

# Climate Action PROGRESS 2013

An aerial photograph of Portland, Oregon, showing a dense urban landscape with numerous skyscrapers, a river winding through the city, and a large highway interchange in the foreground. The image is partially covered by green overlays containing text.

Portland State University



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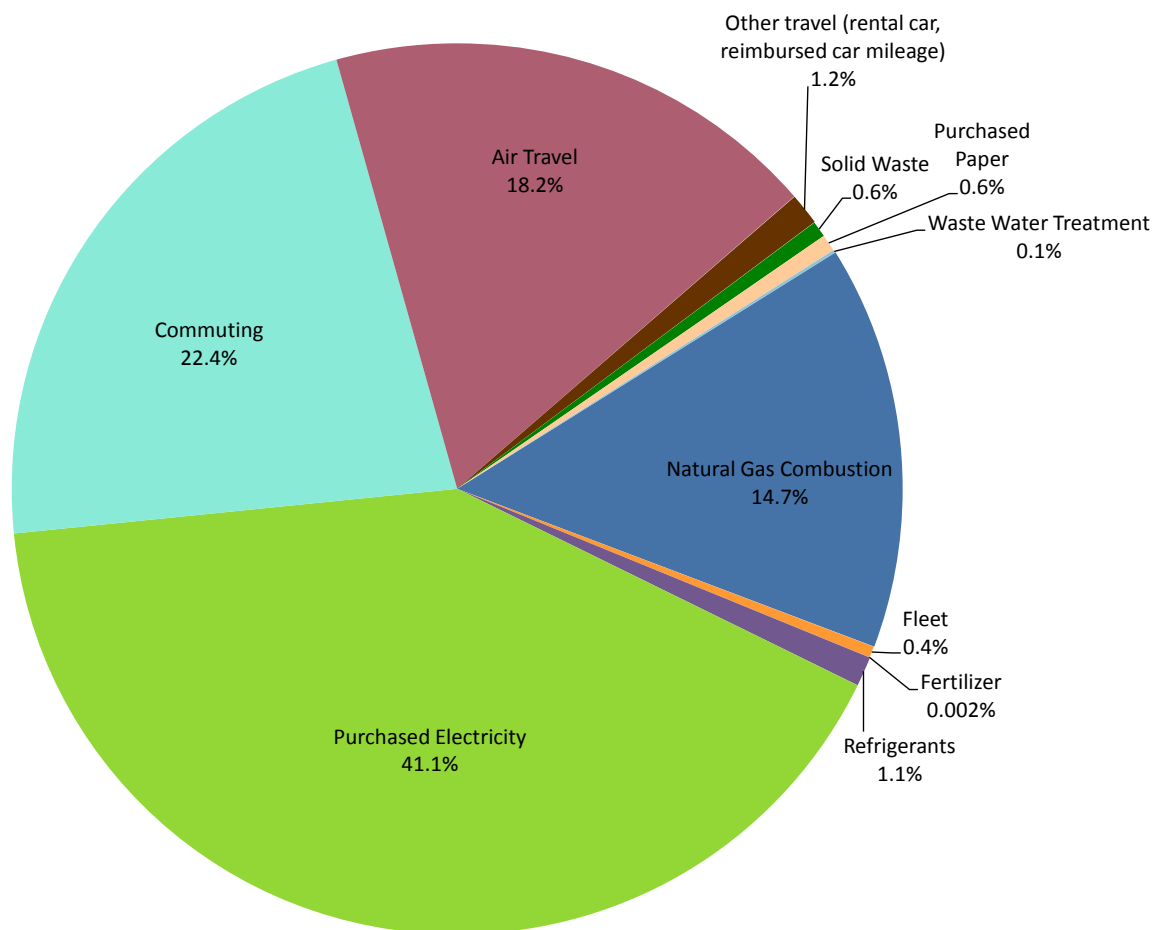
# Executive Summary

## 2013 Climate Action Progress Report

In 2010, Portland State University (PSU) adopted the University's first [Climate Action Plan](#) (CAP) as part of the American College and University President's Climate Commitment (ACUPCC). The CAP calls for climate neutrality by 2040 and identifies emission reduction targets in the following areas: Buildings & Energy, Materials, Travel, Commuting, Education & Research, and EcoDistrict Development. This report serves as an assessment of progress to date and provides: an updated carbon emissions profile, a snapshot of progress on individual actions, a summary of efforts contributing to CAP goals, and suggestions regarding next steps.

## 2012 Greenhouse Gas Emissions Profile

PSU's gross carbon footprint was calculated at 46,528 metric tons of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>e) in 2012, 60,741 MTCO<sub>2</sub>e in 2008 (baseline year), and 45,133 MTCO<sub>2</sub>e in 2010. Unfortunately, year to year analysis has been inconsistent and the degree of change cannot be stated with confidence. Efforts are underway to normalize data and determine shifts in emissions over time. Below is a breakdown of PSU-generated emissions by source.



## Action Items Snapshot

The Progress Report "Snapshot", a series of introductory pages in each section, illustrates progress on every action item in the CAP. Of 140 actions, PSU has completed or nearly completed 41, roughly 29% of actions identified. Some progress has been made on an additional 34% of actions. These percentages, however, do not accurately communicate the full scope of progress towards CAP goals. Many efforts have driven progress but were not specifically called for in the plan and are not accounted for in the Snapshot. This report provides an overview of climate action efforts at PSU in the past three years, including those not identified in the CAP.

# Executive Summary

## ***Climate Action Highlights***

- Hired a full-time Utilities Manager
- Added a 53.8 kWh, 4,222 SF solar array producing 38,000 kWh of renewable energy annually
- Initiated a partnership with Energy Trust of Oregon, to develop an energy management plan
- Conducted a campus-wide waste audit and vastly improved waste data collection and analysis
- Implemented a “hold and release” function on centrally managed printers, saving 354,177 sheets of paper in two terms
- Formed a Sustainable Drinking Water Task Force (SDWTF) aimed at reducing bottled water consumption and associated waste
- Initiated a survey to identify PSU air miles traveled and establish a baseline
- Added new video conferencing technologies that can be promoted as an alternative to travel
- Drive alone trips decreased to 17% for students and 26% for employees; a 10.5% and 7% drop, respectively, from 2011
- Added 78 new secure bike parking spaces
- Launched VikeBikes program which provides long-term bike rentals for students
- Developed a sustainability course identification rubric to analyze syllabi and catalog sustainability courses
- Hired an Undergraduate Research, Engagement and Creative Activities (URECA) Coordinator to connect campus sustainability initiatives and academics
- Established a governance structure, an action plan and an engagement strategy for SoMa EcoDistrict

## ***Next Steps***

The process of working towards CAP targets and assessing progress has illuminated the need for revisions to several targets and action items. Several suggested changes can be found in this document and the Climate Action Plan Implementation Team (CAP-IT) has begun the process of evaluating actions and targets to recommend changes for the next iteration of the Plan. A larger effort is underway to develop a sustainability strategic plan for the University that could encapsulate all campus sustainability goals, including climate action strategies.



# Introduction

## ***Introduction & Background***

In May 2010, PSU President Wim Wiewel signed the University's first Climate Action Plan (CAP), as part of the American College and University President's Climate Commitment (ACUPCC). The CAP outlines targets and action items in specific focus areas aimed at incrementally reducing PSU's carbon footprint and achieving carbon neutrality (balancing carbon released with an equivalent amount sequestered or offset), by 2040.

In response to CAP directives, an interdepartmental group formed to begin implementing carbon reducing strategies. That group, the Climate Action Plan Implementation Team (CAP-IT), is comprised of five sub-committees representing the CAP-identified focus areas: Buildings & Energy, Materials, Travel & Commuting, Education & Research, and EcoDistrict Development. Since 2010, CAP-IT has met monthly to plan, track, and report progress in each area. This report strives to inventory and summarize climate action efforts to date.

The 2010 CAP stipulated numerous action items for reducing carbon emissions. Initially, these provided much needed direction. However, the prescriptive nature of the plan created challenges for progress reporting, as some actions may no longer be relevant or considered the best approach for meeting larger reduction goals. The Progress Report "Snapshot", a series of introductory pages within this report, illustrates progress on every action item in the CAP. Some actions have been resolved, some are worked on continuously, some require significant resources, and others are no longer being pursued.

Of 140 actions identified in the CAP, PSU has completed or nearly completed 41, roughly 29%. Some progress has been made on an additional 34% of actions. These percentages, however, do not accurately communicate the full scope of progress towards CAP goals. Many efforts made in the last three years have driven progress but were not specifically called for in the plan and are not accounted for in the Snapshot assessment. Moving forward, PSU aims to maintain aggressive reduction goals within each category, but allow a more flexible approach towards strategies for meeting these goals. This report outlines climate action efforts in the past three years, including those not called for in the CAP.

Since adopting the CAP, stakeholders are more aware of existing opportunities as well as limitations related to climate action goals. The work of formulating strategies for emissions reduction and developing tracking mechanisms for previously unrequested data has been enlightening. Lessons learned will inform the next iteration of the CAP and prime the University for further reducing carbon emissions. The Campus Sustainability Office (CSO) is working with campus partners to better institutionalize data collection methodology and thoroughly document the process for future stewards of the greenhouse gas (GHG) assessment and campus climate action.

The following sections of this report provide:

- An updated carbon emissions profile
- Snapshots of progress on individual actions identified in the CAP
- A summary of efforts contributing to CAP goals within specific focus areas
- Suggestions regarding next steps and revisions

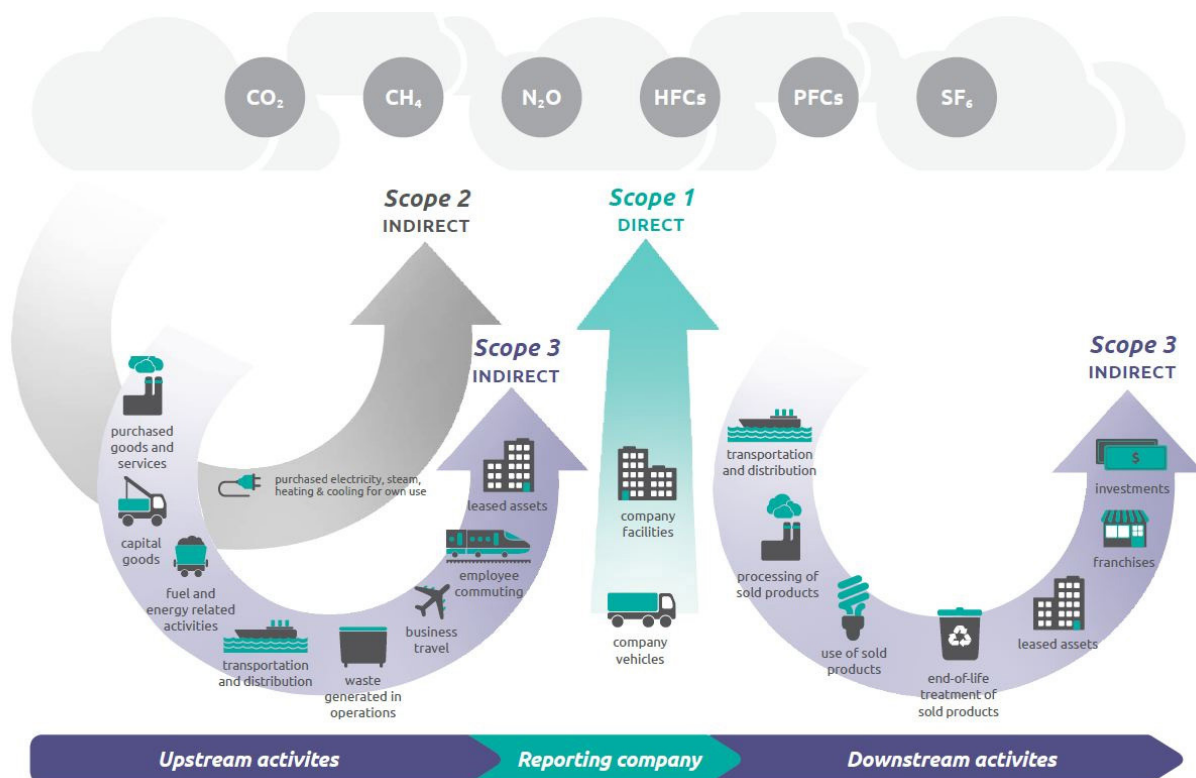
# Emissions Profile

## Emission Boundaries

**SCOPE 1:** DIRECT SOURCES SUCH AS NATURAL GAS COMBUSTION, VEHICLE FLEET, AND REFRIGERANTS

**SCOPE 2:** INDIRECT SOURCES SUCH AS ELECTRICITY GENERATED OFF-SITE AND PURCHASED BY PSU

**SCOPE 3:** INDIRECT SOURCES EMBODIED IN THE LIFE CYCLE OF PRODUCTS AND SUPPLY CHAINS, UNIVERSITY TRAVEL, COMMUTING, WASTE DISPOSAL, AND WATER TREATMENT



Source: Greenhouse Gas Protocol

## Methodology

Though every effort was made to employ a consistent approach for accurate year to year comparisons, CSO acknowledges several data limitations. Instances of inconsistent methodology due to weak institutional memory, changes in building use and ownership over time, revisions to the tool used to calculate emissions, and a lack of systemic mechanisms for collecting data likely account for some portion of yearly differences. Thus, the degree and direction of change in carbon emissions cannot be stated with confidence. However, efforts are underway to normalize data from past years and better understand shifts in emissions over time.

## Scope Specific Limitations

Scope 3 emissions, or indirect GHG emissions, are notoriously difficult to account for. Relatively accurate data is available for tracking emissions from waste disposal and commuting behaviors. However, existing reporting structures for University sponsored travel does not yield easily accessible information regarding distances traveled by mode. Mileage information is available through travel agencies, however a labor intensive approach must be taken to uncover those

# Emissions Profile

metrics for reimbursed travel. A survey is now underway to do that, but reimbursed air miles are currently excluded from the FY 12 GHG inventory.

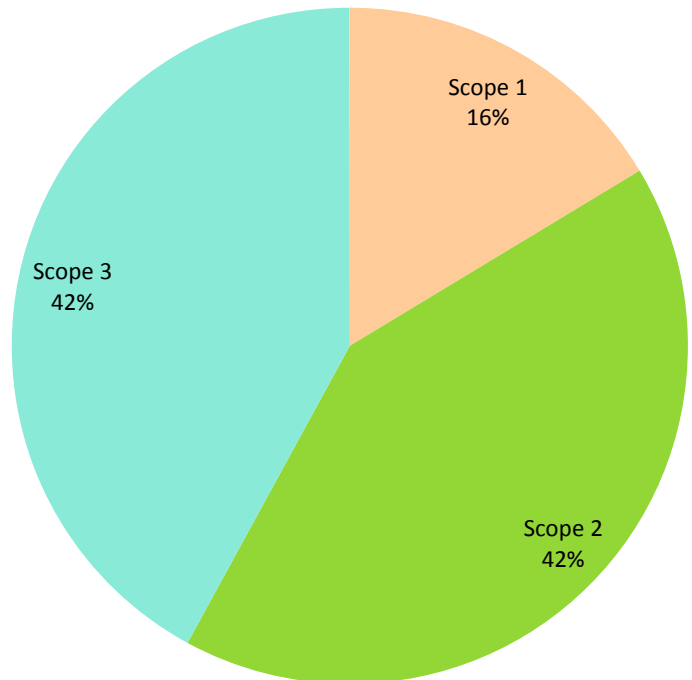
While it is widely held that embodied emissions from the supply chain of purchased goods and services (resource extraction, manufacturing and transporting goods to campus) comprise a significant portion of an organization's carbon footprint, those remain the most challenging emissions to account for. Supply chain emissions are not calculated in the current version of the carbon calculator. For that reason, they are excluded from this inventory. Additionally, scope 1 and 2 emissions from operating leased spaces are not accounted for in the FY12 GHG inventory.

## **Greenhouse Gas Inventory, FY 2012**

PSU's most recent GHG emissions assessment was performed by CSO in 2012 using data from fiscal year 2012 and the [Clean Air Cool Planet Campus Carbon Calculator](http://rs.acupcc.org/ip/554/). See <http://rs.acupcc.org/ip/554/> for PSU GHG reports submitted to the ACUPCC.

The University's gross carbon footprint for FY12 was 46,528 metric tons of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>e) compared to 60,741 MTCO<sub>2</sub>e in 2008\*, and 45,133 MTCO<sub>2</sub>e in 2010. FY12 emissions represented 2.0 MTCO<sub>2</sub>e per student FTE and 8.8 MTCO<sub>2</sub>e per 1000 square feet of campus space. The recently-released Oregon University System (OUS) GHG report noted that PSU had the lowest emissions per student of all schools in the OUS system, and was in the 10th percentile compared to similar institutions nationwide.

\*2008 emissions are listed in the 2010 CAP as 105,803 MTCO<sub>2</sub>e, which included an analysis of supply chain emissions.



