projects and activities. To absorb this additional workload, PSU will need to add one full-time equivalent member to the CSO staff. This person will also identify resources available through grants and partnerships, and ways to increase coordination of the sustainability efforts undertaken by staff, students, and faculty. Additionally, there will need to be monetary allocation or interdepartmental agreements that allow other administrative offices to take on emissions tracking and reduction projects in a manner that does not affect their overall workloads. In the longer term, significant resources will need to be allocated to finance feasibility studies, consultants, and project implementation.

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The Plan is broken into six sections: **Buildings**, **Materials**, **Commuting**, **Travel**, **Research and Education**, and **EcoDistrict Development**. Each section focuses on an area of PSU's operations and programs that plays a vital role in affecting greenhouse gas (GHG) emissions levels on campus. For ease of reading, the sections are separated from each other; however, many of the actions items in each section overlap with, reference, and/or support actions contained within a different section. The hope is that with each update of the Plan, the level of integration and cross-section awareness will continue to increase.

Sections

Buildings: Outlines actions for increasing the efficiency of campus systems, reducing energy demand on campus, increasing the amount of on-site renewable energy production, reducing emissions through better utilizing campus space, and tracking new climate change building codes.

Materials: Outlines actions for increasing the campus waste diversion rate, reducing overall waste production, and decreasing the embodied emissions associated with the extraction, manufacturing and transport of materials, goods, and foods consumed as a result of campus activity.

Travel: Investigates methods for decreasing the carbon intensity of campus travel and outlines the developmental steps for establishing a voluntary program that offsets campus travel emissions by investing locally in renewable energy, energy efficiency, and clean energy projects.

Commuting: Outlines actions for reducing drive alone trips to campus, reducing the per capita trips made to campus, and decreasing the carbon impact of vehicles used to commute to campus.

Research and Education: Outlines actions for increasing the global recognition of sustainability research and education at PSU and details preliminary steps for establishing an institutional structure for integrating operations and academic efforts around emissions reduction.

EcoDistrict Development: Discusses the "EcoDistrict Initiative" as it impacts PSU, and then outlines actions for establishing a governance system to manage the district and meeting the overall goals of the initiative.

Each section of the Plan contains the following elements:

1. Ongoing Efforts: Significant work is underway to mitigate greenhouse gas emissions at PSU. These existing activities and programs, and the resources needed to sustain them, are described in each section.
2. 2030 Targets: Each section addresses multiple challenges, each of which are associated with a unique measure. The 2030 Targets aggregate this information into a single measure to indicate whether or not the University is on track to meet the overall 2040 goal for the section.
3. One- to Three-Year Actions: Actions are the incremental steps led by department personnel to move PSU toward long-range goals and targets. These short-term actions may be new initiatives or they may represent an expansion of existing efforts. They will be completed – or reach a major milestone – within three years after the Plan's adoption. Taken together, the actions comprise a three-year strategic plan.
4. Long-Term Actions: Based on current limitations, such as political change and time or capacity constraints, not all of the desired actions will fall within a one- or three-year timeline. Long-Term Actions reflect ideas that aren't feasible to complete within the three-year time frame.

Key Terminology[10]

Some essential terms and phrases are used repeatedly throughout the Plan:

Association for the Advancement of Sustainability in Higher Education (AASHE): an association of colleges and universities working to create a sustainable future.

American College and University Presidents Climate Commitment (ACUPCC): an effort to accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, create solutions, and provide leadership-by-example for the rest of society.

Carbon Dioxide (CO_2): the chemical compound containing one atom of carbon and two atoms of oxygen.

Carbon Dioxide Equivalent (CO_2e): the quantity of a greenhouse gas multiplied by a Global Warming Potential (GWP) factor, relative to CO_2. This is the "standard unit" used to quantify various greenhouse gasses.

Carbon Offsets: reductions of greenhouse gases that can be used to counteract emissions from other activities, measured in metric tons of CO_2e. While similar, carbon offsets are not the same as Renewable Energy Certificates (RECs).

Energy Use Index: a measure of energy use from electricity and natural gas expressed in Kilo British Thermal Units (kBtu) and normalized by the total square footage of a building.

Greenhouse Gas (GHG): any gas that contributes to global warming including, but not limited to, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Intergovernmental Panel on Climate Change (IPCC): a scientific body established to provide policymakers with an objective source of information about climate change.

Metric ton, tonne, or metric tonne (t): One metric ton is 1000 kilograms or 2204.62 pounds.

Mode Split: the proportion of people that use each of the various types of transportation. For PSU, this phrase refers to the different modes of transportation used for trips to and from campus.

Renewable Energy Certificate (REC): a tradable certificate that represents a unit of energy produced by renewable energy sources. Owners of RECs can claim that they are using renewable energy equal to the amount of RECs they own.

University District: refers to the southern area of downtown that is anchored by PSU and overlaps with portions of the Downtown and Corbett-Terwiliger-Lair Hill neighborhoods.

Action Terms

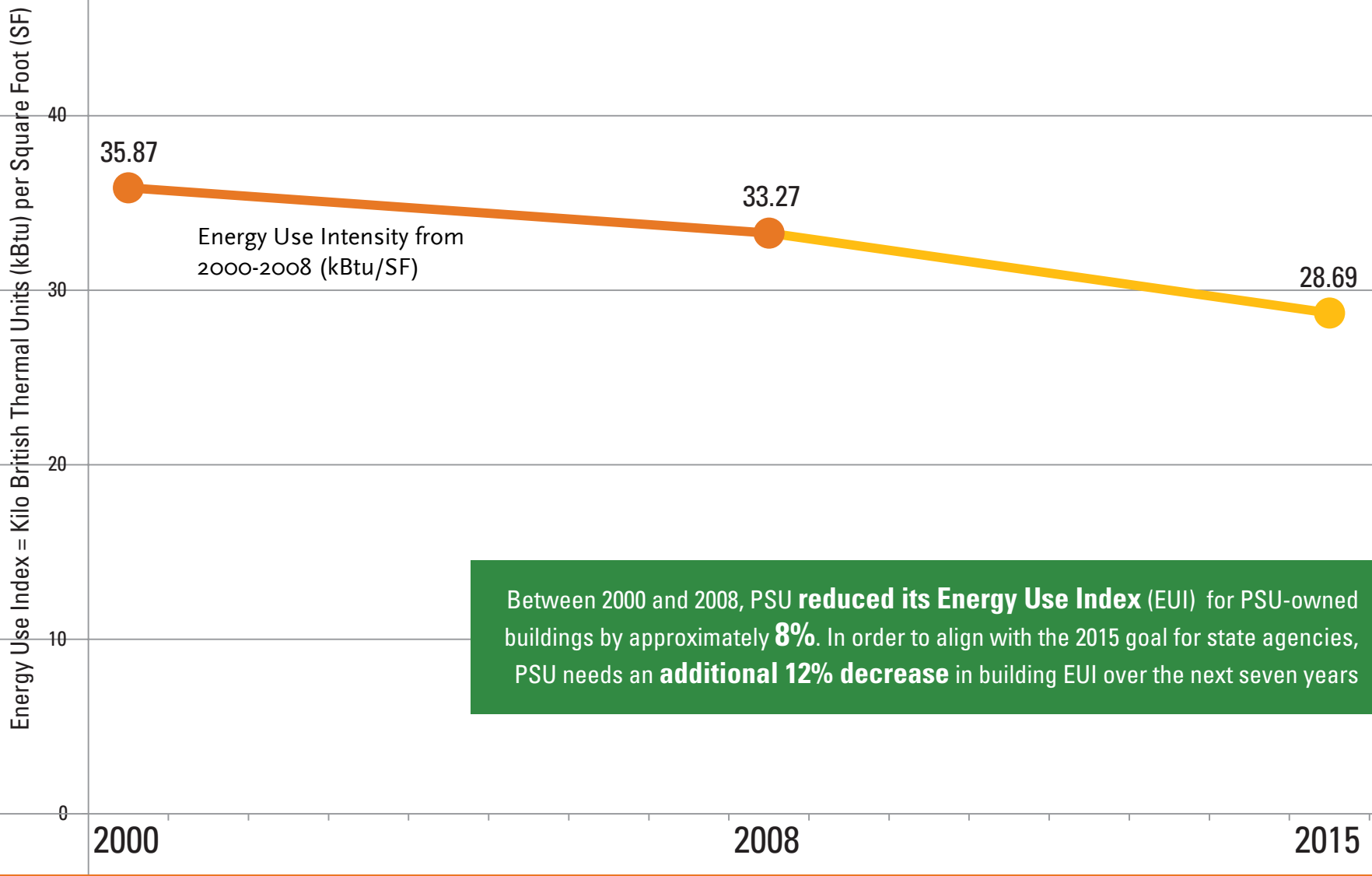
Throughout the CAP, action terms are used in conjunction with "One- to Three-Year Actions" to designate particular categories of action, including:

***Standard Operating Procedure (SOP) Change*:** Signifies that a specific action, question, or project requires an evaluation and/or policy change that would impact standard operating procedures at PSU.

***EcoDistrict Development*:** Signifies that a specific action, question, or project reaches beyond the PSU-owned boundary and affects surrounding properties[11].

***Research Project*:** Signifies that the specific action is meant for class and/or academic research work. The action will not happen without student/faculty assistance.

Energy Use Index: History and Target



Between 2000 and 2008, PSU **reduced its Energy Use Index** (EUI) for PSU-owned buildings by approximately **8%**. In order to align with the 2015 goal for state agencies, PSU needs an **additional 12% decrease** in building EUI over the next seven years

2030 Targets & Actions: Buildings

By 2039, PSU plans to increase enrollment numbers by 12,500 students. This growth will place additional demand on current campus facilities, and it will also require significant amounts of new construction[12]. As a result, PSU's ability to meet carbon and energy reduction goals will depend on careful planning and decision-making about class scheduling, building programming, building maintenance, energy use, renovation, new construction, and on-site renewable energy generation.

Operating campus buildings is the second largest contributor to the campus greenhouse gas (GHG) profile, accounting for 36% or approximately 38,000 $MTeCO_2$ of annual emissions. These emissions are limited to those from natural gas and electricity. Emissions from construction, demolition and materials consumed within the buildings are included in the "Materials" section of the CAP.

Actions contained within this section consist of the following:

- increasing efficiency of heating, ventilation, and air conditioning (HVAC) systems
- reducing on-site demand for energy
- increasing on-site renewable and clean sources of energy
- improving efficiency of space utilization in campus buildings
- tracking and implementing new building code requirements for climate mitigation and adaptation[13]

The CAP explores efficient and affordable methods for emissions reductions in all areas of interest.

Five PSU buildings have been certified through the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, including two gold and three silver buildings. The State of Oregon requires all new buildings to meet the LEED silver standard.[14] Additionally, PSU is a key partner in the proposed Oregon Sustainability Center[15], a project designed to be the largest living building in the nation[16]. PSU is also excelling in the area of green building research, as professors and students investigate technologies and questions around green roofs, energy efficiency, and more.

Achieving dramatic reductions in building-related emissions will require a continuous push to localize energy demand management and supply. This trend can have the residual benefits of:

- Increasing community awareness of and response to energy conservation projects and campaigns
- Reducing institutional vulnerability to future spikes in energy prices
- Increasing energy security (lower risk for blackouts or brownouts)

PSU Facilities & Planning (FAP), Auxiliary Services (AUXS), and the Campus Sustainability Office (CSO) will lead the actions in this section. The successful completion of these actions will require ongoing coordination of these departments with PSU Finance & Administration (FADM), the FAP Systems Shop, and the Energy Trust of Oregon.

CAP = Climate Action Plan
CSO = Campus Sustainability Office
TAPS = Transportation and Parking Services
BPS = Bureau of Planning and Sustainability
FADM = Finance and Administration
AUXS = Auxiliary Services
FAP = Facilities and Planning
PoSI = Portland Sustainability Institute

Ongoing Efforts

PSU has already undertaken actions that support the effort to reduce emissions associated with building energy usage. These projects must be continued to reach the goal of climate neutrality by 2040.

