CENTRAL OREGON
community college
SUSTAINABILITY

Central Oregon Community College Climate Action Plan

Prepared for
Central Oregon Community College

December 2024

Central Oregon Community College Climate Action Plan

Prepared for

Central Oregon Community College
2600 NW College Way
Bend, OR 97703

Prepared by

Parametrix
5 SE Martin Luther King Jr. Boulevard, Suite 400
Portland, OR 97214
T. 503.233.2400 F. 1.206.649.6353
www.parametrix.com

December 2024

Citation

Parametrix. 2024. Central Oregon Community College Climate Action Plan. Prepared for Central Oregon Community College by Parametrix, Portland, Oregon. December 2024.

Acknowledgements

Central Oregon Community College Project Team

Noelle Bell Copley, Sustainability Coordinator and PCLC Co-Chair

Owen Murphy, Professor of Health and Human Performance and PCLC Co-Chair

Tally Nelson, Energy Analyst, Campus Services

Josh Clawson, Director of Campus Service

Laurie Chesley, President of Central Oregon Community College

COCC President's Climate Leadership Commitment (PCLC) Members

Michael LaLonde (Senior Leadership Team Lead), Vice President of Finance and Operations

Brittany Nichols, Director of Foundation Programs

Janelle Bartow, Senior Financial Aid Specialist

Katie Foltz, Transcript/Degree Evaluator

Tina Hovekamp, Director of Library Programs

Christy Chaung, Administrative Assistant, Vice President Student Affairs

Amy Ward, Director of Redmond Campus

Parametrix Consulting Team

Josh Proudfoot, Senior Advisor

Tracy Lunsford, Local Agency Climate Mitigation Practice Lead

Claudia Denton, Climate and Environmental, Social, and Governance (ESG) Consultant

Grace Thirkill, Climate and ESG Consultant

Maddie Cheek, Climate and ESG Consultant

Other Acknowledgements

The project and consulting team engaged with numerous internal COCC partners and community organizations during the outreach for this Climate Action Plan and appreciate their time and input.

This page intentionally left blank.

Contents

Executive Summary

The Central Oregon Community College (COCC or College) Climate Action Plan (CAP) is a strategic document aimed at guiding the institution toward our target of achieving carbon neutrality by 2050. This plan builds on existing sustainability efforts and leverages the President's Climate Leadership Commitment (PCLC) framework developed by Second Nature, recognizing the leadership role higher education institutions can play in climate action.

COCC has a long history of sustainability and climate action, including the establishment of the Sustainability Committee in 2011, the installation of photovoltaic (PV) solar panels at the Redmond Campus, and the incorporation of sustainability into the College's 2023–27 Strategic Plan. These initiatives provide a strong foundation for future emission-reduction efforts and demonstrate our longstanding commitment to environmental stewardship.

This CAP is a 5-year implementation plan outlining priority climate actions designed to make significant progress toward our overall goal of doing our part to limit global warming to 1.5°C and our target of achieving carbon neutrality by 2050. The priority climate actions and policies in this plan are listed in Table ES-1. The Priority Climate Actions and Implementation section describes each action in detail including the GHG reduction potential, implementation timelines, costs and cost savings information, a description of co-benefits, and an action implementation strategy.

Table ES-1. COCC Priority Climate Actions and Policies

Categories	Priority Actions and Policies
Buildings and Energy (BE)	BE-1: Upgrade building envelopes based on audit findings to improve energy efficiency.
	BE-2: Upgrade HVAC equipment in campus buildings with smart and/or high efficiency hardware options.
	BE-3: Upgrade lighting controls using mechanisms like occupancy sensors, photo-sensors, and/or timers (stand alone or energy management system/EMS-interfaced).
	BE-4: Electrify existing gas heating systems.
	BE-5: Electrify existing gas cooking systems.
	BE-6: Install additional photovoltaic (PV) solar.
	BE-7: Install battery storage systems to utilize more electricity from COCC-owned solar panels.
Purchased Reductions (PR)	PR-1: Purchase RECs for electricity use that cannot be otherwise mitigated or offset at this time.
	PR-2: Purchase verified carbon offsets for natural gas use that cannot be mitigated based on efficiency measures alone.
Transportation (T)	T-1: Support faculty, staff, and students to use climate-friendly commute options.

Categories	Priority Actions and Policies
	T-2: Provide incentives for taking transit, using active transportation, carpooling, or the vanpool to get to and from campuses.
Policy and Behavior Change (PBC)	PBC-1: Adopt and enforce College-wide energy conservation policies and procedures.
	PBC-2: Encourage COCC staff, faculty, and students to adopt climate-friendly behaviors.
	PBC-3: Develop environmental, social, and governance (ESG) purchasing policies for campus admin assistants.
	PBC-4: Adopt a green building policy.

REC = renewable energy certificate

As an interim target, COCC aims to achieve 16% reduction in emissions over the 2022 baseline greenhouse gas inventory by 2030. This ambitious but achievable target includes absolute reductions to emissions sources covered by the Second Nature PCLC Carbon Commitment. Additionally, we have set a stretch target of achieving carbon neutral emissions from scope 1 and 2 fossil fuel sources by 2030, or as soon as practicable.

COCC is committed to transparently tracking and reporting progress on climate action, ensuring that the institution remains on track to meet its climate objectives. Through this Climate Action Plan, we demonstrate our understanding that environmental stewardship, academic excellence, and community leadership are inextricably linked in today's rapidly evolving climate landscape. By working collaboratively with students, faculty, staff, and community partners, we are poised to create meaningful change and contribute to a more sustainable future for generations to come.

Letter from the President and President's Climate Leadership Committee

Colleagues and Community Members,

Aligning with efforts around the globe to prioritize climate resilience, Central Oregon Community College (COCC) this year began initiating a Climate Action Plan to build a blueprint for how the college will work to ultimately achieve carbon neutrality. It's a move that comes from COCC's allegiance to the President's Climate Leadership Commitment — officially signed in 2022 — that connected the college to a national higher education initiative aimed at strategically reducing institutional carbon footprints. The commitment supports COCC's strategic plan, to create processes and systems to foster high-quality and operationally sustainable work.