## **Emissions by scope, FY 2008, 2010, & 2012 (MTCO<sub>2</sub>e)**

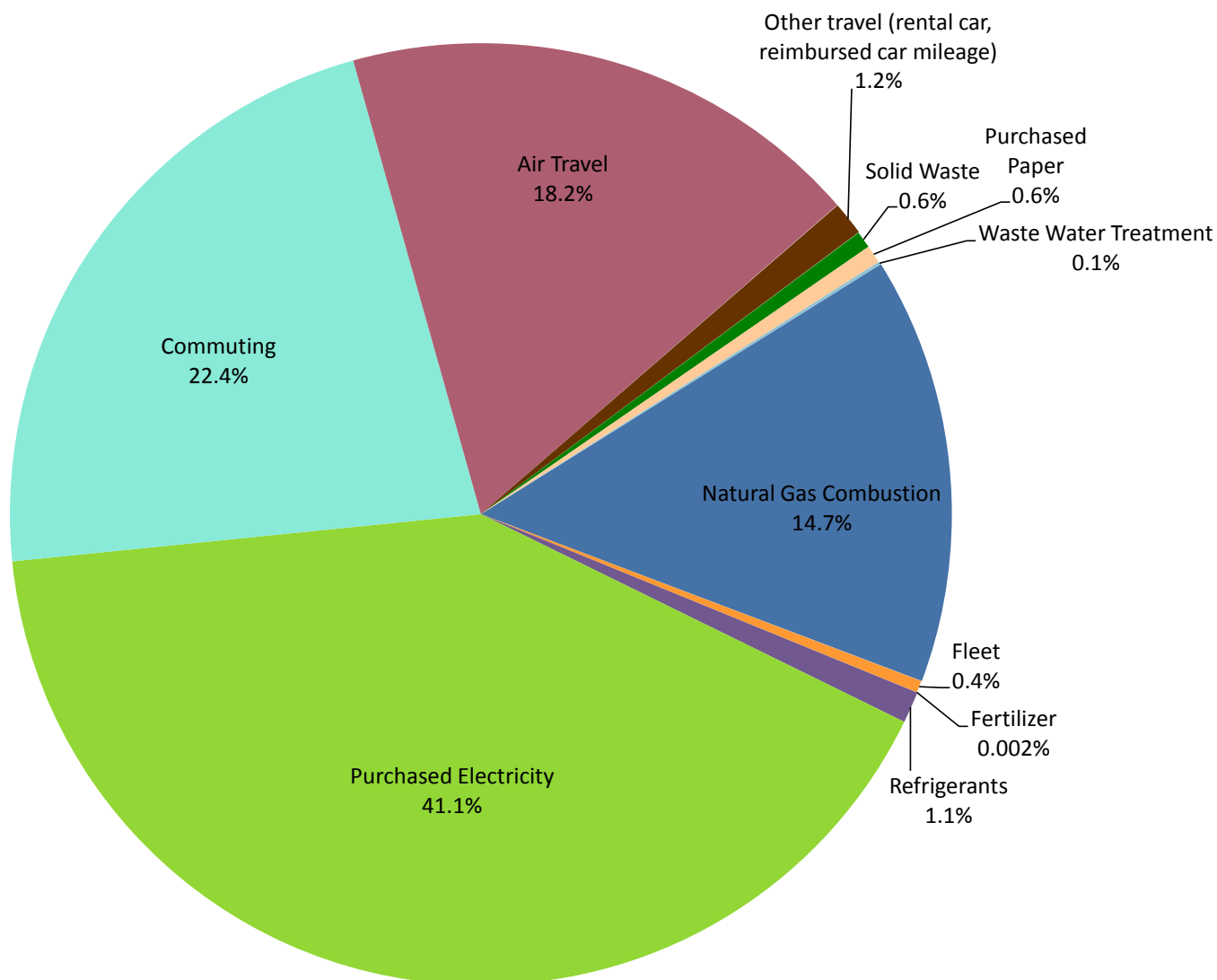
| Fiscal Year | Scope 1 | Scope 2 | Scope 3    |
|-------------|---------|---------|------------|
| 2008        | 7,777*  | 31,972  | 20,992     |
| 2010        | 6,609   | 20,144  | 18,380     |
| 2012        | 7,602   | 19,367  | 19,559.2** |

\*Excludes fugitive emissions \*\* Unlike previous years, includes purchased paper and excludes reimbursed air miles



# Emissions Profile

PSU Emissions by Source FY12 (MTCO<sub>2</sub>e)



TOTAL EMISSIONS FOR PSU IN FY12 EQUATED TO THE ANNUAL EMISSIONS OF 9,693 PASSENGER CARS, OR THE ENERGY USE OF 2,395 HOMES.

<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>



- ACHIEVED
- NEAR ACHIEVEMENT
- SOME PROGRESS
- NOT ACHIEVED
- NO LONGER PURSUING

# Snapshot: Buildings & Energy

## 1. REDUCE ENERGY USE PER SQUARE FOOT 25% BELOW 2000 LEVELS THROUGH DEMAND MANAGEMENT

- Plan for expanding energy competitions to other residence halls
- Energy policy that includes purchasing and power mgmt standards
- Energy conservation education program for academic buildings
- Energy use display system for the eight largest campus buildings
- Energy efficient surge protectors at all employee workstations on campus
- Determine feasibility of PSU participating in City's High Performance Building program

## 2. GENERATE 80% OF TOTAL BUILDING-RELATED ENERGY USE FROM LOCAL, RENEWABLE SOURCES

- Research funding for large wind turbines
- Look at integrating light harvesting into new building plans and retrofits
- With OUS, explore third-party PV agreements
- Use survey to identify locations on campus for renewable energy installations
- Perform anaerobic digester study with PoSI
- Suggest alternate use for \$50,000 earmarked for urban wind energy system by Chancellor's office
- Analyze impacts of biomass in PSU district energy system.

## 3. INCREASE EFFICIENCY OF THE ENERGY SYSTEMS BY 50% (2000 BASELINE)

- Hire utility manager
- Revisit combined heat & power
- Investigate smart grid technologies
- Analyze waste heat loads.
- Incorporate energy efficiency measures into 'Design Standards'
- Protocols for gathering baseline utility data from newly acquired buildings
- Discuss expanding the steam loop beyond PSU with surrounding property owners
- Apply energy performance ratings to all buildings
- Review & update PSU District Energy Plan
- Research workforce training programs in clean tech.
- Reinvest REC funding into on-site efficiency improvements
- Create standard schedule, strategy, & funding for building retro-commissioning
- Protocols & standards for using best HVAC technology

## 4. REDUCE TOTAL ENERGY USE BY 10% THROUGH BETTER UTILIZATION AND SCHEDULING OF BUILDINGS

- Assess opportunities to improve scheduling and fees related to the use of classrooms, weekend events, HVAC zones, custodial services, and security services.
- Develop energy intensity calculation that factors campus population change into the EUI.
- Develop new models for space allocation that support CAP
- Develop baseline for classroom usage in 2008-2009.
- Assess links between CAP goals and online or hybrid courses
- Track and display the usage and density of people in campus buildings.
- Adopt standard metric for analyzing newly purchased buildings' potential to increase utilization.

## 5. TRACK & INTEGRATE ALL REVISIONS TO THE COMMERCIAL BUILDINGS CODE THAT DEAL WITH CLIMATE CHANGE

- Track Oregon code redevelopment process, as it relates to climate change adaptation.
- Track code improvement within the City of Portland, such as the recent RICAP 5.
- Track process to revise Oregon building code to match the targets of Architecture 2030.
- Integrate relevant pieces of Architecture 2030 into PSU's building policies.
- Determine what is needed to care for new system changes outlined in the CAP.

# Buildings & Energy

## *Introduction*

PSU is making considerable headway towards increasing energy efficiency in our utility systems, reducing demand via behavior education programs, and streamlining consumption through better utilization of campus space. Opportunities remain in the realm of policy development, renewable energy utilization, and prioritizing continued efficiency upgrades. Since the Climate Action Plan (CAP) was adopted in 2010, PSU has looked extensively at the initial targets and baselines used for determining these goals. Due to the complex nature of PSU's district energy systems and campus electrical loops, as well as a rapid growth in enrollment, square footage, and real estate, some of these targets may need to be refined. The majority of PSU's targets are based on 2000 levels, and the data used to compile the baseline represents less than half of the current square footage. In addition, the baseline excludes any student housing since they were operated independently at the time. Finally, a major focus on obtaining and conducting federal research grants has increased the intensity of energy use in research facility locations, which will need to be accounted for to show the actual results of energy efficiency activities.



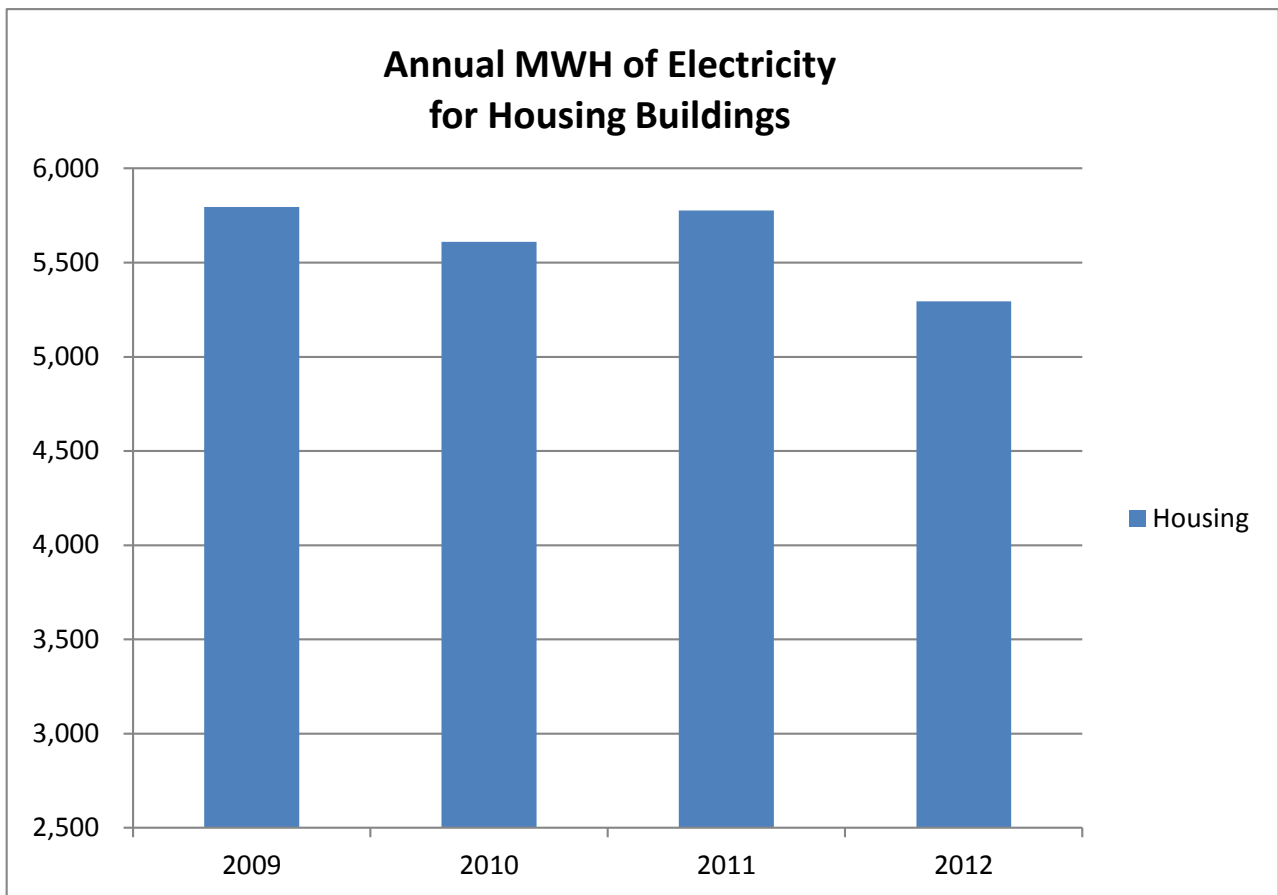
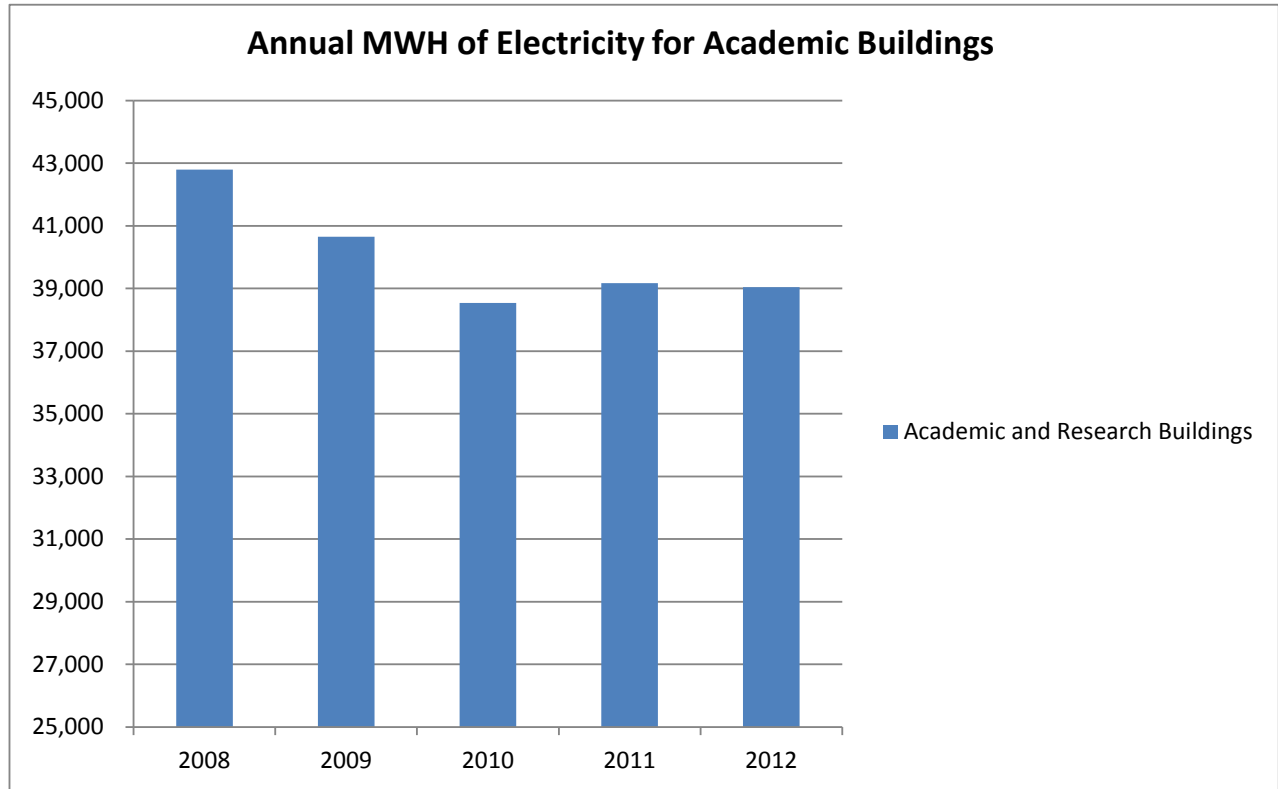
With the next revision of the CAP, a new baseline with updated goals will be proposed to more accurately reflect our current set of data, as well as energy reduction efforts that have occurred over the past decade. Such efforts include but are not limited to: construction or renovation of 8 LEED certified buildings and major capital investment in the district heating and cooling systems that increased efficiency through better insulation and planned redundancy. Based on additional metering installed with the campus loop projects, the methodology for distributing utility usage was updated for Academic Year 2010-2011 to account more accurately for energy used by the steam and chilled water loops. Previous allocations were done strictly on a per square foot basis, and did not take into consideration the vast differences in heating and cooling required for a research facility as opposed to an academic or administrative environment. Future reduction goals will be established on a building by building basis, taking into consideration the current condition of the building, improvements that have already been made, changes in use, and planned capital and operational upgrades.

Since 2010, PSU has made progress towards many of the 1 and 3 year goals of the CAP, including adjusting building schedules to more efficiently use facilities, hiring a Utility Manager, upgrading mechanical systems, and expanding energy education programs. In addition, starting in January 2013, PSU is working with the Energy Trust of Oregon (ETO) on a Strategic Energy Management program that will help formalize a University Energy Management Policy and develop a comprehensive project and activity framework to identify energy savings opportunities.

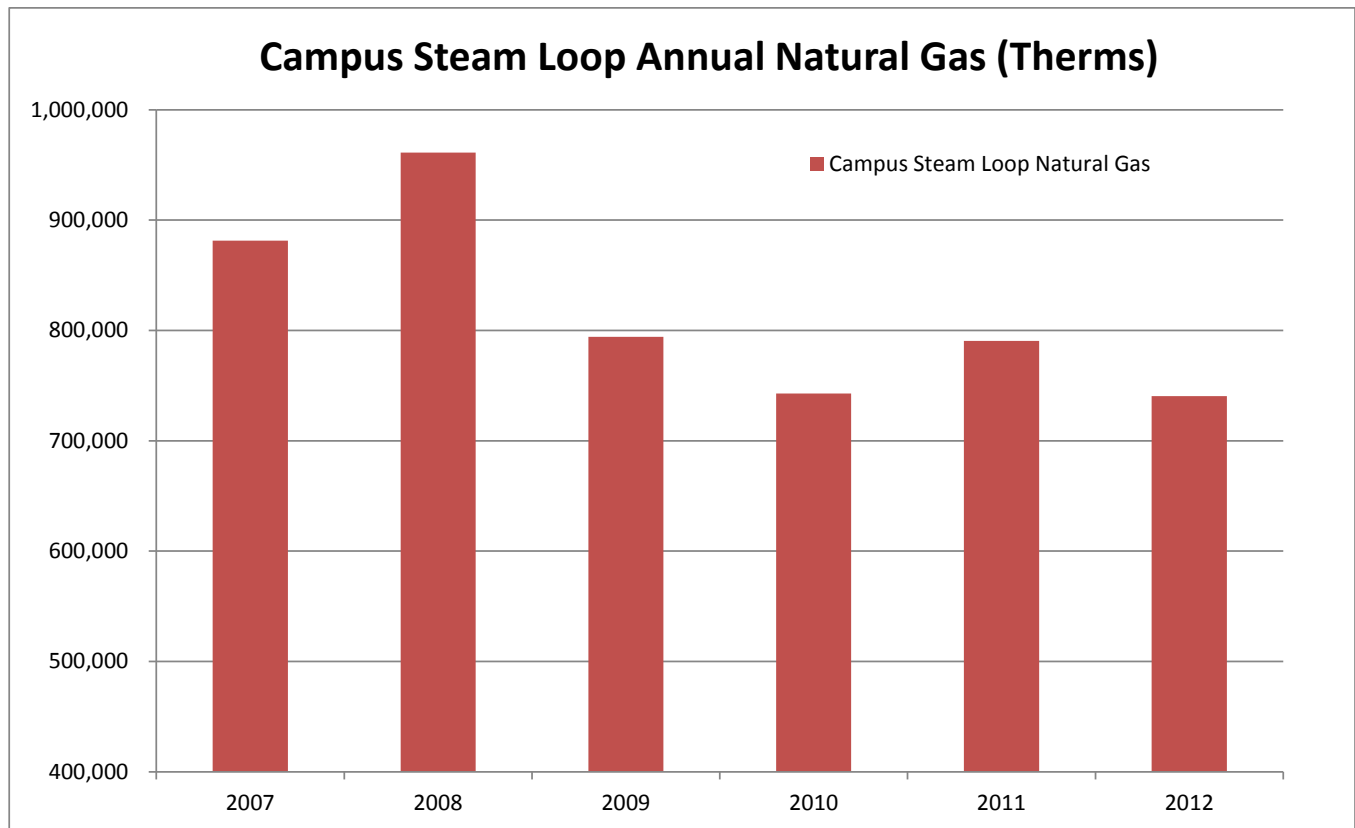


# Buildings & Energy

## Year to Year Comparisons:



# Buildings & Energy



## **TARGET #1: REDUCE ENERGY USE PER SQUARE FOOT 25% BELOW 2000 LEVELS THROUGH DEMAND MANAGEMENT PRACTICES**

### ***Education & Awareness***

Several progressive steps were taken to integrate energy conservation education into residence halls. EcoReps (student resident leaders promoting environmentally responsible behaviors) partnered with the Campus Utilities Manager to transform PSU's annual energy challenge into a broader competition that also benchmarked water use. This expanded focus enabled participation in the nationally recognized competition, Campus Conservation Nationals. In early 2013, Broadway, Ondine, and Epler residence halls competed in that challenge. EcoReps hosted a candlelit dinner, a night of "Blackout Board Games", and a "Conservation Conversation" among other events. Students collectively saved 23,906 kilowatt hours of electricity (equal to 10,900 pounds of carbon dioxide) during the three week competition. Additionally, the Campus Sustainability Office (CSO) implemented the "Lights off when leaving" campaign. Small stickers with this reminder message were adhered to existing light plates in every residence hall on campus. Finally, EcoReps produced PSU's first *Green Guide for Residence Halls*. This guide was provided in every residential unit on campus when students arrived in Fall 2012. It outlines conservation behaviors specific to living on campus and will be a reoccurring, annually updated resource for actions and choices that reduce energy consumption on campus.