Ongoing Activity/Program	*Lead Office*	*Program/Activity Age (years)*	*Target*
Steam loop efficiency upgrades	FAP	2	#3
Central deployment of power conservation settings for all desktop computers and network printers based on findings from Human Resources pilot	OIT	1	#1
Lighting upgrades in housing buildings	AUXS	2	#3
Energy conservation competition (a pilot project in the Broadway Housing Building)	CSO, Res. Life	0.5	#1
Achieving LEED Silver or better for all new buildings and major renovations	FAP	6	#5
Case study on integrating "smart grid" technologies at the PSU campus	CSO	1	#1
Utility data consolidation project, including energy use in leased space to increase accuracy of GHG inventory	CSO, FAP, AUXS	1	All
Campus utility metering assessment and installation	AUXS, FAP, CSO	0.5	#1
Nighttime energy audit pilot with scorecards for building occupants	CSO, FAP	0.3	#1
Investigation of bundling and selling BETC credits	CSO, FAP	0.1	#2

2030 Target #1

Reduce energy use per square foot 25% below 2000 levels through demand management practices.

The least costly energy reductions can be achieved through demand reduction. To reduce demand, the University can provide information and incentives to energy users, while simultaneously increasing their capacity to adjust personal energy use.

One-Year Actions

- Using the 2010 building energy competition[17] pilot project in PSU's Broadway Housing Building as a model, develop a strategic plan for expanding energy savings competitions to other residence halls. This would include a year-round education and awareness campaign, including an online video.
- Adopt an energy policy that includes Energy Star standards for appliances, authorizing OIT to establish central power management for staff computers, building temperature set points, a list of non-essential personal appliances (space heaters, refrigerators, coffee makers, etc.). *(SOP Change)*
- Develop a comprehensive energy conservation education program for academic buildings that:
  - provides clear information dispelling myths and providing motivation for behaviors/issues identified during the nighttime energy audit pilot[18]
  - provides recognition for building occupants who reduce their nighttime base energy load

- requires energy conservation briefings to all new employees
- formalizes Green Teams in each department

Three-Year Actions

- Build an energy use display system for the eight largest buildings on campus[19] that graphically displays consumption levels in real-time format.
- Install energy efficient surge protectors at all employee workstations on campus and teach people how to use them – Energy Trust rebates may be available.
- Determine the feasibility and impact of PSU participating in the City of Portland's High Performance Building program. *(Research Project)*

2030 Target #2

Generate 80% of total building-related energy use from local, renewable sources.[20]

Reaching carbon neutrality will require an eventual shift to renewable energy for electricity, heating and cooling. Energy efficiency efforts, demand management, and better building usage, will help reduce the intensity of energy use per square foot of campus buildings. Continued efforts to localize and clean PSU's energy supply will also help decrease PSU's sensitivity to electricity and gas prices and increase overall energy security at the University.

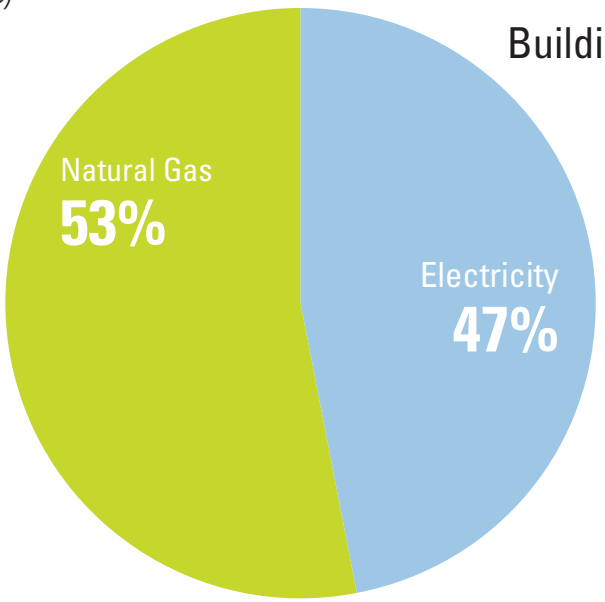
One-Year Actions

- Analyze the potential to integrate light harvesting[21] into new building plans, as well as retrofits in existing buildings. *(Research Project)*
- Continue to work with the OUS Chancellor's Office to explore third-party agreements for photovoltaic array installation.
- Based on research by engineering faculty, suggest an alternate location or use for $50,000 earmarked for an urban wind energy system by the Chancellor's office[22]. *(Research Project)*
- Research funding mechanisms used by other universities and institutions that have installed large wind turbines (Appalachian State University, University of Vermont, University of Minnesota, etc.). *(Research Project)*

Three-Year Actions

- Perform an anaerobic digester[23] study with the Portland Sustainability Institute to look at feedstock needs and sources for a digester, as well as siting and economic concerns.
- Conduct surveys and targeted interviews with students, faculty, and staff to identify ideal locations on campus for renewable energy installations based on visual impact, instructional value, and technical feasibility. *(Research Project)*
- Perform an analysis of the impacts of using biomass in PSU district energy system. *(Research Project)*

Building Energy Use by Type in 2008 (kBtu)



2030 Target #3

Increase efficiency of the energy systems by 50% (using a 2000 baseline).

The University's energy systems[24] – both the district energy system and the systems in individual buildings – have untapped potential for money and energy-saving retrofits and upgrades. The actions in this section focus on increasing the resources and decision-making capacity necessary to accelerate the University's investment in existing energy systems. PSU can also improve information systems and integrate data into current managerial systems, allowing the operations sides of the University to better respond to shifts in energy needs.

One-Year Actions

- Revisit the combined heat and power application submitted to the U.S. Department of Energy in the summer of 2009, performing a more detailed pro forma, analyzing other potential funding sources, aligning with the PSU Framework Plan, and reevaluating the scale of the project. *(EcoDistrict Development)*
- Reinvest the money currently spent on Renewable Energy Certificates into on-site efficiency or capacity-building improvements, such as metering. Consider formalizing the duties, responsibilities, and team roles of the Energy Fund Management Team. *(SOP Change) (EcoDistrict Development)*
- Complete an analysis of current waste heat loads on campus and the potential to harvest these loads and integrate them into the campus steam loop. *(EcoDistrict Development)*
- Create a standard schedule, long-term maintenance strategy, and funding mechanism for building retro-commissioning (also known as continuous commissioning). *(SOP Change)*[25]
- Apply energy performance ratings to all campus buildings through the Energy Star Portfolio Manager program.
- Research other public entities that have implemented workforce training programs in clean technologies. *(Research Project)*

Three-Year Actions

- Hire a utility manager to oversee PSU's $6.6 million utility budget and develop a comprehensive energy management program. This includes metering utilities for each building on campus.
- Develop a high level scan of available smart grid technologies and their potential use at PSU. *(Research Project)*
- Review and update the PSU District Energy Plan completed in 2007 and prioritize six capital improvement projects that will support Target #3. *(EcoDistrict Development)*
- Incorporate energy efficiency measures in Facilities and Planning 'Design Standards.' Apply these standards across campus, including in housing buildings (i.e. when a renovation is taking place, replace single pane windows with models that have U-values lower than .30) Review design standards for climate adaptation – given anticipated increases in summer temperatures. *(SOP Change)*
- Establish protocols for gathering baseline utility data from new building acquisitions. (SOP Change)
- Develop protocols and standards for using the best HVAC technology wherever possible, including raising upper limit on datacenter temperature and cool aisle ceiling design. *(SOP Change)*
- Initiate discussions with surrounding property owners about expanding the steam loop beyond PSU boundaries. *(EcoDistrict Development)*

2030 Target #4

Reduce total energy use by 10% (using a 2000 baseline) through better utilization and scheduling of buildings.

Current space utilization practices are considered to have a negative impact on the overall efficiency of PSU energy usage. Efficient use of residential, classrooms, and office space can delay the need for PSU to acquire or develop new buildings.

One-Year Actions

- Develop a way to analyze energy intensity that factors campus population change into the Energy Use Index (EUI) kBtu/square foot to ensure that higher room utilization rates support (rather than counter) the energy intensity goals of the CAP.
- Use the PSU Framework Plan, and the work of the Space Committee, to develop a baseline for classroom usage for 2008-2009.
- Work with the Space Committee to develop new models for space allocation that help achieve CAP goals. *(EcoDistrict Development) (Research Project)*

Three-Year Actions

- Assess links between CAP goals and Office of Academic Affairs' effort to convert some courses to online or hybrid format.
- Create an analysis tool that tracks and visually displays the usage and densities of people in all campus buildings.
- Using PSU's new scheduling software, assess opportunities to improve scheduling and fees related to the use of general pool classrooms, departmentally controlled classrooms, weekend events, HVAC zones, custodial services, and campus security services.
- Adopt a standard metric for analyzing new building purchases based on their current ability and future potential for increasing building utilization levels. *(SOP Change)*

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2030 Target #5

Track and integrate all revisions to the commercial buildings code that deal with climate change.

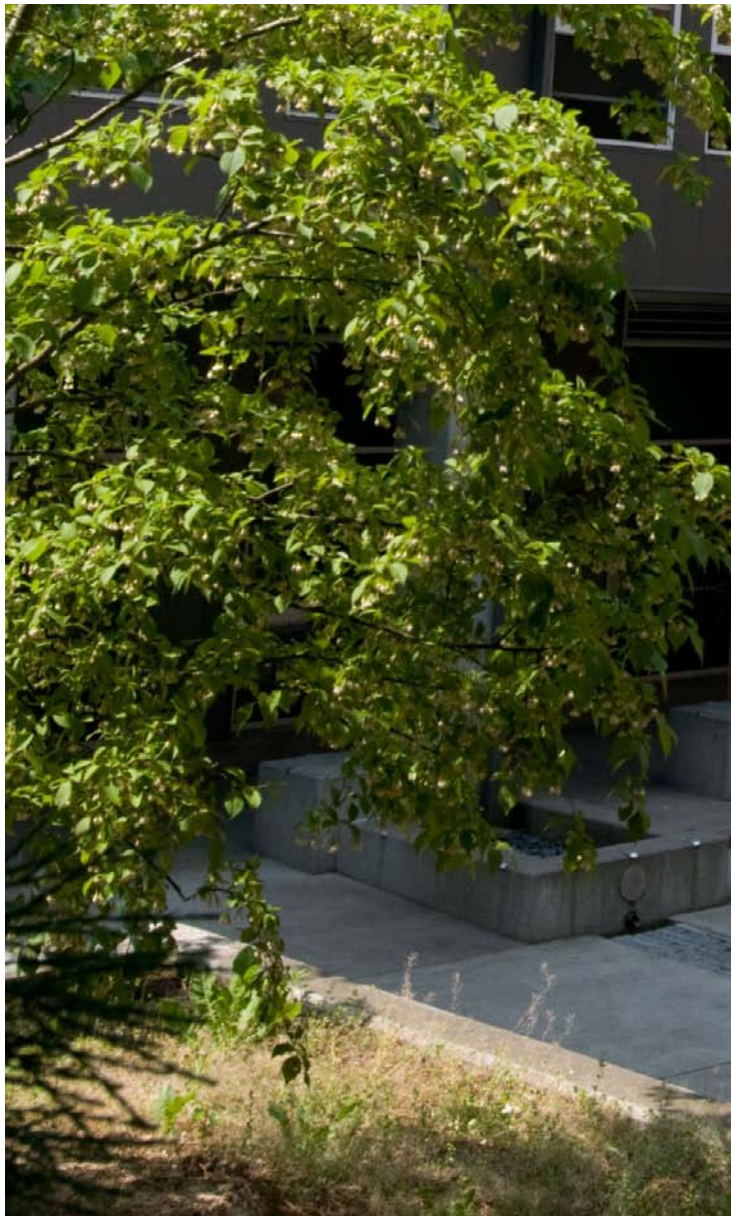
The world of climate change adaptation and mitigation is moving at a rapid pace, as universities, governments, non-profits, and private sector members pioneer new strategies to address climate issues. Therefore, it is vital that PSU tracks, reviews, and selectively incorporates new practices in the realms of climate mitigation and adaptation.

One-Year Actions

- Track the Oregon code redevelopment process, which discusses methods for buildings to adapt to the physical impacts of climate change[26].
- Track code improvement efforts within the City of Portland, such as the recent RICAP 5, which was completed in early 2010[27].
- Track progress on the process to revise the Oregon building code to match the targets of Architecture 2030[28].

Three-Year Actions

- Integrate relevant pieces of Architecture 2030 into PSU's building polices.
- Assess skills of existing maintenance personnel to determine what training or additional capacity is needed to care for new system changes outlined in the CAP, such as new renewable and clean energy and smart grid systems.



