Sustainability Assessment

and

Sustainability Plan

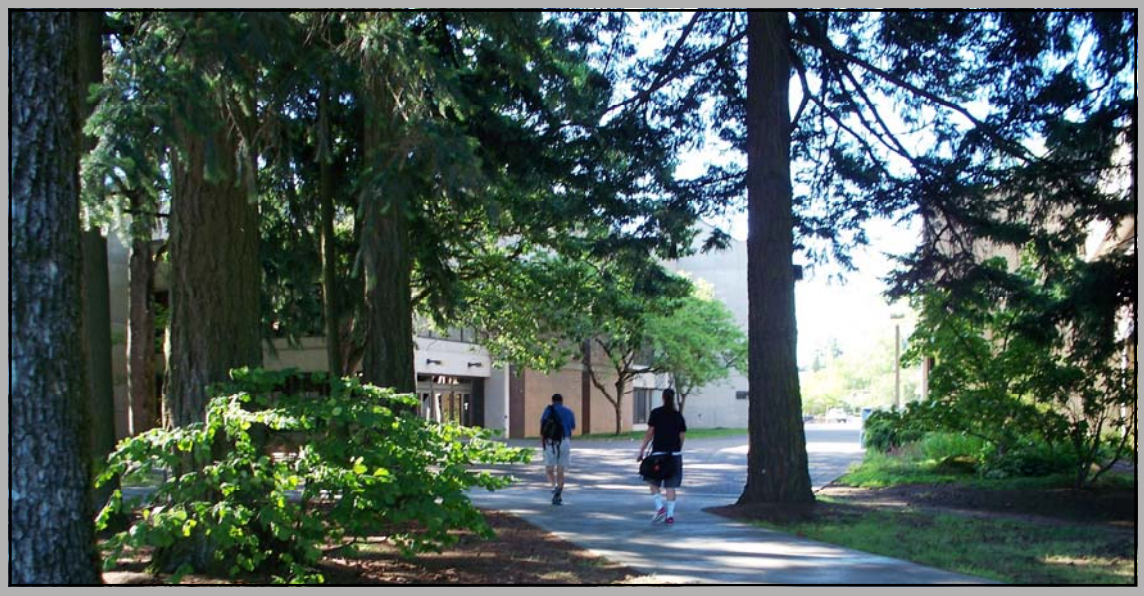
Clackamas Community College

Oregon City, Oregon

2009-2010

Sustainability Plan

Clackamas Community College
Oregon City, Oregon



Summer 2010

Sustainability Plan

Clackamas Community College

Oregon City, Oregon

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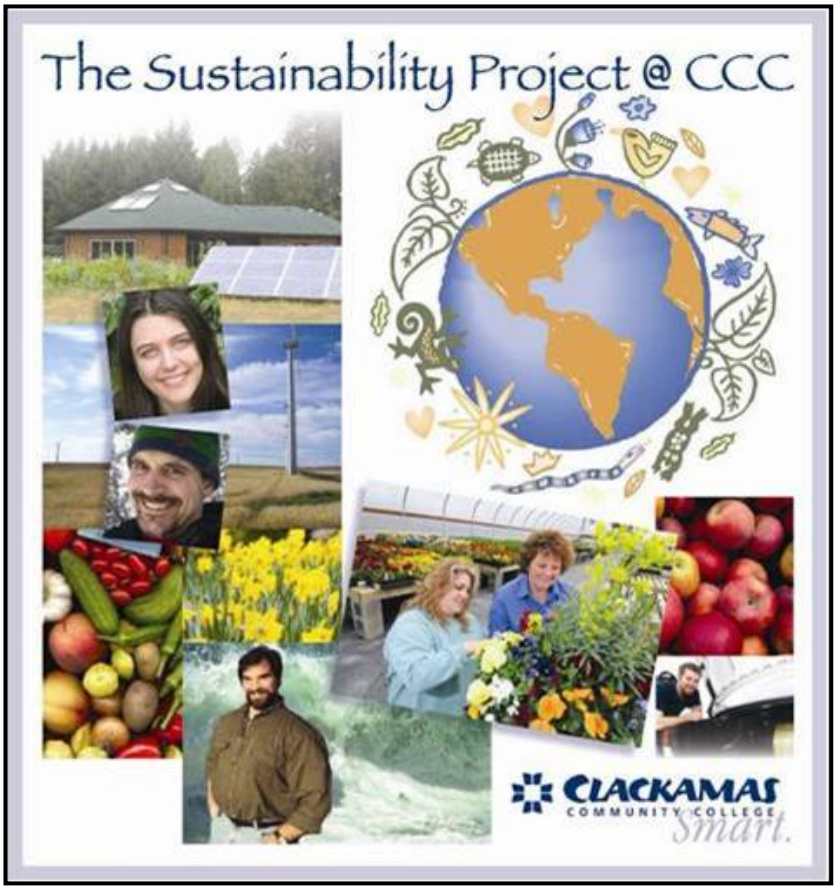
The Sustainability Committee of Clackamas Community College

Summer 2010

Introduction



Clackamas Community College completed a *Sustainability Assessment* and a greenhouse gas inventory in the spring of 2010. The urgency to complete these studies sprang from the institution's deep commitment to resource conservation, energy efficiency, pollution prevention and regional economic sustainability. Sustainability is also a natural fit with the College's mission to provide education for the health, well-being *and sustainable future*s for its students, their families and their communities.

During the discovery phase for the *Sustainability Assessment*, more than 100 people in the campus community contributed information about sustainable practices and activities undertaken by the College in recent years. The resulting document became an inventory of these accomplishments. It also made clear the vision, initiative and energy that had moved the College toward greater environmental, economic and social sustainability.

The *Assessment* enumerated the College's efforts to purchase products manufactured of recycled or renewable materials, to construct sustainable buildings, to support local businesses, to be a good steward to the natural resources on and adjacent to its properties, to decrease consumption and waste, and to reduce its energy usage and dependence on fossil fuels. The College's considerable energy conservation efforts were showcased, including upgrades to lighting, heating, cooling, ventilation and irrigation systems that saved the College $1.7 million in lowered energy usage between 2006 and 2010. The *Assessment* highlighted a new three-course series, Pathways to Sustainability, offered in the Humanities Department. It pointed out the College's role in delivering fresh professional development training workshops focused on sustainability to business and industry in the region, and in creating new career and technical education programs in renewable energy technology and management.

It was clear that Clackamas Community College had gone a long mile to integrate principles and practices of sustainability into many aspects of college life, education, facilities planning, operations and maintenance. The *Assessment* results stood up well to measures of sustainability offered through AASHE,[1] ACUPCC,[2]

[1] American Association for Sustainability in Higher Education
[2] American College and University Presidents' Climate Commitment

and other sustainability evaluation systems. It held its own with the assessment results of many public and private higher education institutions, and in energy conservation measures, exceeded most of them.

The final chapter of the *Assessment* pointed out work that remains to be done. It included scores of recommendations made by the Sustainability Committee and others in the college community. These recommendations stemmed from concerns about climate change, a fragile global economy, impending resource depletion and impacts of population growth, environmental pollution and the increasing costs of energy and materials, and other compelling issues. These issues are challenging institutions and individuals to change civilization as we know it, and to pioneer leaner, more-efficient, socially equitable, sustainable human environments. These challenges create remarkable opportunities for the College to become even more sustainable. This *Sustainability Plan* provides an organizational development approach for accomplishing the actions listed here.

The *Plan* creates opportunities for individuals and departments to contribute to the College's renewed sustainability goals and provides a framework to be successful in achieving them. Through these successes, the College's Sustainability Program has the potential to become a source of pride for the campus community – in short, to be an effective vehicle for both internal and external public relations campaigns.

The experiences of other colleges nationwide have shown that when campus leaders make sustainability a high priority in all aspects of college life, academics and operations, and publically acknowledge their institution's sustainability program successes, more successes are likely to happen. In this upbeat environment, people take hold of projects and initiate new practices. Outreach education to the college community can be rolled out to the drumbeat of sustainability, in which everyone is acknowledged as a key player in ongoing success.

This *Plan* highlights policies that need to be formulated and actions taken to continue the College's accomplishments in sustainability. They are derived from recommendations summarized in the *Clackamas Community College Sustainability Assessment* and the following sources:

- preliminary findings of the 2009-2010 *Clackamas Community College Greenhouse Gas Inventory*
- observation of campus conditions during the *Assessment*
- generally accepted principles of sustainability & climate neutrality
- elements of LEED, The Natural Step, Earth Advantage, Energy Star, the American College and University Presidents Climate Action Plan, the American Association for Sustainability in Higher Education, STARS, and other systems
- model sustainability & climate neutrality program elements of selected municipalities and colleges
- organizational development & project management principles

A complete bibliography of resources consulted to develop this *Plan* can be found in the *Sustainability Assessment*, which appends this document.

How to Use this *Plan*. Sustainability actions already completed are summarized in bullet points at the beginning of each sub-section of the *Plan*. Actions that need to be addressed are listed below this. Lead roles are noted, together with (if known), support needed, indicators of success, monitoring ideas, and notes on implementation notes and next steps. Project timelines and funding sources are left to be determined by project leads as collaboration proceeds to implement the *Plan*.

The *Plan* is intended to be a living document. Ongoing collaboration will occur to prioritize and fine tune each action, and the *Plan* will change over time as the campus community continues to incorporate sustainability into curricula, operations, education, campus life and services to students. As projects are completed, they can be moved onto *Actions already completed* lists and new projects developed for action. The framework of the completed *Plan* follows the rough outline below (please note that the basic elements of the *Plan* are listed alphabetically, not in order of priority). This outline was developed from findings & recommendations of the *Assessment* and from areas of emphasis utilized by other college sustainability plans and other sustainability evaluation matrices.

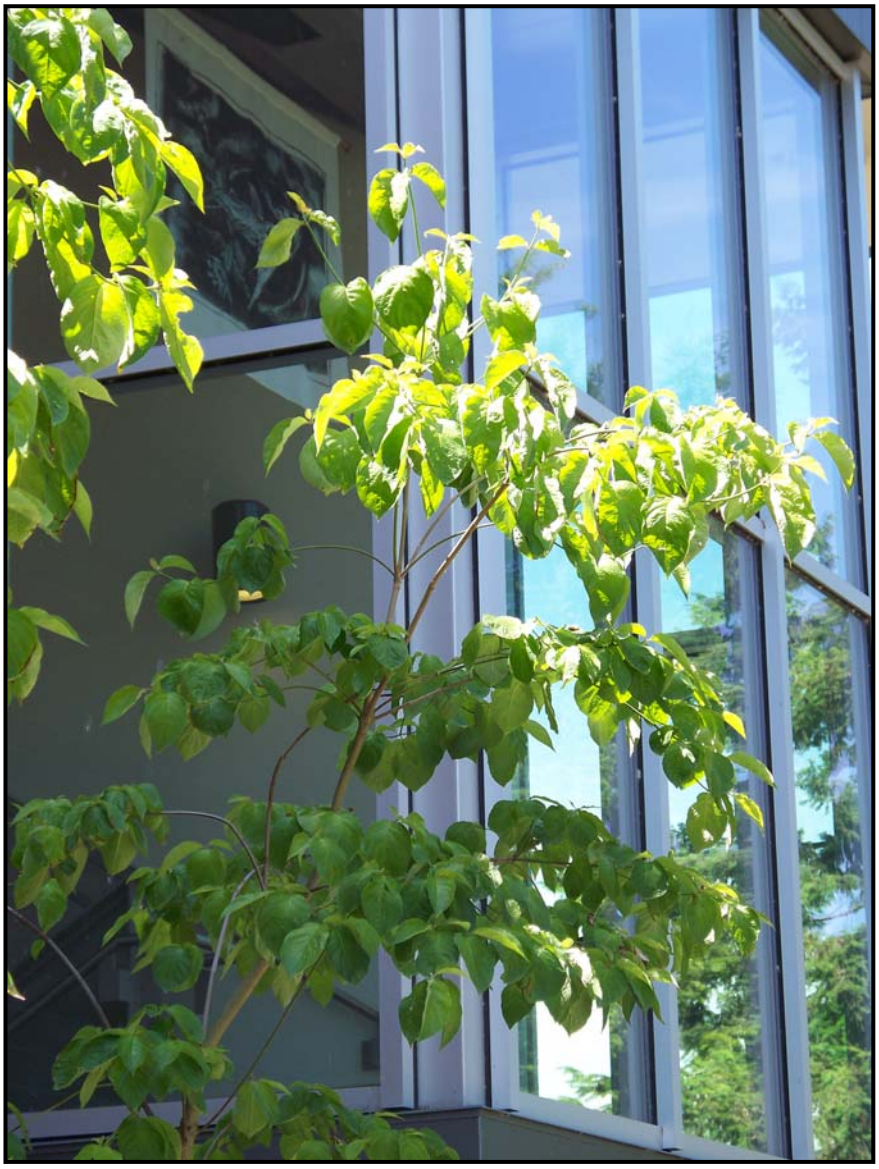
I. Buildings
II. Climate Protection
III. Communication & Events
IV. Curriculum & Education
V. Custodial, Maintenance & Operations
VI. Energy
VII. Food Service (also see Purchasing)
VIII. Landscape & Grounds Keeping
IX. Leadership & Implementation
X. Purchasing
XI. Stormwater
XII. Transportation
XIII. Waste & Recycling

Contents

Objective 1: Reduce the kind & amount of waste the college produces

- Outreach & Education
- Expansion & Pre-Cycling
- Garbage Leachate

I: Buildings



A: Site Selection

Objective 1: CCC develops education centers in ways that encourage and contribute to the twenty-minute city of the future.[1]

1.1: Public Transit & Bike Routes

Activities already completed:

The Harmony Community Center

- is redeveloping and improving an existing built environment
- is within an established infrastructure service network
- has dense, nearby residential, industrial and commercial neighborhoods whose current & future stakeholders include both students and career & technology partners
- provides views of and access to an adjacent natural area

The Oregon City Campus

- is well-established, with 19 education buildings

The Wilsonville Campus

- serves community education needs in the south metro area and region-wide energy infrastructure training needs

[1] The twenty-minute city is a city in which everyone's needs for transportation, education, workplace, shopping and recreation are within 20 minutes of where they live. It is a walk-able, bike-able place with immediate access to a public transit network. The twenty-minute city is compact, people-friendly, and uses efficient infrastructure to provide residents, businesses and institutions with water, power, sewage, communication and transportation.

Action 1: Interface with regional and municipal transportation planning to contribute to development of public transit and bike and pedestrian routes to the Harmony Campus as well as the College's other two campuses.		
Lead: Dean of College Advancement	***Complete by Date:***	***Funding Source:***
Support Needed: Eventually, the College may need to contribute funding to transportation system developments		
Measures of Success: The college is engaged in long-term and conceptual transportation planning		
How Completion will be Reported: Dean of College Advancement reports to CEO, Board, President's Council		
How Project will be Monitored • ***During Implementation:*** College remains an engaged player in transportation planning with ODOT, Metro and local municipalities • ***After Implementation:*** Transit lines and pedestrian & bike routes link to all campuses		
Implementation Notes:		
Next Steps:		

B: Site Evaluation

Objective 1: CCC constructs new education buildings & appurtenant structures on sites where healthy environmental conditions will protect and support the short- and long-term health of building occupants, users and maintenance & custodial staff.

1.1: Legacy Contaminants

Actions already completed:

- The College utilized extensive worker and environmental health practices to remediate mold problems at an existing building that was demolished on the Harmony site to make room for new construction.

Action 1: Undertake thorough Level I & II site evaluation when considering properties for acquisition, to ascertain the presence of legacy contaminants and the procedures and costs necessary to remove, isolate or encapsulate them. Include air quality and soil radon & lead testing in this evaluation.		
Lead: VP & Director of Campus Services	***Complete by Date:*** When considering acquisition of real estate	***Funding Source:***
Support Needed: Consultant firm specializing in these analyses.		
Measures of Success: Studies undertaken; reports clear and specific; remediation needs clearly articulated. Follow up will include remediation actions and costs for each category of action.		
How Completion will be Reported: VP & Director of Campus Services to CEO, Board, President's Council, College Council, PIO		
How Project will be Monitored • ***During Implementation:*** By VP and Director of Campus Services • ***After Implementation:*** Site testing after remediation activities are completed		
Implementation Notes: On-site inspection (rather than merely observation) may be warranted, depending on pollutants identified		

Next Steps:

1.2: Potential Pollution of Site

Action 1: Evaluate the potential for pollutants to flow or be deposited *onto* the site from beyond property boundaries.		
Lead: Director of Campus Services	***Complete by Date:*** During initial site design & conceptualization of grading, stormwater & ventilation	***Funding Source:***
Support Needed: Potentially, the municipal permitting entity's hazards & health specialists, sewer and stormwater specialists; CCC's ventilation specialist;		
Measures of Success: The potential for offsite spills to affect the site, deposition of air-borne industrial pollutants on the site, overflows from area street drainage to flow onto the site, sewer overflows and other potential pollution hazards to the site are evaluated during project conceptual design, and mitigation measures are incorporated into project designs		
How Completion will be Reported: Director of Campus Services to VP		
How Project will be Monitored • ***During Implementation:*** Topic is an agenda item at team meetings until issues are resolved • ***After Implementation:*** Mitigation measures are in place and are functioning properly		
Implementation Notes: Director of Campus Services bird-dogs these items all the way through design & construction		
Next Steps:		

1.3: Potential Pollution of off-site Resources by Site Activities

Action 1: Identify offsite resources, such as waterways, streams, stormwater systems, natural areas and sensitive land uses such as schools, hospitals, residences and office buildings, to be impacted by site activities; integrate mitigation measures into project design		
Lead: Dean & Director of Campus Services	***Complete by Date:*** During building conceptual design	***Funding Source:*** None needed
Support Needed:		
Measures of Success: Site is graded to contain potential spills from loading activities, stormwater leaving the site does not erode slopes or degrade natural areas, water quality or wildlife habitats; building exhaust does not impact other nearby buildings; pedestrian walkways & landscaping are designed to encourage people to stay on the site; disposal & recycling opportunities prevent litter from becoming a problem; building mechanical systems do not create sounds of a volume to disturb occupants or neighbors		
How Completion will be Reported: • Discussions about these items occur during conceptual design phase and are included in final designs		
How Project will be Monitored • ***During Implementation:*** Design review • ***After Implementation:*** Sign-off by owner		
Implementation Notes:		
Next Steps:		

1.4: Emergency Response Staging

Action 1: Consider needs for other entity's emergency response teams to access or stage from the site, and for the college to store & retrieve materials to respond to spills of hazardous materials		
Lead: Dean of Campus Services	***Complete by Date:*** During development deliberations & planning	***Funding Source:*** None needed
Support Needed: Director of Campus Services, Manager of Campus Operations		
Measures of Success: This topic is included in site evaluation for new college facilities		
How Completion will be Reported:		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

C: New Buildings:

Objective 1: Construct energy efficient, sustainable, healthy education buildings

1.1: Specifications for Sustainable Buildings

Actions already completed:

- The College has constructed a succession of five buildings that integrate a range of energy efficiency design elements and environmentally friendly practices and materials. These elements and practices include passive site stormwater treatment, water-conserving landscapes, low emissive windows, no- and low-VOC emitting materials, energy efficient HVAC systems & building designs, repurposed & salvaged materials, use of natural daylight, water conserving restroom fixtures, and local & environmentally friendly materials, finishes, furnishings, coatings & adhesives
- In the spring of 2010, Campus Services completed research and writing of *Sustainable Building Specifications.*

Action 1: Collaborate with architects concerning sustainable specifications for future buildings		
Lead: Campus Services Director	***Complete by Date:***	***Funding Source:***
Support Needed: Campus Services: Project Manager, Engineer Team Leader; College architects		
Measures of Success: At key points, the College's architects review and collaborate concerning scope and detail of the College's *Sustainable Buildings Specifications*, a living document; revisions and updates are made, as appropriate. The specifications include: • Water & energy conservation, fixtures & systems; metering & sub-metering • Design for day-lighting, with coordinated, energy efficient electric lighting systems • Passive cooling, ventilation & heating (including use of waste heat) systems; coordinated with energy efficient HVAC mechanical systems • Energy efficient & reflective roofing systems & materials • Energy efficient envelopes, windows & entry way designs		

- Sustainable materials: locally sourced, recycled/recyclable; environmentally friendly processing; low- or no- VOC furnishings & finishes; Green Seal & Forest Stewardship Council and other third-party certified products
- Design for universal access
- Design for Indoor Environmental Quality (air quality, light, temperature, acoustic space, aesthetics), including cleaning systems & materials; moisture management; Integrated Pest Management; avoidance of glare; placement of outdoor air intakes to avoid building exhaust & other pollutants; design for noise minimization; energy efficient and healthy office machines & materials; standards for thermal comfort

How Completion will be Reported: Status reports to Board, President's Council, College Council, The Clackamas Print, FYI Today

How Project will be Monitored:

- ***During Development:*** Campus Services Director & College architect review & collaborate prior to and during design of new buildings
- ***After Implementation:*** Buildings are commissioned and meet CCC standards for energy use, durability, efficiency, indoor environmental quality, etc.

Implementation Notes: Use specifications as quality check-point in design and value engineering

Next Steps:

- Incorporate into contract language, bid evaluation, purchasing standards, project inspection, payment schedule & terms
- Develop & promulgate fresh standards for occupant behavior change concerning building thermal comfort (occupants dress for very warmest and coldest events of year)

1.2: Healthy Materials & Construction Processes

Action 1: Integrate environmentally friendly and healthy construction materials and processes into design approach for new buildings.

Lead: Director of Campus Services	***Complete by Date:***	***Funding Source:***

Support Needed: Design & construction teams include this experience & expertise *specifically* in scope of services & expertise; CCC support staff may provide or request additional research on selected materials proposed for use; all materials substitutions must be accompanied by written research findings and applicable data

Measures of Success: New buildings are constructed with tried-and-true health-safe materials & processes that are environmentally friendly.

How Completion will be Reported: Director of Campus Services to VP, College Council, CEO, Board, FYI Today, Clackamas Print

How Project will be Monitored

- ***During Implementation:*** Discussions about materials & processes early & often, from concept to take-offs
- ***After Implementation:*** Buildings perform well, indoor air quality is commissioned, occupants are pleased

Implementation Notes: Director of Campus Services bird-dogs these items all the way through design & construction

Next Steps:

D: Existing Buildings:

Objective 1: CCC retrofits existing buildings to be energy efficient, sustainable & healthy

1.1 Energy Audit

Actions already completed:

- The College has installed several generations of energy efficient lamps and lighting systems over the past few decades
- Installation of new digital control systems enables real-time, remote and programmable control of HVAC systems
- Older buildings have been retrofitted with high efficiency elements of HVAC systems
- Sub-meters have been installed to monitor and manage energy use in selected buildings/spaces
- An energy audit is being undertaken to characterize potential energy savings in older buildings so that modeling can be done to prioritize retrofits for energy saving & efficiency
- Solar collectors have been installed on the rooftops of Pauling, Randall & McLoughlin to supply these buildings' hot water needs
- A demonstration wind turbine has been installed on the rooftop of Barlow
- A pilot project in ground-source cooling has been installed at Lewelling

Action 1: Complete energy audit		
Lead: Campus Services: Director, Engineering Team Lead; consultant	***Complete by Date:***	***Funding Source:***
Support Needed: Campus Services support staff		
Measures of Success: Audit complete; recommendations derived & prioritized		
How Completion will be Reported: Consultant to Campus Services; Campus Services to VP of Campus Services, PIO, FYI Today, The Clackamas Print		
How Project will be Monitored • ***During Implementation:*** Oversight by Campus Services personnel • ***After Implementation:*** Progress on retrofitting existing buildings		
Implementation Notes:		
Next Steps: • Apply findings from characterization studies of typical buildings to develop retrofit needs for all buildings • Identify & secure funding for retrofit needs		

1.2: Energy Efficiency Retrofits

Action 1: Implement the recommendations of the energy efficiency audit, according to priorities. Potential actions could include: • Implement efficiency upgrades to existing mechanical HVAC systems • Construct energy-saving alternatives to the roll-up doors in the Boiler Room, Automotive and similar shops & spaces • Improve insulation

• Address envelope infiltration • Construct double-door entry vestibules • Replace window glazing with low emissive glazing • Install perforated stairs • Install higher efficiency lamps where needed and implement new lighting standards calling for lower illumination in some spaces • Reduce plug loads and swap out older appliances for Energy Star equipment		
Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering Team Leader; Director of Campus Operations		
Measures of Success: Retrofits installed; Energy use data shows energy improvements		
How Completion will be Reported: Campus Services reports to Campus Services VP, PR		
How Project will be Monitored • ***During Implementation:*** Campus Services Director will manage projects • ***After Implementation:*** Engineering Team Leader will conduct quality control		
Implementation Notes:		
Next Steps:		

1.3: Re-commission Building Systems

Action 2: Work with an outside consulting firm once each five to ten years to have buildings re-commissioned.		
Lead: VP, Dean, Director & Energy Manager, Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Campus Services regularly provides CEO and executive team with information about the critical nature of this activity and its very large payoff in avoided energy costs.		
Measures of Success: Re-commissioning costs are factored into annual operating budget		
How Completion will be Reported: All buildings are re-commissioned once each five to ten years		
How Project will be Monitored • ***During Implementation:*** Energy manager keeps records of re-commissioning schedule, activities and needs • ***After Implementation:*** Energy savings are realized and reported to CEO, VP, Board, President's Council, College Council, PIO, local newspaper, The Clackamas Print		
Implementation Notes:		
Next Steps: Invite a re-commissioning firm to give a presentation to the Board, explaining re-commissioning benefits		

II: Climate Protection

A: Greenhouse Gas Emissions

Objective 1: Complete greenhouse gas inventory, develop protocols for periodic inventory update and prioritize & plan actions

1.1: Inventory

Actions already completed:

- The initial greenhouse gas inventory for the College was completed in spring of 2010, using international standards for emission coefficients to determine GHG emissions totals
- Data sources and data-keeping personnel for the Oregon City campus have been documented
- Data record-keeping methods have been recommended to all departments and personnel who accumulate information critical to the ongoing assessment of the College's greenhouse gas emissions
- Baselines have been established that will allow the College a quantifiable way to measure progress while moving forward
- Primary recommendations to reduce the College's greenhouse gas emissions have been made

Action 1: **Continuing Inventory.** Determine frequency and means by which CCC's GHG assessment will be updated in the future, including: purchased energy, on-campus energy generation; transportation emissions (commuting, air travel, campus fleet); fertilizer use; solid waste (incineration/landfill); refrigerants and other chemicals; carbon offsets (renewable energy credits purchased, composting, forest preservation etc)		
Lead: VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: CCC Business Services to initiate routine data collection schedules, formats and units for all personnel who have information related to inventory needs		
Measures of Success: Inventory complete; personnel have guidelines for ongoing data collection for inventory updates		
How Completion will be Reported: Principal investigator to Campus Services VP & Dean, PIO		
How Project will be Monitored • ***During Implementation:*** Principal investigator confers with technical advisory committee • ***After Implementation:*** Personnel continue to collect data in appropriate schedules, formats & units for inventory updates		
Implementation Notes:		
Next Steps:		

1.2: Harmony & Wilsonville Campuses

Action 1: **Inventory Wilsonville & Harmony Campuses.** Add these campuses to the inventory (see scope above)		
Lead: VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: CCC Business Services to initiate routine data collection schedules, formats and units for all personnel who have information related to inventory needs		
Measures of Success: Inventory complete; personnel have guidelines for ongoing data collection for inventory updates		
How Completion will be Reported: To VP & Dean of Campus Services, PIO		
How Project will be Monitored • ***During Implementation:*** Principal investigator presents to technical advisory committee • ***After Implementation:*** Personnel continue to collect data in appropriate schedules, formats & units for inventory updates		
Implementation Notes:		
Next Steps:		

1.3: Action Planning

Action 1: **Action Planning.** Coordinate with Sustainability Committee and its sub-committees to set goals and develop action plan to reduce GHG emissions.		
Lead: VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engagement of CEO, Executive team, Sustainability Committee, VP & Dean of Campus Services		

Measures of Success: Actions are planned, including accountability, schedule, reporting, monitoring.
How Completion will be Reported: Staff reports to Sustainability Committee and its sub-committees, to VP of Campus Services
How Project will be Monitored • ***During Implementation:*** Sustainability Committee includes this item on fall 2020 agendas. Appropriate sub-committees or staff are taking action to develop action strategies in fall & winter. • ***After Implementation:*** Action strategies are fully developed, including accountability, schedule, reporting, monitoring.
Implementation Notes:
Next Steps: Implement projects.

Objective 2: Continue to reduce the College's transportation-related greenhouse gas emissions.