The Climate Action Plan builds upon, and reinforces, existing sustainability initiatives and programs at COCC, including: a student-elected "green fee" to purchase renewable energy that started in 2006; the launch of the student-and-staff Sustainability Committee to implement recycling and encourage environmental stewardship in 2010; and the creation of a Sustainability coordinator role in 2021. The College completed its first-ever greenhouse gas emissions inventory in 2022, a baseline for the Climate Action Plan, assembling data that includes student commutes and campus-wide electricity bills.

The Climate Action Plan outlines steps and investments that call for waste reduction, energy conservation and a more collective approach to climate resilience — all fixed on a carbon-neutrality target date.

As climate science predictions have been born out around the world, we have felt the effects here in Central Oregon. Record droughts and temperatures have contributed to accelerated snowmelt, water scarcity, wildfires, poor air quality, school closures, compromised recreational opportunities and negative economic impacts. COCC's Climate Action Plan will address climate change at an operational and curricular level in order to inspire and empower students to take meaningful action for the surrounding community and the planet.

The United Nations' Intergovernmental Panel on Climate Change, the world's leading authority on the causes and consequences of climate change, has stated that "the choices and actions implemented in this decade will have impacts now and for thousands of years." These choices and actions are more imperative than ever.

COCC's vision statement includes sustainability as one of its guiding values: *We commit to responsible stewardship of our natural environment, today and for future generations*. That value and the work that defines it will only succeed to the extent that students, faculty, staff, trustees and the greater community adopt a culture of environmental stewardship for a sustainable future. Only together can we meet these climate goals. Thank you for being a part of the solution to achieve carbon neutrality.

Your President and the Climate Commitment Strategic Plan Action Team (2023-27),

Laurie Chesley, COCC President
Michael LaLonde
Noelle Bell Copley
Owen Murphy
Brittany Nichols
Janelle Bartow
Josh Clawson
Katie Foltz
Tina Hovekamp
Christy Chaung
Amy Ward
Tally Annette Nelson

Introduction

Climate change is one of the most pressing challenges of our time, demanding bold action and transformative leadership across all sectors. As a higher education institution, Central Oregon Community College (COCC) recognizes our unique position to demonstrate leadership in this space and drive meaningful change. Following the framework developed by Second Nature,[1] which acknowledges the distinctive capacity of higher education institutions to create lasting environmental impact, we are joining other forward-thinking colleges and universities in taking decisive action on climate change.

A climate action plan (CAP) serves as a comprehensive strategic document that outlines an organization's path toward carbon neutrality. This CAP is a 5-year plan that serves as our roadmap for achieving our climate objectives in alignment with our strategic plan and overall mission to empower students and engage communities through high-quality, equitable, and accessible lifelong education. As we embark on this critical journey, we are committed to working collaboratively with students, faculty, staff, and community partners. This plan reflects our understanding that environmental stewardship, academic excellence, and community leadership are inextricably linked in today's rapidly evolving climate landscape. Together, we will work to create meaningful change and contribute to a more sustainable future for generations to come.

Overview of this Climate Action Plan

This CAP begins by establishing the foundation of COCC's commitment to climate action; it outlines our specific goals and targets and provides an overview of sustainability and climate initiatives at COCC. This is followed by a summary of the climate risks facing Central Oregon and their implications for our campuses and operations.

Next, the plan presents our current climate impact through a greenhouse gas (GHG) emissions inventory, along with a summary of the current policy landscape affecting emissions now and into the future. This context sets the stage for the comprehensive section on the priority climate actions included in this plan that are designed to support our overall goal of doing our share to limit global warming to 1.5°C. Full implementation of these actions will achieve our interim target of 17% reductions by 2030 and make significant progress toward our target of climate neutrality by 2050.

For each priority action, this plan provides a summary table with annual GHG reduction potential, implementation timeline, and summarized costs and savings information. These tables are accompanied by the following for each action: a description of the action and associated co-benefits and an implementation strategy including opportunities and barriers, roles and responsibilities, additional cost information, funding and resource availability, potential tracking metrics, and next steps.

The plan concludes by highlighting the ongoing education, outreach, and engagement needed to bolster the culture of sustainability and climate action at COCC. This includes opportunities for incorporating climate into COCC's curriculum and our commitments to transparently tracking and reporting our progress on climate action.

[1] https://secondnature.org/about-us/

Climate Action Plan Outreach and Engagement

Throughout the process of developing this CAP, the project and consultant team engaged with COCC partners and community organizations to seek input and incorporate feedback. Engagement efforts focused on reaching key audiences to provide education and garner buy-in and enthusiasm for climate action. These efforts helped to raise awareness about the process, cultivate a welcoming and inclusive sustainability culture at COCC to facilitate ongoing participation, engage a broad range of partners and perspectives in the planning process, collect feedback to identify blind spots and specific action opportunities, and demonstrate climate leadership in Central Oregon. Engagement was centered around two workshops—one focused on transportation and the other on policy and behavior actions—collaborating directly with the facilities director regarding the building and energy actions, as well as a session at the COCC Fall Kickoff event.

Three key themes emerged from the engagement feedback. First, participants emphasized the need to increase awareness of existing sustainability programs and climate initiatives across campus and the surrounding communities. Second, they called for expanded opportunities and incentives to encourage faculty, staff, and students to participate in climate action at both individual and institutional levels. Finally, there was support for developing formal policies and procedures to improve our operational efficiency, particularly in areas such as building temperature management, campus-wide purchasing, and strategic scheduling initiatives.

Key terms used in this plan are explained below. See the glossary at the end of this plan for more terms and details.