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Long-Term Actions

2030 Action #1

Connect building occupants with energy data through real-time energy dashboards in 75% of campus buildings.

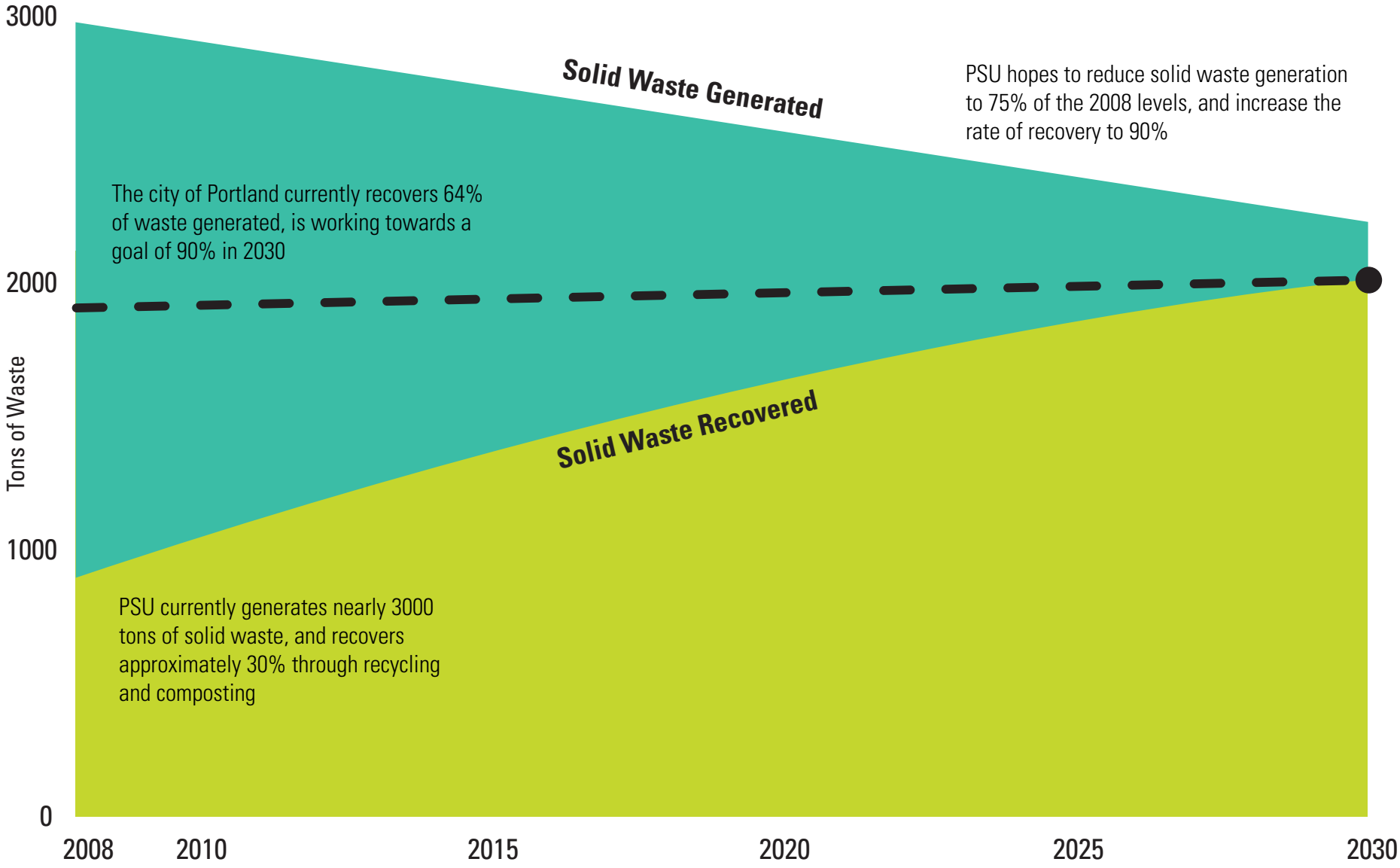
2030 Action #2

Participate in a utility feed-in tariff for small wind, solar PV, biomass or plant-derived natural gas in the University EcoDistrict.

2030 Action #3

Require that contractors partner with a local workforce training organization to provide job opportunities for underprivileged individuals. (SOP Change)

Solid Waste Generation & Diversion Targets



2030 Targets & Actions: Materials

Based on 2008 estimates by Good Company, material resource flows[29] at PSU contribute 41% or approximately 43,000 MTeCO2 of annual campus emissions. Until recently, calculations of emissions from material goods have underestimated the importance of this category. In light of recent revisions to the calculations used both at the federal level by the EPA, and at the regional level by Metro, the PSU CAP now includes emissions from raw material extraction, production and transportation of goods and services which pass through campus, including the PSU food system.

Based on overall weights recorded and tracked by the University's contracted waste hauler, Trashco, disposal rates of material goods have been relatively steady for the past few years. Since 2008, coordination between PSU's food service provider (Aramark) and the City of Portland's business composting program has reduced the amount of organic waste being sent to the landfill. "Victor's at Ondine" dining hall has taken important steps to eliminate unnecessary waste streams by using durable service-ware and adopting trayless dining and "back of the house" composting. This is a progressive model that should be expanded if the University is to reach the dramatic waste reduction goals outlined in the Plan.

To reach the 2030 Targets outlined in this section, the strategies for materials, goods and foods rely on solutions that address both the physical and social organizational challenges. This Plan highlights infrastructure upgrades and progressive contract improvements needed to address the physical components of emissions reductions and the civic engagement needed to fully implement required changes.

The current approach to handling materials, goods, and foods at PSU can be characterized as somewhat disjointed. For example, individual departments purchase office supplies from multiple companies, often without contracts. This makes it difficult to track consumption rates and purchasing habits. Furthermore, the recycling system is hindered by the lack of consistency in recycling receptacles, which leads to confusion among users and high contamination rates. In general, there is a piecemeal approach to servicing campus garbage and recycling stations, with responsibility shared among the staff of PSU Recycles! and contracted custodial services.

While recycling in the Portland region has its roots at PSU, with the founding of the Portland Recycling Team (PRT) in 1970, an official recycling program for the University was not launched until recently. In 2003, an innovative contract with waste hauler Trashco helped to incentivize the overall reduction of landfill-bound waste. At the same time, PSU signed a dining services contract that outlined a strategy for avoiding waste and improving food sourcing for campus dining facilities and catered events. Currently, the weight of trash, recycling, and compost taken from campus is an aggregate figure provided by the waste hauler without further breakdown by building or area of campus.

CSO=Campus Sustainability Office
AUXS=Auxiliary Services
FAP=Facilities and Planning
CES=Community Environmental Services
EPA=Environmental Protection Agency
DEQ=Department of Environmental Quality
Metro=Portland Metropolitan Regional Government
PRT= Portland Recycling Team

The actions and targets described in this section address the primary goal of emissions reduction and simultaneously tackle additional University priorities by: building partnerships with surrounding downtown businesses (in the development of an EcoDistrict "waste-shed")

- proposing substantive opportunities for real-world student experience through increased collaboration between academic and operational departments
- reducing the overall costs associated with wasted materials, goods, and foods at PSU by preventing unnecessary waste from the front-end
- consolidating waste streams for better management on the back-end
- positively influencing the behavior of students and staff by changing perceptions of "waste" though education and outreach

Implementing the recommendations in the Materials section will require the coordinated efforts of a number of programs and departments, both within the University and through community partnerships. It will also require prioritizing the flow of materials, goods, and foods as a key consideration in the assessment of PSU's emissions. The primary responsibility for seeing actions through will fall to PSU Recycles!, FAP, and CSO, with support from Community Environmental Services (CES), Trashco, and the Dining Services and Custodial Services contractors.

Ongoing Efforts

PSU has already undertaken actions that support the targets in this section. These practices must be continued in order to reach the goal of climate neutrality by 2040. Below is a list of these activities or programs:

Ongoing Activity/Program	*Lead Office*	*Program/Activity Age (years)*	*Target*
ReUse center for exchanging surplus office supplies	PSU Recycles!	6	All
Chuck it for Charity at the close of the year	PSU Recycles!	5	All
Public composting (pilot program)	PSU Recycles!	0.25	#2
Low waste dining initiative at Victor's (located in Ondine)	AUXS	0.4	#1
Event compost support	PSU Recycles!	1	#2
Waste reduction education and outreach	PSU Recycles!	6	All
"Its all in the hall" bin consolidation project	PSU Recycles!	1.5	#2
Servicing public recycling bins in residences halls	PSU Recycles!	6	#2
Servicing public recycling bins in academic buildings	PSU Recycles! Custodial Service Provider	6 1.5	#2
Extra support for residence hall move-in recycling at the start of the term	PSU Recycles!	5	#2
Reuse of surplus office furnishings	FAP Shipping & Receiving	10+	All
Tracking consumption of major commodities (copy paper, paper towels, toner, etc.)	CSO	1	All

2030 Target #1:

Reduce solid waste generated[30] on campus by 25% (using a 2008 baseline). (waste prevention target)

For the most part, current materials procurement and disposal systems at PSU fail to discourage waste prevention. To reach deep carbon reductions in materials use, a paradigm shift will be needed. This shift will require a continued investment in physical systems and changes in business practices. However, it will also require continuous education to embed materials reduction and reuse into everyday actions on campus.

One-Year Actions

- Write a three-year strategic plan for recycling at PSU that outlines strategies for increasing capacity, analyzes benefits and costs of the program, sets goals, explores a partnership with CES, and proposes a long-term funding structure for the program.
- Develop a strategy for collecting accurate baseline data for material waste generation on campus.
- Establish printing standards for campus, require all new printers to be duplex-capable, and ensure that all existing duplex-capable printers are set to duplex by default. *(SOP Change)*
- Analyze the benefits of adjusting the free printing limit for students in labs from 500 to 250 per term.

- Identify barriers and opportunities for eliminating bottled water from all PSU-sponsored catered events, departmental offices, and student group activities. *(SOP Change)*
- Expand the education and outreach campaign supporting reusable cups and containers on campus.
- Complete a feasibility analysis and timeline for composting all waste from catering and dining facilities on campus and switching to durable service-ware. *(Research Project)*

Three-Year Actions

- Create a centralized tracking system for purchases of high volume campus goods. *(SOP Change)*
- Explore options that can be included in a new dining service RFP with zero waste goals – adopting those of Victor's at Ondine. *(Research Project)*
- Establish formal relationships with reuse institutions like the ReBuilding Center, ReStore, and TerraCycle.

2030 Target #2:

Reduce landfill-bound waste to 10% of total waste generated (diversion target).[31]

The goal of the Materials section is to incrementally transition the PSU campus toward a zero-wasting environment over the next 20 years. Therefore, it is paramount that the University continues to increase its capacity to capture and divert usable materials from the landfill.

One-Year Actions

- Revise custodial and dining services contracts as they relate to recycling and compost.
- Expand education and outreach for recycling and composting to specifically target student leaders, new student orientation, new employee orientation, and residence halls.
- Establish a waste reduction coordinator for the athletics department who is tasked with increasing diversion rates at athletic events.

Three-Year Actions

- Establish standards and a funding mechanism for consistent indoor and outdoor recycling stations. *(SOP Change)*
- Create a centralized system for tracking diversion rates for new construction, major renovation, and in-house remodels. *(SOP Change)*
- Explore the feasibility of creating a waste-sorting program. *(Research Project)*

2030 Target #3:

Reduce embodied emissions for select commodities by 25% (using a 2008 baseline).[32]

To take meaningful action on emissions, PSU must address the true impact associated with the consumption of materials, goods, and foods. The University has not developed a rigorous tracking system for embodied emissions, but the plan still includes this level of analysis in order to raise the University community's awareness about waste reduction and to support behavioral changes.

One-Year Actions

- Develop a paper-reduction and awareness campaign to help departments reduce copy paper use by 30% and purchase paper with at least 30% post-consumer recycled content[33] [34].
- Evaluate opportunities to increase low carbon food purchasing by Food for Thought Café and the dining services contractor. *(Research Project)*

- Partner with DEQ to develop a strategy to refine data collection methods for materials, goods, and foods embodied emissions data.
- Write a food action plan that evaluates current food purchasing policies and performance at the University, develops steps to align with the Multnomah Food Initiative, and increases the amount of low carbon food consumed on campus. *(Research Project)*

Three-Year Actions

- Enforce or work with a contractor to modify food purchasing contract requirements for dining services based on the evaluation done in year one. *(SOP Change)*
- Write a landscape plan for the University that aligns with the PSU Framework Plan and the food action plan.