2.1: Shuttle

Actions already completed:

- The College and funding partners initiated a free pilot shuttle from the end of TriMet's Green Line at Clackamas Town Center to the Oregon City campus in spring of 2010

Action 1: **Shuttle from Public Transit.** Continue to reduce GHG emissions associated with commute to college by supporting a shuttle service from public transportation termini to the Oregon City campus. Possibly expand to Harmony campus.		
Lead: VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Project Manager, ASG, Partners		
Measures of Success: Shuttle and funding partners and mechanisms are strong & consistent; College consistently renews these partnerships & seeks others;		
How Completion will be Reported: To VP of Campus Services		
How Project will be Monitored • ***During Implementation:*** Trips and ridership are recorded • ***After Implementation:*** Greenhouse gas emissions avoided due to shuttle service are calculated & reported		
Implementation Notes:		
Next Steps:		

2.2: Carpool Incentive

Actions already completed:

- In spring of 2010, the College explored a carpool incentive program with funding partners but the program was not able to be funded at that time

Action 1: **Carpool Incentives & Priority Parking.** Continue to partner with Metro and other transportation partners, announce carpool incentives and reward participants.		
Lead: VP of Campus Services	***Complete by Date:*** *Annually*	***Funding Source:***

Support Needed: Project Manager, ASG
Measures of Success: Carpooling staff & student groups increase; Carpooling bulletin boards are posted in primary common spaces on all campuses; College evaluates priority parking for carpoolers
How Completion will be Reported: To VP of Campus Services
How Project will be Monitored • ***During Implementation:*** If priority parking is implemented, use of this area is observed • ***After Implementation:*** Carpooling staff are counted in biannual survey
Implementation Notes: Although the priority spaces would be marked with stencils, its use would be on the honor system
Next Steps:

2.3: Walking & Biking

Actions already completed:

- The College publicly recognizes its bike champions
- Fall "Jump-Start" activities in 2009 featured a local bike ride hosted by a faculty bike enthusiast
- A walking trail circumnavigates the Oregon City campus; students at the Harmony Community Campus can walk on natural area trails adjacent to the campus

Action 1: **Support Initiative to Walk & Bike to College.**		
Lead: VP of Campus Services, Dean of College Advancement	***Complete by Date:***	***Funding Source:***
Support Needed: College Advancement, Project Manager, ASG		
Measures of Success: • College is participating with Oregon City, Clackamas County & ODOT to learn about and lobby for bike/pedestrian planning for campus surroundings • College's needs & recommendations are included in area transportation planning and road repaving, re-striping activities • Selected College roads are striped for bicycles and pedestrians; additional sidewalks in remote areas of the Oregon City campus are constructed		
How Completion will be Reported: To VP of Campus Services, PIO		
How Project will be Monitored • ***During Implementation:*** College representative regularly attends local and regional transportation planning meetings; on-campus bike & pedestrian routes remain important elements of college transportation planning, road upgrades and bond planning • ***After Implementation:*** There are dedicated striped bike and pedestrian routes throughout the campus		
Implementation Notes: Sidewalk & bikeway construction and/striping should be included in a bond request		
Next Steps:		

2.4: Light Weight Service Vehicles

Actions already completed:

- Campus Services has two very light-weight service vehicles: the 'Gator and a three-wheeler (both gas-powered).

Action 4: low-emissions campus fleet		
Lead: Director of Campus Services, Operations Mgr.	***Complete by Date:***	***Funding Source:***
Support Needed: VP of Campus Services		
Measures of Success: Older vehicles are replaced by cleaner, more efficient and/or electric vehicles		
How Completion will be Reported: Campus Services to PIO		
How Project will be Monitored • ***During Implementation:*** Annual gas- and carbon-savings to be announced to the College community • ***After Implementation:*** Announcements to be ongoing, as more efficient/electric vehicles are acquired		
Implementation Notes: Need timeline & strategy for acquiring low-impact College fleet		
Next Steps:		

2.5: Electric Vehicle Plug-in Stations

Action 1: Plug-in stations for electric vehicles		
Lead: Director of Campus Services, Operations Manager	***Complete by Date:***	***Funding Source:***
Support Needed: VP of Campus Services		
Measures of Success: Bond approved, funds allocated		
How Completion will be Reported: To PIO, information to Sustainability Manager for records. Annually, report number of stations, amount of use, electricity required to operate the stations and avoided gas usage due to the stations.		
How Project will be Monitored • ***During Implementation:*** Conceptual design selected; RFP issued, bids received • ***After Implementation:*** Station built, function and condition regularly monitored		
Implementation Notes:		
Next Steps:		

2.6: Research & Development

Action 1: Support student research & development of a light vehicle powered by compressed air		
Lead: Automotive Technology & others	***Complete by Date:*** Project is current	***Funding Source:***
Support Needed: Materials might be provided by industry partnerships; machine tooling help from Manufacturing department		
Measures of Success: Project remains active, research & testing produce positive results.		
How Completion will be Reported: To PIO, FYI Today, The Clackamas Print		
How Project will be Monitored • ***During Implementation:*** CCC's Health & Safety coordinator provides safety guidelines for research &		

testing • ***After Implementation:*** It works!
Implementation Notes:
Next Steps:

2.7 Airplane Travel

Action 1: Limit airplane travel by staff for conferences, professional meetings, etc.		
Lead: President & Vice President	***Complete by Date:***	***Funding Source:*** None needed
Support Needed: Vice president and provost provide public support for this initiative		
Measures of Success: • Airplane travel diminishes • College hosts more conferences • Staff engaged in more teleconferencing		
How Completion will be Reported: FYI Today		
How Project will be Monitored • ***During Implementation:*** Plane fares paid by College per annum, and to what locations • ***After Implementation:*** GHG cost of these journeys		
Implementation Notes: Need systems and designated people to track airplane flights purchased and to determine the greenhouse gas emissions of those flights		
Next Steps:		

2.8 Local & Regional Travel

Action 1: Limit single-vehicle travel for off-site College business, conferences, professional meetings, etc.		
Lead: President & Vice President	***Complete by Date:***	***Funding Source:***
Support Needed: • Vice president and provost provide public support for this initiative • College promotes teleconferencing, webinars • College hosts more conferences		
Measures of Success: • Deans & department chairs discuss at staff meetings • College investigates and purchases a hybrid vehicle or purchases a Zip Car membership • Employees carpool to attend conferences within a local radius • College promotes teleconferencing, webinars • College hosts more conferences		
How Completion will be Reported: • Staff report carpooling to off-site College meetings, etc. • Annual announcement to College community in FYI monthly		
How Project will be Monitored • ***During Implementation:*** Annual review of avoided single-vehicle trips • ***After Implementation:*** Continued annual review		

Implementation Notes:
Next Steps:

2.9: Anti-Idling Policy

Action 1: Prepare & announce an anti-idling on campus campaign for the entire College community, including contractors & maintenance staff		
Lead: President & PIO; Director of Campus Services	***Complete by Date:***	***Funding Source:*** none needed
Support Needed: From President, ASG; facts & info from Automotive department		
Measures of Success: If people are thinking twice before idling, this program is having success		
How Completion will be Reported: Announcements are made; perhaps The Clackamas Print runs a story on air pollution from idling		
How Project will be Monitored • ***During Implementation:*** Communication campaign is developed and deployed; contractors are notified in contracts • ***After Implementation:*** Spot query finds that general awareness is raised		
Implementation Notes: This campaign can be orchestrated in a positive way: "We're proud to be an anti-idling campus making sure to protect our clean air" or something similar		
Next Steps: This is an initiative that can just take off and get done, with one champion to jump-start it.		

2.9: Community Education Sites

Action 1: Consider taking technical, professional development and academic courses to available facilities (such as schools, community centers, churches or even vacant storefronts) within neighborhoods.		
Lead: Dean of Curriculum	***Complete by Date:***	***Funding Source:***
Support Needed:		
Measures of Success: College education is offered at community facilities within neighborhoods.		
How Completion will be Reported: Pilot project determines courses by neighborhood demographics; success of offerings is evaluated; students are polled to learn what additional courses they would take in their neighborhood.		
How Project will be Monitored • ***During Implementation:*** Number of students attending; courses attended and desired. • ***After Implementation:*** Greenhouse gas & infrastructure costs avoided by decentralizing education.		
Implementation Notes: Designate an office or a person to track increases in course offerings at community sites.		
Next Steps:		

Objective 3: Placeholder

B: Placeholder

III. Communication & Events

A: Outreach & Education

Objective 1: Continue to engage the college and its greater community in events that illuminate diverse aspects of sustainability and inspire change.

1.1: Sustainability Lecture Series

Actions already completed:

- The College's Spring Lecture Series Sub-Committee of the Sustainability Committee annually organizes this event, which is publicized by the PIO

Action 1: Continue the *Spring Lecture Series in Sustainability*, featuring speakers, events & films		
Lead: Lecture Series Committee	***Complete by Date:***	***Funding Source:***
Support Needed: PR, $ for promoting in off-campus media, design, printing & duplication, stipend for speakers, film rental, other.		
Measures of Success: • Number of people attending; widespread engagement of faculty and students		
How Completion will be Reported: FYI Today, The Clackamas Print; local newspapers; at end of season to Sustainability Committee;		
How Project will be Monitored • ***During Implementation:*** o Effective committee manages search, scheduling, communications with speakers, PR & room scheduling o Complete, timely advance information to PR for publication and promotion. • ***After Implementation:*** o Post-events evaluation by committee, PR, room scheduler, PIO, publications & other support functions involved		
Implementation Notes: Need to start planning in fall term; schedule firm by end of winter term; marketing materials & info to PIO by first week of spring term.		
Next Steps: Committee evaluates time, topics, venue, attendance, and formulates written recommendations for next year.		

1.2: Annual Awards

Actions already completed:

- The College annually includes sustainability champions in awards & recognitions

Action 1: Stage sustainability & climate neutrality events, competitions and awards for the campus community: e.g. inter-office energy challenge, green Fridays, bike to school day, paperless day, green bands celebration, etc. Recognize champions.		
Lead: Project committee & manager	***Complete by Date:***	***Funding Source:***
Support Needed: $ for competitions, announcements, awards ceremony decorations, hors d'oeuvres, prizes		
Measures of Success: • Annual ceremony is a campus-wide forum to report on student/admin./committee sustainability projects & accomplishments. The forum might have performances, concurrent sessions, goal-setting, and events. • Champions identified & publically awarded; new practices adopted; college community engaged		
How Completion will be Reported: To PR for monthly & daily FYI, announcement to local press & other		
How Project will be Monitored • ***During Implementation:*** Planning begins in fall • ***After Implementation:*** Committee reviews prep., logistics, schedule, duties, and makes recommendations for next year		
Implementation Notes:		
Next Steps:		

1.3: Sustainability Buzz

Actions already completed:

- College PR provides announcements, information for the daily FYI for faculty & staff

Action 1: Provide ongoing announcements about sustainability**,** e.g. in FYI news: buzz about energy efficiency accomplishments; best practices for sustainability; event announcements, lecture & film series		
Lead: PIO, Project Manager	***Complete by Date:***	***Funding Source:***
Support Needed: Sustainability Committee & committee staff; Campus Services; various departments & instructors		
Measures of Success: Continual buzz about the College's sustainability accomplishments & programs		
How Completion will be Reported: FYI Today, FYI Monthly, announcements in local newspaper,		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

Objective 2: Prepare & disseminate sustainability outreach information for potential & new students & employees.

2.1 Sustainability Web Page

Actions already completed:

- The College has standardized web page format & styles, determined levels of entry for page developers and updaters, and provides orientation through the IT department

Action 1: Create content for a sustainability tab in the College's web pages that includes mission, academic offerings, student life, past accomplishments and current projects concerning achievement of campus sustainability.		
Lead: Sustainability enthusiast, Project Manager, Web Committee	***Complete by Date:***	***Funding Source:***
Support Needed: IT, PR, Publications, instructor of Digital Media, Web Committee		
Measures of Success: • Updating strategy & responsibilities are determined at the outset of the project. • Site is illustrated, has been Beta tested, is complete, has easy-to-understand and information, is easy to find, link to & navigate.		
How Completion will be Reported: Project lead reports to CEO, PR; information to sustainability manager for records.		
How Project will be Monitored • ***During Implementation:*** Links automatically update with updated information from the various contributing departments. Project is following a timeline and milestones for development of each section of the web site. • ***After Implementation:*** Web site continues to be updated with fresh & changing information.		
Implementation Notes: Need to get going right away: 1st develop a list of items that need to be on the site; determine which of these can be linked to existing information that is updated by department, which needs to be created from scratch. Find and photograph images for the site.		
Next Steps:		

2.2: Sustainability Orientation

Actions already completed:

- New students received orientation to College sustainable practices at beginning of fall term 2010
- 2010 Spring term Video students are working to create an orientation video for new students, about recycling
- The college has completed a video, *Sustainability in Academics, Operations & Campus Life*, to play on CCTV. This could be used for new student orientation

Action 1: Sustainability Orientation for New Employees, New Students		
Lead: Project Manager, HR Manager, PIO	***Complete by Date:***	***Funding Source:***
Support Needed: PR, IT, Multi-media		
Measures of Success: These orientation items are presented to new employees and students beginning in		

fall 2010: • Sustainability initiatives & practices at the College, including Integrated Pest Management, water conservation, carpooling & shuttle, sustainable purchasing choices, litter-free campus, restrained printing, recycling (both front-of-the-house and back-of-the-house), green buildings, energy efficiency, management of office trash & recycling . . .
How Completion will be Reported: Project team reports completion or orientation materials to CEO & Foundation
How Project will be Monitored • ***During Implementation:*** Project components, schedule, milestones, responsibilities & needs are developed at project outset • ***After Implementation:*** New students and employees
Implementation Notes:
Next Steps:

Objective 3: Provide periodic information in "green bytes" to the College community about environmental & sustainability best practices.

3.1: Best Practices

Actions already completed:

- Daily FYI ran sustainability info, notes & quotes each day of Earth Week, 2010

Action 1: Short "Green Buzz" items weekly in daily FYI		
Lead: Health & Safety Coordinator, Project Manager	***Complete by Date:***	***Funding Source:***
Support Needed: PIO: daily FYI for staff; ASG Portal Manager: daily FYI for students		
Measures of Success: Once each year, the College community is informed *in a friendly way* ("*did you know . . .*") about how to do/use the following: • Recycle batteries, aerosol cans, hazardous wastes, universal wastes, plastic films, etc. • Where to wash campus & Automotive Department vehicles and how to use the Wash Rack • How the recycling stations are intended to be used • Campus smoking policy • Stormwater system vulnerability to pollution • Paper conservation & printing • Campus natural areas • Anti idling policy • Community gardening plots • Also, friendly tips about everyday life practices for home, e.g. take old televisions, computers, cell phones to e-cycling depot, mercury-containing bulbs back to vendor, info about chemical-free lawns . . .		
How Completion will be Reported: Leads log dates and topics announced		
How Project will be Monitored • ***During Implementation:*** Year-round weekly or bi-weekly Green Buzz • ***After Implementation:***		
Implementation Notes: Leads compile info for Green Buzz by end of summer 2010		
Next Steps:		

3.2: Accomplishments

Action 1: Provide information annually to College community about quantities of materials recycled each year, both front-of-the-house and back-of-the-house.		
Lead: Health & Safety Coordinator, Campus Services Secretary, Project Manager, IT Manager, Automotive Manager	***Complete by Date:***	***Funding Source:***
Support Needed: VP of Campus Services, PIO		
Measures of Success: Data is collected and stored in an easy to retrieve format; information is available in useable formats by various leads College-wide.		
How Completion will be Reported: Tons of paper, metal, glass, etc. How many computers, fluorescent lamps, batteries, etc. were recycled last year? How many barrels of oil, gallons of solvent were recycled from the automotive labs?		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes: Needs an executive champion		
Next Steps:		

Objective 4: Engage the College community in providing tips & information for achieving climate neutrality and sustainability,

Activities already completed:

- The Horticulture Department puts out a great deal of information for the community, and provides community events and education about chemical-free gardening, growing produce, propagating plants, composting and similar activities.

4.1: Fact Sheets

Action 1: Engage the English & Art departments in researching, writing and designing one-page fact sheets on different aspects of sustainability, concluding with a call to action.		
Lead: Sustainability enthusiast	***Complete by Date:***	***Funding Source:***
Support Needed: Printing & Duplication; Art;		
Measures of Success: Several fact sheets printed		
How Completion will be Reported: Information to sustainability manager for records		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps: Engage other departments in creating information & fact sheets		

4.2: Green Suggestion Box & Bulletin Board

Action 1: Create a green suggestion box & bulletin board		
Lead: ASG; Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Campus Services Maintenance Staff, PIO; ASG Student Portal Manager		
Measures of Success: Box & bulletin boards are in Community Center; have been announced on student portal and on daily FYI		
How Completion will be Reported: On daily FYI, student portal, information to sustainability manager for records		
How Project will be Monitored • ***During Implementation:*** Project Manager to check in with ASG, Campus Services Maintenance Staff, PIO • ***After Implementation:*** Contents of box are collected monthly, items on board changed monthly		
Implementation Notes:		
Next Steps: Engage departments in creating information for the bulletin board		

4.3: Sustainability Tips on Screen Savers

Action 1: Develop a screen saver with sustainability tips		
Lead: Digital Media Department with English Department; a committee of enthusiasts	***Complete by Date:***	***Funding Source:***
Support Needed: IT,		
Measures of Success: • The screen saver is developed and deployed • It plays on monitors in registration areas, computer lab monitors and other places where open-use computers are available on the three campuses		
How Completion will be Reported: • Announce in FYI Today		
How Project will be Monitored • ***During Implementation:*** English Department & Multi Media Department edit content and supporting technologies • ***After Implementation:*** One person or a committee updates this information quarterly		
Implementation Notes:		
Next Steps:		

Objective 5: Develop strategies and methods to let the greater community know about environmental and sustainable events & education opportunities at the college.

5.1: Social Media

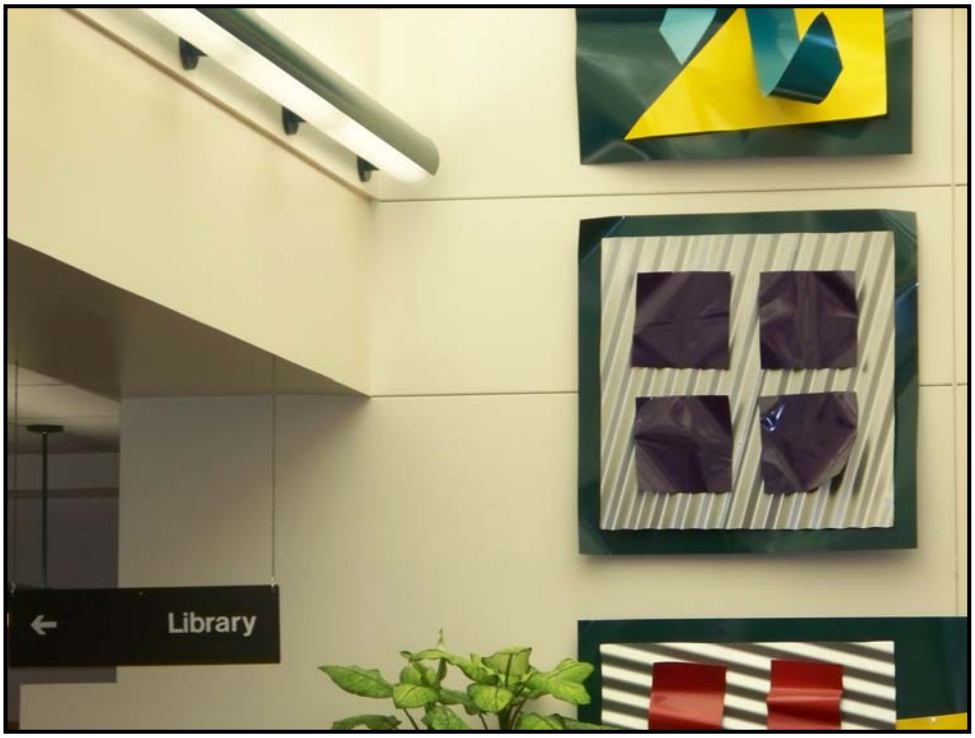
Actions already completed:

- Annually, the community is invited to the Spring Lecture Series in Sustainability.

- Horticulture hosts *Plants & Pizza*, the annual *Plant Sale*, and numerous community education workshops.
- The College PR department routinely provides announcements of upcoming events and courses to local media groups.
- *Clackamas Print* articles are picked up by the Oregon City newspaper

Action 1: Consider providing updated College information on Twitter, Facebook, YouTube		
Lead: PIO	***Complete by Date:***	***Funding Source:***
Support Needed: IT Dean & Director; multi-media, journalism and video instructors; student focus group		
Measures of Success: College social media sites are aggregated so that one update populates to all sites, including College's web site; students are responding (site visits are tracked); form in registration office adds a box for *social media* on the page that asks how the student learned about the course or program offerings.		
How Completion will be Reported: Social media sites are up and running, and are linked to the College's sustainability web site		
How Project will be Monitored • ***During Implementation:*** Project is on a roll by midway through fall quarter, 2010. Site programming is in swing. • ***After Implementation:*** Sites are linked, functional, updates populate through all		
Implementation Notes: Make sure to place code words any prospective student might use when searching for sustainability offerings, courses, events or programs, into metadata for each social medium used. Also tag all photos with Clackamas Community College, sustainability		
Next Steps:		

IV. Curriculum & Education



Objective 1: Create goal & mechanisms for inclusion of sustainability in education

1.1: Integration of Sustainability into Curricula

Actions already completed:

- A three-course seminar series in Humanities, Pathways to Sustainability, has been offered since 2008-2009, with high enrollment and student engagement
- The Career & Technical Education division has developed programs in Renewable Energy Technology and Renewable Energy Management; the division is also creating a Renewable Energy Technology Center on the Oregon City Campus. Students will be able to use the College's renewable energy systems and energy management systems as living labs.

Action 1: Integrate sustainability & climate neutralization into curricula		
Lead: Provost, deans, department chairs	***Complete by Date:***	***Funding Source:***
Support Needed: Strong support from Provost, deans, department chairs.		
Measures of Success: Each instructor in each department has integrated a sustainability concept & related skill(s), *appropriate to the syllabus and topic of study*, into each class		
How Completion will be Reported: By instructor, to department chairs and from thence, to deans & provost		
How Project will be Monitored • ***During Implementation:*** Deans receive & document reports from chairs; chairs receive & document reports from instructors • ***After Implementation:*** Provost & Sustainability Committee review scope of sustainability infusion		
Implementation Notes: This initiative requires an impassioned request and follow-up from the executive level at the College		
Next Steps:		

1.2: Capstone Courses

Action 1: Develop capstone courses, with sustainability as a focus, in technology, science & humanities programs		
Lead: Inspired instructors	***Complete by Date:*** Announce in Fall 2012 catalogue	***Funding Source:***
Support Needed: Provost, Curriculum Dean, Deans, Department Chairs; Course development time		
Measures of Success: Capstone courses with sustainability as a focus are offered in humanities, science & technology fields		
How Completion will be Reported: To Provost, Curriculum Dean, PIO; information to sustainability manager for records and to the person in charge of the College's *Sustainability* web page		
How Project will be Monitored • ***During Implementation:*** Department chairs keep tabs, announce to President's Council • ***After Implementation:*** Monitor student enrollment, student professional goals, supporting courses leading to the capstone		
Implementation Notes:		
Next Steps:		

1.3: Interdisciplinary Hybrid Courses

Actions already completed:

- In the spring of 2010 the Spring Sustainability Lecture Series was offered for credit for the first time.

Action 1: Develop interdisciplinary hybrid courses that integrate arts, humanities, math & science		
Lead: Inspired instructors	***Complete by Date:***	***Funding Source:***
Support Needed: Deans, Department chairs		
Measures of Success: • Hybrid courses are on the books and retain students • Consider one mandatory hybrid sustainability course for all graduates • Consider team teaching		
How Completion will be Reported: To Curriculum Dean; Information to sustainability manager for records, the person who manages the college's sustainability web pages		
How Project will be Monitored • ***During Implementation:*** Students receive pre- and post evaluation of scope of awareness • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

Objective 2: Support instructor education in sustainability

2.1: Professional Development[1]

[1] Environmental Education for Educators.

- Launch the program that has already been developed for the college by CCC faculty working with a National Science Foundation Grant. The program would articulate with Oregon State University's teacher education program.

Action 1: Establish & maintain funding to support professional development activities concerning sustainability.		
Lead: Grants office, Customized Training & Development, Distance Learning	***Complete by Date:***	***Funding Source:***
Support Needed: Provost, Curriculum Dean, Directors of Distance Learning, Customized Training & Development		
Measures of Success:		
How Completion will be Reported: End of year President's report		
How Project will be Monitored • ***During Implementation:*** Number of instructors engaged; scope of training in which instructors have participated • ***After Implementation:*** Application of new methods to revised and new curricula		
Implementation Notes:		
Next Steps:		

2.2: Workforce Development

Action 1: Improve the College's training interface with Workforce Development to enhance instructor training.		
Lead: Department Chairs, Instructors Director of Customized Training & Development,	***Complete by Date:***	***Funding Source:***
Support Needed: Provost, Curriculum Dean		
Measures of Success: Workforce Development musters resources to develop and present tailored training sessions for specific groups at the College, in College facilities		
How Completion will be Reported: To Provost, Curriculum Dean, PIO; Information to sustainability manager for records, person who manages the College's sustainability web page		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

2.3: Distance Learning

Actions already completed:

- The Distance Learning Department has been offering a series of workshops for instructors in how to use Moodle, the College's new digital, distance learning system, to manage communications with students as well as course content & grading

Action 1: Increase instructor training in online instruction tools		
Lead: Directors of Distance Learning, IT	***Complete by Date:***	***Funding Source:***
Support Needed: Provost, Curriculum Dean, department chairs		

Measures of Success: • The announcements advertising the online instruction tools focus on problems instructors need help to solve
How Completion will be Reported: • Numbers of instructors trained and their satisfaction with the new tools (make sure to provide a post-course evaluation sheet) • Widespread adoption of new online instruction tools
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***
Implementation Notes:
Next Steps:

2.4: Program Development

Action 1: Consider developing the following programs: Sustainability Coordinator, Institutional Waste & Recycling Management; Energy Efficiency Evaluator		
Lead: CTE, w/ help from Customized Training & Development	***Complete by Date:***	***Funding Source:***
Support Needed: From Provost, Curriculum Dean, Workforce Development		
Measures of Success: Curriculum for at least one new sustainability related program is developed		
How Completion will be Reported: State approves		
How Project will be Monitored • ***During Implementation:*** Progress reports to Provost, Curriculum Dean & Workforce Development at end of fall & winter terms, 2010 • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

Objective 3: Create ways for students to become engaged in sustainable solutions for the College through inquiry-based study.

3.1: Student Research – Technology

Action 1: Determine ways to involve students in meaningful research projects connected with sustainability questions & environmental accounting. e.g.: • How much water would be saved by eliminating cafeteria trays? • Best solar incidence for solar hot water system on a selected building? • How does an energy-producing algae cell work and where would it be best located on campus for optimum production? • What mass of biofuels would be required annually to operate a fuel cell? • How to assess the geothermal heat potential of geologic substrata at the Oregon City campus? • What would be the energy generation capability of exercise machines in the Weight Room of the

Gymnasium? • Compare the cost and carbon footprints of using towels or electric blowers for hand drying. • Analyze paper use, stormwater generation, and make recommendations to minimize. • Carry out elements of updated greenhouse gas emissions inventories.		
Lead: CTE, Science, Engineering, Physics, Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Provost, Curriculum Dean, Deans, Department Chairs		
Measures of Success: • Long-term studies have been initiated on campus to which successive generations of students will contribute data. • The College's HVAC & renewable energy systems, or replicas of them, serve as learning labs for students learning to install, troubleshoot, monitor & maintain these systems • Instructors use databases for these systems in applied math and other relevant courses • College decisions about phasing in new technologies or phasing out older technologies are based on the findings of student research • Students are designing, installing & monitoring renewable energy systems on campus		
How Completion will be Reported: To Industry partners, Provost, Curriculum Dean, PIO; Information to sustainability manager for records, person who manages the College's sustainability web page		
How Project will be Monitored • ***During Implementation:*** Deans & department chairs champion these applications for appropriate courses • ***After Implementation:*** New equipment, technologies& trouble-shooting protocols are integrated into these applied exercises and research projects		
Implementation Notes:		
Next Steps:		

3.2: Cooperative Work Experience/Work Study Experience / Internships / Job Shadow

Action 1: Develop a campus-wide list of special and ongoing sustainability projects in which work-study and cooperative work experience students can become engaged.		
Lead: Campus Services, Student Services, individual departments	***Complete by Date:***	***Funding Source:***
Support Needed: Dean of Campus Services, departments		
Measures of Success: Tasks such as: • analyzing the recycling system and making recommendations • mapping invasive plant & animal species on campus and recommending actions • determining annual paper use; reviewing printing technologies & making recommendations • Evaluating cost of using compostable serving ware in the Cafeteria and sending food waste to compost facility • Evaluating establishment of a kitchen garden for the Cafeteria • Evaluating vending machine contracts & sale items		
How Completion will be Reported: To PIO, College Council; Information to sustainability manager for records		
How Project will be Monitored		

• ***During Implementation:*** Copies of sustainability-focused work-study & CWE project reports, findings & recommendations are kept in the office of the Sustainability Manager (originals in offices where the work was commissioned). • ***After Implementation:***
Implementation Notes:
Next Steps:

3.3: Student Input into Distance Learning Offerings

Action 1: Engage diverse student communities in dialogues to determine depth and breadth of unmet needs for distance learning and flexible learning scheduling.		
Lead: Curriculum Dean, Distance Learning Director, ASG	***Complete by Date:***	***Funding Source:***
Support Needed: May need help from IT to develop student survey		
Measures of Success: Student needs are better known, distance learning courses and course schedules can be tailored to fit this need		
How Completion will be Reported: New DL courses and schedules have been developed & offered		
How Project will be Monitored • ***During Implementation:*** o A committee has been assembled to gather this information o A student survey or method to interview students has bee selected and initiated • ***After Implementation:*** o Findings have been assembled or tabulated o Recommendations have been forwarded to the curriculum committee o Additional classes and/or sections are being arranged		
Implementation Notes:		
Next Steps:		

Objective 4: Develop partnerships that support the engagement of high school and at-risk students in sustainable practices.