CSO also launched an online education resource that addresses energy use in residence halls, academic buildings and offices. The site serves as a clearing house for sustainability efforts across a variety of different areas, including energy. A portion of the site is devoted to education at the individual level. The ["actions you can take"](#) section organizes best practice suggestions, including energy conservation, though the lens of varied campus spaces and user experiences. For instance, the "I research in a lab" category includes: "close fume hood sashes when not in use and save up to 50,000 lbs of CO<sub>2</sub> per year". Energy conservation education permeates all eight individual action categories:

# Buildings & Energy

- I commute to campus
- I eat on or around campus
- I work in an office
- I learn or teach in a classroom
- I travel for university purposes
- I purchase university supplies
- I live on campus

PSU's acquisition of two energy dashboards provides yet another fixed outlet for energy education. The first was installed at the Smith Memorial Student Union and another is coming on line soon as part of the Lincoln Hall renovation project. There is still work to be done on identifying a more consistent funding mechanism for procuring additional display systems for our largest buildings on campus. Moving forward, PSU may consider a web based platform that could provide information for multiple buildings rather than installing individual screens. However, further investigation is required.

There are still many opportunities for expanding energy education and awareness efforts. Integrating conservation briefings into new employee orientation remains a key priority and night audits have yet to take place. There are significant challenges to conducting night audits including building access and verification methods for measuring performance. However, the idea warrants further discussion. Finally, campus Green Teams remain underutilized. CSO is working to identify strategies for growing the network and leveraging opportunities within that group.

STUDENTS COLLECTIVELY SAVED 23,906 KILOWATT HOURS OF ELECTRICITY (EQUAL TO 10,900 POUNDS OF CARBON DIOXIDE) DURING THE CAMPUS CONSERVATION NATIONALS COMPETITION.

## ***Power Management***

The Office of Information and Technology (OIT) has established an internal Energy Star purchasing policy for all new computers, but PSU has yet to adopt campus wide guidelines and this remains a priority for future efforts. PSU has, however, made headway on establishing a power management policy for campus computers. OIT partnered with CSO to roll out a power management pilot project in select offices representing diverse user profiles. Still in the early adopters phase, OIT is tracking progress and troubleshooting issues in anticipation of a campus wide program. The policy calls for settings that put monitors to sleep after fifteen minutes of inactivity and computers after twenty minutes. Additionally, through an incentive program with ETO, PSU successfully distributed Watt Stopper energy saving power strips across campus departments. There is an opportunity to purchase these strips on an annual basis. However, there is some uncertainty about the return on investment for the devices. Upfront cost per unit is high and may not be justified by the small energy savings actually achieved. The power management program yields much more potential for energy savings in an office environment. WattStoppers may be more effective in residence halls where lights, iPod docs, speakers, and other small appliances are in regular use and could be better managed through the strip sensors.

## ***Capital Advisory Committee***

In fall 2012, a Capital Advisory Committee (CAC) was formed to advise the president on the physical development of campus including new construction, major renovations, new leases, and acquisition of property. The committee pulls together leaders from the major divisions of the university including members of the Executive Committee, ASPSU, the Dean's Council, Faculty Senate, and the Director of the Institute for Sustainable Solutions. Within individual subcommittees, there is broad representation from various academic units as well as staff from planning, sustainability, facilities, and capital project departments. The group will address a wide range of topics and much of their work will impact efforts



# Buildings & Energy

to reduce energy use on campus and progress towards our climate action goals. CAC's core focus areas are:

- Student space (support services and community spaces)
- Academic & Research Space
- Deferred & Preventative Maintenance
- Housing Development & Programming
- Campus Standards (sustainability requirements, space, facilities use, and building design)
- Space Management

The formation of this committee provides a great opportunity to prioritize physical improvements and upgrades, institutionalize efficiency standards, and optimize use of campus space.

## **TARGET #2: GENERATE 80% OF TOTAL BUILDING-RELATED ENERGY USE FROM LOCAL, RENEWABLE SOURCES**

### ***Onsite Renewable Energy***

In 2011, the Lincoln Hall historical renovation was completed, achieving a LEED Platinum certification. This comprehensive overhaul included the addition of a 53.8 kWh, 4,222 square foot rooftop solar array. The array added 38,000 kWh of annual renewable energy production to PSU's energy portfolio and saves an estimated \$3,720 a year in utility costs. PSU continues to take advantage of every available funding opportunity for renewable energy solutions through incentive programs and partnerships. PSU has investigated the feasibility of a biodigester, but it is not a viable option at this time due to logistics, current staffing levels, and storage capacity issues. As new technologies develop, PSU will continue to look at opportunities to use cleaner energy sources as well as the possibility of investing in offsite renewable energy production that can be used on-site via net-metering.

### ***Renewable Energy Credits***

From September 2008 – September 2010, PSU purchased renewable energy credits (RECs) offsetting 100% of its energy consumption. With direction from CAP-IT, the decision was made to stop purchasing RECs that were funding out of state projects and instead allocate that money towards energy saving projects on campus. Due to unanticipated increases in rate schedules associated with the electrical utility charges, these funds were needed to offset an on-going increase in electricity costs. PSU is now working to develop a funding mechanism so that savings associated with utility usage reductions or reductions in utility rates can be used to either fund purchasing RECs or implementing energy efficiency measures on-campus.

## **TARGET #3: INCREASE EFFICIENCY OF THE ENERGY SYSTEMS BY 50% (2000 BASELINE)**

### ***Renovations & Upgrades***

PSU has made a number of efficiency improvements in the past three years, including major renovations at Science Research and Teaching Center (SRTC) and Lincoln Hall, and a major upgrade to our steam and chilled water systems. That upgrade included establishing a true steam loop, connecting two existing heating plants, constructing new tunnels, and better insulating the existing pipe distribution. A new 1000 ton chiller and a heat recovery chiller were installed allowing for more efficient chilled water production as part of the Campus Loop project. Both SRTC and Lincoln hall incorporated systems to capture energy in tempered exhaust air loads via a heat recovery wheel and heat recovery coils, improving

# Buildings & Energy

the efficiency of operations in both buildings. Additionally, older, less efficient cooling towers were replaced at Science Building 1 and SRTC, and the capacity of the SRTC tower was increased to allow PSU to cool the campus on all but the hottest summer days without the use of well water. We can easily assume energy savings have resulted from these projects; however, calculating the overall efficiency of these energy systems and the exact decrease over the baseline period is difficult due to the lack of data available for these time periods. PSU is now tracking the tonnage of chilled water produced, gallons of condensate coming back from the steam system, and kWh used by campus on a daily basis so that future changes in consumption can be quantified.

## **TARGET #4: REDUCE TOTAL ENERGY USE BY 10% THROUGH BETTER UTILIZATION AND SCHEDULING OF BUILDINGS (2000 BASELINE)**

### *Campus Space Utilization*

Building heating, ventilation, and air conditioning (HVAC) systems are some of the most energy intensive components of building operations. One of the simplest and most cost-effective ways to conserve energy in a campus setting is to consolidate the scheduling of classes. This involves packing classes into the fewest buildings possible, while utilizing the most energy efficient buildings available. Along these lines, PSU consolidated night and weekend classes, previously scattered across 21 buildings, into five buildings. Electricity consumption in one building, Urban Center, fell by 18.5 percent in fall 2012, compared to the previous three-year average. Weather, equipment efficiency, and occupant behaviors all impact energy consumption, but PSU's Utilities Manager estimates that the scheduling changes reduced consumption by roughly 78,000 KWH in Urban Center. The Standards Committee, a subcommittee of the newly formed Capital Advisory Committee, is planning on assessing the operating hours of all PSU buildings. The group aims to ensure that unoccupied spaces are not being unnecessarily heated or cooled, and buildings that are being serviced are more fully utilized.

## **TARGET #5: TRACK AND INTEGRATE ALL REVISIONS TO COMMERCIAL BUILDINGS CODE THAT DEAL WITH CLIMATE CHANGE**

PSU is committed to major renovations and new buildings meeting a LEED Silver standard, and has been able to achieve Gold and Platinum in its most recent projects. PSU is required to meet or exceed code in all new projects and major renovations, and energy models are completed with most major projects to predict how the building will perform. In the next revision of the CAP, working with the Standards Committee and others, this target may be revised to include a recommendation that all new projects and major renovations exceed current code by a specific percentage.

### *Looking Ahead*

#### *Strategic Energy Management*

PSU is a participant in ETO's Strategic Energy Management Program, which will help us evaluate current operation procedures for our facilities, identify areas for improvement, establish strategies for engaging building occupants in energy reduction, and develop a long range energy management plan. This will be a yearlong process involving monthly meetings with ETO organizers as well as other participating organizations, including Nike's Beaverton campus, the City of Portland, and Lewis & Clark College. PSU has established a cross-functional team with representation from Facilities Operations, Capital Construction, Finance, and Sustainability to assist in implementing the Strategic Energy Management Program. The end goals of the program are:

- Develop a formal University Energy Management Policy to support PSU's sustainability goals
- Formalize a comprehensive list of energy saving initiatives with anticipated pay back that reduce consumption

# Buildings & Energy

and provide a path towards long term energy reduction

- Establish a method for including life time energy consumption and total cost of ownership into purchasing decisions for all University units
- Create an energy consumption baseline that allows for long term tracking and adjustments that account for operational, occupancy, enrollment, or building use changes as well as shifts in consumption due to added energy intensive research
- Implement operational changes with a 5-10% energy reduction goal over the next 24 months, for which ETO will provide an incentive equivalent up to \$0.02/kWh saved and \$0.20/therm saved

This group is now considered the CAP-IT Buildings & Energy subcommittee and their work will likely yield new targets and action items for the CAP.

## ***Centralized utility billing***

Ideally, information from utility statements could help calibrate our own monitoring efforts, track consumption at a more individualized level, and better target our education efforts. However, with decentralized purchasing and multiple departments and buildings in the mix, extracting useful data from campus utility bills can be time consuming and challenging. PSU is now investigating a third party bill payment, auditing, and tracking solution to increase accuracy of data collection, give greater line item detail for budgeting, obtain more timely notification of abnormal usage, and provide greater access to the University's water, sewer, electricity, natural gas, and waste removal history. This, coupled with the development of the strategic energy management plan, would help PSU establish more reliable baselines and provide a more efficient way to compare data sets for the CAP.

## ***EDA Grant***

PSU is currently pursuing a 1.5 million dollar grant from the Economic Development Administration (EDA) to fund an integrated energy efficiency project that would upgrade PSU's existing district energy loop, employ deep energy retrofits to campus buildings, and expand measurement and verification systems through enhanced metering. The proposal also includes academic, professional development, and district scale sustainability components (see Education & Research section) serving students, faculty, EcoDistrict partners, and local energy efficiency professionals. Proposed energy improvements include:

### District Energy Upgrade

The West Heating Plant Boiler Replacement Project, happening regardless of EDA funding, will replace an outdated, inefficient boiler with a new high-efficiency (approximately 85% efficient) 600 HP boiler. The project will include a new deaerator tank, condensate return unit, and new feedwater and fuel pumps. The upgrade will also modify the campus loop infrastructure, including replacing portions of steam and condensate piping adjacent to the West Heating Plant. Additionally, a fan system, which currently interferes with the routing of new steam and condensate piping, will be re-configured and brought up to code. The district energy improvements would also increase the likelihood of eventually decommissioning the Cramer Hall Boiler Plant, allowing for reallocation of that space. Other potential energy savings and emission reduction measures include the installation of boiler economizers, variable frequency drives, and controls upgrades.

### Campus-wide Metering

This portion of the project would vastly improve metering of campus buildings and enable more effective tracking of campus energy consumption. A web-based monitoring service would track building-specific energy consumption, greenhouse gas emissions and help identify opportunities for increased efficiency. The proposal calls for installation of domestic water, chilled water, water heating, natural gas, and electrical meters in 23 campus buildings.





# Snapshot: Materials

## 1.) REDUCE SOLID WASTE GENERATED ON CAMPUS BY 25% (2008 BASELINE)

- Develop strategy for collecting accurate baseline waste generation data.
- Identify barriers and opportunities for eliminating bottled water from all PSU-sponsored events, departmental offices, and student group activities.
- Establish printing standards for campus, require new printers to be duplex-capable, and ensure all printers are set to duplex by default.
- Expand education and outreach campaign for reusable containers.
- Complete feasibility analysis and timeline for composting waste from all catering and dining facilities and switching to durable service-ware.
- Create centralized tracking system for high volume purchases.
- Write a three-year strategic plan for recycling.
- Explore options that can be included in a new dining service RFP with zero waste goals, adopting those of Victor's at Ondine.
- Establish formal relationships with reuse institutions like the ReBuilding Center, ReStore, and TerraCycle.
- Analyze benefits of adjusting the free printing limit for students from 500 to 250 per term.

## 2.) REDUCE LANDFILL-BOUND WASTE TO 10% OF TOTAL WASTE GENERATED

- Expand education /outreach for waste diversion to student leaders, new student orientation, new employee orientation, & residence halls.
- Revise custodial & dining services contracts as they relate to waste
- Standards & funding for consistent recycling stations.
- System for tracking diversion rates from new construction, major renovation, & inhouse remodels.
- Waste reduction coordinator for Athletics
- Feasibility of creating waste-sorting program.

## 3.) REDUCE EMBODIED EMISSIONS FOR SELECT COMMODITIES BY 25% (2008 BASELINE)

- Modify food purchasing contract requirements for dining services based on the evaluation done in year one. (SOP Change)
- Paper-reduction & awareness campaign
- Evaluate opportunities to increase low carbon food purchasing by Food for Thought Café and Dining Services contractor.
- Strategy to refine data collection for materials, goods, & foods' embodied emissions.
- Food action plan
- Landscape plan for the University

# Materials

## Introduction

The Climate Action Plan outlines targets for achieving waste reduction, waste diversion, and reduced embodied emissions associated with specific commodities. PSU has progressed in all of these areas. However, future progress in waste management has been hindered by significant challenges in the last year.

In 2012, PSURecycles! (the campus recycling crew) was dissolved due to budget constraints. An attempt was made to divide and absorb many of the responsibilities among various departments and student groups, however, a consistent and comprehensive focus on waste management has been diluted and many programs are no longer functioning. Post-consumer composting services were eliminated, educational efforts and event waste support have been reduced, and waste auditing efforts have suffered. PSURecycles! also served as an important communication and feedback channel between building occupants, waste haulers, janitorial staff, and other stakeholders.

In response to this change, the Campus Sustainability Office (CSO), Facilities and Property Management (FPM), Community Environmental Services (CES), Climate Action Implementation Team (CAP-IT), EcoReps and the Sustainability Leadership Center (SLC) have partnered to try and maintain momentum, each working within their own time and budget constraints. Despite this collaborative effort, there is concern that comprehensive waste management is no longer institutionalized and the great work happening now may be lost in future years due to student and staff turnover.