- **Carbon neutral/neutrality** – Achieving a balance between the greenhouse gases (GHGs) emitted and those removed from the atmosphere, resulting in no net operational GHG emissions. This is often referred to as achieving net-zero emissions.
- **Climate action plan** – A plan adopted by an institution that sets a target date for achieving a GHG emissions reduction goal and a set of climate actions that support meeting that goal.
- **Climate actions** – Specific activities, programs, policies, and procedures and so forth that aim at reducing the severity of human-induced climate change and its impacts.
- **Greenhouse gases (GHGs)–** Gases that trap heat in the atmosphere by absorbing infrared radiation.
- **Greenhouse gas emissions** – The release of GHGs either by combustion or uncontrolled releases of substances such as refrigerants and methane gases into the atmosphere.
- **Greenhouse gas inventory** – An inventory of GHGs measures gases in metric tons of carbon dioxide equivalent (MTCDE). It is also known as a carbon footprint. In GHG inventories, emissions are categorized into emissions scopes per global GHG accounting protocols.
    - → **Scope 1 emissions** are referred to as *direct* emissions. They are calculated from the amount of fossil fuels burned in boilers, central heating plants, campus-owned vehicles, and on-campus power plants, etc. This energy is typically used to heat and cool buildings or to directly generate electricity used on campus.
    - → **Scope 2 emissions** are produced off campus by burning fossil fuels to generate energy (typically electricity) that is purchased by the campus or the campus' utility consumption. Renewable energy typically has no, or very little carbon emissions related to its purchase.

  - → **Scope 3 emissions** are referred to as *indirect* emissions. The Second Nature Carbon and Climate Commitments require two scope 3 emissions sources: commuting and air travel.

- **Sustainability** – The ability to meet the needs of the present without compromising the ability of future generations to do the same. Includes consideration of environmental, social, and economic dimensions.

COCC's Commitment to Climate Action

In recognition of the importance of taking clear, decisive action on climate change, President Laurie Chesley signed the **Second Nature Presidents' Climate Leadership Commitment (PCLC)** Carbon Commitment in 2022, committing COCC to achieve carbon neutrality as soon as possible. Sustainability is also included as one of the core goals in **COCC's 2023–27 Strategic Plan**.

The PCLC provides a framework for signatories to advance campus climate action and requires signatories to develop a CAP. The following PCLC activities and requirements align with the COCC Strategic Plan:

- Establish a PCLC taskforce.
- Complete a GHG emissions inventory within 1 year, then annually after that.
- Set a target date for achieving carbon neutrality as soon as possible with interim target dates for meeting milestones along the way.
- Establish mechanisms and indicators for tracking progress.
- Integrate sustainability and carbon neutrality into the curriculum and other educational experiences for all students.
- Make the CAP, annual GHG inventories, and annual progress reports available to the public.

Climate Goals and Targets

Example Climate Goals and Targets

State of Oregon

The State of Oregon's climate goal for climate neutrality by 2050 was updated in 2023 and set the following emissions reduction targets, which are roughly in line with the United Nations' Paris Agreement[2] 1.5°C goal:[3]

- Target: By 2050, or as soon as practicable, Oregon will achieve net zero emissions and achieve and maintain net negative emissions thereafter.
  - → Milestone target: Oregon will achieve at least a 45% reduction below 1990 levels by 2030.

[2] Key aspects of the Paris Agreement | UNFCCC https://unfccc.int/most-requested/key-aspects-of-the-paris-agreement.

[3] Meeting Our Goals — Oregon Climate Action Commission https://climate.oregon.gov/meeting-our-goals.

- → Milestone target: Oregon will achieve at least a 70% reduction below 1990 levels by 2040.
- → Milestone target: Oregon will achieve at least a 95% reduction below 1990 levels by 2050.

Educational Institutions

While many larger colleges and universities have established climate goals that can serve as examples, COCC's commitment to climate action is on the leading edge for colleges of its size. Example goals from other educational institutions include the following:

- Achieve carbon neutrality by 2040 (Portland Community College)[4]
- Achieve carbon neutrality by 2050 (Lane Community College)[5]
- Achieve carbon neutrality by 2025 (Oregon State University)[6]

COCC's Climate Goal and Targets

Goal: COCC will do its share to limit global warming to 1.5°C.

Target: By 2050, or as soon as practicable, COCC will achieve carbon neutral emissions for all emissions sources (included in the GHG inventory) and achieve and maintain carbon neutral or net-negative emissions thereafter.

- **Interim target: By 2030, achieve 16% reduction in emissions over the baseline GHG inventory, equivalent to 1,970 MTCDE in reductions.**

  This includes absolute (not net) reductions to emissions sources covered by the PCLC Carbon Commitment. This plan sets an ambitious but achievable pathway to an estimated 16% reduction in emissions included in the baseline GHG inventory by 2030. The included climate actions provide the following reductions:

  - → **Scope 1: 4% of total emissions.** This equates to a 16% reduction in scope 1 emissions from reducing natural gas use.
  - → **Scope 2: 6% of total emissions.** This is a 16% reduction in scope 2 emissions from reducing retail electricity use and adding solar electricity generation. If purchased renewable electricity is included, COCC can reduce 100% of its scope 2 emissions.
  - → **Scope 3: 5% of total emissions.** This equates to a 16% reduction in included scope 3 emissions from reducing emissions from commuting to and from campus.
- **Stretch target: By 2030, or as soon as practicable, COCC will achieve carbon neutral emissions from scope 1 and 2 fossil fuel sources.**

[4] Portland Community College Climate Action Plan (2021) https://www.pcc.edu/sustainability/wp-content/uploads/sites/22/2021/10/Compressed-CAP-1.pdf.

[5] Lane Community College Climate Action Plan (2018) https://www.lanecc.edu/sites/default/files/migrated-files/sustainability/lane_community_college_cap_2.0.pdf.

[6] OSU Path to Carbon Neutrality (2022) - https://fa.oregonstate.edu/sites/fa.oregonstate.edu/files/sustainability/docs/path_to_carbon_neutrality_6-8-22.pdf.

In addition to the interim target to reduce absolute emissions from all scopes, this stretch target includes reducing emissions through purchased instruments including renewable energy certificates (RECs; see Section 3.3 for more information) for scope 2 electricity and offsets for scope 1 natural gas use and fleet fuels. Fugitive emissions are excluded from this target, as they are not fossil-fuel-based emissions.