4.1: Oregon City High School Partnership for Natural Area Study & Stewardship

Action 1: Explore developing natural resource education and stewardship program w/ OC high school youth		
Lead: Director of Campus Services, CCC Director of High School & Youth Programs; corollary at OSHS	***Complete by Date:***	***Funding Source:***
Support Needed: OC Schools, Campus Services		
Measures of Success: Program is in swing; students assessing natural areas, making recommendations & plans		
How Completion will be Reported: To Deans, College Council, PIO; Information to sustainability manager for records		
How Project will be Monitored		

• ***During Implementation:*** Students are presenting findings & ideas, preparing stewardship plans, asking for support • ***After Implementation:*** Students are passing program on to next year's leaders
Implementation Notes: Campus Services will need to be engaged to kick off, check in
Next Steps:

4.2: Teen Parents & At-risk Youth

Actions already completed:

- Teen parents are learning life skills that contribute to sustaining their families

Action 1: Infuse science & sustainability related learning into activities & curricula for at-risk youth. Create sustainability related engagement opportunities on campus for at-risk youth, e.g.: • working with the College's composting & recycling facilities • creating "how-to" posters for the College's recycling program • managing the College's kitchen garden • doing vegetation management in pesticide-free areas • creating activities for younger students, etc.		
Lead: Teen & Youth program directors & instructors at CCC	***Complete by Date:***	***Funding Source:***
Support Needed:		
Measures of Success: At-risk youth are engaged in identifying needs for waste reduction, recycling, composting, vegetation management, and researching & applying best practice solutions.		
How Completion will be Reported: End-of-term report to Chair(s), Dean, PIO; Information to sustainability manager for records		
How Project will be Monitored • ***During Implementation:*** Early, mid- and late-quarter report by lead teacher to Director/Chair • ***After Implementation:*** Momentum from first project moves to second		
Implementation Notes: Student groups may request Campus Service or other assistance/materials from time to time		
Next Steps:		

Objective 5: Develop a community education & outreach pipeline for disseminating information about sustainable practices.

5.1: Family Resource Center

Action 1: Identify and adopt sustainable practices that routinely will be done with children, such as cooking with nutritious, local, basic foods in season, composting, gardening, recycling, reusing materials and sharing tools.		
Lead: Center Director	***Complete by Date:*** Plan complete by Fall 2010	***Funding Source:***
Support Needed: Limited support may be needed from Campus Services		
Measures of Success: Children are engaged in numerous sustainable activities and practices; children have		

"Show You" day each quarter to demonstrate themes they have been working with (e.g. snacks made from garden veggies; kid-friendly recycling system; collection of household items for charity, etc.)
How Completion will be Reported: Children have projects to show or share at end of each term. End of term info to Chair, PIO, to sustainability manager for records.
How Project will be Monitored • ***During Implementation:*** Teacher logs relevant activities; children engaged in new activities • ***After Implementation:*** Older children mentor younger ones
Implementation Notes: Some materials will be needed
Next Steps:

5.2: Horticulture / Grounds

Activities already completed:

- Many, many best practices activities already have been showcased by Horticulture, including irrigation management, low-water gardening, organic fruit & flower gardens, propagation, grafting & pruning, compost management, winter twig identification, and many more.

Action 1: Continue to utilize the College as a demonstration site, holding workshops or developing classes in the following: • Start a demonstration kitchen garden for use by Food Services. • Provide cooking literacy and nutrition workshops on campus for various communities. • Provide information on cooking without meat. • Provide information about cooking with garden vegetables. • Continue to support the community gardens on the Oregon City campus • Implement a demonstration terra pieta (biochar) project on campus		
Lead: Horticulture Chair or her designees	***Complete by Date:***	***Funding Source:***
Support Needed: Campus Services, to develop (and protect) the demonstration garden site; Food Services, to give it a try; Horticulture, to plant and manage the garden, or teach Cafeteria staff how to do this.		
Measures of Success: Garden in place and planted by end of Winter term, 2011.		
How Completion will be Reported: To PIO, The Clackamas Print, President's Council; Information to sustainability manager for records		
How Project will be Monitored • ***During Implementation:*** Frequent inspection for plant and animal pests; properly sequenced planting, irrigation & mulching • ***After Implementation:*** Same		
Implementation Notes: Will need some help from Campus Services (tilling, materials for pest control)		
Next Steps:		

5.3: Students & Community

Action 1: Develop and implement a strategy to consistently engage students in dialogue and community outreach about climate change and carbon footprint; conservation practices, waste stream reduction, recycling, building mechanical systems

Lead: ASG Advisor, Project Manager	***Complete by Date:***	***Funding Source:***
Support Needed: Work sessions with ASG & Student Sustainability Initiatives Club – engage them in ongoing dialogue about issues, challenges, solutions, accomplishments		
Measures of Success: ASG & Student Sustainability Initiatives Club become knowledgeable about and major ambassadors of the College's sustainability strategies		
How Completion will be Reported: Project Manager reports to VP & Director of Campus Services on working sessions w/ ASG and ensuing activities & products		
How Project will be Monitored • ***During Implementation:*** Working sessions are being held each term • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

V. Custodial, Maintenance & Operations

Objective 1: Provide regular information to the campus community regarding upgrades, changes & how-to-use aspects of the College's conservation programs.

1.1: Communications w/ PIO, ASG & College Community

Actions already completed:

- The Dean of Campus Services keeps the College Board updated about efficiencies gained and energy conserved through Campus Services' rigorous energy conservation program

Action 1: Regularly provide written blurbs to PIO& ASG regarding: • Changes in recycling system that need to be articulated to campus communities. • Campus stormwater system, how it works, its vulnerability to pollution and ultimate discharge to streams. • Upgrades in campus energy system that are reducing energy consumption. • Demonstration projects using renewable energy. • Other, as appropriate; this constant communication program can be managed as a very upbeat internal *and* external public relations program		
Lead: Campus Service Dean, Director, Project Manager	***Complete by Date:***	***Funding Source:***
Support Needed: PIO posts on Daily FYI; ASG posts on Student Portal		
Measures of Success: Campus community gets frequent updates on sustainability systems & accomplishments		
How Completion will be Reported: Community is informed about how to use systems, what is being done to conserve energy "in the back of the house," what is new		
How Project will be Monitored • ***During Implementation:*** More brief announcements about related activities appear in FYI today • ***After Implementation:*** There is more basic understanding of the College's conservation programs		

among everyone in the campus community
Implementation Notes: Just do it.
Next Steps:

Objective 2: Continue to protect environmental health & safety of students, staff, the public, maintenance staff and the environment in all maintenance operations.

2.1: Green Practices, Processes & Materials

Actions already completed: The College has an extensive environmental health & safety program, including:

- waste and recycling (construction materials, used furniture, paper, bottles and cans, scrap metal, etc.)
- universal waste management (batteries, televisions, computer monitors, CPUs, fluorescent lamps, aerosol cans, refrigerants, etc.)
- hazardous waste management (solvents, batteries, oils, paints, wastes from photo, science and chemistry labs)
- stormwater inlet cleaning
- spill prevention and response training and readiness
- hazardous chemical emergency response and spill cleanup
- guidelines for materials handling, storage and containment
- Campus Services Safety Team
- industrial hygiene surveys for toxic vapor, gas, dust or noise
- asbestos identification and monitoring
- fire and life inspections and fire extinguisher inspection and maintenance
- emergency evacuation training
- coordination for personal protective equipment selection and coordination of respirator fit testing and issuance
- injury/illness incident reporting
- safety complaint investigation and resolution
- safety training for departments
- ergonomic evaluations
- hazard communication and training for use of Material Safety Data Sheets (MSDSs)
- first aid supplies for laboratory classrooms

In addition, the Campus Services Division of the College has adopted dozens of “Green” materials and processes, including:

- locally manufactured, low VOC paints
- low VOC adhesives & other finishes
- sustainable, low VOC carpeting
- locally made, durable, recyclable furnishings
- just-in-time purchasing (to minimize warehousing, potential spills, deterioration & wastage)
- Building entryways are managed to reduce track-in of dust, dirt & moisture; walk-off carpets are manufactured of recycled materials and are fabricated to facilitate cleaning

Action 1: Develop guidelines and best practices for the following: • Purchasing, handling, storing and working with treated wood. • Maintaining campus stormwater swales and ponds. • Coordinate with ODOT, Oregon City & Clackamas County and other agencies concerning stormwater and watershed management, to develop partnerships for future grants & FHWA projects. • Develop annual PM schedule for cleaning vaults in Automotive wash rack and document this. • Look for opportunities to replace wooden outdoor structures such as picnic tables and boardwalks, especially near water, with plastic lumber that can be recycled (Trex). Alternatively, small outdoor structures can be constructed of cast concrete that is formed to look like wood. • Evaluate purchase, management and recycling of various types of batteries, and develop periodic training refresher for maintenance staff		
Lead: Project Manager	***Complete by Date:***	***Funding Source:***
Support Needed: From Dean & Director of Campus Services		
Measures of Success: New practices are adopted, maintenance staff is trained and begins to implement them		
How Completion will be Reported: Upon implementation, new practices are announced to PIO.		
How Project will be Monitored • ***During Implementation:*** Guidelines are being developed by mid-fall term. • ***After Implementation:*** Maintenance staff reports on implementation of practices as they are needed for projects. Any follow-up revisions to practices are made.		
Implementation Notes:		
Next Steps:		

Objective 3: Continue to evaluate means by which the College can decrease consumption and waste in Maintenance & Operations.

3.1: Paper Use & Printing

Activities already completed:

- The Campus Services Dept. eliminated desktop printers, shifting to a multi-function central machine.
- Printing & Duplication uses 100 percent post-consumer recycled paper derived from Forest Stewardship Council certified forests and manufactured with renewable energy. All print orders to this department may be made electronically. The default setting for printers in Printing & Duplication is double-sided. All paper waste is recycled. Paper printed on only one side is saved for instructors who request it. Toner cartridges are recycled.
- Most College communications go out electronically; many meetings are paperless; digital technology is minimizing paper in registration & other College processes; eBooks, paperless classes & Moodle are decreasing paper use. The default setting for Computer labs' printers is double-sided.

Action 1: Complete evaluation of printing College-wide, focusing on printers, printer technology, use tracking, printer networking, paper use, inks and office worker health, and provide written recommendations, including IT strategies & purchasing guidelines.

Lead: VP, Dean & Director of Campus Services, Dean of IT, consultants	***Complete by Date:***	***Funding Source:***
Support Needed: Working committee.		
Measures of Success: Written recommendations and guidelines based on cost comparisons and health considerations.		
How Completion will be Reported: New recommendations and printer purchasing guidelines to College community.		
How Project will be Monitored • ***During Implementation:*** VP assures committee work is focused; costs are analyzed. • ***After Implementation:*** Clear purchasing policies and guidelines are developed.		
Implementation Notes:		
Next Steps:		

3.2: Water Use

Activities already completed:

- The College's newer buildings have auto-flush toilets that utilize only 1.6 gallons of water with each flush. Older restrooms are retrofitted as funds are available and where older plumbing infrastructure allows. Each auto-flush mechanism is powered by four C batteries that are changed every two to four years, as needed, and recycled.
- The College is also installing a water reclamation system in the welding lab.
- In 2009, watering ceased in all turf areas not actively needed for sports. Only the planting beds and active athletic fields are watered, and only as needed. This action has resulted in a decreased need for mowing as well as considerable water savings during the College's highest water use months in summer and early fall. Grounds Keeping is approaching an absolute minimum use of irrigation water, using only the amount needed to maintain new plants.
- The new Harmony campus has irrigation controllers wired to a rain gauge and an evapotranspiration meter. The controllers can be programmed, and they have sensors that shut down area irrigation in the event of line breaks, leaks or rainfall.
- Also at the Harmony campus, rain water harvested from the roof waters native bunchgrasses and rushes and is infiltrated on site.

Action 1: Continue to pursue technologies, systems, meters, equipment and fixtures to conserve water, indoors and out. • Install additional low-flow toilets, and water-on sensors for lavatory sinks. • Evaluate micro-irrigation heads for watering campus turf and planting beds. • Retrofit Oregon City campus irrigation system to accommodate irrigation controllers. • Purchase irrigation control system for remote control of irrigation systems, and provide training in the new system to groundskeepers.		
Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Board support is needed for expenditures on this initiative.		
Measures of Success: Steady implementation of water conservation systems, equipment & fixtures.		
How Completion will be Reported: To PIO and information to sustainability manager for records.		

How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***
Implementation Notes:
Next Steps:

3.3: Green Cleaning & Janitorial Supplies

Activities already completed:

- At the Harmony campus, custodial staff use cleaning materials certified by Green Seal.
- At the other campuses, "Eco-friendly" cleaning products are used. These are Sustainable Earth, chemically neutral products from a local vendor that specializes in water-based, soy, citrus and other non-toxic products.
- Some of these products are in highly concentrated forms to be diluted with water, so that storage space for products is minimal, delivery is infrequent, and the amount of used containers generated is very low.
- The department purchases only the supplies immediately needed, so that no products or cleaning agents are warehoused. The vendor provides one-day delivery service.
- Four types of cleaning products are used: floor cleaner; a stronger, more alkaline cleaner for tables and counters; a cleaner for glass, chrome and mirrors; and a disinfectant for restrooms and classroom tables.
- At selected locations, Nora flooring has been installed. This material can be cleaned with water only, does not require use of strippers or waxes, and the machinery required for cleaning & buffing it, and its long-lasting pads, can be used on other types of flooring.

Action 1: Continually evaluate indoor pesticide management materials to control mold, mice, etc. • One aspect of this effort is to continually evaluate building infiltration, perforations and tightness. • Another is to continually evaluate materials: their resistance to moisture and to biological agents such as mold & fungus. • Also evaluate chemicals in pesticides, biocides, rodenticides, herbicides, etc.		
Lead: Director, Campus Services; Director, Campus Operations; Lead, Custodial Services;	***Complete by Date:***	***Funding Source:***
Support Needed: Annual tickler on calendar.		
Measures of Success: • Building air & water leakage points that can admit mice, insects, etc. are identified and filled • Moisture- & biological-resistant materials are used • Traps are used where practicable • Non-toxic "household" means of pest control (such as boric acid for ants) are evaluated • New non-toxic pesticides are evaluated		
How Completion will be Reported: Information to sustainability manager for records.		
How Project will be Monitored • ***During Implementation:*** Annual discussion and review among Custodial and Operations staffs • ***After Implementation:*** Changes continue to be incorporated		
Implementation Notes:		
Next Steps:		

VI. Energy

Objective 1: Develop & maintain means to implement renewable energy & energy conservation projects.

1.1: Funding & Personnel

Action 1: Explore all avenues for bond, grants and partnerships to support renewable energy & energy conservation projects		
Lead: CEO, VP of Campus Services, Customized Training & Development	***Complete by Date:***	***Funding Source:***
Support Needed: From CEO, VP of Campus Services, grants writer, non-profit grants advisor		
Measures of Success: A continuous cycle of audits & re-commissioning continually identify energy conservation benefits that can be achieved		
How Completion will be Reported: Funds are obtained; retrofits, upgrades & energy efficiencies continue to be accomplished; energy usage goes down		
How Project will be Monitored • ***During Implementation:*** Grant requests are successful; partnerships are fruitful; incentives & rebates are received, tax payers value conservation accomplishments and pass bond • ***After Implementation:*** Cycle of funding and project implementation continues		
Implementation Notes:		
Next Steps:		

Objective 2: Continue to explore and implement means to conserve energy, decrease use & dependence upon fossil fuels & develop renewable energy

1.2: Conserve Energy & Invest in Renewable Energy

Actions already completed:

- The College is engaged in a program of energy use evaluation, energy efficiency monitoring & audits, and building energy efficiency upgrades & retrofits
- Stimulus funds in summer 2009 funded installation of solar hot water for three buildings on the Oregon City campus
- These funds also enabled the installation of remote digital control systems for HVAC systems
- Air handlers and building ventilation controls were upgraded
- A pilot ground-source cooling project was installed
- Remote digital control systems for building mechanical ventilation, heating & cooling systems were installed and maintenance staff were trained to operate & maintain them
- Earlier lighting upgrades also reduced energy use; the College continues to install energy efficient lighting
- Additional Stimulus funds will support summer 2010 projects
- Solar hot water is being generated for three buildings on the Oregon City campus: Pauling, Randall & McLoughin
- Plug loads have been inventoried in selected buildings on the Oregon City campus
- Supply and return lines for hydronic loops have been insulated
- Electrical sub-meters have been installed in selected locations
- Computer and phone lines have been consolidated; efficient blade servers have been installed in a chilled space; a backup generator for the servers has been installed

Action 1: Continue program of energy efficiency evaluation, upgrade, retrofit, e.g.: • Continue energy audit to prioritize architectural and mechanical system retrofit needs for existing buildings • Retrofit existing buildings & upgrade mechanical systems as needed & prioritized. • Implement pilot project to install and evaluate high-speed hand dryers in restrooms. • Develop alternative sources of energy. • Reduce plug loads; Continue to phase out individual copy machines. • Replace outdated appliances with more efficient ones. • Evaluate energy-savings in IT operations and hardware. • Evaluate energy savings of implementing building schedules. • Evaluate/design/construct charging stations for electric vehicles on campus.		
Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: From Dean of College Advancement for bond projects, from VP of Campus Services for budget allocations, from grants office or Project Manager for external funding		
Measures of Success: Projects continue to be funded; conservation gains continue to be made.		
How Completion will be Reported: Each phase of completion is reported to VP of Campus Services, Board, PIO; information to sustainability manager for records.		
How Project will be Monitored • ***During Implementation:*** Director of Campus Services oversees contract work; Engineering lead		

oversees technical work. • ***After Implementation:*** Engineering lead tracks conservation & efficacy and reports on this.
Implementation Notes:
Next Steps:

2.1: Reduce Phantom & Plug Loads

Activities already completed:

- As part of an energy audit in spring of 2010, Campus Services staff undertook an inventory of plug loads in selected buildings on the Oregon City campus

Action 1: Reduce phantom & plug loads college-wide		
Lead: Directives must come from CEO, VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Development of campus policy; data from Campus Services lead of engineering team		
Measures of Success: • Policy has been developed and vetted. Policy includes: o limits & restrictions for plug-in appliances o new standards for thermal comfort range, and appropriate dress for indoor climate conditions o possibility of no-work heat-days and alternative of telecommuting o college to replace appliances with Energy Star • Instructors & staff have been informed; Follow-up actions are being taken (see monitoring, below)		
How Completion will be Reported: Compare plug inventory done in Feb. of 2010 to inventory in Feb. 2011.		
How Project will be Monitored • ***During Implementation:*** o PR office develops and deploys an upbeat informational buzz about new policy and what employees are being asked to do. This gives tips and recognizes some college champions o The number of plug-in appliances in offices & staff rooms has been reduced o Individual heaters have been removed o The number of desktop printers has been reduced o Appliances that remain are plugged into *readily reachable* power strips that can be switched off o College begins to surplus non-Energy Star appliances and replace with Energy Star • ***After Implementation:*** Energy use in buildings is measurably lower in comparison to a comparable period		
Implementation Notes: This can be done! Without rancor! Make it an internal public relations celebration! Look what we did! Because it was the right thing to do!		
Next Steps:		

2.2 Desktop Printers

Action 1: Reduce/eliminate desktop printers. This is really part of Action item 1, above, as well as an element of the College's goals to reduce paper & printing. It deserves its own category because of its primary connection with IT and Printing & Reproduction.

This initiative can be billed as a new centralized and networked printer system.		
Lead: Lead must come from CEO, VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: • Data from Campus Services staff in Information Technology, Engineering, Printing & Duplication and Health & Safety • Development of printing policy, paper purchasing reduction goal, and an upbeat education & outreach buzz		
Measures of Success: • The college eliminates desktop printers for reasons of worker health protection and conservation of materials & energy • All departments use centralized printers • These printers are *photocopiers* (more cost-saving), not laser printers • The printers are networked so that documents can be scanned and emailed • Duplex printing is set as a default, and vendor contracts and agreements must specify that a charge may not be made for two clicks for one-click jobs • PR office initiates a friendly informational buzz about the change and the conservation and energy saving accomplishments it will initiate • Printing & Duplication redoubles its education & outreach efforts concerning conservation & cost; how to use P&D services		
How Completion will be Reported: Perhaps announce on daily FYI, & celebrate these accomplishments		
How Project will be Monitored • ***During Implementation:*** o Policy committee develops & vets policy; develops upbeat outreach buzz o Announce building-by-building progress after initiative goes into action • ***After Implementation:*** o Announce to College community the number of desktop printers taken out of service o Provide information about the new centralized & networked printer system		
Implementation Notes: Champion the new system often and in an upbeat way. There could even be office-to-office or building-to-building contests of some kind, with goofy prizes for winners.		
Next Steps: Take the plunge.		

2.3: Energy Efficient Appliances

Action 3: Replace inefficient appliances with Energy Star-approved items (1st, evaluate the need for the appliance)		
Lead: Leadership on this must come from CEO & VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering Team Leader provides data about electricity draw of plug loads & inefficient appliances		
Measures of Success: Chief financial officer makes this a priority in budget over a span of 5 years. Replacement process begins;		
How Completion will be Reported:		
How Project will be Monitored • ***During Implementation:***		

• ***After Implementation:***
Implementation Notes:
Next Steps:

2.4: Monitor Energy Use

Action 1: Continue to install electrical and natural gas sub-meters where warranted		
Lead: Dean of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering Team Lead to make recommendations		
Measures of Success: Meters installed; Engineering Team Lead gathers & records data		
How Completion will be Reported: Dean of Campus Services to CEO, VP of Campus Services, Board		
How Project will be Monitored • ***During Implementation:*** Engineering Team Lead oversees installation & function of meters • ***After Implementation:*** Engineering Team Lead analyzes collected data and makes recommendations derived from it		
Implementation Notes:		
Next Steps:		

Action 2: Evaluate room scheduling & occupancy sensors by researching the literature and perhaps initiating a pilot study to evaluate energy savings of consolidating HVAC use.		
Lead: Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering Team Lead analyzes data and provides recommendations.		
Measures of Success: Evaluation is complete, recommendations are made.		
How Completion will be Reported: to Dean, Director and VP of Campus Services; info to Sustainability Manager for records		
How Project will be Monitored • ***During Implementation:*** Engineering Team Lead and Campus Services Director review biannually • ***After Implementation:*** Recommended actions are underway.		
Implementation Notes:		
Next Steps:		

Action 3: Evaluate continued IT efficiencies for offices, labs & central locations.		
Lead: Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Dean of IT, Engineering Team Lead		
Measures of Success: Energy-saving retrofits continue to be made; annual budgets for upgrades continue to be funded		
How Completion will be Reported: Report to VP of Campus Services, PIO, Board, showing energy savings		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

2.5: Create Upbeat Outreach Education about Building & Classroom HVAC Needs

Action 1: Develop college-wide policy and outreach program concerning thermal comfort ranges and HVAC requests at unscheduled times		
Lead: CEO; VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering Team Leader; PIO		
Measures of Success: • CEO makes positive announcement about new energy program to instructors and staff . . . we're all doing our best to decrease energy use, and so . . . • Quarterly room use schedules are provided to Engineering Team Leader • Needs for HVAC services at off hours, holidays, breaks and evenings are provided to Engineering Team Leader 24 hours in advance • Staff & employees understand new thermal comfort range and dress appropriately		
How Completion will be Reported:		
How Project will be Monitored • ***During Implementation:*** Quarterly, Engineering Team Leader provides report to Dean of Campus Services, who relays this to VP, deans, CEO; information to sustainability manager for records • ***After Implementation:*** After second year of implementation, Engineering Team Leader provides energy saving results to VP, deans, CEO; information to sustainability manager for records		
Implementation Notes: This needs to be orchestrated with a huge, positive buzz		
Next Steps:		

2.6: Develop & Increase Use of Local Renewable Energy

Actions already completed: Please refer to *Buildings*, in Section I of this document

Action 1: Continue developing solar, wind, geothermal and co-generated renewable energy		
Lead: Dean, Director & VP of Campus Services, Dean of CTE	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering Team Lead		
Measures of Success: Renewable energy technologies continue to be installed; reliance on grid-supplied energy decreases		
How Completion will be Reported: By Dean of Campus Services to VP of Campus Services, CEO and Board; information to sustainability manager for records.		
How Project will be Monitored • ***During Implementation:*** Project management by Director of Campus Services • ***After Implementation:*** Operation, monitoring, data collection by Engineering Team Lead		
Implementation Notes:		
Next Steps:		

2.7: Develop Distributed Energy Partnerships

Action 1: Negotiate with energy providers to purchase from or credit the College for energy conserved		
Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Engineering team leader		
Measures of Success: Negotiations are successful		
How Completion will be Reported: By Dean of Campus Services to VP of Campus Services, CEO and Board; information to sustainability manager for records.		
How Project will be Monitored • ***During Implementation:*** By Dean of Campus Services to VP of Campus Services, CEO and Board; information to sustainability manager for records.. • ***After Implementation:*** By Dean of Campus Services to VP of Campus Services, CEO and Board; information to sustainability manager for records..		
Implementation Notes:		
Next Steps:		

Objective 3: Adopt & fund an energy management program[1]

Action 1: Implement an energy management program		
Lead: Dean & Director of Campus Services; Engineering team leader	***Complete by Date:***	***Funding Source:***
Support Needed: CEO & executive team;		
Measures of Success: Plan has been adopted. It includes: • A *Reliability Program*, including maintenance, modernization, operations, training, & contingency planning components • An *Efficiency Program*, including evaluation of plant property, instrumentation & metrics, controls, energy organizational efficiency • A *Low Cost / No Cost Program*, including negotiations with utilities, time-of-use demand-control program, establishment of an electrical demand control system & maximized use of off-peak energy; elimination of excess lighting, reduction of steam pressures, energy use audit of equipment no longer needed or used, audit of hot water temperatures for possible reduction; • An *Awareness Program*, including *Training* of management, energy manager, coordinator & operators; *Communication* of energy management, an engineering web page; hot line for energy suggestions; annual conference; *Behavior Modification Program* including competition, awards & recognition, and means to *Evaluate* & report on the energy program • *A Stable Funding Program*, including long-range budget, re-commissioning & repair, accounting program, life cycle costs, energy analysis, ID & prioritization of future projects,		
How Completion will be Reported: The College has a properly funded energy management program with support from the executive team		
How Project will be Monitored • ***During Implementation:*** Training of top managers has begun; energy programs are in place • ***After Implementation:*** Top managers become knowledgeable and participate in evaluating annual reports & projections		

[1] From Ljucevic, Hilmo, *Energy Management Plan*, 5-10-2009.