Long-Term Actions

2030 Action #1

Hire a full-time staff person to develop and coordinate a reuse program for the University that focuses on buying used and local products for campus use whenever possible.

2030 Action #2

Develop a phased program for removing excess trash receptacles on campus.

2030 Action #3

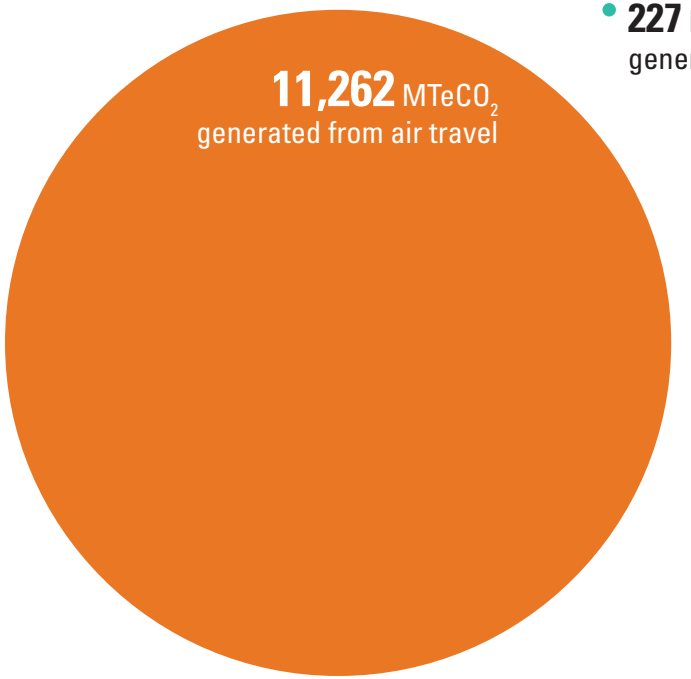
Incorporate embodied emissions analysis into the decision-making processes for purchasing materials, goods, and foods.

In fiscal year 2008, PSU purchased at least **147 tons of copy paper**. If this were assembled into a stack, the pile would be **1.9 miles high, or 90% the height of Mt. Hood**. 100 metric tons of CO_2 and **$100,000** could be saved if PSU set a 30% paper reduction goal.

PSU-Sponsered Travel in FY 2008

9,378,428 air miles *(includes study abroad)*

562,590 car miles *(includes reimbursement for personal car use, Enterprise rentals and Zipcar rentals)*



227 $MTeCO_2$
generated from car travel

17 X more miles traveled by air

50 X more carbon emitted from air travel

2030 Targets & Actions: Travel

Travel is an essential component of academia at PSU, strengthening faculty engagement in national and international discourse. As the colleges within PSU have grown stronger, travel has increased. In the past 20 years miles from travel have risen, reaching nearly 10 million miles in fiscal year (FY) 2008[35]. This equates to over 30 round trips to the moon. FY 2008 emissions from travel amounted to approximately 12,000 MTeCO2, or 11% of PSU's emissions.

The State of Oregon, the Oregon University System (OUS), and the Internal Revenue Service (IRS) determine many of the governing rules for PSU-funded travel. At times, these guidelines require travelers to choose carbon intensive forms of travel over less intensive options. As a result, there are some barriers that can be addressed at PSU, but most must be addressed through OUS. All OUS members have signed on to the American College and University Presidents Climate Commitment (ACUPCC), resulting in a statewide discussion and overall awareness about travel emissions.

Because travel tracking (for climate impact) was not an institutional priority until recently, PSU has very little historical data on travel patterns and limited information on travel mode split. In order to take meaningful actions to reduce travel emissions, data tracking systems will need to be established, and this will require additional resources.

This Plan outlines opportunities for engaging faculty, staff, and students in exploring the University's travel impacts. As a result, PSU administration will have sufficient information to improve campus travel policies, and the campus population will also be more engaged and aware of their travel impacts.

Although emission reductions are the primary goal of the actions in this section, there are a variety of additional benefits that could potentially arise from travel alternatives. Implementing programs and raising awareness about less carbon-intensive travel will connect faculty who normally do not interact, save time and money through reduced or more efficient travel,[36] and provide a means for internalizing the emissions costs associated with travel.

CSO will complete the bulk of the actions in this section; however, many of the actions will require significant and continual coordination with the BAO, OUS, the Provost, the academic Deans, and OIT.

CAP=Climate Action Plan
CSO=Campus Sustainability Office
BAO=Business Affairs Office
TAPS=Transportation and Parking Services
BPS=Bureau of Planning and Sustainability
IRS=Internal Revenue Service
OUS=Oregon University System

Ongoing Efforts

PSU has already undertaken actions that support the targets in this section. These practices must be continued in order to reach the goal of climate neutrality by 2040.

Ongoing Activity/Program	*Lead Office*	*Program/Activity Age (years)*	*Target*
Exploring ways to streamline data tracking university-sponsored travel – data needs include expenditures, destination, and mode of travel	BAO, OIT, CSO	1.3	#2
Complete FY 2009 baseline Sources of data include: travel agencies, P-card transactions, Enterprise vehicle rental, ZipCar, RAZ chartered buses, reimbursements for use of personal vehicles	CSO	0.75	#1

2030 Target #1

Maintain 2010 levels of travel emissions.

Over the next 20 years, PSU employee and student travel will grow if steps are not taken to provide alternatives. In response, PSU will:

- develop viable distance communication options that can be used to avoid travel in certain circumstances
- provide greater awareness about available lower carbon travel options
- remove many of the internal and OUS-wide barriers to choosing lower-carbon forms of travel

Engaging in these activities will allow PSU to use fewer emissions per unit of travel, thus accommodating an increase in total travel while maintaining current travel-related emissions levels.

One-Year Actions

- Identify barriers that hinder faculty, staff and students from choosing low carbon forms of travel, and then communicate those barriers to PSU Administration, OUS, and the Chancellor's office.
- Request that the OUS Sustainability Initiatives Committee convene a working group to discuss barriers and share solutions related to travel.

- Identify departments with the highest travel expenditures and conduct interviews with faculty and staff to gain a better understanding of departmental travel patterns and options for trip reduction or switching to less carbon-intensive means of transportation. *(Research Project)*
- Forecast 10-, 20-, and 30-year projections for PSU travel rates. *(Research Project)*
- Promote CarPoolMatchNW for events being held at PSU and for employees attending events elsewhere.

Three-Year Actions

- Draft a strategic plan with OIT and Network & Telecom Services to increase the University's capacity to meaningfully engage in distance communication and distance conferences.
- Develop a centralized system for tracking faculty and staff trips that has the capacity to connect faculty/staff who plan to attend the same events so they can coordinate travel modes/costs. *(SOP change)*
- Identify all opportunities to educate PSU employees and students about climate impacts of travel and alternatives; develop online training resources that provide tips and awareness about green travel.
- Consider adding a box on travel forms where the travel applicant can acknowledge his/her carbon impact by listing miles or simply signing a statement. *(SOP change)*
- Develop a tool that allows PSU managers to understand trade-offs among travel costs, time expenditure, and mode of travel when approving employee travel requests. *(Research Project)*

2030 Target #2

Establish a local offset program for travel that is used by 75% percent of travelers.

One-Year Actions

- Research best practices and lessons learned from other institutions to develop a methodology for collecting, administering, and assessing progress of a voluntary carbon offset program. *(Research Project)*

Three-Year Actions

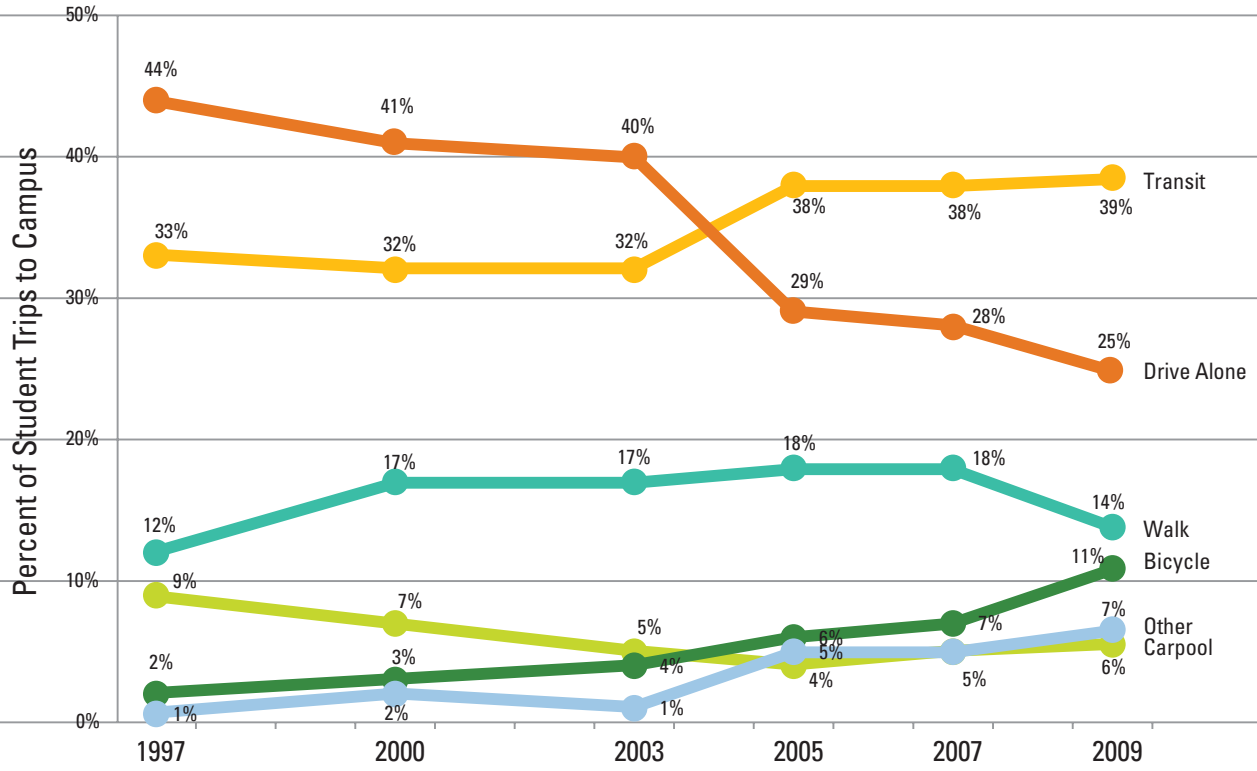
- Complete an outreach and communication campaign, targeting employees and students, that provides information about the costs and benefits of a carbon offset program and evaluates willingness to participate.
- Work with BPS and Metro to develop a list of PSU-campus and regional emissions reduction projects that would be strong candidates for receiving funding from a voluntary carbon tax on travel.
- Through CSO administration, implement and monitor a carbon offset program for travel emissions. *(SOP change)*
- Record and communicate the emissions and total cost reductions associated with the voluntary carbon offset program.

Long-Term Actions

2030 Action

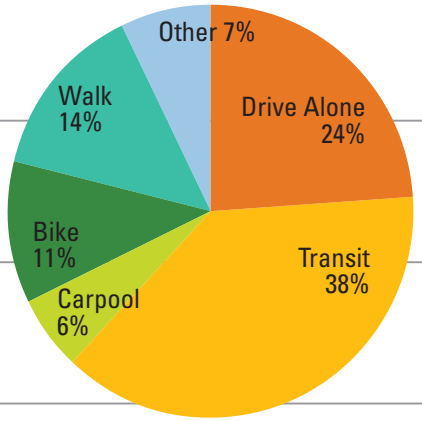
Implement a travel offset program for all departments.