Beyond Carbon Neutrality – Added Value of Climate Action

While reducing our GHG emissions is the primary goal of this CAP, the benefits of implementing climate actions extend far beyond this core objective. Taking climate action and embracing a culture of sustainability will have a cascading positive impact throughout our campus and wider community.

Co-benefits are additional benefits that arise from policies or measures that are intended to address one objective (in this case, reducing GHG emissions) while simultaneously advancing other valuable goals. These positive benefits extend across many areas of campus operations and experience. Co-benefits considered in this CAP include the following:

- **Cost savings.** The potential for an action to reduce costs over the useful life of the asset. For example, energy efficiency improvements lead to significant cost savings on utility bills and can increase asset values.
- **Improved air quality.** In addition to reducing GHGs, many actions reduce other air toxics and pollution. For example, reducing fossil fuel use immediately improves local air quality and public health outcomes.
- **Improved public health and well-being.** The potential for an action to improve public health outcomes or overall well-being of individuals impacted. For example, increasing active transportation use can yield positive health benefits.
- **Enhanced resilience.** The potential for an action to also increase resilience to current or future climate hazards such as wildfires and drought. For example, upgrading building envelopes to improve energy efficiency also protects building occupants from extreme heat and cold.

Throughout this CAP, specific co-benefits are highlighted for each strategy and action to demonstrate how each initiative creates added value across campus services and the broader community.

History of Sustainability and Climate Action at COCC

In addition to signing the PCLC Carbon Commitment, COCC has made great strides in climate action and sustainability over the last two decades, including adopting policy, completing projects to reduce emissions, and integrating sustainability into campus operations and course offerings.

Policy and administrative efforts

- Established the Sustainability Committee in 2011 to inspire and encourage COCC students, faculty, and staff to embrace sustainable practices at COCC.
- Established a local food purchasing clause and food recovery process for campus dining operations in 2019.

- Established the Alex Kollar Memorial Scholarship in 2022 to inspire students at COCC to pursue sustainability education.
- Funded a full-time campus sustainability coordinator position in July 2023.
- Incorporated environmental sustainability as a critical initiative in the College's 2023–27 Strategic Plan, including establishing a Climate Action Task Force. The task force is charged with implementing the requirements of the PCLC and sharing ideas and progress.
- Established a Green Revolving Fund in 2024 to reinvest savings from energy efficiency projects into future energy efficiency projects.

Emissions-reduction projects

- Installed solar PV at the Redmond Campus. The **Redmond solar array** has generated 5.8 gigawatt hours (GWh) of power since 2017. This is equivalent to offsetting 8.1 million pounds of carbon dioxide—saving 3,900 trees or avoiding using over 3,300 barrels of oil according to the Redmond Solar Array Dashboard.[7]
- Completed a solar feasibility study at the Madras Campus.
- Installed COCC's first Level 2 electric vehicle (EV) charging stations in 2019 and 2023. There are currently 12 charging stations spread across the four COCC campuses: Bend, Redmond, Madras, and Prineville.
- Participated in the Energy Trust of Oregon's Strategic Energy Management[8] program from 2019 to present.

Education and campus operations

- Increased sustainability designated (SD) and sustainability (SUS) course offerings for students. As of fall 2024, 18 courses are approved as part of COCC's **Sustainability Curriculum**.
- Established waste reduction programs for students, including recycling, food waste, composting, Clothing Connection, Zero-Waste bundles, and providing reusable takeout containers for residents of Wickiup Hall.
- Earned Tree Campus status from the Arbor Day Foundation and Bee Campus status from the Xerces Society since 2022.

While COCC will need to pursue additional actions and/or policies to reach the goal of achieving carbon neutrality, these initiatives provide a strong foundation for future emissions reduction efforts at COCC and demonstrate our long-term commitment to sustainability and environmental stewardship.

Understanding Climate Risks in Central Oregon

While this CAP is focused on climate mitigation (actions aimed at reducing or removing GHG emissions to slow climate change), it is also important to consider climate risks and hazards to better prepare and adapt to future climate conditions. Central Oregon can expect to experience

[7] Generation data and equivalencies as of November 2024. https://www.cocc.edu/departments/campus-services/redmond-solar.aspx

[8] https://www.energytrust.org/industry-agriculture/industry-strategic-energy-management/

changes in climate such as increased heat, longer and more extreme dry seasons, earlier winters, and changes in precipitation patterns. The natural hazards that Central Oregon is most vulnerable to include extreme heat, drought, algal blooms in freshwater bodies, wildfires and smoke, decreased snowpack and spring melt on average as precipitation moves from snow to rain in the winter months, and atmospheric rivers as rainfall. Other hazards include windstorms and floods. These climate hazards impact human health and safety, the economy, and the overall quality of life. The effects of climate change make these natural hazards more likely to occur.[9] Table 1 outlines how these hazards may affect the COCC campuses and communities.

Table 1. Climate Hazards in Central Oregon

Climate Hazard	Potential Impacts to COCC Campuses and Communities
Extreme heat	▪ Increased energy load for cooling on more frequent and more intense hot summer days. ▪ Commute by transit or active modes becomes more exposed to hazards. ▪ Disruptions to work or classes.
Drought	▪ Risk to vegetation survivability. ▪ Water stress or a greater need to conserve (pending water source).
Algal blooms	▪ Freshwater bodies become unsafe for recreation. ▪ Water treatment challenges for drinking and wastewater.
Wildfires	▪ Disruption of classes and/or activities. ▪ Property damage to the homes of students, staff, and/or faculty. The emotional toll of dealing with destruction from fire. ▪ Public safety power shutoffs to reduce wildfire risk from electric utilities. ▪ Ancillary utility shutoffs for utilities such as drinking water and wastewater when electric utility shutoffs occur.
Wildfire smoke	▪ Disruption to local activities from fire events both locally and in faraway places. ▪ Health hazards associated with poor air quality, not just for those with respiratory and heart conditions but also is a whole-body stressor that could accelerate other conditions or symptoms. ▪ Indoor air quality laws not met.
Decreased snowpack and spring melt	▪ Disruption of winter sports or activities. ▪ Water stress or a greater need to conserve (pending water source). ▪ Less freshwater available aboveground.