Implementation Notes:
Next Steps:

Objective 4: Research & develop new forms of renewable energy

4.1: Bio-fuels

Action 1: Develop a bio-fuels digester that uses local agricultural wastes and pruning debris and soft vegetation from campus		
Lead: Energy manager, CTE & Science divisions	***Complete by Date:***	***Funding Source:***
Support Needed: Work with OSU Extension, Clackamas County Soil & Water Conservation Service, Natural Resources Conservation Service, CCC Horticulture		
Measures of Success: Research is producing results, conclusions, recommendations, new research		
How Completion will be Reported: To PIO, local newspaper, The Clackamas Print, CTE partners		
How Project will be Monitored • ***During Implementation:*** Instructors & students are engaged • ***After Implementation:*** We have a demonstration bio-fuels digester on campus		
Implementation Notes: If successful, possibly convert areas of open fields to quick tree crops such as cottonwoods, to harvest for biomass energy production.		
Next Steps:		

VII. Food Service (also see Purchasing, Chapter X, below)

Objective 1: Minimize waste as much as practicable, while keeping up with regional developments in management of conservation, waste & recycling

1.1: Recycling & Waste Management

Actions already completed at the Oregon City campus:

- Food waste is minimized by forecasting customer needs daily, and adjusting amounts of prepared foods accordingly
- Tomorrow's salads, sandwiches and wraps are made with ingredients at the end of each day
- Prepared foods that are left over at the end of the day are sold at half price
- Condiments are provided in bulk containers
- The cups that look like Styrofoam are actually biodegradable, and the plates for grilled food and sandwiches are manufactured from bamboo shoots
- Managers are evaluating more sustainable containers for bentos and salads
- New napkin containers dispense only one napkin at a time, minimize waste
- Kitchen staff rinses and recycles cans, cardboard and plastic containers

- Two recycling stations are available for customers
- Inefficient kitchen equipment has been taken out of service and is being replaced by more efficient equipment

Action 1: Identify actions & practices needed to become compliant with new food & serve ware waste and recycling systems that are on the horizon in the region		
Lead: Dean of College Advancement; VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Schedule attendance at consortia meetings, allow time to attend		
Measures of Success: • The Deans of College Advancement & the Campus Services Division attend meetings of regional recycling planning & consortia (with Metro and Clackamas County) and keep tabs on what other Oregon colleges are doing in these areas, to learn what changes in waste and recycling are on the horizon • Communication is occurring college-wide at CCC about these coming changes • Funds are allocated for equipment & supplies to transition to new system		

How Completion will be Reported:
• The college will be
  • coordinating with Cafeteria management to evaluate additional pre-cycling changes that can be made through purchasing
  • evaluating alternative serving ware materials, for the time when plates & utensils will be collected for composting
  • evaluate equipment for storage of compostable cafeteria wastes
  • holding stakeholder work sessions to find ways to increase recycling in the Cafeteria
  • evaluating water use in the kitchen and researching ways to conserve water use in food service areas
  • Investigating use of returnable take-out containers
  • Eliminating trays (the largest water use comes from washing them)		

How Project will be Monitored • ***During Implementation:*** Project Manager is assembling a committee, coordinating & setting agendas, facilitating meetings, preparing minutes, articulating next steps, developing budget for transition • ***After Implementation:*** Transition to next generation food service waste & recycling systems is smooth		
Implementation Notes: Manage this project so that it can be a green marketing triumph for the Food Services contractor		
Next Steps: Engage all players in summer of 2010; complete evaluations and develop implementation recommendations & strategy by end winter term 2011.		

Objective 2: Provide the campus community with nutritious, healthy food with low embodied energy

2.1: Locally Produced & Healthy Foods (please also see Chapter X, Purchasing, below)

Activities already completed:

- A coffee cart at the Harmony Community Campus provides locally sourced coffee
- The Cafeteria at the Oregon City campus offers a variety of low-fat wraps with fresh vegetables

Action 1: Research local food production, supply networks & suppliers		
Lead: VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Food Service Manager; kitchen gardens specialist; purchasing agent; Manager of Campus Operations; purchasing agent, Project Manager		
Measures of Success: • Project Manager is researching local food networks & suppliers • Food Service manager is evaluating menu items that reflect local & seasonal markets • Food Service manager is evaluating alternatives to high-fat, low-cost meals (French fries w/ rich dip; soda drinks) • Kitchen garden specialist is researching all aspects of developing & maintaining a kitchen garden on the OC campus • Kitchen garden specialist is sourcing equipment, costs & labor to sustain a kitchen garden; and recommending a program, including the possibility of a course, work-study assignments and other mechanisms		
How Completion will be Reported: Project Manager prepares written reports from each inquiry area together in a master report with recommendations		
How Project will be Monitored • ***During Implementation:*** All discovery processes are moving ahead. • ***After Implementation:*** Clear report with recommendations.		
Implementation Notes:		
Next Steps: Develop actual implementation project: roles, budget, timelines, deliverables		

Objective 3: Provide information to the campus community about how to use recycling stations in the Cafeteria

3.1: Education & Outreach (please also see Section III, Communication & Events / Objective 2: Sustainability Orientation)

Action 1: Develop, continually update and present an outreach program to the campus community about how to use the Cafeteria's sorting & recycling stations.		
Lead: Dean & Director, Campus Services, ASG	***Complete by Date:***	***Funding Source:***
Support Needed: ASG could be major helper here		
Measures of Success: • This outreach is included, together with information about how to use the campus-wide recycling stations, at new student orientation fall term, 2010 and thereafter in fall • Student teams (perhaps from ASG) help orient Cafeteria users to sorting system at noon during the first week of each term • Upbeat messages are crafted for iteration by CEO at appropriate times; by PIO in Daily FYI, and by Project Manager in various communications		
How Completion will be Reported: Recycling in Cafeteria is improved; percentage of materials recycled is increased; everybody knows how the recycling system in the Cafeteria works		
How Project will be Monitored • ***During Implementation:*** ASG and others stand by in the Cafeteria at lunch the first two weeks of		

school to help and guide recycling • ***After Implementation:*** Everyone seems to know what gets recycled, how to sort, where to put recyclables
Implementation Notes: This is a team effort, a friendly outreach activity. *It would be very beneficial if a team could make up large explanatory posters, ala LCC, with actual recyclable items attached to them*
Next Steps: Campus Services, ASG and Food Services collaborate and strategize to carry off this activity

Objective 4: Save energy and water in the College Cafeteria

4.1: Energy & Water Conservation

Action 1: Purchase energy and water-conserving kitchen equipment		
Lead: Managers of Food Service, Campus Energy & Operations	***Complete by Date:***	***Funding Source:***
Support Needed: VP of Campus Services		
Measures of Success: College kitchens are efficient; energy & water usage drops		
How Completion will be Reported: To Board, FYI Today; Clackamas Print		
How Project will be Monitored • ***During Implementation:*** New equipment is installed • ***After Implementation:*** Report on first-year savings		
Implementation Notes: Make sure to apply for credits, where they are applicable.		
Next Steps:		

VIII. Landscape & Grounds Keeping

Objective 1: *Protect, preserve, restore & enhance natural areas*

Actions already completed:

- The College's 2007 Master Plan includes criteria for site planning & review, including:
  - A minimum of 15 percent of the Oregon City campus area shall be landscaped
  - Natural landscaping comprised of native species should be employed, where possible
  - Site development should preserve, where possible, all trees 6 inches in diameter measured at 4 feet from ground level; trees removed for development will be replaced according to requirements set forth in the plan
  - The *Water Quality Resource Area* surrounding the Environmental Learning Center is subject to the city of Oregon City's water resource codes
- In 2010, sixty-eight percent of the Oregon City campus grounds remained in quasi-natural or managed open spaces
- The larger patches of native vegetation on the Oregon City campus are managed for habitat and native ecosystem preservation.

- The Grounds Keeping Committee contributes information to architectural & development teams about the College's goals for natural area planning & preservation
- Groundskeepers maintain pond & wetland hydroperiods & consider nesting and rearing seasons when scheduling mowing and pruning near natural areas and when scheduling pond maintenance. Fire safety requirements also affect mowing schedules
- Groundskeepers strive to develop partnerships with volunteer & service groups to help with trail & natural area maintenance and stewardship
- They also apply the principles & practices of the Integrated Pest Management program when evaluating the need to apply pesticides. Pesticides used are those for which the longest studies have been done and which have the highest safety ratings by the Oregon Department of Agriculture and the US Fish and Wildlife Service. They are purchased as needed and used up at the time of application to avoid bulk storage. Just-in-time materials are stored in an approved chemical storage structure.

1.1: Invasive Plants

Action 1: Protect the integrity of remnant native landscapes on campus by identifying and removing aggressive non-native plants		
Lead: Head Groundskeeper & staff	***Complete by Date:***	***Funding Source:***
Support Needed: Funding to contract labor & equipment for removal		
Measures of Success: • Priority has been assigned for species control • The locations of red-list species have been identified & flagged • Crews have eradicated these species, using appropriate methods, in these locations • Grounds keeping personnel have time to monitor invasive species in following two to three years, and to monitor noxious species invasion in subsequent years		
How Completion will be Reported: Annually, to Dean of Campus Services, PIO, sustainability manager		
How Project will be Monitored • ***During Implementation:*** Grounds keeping staff make sure that crews do not eliminate native species near eradication sites; that minimal site damage is done during eradication activities, that plant parts are properly disposed • ***After Implementation:*** On-going monitoring, reporting, follow-up		
Implementation Notes:		
Next Steps: College to include invasive plant monitoring and removal in Campus Services budget		

Action2: Insert contract language requiring mowing contractors & vendors to wash undercarriages of mowing equipment before bringing it onto campus, to avoid the spread of noxious weeds		
Lead: Director of Campus Services, Purchasing office, Grounds Keeping	***Complete by Date:***	***Funding Source:***
Support Needed: None		
Measures of Success: Mowing equipment arrives clean		
How Completion will be Reported: to Dean of Campus Services, PIO, sustainability manager		
How Project will be Monitored • ***During Implementation:*** Grounds Keeping staff inspects mowers when they arrive • ***After Implementation:*** Clean mowers arrive on campus consistently		
Implementation Notes:		

• Determine when contract is next up for renewal or bid; insert additional contract language then; make sure to point this requirement out to bidders. • (Best Practices about mowing equipment hygiene is available on the Internet)
Next Steps:

Action 3: Determine and observe buffer zones for herbicides in wetland & riparian areas that drain to ditches & streams and thence to the Willamette River system		
Lead: Campus Services, with assistance (usually free) from a wetlands specialist from US Fish & Wildlife Service	***Complete by Date:***	***Funding Source:***
Support Needed: Grounds Keeping		
Measures of Success: • Buffers are re-affirmed, tweaked or established • Buffer map is included in mower contract, if needed • Grounds Keeping pre-marks these in the field before mowing season, if needed • Contractors observe existing or new buffer practices		
How Completion will be Reported: to Dean of Campus Services, PIO, Clackamas Print, FYI Today		
How Project will be Monitored • ***During Implementation:*** Inspection by Grounds Keeping • ***After Implementation:*** Ongoing oversight by Grounds Keeping		
Implementation Notes: As above		
Next Steps: Conversation with purchasing and others handling contracting		

1.2: Environmental Learning Center

Action 1: Find and leverage funding for redevelopment and restoration of the entire Environmental Learning Center site.		
Lead: VP, Dean & Director of Campus Services; Director of Environmental Learning Center; Chair of Horticulture	***Complete by Date:***	***Funding Source:***
Support Needed: Work with the Greater Oregon City Watershed Council and others to strategize about this project as a matter of regional and watershed priority		
Measures of Success: This project becomes a priority agenda item among several important regional partners; Headwater wetlands are restored and reconnected to Newell Creek.		
How Completion will be Reported: To local newspapers & natural resource groups; to Clackamas Print and College community		
How Project will be Monitored CCC and ELC's Director continue to interface with USFWS, Metro, watershed council & others to find ways to leverage funds & partnerships • ***During Implementation:*** TBD • ***After Implementation:*** TBD		
Implementation Notes: TBD		
Next Steps: TBD		

Objective 2: Conserve water while maintaining landscaping, grounds & athletic fields

Actions already completed:

- In summer of 2009, watering ceased in all turf areas not actively needed for sports. Only the planting beds and active athletic fields are watered, and only as needed
- At the Harmony campus, irrigation controllers wired to a rain gauge and an evapotranspiration meter. The controllers can be programmed, and they have sensors that shut down zone irrigation in the event of line breaks, leaks or rainfall
- Also at the Harmony campus, rain water harvested from the roof waters native bunchgrasses and rushes and is infiltrated on site.

1.2: Technology

Action 1: Install appropriate water-saving technology to maintain landscapes & athletic fields • Apply central irrigation controls to allow remote monitoring and control of irrigation systems at all campuses • Install rain gauges, evapotranspiration meters and irrigation controllers at campus locations • Install sub-meters to enable evaluation of water use by zones • Evaluate financial & human resources needed to achieve desired conditions • Install drip and other low-flow irrigation technologies where needed		
Lead: VP, Dean & Director of Campus Services, Grounds Keeping	***Complete by Date:***	***Funding Source:***
Support Needed: This needs to be a College priority with the same importance as achieving greater energy efficiency		
Measures of Success: Campus Services is able to report quantity & cost of water saved		
How Completion will be Reported: Annual savings, compared with baseline; report to Board, The Clackamas Print, local newspaper, watershed & fisheries partners		
How Project will be Monitored • ***During Implementation:*** Campus Services & Grounds Keeping oversee selection of appropriate technology; inspect installation • ***After Implementation:*** Meters & technology are working correctly		
Implementation Notes: Grounds Keeping identifies irrigation zones and placement of evapotranspiration meters		
Next Steps: Find the money		

1.3: Standards

Action 1: Reduce needs for mowing & watering		
Lead: Campus Services Director; Grounds Keeping; Health & Safety Coordinator; Safety Officer; local Fire Marshal;	***Complete by Date:***	***Funding Source:***
Support Needed:		
Measures of Success: • Convert some turf areas to mixed grasses and herbs, native forest or shrub/forest associations		
How Completion will be Reported: To Board, local newspaper, PIO, funding partners		

How Project will be Monitored • ***During Implementation:*** Safety, fire & sight distance priorities will be monitored throughout project design • ***After Implementation:*** " " and invasive plants, litter will need to be monitored in future
Implementation Notes: Implement & monitor a pilot project to begin
Next Steps: TBD

Objective 3: *Protect air & water quality*

3.1: Equipment

Air quality protection actions already completed:

- College roads and parking lots are swept periodically; this helps to minimize dust from traffic
- Non-paved parking areas are graveled to prevent dust and tracking
- As a rule, the College does not have dust-generating events or activities

Action 1: Evaluate substituting two-cycle backpack leaf blowers with a lesser polluting (and quieter) technology as new designs are marketed.		
Lead: Director, Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: N/A		
Measures of Success: Two-cycle blowers are eliminated in favor of lesser-polluting technology		
How Completion will be Reported: To Clackamas Print, Board, PIO		
How Project will be Monitored: • ***During Implementation:*** Performance of new technologies will be evaluated • ***After Implementation:*** N/A		
Implementation Notes: N/A		
Next Steps: N/A		

3.2: Stormwater Ponds & Swales

Water quality protection actions already completed:

- The Oregon City campus has a network of stormwater detention ponds intended to desynchronize and partially treat drainage from the campus's extensive impermeable surfaces

Action 1: Evaluate condition & function of stormwater swales and ponds; upgrade plantings as needed to enhance filtration, uptake of pollutants and infiltration of stormwater		
Lead: Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Grounds Keeping Committee; Grounds Keepers; Horticulture chair		
Measures of Success: Revitalization of stormwater basin plantings		
How Completion will be Reported: To Board, PIO, watershed community		
How Project will be Monitored • ***During Implementation:*** Appropriate oversight of species selection, planting methods, 1st year care &		

survival of plants, replacement of plants • ***After Implementation:*** Annual inspection of plant vigor, extent
Implementation Notes: • Contract crews selected for prior experience and success with stormwater swale plantings • Grounds Keeping staff oversees contract crews
Next Steps: Put swale assessment, plant prescription & implementation on annual calendar of Grounds Keeping activities

Objective 4: Conserve organic debris generated by campus grounds keeping activities

4.1 Composting

Actions already completed:

- Most woody debris is chipped and broadcast in selected areas on the Oregon City campus
- Most moist organic debris is retained on campus
- The Horticulture department has a composting demonstration area

Action 1: Establish or refresh a grounds composting area on campus and properly fund this to include equipment, training and staff time to manage it		
Lead: Director of Campus Services, with Horticulture	***Complete by Date:***	***Funding Source:***
Support Needed: Horticulture department		
Measures of Success: • Equipment & labor are available to chip woody debris generated on campus • Equipment & labor are available to save green debris generated from pruning, etc., for mixing with wood chips for composting • Grass clippings are recycled in the grass while mowing • Composted material is applied to appropriate planting areas		
How Completion will be Reported: College Board, local newspaper, The Clackamas Print, watershed partners		
How Project will be Monitored • ***During Implementation:*** Grounds Keeping & Horticulture establish methods, materials, management • ***After Implementation:*** Same entities determine success or needs to improve program		
Implementation Notes:		
Next Steps:		

IX. Leadership & Implementation

Objective 1: *Promulgate & support the infusion of sustainability into all aspects of academics, operations & campus life*

1.1: Advisory Group

Actions already completed:
The College Sustainability Committee has

- Developed a mission statement: *Through education and action, the Clackamas Community College Sustainability Committee aims to assess, plan and implement strategies for social, environmental and economic sustainability on campus and in our larger community.*
- Helped promote a *Lectures in Sustainability* series, beginning in 2006, supported by the Clackamas Community College Foundation, featuring visionary speakers in the sustainability movement.
- Assisted to promote Green Screen, a series of films highlighting topics in human/global ecology.
- Helped promote The Sustainability Project, a communication campaign highlighting current and progressive information for the campus community through various media, including a newsletter with a calendar of events.
- Initiated a waste audit, which resulted in the establishment of improved recycling stations in each building.
- Convened campus community members interested in sustainability to garner ideas and support initiatives such as Campus Services' energy efficiency program.
- In academic year 2009-2010, engaged the work of an environmental consultant and a climate scientist to complete a sustainability assessment, a greenhouse gas inventory a sustainability plan and specifications for sustainable buildings.

Action 1: Formalize the Sustainability Committee as an advisory group to the executive team.		
Leads: Dean of Arts, Humanities & Science; VP & Dean of Campus Services; Chair of Horticulture	***Complete by Date:***	***Funding Source:***
Support Needed: Support of executive team		
Measures of Success: • Committee includes a representative from most instructional & operational areas. • Selected administrative decision-makers are included on committee to communicate directly with executive team for support, policy & funding. • Committee derives priorities & major projects from sustainability plan. These priorities are reflected in fiscal planning, if funding is needed. • Committee forms working committees for each major project; defines supporting actions to achieve each goal; sets responsibilities, milestones and deliverables. • Committee develops a continual process of assessing achievements and needs in sustainability. • Committee communicates with campus community through Sustainability website and College Committees page. • President receives quarterly report & recommendations from Sustainability Committee and reports on sustainability initiatives to the College community.		
How Completion will be Reported: To campus community at beginning of fall term, 2010.		
How Project will be Monitored: • ***During Implementation:*** Meetings are action-oriented; sub-committees have action tasks; completion is reported; • ***After Implementation:*** Progress continues to be made; large and small actions are undertaken & completed; funding is found or allocated to support large initiatives; the College's core value of sustainability is reflected in an array of related accomplishments		
Implementation Notes: Begin with the end in mind.		
Next Steps: Determine agenda for year; appoint chair, set schedule of meetings.		

1.2: Deans, Directors & Chairs

Activities already completed:

- The Humanities department offers a three-course series, *Pathways to Sustainability*
- The College as a whole has initiated a wide array of activities and programs that foster a sustainable college
- Notable sustainability champions work in Horticulture, English, Athletics, Career & Technical Education, Customized Training & Development, English as a Second Language, the Environmental Learning Center, the Cafeteria, Printing & Duplication, the Library, Grounds Keeping, the Bookstore, Campus Services and other areas on campus

Action 1: Encourage & support faculty to identify and provide: • Course-appropriate learning opportunities in sustainability • Activities & work/study opportunities in sustainability for students in Extended Learning, Early Childhood Education & Human Services • Capstone classes for interdisciplinary student teams to contribute to assessment, analysis, design or revision of systems that result in greater sustainability on campus

• Develop learning/lab/practice modules in sustainability in all activity centers on campus, from the FRC to the ELC • Encourage ASG to identify & implement annual sustainability campaigns		
Lead: Deans & Directors	***Complete by Date:***	***Funding Source:***
Support Needed: PIO, The Clackamas Print		
Measures of Success: • Campus community is engaged at all levels in continued sustainability accomplishments, including: human services, extended learning, career & technical education, arts, business & humanities, athletics, academics		
How Completion will be Reported: • Consistent buzz at meetings of the Board, College Council, President's Council, division & department meetings • Accomplishments & activities have frequent coverage in FYI Today • Sustainability has a presence on CCC's web pages; CCC turns up in the top 10 results when a prospective student Googles *Sustainability education in Oregon Community Colleges*		
How Project will be Monitored • ***During Implementation:*** Sustainability & related activities are consistent agenda items for Dean & department meetings; there is a steady trickle of new courses, work/study opportunities & sustainability related activities on campus • ***After Implementation:*** CCC claims a strong niche in sustainability education and orientation among the state's and region's community colleges		
Implementation Notes: Strong championship & support is needed from those in leadership positions		
Next Steps:		

1.3 Executive Team

Activities already completed:

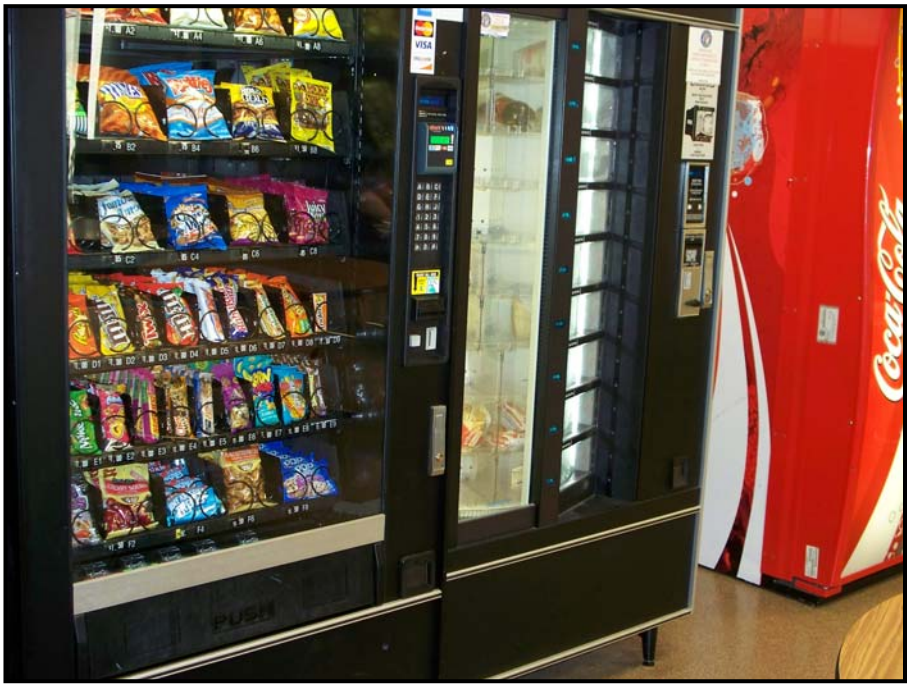
- The College claims sustainability as a core value
- Considerable accomplishments have been made to "LEAN" processes & paperwork
- Between 2005 and 2010, the College saved $1.7 in avoided energy costs due to energy system retrofits & upgrades

Action 1: • Invest rigorously in energy efficiency • Initiate and foster campaigns calling for campus community to dress for the weather, turn off lights, limit printing, reduce plug loads in offices; be vigilant about recycling . . . • Provide direction re: transportation, space, energy, purchasing, waste & recycling • Encourage development of departmental sustainability resource guides • Establish & fund office of sustainability • Continue to promote best practices and processes streamlining (reduce time and paperwork) • Provide sustainability "onboarding" information to new staff & instructors • Invest in grants office & donor opportunities • Provide annual sustainability report to College and to Board • Seek industry partners for cost and brain-sharing

Lead: President & Executive group	***Complete by Date:***	***Funding Source:***
Support Needed: Constant buzz from CCC Public Information Office		
Measures of Success: • College invests in grant writer; grants are won to continue investments in energy efficiency and many other activities and infrastructure that contribute to a more sustainable institution • College announces expectations for dressing for exceptionally hot or cold weather (rather than rushing to the thermostat or calling energy manager for micro climate adjustments) • Other new College policies are promulgated and widely discussed: turn off lights, limit printing, no under-desk plug-ins • New purchasing policies are distributed college-wide: don't purchase canned air[1] (use squeeze bulbs instead), etc. • New employees are given information about CCC's sustainability practices and expectations • The College is sharing resources with some outside partners		
How Completion will be Reported: Constant buzz in FYI today; news to local papers, The Clackamas Print		
How Project will be Monitored • ***During Implementation:*** Standing agenda item for executive & Board meetings • ***After Implementation:*** If everyone knows about the College's sustainability efforts and programs, progress has been made!		
Implementation Notes: Needs clear, consistent, friendly championship from executive level		
Next Steps: Incorporate into business & meeting models		

[1] The chemical that replaced fluorocarbon in aerosol cans is even more damaging to the ozone than the chemical it replaced.

X. Purchasing



Objective 1: *Through College-wide leadership, strategic action & coordination, implement sustainable purchasing policies*

Actions already completed:

- To reduce hazards of materials storage (e.g. spills, fires) the College has reduced warehousing of goods and materials, and, as much as possible, practices on-demand purchasing
- Purchasing of alternative, non-toxic, non-hazardous materials is encouraged

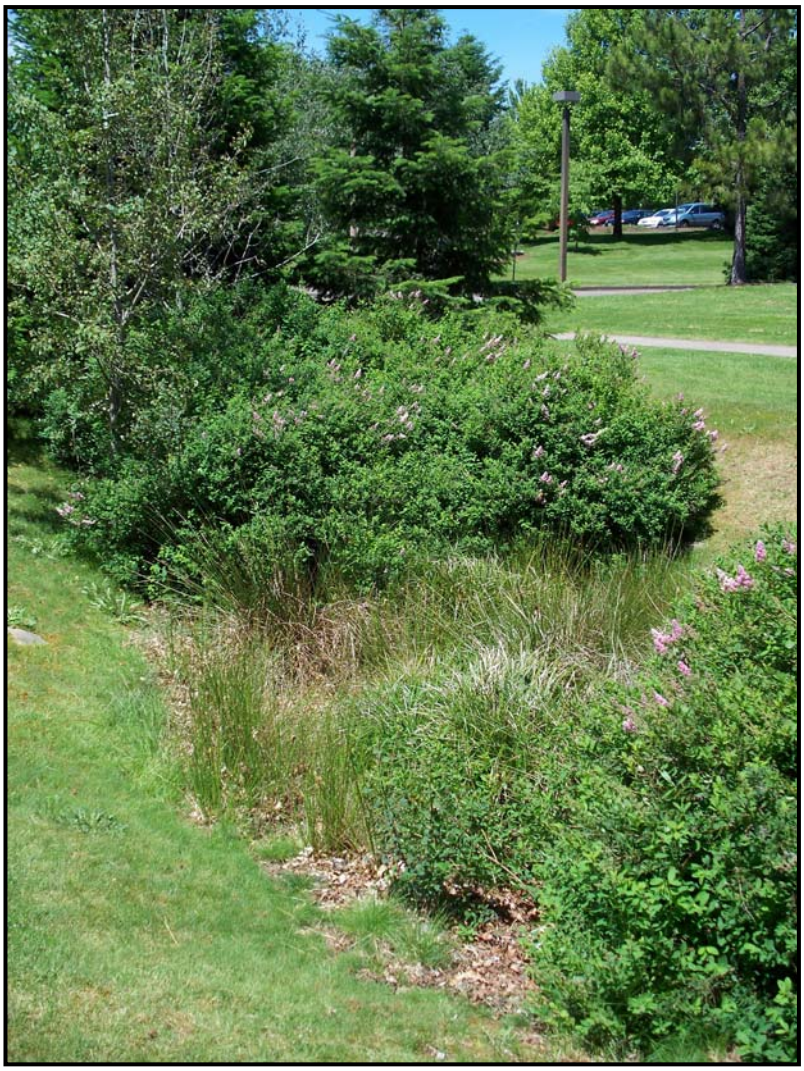
1.1: Vending Machines

Action 1: Review & revise contracts & agreements with vending machine companies: • Require Energy Star-rated machines • Include healthy snacks manufactured locally • Eliminate bottled water & containers made with BPAs or HFCs • Eliminate glass containers & containers that cannot be returned for a deposit		
Lead: VP of Campus Services; Sustainability Committee	***Complete by Date:***	***Funding Source:***
Support Needed: Purchasing department to follow through		
Measures of Success: • Vending machines contain nutritious snacks & supplied by local companies • Glass bottles and containers with BPAs and HFCs have been eliminated • Only refundable containers are offered in vending machines • Bottled water is not sold on campus		
How Completion will be Reported:		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

1.2: Contracts

Action 1: Develop sustainable purchasing policies & guidelines, including sourcing of local goods.		
Lead: VP of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Purchasing department to follow through		
Measures of Success: • Sustainability elements are included in contracts & specifications (e.g. sustainable materials (locally sourced, recyclable, non-toxic . . .) • Purchasing guidelines have been established, with input from department personnel who purchase • The College has created & promulgated guidelines for and sourced alternatives to toxic or hazardous materials • Department copiers will duplex by default and not charge for two clicks when only one is used • Annual quantities of paper purchased are known, and are annually reviewed to evaluate whether paper use is declining		
How Completion will be Reported: To VP of Campus Services by the various players; from thence to PIO & FYI Today, local newspaper, The Clackamas Print		
How Project will be Monitored • ***During Implementation:*** Project leaders have been identified; project timelines and task leaders have been established; projects are making progress and will meet deadlines • ***After Implementation:*** All purchasers have guidelines in hand; Policies & guidelines are in place, where applicable, in all contracts & bid solicitations		
Implementation Notes: After implementing for 6 months, purchasing committee should reconvene to discuss and fine tune the purchasing guidelines. Many models are available; no need to invent the wheel.		
Next Steps: Needs championship from executive level.		