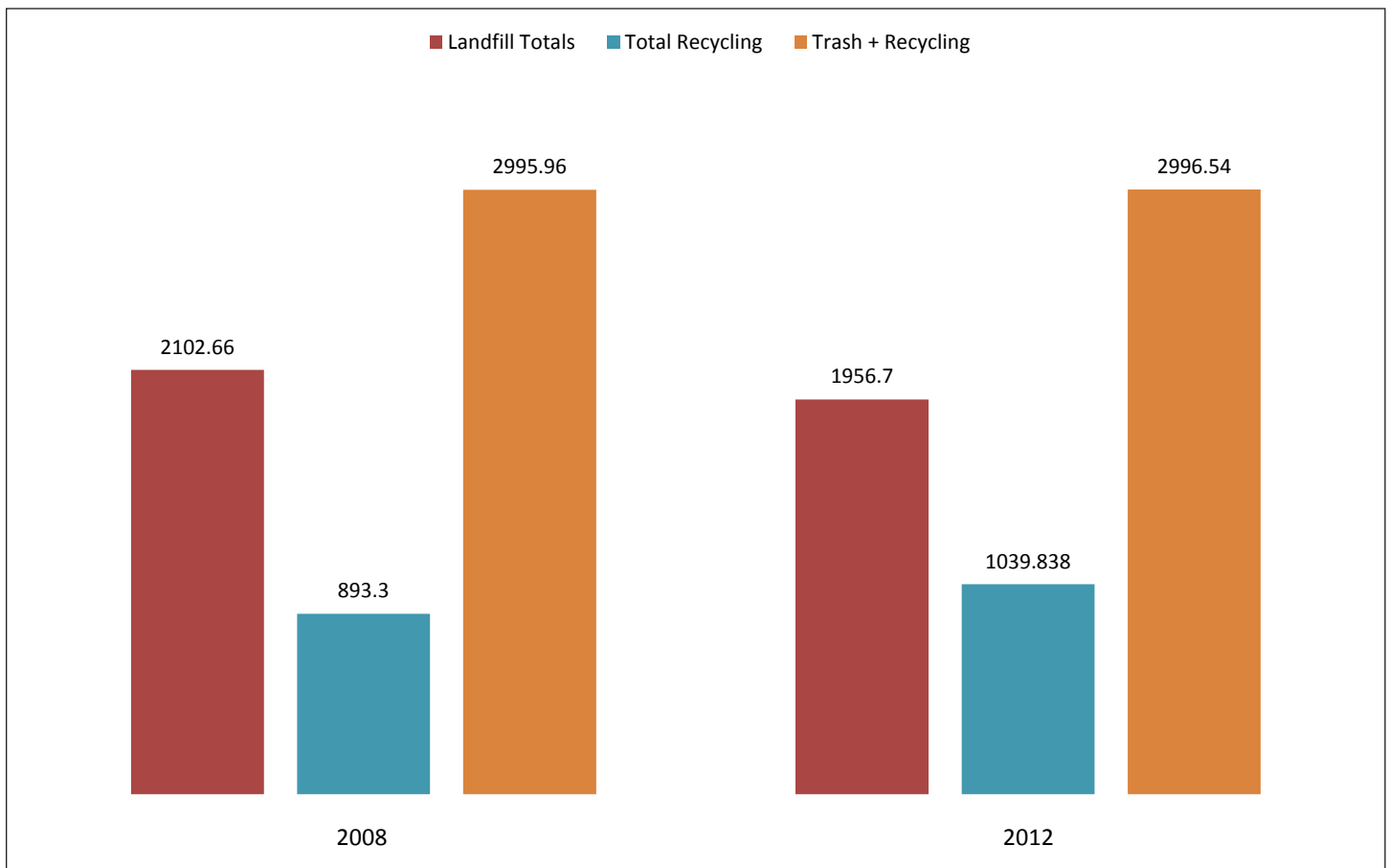
## Trends FY08 (Baseline), FY12 (Performance Year)

In fiscal year 2008, the baseline year established in the CAP, PSU was not collecting data on a full scope of diversion (diverted from a landfill) and disposal (landfilled) activities. Notable exclusions in that data set include construction & demolition debris (from contracted projects), universal waste, Styrofoam, toner recycling, electronic waste, and solid waste totals for campus move-in and move-out. Likewise, reuse programs have never been accounted for in diversion totals. In 2013, the Campus Sustainability Office (CSO) and Community Environmental Services (CES) began a comprehensive overhaul of materials management data collection to better understand areas for improvement and gauge progress and performance. FY 13 data (complete in July 2013) will give us the most complete collection of data to date and will provide a good baseline for comparison moving forward.

Nonetheless, it is worth noting the difference in performance between FY2008 and the last year on record, FY 2012. The same (incomplete) metrics were used for both years. The numbers are promising and indicate gradual progress towards reduction and diversion goals. Total solid waste generation remained static, however enrollment increased, meaning the amount of waste generated per full time student actually *decreased*. Diversion rate increased by approximately 5% in that time and landfilled waste decreased.

| Progress Indicators  | FY 2008  | FY2012   |
|--|--|--|
| Diversion Rate<br>(% total solid waste diverted from landfill) | 29.82%   | 34.70%   |
| Total Diverted (tons)  | 893.30   | 1039.838                                       |
| Landfill Total (tons)  | 2102.66  | 1956.70  |
| Total solid waste (tons)(landfill & diverted)                  | 2995.96  | 2996.54  |
| Total solid waste per full time student: (tons/<br>student)    | .23 tons per student OR<br>460 lbs per student | .19 tons per student OR<br>374 lbs per student |

# Materials



## ***Changes to CAP-IT Materials Sub-committee***

The materials subcommittee of CAP-IT has primarily focused on purchasing, an area that remains a challenge. However, as a part of efforts to reconstruct waste management programs and revive PSU's commitment to sustainable food procurement on campus, CAP-IT felt it necessary to divide the materials group into separate task forces. The Materials subcommittee currently consists of a Food Purchasing Task Force and a Waste Management Task Force. This temporary split allows us to hone in on specific targets with the input of experts in each realm.

### Food Purchasing Task Force:

The Food Task Force brought together a vast network of expertise including SLC's food systems coordinator, ISS's Food Systems Intern, Aramark representatives, CSO, and faculty who research food systems. This group is focused on improving supply chain management as well as refining priorities and targets around environmentally and socially responsible food purchasing. The work of this group is complimented by several student-led food systems groups as well.

### Waste Management Task Force:

The waste management task force focuses on increasing and improving waste data tracking across campus, institutionalizing policy and procedural changes that support waste reduction and diversion efforts, and identifying key areas to employ targeted educational campaigns. The efforts of this group are also supported by SLC's student led Waste Reduction Task Force.

# Materials

## **TARGET # 1: REDUCE SOLID WASTE GENERATED BY 25% (2008 BASELINE)**

### ***Tracking, Analysis, & Strategic Planning***

PSU has made great improvements in waste tracking, conducting a cost benefit analysis of our materials management program, and establishing more accurate baselines. In early 2012, a group of stakeholders created a materials management vision for PSU that prioritized next steps and established strategic action items. All parties agreed that PSU needed to employ a holistic approach incorporating improved data collection, community feedback, logistical support, and adequate education and outreach. The work of this visioning group spurred the formation of the Waste Management Task Force, a subset of the CAP-IT Materials subcommittee. The task force spearheaded several partnerships and initiatives related to tracking, analysis, and strategic planning. Among these initiatives (in various stages of completion):

- Streamlining and growing our waste data collection and management
  - » Improving reporting and tracking of construction and demolition waste
  - » Improving reporting and tracking of electronic, hazardous, and universal waste
  - » Tracking and accounting for reuse programs
- Conducting a campus wide waste audit
- Establishing a feedback group with stakeholders
- Minimizing waste in campus moves
- Increasing composting options throughout campus
- Evaluating and improving waste management infrastructure in custodial contracts

Of particular importance, is a current effort to improve data collection, management, and analysis through a partnership between CES, FPM, and CSO. The effort employs a sophisticated tracking tool that compiles data from waste haulers and various campus and external vendors. This project has greatly increased the transparency of waste management programs at PSU.

### ***Printing***

Due to the decentralized nature of purchasing and IT management across campus, it is difficult to require *every* new printer to be duplex-capable and ensure default duplex settings. However, many printers are centrally managed by the Office of Information and Technology (OIT) and set to duplex by default. Meanwhile, CSO has worked through the Green Team and Climate Champion programs to encourage duplexing within departments. A greater awareness campaign and policy is needed to affect the broader campus community. OIT has also employed a “hold and release” function on all printers within centrally managed labs. Individuals must release their print jobs at a central kiosk, rather than each job printing automatically, avoiding waste from unclaimed or unintentional prints. In the first two terms, “hold and release” has saved 354,177 sheets of paper, equivalent to 4.4 trees, and 1,593.8 kg of CO<sub>2</sub>. Another opportunity for savings lies in reducing students’ free printing quota (currently 500 pages per term). This option has not been thoroughly investigated and remains a future goal.

**IN THE FIRST TWO TERMS, “HOLD AND RELEASE” PRINTING HAS SAVED 354,177 SHEETS OF PAPER, EQUIVALENT TO 4.4 TREES, AND 1,593.8 KG OF CO<sub>2</sub>.**



# Materials

## ***Bottled Water***

In 2011, the Sustainable Drinking Water Task Force (SDWTF) was formed to investigate all possibilities for reducing bottled water consumption and associated waste at PSU. The task force comprised of *Take Back the Tap* student leaders, staff, and faculty, was charged with dissecting challenges, cataloging opportunities, and developing suggestions. The group ultimately struck a compromise with unanimously supported recommendations for reducing PSU's bottled water purchases and promoting consumption of tap water. The final report was released in Spring 2012 with presidential endorsement. It highlights opportunities for eliminating bottled water from all PSU-sponsored events, departments, and student activities. In lieu of purchasing bottled water, the report also outlines strategies for increasing access to clean and free water across campus, including installation of refill stations where feasible. CSO has since been tasked with implementation and is now working with a cross campus network to phase in recommended changes. New signage for every location is under development, an educational [website](#) was launched, and an updated map was created to increase visibility for the effort.

## ***Campus Dining & Catering***

Aramark continues its BYOMug discount program and recently established a reusable to-go box program for Viking Food Court and Victor's dining hall. The pending success of the durable container program could help justify more reuse options such as reusable to-go utensils that could be turned in and exchanged with containers. Additionally, Aramark Catering now offers durable china for events held in Smith Memorial Student Union at no extra charge. There are plans to expand that offer to events in Neuberger Hall as well. Overall, waste management service at campus events remains inconsistent, and requires increased attention and institutionalization. Updates to the Dining Services contract, enhanced monitoring of adherence to the contract, and better communication between Campus Events, FPM, and CSO are needed.

## ***PSU ReUses!***

The PSU ReUse Room has undergone a transformation increasing both the accessibility and visibility of that program. The room is now accessible much earlier and later in the day than in previous years. Social media is used to advertise inventory, promote creative reuse ideas, and issue a call for needed supplies. These new strategies have increased participation in the program. In 2010, the ReUse Room was estimated to have achieved \$300 in avoided costs *every week*. A more current assessment is now underway and will be completed in June, 2013. In past years, the Reuse room collected, washed and redistributed travel mugs to the campus community. EcoReps are currently evaluating opportunities to revive that effort. The ASPSU Food Pantry, which stocks donated canned goods and non-perishable items, is now partnering with the PSU ReUse Room on education and outreach.

Chuck-it for Charity, PSU's campus move-out donation program, has successfully redistributed many tons of usable household items, clothing, furniture, non-perishable food, and more every year. This large-scale operation conveys a visible commitment to sustainable materials management on campus, saves the university thousands of dollars in disposal fees, and contributes to local charities. However, with the loss of PSURecycles!, the program has suffered. In fact, it did not occur in 2012, sending material from housing communities to the landfill that could have otherwise been donated. Using totals from past Chuck- it events (recently recovered), it is estimated that four to seven thousand pounds of material could have been diverted in 2012 had the event taken place. Currently, FPM, University Housing & Residence Life, and CSO are partnering to define new roles and responsibilities and ensure continued success for this important program.

## ***Promoting Reuse & Waste Prevention***

Avoiding consumption is the most effective means of reducing solid waste generation. To that end, PSU has begun placing greater educational emphasis on reuse programs. These programs are promoted and encouraged through signage, campus newsletters, the Green Campus website, and the annually distributed Housing Green Guide produced by SLC. Future goals include promoting the full array of reuse programs on campus by tapping into existing informational

# Materials

channels like student orientations and the onboarding process for new staff. Additionally, the student Waste Reduction Task Force was established to engage the student community in waste reduction events, such as Recyclemania, Chuck-it for Charity, and Campus Conservation Nationals. The task force creates innovative outreach materials including unique art displays that inspire dialogue and motivate behavior change throughout campus.

## **TARGET #2: REDUCE LANDFILL-BOUND WASTE TO 10% OF TOTAL WASTE GENERATED**

### ***Construction & Demolition(C&D) Diversion***

Increased emphasis on data collection continues to encourage new processes for gathering information. One example is a process for tracking C&D waste diversion for new construction, major renovations, and in-house remodels. Given that every new construction or major renovation project is LEED certified, C&D waste totals could be easily obtained through required submittals, yet it hasn't been done in the past. Smaller, contracted projects present the greatest challenge as no waste data are being collected for those jobs. CSO is currently working with Capital Projects & Construction (CPC) to develop contractual language requiring sustainable waste management and a formalized process for reporting C&D waste totals.

### ***Contract Revisions***

In 2012, CSO, FPM, and the Office of Purchasing & Contracting began preparing an RFP for the upcoming custodial contract renewal. Seeing the need for greater emphasis on waste diversion across campus, the group amended the scope of services to move towards a centralized collection model. This approach excludes desk-side service and funnels waste into areas where all disposal and diversion options are available. Centralized collection tends to increase diversion and decrease contamination. It also streamlines custodial service, saving on time and resources. Post-consumer office compost collection was also added to the scope of services. Additionally, PSU's Food Service contract is undergoing revisions to better facilitate recycling and compost services on campus.

### ***Infrastructure & Personnel***

Budget cuts have impacted materials management efforts on campus. Short term financial gain from cutting personnel, service, and infrastructure does not account for long term savings achieved through sustainable materials management in the form of revenue from source separated commodities, lower tip fees for diverted goods, and waste reduction through education and programming. In a reactive financial environment, consistent funding mechanisms for recycling stations or new personnel dedicated to waste management have not been feasible. However, there has been some progress towards establishing a standardized approach to materials management infrastructure. Midpoint tri-sorting collection stations are now regarded as the campus standard for both "All in the Hall" locations as well as shared departmental collection sites such as kitchens. Over time, as funding opportunities arise, containers will be added where needed. Additionally, materials management infrastructure should be considered in future capital project costs.

### ***Composting***

In partnership with Eco-Reps and the (student) Food Systems Task Force, Victor's Dining Hall is now supporting voluntary composting for residents in Ondine and Broadway. Victor's provides large reusable yogurt containers for compost collection and empties compostable waste brought down by residents. Post-consumer composting service for offices was recently eliminated. Departments can choose to compost, but must empty containers themselves. Most have elected not to participate. In the recent campus waste audit, 36% of the landfill-bound waste was compostable, highlighting a great need for increasing compost services. Recent revisions to the custodial RFP include options for adding post-consumer compost collection for offices and there are also efforts underway to institutionalize composting at events. A recent commitment from Aramark ensures composting service at any event with 100+ people. While this is a promising start, this

# Materials

option should be expanded to every campus event moving forward.

## ***Consistent & Targeted Messaging***

There are many simultaneous efforts to engage the campus community in waste-related educational programming. In the absence of PSURecycles!, campus partners have attempted to provide year round recycling, composting, and materials management education to students, faculty, and staff. Even with numerous groups working together, there are still specific educational needs that need to be addressed. With transient populations on campus, many messages need to be reinforced often. Institutionalizing these messages is essential. Building off designs created by Co-Creative, branded signs were developed for use in all future installations of waste collection stations, including special containers for composting, rigid plastics, etc. Posters with general recycling information are available for anyone to [download](#) and use in their department.

## ***Battery & CFL Recycling Stations***

In February of 2013, Eco-Reps distributed battery and compact fluorescent (CFL) bulb recycling bins to Ondine, Broadway, and Montgomery residence halls. Both are collected by Environmental Health and Safety (EH&S)

on an as needed basis. Additionally, A *Bettery* battery swap station was installed in Smith Memorial Student Union (SMSU). Students can purchase rechargeable batteries from the machine and then exchange them for recharged batteries when they lose power. The machine also accepts old single-use alkaline (AA, AAA, C and D) batteries to be recycled.

## **TARGET # 3: REDUCE EMBODIED EMISSIONS FOR SELECT COMMODITIES BY 25% (2008 BASELINE)**

### ***Scope 3 Emissions Tracking***

Tracking embodied emissions for purchased materials remains a challenge. Past assessment of scope three emissions was contracted out and raw data were obtained from high level OUS reports. There is currently no effective means of tracking all campus purchases on a regular basis, due to varied procurement processes (p-cards, variety of vendors used, no central tracking system). Evaluating progress in this area requires a detailed and comprehensive tracking system that can be managed in house and produce consistent annual reports of all campus procurement. Embodied emissions in purchased goods are likely the largest portion of our carbon footprint; therefore they must be addressed in both action and analysis. However, due to the current challenges that surround data collection and tracking, embodied emissions

## **COMPOST: ANY FOODS, PAPER TOWELS & NAPKINS, COFFEE FILTERS & TEA BAGS**



**LIQUIDS, GREASE, COOKING OIL  
NON-COMPOSTABLE PLASTIC BAGS  
TAKEOUT CONTAINERS  
STYROFOAM  
GLASS OR METAL**

# Materials

are likely to be addressed on a less frequent reporting schedule. CSO is currently exploring options for a more consistent approach to accounting for these emissions.

## ***Embodied Emissions: Food***

Food for Thought, PSU's student run café, remains dedicated to serving low carbon vegan and vegetarian fair as well as providing local and organic options. In partnership with SLC's Food Systems Task Force, Victor's Dining Hall implemented a weekly "Meat(less) Monday" policy, greatly reducing the demand for carbon rich meat dishes. They also hold monthly outreach events to educate students on sustainable food choices. Additionally, fruit smoothies have been added to the breakfast menu, providing a new meat free alternative. The task force is now working to extend "Meat(less) Mondays" to Viking Food Court. Stakeholders are also working to refine contractual goals around sustainable food purchases and build a more comprehensive tool for tracking total expenditures on local, regional, organic, and/or third party certified products.