[9] Bend Community Climate Action Plan (see Appendix C)

Climate Hazard	Potential Impacts to COCC Campuses and Communities
Atmospheric rivers and larger winter storms	▪ Localized flooding affecting buildings, transportation, and other infrastructure. ▪ Increase of soil contaminants getting into groundwater due to large volumes of precipitation happening in a short time. ▪ Heavy rainfall causes debris flows that require cleanup.
Windstorms	▪ Power outages. ▪ Debris flows that require cleanup.

COCC's Greenhouse Gas Emissions

To make meaningful progress toward carbon neutrality, an organization must first understand its own climate impact. A GHG emissions inventory establishes the baseline conditions by detailing the sources and quantities of GHG emissions. COCC completed its first GHG emissions inventory using 2022 data to establish a baseline. The 2022 inventory is consistent with Second Nature inventory guidance[10] and includes scope 1, scope 2, and scope 3 emissions sources, as defined in the introduction and glossary and Figure 1.

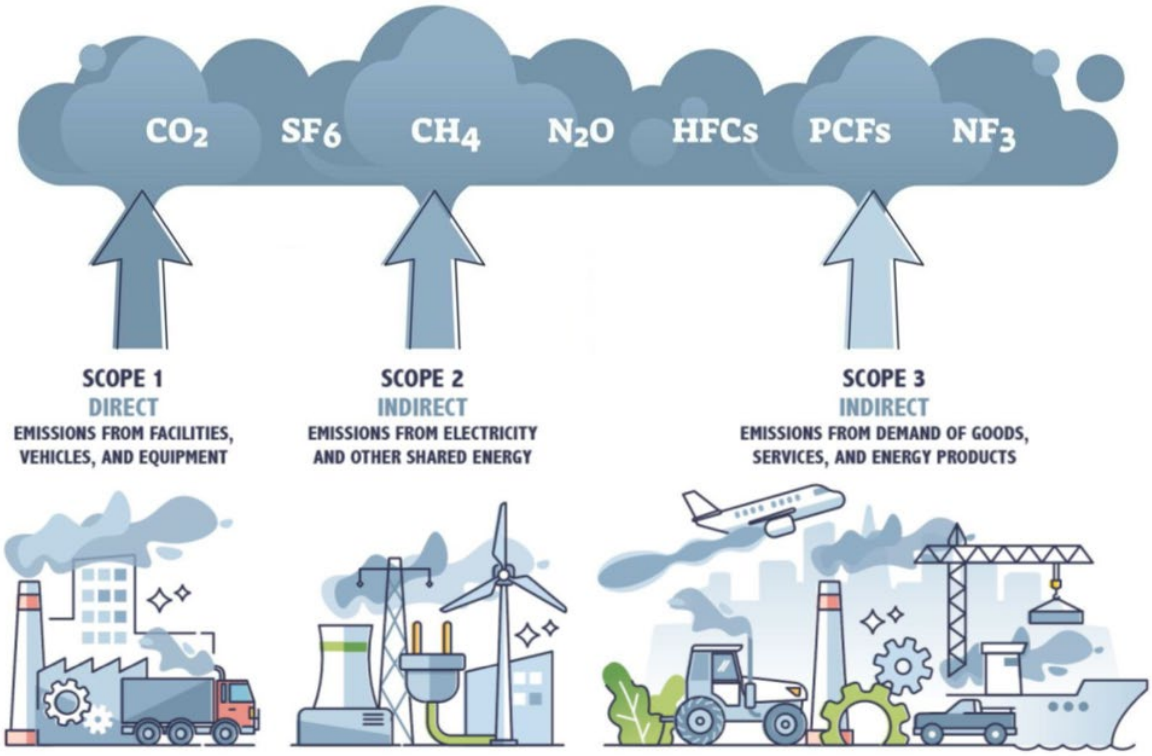

Figure 1. Greenhouse Gas Emission Scopes

Subsequent inventories will help COCC understand where and how its climate action efforts are impacting its operational emissions.

GHG inventories measure seven GHGs by weight as defined by global GHG accounting protocols. Analysis converts all gases into metric tons of carbon dioxide equivalent (MTCDE) using global warming potentials. One MTCDE is equivalent[11] to 1.2 acres of forest sequestration for 1 year.

[10] Second Nature GHG Inventory Guidance - https://docs.google.com/document/d/1WKuPQ8u587NPGFY_AO5hSALPgGmtiGikP1keU-I9cmQ/edit?tab=t.0#heading=h.ntad2ph24uat

[11] According to EPA's GHG Equivalencies Calculator

In 2022, COCC's GHG emissions totaled 11,295 MTCDE. This is equivalent to the carbon sequestered by 13,187 acres of U.S. forests in 1 year. Figure 2 shows the percentages of COCC emissions by source. COCC's largest emissions sources were purchased electricity (39%), natural gas (22%), and commuting (21%) in 2022.

For the sake of this Climate Action Plan, we are focusing on the main two categories of emissions including:

1. Buildings and energy use make up 73% of COCC's total emissions and include stationary sources (i.e., natural gas use), purchased electricity, and fuel and energy-related activities.
2. Transportation makes up 22% of COCC's total emissions and includes commuting, business travel, and mobile sources.

Table 2 details COCC's emissions by source and scope, as determined in COCC's 2022 GHG emissions inventory.