XI. Stormwater (Please also see Chapter V, Custodial Maintenance and Operations, above, for details)



Objective 1: *Maintain and improve functioning of existing stormwater system*

Activities already completed:

- The College and its consultants and planners have identified short- & long-term strategies & projects to reduce impervious surfaces and stormwater pollution, desynchronize stormwater runoff, increase infiltration, achieve net-zero runoff from new projects
- Passive stormwater collection, detention & treatment facilities are planned and constructed for every new College development project

1.1: Maintenance Schedule & Activities

Action 1: Upgrade maintenance schedule and activities for the Oregon City campus's stormwater system		
Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Need executive support for this essential water quality		
Measures of Success: • Chain-of-custody information has been acquired from the CB cleaning contractor and reviewed to learn the ultimate disposal location of materials suctioned from each of the campus's stormwater systems • The precise PM activities of the contractor have been reviewed to learn whether some activities can be deleted and others enhanced. • Automotive's wash rack vault & oil water separator are cleaned twice yearly on schedule, rather than		

during overflow events
- A twice-yearly PM schedule for cleaning *primary* stormwater CBs (those that outfall to wetlands, ditches, streams) has been developed
- Erosion at outfall sites has been identified and solutions are being designed to curtail this
- The last downstream stormwater catch basin in each parking lot has been identified and evaluated for oil/water separation (by means of inclined plate) *or oil protection* (by means of absorbent booms or socks) and enhanced grit catchment.
- A PM schedule has been created for clearing inlets to and outfalls of stormwater swales.
- Stormwater swale maintenance training has been provided to grounds keeping staff.
- Replacement plants for swales have been purchased, as needed, and installed.

How Completion will be Reported: Upgraded stormwater maintenance program is reported to Board, campus community, watershed groups.

How Project will be Monitored
- ***During Implementation:*** Project has a manager, tasks, schedule, reporting.
- ***After Implementation:*** Oil separation from campus stormwater, primarily from parking lots, has been improved; oil leaving the Oregon City campus in stormwater has been reduced by means of improved oil/water separation.

Implementation Notes: This project should begin with a thorough inventory and mapping of CBs, bubblers, grit collection facilities, oil/water separation devices and major outfalls from each the campuses.

Next Steps: Coordinate with the Environmental Learning Center, the Greater Oregon City Watershed Council, Metro Greenspaces and others.

Objective 2: *Reduce stormwater discharges from campuses*

2.1: Impermeable Surfaces

Action 1: Remove unneeded outdoor permeable surfaces and replace with (native) vegetation, e.g., the heaved sections of hard surface near the bus turn-around on the Oregon City campus

Lead: Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***

Support Needed:
- Equipment (grinder or wet saw, pavement breaker, backhoe & dump truck)
- Refinishing hard edge
- Site & soil prep & planting – convert selected hard surfaces to bioswales or planting beds.

Measures of Success: Hard surface removed

How Completion will be Reported: to College Council

How Project will be Monitored
- ***During Implementation:*** N/A
- ***After Implementation:*** N/A

Implementation Notes:

Next Steps:

2.2: Stormwater Storage

Action 2: Store and use rainwater for irrigation.		
Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: Energy manager to evaluate whether stored stormwater could be used to store heat or preheat water for the hydronic system in winter; what controls would be needed to articulate with irrigation system in summer		
Measures of Success: Technical & cost/benefit analysis are performed at time of project development		
How Completion will be Reported: N/A		
How Project will be Monitored **N**/A • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes: N/A		
Next Steps: N/A		

XII. Transportation & Circulation

Objective 1: *Maintain transportation facilities*

Activities already completed:

- Note: Many of the items that could be included here are instead discussed in Chapter III, Climate Protection, in this document
- Items concerning management of stormwater pollutants from parking lots and roads are also discussed in the chapters on Stormwater (Chapter XI) and Landscaping & Grounds Keeping (Chapter VIII)

1.1: Roadways & Parking Lots

Action 1: Continue to protect the College's investment in its transportation system, make improvements and protect stormwater quality

- Crack seal the space between asphalt roads and concrete curb to minimize the need to apply herbicides in curb lines that drain to stream headwater areas.
- Slurry or chip seal parking lots as needed to prevent further alligatoring & deterioration.
- Alternatively, grind and replace parking lot paving, separate base materials from subgrade and replace base materials with materials of proper size, gradation and compaction.
- Alternatively, design and construct permeable lots.
- During lot upgrading or reconstruction, integrate new stormwater catchbasins with high-performance oil/water separation capabilities, preferably inclined-plate style. *Please also see the chapter on Stormwater.*
- College stormwater outfalls to live streams, ditches or to public systems that will ultimately discharge to live streams should be upgraded for high-performance oil/water separation and grit collection. *Please also see the chapter on Stormwater.*
- Prepare a catchbasin preventative maintenance schedule that puts priority on those CBs actually designed to collect grits and separate oil and water. *Please also see the chapter on Stormwater.*
- Make sure to include the Automotive Wash Rack in the preventative maintenance schedule. *Please also see the chapter on Stormwater.*

Lead: VP, Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: A strong water quality advocate		
Measures of Success: Stormwater protection measures have been put in place commensurate with the volume and condition of vehicles entering, exiting and parking at campus		
How Completion will be Reported: Retrofits are reported to Board, PIO, watershed groups		
How Project will be Monitored		

- ***During Implementation:*** Campus Services oversees selection & construction of pollution prevention facilities in stormwater drainage system
- ***After Implementation:*** The new facilities are monitored to assure performance, and placed on maintenance schedules

Implementation Notes: Look for opportunities to piggy back on city & county stormwater improvements & retrofits; or upgrades concomitant with state or federal highway projects on adjacent roadways

Next Steps:

XIII. Waste & Recycling

Objective 1: *Reduce the kind & amount of waste the college produces*

1.1: Outreach & Education

Actions already completed:

- A robust recycling program has dramatically reduced the amount of waste the College sends to landfills. Besides everyday consumer recycling (drink containers, paper) the program encompasses construction materials, used furniture and scrap metal
- Universal wastes are also recycled. These include batteries, televisions, computer monitors, CPUs, fluorescent lamps, aerosol cans, refrigerants, etc.
- Hazardous wastes managed for recycling or disposal by contractors include solvents, batteries, oils, paints, wastes from photo, science and chemistry labs
- In spring of 2010, the College began recycling plastic films that come as pallet wraps or in shipments of computers, filters, etc.
- In April 2010 the College recycled 1400 pounds of batteries (wet cell, alkaline, nickel-cadmium). This amounted to approximately $3,500 or between $2 - $3 per pound for disposal (plus time to disassemble computer batteries).
- Also in spring of 2010 a student created a video about how to use the College's recycling system. The video is intended to be used during New Student Orientation at the beginning of fall term, 2010.

Action 1: Develop an ongoing communications campaign to keep the topic of recycling & waste prevention fresh in the minds of an ever-changing College population		
Lead: Dean & Director of Campus Services; ASG	***Complete by Date:***	***Funding Source:***
Support Needed: A champion to coordinate, collaborate, manage project, move it along		
Measures of Success: • There is a buzz about the College's recycling accomplishments several times a year that provides regular updates on how, what and where to recycle on campus, and also reports recycling successes and benchmarks. • Improve recycling in the Cafeteria; Look to OMSI and Lane Community College for models on recycling education *in* the Cafeteria. Engage ASG in developing outreach a recycling education outreach campaign, particularly for the Cafeteria. • Support waste audits in the Quad every two years, accompanied by a performance-style narrator and		

events. Publish the results immediately and call for the campus community to develop ideas to reduce waste.
How Completion will be Reported: • Track annual tonnage to landfill. Announce to College community annually to increase reduction awareness and focus. • Track annual tonnage of recycled materials to recycling center. • Track & report tonnage and income from metal recycling by Automotive, Campus Services, Welding, and Training Center.
How Project will be Monitored • ***During Implementation:*** College community understands how to use the recycling system; there is very little contamination of garbage (waste) with recyclable items • ***After Implementation:***
Implementation Notes: This campaign needs an ever-present champion with time to coordinate
Next Steps:

1.2: Expand Recycling/Pre-cycling Programs

Action 1: Seek, facilitate and maintain consistent upgrades to the recycling system.		
Lead: Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed:		
Measures of Success: • Bottled water sales are eliminated on campus. *Please also see the chapter on Purchasing.* • Investigate food waste recycling. *Please also see the chapter on Food Service.* • Continue to evaluate plastics recovery as the market changes. • Fund and engage in a continual cycle of upgrades to the recycling system as the market continues to evolve. • Reduce the quantity of class schedules printed each term so that there are not so many extras. • Make electronic schedules easier for users to jump to the sections they want to scan. • Install high-speed hand dryers in restrooms to eliminate paper towel waste and achieve savings in labor to maintain towel dispensers and waste.		
How Completion will be Reported:		
How Project will be Monitored • ***During Implementation:*** • ***After Implementation:***		
Implementation Notes:		
Next Steps:		

1.3: Protect Stormwater from Garbage Leachate

Action 1: Manage leakage from the waste compactor		
Lead: Dean & Director of Campus Services	***Complete by Date:***	***Funding Source:***
Support Needed: from recycling coordinator		
Measures of Success: • At a minimum, leachate is filtered before running to storwater inlet		

• Steps to provide containment of leachate have been taken; drop box provider has been advised to provide a container that does not leak
How Completion will be Reported: • Filters are installed and are regularly changed • Container is welded to stop leakage • Leachate no longer runs to inlet
How Project will be Monitored • ***During Implementation:*** Discussions with drop box provider are initiated; actions have been agreed upon; solution will be implemented within an agreed-upon timeline • ***After Implementation:*** The drop box does not leak
Implementation Notes:
Next Steps:

Sustainability Assessment

Clackamas Community College

Oregon City, Oregon

2009

Sustainability Assessment

Clackamas Community College
Clackamas County, Oregon

Prepared for
The Sustainability Committee
& the interested campus community

in collaboration with
The Clackamas Community College Sustainability Committee
The Clackamas Community College Community
Vice President of Campus Services Courtney Wilton
Dean of Arts, Humanities & Social Science, & Sustainability Co-Chair Bill Briare
Horticulture Chair & Sustainability Co-Chair Elizabeth Howley

by
Martha Mitchell, Sustainability Coordinator

June 2010

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Mickey Yeager, Groundskeeper

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Cathy Hanson, Chair, Skills Development; Instructor, Adult High School Diploma

Ray Hoyt, Director, Customized Training & Development
Elizabeth Lundy, Dean of Instruction
Terry Mackey, Chair, Library (Science faculty)
Suzanne Munro, English as a Second Language
Lisa Nolan, Catalogue Librarian/Systems Coordinator
Becky Ogden, Chair, Early College Options
Lisa Palmer, Interlibrary Loan Coordinator
Shelly Tracy, Director, Utility Training Alliance, Energy & Resource Management, Wilsonville Campus
Theresa Tuffli, Dean of Community Education, Wilsonville & Harmony Campuses

Student Services
Mindy Brown, Chair, Student Leadership, Outreach & Testing
Carol DeSau, Bookstore Manager
Debbie Goforth; Customer Service, Bookstore
Fayne Griffiths, Director, Financial Aid
Keoni McHone, Althletics
Jann York, Student Services Coordinator, Harmony Campus
Bill Zuelke, Dean of Student Services

Additional CCC Sustainability Initiatives
Tim Maher, Sustainability Outreach Coordinator, Principal Investigator, Campus Greenhouse Gas Emissions
Meghan O'Loughlin, Manager, Food Services
Marlo Smith, Chair, Student Sustainability Club

Other Partners, Experts & Resource People
Mary Ann Aschenbrenner, Regional Travel Options, Metro
Sandi Burns, Clackamas Transportation Alliance
Clackamas County Office of Sustainability
Eben Polk, Sustainability Coordinator
Susan Terry, Sustainability Coordinator
J.B. Collins, Sales Representative, Coastwide Labs
Christine Hollenbeck, Clackamas River Water Providers
Don Rhodes, TriMet
Tim Shea, Director, Small Business Development Center, Harmony Community Center
Audrey Shuffield, VPSI, Inc.

Other Colleges & Universities
Clark Community College, Vancouver, Washington
Jim Green, Director of Facilities Services, Clark College
Jim Watkins, Clark College Construction Project Manager, Columbia Tech Center
Emory University, Atlanta, Georgia
Arri Eisen, Co-Lead, Piedmont Project (Curriculum Sustainability Infusion)
Lane Community College, Eugene, Oregon

Jennifer Hayward, Sustainability Coordinator , Ann Scott, Energy Analyst & Coordinator
Mike Sims, Recycling Coordinator
Todd Smith, Coordinator, Health & Wellness Building
Dave Willis, Facilities Director

Clark Community College, Washington
Jim Green, Dean of Facilities & Maintenance

Macalester College, St. Paul, Minnesota
Suzanne Hansen, Sustainability Coordinator

Mt. Hood Community College, Gresham, Oregon
Karen Reynolds, Environmental Health and Safety Officer

Listservs

- American College & University Presidents' Climate Commitment (ACUPCC) Association for the Advancement of Sustainability in Higher Education (AASHE)
- Green Campus
- Green Schools, Brown University
- Higher Education Association Sustainability Consortium
- Public Sector Sustainability Coordinators, Portland Metropolitan Region
- U.S. Department of Energy, Office of Energy Efficiency

Preface

Thank you for your contributions to Clackamas Community College's sustainability achievements. Without your efforts, the many programs and practices highlighted here would not have been initiated. This assessment provides a current snapshot of the College's sustainable practices in three areas: campus culture, education and energy. The final chapter, *Opportunities,* presents ideas for future achievements and for development of a sustainability plan for Clackamas Community College.

Your review of this document is invited. Please refer to the table of contents to locate the subject areas that interest you and look them over to make certain they are accurate and complete. Please also look over Chapter IV, *Opportunities,* and note your additional ideas.

The hierarchy of headings in this document is organized as follows:

Chapter Heading
Major heading
Sub-heading
MINOR SUB-HEADING
Sub-sub-heading.

Comments, corrections and suggested additions can be emailed to martham@clackamas.edu. Please note page number and sub-heading or paragraph in your notes. Please provide corrections and suggestions in complete sentences for ease in editing.

Your review will help move this process forward to the next step: Creating a sustainability plan in which the entire college community is invested.

Thanks again!

Contents

Through education and action,
the Clackamas Community College Sustainability Committee
aims to assess, plan and implement strategies
for social, environmental and economic sustainability
on campus and in our larger community.

- **Sustainability Committee**
  Clackamas Community College

"There aren't a lot of arenas in which we can look back in 50 years and say, "That really did make a difference!"

- **Elizabeth Howley**
  Sustainability Committee Co-Chair, CCC

Sustainability:

"...meeting the needs of present generations without jeopardizing the needs of future generations - a better quality of life for everyone, now and for generations to come. It offers a vision of progress that integrates immediate and longer-term needs, local and global needs, and regards social, economic and environmental needs as inseparable and interdependent components of human progress."
- European Commission, 2006

"We can't solve problems by using the same kind of thinking we used when we created them."
- **Albert Einstein**

"If it can't be reduced, reused, repaired, rebuilt, refurbished, refinished, resold, recycled or composted, then it should be restricted, redesigned or removed from production."
- **Berkeley Ecology Center**

"The character of a society is the cumulative result of the countless small actions, day in and day out, of millions of people."
- **Duane Elgin**

"Little acts have big impacts."
- Martha Mitchell
Sustainability Coordinator, CCC

Introduction

This document provides an overview of the resource conservation, energy efficiency and sustainability programs, partnerships, coursework and activities developed, accomplished or underway at Clackamas Community College, so that the institution's sustainability and climate neutrality goals can be identified and actions planned and implemented.

Context for College Leadership & Action

*Energy Efficiency & Resource Conservation***.** Clackamas Community College provides regional leadership in sustainability by adopting and teaching environmentally, socially and economically sustainable practices. The college and has a long history of engagement in these issues – integrating sustainable practices into campus life and infrastructure, developing demonstration projects for campus and region-wide educational communities and developing curricula for diverse student groups pursuing professional, technical, career, academic and basic and continuing education. The campus community is resolved to do more.

The realities of climate change, resource depletion, the impacts of population growth and a global economic crisis have focused attention on the need to reduce the energy consumption, greenhouse gas emissions and carbon footprints of residential, commercial, industrial and institutional structures. In a report to the U.S. Senate Committee on Environment and Public Works, the U.S. Green Building Council reports: [1]

> *"In the United States, the built environment accounts for approximately one-third of all energy, water and materials consumption, and generates similar proportions of pollution."*

It has become common knowledge that buildings are the single largest contributor to carbon emissions, producing more than 40 percent of total emissions. Further,[2]

> *"In the Pacific Northwest, despite relatively abundant hydropower, nearly half of all electricity is from coal, natural gas and nuclear power plants . . . "*
>
> *"Because buildings last for many decades, efforts to reduce emissions from buildings need to address both existing structures and new construction. More than half the building stock that will exist in 2050 already exist today. For that reason, . . . seek to improve the energy efficiency of existing buildings."*

Clackamas County, Clackamas Community College, the state of Oregon, the Federal Department of Energy and indeed, municipalities and states throughout the nation are focused on making the largest reductions in energy consumption and building efficiencies through the adoption of green

[1] From US Green Building Council. Feb. 2003. *Building Momentum: National Trends for High-Performance Green Buildings.* Prepared for the US Senate Committee on Environment and Public Works.
[2] From City of Portland and Multnomah County, *Climate Action Plan, 2008.*

building standards and the re-tooling of heating, lighting, cooling, ventilation, insulation and water systems of buildings.

College Board's Renewable Energy Goals for the Academic Year 2009-2010. Current efforts to reduce the carbon footprint of the three college campuses and their infrastructures are being focused on increasing building energy efficiencies. The College Board has charged the Campus Services Department to:

- identify improvements to better control energy consumption
- undertake energy conservation demonstration projects
- coordinate to provide students with educational opportunities based on the college's renewable energy projects

Significant progress has already been made to identify and make improvements to energy efficiency at the College, as noted in the third section of this overview. To date, solar hot water serves Pauling, McLoughlin and Randall, and "smart" energy efficient components and direct digital controls for heating, ventilation and cooling systems have been installed in the buildings in which they were most needed. These efficiencies have allowed the college to save nearly $1 million in utility costs between 2006 and 2010.

Workforce, Career, Academic & Technical Education & Training. Concurrently, the College engages business and industrial communities in a continuing dialogue to learn what academic, professional and technical education and training are needed to support the region's economy and workforce. New curricula and courses for professional development in sustainable practices and renewable energy and other aspects of emerging green technology continue to be developed. These are summarized in later sections of this document.

The College community recognizes that through its education and training programs, it plays a significant role in furthering the economic well-being of every household and business in the district. The idea is that when everyone does better, everyone does better. When businesses thrive and people have access to training and education that allow them to make living wages, they are able to make choices that affect their quality of life.

Many quality-of-life choices center on sustainability: choices about maintaining family health and hearth; choices about spending on utilities and weatherization; choices about education and training; choices about employment in sustainable businesses that serve a vital economy. In its mission to provide the best possible choices for the diverse populations it serves, the College also offers a range of services to high school students, differently abled students, returning adult students, veterans, students whose native language is not English, students wishing to retrain in new fields, and those seeking certificates, AAS degrees or transferring to four-year colleges.

Sustainability in College Systems. Increasing demands for and shortages of water make it critical for institutions to take a careful look at water use, water waste and opportunities for water reuse. The campus community has goals for integrating greater sustainability into its water use, waste and recycling programs, purchasing, transportation, management of campus grounds and stormwater, and infusing new practices in all of these areas into the College's academic, professional and technical education programs.

I. Sustainability & Campus Life

There is a growing societal imperative to create more sustainable organizations, neighborhoods, regions, cities, agricultural systems, resource uses, manufacturing processes, energy production and utilization, and world-wide trade and transportation. Awareness of these matters is shifting civilization's very perspectives at a global scale.

The College community has been paying attention as sustainability issues have emerged. Campus champions have adopted practices, developed programs and created outreach events that have helped sustainable principles and practices to become part of campus culture and campus life. Chapters I, II and III of this document attempt to capture the ways in which sustainability already has been incorporated into the College. The College community celebrates these achievements and eagerly looks to a near future in which they can turn their many ideas, enumerated in Chapter IV, into successful projects. Chapter IV also proposes an outline for grouping those ideas so that effective working groups can carry them out.

Past & Continuing Environmental Protection Accomplishments. The College has a track record for reaching and achieving its goals in environmental protection and for protecting the health & safety of the campus community. The many natural resource protection and health & safety initiatives of the of the '70s, '80s and '90s have been incorporated into facility and grounds planning and maintenance, and have become standard operating procedures. Some of these procedures are listed in this document. For example, water resource protection forms a core strand in the College's grounds maintenance program, stormwater designs, science programs and in opportunities on campus for interpretive education in conservation and natural resources. Health & safety provisions can be seen everywhere, affecting such things as materials and locations of office furniture, fuel & material storage, tool handling, universal access and signage.

The Sustainability Committee. An active, campus-wide, interdisciplinary sustainability committee, established in 2007, has nurtured and supported a growing culture of sustainability at the College. Accomplishments and activities include:

- Developed a mission statement: *Through education and action, the Clackamas Community College Sustainability Committee aims to assess, plan and implement strategies for social, environmental and economic sustainability on campus and in our larger community.*
- Helped promote a Lectures in Sustainability series, beginning in 2006, supported by the Clackamas Community College Foundation, featuring visionary speakers in the sustainability movement;
- Assisted to promote Green Screen, a series of films highlighting topics in human/global ecology;
- Helped promote The Sustainability Project, a communication campaign highlighting current and progressive information for the campus community through various media, including a newsletter with a calendar of events;
- Initiated a waste audit, which resulted in the establishment of improved recycling stations in each building.

- Convened campus community members interested in sustainability to garner ideas and support initiatives such as Campus Services' energy efficiency program.

Executive Group

- Incorporated triple-bottom line considerations (environmental, economic and social justice) into the College's core values and performance expectations for the Campus Services division.
- Established priorities for and implemented a $373,000 Pathways to Sustainability grant (AKA "The Green Grant") from the Oregon Governor's Strategic Investment Fund in 2009 to support many activities to infuse campus culture with activities to enhance awareness of global climate and sustainability issues.

Associated Student Government (ASG). In 2008, student government launched a campaign to educate the campus community about the waste inherent in the purchase of bottled water, and lobbied for construction of water bottle filling stations on campus. The filling stations were installed. Students also participated in the waste audit and recommended a more comprehensive and easy-to-use campus recycling system. Collection stations were expanded and signage was updated. In other activities to support sustainable campus communities, the ASG:

- collects food for families in need
- administers grants for childcare
- oversees student clubs
- hosts a book exchange
- houses the lost & found
- hosts events for students and their children
- runs a grants program for textbooks
- provides housing information for students
- rents lockers to students
- provides access to a free phone for local calls
- stages public debates and discussions to raise awareness about ballot initiatives
- oversees the student portal on the college's webpage & network
- hosts a number of events for the college community

New Student Orientation. Beginning in fall term, 2009, new students received a broad orientation to the College's sustainability goals, community partnerships, achievements, practices (recycling, etc.), studies, and technical and professional offerings. Moreover, they were acknowledged for the sustainability actions they take in their personal lives and invited to contribute to the College's efforts.

Student Sustainability Initiatives Club. This club was launched in fall of 2009, and is planning several events around the topic of waste and recycling.

Athletics Department. Annually, the department uses approximately 100 cases of paint in aerosol cans to mark soccer fields and cross-country courses. The cans are aspirated and drained and recycled. The drained contents are collected in a 55-gallon drum and hauled away by an approved contractor.

The department is moving away from using disposable plastic and wire flags for marking XC race lanes, and instead, using more reusable, recyclable polyethylene flagging to mark lanes.

College News (Journalism Department). Students produce *The Clackamas Print* and *Clackamas News Online,* regularly covering sustainability goings-on around campus. Examples

include the "Green Grant" activities during academic year 2008-2009, the $2.8 million energy efficiency projects accomplished with various funding sources during the summer of 2009 and interviews with sustainability champions at the College.

Campus Communications. The public relations office posts updated information on the campus website about the activities of the Sustainability Committee. The department also collaborates with the publications office on text and page designs to highlight renewable energy and sustainability projects and ideas for special publications.

Environmental Health & Safety Programs. The College has a full-time environmental health and safety officer who oversees environmental compliance and several other programs. Programs that help to maintain sustainable campus life and practices are listed below:

- waste and recycling (construction materials, used furniture, paper, bottles and cans, scrap metal, etc.)
- universal waste management (batteries, televisions, computer monitors, CPUs, fluorescent lamps, aerosol cans, refrigerants, etc.)
- hazardous waste management (solvents, batteries, oils, paints, wastes from photo, science and chemistry labs)
- stormwater inlet cleaning
- spill prevention and response training and readiness
- hazardous chemical emergency response and spill cleanup
- guidelines for materials handling, storage and containment
- Campus Services Safety Team
- industrial hygiene surveys for toxic vapor, gas, dust or noise
- asbestos identification and monitoring
- fire and life inspections and fire extinguisher inspection and maintenance
- emergency evacuation training
- coordination for personal protective equipment selection and coordination of respirator fit testing and issuance
- injury/illness incident reporting
- safety complaint investigation and resolution
- safety training for departments
- ergonomic evaluations
- hazard communication and training for use of Material Safety Data Sheets (MSDSs)
- first aid supplies for laboratory classrooms

Water Resource Protection (also see Stormwater, in a subsequent section of this synopsis)**.** The Oregon City campus, on 164 acres, has an extensive passive stormwater detention and treatment system, which safeguards habitats for threatened and endangered cold-water fish in a watershed to which campus stormwater drains.

Just-in-Time Purchasing. To reduce hazards of materials storage (e.g. spills, fires) the College has reduced warehousing of goods and materials, and, as much as possible, practices on-demand purchasing. Purchasing of alternative, non-toxic, non-hazardous materials is encouraged.

Centralized Printers. The use of centralized printers in departments and work groups decreases energy use and may contribute to the College's efforts to decrease paper use.

Telecommuting. In an effort to reduce the air quality impacts of employees commuting to campus, College Board policy allows instructors, adjunct instructors, staff and classified employees to productively telecommute with supervisors' permission and a plan for regular communication. College email is accessible to campus personnel from their home computers.

Commute Options. A College Transportation Committee is working with regional transportation planners and public transit providers to explore alternatives to single-vehicle employee commutes. The committee is developing a pilot project and incentives for carpooling and is evaluating a shuttle between the end of the light rail Green Line and the Oregon City campus.

Technology & Smart Classrooms. Increasingly, coursework involves less paper as instructors use smart technologies to engage students in learning. Approximately 90 classrooms have technology – including computers, smart boards, InFocus capabilities and Turning Point systems that facilitate student interaction with learning materials in PowerPoint formats.

Flexible Scheduling for Students. The economic vicissitudes of the past few years have created urgent training and education needs among all sectors of the College's student body – from the unemployed to the employed, from traditional students to career changers, from accelerated learners to those wishing to improve basic skills, from technical education to lower division transfer, and from traditional technicians to green technology workers. CCC has responded by offering additional sections of classes, technical skills classes, such as welding, during late evening hours, and through accelerated basic skills courses in which an entire term's material is offered in a condensed format.

Reduced Commuting – Four-Day Work Week. In an effort to cut down on resources expended for commuting to campus, employees who maintain campus landscapes, facilities and infrastructures work 10-hour days, four days per week, year-round. This is in keeping with the county's sustainability scheduling, in which all employees work four-day weeks year-round. All College employees work four-day weeks in summer. Additionally, many instructors telecommute, and employees have access to their email accounts from home.

Library Services

Dye Learning Center. The acquisitions librarian has acquired and continually updates the Library's collection of books about sustainability. The interlibrary loan librarian has a special interest in sustainability and serves as a deep resource in this topic for faculty and staff. In summer, the Library operates on reduced hours. The chair of the department is one of the College's bike-to-work champions and is an outspoken advocate of sustainable lifestyle, with expertise in solar systems.

Clairmont Media Center. The Horticulture Division maintains an extensive collection of resources about crop growing, gardening, landscaping, good production and sustainability.

Food Services
Oregon City Campus. The contracted managers of the cafeteria minimize food waste by forecasting customer needs daily and adjusting amounts of prepared foods accordingly. Tomorrow's salads, sandwiches and wraps are made with ingredients at the end of each day. Prepared foods that are left over at the end of the day are sold at half price.

Condiments are provided in bulk containers. The cups that look like Styrofoam are actually biodegradable, and the plates for grilled food and sandwiches are manufactured from bamboo shoots. Managers are evaluating more sustainable containers for bentos and salads. New napkin containers dispense only one napkin at a time, minimize waste.

Kitchen staff rinses and recycles cans, cardboard and plastic containers. A recycling station is available for customers. A second recycling station is being planned.

Plans are being discussed to acquire more efficient kitchen equipment.

Harmony Community Campus. A coffee cart located in the student commons provides snacks and locally sourced coffee.

Wilsonville Training Center. The utility partners provide food service to their students at this location.