## ***Embodied Emissions: Green Purchasing***

A number of resources exist for informing wise purchasing decisions (or preventing purchases in the first place). Those resources include:

- [Climate Champions](#) Program
- CSO website: ["Purchase Wisely. Reduce your impact."](#)
- The student [Green Housing Guide](#)
- New employee orientation includes green purchasing information
- PSU procurement website: [introduction to green purchasing](#)

PSU has yet to establish a responsible procurement policy, however individual efforts are underway that address a variety of services and supplies. The Capital Advisory Committee, for example, is working on guidelines for furniture purchases that may emphasize attributes like low emitting, regionally sourced, and recycled content material as well as overall durability. Similarly, the developing Design and Construction Guidelines will outline some purchasing requirements for specific products. These efforts are dispersed and disconnected. Reducing embodied emissions on a large scale will require a University policy and procedural controls that address the life cycle and total cost of ownership of purchased products.

## ***Looking Ahead***

The last three years have been both challenging and promising. In one regard, the loss of PSURecycles! impeded progress and forced a reinvention of basic services, processes, and communication channels. Alternatively, the partnership with CES yielded new, more accurate data and shed light on many possibilities for improvement from contractual revisions to infrastructure organization. That project will help inform business decisions and clarify the need for resources and policies around materials management. As FY13 comes to a close, a more complete picture of PSU's waste profile is emerging as well as a more accurate baseline for measuring waste reduction progress.

In spite of great partnerships, new programs, better tracking systems, and increased transparency, many challenges remain. Waste management at events remains uncoordinated and inconsistent. It is difficult to ensure recycling and compost services at events, despite the fact that PSU pays a premium for compostable service ware. Additionally, event planners hoping to reduce waste by opting for durable service ware encounter a significant financial burden (in most locations on campus). In general, waste diversion programs are suffering from the lack of dedicated staff to monitor and promote programs, and efforts to maintain momentum are threatened by the lack of an institutionalized approach.

Likewise, there has been progress, but challenges remain in the effort to monitor, control, and reduce University

# Materials

purchases. Singular initiatives to institutionalize green purchasing have been established, but a universal commitment to environmental stewardship with regard to material consumption is lacking. Tracking purchases remains a huge challenge due to the decentralized and autonomous nature of current procurement procedures. CSO continues to investigate possible solutions through existing software resources as well as through individual supply vendors.

## Remaining Opportunities:

- Expand reuse and exchange programs (mugs, lab chemicals, electronics, building supplies, architectural salvage, etc.)
- Institutionalize a process and infrastructure for “zero waste” events on campus
- Expand education on purchasing and waste prevention
- Expand diversion programs for campus move-in and establish efficient process for move-out
- Establish a centralized procurement system that defaults to environmentally preferable products and is capable of auditing and reporting campus-wide purchases by type
- Develop standards for environmentally preferable and socially responsible purchasing:
  - » Office supplies, electronics and appliances (energy star, EPEAT)
  - » Paints, furniture, carpet
  - » Food
  - » Custodial supplies
- Adopt LEED EB+OM commitment for campus buildings
- Become a leader in materials management by establishing a University “Life Cycle / True Cost of Ownership” policy that addresses environmental stewardship in both consumption and disposal of campus goods
- Lower print quota for students
- Acquire a centralized contract for paper shredding and begin tracking
- Process and market revenue generating commodities (cardboard, etc.)
- Develop design standards for waste storage (indoor and outdoor )in all major construction
- Include waste infrastructure (standardized bins and composting containers) in project costs
- Improve and standardize waste diversion and reduction infrastructure for campus events (including athletic events)
- Institutionalize composting
- Institutionalize toner, clamshell, and other specialty recycling programs
- Improve engagement/ownership for move in/out waste reduction programs



# Snapshot: Travel

## 1.) MAINTAIN 2010 LEVELS OF TRAVEL EMISSIONS

- Complete 2009 baseline
- Explore ways to streamline travel data tracking.
- Add travel data to BAO newsletter and highlight star departments
- Promote Drive Less. Connect.
- Identify barriers to choosing low carbon forms of travel, & communicate barriers to PSU Administration, OUS, and the Chancellor's office
- Identify departments with highest travel expenditures and conduct interviews
- Identify all opportunities to educate PSU employees & students about climate impacts of travel & alternatives
- Develop centralized tracking of faculty and staff trips & coordinate travel modes/costs. (SOP change)
- Request OUS Sustainability Initiatives Committee convene working group to discuss travel
- Forecast 10-, 20-, and 30-year travel rate projections
- Strategic plan with OIT & NTS to increase capacity for distance communication & conferences.
- Consider adding a box on travel forms to indicate carbon impact (mileage, etc.)
- Develop tool to understand trade-offs among travel costs, time expenditure, and mode
- Track short flights versus long flights
- Recommend companies for travel based on efficiency of plane/flights
- Convene group from OUS to share tools regarding travel

## 2.) ESTABLISH A LOCAL OFFSET PROGRAM FOR TRAVEL THAT IS USED BY 75% PERCENT OF TRAVELERS

- Research other institutions to develop methodology for a voluntary carbon offset program
- Complete outreach campaign that provides information about a carbon offset program and evaluates willingness to participate
- Work with BPS and Metro to develop list of emissions reduction projects that would be candidates voluntary carbon tax funding
- Implement and monitor a carbon offset program for travel emissions
- Record & communicate emissions & total cost reductions associated with voluntary carbon offset program

# Travel

## ***Introduction***

PSU employees and students travel for a variety of reasons including recruitment, professional development, study abroad opportunities, and athletic events. As with all scope 3 emissions, the collection of data related to travel has been challenging. PSU recently purchased new software to streamline the travel approval and reimbursement process. This new module could also yield a more efficient approach to tracking miles traveled, however the exact capabilities of that program are still emerging. The Campus Sustainability Office (CSO) is exploring options to better account for travel associated emissions and will continue to work with the Travel Office (within Campus Accounting Services) to investigate new opportunities provided by the web-based program.

Despite the challenges surrounding tracking and benchmarking travel related emissions, there are several opportunities to potentially influence travel behaviors through education and outreach. Without a clear baseline, the ability to accurately understand the impact of those behaviors is difficult, but it should not hinder efforts to promote sustainable travel behaviors, provide a variety of travel alternatives, and establish an offset option.

## **TARGET #1: MAINTAIN 2010 LEVELS OF TRAVEL EMISSIONS**

### ***Data Limitations***

Establishing a 2010 (or any) baseline for PSU travel-related emissions is not a straightforward task. In order to estimate emissions associated with travel, miles traveled per mode (air, rail, bus, etc.) must be accounted for. However, there are currently no processes in place that yield such information in its entirety, or with ease.

Currently, University travel is arranged, and thus must be tracked, through two separate processes: via contracted travel agencies, or personal reimbursement forms. Fortunately, the contracted agencies (Azumano Travel, Uniglobe, and Peak Travel) are able to provide extensive reporting that includes mileage by mode and a breakdown of short, medium, and long-haul flights. These data were used in the FY12 GHG assessment.

However, travel purchased by an individual and reimbursed by the University is recorded through travel reimbursement forms submitted to the Travel Office. The forms do not record necessary data (miles traveled and mode) and are stored in paper form only, making it time consuming to extract useful information. An efficient, accurate, and replicable method for collecting data from these thousands of forms for “non-agency travel” has yet to be determined.

In 2013, with assistance from the Travel Office, CSO began a project to manually record FY12 air travel destinations from a subset of reimbursement forms that exclude travel booked through an agency. Air travel was selected as a focus due to its high emissions profile. Other modes of travel such as train, bus and ferry are not currently being tracked. Once the reimbursement form survey is complete, and data have been collected and summed, an estimate of total miles (and thus emissions) attributed to non-agency air travel will be complete. Therefore, the baseline for emissions from all air travel can be recorded and goals for reduction of emissions may be set.

A new version of the Clean Air Cool Planet calculator, which PSU uses to estimate an emissions profile, now allows for the input of dollars spent on travel, rather than miles to calculate emissions. However, using current tracking systems, isolating dollars spent per mode of travel, and separating costs such as hotel fees from total travel expenditures, is not feasible without manually looking through each paper form.

### ***Travel Module***

The Travel Office has purchased a module for Banner, the University’s accounting system, which should allow electronic data gathering for reimbursed travel expenses. However, it is not clear at this time the level of reporting detail possible, as the module is not yet up and running. CSO is hopeful that in the future, data on dollars spent or miles traveled per

# Travel

mode will be a report that the module can generate.

Current and past estimates of air travel emissions include miles from agency travel, and study abroad air miles only. The sampling of reimbursement forms now underway should yield a better estimate of the impact that all air travel has on University emissions.

## PSU Sponsored Travel in FY 2012:

| Travel Type                              | Units           | Emissions (MTCO <sub>2</sub> e)   |
|--|-----------------|---|
| University fleet: gasoline vehicles      | 21,309 gallons  | 191.8   |
| University fleet: electric vehicles      | 2,962 kWh       | 1.1   |
| Travel by rental car                     | 878,382 miles   | 548.9<br><br>Grouped as “other directly financed travel” in carbon calculator |
| Reimbursed Travel by personal automobile | 595,206 miles   |   |
| Travel by biodiesel bus                  | 13,671 miles    |   |
| Agency Arranged Air Travel               | 9,022,825 miles | 5311.4  |
| Study Abroad Air Travel                  | 5,377,996 miles | 3165.8  |
| Reimbursed Air Travel                    | Pending         |   |

## TARGET #2: ESTABLISH A LOCAL OFFSET PROGRAM FOR TRAVEL THAT IS USED BY 75% OF TRAVELERS

Currently, none of PSU’s contracted travel agencies offer offset programs for travel emissions, and all use the same software for their online booking tool. The maker of the software has expressed interest in adding a feature to allow the purchase of emission offsets, however a timeline for implementation is unknown. At this time, there are many challenges around establishing an internal offset program for travel emissions. CSO and the Travel & Commuting subcommittee will continue to investigate offset programs at other universities and explore possibilities for providing that option for PSU travelers in the future.

### *Looking Ahead*

Given the difficulty in gathering accurate data, the focus for the next year should be in creating a system that makes it more feasible to accurately track all travel emissions. Future options for capturing information include reports through Banner (university information system), creation of additional financial account codes to accurately separate transportation from other travel costs, and/or conversion of dollar amounts to miles traveled per mode.

# Travel



Additionally, many education and outreach opportunities remain. The Office of Information Technology (OIT) supports several [video conferencing technologies](#) that can be promoted as an alternative to travel. While video conferences may not replace all travel, they could be a good alternative for meetings or other occasional collaborations that don't require an in-person presence.

PSU should continue to inquire with contracted travel agencies regarding the progress on establishing offset options within their online booking tools. Because all the contracted travel agencies use the same type of software, the establishment of an emissions offset option may need to come from the software company. Once this option exists, promotional efforts and possibly incentives for PSU departments to purchase offsets can be developed. Regardless of potential software solutions that may be provided through travel agencies, researching offset programs at other universities remains a priority.





ACHIEVED

NEAR ACHIEVEMENT

SOME PROGRESS

NOT ACHIEVED

NO LONGER PURSUING

# Snapshot: Commuting

## 1.) REDUCE THE MODE SHARE OF DRIVE ALONE TRIPS TO 15% OF COMMUTE TRIPS MADE TO THE PSU CAMPUS

- Provide prime, reduced-rate parking to carpool or vanpool vehicles
- Offer daytime car-sharing service
- Subsidized transit passes to students & staff members
- Offer on campus bicycle repair & maintenance services
- Workshops such as “Bike Commuting for Women” etc.
- Host community-building programs for bikers
- Participate in Bike Commute Challenge, etc.
- Develop a bike parking plan
- Increase bike parking spaces in covered areas & secure areas
- Maximize parking fees
- Partner with the City & TriMet on transportation infrastructure
- Demonstration projects in & around campus
- Partner with City to implement Bicycle Master Plan
- Develop bicycle theft prevention strategy.
- Develop outreach plan to increase knowledge about transportation options
- Explore additional funding to increase the subsidization of transit passes
- Explore additional funding to support transportation infrastructure improvements
- Partner with City to enhance bike & pedestrian connections over I-405
- Develop policy requiring commuting be considered during the planning of all projects

## 2.) REDUCE THE PER CAPITA NUMBER AND DISTANCE OF COMMUTE TRIPS TO THE PSU CAMPUS

- Information campaign for new students, encouraging consideration of transportation choosing housing
- Build more student housing & on-campus amenities
- Establish areas on campus for Bike Share stations
- Increase the capacity for and promotion of distance learning & online courses
- Information campaign encouraging students to consider transportation when looking for employment
- System to track telecommuting and condensed work schedules used by staff members
- Policy supporting private housing and commercial development near campus.

## 3.) LOWER THE CARBON IMPACT OF VEHICLES USED IN THE COMMUTE TO CAMPUS

- Increase the number of charging stations on & around campus
- System to track use of low carbon vehicles for commuting purposes
- Prime parking spaces to low emission vehicles
- Real-time informational signage showing where parking is available
- Campaign to encourage SOV commuters to use alternate modes for a portion of commute

# Commuting

## Introduction

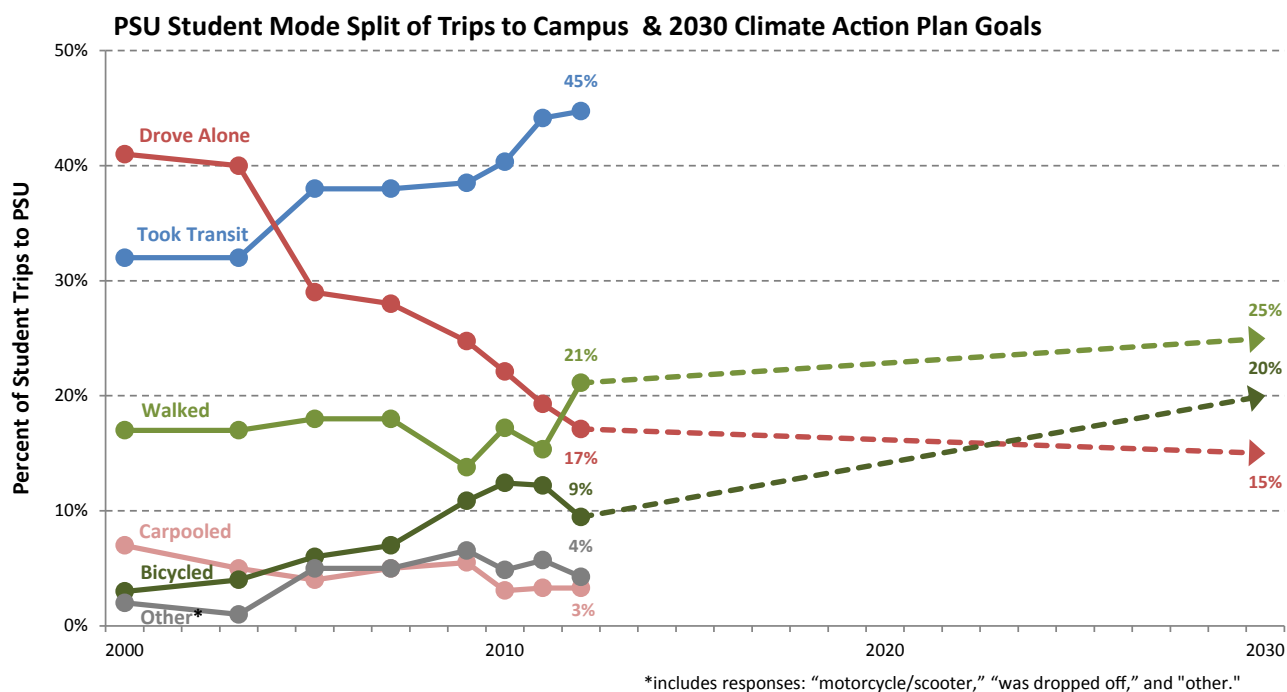
PSU is primarily a commuter community, bringing students and employees from all over the metropolitan area to campus. With campus located at the heart of the TriMet transit system, it is not surprising that so many students and employees take advantage of the access to two MAX light rail lines, the Portland Streetcar, and fifteen different bus routes that run through campus. Portland is nationally known for its numerous bike lanes and paths that make biking to PSU a good option for many. Additionally, there are three car sharing companies with vehicles on or near campus, granting students and staff access to over 25 vehicles, limiting the need to drive a personal vehicle to campus.

PSU's Transportation and Parking Services (TAPS) department has been working to promote commuting by transit, bicycle, walking, and carpool in order to decrease the demand for parking on campus and reduce the number of trips made by single-occupancy vehicles. The mode split graph below shows the results of various subsidies and programs over the last 12 years. These efforts work congruently with the Climate Action Plan (CAP) targets, but are also part of the overall transportation demand management strategies in place to manage approximately 4,000 parking spaces and to prevent the need to build more parking on campus.