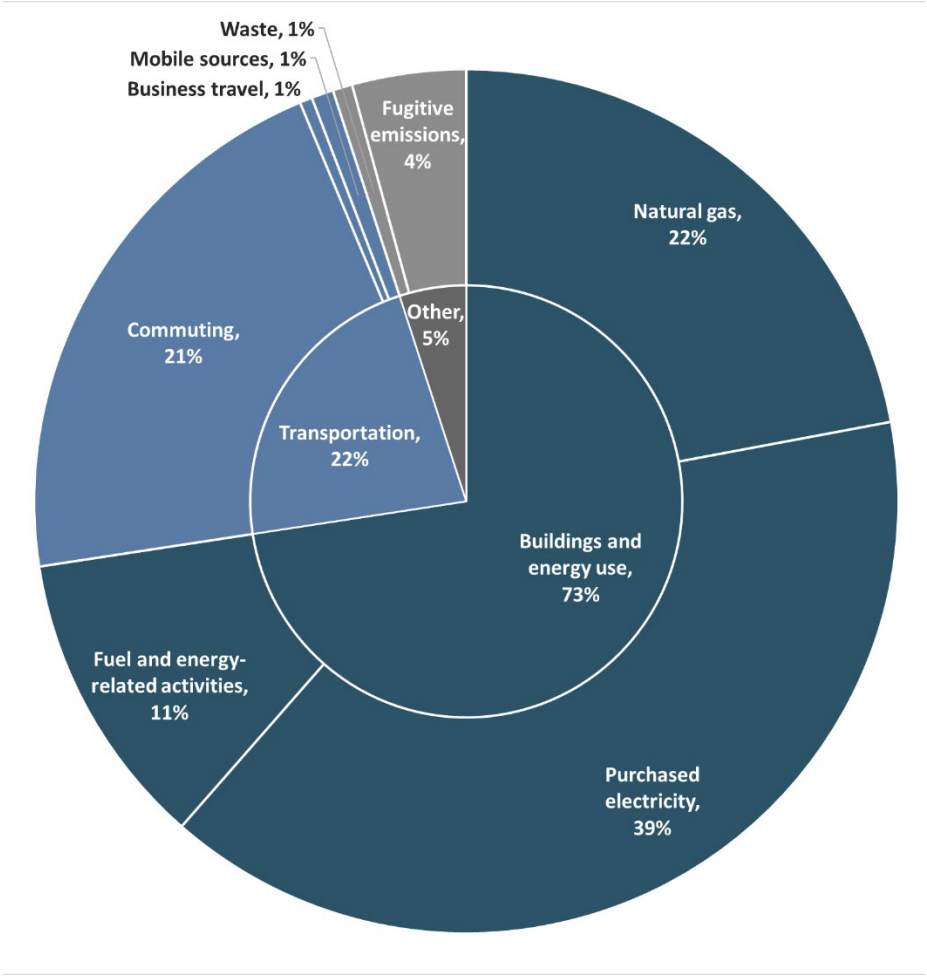

Figure 2. COCC's 2022 Emissions by Source

Table 2. COCC's 2022 Emissions Detail by Source and Scope

Emissions Source	Scope	Emissions in MTCDE	Percentage of Total Emissions	Notes
Buildings and Energy Use				
Natural gas	1	2,491	22%	Natural gas is used primarily for space and water heating, as well as cooking.
Purchased electricity [a]	2	4,449	39%	Purchased electricity from Pacific Power. Market-based accounting using the specific generation resources provided by Pacific Power.
Fuel and energy-related activities	3	1,258	11%	Upstream emissions from production and transport/transmission of fuel and energy. These emissions depend on the quantities and types of fuels produced and combusted in electricity production.
Transportation				
Mobile sources	1	93	1%	Fuel used in fleet vehicles and other mobile equipment.
Commuting	3	2,386	21%	These emissions come from students, faculty, and staff commuting to class and work.
Business travel	3	53	1%	Travel by COCC faculty and staff for business purposes.
Other				
Fugitive emissions	1	481	4%	Refrigerant gases are used in cooling equipment such as air conditioning in buildings, vehicles, and refrigerators. These emissions may vary significantly year to year. Refrigerants have a wide range of climate impact and can leak slowly or suddenly, potentially releasing dozens to hundreds of MTCDE at a time from a single piece of cooling equipment.

Emissions Source	Scope	Emissions in MTCDE	Percentage of Total Emissions	Notes
Waste generated in operations	3	83	1%	Transport and landfill emissions from COCC's waste. Landfill emissions are primarily caused by the methane from food waste escaping before being capped at the landfill.
Purchased goods and services	3	*Not estimated*		Not currently estimated but has potential to be a significant emissions source. Note that this category includes emissions from sources such as building construction, major facilities projects, food, supplies, and equipment.

MTCDE = metric tons of carbon dioxide equivalent

a Electricity emissions can be calculated using two different methodologies: location-based accounting, based on the shared average electricity emissions in the Northwest Power Pool, or market-based accounting which is based on the electricity that is purchased from your specific utility. To reach net-zero emissions for electricity, market-based electricity accounting must be used.

Priority Climate Actions and Implementation

This plan includes 15 priority climate actions and policies with a 5-year implementation plan to reduce 16% of GHG emissions by 2030 and make significant progress toward achieving the goal of carbon neutrality by 2050. These emissions-reduction actions are organized into four categories (buildings and energy, energy purchasing, transportation, and policy and behavior change) based on COCC's GHG emission sources and the types of actions.

Table 3. COCC Priority Climate Actions and Policies

Categories	Priority Actions and Policies
Buildings and Energy (BE)	BE-1: Upgrade building envelopes based on audit findings to improve energy efficiency.
	BE-2: Upgrade HVAC equipment in campus buildings with smart and/or high efficiency hardware options.
	BE-3: Upgrade lighting controls using mechanisms like occupancy sensors, photo-sensors, and/or timers (stand alone or energy management system/EMS-interfaced).
	BE-4: Electrify existing gas heating systems.
	BE-5: Electrify existing gas cooking systems.
	BE-6: Install additional photovoltaic (PV) solar.
	BE-7: Install battery storage systems to utilize more electricity from COCC-owned solar panels.
Purchased Reductions (PR)	PR-1: Purchase RECs for electricity use that cannot be otherwise mitigated or offset at this time.
	PR-2: Purchase verified carbon offsets for natural gas use that cannot be mitigated based on efficiency measures alone.
Transportation (T)	T-1: Support faculty, staff, and students to use climate-friendly commute options.
	T-2: Provide incentives for taking transit, using active transportation, carpooling, or the vanpool to get to and from campuses.
Policy and Behavior Change (PBC)	PBC-1: Adopt and enforce College-wide energy conservation policies and procedures.
	PBC-2: Encourage COCC staff, faculty, and students to adopt climate-friendly behaviors.
	PBC-3: Develop environmental, social, and governance (ESG) purchasing policies for campus admin assistants.
	PBC-4: Adopt a green building policy.