PSU Student Mode Split History

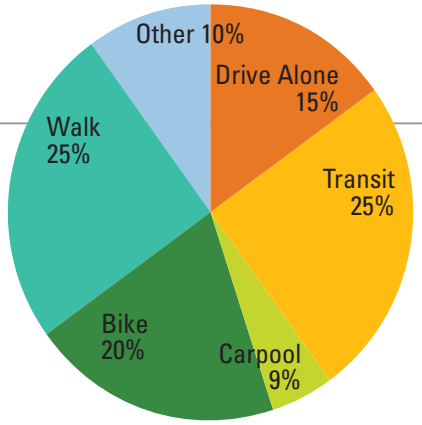


*Other includes responses: "other," "motorcycle/scooter," and "was dropped off"

PSU Student Mode Split 2009



PSU Student Mode Split 2030



2030 Targets & Actions: Commuting

Universities are not formally required to offset greenhouse gas (GHG) emissions borne by commuters, but these emissions are still tracked in climate action plans because it is incumbent upon large institutions to develop programs that encourage low-impact commute options.

Commuting resulted in approximately 12,000 MTeCO2, or 11% of campus emissions, in 2008. PSU is a growing campus that is accessed by individuals from around the region; therefore, commuting to PSU by students and employees will be a source of GHG emissions for many years to come. One priority of the PSU Framework Plan (FP) is to increase connectivity to the University – primarily by promoting and strengthening alternative options to vehicular travel. Additionally, a goal of the FP is for PSU to house 25% of students on campus, thus increasing the percentage of students who walk and bike to campus.

PSU's control over commuting behavior is limited due to the ubiquity of roadways throughout the region and the widespread availability of parking facilities close to campus that are not owned by PSU. However, in recent years, the University has demonstrated success in influencing commuting behavior. PSU's efforts to decrease the percentage of students and employees who drive to campus, and the distance that they travel, coupled with increasing vehicle efficiency, will result in a drop in GHG emissions even if the absolute number of vehicles arriving on campus remains constant.

Already, PSU and the City of Portland (CoP) fund a variety of projects and programs aimed at decreasing single occupancy vehicle travel, mostly through the use of parking revenue. PSU actively pursues financial and political support for multiple modes of transportation to access the district. Continued planning efforts will enhance the social and physical infrastructure necessary to increase access to campus via modes of transportation other than driving alone. Decreasing the prevalence of drive alone trips to campus is essential for achieving aggressive carbon reduction goals.

Between 1999 and 2009, the percentage of PSU employees **driving alone to campus dropped from 47% to 26%**. During that same period, the percentage of PSU students driving alone to campus dropped from **41% to 25%**.

Commuting patterns changed significantly between 1999 and 2009. In 1999, 47% of employees and 41% of students drove alone to campus, while these rates were 26% for employees in 2008 and 25% for students in 2009. At the same time, the percentage of students and employees who bicycled to campus increased dramatically. Only 5% of employees and 2% of students biked to campus in 1999, while these rates were 10% for employees in 2008 and 11% for students in 2009. These changes in commuting behavior have demonstrated that the campus community is capable of significant mode split changes in a short amount of time. In order for PSU to achieve its carbon reduction goals, it has established mode split targets for 2015 and 2030.

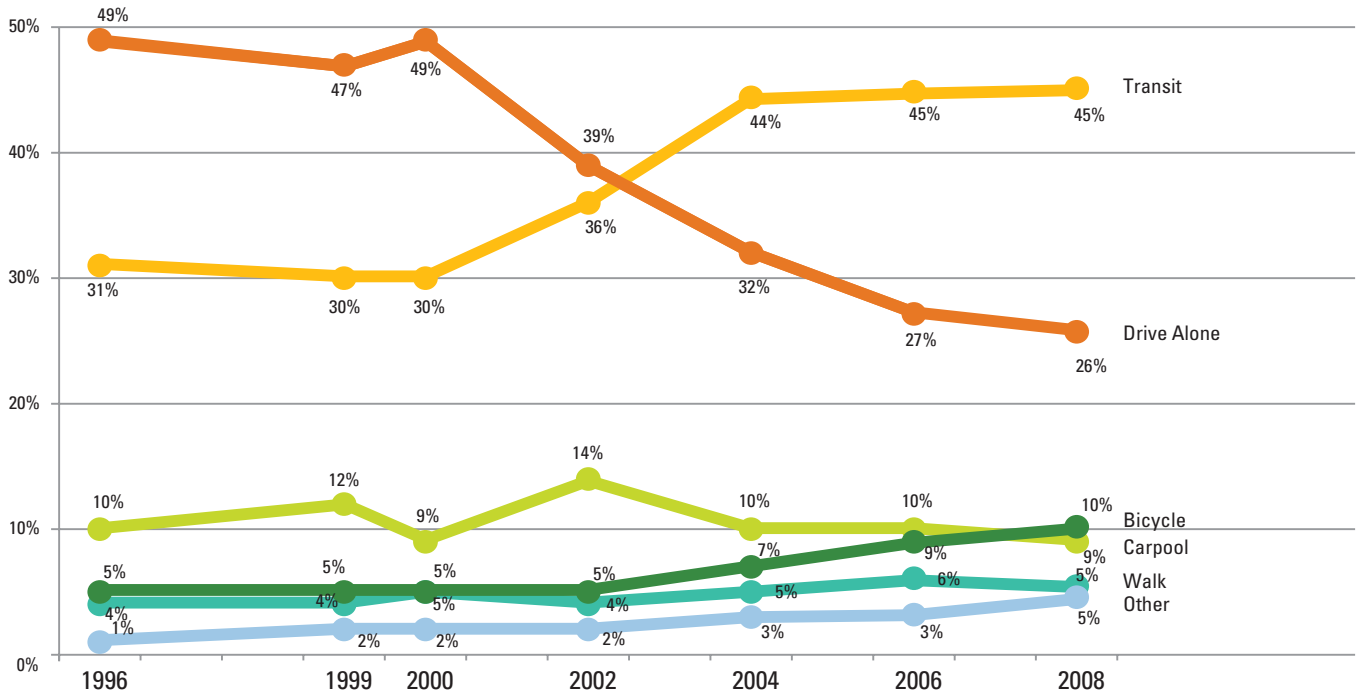
It should be noted that the strategies and actions identified in the CAP will provide benefits beyond the reduction of emissions. For one thing, the University will be able to forgo the construction of additional

CAP = Climate Action Plan
CSO = Campus Sustainability Office
TAPS = Transportation and Parking Services
BPS = Bureau of Planning and Sustainability
FADM = Finance and Administration
AUXS = Auxiliary Services
CoP = City of Portland
FP = PSU Framework Plan

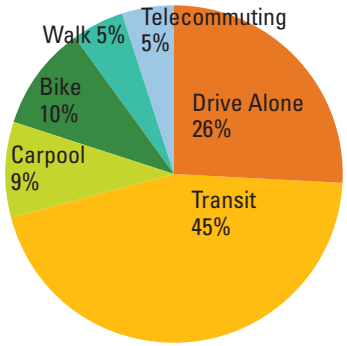
parking structures, and associated capital expenses. University students and employees will also benefit. Low-emission transportation modes are more affordable than vehicle ownership and often provide physical and mental health advantages.

Although a number of actions will be completed by PSU Transportation and Parking Services (TAPS), implementation of the CAP will require a high degree of cooperation among PSU departments, advocacy groups, and local government agencies. Within PSU, an emissions mitigation team composed of staff members in Auxiliary Services (AUXS) will take primary responsibility for managing the implementation of actions, communicating with PSU departments, and coordinating with external organizations regarding commuting related emissions.

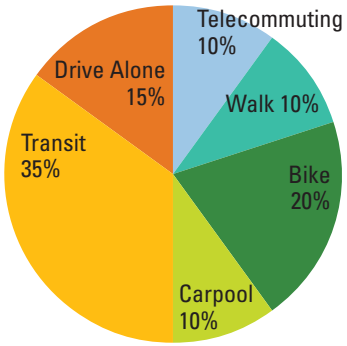
PSU Faculty & Staff Mode Split History



PSU Staff Mode Split 2008



PSU Staff Mode Split 2030



Ongoing Efforts

PSU has already undertaken actions that support the targets in this section. These practices must be continued in order to reach the goal of climate neutrality by 2040.

Ongoing Activity/Program	*Lead Office*	*Program/Activity Age (years)*	*Target*
Maximize parking fees using market-based strategies (i.e. variable-based pricing)	TAPS	5	# 1
Provide prime parking spaces to individuals who carpool or vanpool at reduced rates	TAPS	10+	# 1
Partner with a car-sharing service to accommodate the occasional need to use a car for personal and business trips during the day	TAPS	7	# 1
Provide subsidized transit passes to students and staff members	TAPS	10+	#1
Provide on-campus bicycle repair & maintenance services	TAPS	5	
Lead workshops such as "Bike Commuting for Women" and "Bike Commuting during Winter Conditions"	TAPS	3	# 1
Host community-building programs such as Breakfast for Bikers and Community Coffee Rides.	TAPS	2	# 1
Participate in promotional events sponsored by community organizations, including the Bike Commute Challenge sponsored by the Bicycle Transportation Alliance (BTA)	TAPS	4	# 1
Partner with the City and TriMet in improving transportation infrastructure on and around campus, including bike parking, transit facilities, and intersection crossings and crosswalks (i.e. curb extensions)	TAPS	4	# 1
Advocate for demonstration projects in and around campus including the designation of "Green Streets" by the City of Portland, and "active transportations corridors" by METRO	TAPS	2	# 1

2030 Target #1

Reduce the mode share of drive alone trips to 15% of commute trips made to the PSU campus.

The transportation mode that creates the largest amount of emissions per passenger per mile is single occupancy vehicle travel, or driving alone. It is crucial that the University disincentivize driving alone while facilitating and incentivizing other options in addition to biking and walking.

One-Year Actions

- Develop a bike parking plan that formalizes the annual evaluation of parking demand and corresponding installation of new bike racks.
- Develop university policy formally requiring that PSU's strategies to reduce carbon emissions through commuting be considered during the planning of all capital improvements and infrastructure investments. New and renovated structures should provide secure indoor and convenient outdoor bicycle parking. Where the construction process inhibits bicycle and pedestrian connectivity mitigation plans should be implemented.
- Develop a bicycle theft prevention strategy.

- Develop an outreach plan to increase knowledge about transportation options, potentially including:
  - Promotion of carpool networking programs.
  - The distribution of campus bicycle maps highlighting the locations of large bike parking installments, covered/secure parking, services such as showers and lockers and the PSU Bike Hub.
  - Targeted transportation options marketing, resources, and education in a manner similar to the City's SmartTrips program.
  - Installation of sustainable transportation kiosks providing information and services (e.g. bike pumps, transit schedules, maps, postings about on-campus resources or events, etc.).
- Partner with the City to facilitate the implementation of the newly adopted Bicycle Master Plan.

Three-Year Actions

- Increase the number of bike parking spaces in covered areas, and secure areas.
- Explore additional funding sources to increase the subsidization of transit passes for students and staff members, potentially providing a free "Universal Pass" program to students.
- Explore additional funding sources to support improvements in transportation infrastructure in the University District.
- Partner with the City to enhance bike and pedestrian connections over the I-405 corridor.

2030 Target #2

Reduce the per capita number and distance of commute trips to the PSU campus.

It may be possible to eliminate some trips taken to the PSU campus entirely. For trips that continue to be taken to PSU, proximity to campus would enable students and staff members to make low emission transportation choices, and reduce the overall impact of high emission transportation modes.

One-Year Actions

- Develop a University policy formally supporting the private development of housing and commercial uses near campus.
- Work with New Student Programs to develop an information campaign for newly admitted students, encouraging them to consider transportation when making their housing choice.
- Work with University Housing and FAP to build more student housing and amenities for students on campus.

Three-Year Actions

- Work with the Career Center to develop an information campaign for job-seeking students, encouraging them to consider transportation when looking for employment.
- Work with Human Resources to develop a system to track telecommuting and condensed work schedules used by staff members.
- Work with PSU Extended Campus Program to increase the capacity for and promotion of distance learning and online courses.

2030 Target #3

Lower the carbon impact of vehicles used in the commute to campus.

The students and staff members of PSU comprise a very diverse group of commuters. Due to a variety of factors, both personal and professional, it is likely that some people will continue to see a need to commute by car into the foreseeable future. When this need cannot be eliminated, the emissions created by this transportation mode can still be reduced.

One-Year Actions

- Work with PGE and the City of Portland to increase the number of charging stations on and around campus for visitors.
- Develop a campaign encourage commuters who drive to use another transportation mode for a por-

tion of the trip to campus. For example, encourage commuters to "Park and Ride," "Park and Bike," or park farther from campus, walking the last portion of the commute.