Purchasing & Financial Services. This department tracks and reconciles the College's budget, grant funds, purchasing, expenditures, receivables, payroll, Foundation accounts and student financial aid. The department also conducts internal audits and prepares for third-party audits. Data from departments all over campus concerning finance, enrollment & registration is input to a robust, fully integrated program, Datatel. From this data, personnel in Financial Services are able to prepare reports and financial information supplied to campus personnel, board members, state agencies and the public.

The paper and time-saving attributes of such a system are enormous. In addition, many standard forms are now available online and can be filled out, submitted and filed electronically. These include W2s, W4s, and various other documents. College employees also receive electronic receipts for directly deposited wages and stipends.

This department recently participated in the Lean training, and is making even further departures from the paper world. Financial Services is interested in future implementation of electronic check payment for vendors, students and employees; online approval, online signatures and other paper- and time-saving processes offered by Datatel.

Information Technology (IT). The robust Datatel system also extends to administration, allowing students to apply to the College, schedule basic testing, register, make payments to the College, apply for and receive direct deposit of financial aid funds, add and drop classes, check grades, review and order transcripts, and review the schedule of classes. The system software, hardware and auxiliary systems such as Blackboard and Moodle, are maintained by the Information Technology department.

The IT department replaces approximately 250 to 300 computers annually, bringing new computers into laboratories and classrooms. The computers removed from labs and classrooms are put into service in instructor and staff offices. Computers in this rotation provide service at the College for seven to eight years. Operating systems must be updated as the computers move through service. When the computers reach the end of their service life at the College, they are donated to schools. The department has a contract with a state-approved company to pick up and dispose of remaining surplus computers and technology.

There are a handful of labs that use mobile computers. Despite their lesser energy requirements, the department at this time does not favor laptops over desktops because they cost more, are more vulnerable to theft, are more difficult and costly to repair and have a shorter service life (five years).

Recently, IT has been working to put phones on the same network shared by laptop computers, desktop computers College-wide. Some area printers are connected to phone lines, allowing documents to be scanned and emailed from the printer interface.

Student email accounts are provided through Microsoft's cloud mail service. Moodle, a system for aggregating multi-media information, is coming. On the horizon is desktop virtualization, in which computing is transferred to a central processing system. Multi-point communication (desktop video communication) is on the horizon. A backup generator for the servers will be installed soon.

Streamlining Processes & Decreasing Paper Use

The Lean System. The campus community has embraced a method for evaluating time and resources to complete procedural processes such as registration. By carefully evaluating the range of activities and steps through which a process flows, processes are being streamlined, resources such as time and paper are being economized, and people have time for other tasks. Staff and instructors are being trained in the Lean system.

Blackboard. Faculty is encouraged to participate in workshops to learn how to post classroom materials online and incorporate digital and other computer-accessible media into their courses. The College is considering a migration to Moodle, a personal learning system that enables users to organize and store digital information from a range of media and platforms. A continued migration to on-line learning resources may support the College's paper and energy conservation strategies. However, additional study is needed to determine whether students actually use less paper due to the prevalence of electronic teaching and learning media.

Moodle. Personnel in Information Technology will soon be launching Moodle, a digital personal learning system that allows users to aggregate information from multiple media sources.

On-line Registration & Course Evaluation Forms. The processes of registering and paying for classes may be completed online, saving resources and time for students and administrative staff. Some instructors also provide an online course evaluation procedure.

Bookstore

EBOOKS, DIGITAL MEDIA & BOOK RENTAL. The Bookstore carries eBooks, for which students pay approximately 65 percent of the cost of a new hard-copy book. Many of these books have highlighting, note-taking and test-taking features. Used textbooks, when available, cost about 75 percent of new. The College is testing a book rental. Rental programs have been shown to be cost effective for both colleges and students for courses that are taught frequently over a minimum two-year period. The rental fee is typically around a third of the cost of new. Some courses require students to purchase access codes to websites on which study materials are posted. On-line courses are increasing, and many instructors assign readings from the Internet. The Bookstore keeps detailed records about both electronic and hard copy course materials for all classes.

PACKING MATERIALS & PLASTICS. The bookstore recycles all manner of hard plastics, packing films and packing materials, including Styrofoam.

Paper Conservation. The College continues to seek ways to decrease paper use:

- Campus Services has eliminated desktop printers and shifted to a multi-function central machine. Color jobs are sent by email to Printing and Duplication.
- The Computer Lab printer prints all jobs on both sides of the page.
- All College Council meetings are paperless. Written materials are viewed on laptops or a projector screen, and informational materials, agendas and minutes are posted on the council website.
- Mass mailings to students have been minimized and will continue to decline. Each student has a "My Clackamas" account on the campus network, where College announcements, important dates and reminders are posted.
- Staff no longer automatically receives printed payroll deposit statements, but may opt to receive, view and download statements from their "My Clackamas" accounts.
- The campus community receives instant, time-sensitive electronic "FYI" notices when booting up computers.
- People submitting requests to Printing and Duplication are encouraged to send PDF files, not hard copies.
- The default setting for machines in Printing & Duplication is double-sided.
- Printing and Duplication uses 100 percent recycled paper and purchasing decisions consider sustainable forestry.
- All paper waste (save for punched holes) in Printing and Duplication is recycled.
- Paper recycling bins are spotted throughout offices, classrooms and buildings.
- Printing and Duplication will save paper printed on only one side and give it to instructors who request it for scratch paper.
- Toner cartridges in Printing and Duplication are recycled.
- Staff in Printing and Duplication share a business card.
- The College is working to improve electronic technologies that will make the registration process more convenient for students and administrators and eliminate paper from this process. Many College forms, including purchase orders, are available on the College website and can be filled out and submitted electronically.

- An automated email system now informs the campus community of campus closure due to weather or other emergency.

Students in ASG will soon be having a work session to discuss how to query students about how they use digital class media: Do they read it on screen or print it? If they print it, are they printing it at home or at the college?

Mail & Deliveries
Curtailed Summer Services
- Mail delivery and pickup on the Oregon City campus during summer are restricted to four days per week.
- Deliveries by courier to the Wilsonville and Harmony campuses are restricted to three days per week.
- Warehouse deliveries to all campuses are made on Tuesdays and Thursdays.
- Bookstore deliveries are made daily only at the start of term.

Services during Fall, Winter & Spring Quarters. Delivery and pickup of mail and packages return to daily service due to staff demand.

Campus Shipping & Receiving. Shipping and receiving occur on a level, paved pad in a covered bay in an area distant from the campus's main vehicular and pedestrian activities. Two labeled, ten-gallon buckets of spill response materials are kept within sight of goods being loaded and unloaded. All shipping and receiving activities are recorded, and records of this chain of custody are filed and maintained. The employees who handle and deliver the received goods have current training in forklift operation and spill response. Paper shipping materials are recycled.

An uncovered, sub-grade loading bay is adjacent to the receiving pad. The storm drain inlet in this bay is plumbed to an adjacent vegetated area to which drain water may be pumped when the sump fills.

College Fleet
Motor Pool. Four 15-passenger vans and a 15-passenger bus are available for general use by campus personnel. These vehicles are maintained by off-site certified technicians (see below). Detailing and inspections are performed by campus departments.

Driver Education Vehicles. A pool of 22 driver education vehicles is maintained by certified technicians who rotate tires, change fluids and filters off site and provide other safety related routine maintenance. College personnel do not handle motor oils, solvents or other materials associated with maintenance of driver education vehicles. The vehicles are washed at the College's covered wash facility or at an off-site commercial facility. They are parked at secured locations in the region where driver's education instructors will be working.

Geographic positioning systems (GPS) have been installed in all driver education vehicles. The whereabouts of each vehicle can be tracked, cutting down on unauthorized mileage. Idling time

can also be tracked. Drivers of vehicles whose GPSs record high idle times are contacted with information about the importance of protecting air quality by reducing or eliminating idling.

Campus Services Fleet. Used vehicles are purchased for the maintenance crews. The Air Quality Division of the Oregon Department of Environmental Quality gives the College credit for changing older vehicles out for newer ones with cleaner combustion and more efficient mileage. Fleet vehicles include two SUVs a small bus and a variety of work trucks.

Automotive Fleet. This group has a small pickup and a flatbed.

Bookstore Fleet. The bookstore has a van.

Equipment. The College owns three propane-powered forklifts (Warehouse, Automotive and Welding) two tractors (Grounds and Horticulture) and a Bobcat (Horticulture). A fourth, battery powered forklift, is assigned to the Warehouse.

Rental Vehicles. Enterprise Rent-a-Car provides additional vans as needed.

Fueling

- Campus Services keeps a spare 7-gallon tank of propane on site for the forklifts. This is swapped for a new tank as needed. This spare is stored in a regulation flame-proof metal cabinet in the warehouse.
- Spare gasoline for small gas-powered maintenance equipment is kept in a regulation flame-proof cabinet in the maintenance building.
- Spare gasoline for small gas-powered horticultural equipment is kept in a flame-proof cabinet in the brown barn in the Horticulture area.
- Two thousand gallons of regular gasoline are kept in an above-ground tank in the southwest corner of the northwesterly asphalt parking lot of the Clairmont complex. The tank is double-walled, to provide secondary containment in the event of a leak, as required by the local fire marshal and by federal and state regulations. The area around the tank is hachured with wide white painted bars and is protected by bollards. The former underground tanks were removed around 1992.

  Drivers fuel the vehicles they are using. The pump has a vapor return mechanism, a gauge to monitor leakage; a manual emergency cut-off switch for the pump and a breakaway valve that closes in the event of breakage - all required by fire code. The tank and area are signed: Flammable; No Smoking; Turn off Engine.

  Emergency spill response materials, including absorbents and a storm drain cover, are kept in the Lewelling building. Additional spill response materials are kept in the Automotive and Manufacturing areas.

Facilities Engineering & Maintenance

Materials and Best Management Practices. The facilities maintenance department has incorporated dozens of measures to safeguard both human and environmental health, through sourcing and use of environmentally friendly materials in furnishings, finishes and maintenance and cleaning supplies. Personnel in this department repair, remodel and refinish campus facilities to maintain a safe and comfortable environment for students and the College community. Toward this end, only water-based latex paints are purchased, and only in quantities sufficient for immediate use. Paints are no longer purchased in quantity so there is no need to recycle or dispose of deteriorated paint, and potential fire hazards are avoided. Paint colors are selected from a menu of 10 complementary colors, so that paint is easily obtained for touch-ups and left-over paint can be used for another project. Only low and no VOC (volatile organic compounds) glues and spray adhesives are used. The painting projects accomplished with Stimulus funds in summer ’09 utilized a local paint vendor and its line of no-VOC paints.

The entry way carpets selected for campus-wide use are manufactured from recycled plastic drink containers. As much as possible before making purchasing decisions, personnel evaluate carpeting and upholstery for the eco-friendliness and stability of their materials. The College maintains relationships with eco-friendly suppliers, whose representatives keep maintenance informed of new materials.

Reuse & Repair. Parts, used furniture and materials for repairs and are stored in a building that is no longer used for classes. Here, maintenance staff rebuilds locks, re-sizes doors and retrofits furniture for reuse. Used furniture no longer needed by CCC is given to schools in the greater metropolitan area.

Water Conservation. The College’s newer buildings have auto-flush toilets that utilize only 1.6 gallons of water with each flush. Older restrooms are retrofitted as funds are available and where older plumbing infrastructure allows. Each auto-flush mechanism is powered by four C batteries that are changed every two to four years, as needed, and recycled. The College is also installing a water reclamation system in the welding lab.

Sustainable Buildings. Managers in Campus Services have begun a project to develop flexible specifications for sustainable building design & construction. Under consideration are guidelines for indoor air quality & ventilation, universal access, windows & entry way designs, roof materials, passive lighting, heating, cooling, ventilation, and water use, conservation, metering & sub-metering, cleaning and process materials, and finishes and furnishings

Custodial Services

RECYCLING. Comingled collection of recyclable materials is practiced at the Oregon City and Harmony campuses. The Associated Student Government locates special containers in strategic places on the Oregon City campus to collect deposit-only drink containers so that they can redeem the containers for cash.

Recycling stations are located near the entrances of buildings and in dining and break areas. Custodial staff manages the recycling stations and also hand-sort selected recyclables from trash deposited in campus garbage bins. The College-wide recycling

system continues to reduce the cost of waste disposal. In addition, the purchase of a trash compactor in FY 1997-1998 enabled the campus to change from frequent vendor pick-up of 2-yard bins to once-a-week garbage pickup. This caused a marked reduction in annual cost of waste hauling and disposal, and this cost continues to go down.

At the Wilsonville campus, recyclable materials are still collected in separate bins, according to material, because that facility's recyclables are hauled by a different company that, until recently, did not comingle recyclables. The hauler now commingles recyclable materials from the campus.

Campus Services is beginning a pilot project to collect and recycle plastic films.

Styrofoam, hard plastics and wrapping films from Bookstore operations are taken by an employee to regional collection centers.

The College coordinates with its recycler and a representative of Clackamas County's Clear Stream Program to provide large events on campus with special collection containers for recyclables.

Scrap metal from Campus Services, the Automotive, Machine and Welding shops is collected and purchased by weight. Some of the metal is given to the company that provides the large drop for it. Proceeds from sale of scrap metal go into the general fund in some cases and back into the department funds in others.

The College purchased a trash compactor in 1998. This has allowed us to cut our garbage costs by 85 percent. Our annual cost for garbage disposal continues to go down as we recycle more.

CLEANING. The custodial department purchases Sustainable Earth chemically neutral cleaning products from a local vendor that specializes in water-based, soy, citrus and other non-toxic products. The department purchases only the supplies immediately needed, so that no products or cleaning agents are warehoused. The vendor provides one-day delivery service.

Four types of cleaning products are used: floor cleaner; a stronger, more alkaline cleaner for tables and counters; a cleaner for glass, chrome and mirrors; and a disinfectant for restrooms and classroom tables. On the Harmony Community Center campus, only Green Seal products are used.

The paper towels in campus restroom dispensers are locally produced with 100 percent recycled material by a minority owned company.

The custodial group no longer wipes down door handles and telephone handles. The frequency with which offices are cleaned and waste baskets emptied has been reduced from daily to once per week due to staffing and budget constraints. Staff are responsible

for emptying their own office trash and recycling into larger collection receptacles in each building.

Campus Services has purchased a brand of flooring that requires only water to maintain. There is no need to use wax or strippers. The machinery to maintain these floors can be used on other flooring materials as well, and the pads last twice as long as long as pads formerly in use.

Grounds Keeping & Landscape Maintenance. Groundskeepers maintain and oversee approximately 200 acres on the College's three campuses, including:

- turf
- perimeter fields and natural areas
- athletic fields
- ornamental landscape plantings
- sidewalks & hardscapes
- soft-surface trails
- community gardens
- the Environmental Learning Center, a community center focused on environmental education, located in a restored natural area in the headwaters of Newell Creek
- several somewhat disturbed native habitats, including forested wetlands at the headwaters of Newell Creek and the creek's riparian corridor, as well as remnant closed-canopy Douglas fir forests and oak/shrub habitats. Each of these is identified in landscape documents prepared by the College Grounds Committee. Some also are mentioned in the College's master plan.

The larger patches of native vegetation on the Oregon City campus are managed for habitat and native ecosystem preservation. The campus master plan calls for increasing the dominance of native vegetation toward the periphery of the campus as the distance from the clustered buildings increases. Wildlife needs are considered along with local fire department requirements in the development of mowing schedules for turf and fields near these natural areas.

Within the bounds of budget constraints of safety and security needs, the grounds keeping program generally adheres to the principles of an Integrated Pest Management Program. Groundskeepers spot mow and apply herbicide on a limited basis. Herbicides used are those for which the longest studies have been done and which have the highest safety ratings by the Oregon Department of Agriculture and the US Fish and Wildlife Service. Herbicides are purchased as needed and used up at the time of application to avoid bulk storage. Just-in-time materials are stored in an approved chemical storage structure.

The bulk of turf maintenance and herbicide and fertilizer application is contracted to vendors. Depending on turf or field, level of manicure, proximity to buildings and public safety needs, grass clippings are broadcast during mowing or taken to the horticulture composing area.

In 2009, watering ceased in all turf areas not actively needed for sports. Only the planting beds and active athletic fields are watered, and only as needed. This action has resulted in a decreased need for mowing as well as considerable water savings during the College's highest water use

months in summer and early fall. Grounds Keeping is approaching an absolute minimum use of irrigation water, using only the amount needed to maintain new plants.

Other sustainable landscape maintenance activities include:

- The new Harmony campus has irrigation controllers wired to a rain gauge and an evapotranspiration meter. The controllers can be programmed, and they have sensors that shut down area irrigation in the event of line breaks, leaks or rainfall.
- Also at the Harmony campus, rain water harvested from the roof waters native bunchgrasses and rushes and is infiltrated on site.
- Groundskeepers implement a limited, prioritized program to control invasive, non-native plants.
- There are native species plantings in a large courtyard at the Pauling Center.
- Vegetation in stormwater swales is maintained.
- There is a welcome planting of flowering perennial plants along the campus jogging trail at the main entrance to the Oregon City Campus.

Stormwater

Oregon City Campus. The campus is located on flat to gently rolling uplands in the headwaters of Newell and Caulfield creeks, small urban watersheds. Of the 164 acres comprising this campus, more than two-thirds (68 percent) are landscaped vegetated, and a minimum of two-thirds of the total campus acreage is required by the master plan to remain undeveloped and in a vegetated state. Stormwater from 51 acres of hard surfaces is managed, both in passive stormwater swales and ponds and in piped infrastructure.

Most of the buildings are clustered in a central location with native and ornamental landscape plantings and scattered trees in immediate proximity to the buildings. This core area of buildings is connected by a series of impermeable-surface walkways, breezeways and plazas which are surrounded by asphalt surface parking lots.

At a distance from the core area and parking lots are turf playing fields and lawns, shrub clusters, mown fields, scattered native and ornamental trees, remnant upland and wetland forest ecosystems and planted areas associated with the Horticulture Program. The remnant forests, some of which are not College properties, are protected by Oregon City's Water Quality Resource Area overlay zone.

Stormwater is piped from the western portion of the campus to a stormwater main in Hwy. 213 that discharges to Caulfield Creek. Stormwater from the adjacent Oregon City High School campus is piped from a detention facility to the headwaters of Newell Creek in the Environmental Learning Center (ELC). Also contributing stormwater to the headwaters of Newell Creek are drainage from a portion of Beavercreek Road and drainage from the eastern portion of the campus and its several seasonal detention ponds. Ponds in the vicinity of the ELC are protected by Oregon City's Water Quality Resource Area overlay zone.

Mitigation for construction of new buildings on campus resulted in the construction of a series of detention ponds and bio-swales to filter, infiltrate and detain stormwater. These facilities are at capacity and, during extreme runoff conditions, they overflow or back up. The 2007 Concept master plan calls for an integrated master stormwater plan that achieves "no net increase" and incorporates eco-roofs, downspout-fed rain gardens, permeable pavements, reconstruction of the ELC ponds and development of infiltration and detention facilities in the core area that, combined, will result in no net increase in downstream discharges from the campus and improved water quality discharged from the campus.

A section of open-graded, permeable asphalt has been installed in the handicapped parking area behind the Gymnasium. Campus Services personnel are monitoring it to evaluate the potential for replacing traditional paving with permeable pavements to minimize stormwater runoff. A section of open-graded asphalt on the campus loop trail is also being monitored.

The Oregon City campus has 39 stormwater inlets that receive runoff from campus parking lots, roads, walkways and other impervious surfaces. The stormwater system is a component of Oregon City's National Pollutant Discharge Elimination (NPDES) permit. Area storm drainage is routed to ponds that serve to detain flows, retain sediments, and, in some systems, provide biological uptake of pollutants.

All flows that outfall from the College ultimately enter the headwater zones of live streams. One, Newell Creek, provides habitat for anadromous fish. In February of 2010 the Greater Oregon City Watershed Council completed an environmental assessment of local watersheds, including Newell Creek. Recommendations for habitat improvement are included in this document.

Stormwater catch basins on campus are suction-cleaned by a contractor. In the bus turn-around area, catch basins are fitted with oil-filtering inserts to prevent or minimize spills of diesel, oils and fluids from entering the storm drain system, which ultimately drains to Caulfield Creek. The filters are supplied by Tri-Met and maintained by the campus environmental health and safety officer. Oil-water separators may be installed when key catch basins are replaced.

Harmony Community Campus. Stormwater from the new Harmony building is routed into planter boxes where rushes and other native plants thrive. The parking lots drain to outfalls on the slopes bounding the Mt. Scott Creek valley directly to the south.

Wilsonville Training Centers. The outdoor impermeable surfaces at the Wilsonville campus drain to 10 catch basins.

Commuting

College managers are evaluating options and incentives to reduce the number of single-vehicle trips made to the College. A pilot shuttle project was implemented spring term 2010. The shuttle provides free round-trip service between the end of the light rail line at Clackamas Town Center to the Oregon City campus and to Clackamas County's Red Soils campus. Clackamas County and Metro are funding partners. The shuttle is free and open to the public.

II. Education for a Sustainable Future

Environmental Literacy and Oregon's Sustainable Future (placeholder for Alison Heimowitz).

Community Need for Education in Green Sector Jobs. According to WorkSource / Oregon Employment Department[3], nearly one-third of Oregon's 51,402 "green" jobs in 2008 required a special license or certification. Green jobs are defined by the agency as:

- increasing energy efficiency
- producing renewable energy
- preventing, reducing or mitigating environmental degradation
- cleaning up and restoring the natural environment
- providing education, consulting, policy promotion, accreditation, trading and offsets, or similar services supporting the above activities

Professional Development. The College offers a range of short- and long-term professional development opportunities for people working in green sector jobs. The forms, delivery systems and timing are based on assessed needs of a business or an industry. Courses and workshops are offered to individuals, businesses, business consortia and employers in both public and private sectors.

Clients range from rural to urban, very large companies to very small organizations, high tech to low tech. Community partnerships are myriad, including Clackamas County, Oregon Energy Trust, Association of General Contractors, Northwest Hydrogen Association, PGE and others.

The Customized Training group at the College convenes key industry representatives for mini-summits to identify specific job skills their employees need to be successful. The group also connects industry to workforce partners with access to potential workers. These partners include Oregon Employment Department, WorkSource Clackamas and the College's Workforce Development Department.

The College then provides resources to develop targeted training to meet business and industry needs. Key industries for which the College provides contracted education services include:

- manufacturing
- transportation
- utilities
- sustainability
- high technology
- agriculture & natural resources
- landscaping
- healthcare
- human services
- construction / deconstruction
- retail
- public / non-profit
- professional services

[3] See Bibliography entry under Oregon, State of.

As a result of this deep connection to community workforce needs, the College has provided and continues to provide customized training for employers and industry in collaboration with numerous funding and technical partners. For example, in 2009, the Professional Development group convened a group of business owners and managers engaged in deconstruction to learn their needs for training employees and for information about where to recycle salvaged building materials.

In addition, the College seeks and receives grants to provide technical and professional "bridge" training programs for employed, unemployed, under-employed and newly employed workers. These programs provide opportunities for workers to add certifications to their existing competencies, licenses or certificates. In many cases, such programs have extended traditional craftsman, journeyman and professional skills into the realms of sustainability and renewable energy. For example, an electrician might obtain new certifications in photovoltaic and light emitting diode systems or other new electric technologies, and thus gain more marketable skills in Oregon's green economy.

Collaboration between the College's Professional Development Department and the Career and Technical Education Division has delivered 114 customized training programs to the region's manufacturing sector alone. The role of professional development in supporting new sectors in the region's expanding green economy is clear. Because most training takes place at the employer's place of business, transportation costs and impacts of providing this education are minimized.

The college's department of Customized Training & Development Services is working with Energy Trust of Oregon to implement a water conservation curriculum for plumbers. A sampling of other training workshops for professionals that touch on sustainability and/or extended professional certification include horticulture & landscape management; electronics and microelectronics systems technology, water and environmental systems technology and high-purity water production.

Technical Career Education/Renewable Energy. This division works with technical advisory committees to continually adapt curricula to reflect changing practices and technologies in the workplace. These discussions include the professional development needs in the green, renewable energy and sustainability sectors of the workforce.

In 2008 the division worked with its technical advisors to develop a curriculum (currently under review by the state), for ASS degree programs in a Renewable Energy Technology and Energy & Resource Management. Related curricula and course modules in the division concern alternative fuels, maintenance of hybrid vehicles, solar, photovoltaic and wind energy, as well as a general overview of geothermal energy. In addition to more traditional professional technical skills, the program encompasses electricity, electronics and microelectronics.

Other related accomplishments of the division concerning renewable energy education include:

- A new Utility Apprenticeship program began in fall of '09.
- Also in fall of '09, enrollment in Utility Workforce Readiness Pathways Certificate program and the Energy Resource Management AAS degree program increased by 250 percent.

- The Manufacturing Department is partnering with Oregon State University to fabricate prototype parts for wave buoys.
- Under a partnership with the Oregon Institute of Technology (OIT), CCC students are able to earn a transfer degree to continue in OIT's degree in renewable energy engineering.
- The advisory committee redirected some grant funds to support development of five new renewable energy courses, their accompanying labs and lab equipment.
- A new course, Renewable Energy Systems, was developed and two full sections were offered in spring 2009.
- A new course, Alternative Fuel Systems, has been developed and was offered for the first time in fall 2009.
- Two automotive faculty attended hybrid training.
- The automotive program is developing a specialty in hybrid vehicles and key faculty in this program have received specialized hybrid repair training. They are now working with Toyota to develop a hybrid component of the automotive maintenance curriculum.
- The Automotive Technology program, like many of the College's other technical programs, serves as a living lab in which the institution's commitment to environmentally friendly and resource conservation practices are infused, as noted below.

Automotive Technology. Students are trained in laboratories that employ U.S. Environmental Protection Agency (EPA) and Oregon Department of Environmental Quality (DEQ) standards of practice to safeguard both human and environmental health. The Automotive lab will soon become a DEQ training site.

The department has an extensive recycling program and students are trained to avoid waste when mixing paints and using materials. Listed below are the department's primary practices that support a sustainable automotive industry.

- Petroleum-based paint thinners are recycled on site and the residual sludge is baked into wafers that are collected by a contractor and burned to produce energy.
- Water-borne wastes from automotive paint finishes are recycled back into the paints.
- Metal scrap is sold and the proceeds are used within the department.
- Spent oils, anti-freeze, other fluids and used oil filters are recycled.
- Students' first class in this department addresses personal protection, spill prevention, response and cleanup and hazardous materials handling.
- Spray booths are used, and these are calibrated according EPA specifications.
- No steam cleaning is done.
- Vehicles are washed with cold water in a covered facility on a concrete pad. The solids vault below is suctioned by a contractor as needed. The handle that works the water valve must be signed out by anyone using the wash facility.
- There are no floor drains in the shop. Rinse water from floor washing is collected in a sub-grade vault and serviced by a contractor.
- Vapor hoods are used on parts washers.
- Maintenance fluids are stored in fire cabinets. Empty containers must be turned in at the parts store in the automotive lab when fresh containers are purchased. The empties are recycled.

- Empty aerosol cans are taken to the campus environmental health and safety officer, who manages hazardous wastes.
- Students take a course in alternative fuels.
- The department offers a special course in hybrid vehicle repair.

*Interdepartmental Collaboration on Education for Renewable Energy***.** The College takes seriously its role in the community as a leader and exemplar of sustainability, and is striving on many fronts to retrofit campus facilities and infrastructure for greater energy efficiency[4], to create innovative solutions for renewable energy production, to reduce consumption and waste and to provide examples of sustainable landscape management.

On the academic side, the Technical Career Division – which has developed new certificate and degree programs in Energy Resource Management and Renewable Energy Technology – is now collaborating with the Division of Science, Business and Mathematics to infuse courses in these disciplines with appropriate knowledge, skills and abilities concerning sustainability. This effort will assure that students in energy programs will engage in pertinent learning in the earth sciences, physics, chemistry, biology and quantitative analysis related to their career objectives.

Demonstration Projects, Project Development, Prototype Manufacturing

- Plans are underway to install a vertical wind turbine and solar panel array on a campus rooftop, with a readable panel mounted at pedestrian level for students and community members to observe. This installation is expected to produce enough power to run an overhead pole lamp.
- An instructor designed and developed a wind turbine from two-litre pop bottles and PVC pipe. This project garnered the attention of Clackamas County personnel, who asked to borrow the display. The College then applied for and received a grant to fund a build-your-own wind turbine workshop series.
- Students in the manufacturing program are building prototype components of wave energy turbines being designed by Oregon State University engineering students. The College hopes to expand this kind of partnership to provide real-life manufacturing education and service to the industry as the region's renewable energy sector grows.

Weatherization Installer Training

- Short-term weatherization training was offered in spring of 2009.

Gateway to Renewable Energy Education for High School Students

- Work has begun with Gladstone H.S. and the Oregon Institute of Technology to offer renewable energy instruction for high school applicants to AAS and bachelor's degrees.