REC = renewable energy certificate

This section includes a summary table for each action with annual GHG reduction potential and implementation timeline. The tables are accompanied by the following for each action: a description of the action and associated co-benefits and an implementation strategy including opportunities and barriers, roles and responsibilities, high-level cost information, funding and resource availability, potential tracking metrics, and next steps.

- **Annual GHG reduction potential (MTCDE):** This criterion measures how many MTCDE COCC can avoid putting into the atmosphere by taking each action. This has been estimated for each action in the CAP for both the 5-year interim targets and the full, 100% implementation of each action (100% implementation is defined individually for each action).
- **Implementation timeline:** The implementation timeline describes what will be completed in the next 5 years to meet interim targets and the number of years expected until 100% implementation.
- **Costs and Savings**: This includes summarized sources of costs and savings for each action for the first 5 years of implementation to meet interim targets. Nominal cost is noted for actions that primarily require staff time for implementation.
- **Co-benefits:** Additional benefits that arise from policies or measures that are intended to address one objective (in this case, GHG emissions) while simultaneously advancing other valuable goals. This plan considers cost savings, improved air quality, public health and well-being, and enhanced resilience as potential co-benefits for each action.
- **Implementation strategy:** The implementation strategy for each climate action describes the following:
  - → **Opportunities and barriers:** This describes opportunities and barriers associated with each action, informed by the participant feedback from CAP outreach and engagement workshops.
  - → **Roles and responsibilities:** This describes the implementation lead and supporting department/organization role(s) for each action (i.e., implement, education, and/or partner).
  - → **Costs:** A description of total costs, marginal costs or cost savings, as applicable. Actions that require only staff time or minimal materials are considered nominal cost.
  - → **Funding and resource availability:** Funding and resource availability is highlighted for each climate action with an overall summary below.
  - → **Potential tracking metrics:** This describes metrics COCC could track for each action to measure progress toward interim targets and goals.
  - → **Next steps:** Describes the next steps toward achieving the 5-year targets for each action.

GHG Emissions Reduction Potential

The climate actions and policies included in this plan are a strong start to COCC's commitment to net zero emissions by 2050. If the 5-year plan is fully implemented, the direct actions have the potential to reduce COCC's annual GHG emissions by 16%. When combined with the purchased reductions actions, the 5-year plan has the potential to reduce COCC's annual GHG emissions by 67%.

Figure 3 shows emissions before and after implementation of the 5-year plan. The graphic shows increased baseline emissions (top line of graphic) to account for electrification actions BE-4, Electrify existing gas heating systems, and BE-5, Electrify existing gas cooking systems, which will require additional electricity. Note that two actions—PBC-3, Develop ESG purchasing policies, and PBC-4, Adopt a green building policy—do not have direct associated emissions reductions. As these policies are implemented and COCC makes choices that reduce GHG emissions in the future, these policies will provide additional contribution to COCC's efforts toward net zero emissions beyond what is estimated here.