Three-Year Actions

- Develop a system to track the use of low carbon vehicles for commuting purposes, in order to recognize participants and monitor university progress.
- Install real-time informational signage that tells drivers where parking is available reducing the need to circle in search of parking.
- Provide prime parking spaces to individuals who use of low emission vehicles for commuting.

Long-Term Actions

There are currently no Long-Term Actions for this section.

2030 Targets & Actions: Research & Education

Portland State University's (PSU) investments in academic sustainability and climate change activities focus on enhancing the student experience, building on the success of faculty contributions to teaching and research, and deepening the University's engagement with the larger Portland community. These investments are starting to pay dividends as the University is becoming nationally and internationally recognized for its research and curriculum on climate issues and engagement.

Maintaining a focus on climate research and curriculum at PSU will be necessary to achieve the dramatic reductions in carbon emissions outlined in the CAP. To grow that capacity, the Plan outlines a series of actions to increase the University's ability to study the campus itself, and also to increase global visibility and interest around climate research and curriculum at PSU.

PSU has a history of collaborating with the Portland community on civic ecology projects. More recently, PSU has taken on projects with community partners that deal directly with climate issues. The University's role in this work became more focused in 2006, when PSU established the Center for Sustainable Processes and Practices (the Center) to better coordinate faculty members' sustainability efforts and programs across various schools and colleges.

On September 10, 2008 PSU announced that it had received a generous ten-year, $25M challenge grant from the James F. and Marion L. Miller Foundation, which would support activities and initiatives that promote sustainability at PSU and within the broader community. In April 2010, Robert Costanza – a national leader in multi-disciplinary research, which connects ecology, economics, and sustainability – accepted a position as the Director for the Center.

The Center's efforts to increase collaboration within the University around sustainability, and also to grow PSU's global status, is supported by the Campus Sustainability Office's (CSO) efforts to link climate projects in the operations of the University to research and curriculum. Facilities and Planning (FAP) and Auxiliary Services (AUXS) will also play a vital role in supporting curricular efforts and framing the research agenda around emissions reduction solutions.

CAP=Climate Action Plan
CSO=Campus Sustainability Office
The Center=The Center for Sustainable Processes and Practices
AUXS=Auxiliary Services
FAP=Facilities and Planning
SLC=Student Leadership Center

Ongoing Efforts

Miller grant funds have already helped catalyze campus-wide momentum towards addressing climate issues. Additionally, CSO, AUXS and FAP have begun to take meaningful steps forwards in support of this collaborative effort. These practices must be continued in order to reach the goal of climate neutrality by 2040. Below is a list of these activities or programs:

Ongoing Activity/Program	*Lead Office*	*Program/Activity Age (years)*	*Target*
Graduate and undergraduate fellowships	The Center	2	All
Research and curriculum grants for sustainability	The Center	2	All
Integration of select classes and research projects with University operations	CSO	7	#2
Facilitation of applied student projects on campus	SLC, CSO	5	#2
Communication about sustainable practices on campus	The Center, CSO	2	All
Faculty and student travel grants	The Center	1	All
Domestic and international internships in sustainability	The Center	2	#1

2030 Targets & Actions: Research & Education

2030 Target #1

Become a global leader in climate research and curriculum.

PSU is starting to make a name for itself on the global stage with regard to sustainability and climate research and curriculum. Rather than dispersing energy and resources across many areas, the University has recently begun to develop "nodes of excellence."

One-Year Actions

- Develop a communication and outreach program for PSU's climate-related research initiatives.
- Bring two global leaders to PSU for general lectures and high level meet-and-greets with faculty, staff, and students.
- Create a list of the top ten universities working on urban climate issues.

Three-Year Actions

- Develop and pilot energy/climate literacy learning objectives in select undergraduate courses.
- Expand fellowship/internship programs to include a specific section that focuses on climate issues.
- Host an international conference on urban climate solutions.
- Develop a student exchange program where a PSU student goes to another urban university (and a student from that university comes to Portland) to learn about climate issues as they relate to that specific place.
- Develop a program for K-12 schools in the region to learn, teach, and work on the PSU campus with a specific focus on climate issues.

2030 Target #2

Develop an administrative structure that actively integrates PSU academics with operations around climate mitigation projects.

Academic and operations offices at PSU traditionally have very little interaction. In the past, interaction has been limited and not sustained but that trend has begun to change. Developing higher levels of interaction – and sustained collaboration – between the academic side and operations side of the University will provide students and faculty with more opportunities to work on meaningful campus projects.

One-Year Actions

- Develop an online portal to share and display PSU's climate data and progress on climate goals in relation to other universities.
- Build on the PSU student research project entitled "Market and Competitive Analysis of Sustainability" to develop new strategies for integrating academics

with operations. *(Research Project)*

- Hold a visioning summit where PSU faculty, staff, and students co-develop a vision and long-term goals for reaching a sustainable and desirable campus.
- Host meetings with FAP, AUXS, and other operations departments, as well as academic departments of the University, to discuss the barriers and opportunities for increasing collaboration between the two sides of the University.
- Develop a program wherein CSO works with 2 undergraduate classes (per quarter) on a class-long CAP project or workshop.
- Develop a program wherein the CSO staff works with 2 graduate or undergraduate classes (per year) on a term-long CAP project.

Three-Year Actions

- Develop a strategic plan, including protocol, for bridging gaps between academics and operations
- Hire a new staff member, or reassign a current one, to focus on campus operations (energy management, for example) and projects with classes.

Long-Term Actions

2030 Action #1

- Develop three strategic partnerships with other urban universities around the world on climate-related research and curriculum initiatives.
- Adopt energy/climate learning objective(s) for PSU curriculum.

2030 Action #2

- Create a structure for the Deans and the heads of PSU operations to meet and discuss climate projects.

2030 Targets & Actions: EcoDistrict Development

The University is planning to expand its campus in the coming years and has committed to doing so with minimal environmental impact. Meeting the targets set out in Climate Action Plan (CAP) will require collaboration and increased engagement with surrounding property owners, residents, workers, businesses owners, and community partners. From this perspective, the CAP serves the secondary purpose of driving climate and sustainability efforts in the south downtown area.

The University has already taken steps to expand the scope of its sustainability initiatives beyond what can be accomplished on its own. The proposed Oregon Sustainability Center, which will be located adjacent to PSU's campus, involves the City of Portland (CoP), the Oregon University System (OUS), the Portland Development Commission (PDC), private sector partners, and non-profits. The Montgomery Green Street bike parking garage was partially funded by Metro, and the Harrison Street bike parking room is being developed with funding from TriMet. These projects represent some of the collaboration around sustainability planning and projects that already take place between PSU and other public entities. A key element of EcoDistrict development is to expand this collaboration to include adjacent private property owners in these efforts. The actions outlined in this section support the current nodes for partnership building and collaboration, and recommend a structure for expanding the scope and impacts of these projects.

The EcoDistricts Initiative – currently spearheaded by the Portland Sustainability Institute – provides a framework for coordinating sustainability efforts between PSU and neighboring property owners. An EcoDistrict is defined as:

> *"A neighborhood or district with a broad commitment to accelerate neighborhood-scale sustainability. EcoDistrict members commit to achieving ambitious natural resource performance goals, guiding district investments and community action, and tracking the results over time."*[37]

Given the strong emphasis on carbon reduction, the University's leadership role in the EcoDistricts Initiative will be a valuable mechanism for supporting the targets in the CAP.

Beyond carbon reduction, the formation of an EcoDistrict will provide other benefits to PSU and its neighbors. For example, EcoDistrict development will require increased information flow and accountability among PSU, surrounding property owners, residents, business owners, and workers; this could yield economic and social opportunities that were previously hidden. Additionally, the EcoDistrict development process will increase transparency between PSU facilities and the facilities managers in the surrounding properties, and also enhance understanding of behaviors and opinions of the workers, owners, residents, and business owners in the district area.

PSU Finance and Administration (FADM) already has relationships with many University District property owners, as well as strong ties with CoP and TriMet. As

CSO = Campus Sustainability Office
CAP = Climate Action Plan
Metro = Portland Metropolitan Regional Government
PoSI = Portland Sustainability Institute
PDNA = Portland Downtown Neighborhood Association
BPS = Bureau of Planning and Sustainability
FADM = PSU Finance and Administration
AUXS = Auxiliary Services
OUS = Oregon University System
PDC = Portland Development Commission
CoP = City of Portland
PBOT = Portland Bureau of Transportation

a result, FADM will be a central driver for many of the collaborative efforts in the area. Additionally, AUXS and FAP staff frequently work with local and regional public agencies, the Portland Downtown Neighborhood Association (PDNA), and commercial and retail tenants in the University District. CSO, AUXS, and academic researchers will take a leading role in much of the outreach to residents and small property owners, as well as outreach to organizations that do not already have relationships with FADM.

Ongoing Efforts

PSU has already undertaken actions that support the targets in this section. These practices must be continued to reach the goal of climate neutrality by 2040. Below is a list of these activities or programs:

Ongoing Activity/Program	*Lead Office*	*Program/Activity Age (years)*	*Target*
Outreach to major surrounding property owners	FADM	1	All
Collaboration with Metro, TriMet, Portland Streetcar, and PBOT	AUXS	10+	#2
Communication and engagement with the PDNA	AUXS	8	All
Communication and engagement with TriMet, BPS, and Metro about PSU's climate planning process	CSO	1	All
Outreach and engagement of residents and small business owners about climate planning at PSU	Miller Research	1	#1
Communication and engagement with the city and PDC	FADM	10+	#1
Tracking and coordination with PoSI around EcoDistrict concept development, financing and policies	CSO	1	All

2030 Target #1

Develop a governance structure for the University EcoDistrict that is supported and acknowledged by CoP policies and includes broad representation of stakeholders in the University area.

Actions on climate and environmental issues are often limited by ownership boundaries. Establishing a meaningful boundary for co-developing environmental and climate goals and projects across ownership boundaries may expand the area's capacity to increase environmental health and resident well-being while simultaneously reducing costs. PSU will be a central supporter of University EcoDistrict development; however, without mutual ownership across stakeholders, the initiative will not be sustained.

One-Year Actions

- Conduct preliminary outreach to surrounding property owners, residents, workers, and businesses

about the EcoDistrict concept.

- Work with the PDNA and other downtown area networks to increase awareness of PSU's current environmental performance statistics, as well as current planning efforts (PSU's Framework Plan and CAP, for example).
- Identify additional partners in the Portland Metro region who are undertaking environmental and climate planning efforts and whose perspectives and work would be useful for the EcoDistrict goal-setting process.
- Develop an advisory group that includes, but is not limited to, Multnomah County, BPS, PDC, and the Portland Metropolitan Regional Government (Metro) to coordinate and integrate University EcoDistrict environmental and climate planning with regional efforts.
- Form an initial EcoDistrict working group, or working groups, which have representation from small business owners, major property owners, residents, and workers.

Three-Year Actions

- The EcoDistrict working group, or working groups develop policy recommendations for the University EcoDistrict to adopt internally and also for CoP to consider.
- Work with the PDNA and BPS to host a downtown EcoDistrict planning summit.
- Establish a direct communication and information-sharing channel among the pilot EcoDistricts in other parts of the city.
- Develop a strategic plan for governance development, project implementation, and outreach for the University EcoDistrict.

2030 Target #2

The University area EcoDistrict exceeds the goals set out in local and regional climate and environmental plans (CoP, Metro, Multnomah County).

The theory behind an EcoDistrict is that it will not just meet, but will greatly exceed, local and regional environmental and climate goals. In order to ensure that the initiative is making meaningful progress towards these goals, direct coordination regarding performance measurement methodologies with local and regional entities will occur regularly.

One-Year Actions

- Generate high level analysis of EcoDistrict projects that assess the number of property owners involved, as well as evaluating the costs, barriers, and environmental and carbon reduction impacts. *(Research Project)*.
- Build an online database that displays the environmental and climate performance of the University EcoDistrict.
- Develop baseline population data on surrounding property owners, residents, workers, and businesses and compile an inventory of EcoDistrict projects or activities that are currently taking place.

Three-Year Actions

- Based on the high-level project analysis performed in year one, implement three EcoDistrict projects that involve more than three property owners in the University EcoDistrict.
- Identify key projects from regional environmental and climate plans that can be tested within the University EcoDistrict.