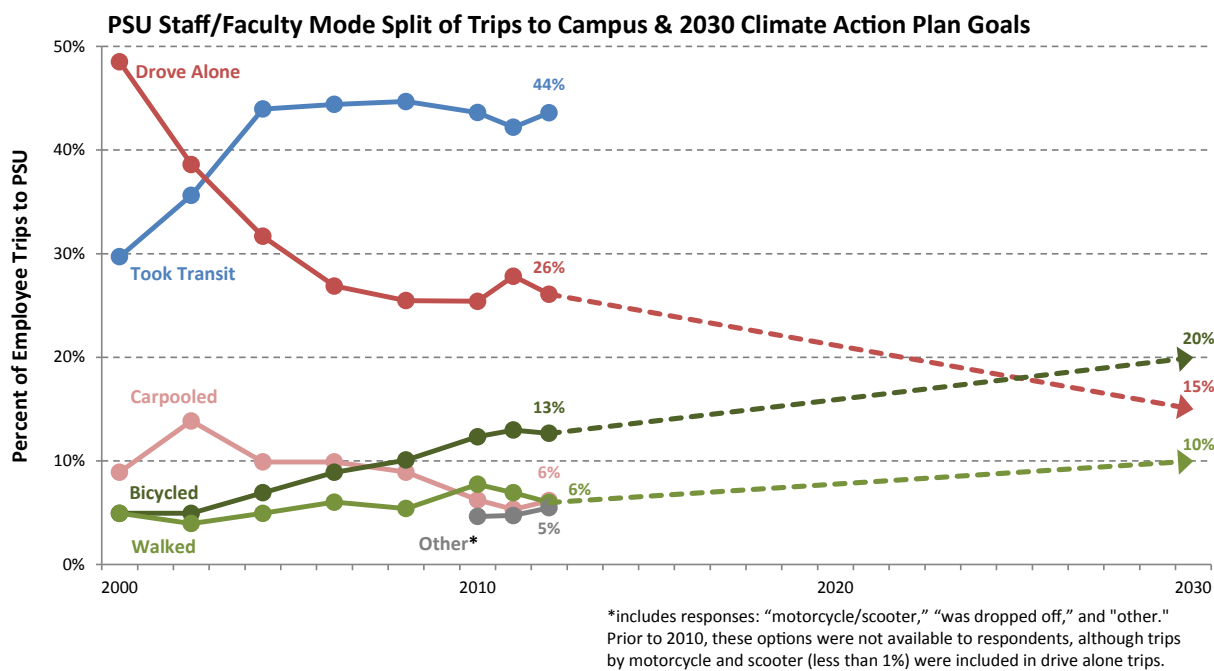
## TARGET #1: REDUCE THE MODE SHARE OF DRIVE ALONE TRIPS TO 15% OF COMMUTE TRIPS MADE TO THE PSU CAMPUS

### Transportation Survey

TAPS works with the Campus Planning Office each year to conduct an online survey of students and employees to determine how trips are made to campus and how behavior changes over time. As shown in the graph below, the Fall 2012 Transportation Survey showed drive alone trips were reduced to 17% for students and 26% for employees; this is a 10.5% and 7% drop, respectively, from the previous year's survey. Many ongoing actions contribute to the decrease in drive alone trips, including robust marketing of transportation options at student orientation, parking permit rate increases, carpool incentives, bicycle commute incentives through the PSU Bike Hub and annual Bike to PSU Challenge, partnerships to provide car-sharing services on campus, and partially-subsidized transit passes for employees and students.



# Commuting



## Changes to Transit Programs

Since public transit is the mode used for the majority of trips by employees and students to campus, changes in transit programs can lead to changes in behavior. In September 2012, TriMet reconfigured their fare system with the introduction of a single-fare system and the elimination of TriMet's Free-Rail Zone. This resulted in increased costs for PSU students and employees. Even with this cost increase, the transportation survey showed a continued decrease in the drive alone trips to campus. New transit programs in fall of 2012 included the implementation of free access to Portland Streetcar for PSU students and employees, and the addition of a subsidized, payroll-deductible annual CTRAN express pass for employees commuting from Vancouver, WA.

## Secure Bicycle Parking

Dry and secure bike parking is one of the most requested amenities among bicycle commuters and potential bicycle commuters. TAPS operates nearly 300 secure bicycle parking spaces in six different locations on campus. These secure facilities offer a dry, safe place to park a bike on campus and include 24/7 access for students or employees who purchase a permit for these spaces. The newest locations for secure bike parking opened in 2012 and 2013. The Science Education Center location added 46 spaces, and the Market Center Building parking garage added 32 more spaces.

## Promotional Efforts

Other efforts for promoting alternatives to driving alone to campus include an improvement in the student orientation and employee onboarding process by informing new students and employees about their transportation options before they arrive on campus. In November 2012, TAPS initiated a program called GoSmart PSU, which gave employees with a parking permit the chance to try public transit for a month at no cost. After the month-long trial, 18 percent of employees who participated kept the transit pass and returned their parking permit. Additional promotional efforts are continuously being explored including individual marketing to specific groups like housing residents and employees with parking permits, to ensure they are aware of the transportation options available.

# Commuting

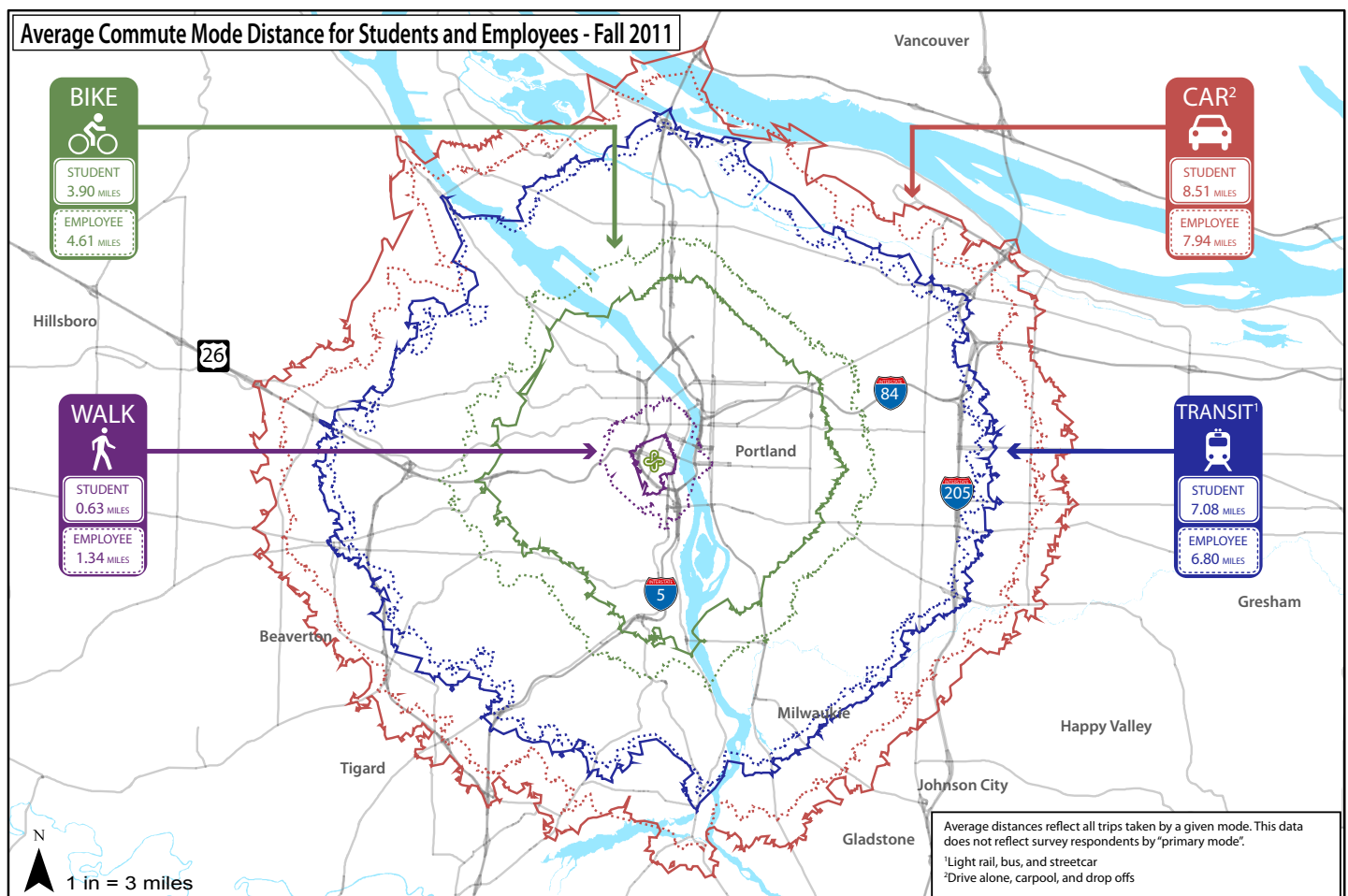
## VikeBikes

The Bike Hub launched the VikeBikes program in 2012, which uses refurbished bicycles to provide long-term rentals for students who do not have access to a bicycle. This has proven to be a good option for students who may not want to purchase a bicycle of their own, or cannot afford to do so. The bicycles are rented by the academic term or for a full academic year and include a helmet, lights, lock, membership to the Bike Hub, and a permit for a secure bike parking garage on campus. As of spring 2013, 54 bicycles were in the VikeBike fleet, with all of them rented out and five students on the waiting list.

## TARGET #2: REDUCE THE PER CAPITA NUMBER AND DISTANCE OF COMMUTE TRIPS TO THE PSU CAMPUS

### Proximity to Campus

As of fall 2012, 10 percent of PSU students live within ½ mile of the center of campus, including 1,658 PSU housing residents. Additionally, 25 percent of students live within three miles of campus, which is often considered a 'bikeable distance'. As of fall 2011 (the most recent data), the average distance that students and employees live from campus is approximately 6.7 miles. The map below shows the average distance that employees and students commute by each mode, according to the 2011 Transportation Survey results.





# Commuting

## *Student Engagement*

TAPS continues to work to provide transportation information to students and parents of students before they make their housing and/or employment choices. Student orientation materials have been improved to include easier-to-read information about transportation. TAPS continues to attend orientations and actively communicate information regarding transportation options. Information is also given through the University Housing Office so students are encouraged to live on or near campus, in part due to more convenient transportation options. University Pointe, a large housing development, opened in fall 2012 and has brought approximately 730 new PSU residents to campus. This building did not include any new parking, and most residents did not bring vehicles with them, successfully illustrating that it is possible to attract residents to campus without providing new parking.

## **TARGET#3: LOWER THE CARBON IMPACT OF VEHICLES USED IN THE COMMUTE TO CAMPUS**

### *Tracking Vehicles Used*

Transportation & Parking Services currently does not have an accurate way to track the number of hybrid or electric vehicles coming to campus. The transportation survey has indicated a minimal number of electric vehicles coming to campus, however market trends indicate there are more hybrid and electric vehicle options available, which will likely increase both vehicle types on campus in the coming years. Additionally, the number of inquiries about electric vehicle charging stations in PSU garages continues to increase.

### *Electric Vehicles*

Electric Avenue is a research and development initiative of the City of Portland, Portland General Electric, and PSU. It was set up as a two-year program beginning in August 2011 to pilot the variety of electric vehicle (EV) charging stations available and learn about the preferences and travel patterns of EV drivers. The charging stations have become increasingly popular, with the 'quick chargers' often being occupied by drivers aiming to charge their vehicle in about thirty minutes. A website ([www.pdx.edu/electricavenue](http://www.pdx.edu/electricavenue)) was set up to provide information, answer questions, host a survey of EV drivers, and promote events. Additionally, a progress report was developed to highlight the lessons learned from this project.

The project has had a large impact on the number of hybrid electric and fully electric vehicles coming to campus. It was recently decided that Electric Avenue

## BIKE to PSU CHALLENGE

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# Commuting

will remain in place until July 2014, which is one year longer than originally planned. Plans have not been made for how to accommodate charging needs once the charging stations are removed. The area where Electric Avenue is located will change with the expansion of PSU's School of Business and the existing site will no longer be available for use.

TAPS is in the process of exploring options for installing charging stations in some PSU garages to maintain adequate charging options. There are two parking spaces in PSU garages that are reserved for electric vehicles, one in the 4th Avenue Garage and one in the Market Center Building garage. Both reserved spaces were based on requests from drivers of plug-in hybrid vehicles, since they are adjacent to 110 volt outlets, which can be used to charge those vehicles. TAPS has also made an arrangement with Zipcar to take ownership over two charging stations in Parking Structure One. Zipcar will use them for electric carsharing vehicles through December 2013. At that time, PSU will take ownership and the stations will be available for public use.

## ***Looking Ahead***

Efforts to reduce the number of drive alone trips to campus will continue. Student trips are close to reaching the CAP goal of 15 percent, so new efforts will focus on trips made by employees, including getting information to new employees sooner and communicating all benefits of the annual transit pass.

The opening of the Collaborative Life Sciences Building (CLSB) in fall 2014 may have an impact on the commuting behavior of some employees and students. The changes associated with the opening of this building are not yet known and will depend on whether students and employees commute directly to and from the CLSB, or if they will also be commuting to the main PSU campus. Commute trends will likely change with the opening of the Portland Milwaukie MAX in 2015, however there is no projection for how much it will impact the number of drive alone trips made to PSU.

An area that could be explored more in the next year is the promotion or formalization of the policy around telecommuting and compressed work weeks for PSU employees. OIT provides several options for video conferencing and remote connections, which helps to support telecommuting. Both of these work options may help to reach this CAP target. In the fall 2012 transportation survey, 9.5 percent of employees reported telecommuting at least once during the survey week, and 1.8 percent reported working a compressed work week. There is currently little information about how prevalent these two work options are, but promotion could reduce the number of vehicles coming to campus each week.

Another avenue for reducing the carbon impact of vehicles coming to campus is the implementation of real-time informational signage that informs drivers where parking is available. This will reduce the need to circle multiple garages in search of available parking spaces. This process has just begun and the signage will likely be implemented in the 2013-2014 fiscal year. Additionally, TAPS will be considering the installation of EV charging stations in some of the PSU garages in order to keep up with the growing demand and requests.



# Snapshot: Education & Research

## 1.) BECOME A GLOBAL LEADER IN CLIMATE RESEARCH AND CURRICULUM

- Bring two global leaders to PSU for lectures & meet-and-greets with campus community
- List the top ten universities working on urban climate issues
- Develop K-12 program at PSU with a focus on climate issues
- Communication & outreach program for PSU's climate-related research initiatives
- Expand fellowship/internship programs to include focus on climate issues
- Host international conference on urban climate solutions
- Develop & pilot energy/climate undergraduate literacy learning objectives
- Develop student exchange program focusing on climate issues

## 2.) DEVELOP AN ADMINISTRATIVE STRUCTURE THAT ACTIVELY INTEGRATES PSU ACADEMICS WITH OPERATIONS AROUND CLIMATE MITIGATION PROJECTS

- Hold visioning summit where PSU community co-develops a vision & long-term goals for a sustainable and desirable campus
- Hire new staff member to focus on campus operations and projects with classes
- Host meetings with operations & academic departments to discuss the barriers and opportunities for increasing collaboration between the two sides of the University.
- Online portal to display PSU's climate data and progress on climate goals
- Develop program wherein CSO works with 2 undergraduate classes (per quarter) on a class-long CAP project or workshop
- Develop program wherein CSO works with 2 graduate or undergraduate classes (per year) on a term-long CAP project
- Develop strategic plan for bridging gaps between academics & operations
- Build on student research project to develop new strategies for integrating academics with operations (Research Project)

# Education & Research

## *Introduction*

When the Climate Action Plan (CAP) was adopted in 2010, it was clear that transformative changes in climate research and education at PSU were critical to achieving aggressive carbon reduction goals. The approach was twofold: (1) PSU needed to build its expertise and assets around climate research and education; and (2) the University needed to dramatically increase the deployment of student and faculty resources towards addressing the University's climate action challenges. PSU has made significant progress; however, it has become increasingly clear that there are many areas of overlap that could easily apply to either target. Lastly, there has been a general shift towards using "sustainability" as an overarching framework for research and curriculum as opposed to the somewhat narrow terminology of "climate action".

## **TARGET #1: BECOME A GLOBAL LEADER IN CLIMATE RESEARCH & CURRICULUM**

### *Showcasing Innovation & Expertise*

Establishing a leadership role in climate research and education requires building a reputation for existing programs by enabling researchers to promote their work in a variety of settings. To that end, the Institute for Sustainable Solutions (ISS) provided a means for showcasing research through its travel assistance program. This program presents a major opportunity for student and faculty researchers seeking to attend and/or present at national and international conferences. Partial or full grants are available through an application process and can be applied to airfare, mileage, conference fees, lodging, food, and other travel-related expenses. Award recipients are asked to submit a trip reflection document that outlines the impact of their experience. Since 2010, the travel program has enabled 146 trips for students and 96 for faculty with an emphasis on supporting travel related to key areas of sustainability research: Urban Sustainability, Ecosystem Services, and Social Determinants of Health. ISS has allocated \$20,000 for students and \$25,000 for faculty for the 2012-2013 academic year.

Additionally, by holding several high profile events on campus, PSU provided a forum for importing expertise and convening leaders in climate action. In 2010, ISS launched an international lecture series that addressed a variety of topics in climate and sustainability. That program has since merged with the School of the Environment's lecture series, which continues to offer talks by local and global environmental experts. PSU also hosted several conferences and meetings to exchange ideas for advancing sustainability on both a national and international scale. Notable events include:

- EcoDistrict Summit (multiple years) (2010, 2011, 2012)
- Annual meeting for the Urban Sustainability Director's Network (2012)
- National Academies summit on Portland and Urban Sustainability (2013)
- Inaugural Oregon Higher Education Sustainability Conference (OHESC) (2013)
- "Thin Ice: The Inside Story of Climate Science" documentary viewing and discussion (2013)

Most recently, PSU hosted Dr. Anthony Cortese, key organizer of the American College & University President's Climate Commitment (ACUPCC), for a public lecture and a series of meetings with campus stakeholders. Cortese's lecture, entitled "Leonardo da Vinci to Higher Education: Lead us on a Healthy, Just, and Sustainable Path Now", proposed that creating a sustainable human society should be a core mission in higher education.

### *Energy & Climate Curriculum*

PSU has a variety of assets related to energy and climate curriculum, however, they are widely dispersed and lacking a cohesive connection. In 2012, ISS partnered with Loren Lutzenheizer (Professor in Urban Studies & Planning) to conduct

# Education & Research

an analysis of PSU's energy and climate curricular offerings, as well as the demand for energy expertise in the regional economy. That report outlines several opportunities for advancing energy and climate curriculum at PSU:

- The global clean energy sector is growing steadily
- There will be significant demand in the region over the next decade for energy professionals
- Employers are seeking specific skill sets and experience
- PSU currently contributes little to the region's energy sector, but is poised to play a much more prominent role in training energy professionals
- In-house training for employees is ad hoc and limited, creating significant opportunities for developing on-going educational programs

## ***Sustainability Course Identification***

Students are not going to achieve every sustainability related learning outcome or gain a complete understanding of sustainability through one course. Therefore, the question for sustainability course identification becomes, "What is the most basic concept of sustainability that must be present in a single course's content regardless of the topic area?"