*Training & Education in Utilities & Energy Resource Management***.** The College's Wilsonville campus provides training and education in partnership with PGE and PacifiCorps. Workers in the utility field pursue training here and the College offers the following programs:

- Utility Workforce Readiness Career Pathway Program: Two-term certificate

[4] Greater detail on the College's energy efficiency undertakings is provided in Chapter III of this document.

- Energy & Resource Management: One-year certificate & AAS degree
- Utility Pre-Apprentice: Line Worker – One-year certificate
- PSU Transfer Agreement

The division is initiating a renewable energy field laboratory, planned to include solar photovoltaic panels, a vertical wind turbine and a wind turbine blade repair facility.

Community Partnerships / Business & Industry. The College has a long history of nurturing regional business and industry partnerships through its strong Apprenticeship and Professional Education and Workforce Training programs. Consistent service to the larger community in these respects has garnered the College more than 165 professional education partners and many joint partners in research, development and work experience. Members of the business and industry community serve on the College's advisory committees, together with subject experts, of whom many provide expertise as adjunct instructors.

Primary partners in renewable energy include:
- PGE
- Energy Trust of Oregon
- PacifiCorps

Academic Instruction. All departments and student learning services at Clackamas Community College are looking at additional opportunities to integrate sustainability into curricula. Past and current activities in this regard are briefly summarized below.

Renewable Energy Demonstration Projects. Academic department deans share a common goal to implement renewable energy projects on campus, and to integrate the embodied principles and technologies of these projects into interpretive kiosks in pedestrian areas and into coursework, curricula and classrooms campus-wide.

Arts, Humanities & Social Science. The articulation of sustainability goals for the campus gained early momentum in the College's Arts and Social Science Department, where campus-wide dialogue began about resource use, human behaviors, campus life and the need for cultural change. This ultimately inspired shifts in the College's waste management and recycling systems and was the catalyst for the founding of the College's Sustainability Committee in 2007.

The Sustainability Committee inspired the College to join the American Association of Sustainability in Higher Education and to take advantage of its resources, including assessment protocols. The committee continues to serves a vital role in generating and maintaining campus-wide interest and engagement in a wide agenda of sustainability initiatives.

> PATHWAYS TO SUSTAINABILITY. Today, the Arts, Humanities and Social Science Department offers a three-course, 15-credit series, Pathways to Sustainability. The classroom activities are modeled on the Socratic method, with students exploring the topic of sustainability through reading, analytical thinking, writing, discussion and

inquiry. The goal of the three-course series is to foster critical thinking, communication, appreciation for the diversity of human experience and the development of social ethics and responsibility. The instructor serves as a facilitator to engage students in the exploration of ideas, and students earn a grade on the basis of their own evaluation of their ambition, commitment and engagement in the course. This hybrid course provides a deep overview of this growing field and serves as a gateway to other courses offered in science, manufacturing and technology.

LECTURE SERIES FOR CREDIT. The Sustainability Committee is developing a lecture series on topics in sustainability that students will be able to take for credit.

ART CENTER. The use of barium, a heavy metal used in glazes, has been discontinued in the ceramics labs. The drainage systems in the ceramics lab sinks have been modified to strain larger clay solids and to filter clay particles. Un-fired clay is recycled. Ventilation hoods have been installed in the areas where fine glaze and plaster powders are handled. Spent photo developing chemicals are collected and picked up by a vendor for disposal. Oil-based paints have largely been replaced by acrylics.

Business, Math & Science. Undergraduate research is alive and well in selected science and technology classes, where it is incorporated into curricula in place of cookbook lab assignments. Students contribute to long-term data sets by applying new technologies to campus environments. They later gain opportunities to analyze and model these "real-life" data sets to make recommendations based on their findings.

WATER ENVIRONMENT SCHOOL. The Science Department puts on an annual "Water Short School" for people who manage and maintain sewer, wastewater and stormwater systems. Concurrent short courses in a wide range of topics are taught by industry experts over several days. The program is widely attended by municipal and state employees from every region of Oregon.

SUSTAINABLE BUSINESS COURSE. In spring 2010, the Business Department will be piloting a new, 1 credit course, BA199 "Sustainable Business". This course provides a balanced look at the impacts of adopting a sustainable approach in business. Course topics include sustainable sourcing and production strategies; cradle-to-cradle manufacturing, measurement and reporting strategies; responsibilities to stakeholders and the changing role of business in society.

COMPUTER SCIENCE. In a process dubbed *Go* Print, students using the open computer labs are allotted a certain number of pages they may print on the central laser printer. Page allotments are made on the basis of the student's credit load. After sending their selections to the central station, students must enter their identification number and confirm the print jobs they've sent to the printer. Staff observes that this second step – signing in and verifying that they truly want to expend page allotments – has reduced the amount of printing being done in open lab printers.

Survey of Computing. This basic computer literacy course typically has 12 sections and enrolls the greatest number of students of any single class offered at the College. It has been re-designed as a paperless course. The new book was co-authored by several people in the Computer Science Division and Chapter 1 is about sustainability.

HORTICULTURE PROGRAM. Nursery products comprise Oregon's principal export and the College's horticulture programs provide regionally significant education and training to the nursery, greenhouse and landscaping sectors of the region's horticulture industry. The principles of environmental stewardship are embodied in horticulture education where, through their work and studies, students care for both human and ecosystem health by caring for the earth, soils, plants and crops.

In keeping with the College mission, the Horticulture Department provides quality education and training for industry and community members. Course offerings in Greenhouse, Landscape, and Nursery Management integrate technical knowledge, practical skills, and environmental stewardship.

As students gain knowledge in the scientific underpinnings of horticulture, they are inspired and empowered to sustain their families, their communities and the businesses in which they work as interns, and later, as employees. Through their application of sustainable business practices, waste is minimized, materials are reused and repurposed, the local economy is supported through sourcing and purchasing, soil is safeguarded and water and energy are conserved.

The Horticulture department works with a consortium of Clackamas River water providers to provide the community with a wide range of workshops that demonstrate water conservation practices, from selection of low water use plants and use of mulches, to irrigation equipment with remote digital control systems.

This department has extensive ties to the community. In the past decade, students have held internships with 192 different nursery, greenhouse and landscaping businesses in the region. In addition, students are supported by diverse scholarships from the regional horticulture community and beyond.

The programs continually incorporate sustainable practices into campus demonstration projects that serve diverse community education audiences. These include:

- students in Horticulture and Landscape certificate and programs
- visiting K-12 audiences
- Metro community outreach workshops for the public
- Area garden clubs

Demonstration projects

- Water-Efficient Demonstration Garden (mulches, irrigation systems, low-water-use plants, dry shade garden, edible garden, native garden, Pacific Northwest garden)
- a composting demonstration area

- an eco-roof demonstration
- a perennial rose & herb garden with organic practices
- the organic, All-America Vegetable and Flower Gardens, including The Organic Insectary Display

Volunteers constructed an additional greenhouse for a year-long workshop in growing edible, organic crops year-round. The workshop began fall term, 2009.

Environmental Learning Center (ELC).
This education outreach program to the community is housed under Horticulture, in the Science Department. The center has two part-time faculty who receive support from a variety of partners region-wide to bring environmental education to students in kindergarten through twelfth grade. The ELC's education focus is water, watershed health and watershed management. Located in the headwaters of Newell Creek, the ELC is at the gateway to Newell Creek Canyon, which possesses some of the region's most significant spawning habitat for coho salmon and steelhead trout. Faculty leads field trips at the site and takes programs into classrooms.

Instructors also provide professional development education to teachers, helping them become better environmental educators by developing their skills to facilitate inquiry-based learning and critical thinking for informed decisions on ecosystem management. Faculty at the ELC worked with funds from the National Science Foundation to develop a degree program to train students to become environmental educators. This program will articulate with Oregon State University's teacher education program. This environmental education for educators program has not been launched at Clackamas Community College.

Interdepartmental Collaboration. The Business, Math & Science Division will be collaborating in Academic Year 2009-2010 to integrate basic education in these disciplines for students who will be going on in renewable energy fields. Instructors will be engaged in a process to evaluate sustainability modules that can be incorporated into existing courses. The Business Department has developed a new course, Sustainable Business, which will provide a balanced look at the short- and long-term impacts of adopting a sustainable approach that includes cradle-to-cradle considerations and triple-bottom-line accounting (people, planet, profits).

Distance Learning. Distance learning opportunities fill a need for flexibility in scheduling that today's busy students need. Approximately 6.6 percent of the 34,170 enrollments in transfer-level course sections in fall 2008 were for distance learning sections. Students who cannot attend College full time are able to take some courses online, or take an additional course that otherwise would not fit into their schedules. The availability of distance learning options supports the community's education needs and at the same time, may reduce paper use, and reduces building energy use and resources used to drive to and from the College.

Instructors frequently prepare electronic course materials at home and post them online for their classes. Telecommuting and the availability of online course materials further reduces the College's paper usage and transportation impacts.

Personnel in the College's distance learning office help instructors develop and design remote learning courses. The office provides weekly drop-in sessions as well as short workshops on e-learning and best practices in course design.

The Distance Learning office assists instructors to keep students engaged by assisting them to adopt e-classroom techniques that appeal to visual learners who are peer oriented: discussion boards with threaded discussions, videos, conferencing, interactive simulations, music, assignment rubrics, interactive web authoring and the ability to interact with instructors.

The College offers two hybrid courses as distance learning options[5]: Orientation to Energy Resource Technology (3 credits) and Energy Resource Technology (3 credits).

Extended Learning. The College is required by law to provide adult compensatory education to its community, and manages 14 such programs, distributed about evenly between skills development programs and programs in which students may earn both high school and College credits. These programs contribute to the College's sustainability efforts by assisting people to gain skills to become employable and thereby, to sustain their families. Enhanced with increased knowledge and with living wages, these individuals go on to practice sustainability in their families by managing budgets, conserving water, gas, electricity, food and fuel and teaching conservation to their children. At work, they practice sourcing and purchasing products that safeguard human health and safety, look for ways to make production more efficient and less wasteful, and recycle, pre-cycle and reuse resources.

Skills development programs include:

- Adult Basic Education
- General Education Development (GED). These courses are taught in English and Spanish and lead to the GED certificate.
- Young Parents Opportunity Program, also leading to an adult high school diploma or GED.
- The Gateway to College Program supports high-risk youth to earn a high school diploma. This program is also a dual-credit program.
- English as a Second Language Programs
- Program of Intensive English for international students.
- Credit developmental classes enhance students' basic skills in reading, writing and study skills.

Dual-credit programs include:

- Advanced College Credit. This program allows high school students to take courses that are certified to have college-level outcomes so that they may earn both high school and college credits simultaneously.

[5] "Hybrid," meaning multiple delivery methods and media, e.g. field trips, online study, lecture, movies and events, etc.

- High School Partnerships. In this program, students take college-level courses taught by College instructors at high school campuses.
- Extended Option Program. This program is tailored for high school students who have completed their matriculation requirements but have not yet graduated and wish to pursue supplemental education.
- The Smart Internships Program provides cooperative work experiences for high school students.
- The Bridges Program supports students who have already earned a high school diploma from their local high schools, but who need additional transitional support to further training, education or workforce skills.
- Clackamas Middle College (in partnership with the North Clackamas School District). This charter school program provides an alternative pathway to the high school diploma, allowing students greater freedom to organize their curriculum, and preparing students for College admission. Clackamas Community College instructors go to the high school, and/or students come to the College for classes.)

Education, Early Childhood Education & Human Services. Aspiring teachers may complete lower division coursework at Clackamas Community College, and then transfer for their upper division work. Students who want to become directors of public or private day care and home care programs may earn certificates or AAS degrees in Early Childhood Education at the College. Students working with families at risk may pursue a certificate in family development.

In all of these fields of study, learning modules are taught in environmental health & safety, and sustainable choices in the selection and purchase of materials. Acquiring baseline education and skills empowers people to understand and participate in a variety of society's sustainable efforts. For example, people who are able to buy a house are likely to take an interest in weatherization and energy efficiency because these things affect their budget. People who are educated are less likely to be exploited in the labor market and more likely to be invested in their communities. By extension, social justice is served by education, and sustainable communities grow from this balance. In other words,

> *"Everyone does better when everyone does better."*
> - Anon.

Continuing Education of Campus Services Staff. Staff who monitor and maintain the College's HVAC technology are trained in the new technologies and their digital control systems, and they continue to attend specialized vendor-sponsored training sessions, pursue additional licenses and certificates and to attend professional development courses.

Articulation with High Schools, Colleges & Universities. Clackamas Community College works to enhance and sustain career pathway continuity in the following ways:

- improve high school student access to professional technical opportunities and career pathways at the College, particularly in the field of renewable energy[6];

[6] The college has developed a Sustainability Pathway in its High School Pathways to Postsecondary project.

- has developed a Sustainability Career Pathway for CCC students;
- sustains relationships with all high schools in the county and has active recruiting programs and events;
- develops and updates articulation agreements between Gladstone High School, the College and Oregon Institute of Technology;
- provides the first year of instruction for students wishing to transfer to Columbia Gorge Community College's Wind Technology Program;
- works to provide clearer transfer pathways for students wishing to enter Oregon State University, the University of Oregon and Oregon Institute of Technology.

III. Energy Efficiency & Renewable Energy

Oregon City Campus – Existing Conditions

Energy Use. In 2005, the engineering team in Campus Services took actions to improve energy efficiency at its three campuses. In that year, the Oregon City campus consumed nearly a half-million dollars in energy. The team undertook technical, economic and financial analysis of lighting, heating, cooling and ventilation equipment, studied energy consumption and emissions and investigated the performance of its pneumatic, hydronic, electrical and electronic control equipment.

The engineering team then ran models to calculate potential savings, reduced emissions and improved comfort if various parts of the lighting, ventilation, heating and cooling systems were replaced, expanded, remodeled, decommissioned, or control sequences modified. A new control system, or direct digital controller, was put in place. It monitors building energy consumption, is programmable, can respond to building conditions and can be remotely observed. The result was a savings of 402,471 kilowatt hours for fiscal year 2005-2006. At the end of fiscal year 2008-2009, the College had avoided consuming a total of 1,783,638 Kilowatt hours, and had accrued a minimum savings (accounting for pricing schedule variations related to peak and off-peak usage) of $214,037. In fiscal year 2009-2010 the targeted savings is $150,000 in unspent utility budget. The three-campus system is presently maintained by three people.

In the summer of ’09, the Oregon Stimulus Program funded more than $1 million to construct and install smart and green HVAC technology controls and components. Some of the new equipment includes atmospheric dampers, ventilation economizers, improved hydronic systems and building automated room scheduling controls. In most buildings, room sensors send data to a local area network, and automated logic controllers make adjustments according to programmed set points, and, in some cases, in response to room occupancy. These infrastructure upgrades will further reduce the College’s energy use and carbon footprint. The engineering team can provide reports on projected energy savings as needed.

*Lighting***.** The College has been retrofitting lighting on its main and satellite campuses for about 15 years, starting with the installation of T-8 florescent lamps, a lower-mercury, longer-lasting lamp than the incandescent and T-12 fluorescent lamps in previous usage. In the past few rounds of construction, even lower-mercury, higher-efficiency T-5 florescent lamps have been installed. With a life of five years, the lamps have reduced maintenance frequency. In facilities such as the gymnasium and theatre, which have many lamps in their overhead lighting systems, this change has resulted in significant energy conservation and improved lighting quality.

During the design/selection process for new site lighting, fixtures were selected with dark skies guidelines. Outdoor pole lights on campus are hooded to limit light pollution of night skies. The lights go out between 11:15 p.m. and dawn.

Recently constructed buildings have included motion-detection sensors to control lighting.

Heating & Cooling. Campus Services is phasing out the use of R12 refrigerant, a chlorinated fluorocarbon, in cooling systems. R22 refrigerant, a hydrochlorinated fluorocarbon, is being minimized or phased out where possible. The chlorofluorocarbons are a family of volatile derivatives of methane and ethane harmful to the ozone layer in the earth's middle atmosphere. This layer absorbs 93 percent to 99 percent of the sun's high frequency ultraviolet light, which is potentially damaging to life on Earth. Where practicable, these refrigerants are being replaced with R410A, which is not as harmful to the ozone layer, but is still a greenhouse gas and must be controlled and contained much the same way as the older phased out gases such as R-12. The old refrigerants are carefully collected and recycled or reclaimed by a certified handler. Campus Services staff handing these products hold the required license to safely handle refrigerants.

Water Pipe Insulation. The College has insulated all above-ground and in-building pipes that convey domestic water supply, chilled water supply, water to the boiler and condensate from the boiler to reduce uncontrolled energy losses in these systems.

Solar Panels produce hot water for sinks and showers in Randall (the Gymnasium), the Pauling Center C and the McLoughlin building.

Natural Gas powers two low-pressure steam boilers in the Oregon City campus's Central Plant. Additional boilers are located in Gregory Forum, the Dye Learning Center and Street Hall. Many of the buildings are supplied with heat and hot water by means of heat exchangers in the distribution system.

In 2004, Campus Services' engineering team undertook modeling and redesigned the boiler controls. The system can now be remotely monitored, activated and shut down in response to outside temperatures and individual building requests. Savings from these optimization actions in the 21 months between September '04 and June '06 were 93,559 therms, at a value of $94,825.

Short-Term Energy Efficiency Goals - Oregon City Campus

Be More Self-Sustaining with Renewable Energy. In a bold move to be more self-sustaining with renewable energy within five years, the College intends to fully develop an alternative energy infrastructure at the Oregon City campus, utilizing renewable resources that may include solar, wind and geothermal resources and co-generation capabilities. Concurrently, the College will develop additional courses to add to its existing programs in Renewable Energy Technology and Renewable Energy Management. In addition, fundamental learning in renewable energy, climate stabilization and sustainability will be infused into curricula in business, math and science.

The renewable energy capacities at the Oregon City campus need to be assessed, and efficiencies, paybacks, credits and synergies of various scenarios evaluated. The Campus Services Division of Clackamas Community College is coordinating this effort and hopes to have Phase I engineering plans, financial instruments and energy grid partners finalized by summer quarter of the 2009-2010 academic year.

*First Step: Renewable Energy Demonstration Projects***.** A team in the Renewable Energy program is embarking on renewable energy demonstration projects that will contribute to the campus's alternative energy infrastructure system. The projects will use local wind, solar and geothermal energy to reduce dependence on the central energy grid and increase efficiencies of existing system. There is great interest in the education and training opportunities inherent in these demonstrations.

Assess Energy Efficiency of Buildings & HVAC Systems. In 2010, Campus Services will be contracting for additional energy efficiency assessments of Oregon City campus buildings and utilities. The findings of this analysis will guide the exploration of on-campus renewable energy sources that could be developed to reduce energy purchases.

Develop Projects to Showcase Ancillary, Local, Renewable Energy. Augment the efficiencies of the College's existing systems by bringing three sources of renewable energy online.

- In a second demonstration project, outdoor lighting energy needs would be supplied by a hybrid system of hooded, solar/wind-powered lights.
- A consulting company will be investigating options to further optimize the heat and hot-water system by: 1) converting to condensing boilers, and/or 2) adding steam turbines to steam conveyance pipes for the purpose of co-generating power; 3) Installation of additional solar thermal systems.

Ground Source Cooling. In fall of 2009, Campus Services used Go Oregon funds (federal Stimulus money) to begin installation of a ground-source cooling project at the Lewelling building that uses the principles of heat transfer between water in the system and the ground. This project is expected to cut building heating and cooling costs up to 50 percent. Reductions in heating and cooling costs will be monitored.

Install Higher-Efficiency Lamps in Selected Locations.

- Replace metal halide lighting in the library with LED or newer technology lamps to reduce heat emissions and increase energy efficiency in this building where lights are on all day and into the evening.
- Investigate options to convert breezeway soffit lights to LED or newer technology lamps.
- Install additional occupancy sensors in selected locations.
- Install pilot site lighting project to test hybrid- (solar/wind) powered outdoor lights.

Investigate Co-Generation in Central Plant. Investigate the potential for steam-powered generators in Central Plant's low-pressure boilers.

Wilsonville Training Center

In 2001, the College constructed an environmentally friendly 35,000 square-foot addition to an existing 12,000 square-foot structure built in 1992 in Wilsonville, Oregon. Basic materials were used, including concrete floors. An open commons area sets the tone for community and

collaboration, and large ground floor and clerestory windows bring daylight into the common space. The double-height commons area can accommodate up to 250 people, and the building is designed to be flexible, allowing standard classroom modules, a variety of seating arrangements and three sizes of classrooms.

This campus is home to the Utility Training Alliance, a Clackamas Community College partnership with PGE and PacifiCorps. The partnership offers opportunities for occupational training and career advancement to employees of the two utilities. The utility companies provide management training in portions of the building, and the College provides training for utility workforce engaged in transmission corridor maintenance. In addition to utility workforce training here, students in the Energy Resource Management certificate and degree programs attend classes at the center. Students may also pursue the six-month Utility Workforce Readiness Pathway certificate which leads into the Energy Resource Management certificate and degree program.

Instructors from the Occupational Safety and Health Association (OSHA) teach free classes at the center. Academic advising, enrollment and testing services are offered at the center and students may pursue general education courses taught evenings and weekends. A dining area, a commons and a bookstore are available, and the center may be rented by community groups for special events & parties.

Funds from the Workforce Investment Council of Oregon and the Workforce Investment Act are provided directly to this center to manage workforce training at the county level. The College assembles resources to deliver training.

Harmony Community Campus

Community Collaboration Creates Community Campus. To inspire and help guide the future of a 100-acre site at Harmony Road, Sunnybrook Road and 82nd Avenue, an unprecedented alliance of partners met to work toward developing a unified vision for the area. Together with citizens and business leaders, this partnership of Clackamas Community College, the Oregon Institute of Technology, North Clackamas School District, North Clackamas Chamber of Commerce and Clackamas County's departments of Transportation and Development, Business and Community Services and Water Environment Services developed the following vision, purpose and mission, guiding principles and name – the Harmony Community Campus – as a framework to help guide future activities on the site:

VISION: The Harmony Community Campus is a model for sustaining the vitality of the economy, environment and community in Clackamas County and the region.

PURPOSE: To increase opportunities for community members to learn, enhance health and fitness, observe and enjoy nature and gather together.

MISSION: The Harmony Community Campus will be a model for a healthy economy, incorporating a variety of educational opportunities, alternative energy uses and green

development practices. It will provide resource protection, conservation and alternative transportation, and will enhance natural habitats and the ecology of the area. People will be encouraged to use public transportation, bicycles, walk or carpool to access the area.

GUIDING PRINCIPLES:

What we do:	How we Do it:
Provide lifelong learning	Ensure transportation choice & accessibility
Demonstrate sustainability	Utilize smart growth principles
Ensure environmental stewardship	Demonstrate shared leadership & responsibility
Support economic development	Model collaboration, cooperation & civic engagement
Promote healthy living	

PARTNERS AT HARMONY COMMUNITY CAMPUS:

- The Oregon Institute of Technology is redeveloping to accommodate the expanding university and renewable energy program.
- Clackamas County Transporation & Development is helping citizens and businesses create vibrant, sustainable communities.
- North Clackams Aquatic Park is providing community based social and recreational experiences.
- Clackamas County Water Environment Services is managing and improving watershed and community health.
- North Clackamas Parks & Recreation District is providing recreational experiences and environments for all ages and needs.
- North Clackamas Chamber of Commerce is committed to a vibrant business environment.
- North Clackamas School District strives to attain excellence in education.
- Clackamas Community College is meeting growing educational, workforce & training needs.

Collaboration with the Medical Community. During conversations of a blue ribbon committee comprised of health care providers, it became clear that there was a need to provide education and technical training for the workforce required by the vibrant medical industry in the area. Pre-design charettes were held with the building's neighbors, future occupants and its designers - the architect, engineer, landscape architects, mechanical and lighting systems engineers and others. A vision for a healthy, sustainable building grew, and was realized in the construction of a 45,600 square-foot building that serves not only dental and medical training needs but general education as well. The center includes a bookstore and has been in operation since 2008.

Today, the new Harmony education building provides a home for the College's thriving health sciences programs, as well as meeting community needs with a large program in English as a Second Language, community education classes, basic skills and general education, and student services. The Clackamas Small Business Development Center is housed in the adjacent Oregon Institute of Technology's satellite campus facility.

A Sustainable Building is Conceived & Constructed. A design objective for the new building was to make it 15 percent to 20 percent more energy efficient than required by Oregon's building code. Sustainable elements of the building include:

SUSTAINABLE DESIGN ELEMENTS:

- Passive solar exposure for light and heat reduce energy use and make the building interior a very pleasant place to be.
- High performance windows minimize heat gain and maximize light transmission.
- Translucent window shades are light colored on the exterior to reflect heat and dark on the inside to reduce glare on computer monitors.
- Daylight sensors within the laboratories automatically adjust lighting levels.
- Stormwater from the roof is routed into retention / flow-through planters built against the building. Inside, a commons area is enlivened by the colors and textures of the native shrubs, rushes and grasses in the planter.
- Exterior sun screens prevent low-angle direct sunlight in winter from entering the rooms and causing glare.
- Re-lights, or interior windows allow interior spaces to be lit by daylight that penetrates into the building's center.
- The building is tobacco and smoke free.
- Light colored roofing reflects heat, reducing cooling costs.
- Low-maintenance, durable materials are utilized for the building exterior.
- Polished concrete floors are durable and require little care.
- Radiant heat is supplied to the lobby by heated water in plastic coils within the floors.
- Many of the products used in construction are made from partially recycled materials.
- Interior finishings, furnishings and paints were selected fo no- or low-volatile organic compounds, in keeping with the building's primary use as a community center and a medical training facility.
- The building complies with ASHRAE 62.1 (standard for indoor air quality) and ASHRAE 55 (standard for thermal comfort conditions for human occupancy).
- There is carbon dioxide monitoring in all high occupancy locations.
- There is no use of ozone damaging chloro flourocarbon-based refrigerants for cooling systems.
- Restrooms have low-flow fixtures and sensor-operated faucets.
- Ceiling tiles have a high light reflectance (90 percent), which helps to minimize the amount of artificial light needed.
- Mechanical and electrical rooms are located in a secured, spacious central workspace that can be expanded to serve new buildings in the future. The systems are operated with direct digital controls

SUSTAINABLE MATERIALS:

- Light gage steel products contain 50 percent or higher recycled materials.
- The majority of the insulation is formaldehyde-free and contains a minimum 25 percent recycled content (at least 20 percent post-consumer).
- Gypsum board on exterior walls has a scrim of fiberglass, which provides no surface for mold to grow on.

- Linoleum bulletin boards are made from renewable raw materials.
- Carpets meet the testing & product requirements of the Carpet & Rug Institutes Green label Plus program.
- Ceiling tiles have 72.7 percent recycled content and have an anti-microbial coating and humidity resistant properties to protect against mold and mildew growth. The tiles have no added volatile organic compound (VOC) formaldehyde.
- Composite wood and agrifiber products contain no added urea-formaldehyde resins and are produced in Oregon.
- Architectural paints, coatings and primers applied to interior walls and ceilings do not exceed the VOC content limits established in Green Seal standard GS-11. No VOC paint products are used on interior spaces.
- Concrete mix contains 10 percent to 15 percent fly ash (a by product).
- Light fixtures were selected to reduce light pollution.
- Ten types of construction waste were collected & recycled.
- Solid surface counters in rest rooms are made from recycled materials.
- White boards and rubber flooring are GreenGuard Indoor Air Quality certified.

CLASSROOMS. The classrooms have high-tech podiums with computer ports, document readers, InFocus projection capabilities, and, in some locations, video conferencing capabilities. Modular furniture in the classrooms lends itself to various configurations to meet students' and instructors' needs. Recycling containers are located at the student mailbox area and in other central locations. The building has no vending machines. Staff decided instead to offer a coffee cart to building users, stocked with locally purchased and made items.

CONTROLS. Building HVAC systems can be monitored and controlled remotely.

IV: Opportunities to Achieve Greater Sustainability

Introduction

It is clear that the College has already gone a long mile to integrate principles and practices of sustainability into every aspect of college life, education and facilities planning, operations and maintenance. A host of campus champions has initiated projects, processes and initiatives to drive these changes. Members of the Sustainability Committee have brought forth many additional ideas to more deeply infuse sustainability into campus life and practices.

This last section, the *Opportunities* section of *Sustainability Assessment for Clackamas Community College* is a collection of ideas to be considered as the *Sustainability Plan* is developed. These ideas are derived from several sources:

- ideas of people interviewed for this *Sustainability Assessment*
- observation of campus conditions
- sustainability principles
- model sustainability program elements of other colleges
- organizational development and project management principles

Framework for the Sustainability Plan. The sustainability accomplishments enumerated in this *Assessment* will be summarized in bullet points, by category, in the forthcoming *Sustainability Plan*, so that the entire completed plan will be a living document that can be updated as projects are completed and new ones developed. The framework of the completed *Sustainability Plan* will follow the rough outline below (please note that the basic elements of the plan [in bold] are listed alphabetically, not in order of priority).