Long-Term Actions

2030 Action #1

Establish a district governance structure that has the capacity to tax itself.

2030 Action #2

Implement an energy project that reaches across five property owners.

Conclusion

PSU's annual greenhouse gas emissions are the collective result of millions of choices by students, staff, and faculty members. We are already making positive climate choices every day that add up to big changes on an annual basis. The PSU 2010 Climate Action Plan highlights existing programs that make positive choices easy, and identifies areas where departments can help PSU community members improve their choices.

The process of moving a large institution towards such a major goal as carbon neutrality is not easy. This Plan outlines the initial steps necessary for building a foundation for this change by identifying barriers to emissions reduction, and suggesting solutions. In addition, the CAP defines ownership and a responsibility for moving actions and activities forward, prescribes work plans to improve data collection systems to measure future progress and efforts, and identifies strategies for centralizing institutional information about emissions in order to raise awareness and facilitate change.

Some efforts will be possible using the current distribution of resources at the University, while others may require additional resources and budget allocation within individual departments. Alliances across institutional boundaries are proposed within the Plan as a means for solving operational challenges. Additionally, partnerships with private industry, public agencies, and the community will be vital to reaching the goal of carbon neutrality by 2040.

Achieving a sustainable campus has no fixed endpoint – it will require a continual process of reinvention. This is an ethic that directly aligns with PSU's development of a "living laboratory" for new sustainable processes and practices. Without a keen and humble understanding of the full (and not yet completely understood) scope of climate impacting activities, efforts to achieve a sustainable campus will continue to be limited and internally flawed. This Plan is a best effort by the planning team, working groups, and students to assess the on-the-ground realities at PSU and establish immediate actions to advance the University's climate stewardship.

References

1. EPA Greenhouse Gas Equivalencies Calculator: http://www.epa.gov/rdee/energy-resources/calculator.html
2. http://www.ghgprotocol.org/standards/corporate-standard
3. http://www.oregon.gov/ENERGY/GBLWRM/docs/OUS_GHG_Inventory.pdf
4. http://www.leg.state.or.us/07reg/measpdf/hb3500.dir/hb3543.en.pdf
5. PSU's GHG inventory uses a similar emissions tracking methodology as Metro's Regional Inventory.
6. http://www.pdxinstitute.org/index.php/whatwedo/ecodistricts
7. An exampled of this work is a project between CSO, Facilities & Planning and Auxiliary Services that aims to better meter and track Scope 1 and 2 emissions.
8. "Carbon neutrality" is different from "net zero" emissions in that carbon neutrality can be achieved using carbon offsets.
9. A combined heat and power engine generates electricity by burning natural gas, and then captures the waste heat from the electricity generation process, and uses the heat for steam or hot water heating.
10. Oregon State University's Climate Action Plan provided some of the content for this section.
11. A full definition of the EcoDistrict concept can be found in the "EcoDistrict Development" section of the plan and in the "Key Terminology" section.
12. 2010 PSU Framework Plan
13. Efficiency measures, fuel switching and "onsite" offsets actions will occur simultaneously. Only once those options have been exhausted will the University investigate the possibility of purchasing off-site offsets.
14. Executive Order 06-02 requires all new state buildings and major renovations to meet the US Green Building Council's Leadership in Energy and Environmental Design (LEED) program's "Silver" standards (Office of the Governor, 2006).
15. http://oregonsustainabilitycenter.org/
16. The building is currently fundraising for a capital gap.
17. The Broadway energy competition was organized by CSO staff, where different floors in the Broadway housing building compete against each other to achieve energy reductions.
18. CSO completed a night audit of a select building on campus to gather data about after hour energy use on campus.
19. These buildings must also be expected to remain in use for 6+ years.

20. Oregon Revised Statute (ORS) 276.900, State Energy Efficient Design (SEED), stipulates that State of Oregon facilities constructed or purchased by authorized state agencies must be designed, constructed, renovated and operated so as to minimize the use of nonrenewable energy resources and to serve as models of energy efficiency (State, 2010). In addition, the 2007 Oregon Legislature passed HB 2620 which requires that public entities spend 1.5% of the total contract price of a public improvement contract for new construction or major renovation of a public building on solar energy technology (State, 2010).
21. Light harvesting is a process where additional natural light is brought into buildings through skylights, light tunnels, etc.
22. The wind resources on campus are insufficient for existing urban wind technology.
23. Anaerobic digesters use microorganisms to quickly breakdown biodegradable substances. One of the byproducts is methane, which can be burned as a renewable resource to run boilers and combined heat and power systems.
24. PSU has central boilers and chillers that provide heating and cooling for a portion of campus buildings.
25. The practice of regularly checking to see that building HVAC systems are running efficiently can save up to 20% on energy use with payback times under three years. For detailed information, visit the Continuous Commissioning Guidebook for Federal Energy Managers: (http://www1.eere.energy.gov/femp/operations_maintenance/om_ccguide.htm)
26. http://www.cbs.state.or.us/external/bcd/committees/11reachcode.html
27. http://www.portlandonline.com/bps/index.cfm?a=206573&c=48212
28. http://www.architecture2030.org/
29. This refers to the production, disposal and movement of materials, goods and foods related to PSU.
30. Waste generation on campus = waste disposed + waste recovered. Another way to understand the term is as a rough estimate for all items purchased minus (-) food and plus (+) yard debris.
31. Based on current estimates, approximately 70% of PSU waste goes to the landfill.
32. At the moment, PSU only has the capacity to give a detailed embodied emissions number for paper purchases.
33. Copy paper is one commodity that can already be tracked for embodied emissions.
34. The CSO developed a copy paper report for FY 2008 that outlines a series of recommendations for paper conservation and purchasing recycled content. Find a copy of the report here: http://www.pdx.edu/sustainability/reports
35. This includes study aboard.
36. This plan does not encourage a reduction in travel that is necessary for building the careers and reputations of faculty and students. However, when there are viable options for reducing travel that does not limit the above factors, then this plan lobbies for that choice.
37. http://www.pdxinstitute.org/index.php/whatwedo/ecodistricts

Appendix A: Research Projects

Throughout the Climate Action Plan nineteen research questions are identified to help reduce carbon on campus. Due to staff capacity limitations, these research projects will only be completed with help from students and faculty. The Campus Sustainability Office (CSO) has described basic needs and structure for these projects; however, there is ample opportunity to refine and customize each project to fit the interests and time constraints of researchers.

As a part of the Outreach and Education Plan (OEP) for the CAP, the CSO will be marketing the overall content of the Plan itself and sharing research opportunities with faculty and students. We hope that the rough descriptions provided below will stimulate interest from students and faculty who read the Plan and inspire them to contact CSO staff to ensure that the project has not already been taken. If the project is still available, the student or faculty member will work with CSO staff to craft a detailed scope and work plan that aligns with current efforts.

The projects are broken into the Plan's six categories and then categorized by either "Case study research" or "Campus-based research." "Case study research" projects will generally be less time-intensive than the "Campus-based research, which will likely require ongoing work with a CSO member or a contact at the University. These delineations do not always hold true, and in many cases the "Case study research" projects could be expanded into a "Campus-based research" project if the faculty member(s) or student(s) have the time and interest to take on the additional work required.

Buildings (Case study research)

1. Research funding mechanisms used by other universities and institutions that have installed large wind turbines (Appalachian State University, University of Vermont, University of Minnesota, etc.).

This project will look at other the successes and lessons learned from universities who have invested in large wind. Search the AASHE Digest (www.aashe.org) for wind turbine installation projects. Is there something PSU can learn from how these projects were funded? Are other public entities in the Portland area considering installing turbines? What kind of capacity would be needed to generate 80% of building-related energy from renewable energy by 2030?

2. Analyze the potential to integrate light harvesting into new building plans, as well as retrofits in existing buildings.

Light harvesting is known for positive health benefits and reduced lighting costs. This project will investigate the costs of this technology and some of the possible downsides (additional cooling loads in the summer, structural problems, etc.). Identify opportunities to enhance light harvesting in mid-century buildings such as Neuberger Hall and the Education/Business Administration Building.

3. *Research other public entities that have implemented workforce training programs in clean technologies.*

The demand for workers in clean-tech fields is increasing each year. This project will identify best-practices in adding workforce training component to RFP language for major renewable energy/weatherizing projects. It will also identify workforce training programs for clean technologies, building retrocommissioning work, potential financing mechanisms, long-term economic benefits for the state and country, and barriers to implementation.

Buildings (Campus-based research)

1. Determine the feasibility and impact of PSU participating in the City of Portland's High Performance Building program.

Participating in the City of Portland's High Performance Building program may be a great opportunity to build stronger ties with the Bureau of Planning and Sustainability, while also providing the University with a more progressive standard for building develop-

ment. This project will look at the immediate costs and benefits of the program, such as incremental budgetary increases for new buildings benchmarked against current standards, utility savings, and changes to health and well being. There will also be a strong focus on the long-term benefits of the program, such as a decrease in risk towards climate change and a hedge against future electricity and gas spikes. For more information go to: (http://www.portlandonline.com/bps/index.cfm?c=45879&)

2. Based on research by engineering faculty, suggest an alternate location or use for $50,000 earmarked for an urban wind energy system by the Chancellor's office.

Urban wind is currently not deemed to be viable for cost effective energy generation on campus. The project will evaluate other renewable or clean technologies that would be good candidates for a technology demonstration project on campus.

3. Conduct surveys and targeted interviews with students, faculty, and staff to identify ideal locations on campus for renewable energy installations based on visual impact, instructional value, and technical feasibility.

Renewable energy systems provide clean energy, but also provide pedagogical and behavioral change value. This project will create a decision-making matrix for siting renewable energy technologies on campus by evaluating the possible limitations as well as the benefits associated with the installation sites.

4. Perform an analysis of the impacts of using biomass in PSU district energy system.

PSU's district energy system already provides much lower carbon heating and cooling than most single building systems on campus, but still has a large carbon load. This project will look at the existing district energy system at PSU and evaluate the feasibility of switching to biomass for some of the fuel source.

5. Develop a high level scan of available smart grid technologies and their potential use at PSU.

The smart grid technology world is vast. These technologies could serve to support many of the demand management goals in the CAP. This project will start with a large scan of the different smart grid technologies in the sector, and then the group will narrow this list by completing an evaluation of the needs and possible application of the smart grid at PSU. Finally, the group will take the list of applicable technologies and perform cost benefits analysis to develop a short list of technologies that PSU might want to invest in.

6. Work with the Space Committee to develop new models for space allocation that help achieve CAP goals.

Strategies related to space management, building programming during major renovations, and scheduling can be used to support higher densities and lower the carbon loads of buildings (per FTE). This project will be done in coordination with the Space Committee, as the project team presents the goals of the CAP to the group and then works to collaborate on existing projects or develop new ones that help support CAP goals.

Materials (Case study research)

1. Explore the feasibility of creating a waste-sorting program.

Studying the breakdown of a waste stream is an effective way to get a detailed understanding of the waste generation and diversion rates on campus. This project will look at best practices by other universities and identify opportunities for improving data collection and raising awareness about PSU's waste stream to reach the City's 75% waste diversion mandate.

Materials (Campus-based research)

1. Complete a feasibility analysis and timeline for composting all waste from catering and dining facilities on campus and switching to durable service-ware.

Appendix A: Research Projects

The City of Portland has recently introduced composting to residents and already makes the service available to businesses. This project will look at opportunities to improve compost capture rates, reduce contamination, and develop a timeline for establishing the capacity for composting 100% of the pre- and post-consumer organics at PSU.

2. Explore options that can be included in a new dining service RFP with zero waste goals – adopting those of Victor's at Ondine.

Victor's at Ondine is already a near zero-waste dining hall. Working with Auxiliary Services, this project will build off of the Ondine example (making additions where necessary) to craft guidelines for the next dining service RFP that sets out the steps for converting all PSU dining to zero waste facilities.

3. Write a food action plan that evaluates current food purchasing policies and performance at the University, develops steps to align with the Multnomah Food Initiative, and increases the amount of low carbon food consumed on campus.

Portland is a national leader in low carbon and local food policies and initiatives. This project will develop recommendations for aligning PSU with those efforts, as well as a series of next steps for purchasing low carbon produce at PSU.