In order to better understand the full set of opportunities for exposing students to sustainability, ISS has developed a sustainability course identification rubric and begun to analyze syllabi against that rubric. The general approach of the rubric is as follows:

*At its core, sustainability is about interconnectedness or interrelationships between economic, equity, and environmental systems, i.e. the three E's of sustainability. Building from this, one can then identify a sustainability course by looking at its content to see if it identifies and describes the relationship between the course topic and at least two of the three E's of sustainability. A minimum of two is required because it's the articulation of the intersections that define sustainability and not the areas themselves. Therefore if a course identifies and describes the relationships between the course topic and two dimensions of sustainability, it is sustainability-related. If the content identifies and describes the relationship with all three dimensions of sustainability, it is sustainability-focused.*

The full list of sustainability related and focused courses can be found here: <http://www.pdx.edu/sustainability/sustainability-courses>. This list is continuously updated as ISS receives additional syllabi to review and integrate.

## ***Sustainability Research Excellence***

Faculty across the University are conducting climate and energy research and interest in the field continues to grow. Examples include:

### Vivek Shandas (Urban Studies & Planning)

- Participatory modeling and EcoDistrict Development, gathering community-based data on public perceptions and awareness of sustainability efforts and aggregating findings to support EcoDistrict projects

### Huafen Hu (Engineering)

- Energy modeling for Broadway residence hall to better understand operational efficiency of HVAC and electrical systems

### David Sailor (Engineering)

- Instrumentation and longitudinal data gathering to better understand performance of a pilot passive house



# Education & Research

## **TARGET #2: DEVELOP AN ADMINISTRATIVE STRUCTURE THAT ACTIVELY INTEGRATES PSU ACADEMICS WITH OPERATIONS AROUND CLIMATE MITIGATION PROJECTS**

### *Living Laboratory*

Many universities use the term “living lab” to describe an on-campus push to integrate operational needs with academic initiatives. Bridging the academics-operations divide offers the promise of win-win opportunities that enhance research and learning while accelerating progress toward carbon reduction goals. Realizing these opportunities requires new partnerships, incentive systems, and mechanisms for establishing communication and transparency amongst stakeholders. When the CAP was written in 2010, PSU was engaging in living lab projects. However, these efforts were not systematically supported, limiting the long-term impacts on campus as well as the learning outcomes for students. Since that time, stakeholders within the University have worked to build a living lab program that would transition the University from a series of good but disconnected projects, towards coordinated efforts that connect learning to institutional impact.



In 2010, ISS began an effort to link curriculum and operational sustainability goals by assisting the development of new classes and facilitating the professor/student relationship with on-campus partners. In 2012, ISS added a new position, the Undergraduate Research, Engagement and Creative Activities (URECA) Coordinator. This position acts as a broker between campus sustainability and academics, with a primary focus on undergraduate populations. The coordinator helps build connections across major silos within the University and serves as the central information hub for opportunities to advance sustainability, both on campus and in the classroom. Although this hands-on approach has helped to spur new classes and support existing ones, additional systems are needed to scale the concept across campus.

With this in mind, ISS and the Campus Sustainability Office (CSO) began to investigate the idea of a “Living Lab Portal” that could provide web-based solutions for sharing information, increasing transparency, and connecting people to projects. Over the past year, the group reviewed software platforms from other organizations and conducted a needs assessment within the University to better define desired capabilities of a potential software solution. This culminated in a proposal to PSU’s reTHINK competition, an initiative of the Provost to identify game-changing ideas for transforming

# Education & Research

teaching methods within the University. The Living Lab Portal proposal was an opportunity to outline the process, required partnerships, and critical investments for building an online clearinghouse for sustainability research projects at PSU. Projects selected for funding will be announced in June.

In addition to exploring technical solutions, ISS and CSO initiated a series of targeted conversations with faculty, students, and facilities personnel to explore barriers and opportunities for establishing a deeper academic and operational integration. These discussions have informed strategy development for more effective project management and have created a space to better understand the needs and opportunities that exist for living lab projects. As a result of this effort, a common definition for PSU's living lab and a set of criteria for living lab projects was developed. This definition represents the collective feedback from over ten faculty, ten staff, and five students.

**PSU DEFINES A "LIVING LAB" AS: A GIVEN PLACE WHERE PROBLEM-BASED TEACHING, RESEARCH, AND APPLIED WORK COMBINE TO DEVELOP ACTIONABLE SOLUTIONS THAT MAKE THAT PLACE MORE SUSTAINABLE.**

*For PSU's campus living lab, this requires a joint commitment from students, faculty, staff, and local residents to design, implement, adapt, and teach new approaches that address issues of equity, economy, and ecology.*

## Criteria for living lab projects:

- **Place:** Reflect a commitment to our campus and neighborhood.
- **Sustainability:** Strive to implement lasting change to make our place more resource efficient, equitable, and ecologically balanced, acknowledging a resource-finite world.
- **Teaching:** Provide results-oriented learning opportunities for students.
- **Fit:** Support PSU's sustainability vision and advance campus and neighborhood priorities.
- **Adaptive:** Take an open-ended approach where ongoing assessment, capturing, and reporting contribute to the collective knowledge base and improve future projects.
- **Engagement and Action:** Foster deep engagement with core community members that leads to meaningful on-the-ground project implementation.

## **Faculty Engagement**

A growing number of professors are interested in linking classes to CAP goals. In 2012, a formal group was convened to advance this topic and build connections among faculty working at the academic-operations interface. This "Community of Practice" shared information on classes being taught, developed opportunities to invite guest lecturers from varied disciplines, and identified collaboration opportunities. In Fall 2012, the group pursued an Environmental Protection Agency (EPA) grant as a potential resource for building a formalized academic-operations integration program at PSU and engaging Portland's five EcoDistricts. The grant development process offered a critical opportunity to build out a framework for systematically enabling living lab projects on campus and in the community. The proposal for the \$216,000 grant includes:

- Hiring three graduate research assistants, over two years, to support community-academic interface, conduct course assessments and evaluate impact
- Faculty stipends to support the development of new courses and adaptation of existing courses
- Staff and faculty time to standardize sustainability assignments, reading materials and action modules ("action-oriented" learning opportunities).

# Education & Research

## ***Applied Sustainability Curriculum***

Since adopting the CAP there has been a dramatic increase in living lab course offerings, which are specifically focused on advancing carbon reduction goals within the district. Examples include:

| Program  | Projects   |
|--|--|
| EcoDistrict Development Capstone                                 | <ul style="list-style-type: none"><li>• Urban Plaza waste sort and green team development</li><li>• Mechanism to reuse and repurpose materials in Urban Plaza</li><li>• Travel data assessment and website</li><li>• Portable energy dashboard</li><li>• Strategy for integrating PSU sustainability programs within University Pointe</li></ul> |
| Engineering Capstone   | <ul style="list-style-type: none"><li>• Cramer Hall Ecoroof installation</li><li>• Site planning for solar PV installation on Parking Structure 1</li><li>• Water management strategies for Lovejoy Fountain Park retrofit</li></ul>   |
| Waste Not graphic design course<br>(Focused on SoMa EcoDistrict) | <ul style="list-style-type: none"><li>• Graphics and programming to create a sense of place</li><li>• Brand development</li><li>• Waste management strategies for Market Center Building</li></ul>   |

## ***Economic Development Administration Grant***

PSU is pursuing a 1.5 million dollar grant from the Economic Development Administration (EDA) for an integrated energy efficiency project. The project would enable deep energy retrofits while linking those efforts to curricular, professional development, and district scale sustainability outcomes. The proposed strategy would achieve interrelated goals, serving the needs of faculty, students, South of Market (SoMa) EcoDistrict partners (see EcoDistrict Development section), and local energy efficiency professionals. Curricular and district-scale sustainability components include a “visualization theater” that would serve as a research facility for informing decision-making across a wide variety of topics. The theater would employ sophisticated software, streaming data from metered buildings to be used for energy research, scenario planning, and hands-on learning. Additionally, the proposal includes PSU’s commitment to develop an energy efficiency certificate designed to meet the needs of local industry. Recent data suggests a severe shortage of energy professionals in the Portland metro area over the next decade. Specifically, regional energy firms seek professionals with expertise in finance, engineering, and public policy. Working closely with industry partners, PSU would create an energy efficiency certificate drawing from existing courses and faculty expertise.

## ***Summary of Curricular Accomplishments***

- Allocation of staff time to build connections between PSU students, faculty, and campus operations
- Proposal to develop a Living Lab Portal submitted for PSU’s reTHINK competition
- Submission for a \$216,000 EPA grant to expand district-scale sustainability curriculum
- Established an active group of faculty to serve as a “Community of Practice” for advancing district-scale sustainability curriculum
- Pursuing \$1.5 million EDA grant for district energy upgrades, energy system research, and curriculum development

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- New and revised courses in Business, Engineering, Urban Studies & Planning, Graphic Design, and University Studies focusing on district-scale sustainability through applied learning strategies & project implementation

## **Looking Ahead**

It has become increasingly apparent that targets in the Research & Education section of the Climate Action Plan need to be evaluated and revised. Target one, “Become a global leader in Climate Research & Curriculum” is far-reaching and general. A more specific target, acknowledging the unique strength and character of PSU’s teaching and research portfolio, may provide more guidance. With that in mind, a revised version might instead call for PSU to *become a national leader in district-scale sustainability research and teaching*. This new language focuses on district-scale sustainability research, an area where PSU is poised to lead, and national leadership (as opposed to global). In addition, the curricular reference in the original target may not be needed because of its inclusion and emphasis within target two.

PSU has made significant strides towards leadership in district-scale sustainability research. However, several fundamental steps still need to be taken in the near term. A potential course of action might include:

- Designing a dedicated section within the Living Lab Portal where staff can propose research project ideas and tag proposals based on area of expertise
- Interviewing faculty who have successfully conducted campus sustainability research to better understand requirements for increasing the occurrence and effectiveness of such projects
- Hosting an urban sustainability research summit focused on developing district-scale opportunities for expanding that research

Target two, “Develop an administrative structure that actively integrates PSU academics with operations around climate mitigation projects”, has remained an extremely relevant goal over time. Both the scope and wording of the target are fairly consistent with current realities and needs. Nonetheless, it could be a more effective tool for guiding action. A revised target might say: “*Develop an administrative structure that actively enables a thriving, internationally recognized living lab culture and program at PSU*”. This rephrasing inserts the term “living lab”, now common language at PSU for discussing academic-operation integration. Additionally, this suggested revision establishes an international goal to strive for, acknowledging that PSU programs have already garnered national attention. A potential course of action might include:

- Develop a leadership committee for supporting living lab projects that advance climate action
- Develop a Living Lab Portal that would serve as an online resource for connecting students, staff, and faculty to curricular and research opportunities
- Build a system for tracking and evaluating the impact of living lab courses
- Establish a network of students who have taken living lab classes who could contribute to enhancing future coursework
- Create visibility for sustainability assets in the SoMa EcoDistrict
- Host a living lab workshop and publish a paper on living lab theory
- Complete a series of effective projects to showcase at AASHE 2014 in Portland
- Develop student mentor positions for building and maintaining linkages between courses and operational needs



# Snapshot: EcoDistrict Development

## 1.) DEVELOP A GOVERNANCE STRUCTURE FOR THE SoMA EcoDISTRICT THAT IS SUPPORTED AND ACKNOWLEDGED BY CoP POLICIES AND INCLUDES BROAD REPRESENTATION OF STAKEHOLDERS IN THE UNIVERSITY AREA

- Direct communication and information-sharing channel among pilot EcoDistricts
- Outreach to surrounding property owners, residents, workers, & businesses about EcoDistrict concept
- Working group with representation from small business owners, major property owners, residents, & workers
- Strategic plan for governance development, project implementation, & outreach for EcoDistrict
- Identify partners in the Metro region who are undertaking environmental and climate planning efforts
- Advisory group that includes Multnomah County, BPS, PDC, & Metro to coordinate and integrate EcoDistrict planning with regional efforts
- Work with PDNA & other downtown networks to increase awareness of PSU's environmental performance statistics & planning efforts
- Working group develop policy recommendations for the EcoDistrict
- Work with PDNA & BPS to host downtown EcoDistrict planning summit

## 2.) THE SOMA EcoDISTRICT EXCEEDS THE GOALS SET OUT IN LOCAL AND REGIONAL CLIMATE AND ENVIRONMENTAL PLANS (CoP, METRO, MULTNOMAH COUNTY)

- Baseline population data & inventory of current EcoDistrict projects/activities
- Implement three EcoDistrict projects that involve more than three property owners in the EcoDistrict
- Online database that displays the environmental and climate performance of EcoDistrict
- Identify key projects from regional environmental & climate plans that can be tested within the EcoDistrict
- Assess the number of property owners involved & evaluate costs, barriers, & environmental impacts

# EcoDistrict Development

## **Introduction**

The Portland Sustainability Institute (PoSI), in partnership with the City of Portland, launched the EcoDistricts Initiative in 2009, a comprehensive strategy to accelerate neighborhood-scale sustainability that integrates building and infrastructure projects with community and individual action. Over a three-year period, PoSI and its partners created an implementation framework, toolkits, a local pilot program, and capacity-building effort for widespread deployment.

An EcoDistrict 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 the results over time.”

As an urban university, Portland State University (PSU) is uniquely positioned to work with and influence its surroundings, create innovative partnerships, and serve and respond to the region’s most pressing issues. Yet, the University’s urban context brings both challenges and opportunities. Complex ownership structures present challenges in the areas of performance assessment, resource management, strategic planning, and behavior change. For these reasons, it is vital for PSU to engage in partnerships not only across campus, but within the community to achieve positive outcomes that move towards climate neutrality. An integrated approach is central to the Climate Action Plan (CAP) and complementary to that of the EcoDistricts Initiative, as it provides a structure for collaboration with neighboring property owners, residents, workers, businesses owners, and community partners.

In 2010, the area around PSU was selected as one of five EcoDistrict pilots. The University’s capacity for research and innovation, proximity to the urban core, unparalleled access to regional transit, and wide range of services positioned it well for the pilot program. The district was originally referred to as the “University EcoDistrict” assuming that PSU would act as a catalyst stakeholder in implementing the program. When the University engaged with neighboring property owners, the name was changed to the South of Market (SoMa) EcoDistrict to better reflect the broad make-up of stakeholders and move away from a more university-centric effort.

EcoDISTRICT MEMBERS COMMIT TO AMBITIOUS  
NATURAL RESOURCE PERFORMANCE GOALS, GUIDING  
DISTRICT INVESTMENTS AND COMMUNITY ACTION, AND  
TRACKING THE RESULTS OVER TIME.

## **SoMa Profile**

The SoMa EcoDistrict is located in the southern corridor of Portland’s Central Business District. The 92-acre area consists primarily of residential and commercial buildings. PSU-owned property accounts for a large majority of the district; around 50%. A number of public and private organizations reside within district boundaries including Regence Blue Cross Blue Shield of Oregon, St. Mary’s Academy, CH2M Hill and Portland’s Bureau of Planning and Sustainability (BPS). The City of Portland owns a significant portion of open space, including the South Park Blocks and the Halprin Fountain Blocks, which form an contiguous green space network along the west and east side of the district.

# EcoDistrict Development

## **TARGET #1: DEVELOP A GOVERNANCE STRUCTURE FOR THE SoMa EcoDISTRICT THAT IS SUPPORTED AND ACKNOWLEDGED BY CITY OF PORTLAND POLICIES AND INCLUDES BROAD REPRESENTATION OF STAKEHOLDERS IN THE UNIVERSITY AREA**

### ***Stakeholder Engagement***

PoSI and PSU began work on the EcoDistrict pilot in 2010 as part of the University District Framework Plan. An accompanying analysis identified key EcoDistrict opportunities to be considered in the University District Framework Plan and the Climate Action Plan with goals related to economic development, mobility, open space, preservation, resource conservation, waste management, and materials use.

Framed within various curricular activities, PSU led multiple events aimed at creating a forum for dialogue among district stakeholders. The Center for Academic Excellence held a series of community engagement breakfasts on EcoDistricts with local residents and businesses.