Buildings
Specifications for sustainable education buildings
Water use, conservation, metering & sub-metering
Day-lighting
Passive heating (including use of waste heat), passive cooling, & ventilation
Roof materials
Windows & entry way designs
Materials (locally sourced, recycled/recyclable)
Universal access
Indoor Air Quality
- Furnishings
- Finishes
- Cleaning materials
- Process materials
- Office machines & materials
- Ventilation

- Pesticides
- Outdoor activities near air intakes

Climate Protection
Greenhouse gas inventory
Placeholder
Placeholder
Placeholder
Placeholder
. . .

Communication & Events
Events (e.g. "Green Fridays," "Energy Challenge," "Bike to School," or "Paperless Day.")
Speakers & films
Competitions, awards & recognition
Sustainability & FYI news
Recycling information & annual report
Sustainability website
Outreach on behavior change (e.g. recycling changes)
Outreach to the larger community on best practices
Inspire college-wide collaboration
Create sustainability piece of "on-boarding"
Green suggestion box, bulletin boards

Curriculum & Education
Academic, career, technical & professional education, basic & continuing education
Special & capstone projects, service learning
Work-study & Cooperative Work Experience
Student club & activities
Demonstration energy efficiency & renewable energy projects

Custodial, Maintenance & Operations
Green cleaning supplies
Re-use, recycling, pre-cycling
Materials (see Buildings)
Purchasing, warehousing
Mold management
Integrated pest management

Energy
Continual program of audits, efficiency upgrades & retrofits
Commissioning, re-commissioning & controls
Sub-metering
Renewable energy – solar, wind, geothermal
Co-generation of energy

IT efficiencies for offices, labs & central locations
Energy efficient lighting
Room scheduling, occupancy sensors
Phantom loads, plug loads
Energy Star appliances
Distributed energy partnerships
Apply savings to fund sustainability program

Food Service (also see Purchasing)
Pre-cycling
Serving ware
Food waste
Recycling & composting
Water use
Students engagement & involvement
Locally produced foods, kitchen garden

Landscape & Grounds Keeping
Invasive species management
Threatened & endangered species management
Composting & chipping
Stormwater
Irrigation, sensors & metering
Pesticides
Integrated pest management
Natural area planning

Purchasing
Sustainability policies & guidelines
Contracts & specifications
Food service contract
- Pre-cycling
- Serving ware
- Food waste
- Recycling & composting
- Water use

Vending machines

Stormwater
ID short & long-term strategies & projects to reduce pollution, desynchronize stm/w runoff, increase infiltration, achieve net-zero runoff from new projects

Transportation
Commute alternatives, options & incentives
Bike & pedestrian safety & connectivity
Idling on campus

Priority parking
Distance learning & telecommuting
Transportation partnerships with outside agencies & interest groups
Timeline & strategy to obtain low-impact campus fleet
Lime airline travel
Promote teleconferencing & telecommuting

Waste & Recycling
Paper
Food
Metal
Plastic
Medical, hazardous & universal wastes
Garbage
Outreach

Proposed Actions & Ideas

The ideas listed below and the plan and projects developed from them will change over time as the campus community continues to incorporate sustainability into curricula, operations, education, campus life and services to students.

I. Buildings

- Develop specifications for sustainable education buildings
  - Water use, conservation, metering & sub-metering
  - Day-lighting
  - Passive heating (including use of waste heat), passive cooling, & ventilation
  - Energy efficiency
  - Roof materials
  - Windows & entry way designs
  - Materials (locally sourced, recycled/recyclable)
  - Universal access
  - Indoor Environmental Quality (air quality, light, temperature, acoustic space)
    - Furnishings
    - Finishes
    - Cleaning materials
    - Process materials
    - Office machines & materials
    - Ventilation
    - Pesticides
    - Outdoor activities near air intakes
    - Light & glare
    - Noise

- Thermal comfort

II. Climate Protection

- Collaborate to evaluate and select/develop methods for assessing campus GHG.
- Consider how selected instructors and student groups can contribute to GHG assessment efforts.
- Consider how learning modules for selected courses can be developed from GHG assessment and goal-setting activities.
- Prioritize actions and coordinate with Sustainability Committee throughout goal-setting and development of action plans.

INVENTORY GREENHOUSE GASSES

- Collect Raw Baseline Data in the following categories:
  - Purchased Electricity
  - Purchased Steam/Chilled Water
  - On-Campus Stationary Sources (energy generation)
  - Transportation (commuting, air travel, campus fleet)
  - Agriculture (fertilizer use, animal waste)
  - Solid Waste (incinerated, landfill)
  - Refrigerants and other Chemicals
  - Offsets (Renewable Energy Credits purchased, composting, forest preservation etc)
- Keep journal records of all contacts.
- Record information sought and contact responses.
- Formulate contact list to streamline future data collection.

CALCULATE EMISSIONS using international standards for emission coefficients to determine campus GHG emissions totals.

ANALYZE AND SUMMARIZE RESULTS

- Develop baselines that will allow CCC a quantifiable way to measure progress while moving forward.
- Formulate recommendations for a climate action plan.
- Present findings to Sustainability Committee and brainstorm solutions.

SUPPORT THE INTEGRATION OF SUSTAINABILITY INTO THE CURRICULUM to improve climate and sustainability literacy on campus and at home.

III. Communication & Events

- Events (e.g. “Green Fridays,” “Energy Challenge,” “Bike to School,” or “Paperless Day.”)
- Speakers & films
- Competitions, awards & recognition
- Sustainability in weekly FYI news

- Create a stand-alone sustainability tab in the College's web pages that includes mission, academic offerings, student life, past accomplishments and current projects concerning achievement of campus sustainability. Also include best practices, interesting & useful information for daily life.
- Outreach on behavior change (e.g. recycling changes)
- Train instructors & staff to manage & recycle commonly used small batteries for hand-held & larger portable devices and appliances, as well as 9-volt batteries
- Outreach to the larger community on best practices
- Inspire college-wide collaboration
- Create sustainability piece for "on-boarding" new employees
- Green suggestion box, bulletin boards
- Buzz about energy efficiency accomplishments . . . projects/savings past, present, future.
- Weekly announcement in FYI or other campus-wide media, containing a sustainability tip, buzz, news bit, activity or call to action.
- Continue announcing Green Screen, Speakers' Bureau other sustainability events.
- Continue providing outreach to the community about environmental and sustainability education opportunities at the College.
- Annually, issue updated information about campus recycling systems, and, especially, recognize the campus community for their efforts to reduce waste and increase recycling. How many tons of paper each year? Of metal, glass, etc. How many computers, fluorescent lamps, batteries, etc. were recycled last year? How many barrels of oil were recycled from the automotive labs? Celebrate accomplishments.
- Periodic updated information about
  - Washing vehicles only in wash rack in Automotive.
  - Basic information about the stormwater system, its vulnerability to pollution, and the natural areas to which College stormwater discharges.
  - Availability of community garden plots through student outreach.
  - Collaborate with English Department to develop illustrated one-page fact sheets that focus on different aspects of sustainability, concluding with a call to action.
- Develop and implement a campus-wide forum to report on student/admin./committee sustainability projects and goals. The forum might have performances, concurrent sessions, goal-setting, events

IV. Curriculum & Education

ACCREDITATION/CORE COMPETENCIES

- Add sustainability to the seven (?) core competencies or educational outcomes to which instructors at CCC teach.

PROFESSIONAL DEVELOPMENT

- Establish & maintain funding to support professional development activities concerning sustainability.
- Improve the training interface with Workforce Development.

STUDENT RESEARCH

- Determine ways to involve students in meaningful research projects connected with sustainability questions (e.g. how much water would be saved by eliminating cafeteria trays? Best solar incidence for solar hot water system on a selected building? How does an energy-producing algae cell work and where would it be best located on campus for optimum production? What mass of biofuels would be required annually to operate a fuel cell? How to assess the geothermal heat potential of geologic substrata at the Oregon City campus? What would be the energy generation capability of exercise machines in the Weight Room of the Gymnasium?)

DATABASE CONTRIBUTIONS**.** Determine what long-term studies on campus could successive generations of students contribute data.

TRAINING IN BLACKBOARD, MOODLE & OTHER ONLINE EDUCATION SYSTEMS

- Increase teacher training in Blackboard and other online tools to reduce paper used in teaching and learning.

STUDENT ENGAGEMENT IN CAMPUS ASSESSMENT VIA INQUIRY-BASED LEARNING

- Identify and engage students in the many tasks of sustainability assessment and recommendations. E.g. Have students look at paper use, stormwater generation, paper towel use in restrooms, solar potential, etc.
- Explore developing natural resource education and stewardship programs with local high school youth.

CURRICULUM INFUSION

- Work to infuse curricula with sustainability modules. Make climate and sustainability literacy official learning outcomes for transfer degree students. Consider accomplishing this through modules in the other outcomes.

WORK-STUDY & COOPERATIVE WORK EXPERIENCE

- Develop a campus-wide list of sustainability projects in which work-study and cooperative work experience students can become engaged.

INTERDISCIPLINARY CAPSTONE CLASSES

- Develop capstone courses in technology, science and social science fields that have sustainability as a focus

DISTANCE LEARNING

- Engage diverse student communities in dialogues to determine depth and breadth of unmet needs for distance learning and flexible learning scheduling.

NEW COURSE PROPOSALS.

- Develop a proposal process that begins with *students,* to complement the existing proposal process that begins with teachers.
- Work to make the lecture series a class for credit.

- Consider offering the following courses: Sustainability Coordinator, Institutional Waste & Recycling Management; Energy Efficiency Evaluator.

ENVIRONMENTAL EDUCATION FOR EDUCATORS

- Launch this program, already developed for the college by faculty working with a National Science Foundation Grant. The program would articulate with Oregon State University's teacher education program.

STUDENT ENGAGEMENT IN ENVIRONMENTAL ACCOUNTING

- Engage students in environmental accounting to evaluate alternative solutions (e.g. compare the cost and carbon footprints of using towels or electric blowers for hand drying).

STUDENT ENGAGEMENT IN PRIORITIZING SUSTAINABILITY PROJECTS ON CAMPUS

- Collaborate with ASG/other student groups (possibly students in the Pathways to Sustainability series) to identify and carry out a sustainability project each term or academic year.

STUDENT ENGAGEMENT IN CONSTRUCTION OF RENEWABLE ENERGY TECHNOLGY CONSTRUCTION ON CAMPUS

- Engage students in designing, manufacturing, installing, retrofitting and maintaining demonstration renewable energy systems on campus.

SUSTAINABILITY LEARNING FOR AT-RISK YOUTH

- Infuse science & related learning into curricula for at-risk youth.

HYBRID COURSES

- Develop more interdisciplinary courses that integrate arts, humanities and math and science.

HORTICULTURE / GROUNDS

- Implement a demonstration terra pieta (biochar) project on campus to test the potential for sequestering carbon in campus soils.
- Start a kitchen garden for use by Food Services.

COMMUNITY OUTREACH

- Be a source of information and a resource for the community for all things sustainable and environmentally sound. Provide demonstration projects, workshops, kiosks, and activities to engage the community. Continue to utilize the College as a demonstration site.
- Develop strategies and methods to let the greater community know about environmental and sustainable education opportunities at the college.
- Provide cooking literacy and nutrition workshops on campus for various communities.
- Provide information on cooking without meat.
- Provide information about cooking with garden vegetables.
- Continue to support the community gardens on the Oregon City campus

FAMILY RESOURCE CENTER

- Identify and adopt sustainable practices such as cooking with nutritious, local, basic foods in season, composting, gardening, recycling, reusing materials and sharing tools that routinely will be done with children.

TEEN PARENT PROGRAM
- Identify life skills that contribute to sustainable lifestyles and communities that will be taught and practiced here.

STUDENTS AND SUSTAINABILITY
- Develop and implement an outreach strategy to consistently engage students in dialogue and decision-making about climate change and carbon footprint.
- Engage students in outreach to student & campus community about new food service. conservation practices, waste stream reduction and campus recycling systems, room controls
- Support ASG group to identify and carry out a sustainability project each term or year.

CAREER DEVELOPMENT
- Generate more contacts for sustainability internships, work study projects, mentoring, job shares and shadows, summer work, experiential (cooperative work experience) credit.

HIGH SCHOOL STUDENTS
- Develop sustainability focused partnerships with district high schools.

V. Custodial, Maintenance & Operations

COMMUNICATION**.** Regularly provide information to Public Information Office regarding
- Changes in recycling system that need to be articulated to campus communities.
- Campus stormwater system, its vulnerability to pollution and ultimate discharge to streams.
- Upgrades in campus energy system that are reducing consumption.
- Demonstration projects using renewable energy.

BUILDINGS & ENERGY / CONSERVATION & RENEWABLE ENERGY
- Develop & maintain funding to implement renewable energy projects.
- Continue program of energy efficiency evaluation, upgrade, retrofit.
- Implement pilot project to install and evaluate high-speed hand dryers.
- Develop alternative sources of energy.
- Develop flexible, sustainable construction standards for new buildings.
- Regularly communicate funding needs to implement renewable energy projects.
- Continue to phase out individual copy machines on campus.
- Reduce plug loads.
- Replace outdated appliances with Energy Star.
- Evaluate energy-savings in IT operations and hardware.
- Evaluate energy savings of implementing building schedules.
- Evaluate/design/construct charging stations for electric vehicles on campus.
- Evaluate de-lamping in over-lit areas.

FACILITY MAINTENANCE
- Develop guidelines for purchasing, handling, storing and working with treated wood.
- Develop guidelines for maintaining campus stormwater swales and ponds.
- Coordinate with ODOT, Oregon City & Clackamas County and other agencies concerning stormwater and watershed management.
- Develop annual PM schedule for cleaning vaults in Automotive wash rack and document this.
- Look for opportunities to replace wooden outdoor structures such as picnic tables and boardwalks, especially near water, with plastic lumber that can be recycled. Alternatively, small outdoor structures can be constructed of cast concrete that is formed to look like wood.

GROUNDS KEEPING & LANDSCAPE MAINTENANCE (please see section VIII, Landscape & Groundkeeping, below)

STORMWATER (Please see section XII, Stormwater, below)

PAPER USE & PRINTING
- Evaluate printing & printers to determine health implications, cost differentials & potential savings of replacing desktop & area laser printers with multifunction photocopiers..

SOLID WASTE MANAGEMENT (Please see section XIV, Waste & Recycling, below)

RECYCLING (Please see section XIV, Waste & Recycling, below)

WATER USE
- Install additional low-flow toilets, and water-on sensors for lavatory sinks
- Evaluate micro-irrigation heads for watering campus turf and planting beds
- Retrofit Oregon City campus irrigation system to accommodate irrigation controllers
- Purchase irrigation control system for remote control of irrigation systems, and provide training in the new system to groundskeepers

TRANSPORTATION
- Develop a timeline and budget for phasing in energy conserving vehicles for the College fleet
- Continue to investigate transportation from the end of the Green Line (light rail) to the Harmony and Oregon City campuses
- Continue to support carpool and alternative transportation options
- Crack seal the space between asphalt roads and concrete curbs to minimize the need to apply pesticide in curb lines that drain to stream headwater areas
- Work with county/city to designate and stripe bike lanes to the College
- Designate and stripe bike lanes on the College road system
- Improve campus pedestrian routes and safety, particularly in places distant from core areas

GREEN CUSTODIAL PRACTICES

- Continually evaluate interior pesticide management materials (mold, mice, etc.)
- Evaluate adopting Green Seal cleaning agents for all buildings

BUILDING MOISTURE CONTROL. Develop college- and building-specific written procedures for moisture controls, including:

- Building materials
- Precipitation control at entryways
- Precipitation & moisture control for envelope
- Ventilation air to control moisture
- Humidity control during unoccupied times
- Condensation control

EQUIPMENT COMMISSIONING. Refer to the college's written protocols for commissioning building equipment, including:

- Installation
- Operation
- Documentation
- O&M manuals & testing
- Ongoing monitoring
- Re-commissioning of key building mechanical systems, including:
  - Contracting w/ commissioning agent
  - Reviewing system documentation & design intent
- Include commissioning requirements in construction documents
- Prepare a commissioning plan and refer to it throughout design & construction
  - Verify installation & functional performance of systems
  - Document results & prepare a commissioning report
- Prepare an indoor air quality commissioning checklist & schedule

CONSTRUCTION ENVIRONMENTAL HEALTH & SAFETY CONTROLS

Include the following in construction planning:

- Define indoor air quality (IAQ) requirements & incorporate them into bid and construction documents
- Require the contractor to develop and use an IAQ management plan to protect the health of workers and future building occupants, to include:
  - Construction dust
  - Chemical fumes
  - Off-gassing materials
  - Moisture
  - Protection of ventilation systems
- Require the contractor to define roles & responsibilities for IAQ best management practices (BMPs) during construction
- Contractor to provide information on all proposed substitutions
  - Materials storage

  - Safe installation
  - Proper sequencing
  - Regular monitoring
  - Safe & thorough cleanup
- Contractor to conduct & document regular inspection & maintenance of IAQ measures,
- Contractor to conduct safety meetings, develop signage, identify unacceptable behaviors & establish contractor agreements that communicate the goals of the IAQ management plan
- Contractor to identify construction practices, including
- Keeping construction materials dry
- Drying water damaged materials immediately
- Cleaning spills immediately
- Sealing unnecessary openings
- Temporarily sealing ductwork
- Ventilating when needed
- During installation of any materials that will emit VOCs, providing spot ventilation for at least 72 hours after work is completed
- Requiring respirators designed to protect workers installing materials that will emit VOCs
- Reducing construction dust
  - Using wet sanding for gypsum board assemblies unless all ventilation & isolation precautions are taken
- Avoiding use of combustion equipment indoors
- Storing liquids outdoors
- Using less toxic cleaning agents
- Considering a building flush-out at end of construction, before building occupancy

BUILDING RENOVATION

Testing. Before demolition or renovation, test for lead, asbestos, mold

Timing. When possible, perform work at times when the occupants are not in the building

Distance. Keep building occupants as far from renovation activities as possible to reduce exposure to possible construction pollutants

Barriers

- Install temporary barriers (e.g., plastic sheeting) to seal the work areas from the occupied areas
- Cover all supply and return air grilles
- Exhaust air from the construction area so that pollutants cannot flow from the construction area to the occupied areas.

Containment

- Confine pollutants to as small an area as reasonably possible, for example, by wet sanding or vacuum sanding drywall to prevent the spread of dust, misting asbestos with water to prevent

it from easily becoming airborne during demolition, and keeping containers of chemicals such as solvents, adhesives, paints, and other coatings closed as much as possible
- Do not operate the heating/cooling equipment when work is causing dust to be visible in the air

Cleanup. At least daily, construction debris, dust, and scraps should be adequately cleaned up and sorted into appropriate recycling bins outdoors

VI. Energy
- Reduce the carbon footprint of the College
- Engage in a continual program of audits, efficiency upgrades & retrofits
- Continue commissioning, re-commissioning & updating controls
- Install electrical and natural gas sub-meters
- Develop renewable energy – solar, wind, geothermal
- Develop Co-generation of energy
- Evaluate continued IT efficiencies for offices, labs & central locations
- Construct energy-savings alternatives to the roll-up doors in Barlow, Automotive and other College buildings
- Continue to install energy efficient lighting
- Evaluate room scheduling, occupancy sensor.
- Reduce phantom loads, plug loads. Reduce/eliminate desktop printers, plug-in heaters
- Purchase Energy Star appliances
- Develop distributed energy partnerships
- Apply savings to fund sustainability program

VII. Food Service (also see Purchasing, section X, below)
- Evaluate additional pre-cycling
- Evaluate alternative take-out & serving ware materials & containers
- Evaluate food waste & composting
- Increase recycling in Cafeteria
- Evaluate water use
- Engage students in outreach about recycling in the Cafeteria
- Evaluate locally produced foods, kitchen garden
- Use foods in season as much as practicable
- Upgrade kitchen equipment to be more efficient

VIII. Landscape & Grounds Keeping
- Protect the integrity of remnant native landscapes on campus as much as practicable, by identifying and removing aggressive non-native plants, considering nesting and rearing seasons when scheduling mowing and pruning and maintaining natural hydroperiods.
- Review and refresh College goals for natural area planning & preservation.
- Fund redevelopment and restoration of the entire Environmental Learning Center site.

- Apply central irrigation controls to allow remote monitoring and control of irrigation systems at all campuses.
- Install rain gauges, evapotranspiration meters and irrigation controllers at campus locations.
- Install sub-meters to enable evaluation of water use by zones.
- Evaluate financial & human resources needed to achieve desired conditions.
- Evaluate substituting two-cycle backpack leaf blowers with a lesser polluting method as new designs are marketed.
- Fund equipment & labor to chip and spread woody debris generated on campus.
- Convert some turf areas to mixed grasses and herbs, native forest or shrub/forest associations.
- Insert contract language requiring mowing vendors to wash the undercarriage of mowing equipment before bringing it onto campus. This action is generally recommended in integrated pest management programs to avoid the spread of noxious weeds.
- Recycle grass clippings while mowing.
- Continue to develop partnerships with volunteer groups to help with trail maintenance and, assist with invasive plant control on campus, and to help with vegetation upkeep at the Environmental Learning Center and other similar areas on campuses
- Install drip and other low-flow irrigation technologies where needed.

IX. Leadership & Implementation

ADVISORY GROUP

- Include a representative from each instructional and operational area of campus.
- Include selected administrative decision-makers so that action steps to achieve each sustainability plan goal have support, direction, policy and funding.
- Derive priorities & major projects from sustainability plan, and means of measuring success
- Form working committees for each major project.
- Define supporting actions to achieve each goal.
- Set milestones and deliverables.
- Develop a continual process of assessing sustainability.
- Communicate with campus community through Sustainability website and College Committees page

DEANS & DIRECTORS

- Direct and support faculty to identify and provide
    - career-related learning in sustainability for students
    - career-related work in sustainability for students in Extended Learning, Early Childhood Education and Human Services
    - Devise means to offer capstone classes in which student teams from different disciplines contribute to assessment, analysis, design or revision of systems that result in greater sustainability on campus
    - Develop learning/lab/practice modules in sustainability in all courses and activity centers on campus, from the FRC to the ASG
    - ASG to identify a sustainability campaign and implement it for a year

EXECUTIVE

- Invest rigorously in energy efficiency
- Initiate and foster campaigns calling for campus community to dress for the weather, turn off lights, limit printing, reduce plug loads in offices; be vigilant about recycling . . .
- Provide direction re: transportation, space, energy, purchasing, waste & recycling
- Encourage development of departmental sustainability resource guides
- Establish & fund office of sustainability
- Continue to promote best practices and processes streamlining (reduce time and paperwork)
- Provide staff & instructor development/resources/training in sustainability
- Invest in grants office & donor opportunities
- Invest in course development and infusion of renewable energy & sustainability into curriculum
- Provide annual sustainability report to College and to board
- Champion sustainability incentives and rewards
- Seek industry partners for cost and brain-sharing

X. Purchasing

- Develop sustainable purchasing policies & guidelines, including sourcing of local goods
- Include sustainability elements in contracts & specifications (e.g. sustainable materials (locally sourced, recyclable, non-toxic . . .)
- Evaluate sustainability of and products in vending machines (healthy choices, local foods, no bottled water, BPAs or HFCs
- Establish guidelines for and source alternatives to toxic or hazardous materials
- Insert contract language requiring grounds keeping contractors to wash the undercarriages of equipment before bringing it onto campus, to control the spread of noxious plant parts.
- Eliminate the sale of bottled water on campus
- Source a copier vendor that does not charge for second page when copier is set for duplexing as a default but only one page is needed
- Investigate use of returnable take-out containers for Food Services
- Eliminate use of Styrofoam on campus
- Eliminate trays in the Cafeteria (the largest water use comes from washing them), eliminate disposable serve-ware and utensils, and minimize water use to make this service more sustainable
- Eliminate purchase of canned air; instead, encourage use of squeeze bulbs for tasks such as dusting, cleaning keyboards and preparing slides and photos for scanning; for heavier shop tasks, use compressed air
- Require vending machine contractors to install refrigerated vending machines that meet Energy Star standards, which have built-in vending miser technology
- Develop purchasing policies and outreach education regarding all types of batteries purchased by the college. Batteries may be considered as hazardous or universal wastes, depending on type. Policies should include:

- processes for prioritizing battery purchases (consider items that do not require batteries)
- consider battery types: ease in collection & recycling batteries; potential for ground- and surface water pollution if disposed in the trash; consider whether battery type must be managed as a hazardous or universal waste
- Consider the following battery types when developing policies:
    - Alkaline
    - Carbon-zinc
    - Lead-acid
    - Lithium
    - Magnesium
    - Mercury
    - Nickel-cadmium
    - Silver
    - Thermal

XII. Stormwater (Please also see Maintenance and Operations, above, for details)

- Redevelop Environmental Learning Center habitat/stormwater treatment ponds.
- ID short & long-term strategies & projects to reduce impervious surfaces and stormwater pollution, desynchronize stormwater runoff, increase infiltration, achieve net-zero runoff from new projects
- Develop once yearly PM schedule for cleaning primary stormwater CBs (those with grits collection and oil/water separation)
- Require paperwork from the CB cleaning contractor showing ultimate disposal location of the suctioned materials (review chain of custody)
- Replace selected CBs in high-use areas and campus discharge points with inclined plate oil-water separators and enhanced grit catchment.
- Create a PM schedule for clearing inlets and outfalls to stormwater swales.
- Provide stormwater swale maintenance training to grounds keeping staff.
- Purchase replacement plants for swales as needed.

XIII. Transportation & Circulation

- Promote commute alternatives, options & incentives to reduce single-occupant vehicle trips to College.
- Establish a carpool bulletin board on all campuses.
- Promote local bike tours.
- Work w/ regional partners to identify and create opportunities.
- Improve campus bike & pedestrian safety & connectivity.
- Construct sidewalks.
- Limit idling on campus.
- Evaluate priority parking.
- Promote distance learning & telecommuting.

- Evaluate transportation partnerships with outside agencies & interest groups.
- Develop timeline & strategy to obtain low-impact campus fleet.
- Limit airline travel.
- Promote teleconferencing & telecommuting.
- Crack seal road edge between asphalt and curb to avoid having to apply pesticides in the curb line that drains to Newell Creek.
- Retrofit catch basins at selected outfalls with coalescing plate oil/water separators and grit vaults.
- Coordinate with ODOT, Clackamas County, Oregon City, Metro and bicycle advocacy group to develop a plan for an expanded network of multi-use pathways to the College.
- Upgrade the walking trail on the Oregon City campus.

XIV. Waste & Recycling

WASTE

- Increase number of recycling stations.
- Increase "customer" outreach efforts and place additional collection facilities to divert more of the College's waste stream to recycling.
- Evaluate food service waste.
- Evaluate a demonstration project in food waste and paper plate/cup recycling and/or composting.
- Evaluate returning to ceramic serve ware in the Cafeteria.
- Manage leakage from the waste compactor by containment, routing it to the sanitary sewer or, at a minimum, filtering it before it flows to the storm sewer system. Change filters frequently.
- Track tonnage to landfill. Announce to College community annually to increase reduction awareness and focus.
- Install high-speed hand dryers in restrooms to eliminate paper towel waste and achieve savings in labor to maintain towel dispensers and waste.

RECYCLING

- Develop recycling communications campaign that provides regular updates on how, what and where to recycle on campus, and also reports recycling successes and benchmarks.
- Improve recycling in the Cafeteria by adding additional recycling station and with regular campus-wide communication. Look to OMSI and Lane Community College for models on recycling education *in* the Cafeteria.
- Ban the sale of bottled water on campus.
- Reduce the quantity of class schedules printed each term so that there are not so many extras.
- Make electronic schedules easier for users to jump to the sections they want to scan.
- Investigate recycling of food waste.
- Provide strong leadership to seek, facilitate and maintain consistent upgrades to the recycling system.
- Continue to evaluate plastics recovery.
- Track tonnage of recycled materials, by category.

- Track tonnage and income from metal recycling by Automotive, Campus Services, Welding, and Training Center.
- Support waste audits in the Quad every two years, accompanied by a performance-style narrator and events. Publish the results immediately and call for campus community to develop ideas.
- Fund and engage in a continual cycle of upgrades to the recycling system as the market continues to evolve

XV. Big Ideas. These can be prioritized based on best investments to reduce greenhouse gas emissions and consumption of fossil fuels.

BIOMASS RECYCLING

- Use pruning debris and soft vegetation from campus, and local agricultural wastes in a bio-fuels digester
- Convert areas of open fields to quick tree crops such as cottonwoods, to harvest for biomass energy production.
- Recycle/compost food scraps.

GROUNDSKEEPING

- Review turf area cultural practices in an effort to reduce irrigation requirements and maintain health and appearance.

STORMWATER

- Remove unneeded outdoor permeable surfaces and replace with (native) vegetation.
- Install sub-surface stormwater treatment/retention systems under surface parking lots.
- Restore and reconnect headwater wetlands to Newell Creek, routing stormwater to these wetlands.
- Store and use rainwater for irrigation.

TRANSPORTATION

- To cut down on the need for people to commute to the College by car, consider taking technical, professional development and academic learning courses to facilities such as vacant stores or existing community buildings within neighborhoods.
- Install charging stations on campus.
- Support Casey Sim's *Big Idea* – a light vehicle powered by compressed air
- Convert surface parking to structured parking.

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