4. Evaluate opportunities to increase low carbon food purchasing by Food for Thought Café and the dining services contractor.

Food is a major area of embodied emissions for the University. Food for Thought Café is a great place to pilot, and better understand the potential benefits and barriers to increasing the percentage of low carbon food being purchased. This project will work with the service contractor and Food for Thought Café to gather baseline data about food currently being purchased, testing the feasibility of piloting a low carbon food program.

Travel (Case study research)

1. Research best practices and lessons learned from other institutions to develop a methodology for collecting, administering, and assessing progress of a voluntary carbon offset program.

Reaching carbon neutrality in the travel category does not mean that the University will stop traveling. This project will investigate different offset programs in the US and the world, specifically focusing on the programs that reinvest the offset money into local carbon-reduction projects. The project will report on the best practices for starting, developing and maintaining one of these programs.

Travel (Campus-based research)

1. Identify departments with the highest travel expenditures and conduct interviews with faculty and staff to gain a better understanding of departmental travel patterns and options for trip reduction or switching to less carbon-intensive means of transportation.

Before taking action on an education campaign or materials to support low-carbon travel, the baseline conditions for travel at PSU must be better understood. This project will generate a report on the departments with the highest travel expenditures that outlines barriers and opportunities for reducing the carbon intensity for travel in these departments.

2. Forecast 10-, 20-, and 30-year projections for PSU travel rates.

Understanding different potential trends for future University travel will be important for setting carbon reduction goals and strategies for the travel section. This project will generate a series of factors that impact future travel trends and based on these factors develop high medium and low carbon emissions for 10-, 20- and 30- years out.

3. Develop a tool that allows PSU managers to understand trade-offs among travel costs, time expenditure, and mode of travel when approving employee travel requests.

When determining the best form of travel for employees, managers need to be given a tool that processes the different options into a single decision. The project will look at a variety of travel patterns for PSU faculty, staff and students and then make an analysis tool that allows managers to receive costs and benefits of different travel options after they input a series of variables (distance of travel, amount of flexible time in the trip, location, etc.).

Commuting

No research projects in this section.

Research and Education

No research projects in this section.

EcoDistrict Development (Campus-based research)

1. Generate high level analysis of EcoDistrict projects that assess the number of property owners involved, as well as evaluating the costs, barriers, and environmental and carbon reduction impacts.

If the district scale is to become a dominant paradigm in sustainable urban development, it should offer triple bottom-line gains over traditional project scales. This project will investigate a series of infrastructure as well as social projects at the district scale, looking at the relative environmental and social benefits.

Appendix B: Data Considerations

The data in this plan should be understood with the following assumptions in mind:

Buildings

College Housing Northwest operated the PSU housing buildings in 2000; neither the local utility (Northwest Natural) or College Housing Northwest have 2000 data for gas usage in those buildings. Therefore, the 2000 gas baseline is actually a proxy based off of 2006-2008 average data for those buildings.

There are rare instances when 2008 data for individual buildings were not available. If there were trend data for three or more years prior to the 2008 for those individual buildings, then aggregates were used to recreate an estimate for 2008. If there were significant inconsistencies in this historic data, then the information was not used.

- *Aggregated data for 2000 (electricity): Parking 2*
- *Aggregated data for 2008 (electricity): Engineering Building, School of Business Administration, Urban Center, University Place*
- *Aggregated data for 2000 (gas): Peter W Stott Center*

If a building was acquired after 2000, then that building, and its square footage were removed from to 2000 baseline calculations.

If a building had missing data for the 2000 or 2008 baselines, then the square feet for that building was removed from the total Energy Use Index (EUI) calculations.

- *Buildings built or acquired after 2000 (electricity and gas): Art Building and Annex, Engineering Building, Kiononia Building, Research Greenhouse, Simon Benson House, Native American Student and Community Center, Science and Education Center, University Place, Broadway Residence Hall, Stephen E. Epler Hall*
- *Data missing, 2000 and 2008 (gas): Systems Science, University Honors, Fourth Avenue, Parking 1, 2, 3*
- *Data missing, 2008 (gas): Montgomery Court*
- *Data missing, 2000 (electricity): Kiononia Building, West Heating Plant*

In certain instances more than one building is on the same gas/electric meter when calculating the 2000 baseline. It was not always possible to determine what meters were shared by what buildings. However, there are some buildings that did not have their own meters. If a building shared a meter with some other building, then the building's square footage were combined and included in the Energy Use Index (EUI) calculations.

The buildings on the district steam loop all feed into the same overall gas meter. Therefore, it was not possible to determine usage for individual buildings on the district loop. Instead, the total usage was spread across the aggregate square footage for buildings on the district steam loop. As a result, all of the buildings on this loop have the same number for gas use intensity.

The 2000 and 2008 baseline energy numbers do not include leased space -- only buildings owned by PSU at the end of fiscal year 2008. Total leased space is about 253,964 gross square feet.

Materials

To determine the diversion rate at PSU the following items are tracked in pounds to create the total recyclable materials leaving campus: compostable food-related organics, mixed recyclables (paper, metal, plastic), glass, yard debris, rendering oil, scrap metal, wood waste, misc. fiber, Styrofoam, rigid plastics, and construction debris. The total pounds of recyclable materials is divided by the sum of recyclables and landfill-bound trash; The final number is a percentage called the diversion rate.

There are currently no data on paper recycled by shredding services, toner cartridges, or pounds of electronics recycled.

To determined waste reduction rates, the total amount of recycling and trash leaving the campus is compared from year to year. If that total number is lower from

one year to the next, the campus is reducing its waste.

Trashco is the waste hauler for the campus. They provide the data tracked by the University in monthly bills. Since PSU is just one of Trashco's many stops on a given day and there are not scales on the trucks, the data the company provides is an estimate that is calculated based on the number and volume of receptacles and frequency of service. Exact weight information is gathered on an annual basis every week during Recyclemania (January-March).

Emissions related to sewer-related methane releases were included as «waste water»in the carbon calculations.

The amount of carbon associated with trash pick-up was not included in the carbon calculations based on the small impact of the activity. The EPA assumes an average of .01 MTeCO2 is associated with the pick-up and transfer for each ton of waste. This would equate to about 30 MTeCO2 at PSU. The Portland Metro Regional Government's greenhouse gas inventory accounts for carbon associated with transporting waste to the Arlington landfill.

Travel

The current travel data does not allow a way to discern between forms of travel such as train, carpool, rental cars at the other end of a flight, type of plane used or bus.

Commuting

Commuting data are collected using surveys administered by Auxiliary Services. The Student Transportation Survey and Employee Transportation Survey are conducted biennially, in alternate years. Responses are collected during a two-week period in May. 2008 emissions were calculated with the 2007 Student Transportation Survey and 2008 Employee Transportation Survey. Several limitations characterize the survey data:

- *For an individual commuter, only the mode used to travel the greatest distance to campus is collected for each day. The surveys do not collect information about trips from campus returning home. The surveys do not collect information about combinations of modes, or multiple trips to campus in a single day. For the purpose of calculating emissions, the single mode was used for each respondent's trip to and from campus for each day of commuting assigned to that mode.*
- *Commute distances were calculated using residential addresses maintained by PSU, which include some inaccuracies. These distances are "as the crow flies," rather than along the street network.*
- *The fuel efficiency of vehicles used to commute to campus is not collected. For the purpose of calculating emissions, national fleet averages were used.*
- *Bus and light rail trips are not separated, although each mode generates different emissions per mile. When calculating emissions, bus and light rail trips were all counted as bus trips; the MAX light rail began connecting to campus in fall 2009.*
- *The Student Transportation Survey includes a wide variety of potential mode choices. For the purpose of calculating emissions, "drove alone," motorcycle/scooter," and "was dropped off" were treated as trips using a "personal vehicle."*
- *The Employee Transportation Survey is constrained by additional limitations, in part because it is designed by TriMet:*
  - *--Only faculty and staff members in permanent positions greater than 0.5FTE are surveyed. Adjunct professors are not surveyed. Part-time, temporary, and student employees are not surveyed.*
  - *--Staff & faculty members not separable. For the purpose of calculating emissions, commuting choices were assumed to be the same for both groups, except that staff members were assumed to travel to campus five days per week instead of four.*
  - *--Streetcar trips are not identified in the survey.*

In order to calculate commuting emissions using the Clean Air -Cool Planet Campus Carbon Calculator, data must be submitted for three different groups: students, faculty, and staff. The calculator is designed to accept the percentages of each group whose primary

mode equates to "personal vehicle," "carpool," "bus," and "light rail." However, because PSU students, faculty, and staff use a variety of transportation modes during a given week, Auxiliary Services calculated the percentages of each group who used the given mode at least one day during the survey period. For each group using each mode, the calculator also requires the average round-trip commutes per week and the average miles per trip. At PSU, these values reflected travel using the specified transportation mode, rather than all trips taken by a group.

The calculator generates per person per mile estimate of emissions using assumptions about the number of people sharing vehicles. For example, the calculator assumes that carpool vehicles contain 2 persons. In order to calculate total annual emissions, the calculator also requires a population total for each group, and an estimate of the number of weeks per year that each group commutes to campus.

Research and Education

No data considerations were included for this section.

EcoDistrict Development

No data considerations were included for this section.

Appendix C: Standard Operating Procedure Changes

The Climate Action Plan recommends a series of standard operating procedure (SOP) changes to help the institution systematically move toward a less carbon-intensive future. This section consolidates all recommendations and divides the SOPs into two categories: Those requiring more analytics before implementation, and those that can be implemented more readily.

The SOP changes in bold type require more specific analytics to support their implementation, such as investigating economic, political and environmental impacts, as well as structural needs for successful implementation. The CSO staff has capacity for some of these analytics, but completing the entire list of policies will require assistance from faculty and students. The SOPs not in bold are those that require only limited analytics before implementation.

These policies are not in a particular order. A prioritization schedule for these policies will begin to emerge once the analysis for costs, benefits and politics are completed for each individual policy.

Buildings

Create a standard schedule, long-term maintenance strategy, and funding mechanism for building retro-commissioning (also known as continuous commissioning) to assure that PSU buildings are operating at optimal efficiency.

Incorporate energy efficiency measures in Facilities and Planning 'Design Standards.' Apply these standards across campus, including in housing buildings (i.e. when a renovation is taking place, replace single pane windows with models that have U-values lower than .30) Review design standards for climate adaptation – given anticipated increases in summer temperatures.

Adopt an energy policy that includes:

- Energy Star standards for appliances,
- authorizing OIT to establish central power management for staff computers,
- building temperature set points,
- a list of non-essential personal appliances (space heaters, refrigerators, coffee makers, etc.).

Reinvest the money currently spent on Renewable Energy Certificates into on-site efficiency or capacity-building improvements, such as metering. Consider formalizing the duties, responsibilities, and team roles of the Energy Fund Management Team.

Develop protocols and standards for using the best HVAC technology wherever possible, including raising upper limit on datacenter temperature and cool aisle ceiling design.

Establish protocols for gathering baseline utility data from new building acquisitions.

Adopt a standard metric for analyzing new building purchases based on their current ability and future potential for increasing building utilization levels. Examples of the items this metric will evaluate are:

- the building's current density – and potential to increase density
- off-hour applications
- multipurpose uses

Materials

Establish standards and a funding mechanism for consistent indoor and outdoor recycling stations.

Create a centralized system for tracking diversion rates for new construction, major renovation, and in-house remodels.

Enforce existing dining services contractual requirements for local and organic standards or work with contractor to modify food purchasing contract requirements based on the evaluation done in year one.

Establish printing standards for campus, require all new printers to be duplex-capable, and ensure that all

existing duplex-capable printers are set to duplex by default.

Identify barriers and opportunities for eliminating bottled water from all PSU-sponsored catered events, departmental offices, and student group activities.

Create a centralized tracking system for purchases of high volume campus goods.

Travel

Through CSO administration, implement and monitor a carbon offset program for travel emissions.

Develop a centralized system for tracking faculty and staff trips that has the capacity to connect faculty/staff who plan to attend the same events so they can coordinate travel modes/costs.

Consider adding a box on travel forms where the travel applicant can acknowledge his/her carbon impact by listing miles or simply signing a statement.

Commuting

No SOP changes in this section.

Research and Education

No SOP changes in this section.

EcoDistrict Development

No SOP changes in this section.