### **Convening Activities**

| Event   | Participants   |
|---|--|
| Community Engagement Breakfast<br><i>What are EcoDistricts?</i><br><i>What is a University EcoDistrict?</i><br><i>How might PSU become a better “member” of the neighborhood?</i><br><i>What are the assets and challenges of the University as we look to fully connect with this emerging sustainable development effort?</i> | PSU staff, faculty, and students, PoSI, Institute for Sustainable Solutions, Sustainability Leadership Center, and community leaders |
| Civic Ecology Workshop<br><i>Interactive charette to facilitate community-scaled participation and guide the University and EcoDistrict toward a sustainable future</i>   | Led by SERA Architects<br><br>PSU staff, faculty, students, and community leaders  |

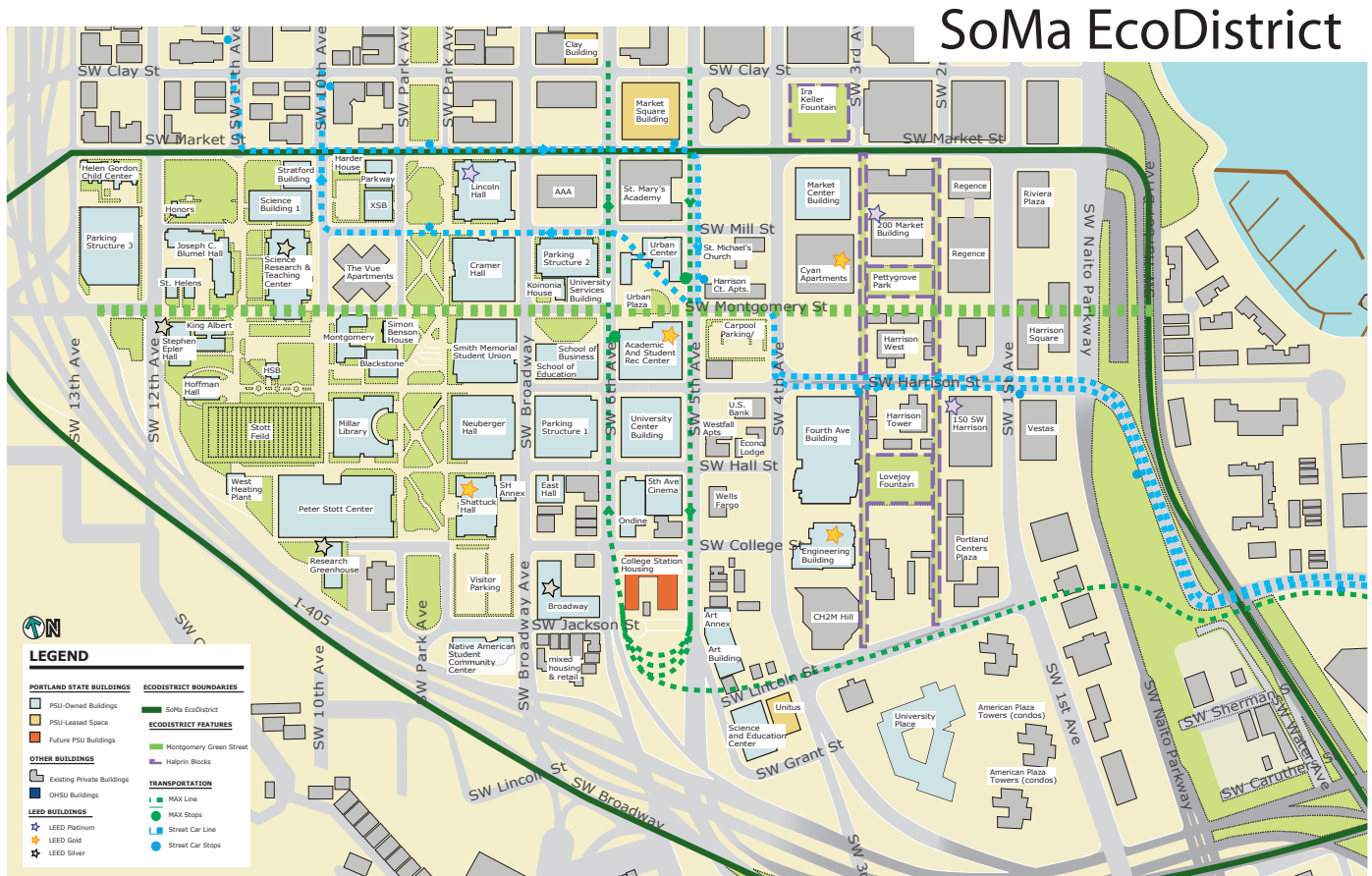
Additionally, PSU hosted a workshop, entitled “How does an Urban EcoDistrict self-activate?” during the 2011 EcoDistrict Summit. The workshop focused on approaches to building consensus, engaging participation and maintaining commitment within a core group. The event included a walking tour, panel presentation, and dialogue session. Those discussions, along with a survey of participating stakeholders, identified seven priority projects:

- Retail strategy
- Montgomery Green Street expansion
- Halprin Fountain Blocks revitalization
- “Basket of services” for new tenants
- Parking benefits district development
- Bike sharing program
- District utilities/PSU expansion

# EcoDistrict Development

## District Organization

In 2011, PSU and thirteen property owners convened to discuss the benefits of working together and understand the challenges around funding and organizational management. The group adopted the name South of Market (SoMa), established physical boundaries, created a vision statement, outlined initial goals, and formalized a steering committee and working group. Additionally, they signed a Memorandum of Understanding documenting their commitment to work together and implement projects that create a sustainable neighborhood. Boundaries of the SoMa EcoDistrict are defined by SW Market Street to the north, SW Harbor Way Drive to the east, I-405 to the south and west.



## SoMa Steering Committee Members

- AAA, *Travel, Insurance, Financial, Auto-related Services*
- Church of Saint Michael, *Religious Institution*
- City Center Parking, *Parking Facilities Management*
- Cushman & Wakefield, *Real Estate Services*
- Harsch Investment Properties, *Real Estate Development*
- Harrison Tower Apartments, *Multi-family Residential*
- Melvin Mark Companies, *Real Estate Services*
- Naito Development LLC, *Real Estate Development*
- Oregon Pacific Management Corporation, *Real Estate Development*



# EcoDistrict Development

- Portland State University, *Higher Education*
- Regence Blue Cross Blue Shield of Oregon, *Healthcare*
- Russell Development Company, *Real Estate Development*
- Schlesinger Companies, *Real Estate Development*
- St. Mary's Academy, *K-12 Education*

## SoMa Vision

To create a sustainable neighborhood for future generations, by working together with our community to define, create, and own a vibrant district with a variety of buildings and parks connected by green streets and public transit that will attract businesses, residents, and visitors to our neighborhood and create a vital and diverse place for people.

## Initial Goals

- Create a strong governing board
- Encourage consistent participation by Steering Committee and new stakeholders
- Maintain a strong commitment to investigate new ideas in sustainability
- Prioritize projects based on principals of economic, environmental, and social equity
- Identify equitable funding sources managed by SoMa EcoDistrict Board
- Balance PSU growth east of 4<sup>th</sup> Avenue with commercial and residential uses

## **Steering Committee Meeting Highlights (2011 – 2012)**

| Presenter   | Topic   |
|---|---|
| Portland Development Commission   | 2011 Central City Grocery Market Analysis :<br><br>Recommends full service grocer at SW 4 <sup>th</sup> and Harrison<br><br>Suggests a small grocery with large prepared food section may be built in a 3-5 year timeframe  |
| TriMet  | Portland-Milwaukie Light Rail Extension Project Updates   |
| Portland Bureau of Transportation   | Bike Sharing Program  |
| Bureau of Planning & Sustainability   | Sustainability at Work Program, Commercial Composting Opportunities and Future Mandates   |
| Bureau of Environmental Services  | 2011-16 Strategic Plan and Area Updates   |
| Alison Dennis, Executive Director,<br>PSU Center for Global Leadership in<br>Sustainability | <i>Instilling a Sustainable Culture</i> <ul style="list-style-type: none"><li>• Don't wait for permission</li><li>• Launch imperfect solutions early</li><li>• Practice strategic corporate social responsibility</li></ul> PSU School of Business: attracting students who see business playing a key role in solving social and environmental problems and growing sustainable business reach and impact. |

# EcoDistrict Development

Jackie Yerby, Sustainability Program  
Manager, Cambia Health Solutions

## *Challenges of a Sustainability Professional*

- Barriers to creating a culture of sustainability
- Approaches to working with the built environment
- Ways to overcome obstacles - patience, persistence, education, finding allies, demonstrate value

## ***EcoDistrict Recognition***

Representatives from the five pilot EcoDistricts began meeting in May 2012 to explore opportunities to leverage collective efforts. The group requested a meeting with the Mayor seeking confirmation of the city's commitment to EcoDistricts through formal designation, appointment of a city bureau to provide leadership and assistance, and exploration of interim and long-term funding strategies.

In October 2012, City Council passed a resolution that officially recognized the five pilot EcoDistricts and directed PDC and BPS to support EcoDistrict efforts. Going forward, BPS will provide technical assistance and determine financing, programming and policy strategies to support project development. PDC will assist with project implementation, connect clean tech firms to project opportunities, and identify district-scale projects through its work on large public-private redevelopment efforts.

## ***Long Term Planning***

In spring of 2012, through funding from the Institute for Sustainable Solutions (ISS) and the Bullitt Foundation, PoSI and PSU faculty conducted an EcoDistrict assessment for SoMa. The analysis compiled building performance data and surveyed community members in SoMa and surrounding neighborhoods. Dr. Vivek Shandas, Associate Professor in the PSU School of Urban Studies, and his team developed the survey which assessed demographics, social perceptions of place, and public support for initiatives.

The *SoMa EcoDistrict Roadmap*, completed in September 2012, and subsequently approved by the Steering Committee includes an assessment of baseline conditions, performance goals, recommended investments, partnership strategies, and prioritized projects. The roadmap identifies opportunities in eight performance areas: Equitable Development, Health & Wellbeing, Community Identity, Access & Mobility, Energy, Water, Habitat & Ecosystem Function & Materials Management. The SoMa Working Group refined these into five focus areas: Destination Gathering Spaces, Connectivity, Green Infrastructure, District Utilities, and Existing Building Retrofits. Each area identifies a long-term strategy for meeting goals, short-term high impact projects, and key implementation partners. Accompanying these recommended strategies and project priorities are three supporting strategies – governance development, engagement, and funding.

A robust governance structure was recommended to guide implementation of strategies and projects over time. The current structure of the SoMa Steering Committee includes co-chairs, a secretary, and working group. PSU has increased its leadership role and participation in the committee with current representation from the Campus Planning Office, Campus Sustainability Office, the Institute for Sustainable Solutions, and Research and Strategic Partnerships. Additionally, SoMa hired a graduate student to coordinate sustainable development projects and programs, including a strategy for expanding participation among University students, condominium residents, office tenants, and facilities staff. SoMa will continue exploring funding mechanisms for project implementation and strengthening organizational capacity.

Formal designation by the City has facilitated more involvement and coordination with PDC and BPS. As SoMa evolves, an advisory group focused on integrating environmental and climate planning with regional efforts may become more significant. Local government involvement in SoMa efforts have shown to be valuable in broadening district-wide buy-in and in building mutual understanding of strategies that support EcoDistrict projects.

# EcoDistrict Development

## TARGET #2: THE SoMa EcoDISTRICT EXCEEDS THE GOALS SET OUT IN LOCAL AND REGIONAL CLIMATE AND ENVIRONMENTAL PLANS (CITY OF PORTLAND, METRO, AND MULTNOMAH COUNTY)

Efforts in the past three years have predominately focused on building organizational capacity. However, progress has been made to align SoMa performance goals to those of the city and region. For each of the eight performance areas outlined in the SoMa Roadmap, an EcoDistrict vision statement, SoMa goal, and accompanying City goal have been identified.

### EcoDistrict Performance Areas

| Focus Area            | EcoDistrict Vision + SoMa Goal  | City Goal   |
|-----------------------|---|---|
| Equitable Development | Promote equity and opportunity.<br><br>Ensure fair distribution of benefits and burdens of investment and development.  | Benefits of growth and change are equitably shared across communities<br><br>( <i>Portland Plan</i> p.18).  |
| Health & Wellbeing    | Promote human health and community wellbeing.   | All Portlanders have access to a high-quality education, living wage jobs, safe neighborhoods, basic services, a healthy natural environment, efficient public transit, parks and green spaces, decent housing, and healthy food<br><br>( <i>Portland Plan</i> p.18).   |
| Community Identity    | Create cohesive neighborhood identity through the built environment and a culture of community.                         | Protect and enhance defining places and features of neighborhood centers ( <i>Portland Plan Policy H-7</i> ).   |
| Access & Mobility     | Provide access to clean and affordable transportation options.  | (1) Create vibrant neighborhoods where 90% of Portland residents and 80% of Multnomah County residents can easily walk or bicycle to meet all basic daily, non-work needs and have safe pedestrian or bicycle access to transit.<br><br>(2) Reduce per capita daily vehicle-miles traveled by 30 percent (2008 baseline)<br><br>( <i>Portland CAP</i> Obj. 5, 6). |
| Energy                | EcoDistrict Vision: Achieve net zero energy usage annually.<br><br>SoMa Goal: Reduce energy consumption by 63% by 2035. | (1) Produce 10% of the total energy used within Multnomah County from onsite renewable sources and clean district energy systems ( <i>Portland CAP</i> Obj. 1).<br><br>(2) Reduce the total energy use of all buildings built before 2010 by 25 percent<br><br>( <i>Portland CAP</i> Obj. 3).   |

# EcoDistrict Development

|                              |   |  |
|------------------------------|---|--|
| Water                        | EcoDistrict vision: Meet both human and natural needs through reliable, affordable water management.<br><br>SoMa Goal: Reduce water consumption by 51% by 2035. | Meet all new water demand through reclaimed water and water conservation<br><br>( <i>Portland Watershed Management Plan</i> p. 39).  |
| Habitat & Ecosystem Function | Achieve healthy urban ecosystems that protect and regenerate habitat and ecosystem function.  | Expand the urban forest canopy to cover one third of Portland, and at least 50% of total stream and river length in the city meet urban water temperature goals as an indicator of watershed health<br><br>( <i>Portland CAP</i> Obj. 13). |
| Materials Management         | EcoDistrict vision: Zero waste and optimized materials management.<br><br>SoMa Goal: 93% of waste is diverted from landfills by 2035.                           | (1) Reduce total solid waste generated by 25%.<br><br>(2) Recover 90% of all waste generated ( <i>Portland CAP</i> Obj. 10, 11).   |

## Initial Projects

### "Adopt-A-Block" Project, Neighborhood Livability

SoMa EcoDistrict and the Halprin Landscape Conservancy began a voluntary, Adopt-A-Block pilot program within the Halprin Fountain Blocks. The goal of the program is to further improve and activate the parks as a cultural resource. Pettygrove Park, the first park to be "adopted", received a boost from a nearby SoMa property owner. An enhanced landscape maintenance plan outlines the use of organic amendments, drought-tolerant turf grass, and high efficiency irrigation, among other practices.

### Lovejoy Fountain Park Structure Redesign, Neighborhood Preservation

A PSU civil engineering senior design capstone project brought together student teams to evaluate the structural integrity and redesign potential of the Charles Moore structure at the west end of Lovejoy Fountain Park. Working with stakeholders from the SoMa EcoDistrict Steering Committee, Portland Parks & Recreation, and the Halprin Land Conservancy, student teams conducted 3-D engineering analyses, wind dynamics studies, and provided upgrade recommendations that would address stakeholder needs and concerns while preserving important cultural and historic features of the park.

## Looking Ahead

### Halprin Fountain Blocks, Destination Gathering Places

SoMa will continue its efforts to improve the quality and attractiveness of the Halprin Fountain Blocks. A PSU capstone class is working with SoMa to evaluate opportunities to improve stormwater management in Pettygrove Park. At Lovejoy Fountain, SoMa is exploring ways to encourage people to use the park as a gathering destination by developing a program of activities, such as events, music, and performances and creating seating areas to attract nearby 4<sup>th</sup> Avenue food cart visitors and invite community interaction. Both projects set out to improve and promote these parks as attractive, healthy urban spaces and important cultural resources of the community.

### Kilowatt Crackdown, Existing Building Retrofits

As an important step to increase energy efficiency in existing buildings within the SoMa EcoDistrict, a group of SoMa property owners are participating in Kilowatt Crackdown, an energy challenge among Portland-area buildings to save



# EcoDistrict Development

energy and reduce operating costs. Owners and tenants receive technical assistance to benchmark energy use, analyze savings opportunities, and identify improvements to building performance. Kilowatt Crackdown is sponsored by the Building Performance Partnership, a partnership between Building Owners and Managers Association Oregon, Northwest Energy Efficiency Alliance's BetterBricks, City of Portland, Portland Development Commission, Energy Trust of Oregon, and Clark Public Utilities. The contest will run from January 2013 until May 2014. Participants will track energy performance using Energy Star Portfolio Manager, a national online comparison tool. Determining an Energy Star rating will also be valuable in assessing feasibility of pursuing the LEED for Existing Buildings: Operations + Maintenance program, which could be utilized by PSU and other SoMa property owners to increase the value of the existing building stock and conserve energy, water, and waste.

## ***Revising Targets for PSU's Climate Action Plan***

The recent addition of PSU leadership to the SoMa Working Group and the effort underway to develop an annual work plan by the SoMa project coordinator will likely provide input for new and/or revised targets and action items for EcoDistricts Development section of the Climate Action Plan.

# Conclusion

## ***Assessing performance & prioritizing action***

PSU has continued to refine the process for assessing greenhouse gas emissions and organizing climate action efforts. However, data collection methodology and accurate base lining continue to be a challenge for several areas. Certain Scope 3 emissions, specifically reimbursed air travel and purchased materials, are particularly challenging to assess and will require new, institutionalized mechanisms for capturing data. Additionally, it is clear that many action items—and in some cases, entire targets—need revision. However, several recent efforts offer potential for improving assessment and accelerating progress through better data collection, revised targets, and prioritized next steps.

### Potential data tracking improvements

- Improved data collection tool for waste diversion programs
- Purchased new Banner module that could streamline data collection for PSU sponsored travel, if capable of providing destinations and mode of travel
- Initiated new effort to assess embodied emissions from supply chain and other scope 3 sources
- Began development of a guide book for future GHG assessments to establish replicable and consistent methodology
- Committed to increase energy metering across campus and develop digital display systems for energy data (if awarded EDA grant)
- Developed rubric for sustainability course identification to better catalog inventory of sustainability-focused teaching and identify opportunities for expansion

### Current Goal Setting Initiatives

- Initiated partnership with the Energy Trust of Oregon to develop a strategic energy management plan which will include a prioritized list of projects and formalized energy goals
- Completed a campus-wide waste audit and report to provide recommendations for improving waste minimization efforts
- Developed the SoMa EcoDistrict Roadmap to identify new action items and targets for the district

## ***Moving Forward***

Portland State is renowned for its culture of sustainability, which touches everything from research and curriculum to new buildings and business operations. However, there are still many opportunities to show leadership, model sustainable solutions, reduce our environmental impact, and work towards carbon neutrality. This report highlights opportunities to provide a framework for prioritizing action in coming years.

Sustainability organizations at PSU have begun to lay the groundwork for what could become a comprehensive sustainability strategic plan with broad goals in various areas including climate action, campus operations, curriculum, research, and more. The next revision of the climate action targets may be housed in the more inclusive framework of a sustainability plan, as these targets are undeniably linked to a number of other sustainability goals.