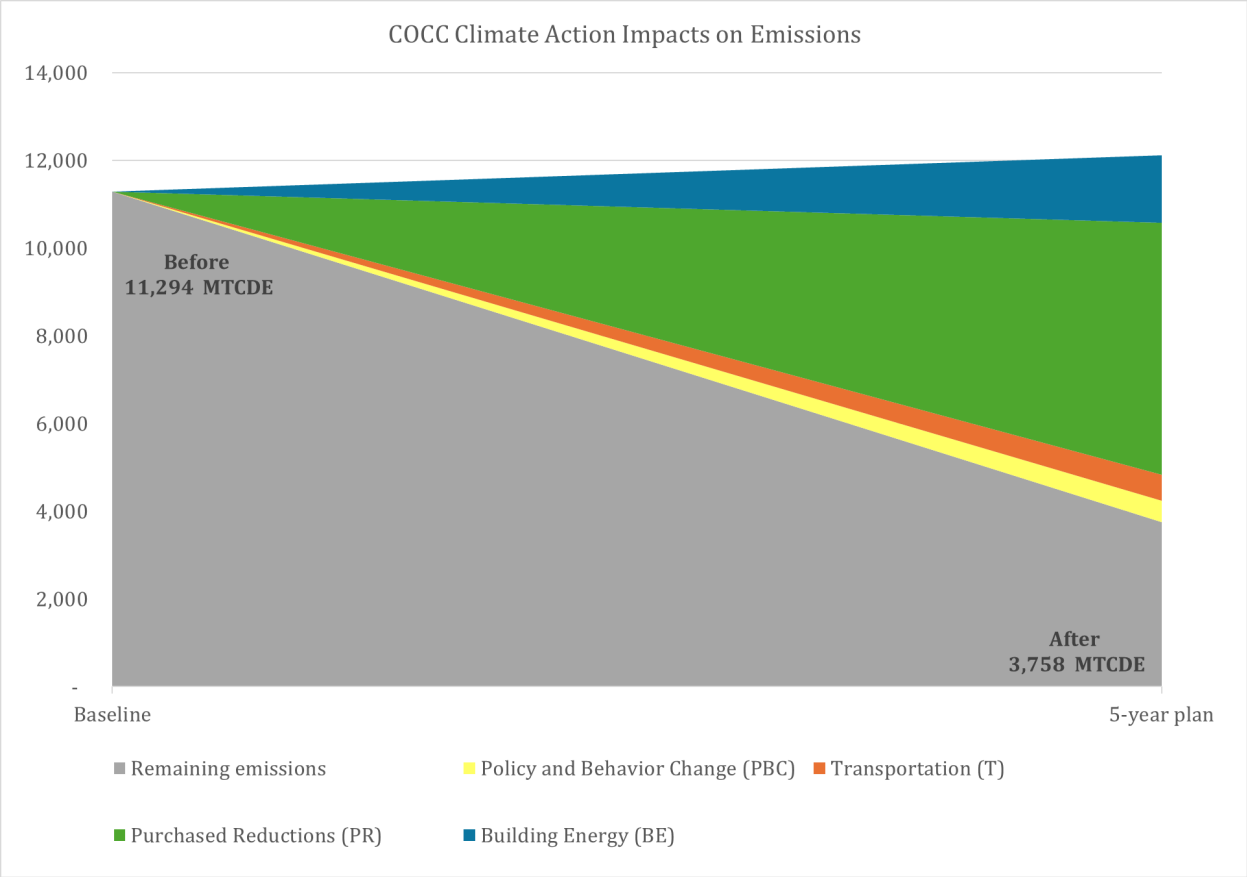

Figure 3. COCC Emissions Before and After Implementation of the 5-Year Plan

Figure 4 below shows more detailed results for each action and category, along with high-level cost information, for implementation of the 5-year plan. Results are modeled by action as well as action category. The results for each individual action may not be additive to the totals as many of the actions have overlapping benefits. The subtotals for each group do add up to provide the total potential reductions.

COCC CAP 5-year Plan Action Summary							
#	Action	Annual MTCDE reduced	Bend	Redmond	Madras	Prineville	% reductions compared to 2022 total
BE-1	Upgrade building envelopes based on audit findings to improve energy efficiency.	**-248**	-214	-28	-4	-2	-2%
BE-2	Upgrade HVAC equipment in campus buildings with smart and/or high efficiency hardware options.	**-189**	-163	-22	-3	-1	-2%
BE-3	Upgrade lighting controls using mechanisms like occupancy sensors and/or timers (stand alone or energy management system/EMS-interfaced).	**-145**	-125	-16	-2	-2	-1%
BE-4	Electrify existing gas heating systems.	**-493**	-423	-58	-9	-2	-4%
BE-5	Electrify existing gas cooking systems.	**-12**	-12	0	0	0	-0.1%
BE-6	Install additional photovoltaic (PV) solar.	**-305**	-296		-9		-3%
BE-7	Install battery storage systems to utilize more electricity from COCC-owned solar panels.	**-150**	-83		-67		-1%
	Subtotal	**-712**	**-609**	**-31**	**-70**	**-2**	**-6%**
PR-1	Purchase RECs for electricity use that cannot be otherwise mitigated or offset at this time.	**-3,758**	-3,251	-460	-2	-46	-33%
PR-2	Purchase verified carbon offsets for natural gas use that cannot be mitigated based on efficiency measures alone.	**-1,987**	-1,705	-236	-35	-10	-18%
	Subtotal	**-5,745**	**-4,956**	**-696**	**-37**	**-56**	**-51%**
T-1	Support faculty, staff, and students to use climate-friendly commute options.	**-470**	-366	-86	-5	-14	-4%
T-2	Provide incentives for taking transit, using active transportation, carpooling, or the vanpool to get to and from campuses.	**-125**	-95	-26	-1	-4	-1%
	Subtotal	**-596**	**-461**	**-111**	**-6**	**-17**	**-5%**
PBC-1	Adopt and enforce college-wide energy conservation policies and procedures.	**-276**	-238	-31	-5	-2	-2%
PBC-2	Encourage climate-friendly behaviors.	**-207**	-179	-23	-3	-2	-2%
	Subtotal	**-483**	**-417**	**-54**	**-8**	**-4**	**-4%**
	Total excluding Purchased Reductions actions	**-1,802**	**-1,487**	**-197**	**-95**	**-23**	**-16%**
	Total for 5-year plan (with Purchased Reductions)	**-7,536**	**-6,443**	**-893**	**-121**	**-79**	**-67%**

Figure 4. 5-Year Plan Projected GHG Emission Reductions by Action

Figure 5 shows results by scope in total and by campus, with percentage reduction for that scope, percentage reduction from baseline total emissions, and remaining emissions based on implementation of the 5-year plan.

Total impact by scope (5-year plan, excluding purhcased reductions)	Annual MTCDE reduced	Bend	Redmond	Madras	Prineville	% reduced from scope	% reduced from total	Remaining emissions
Scope 1, excludes purchased natural gas offsets	-505	-435	-58	-9	-2	-16%	-4%	2,560
Scope 2, excludes purchased renewable electricity credits	-701	-590	-28	-80	-3	-16%	-6%	3,748
Scope 3	-596	-461	-111	-6	-17	-16%	-5%	3,184
Total	**-1,802**	**-1,487**	**-197**	**-95**	**-23**	**-16%**	**-16%**	**9,492**

Total impact by scope (5-year plan - all actions)	Annual MTCDE reduced	Bend	Redmond	Madras	Prineville	% reduced from scope	% reduced from total	Remaining emissions
Scope 1, includes purchased natural gas offsets	-2,491	-2,141	-295	-44	-12	-81%	-22%	574
Scope 2, includes purchased renewable electricity credits	-4,449	-3,841	-487	-71	-49	-100%	-39%	0
Scope 3	-596	-461	-111	-6	-17	-16%	-5%	3,184
Total	**-7,536**	**-6,443**	**-893**	**-121**	**-79**	**-67%**	**-67%**	**3,758**

Figure 5. 5-Year Plan Projected GHG Emission Reductions by Scope

While the focus of this analysis is on the 5-year plan, results were also analyzed for full implementation of the plan. Those results are in Figure 6 below. The full potential of this CAP is a 67% GHG emissions reduction. The difference between the short and long term is that the 5-year plan produces 16% direct emissions reduction (without purchased reductions), whereas the long-term, full implementation of all actions produces 47% direct reductions (without purchased reductions). In both cases, the remaining building energy emissions can be reduced through purchased reductions to achieve the full GHG emissions-reduction potential of 67%.

COCC CAP Action Summary (Full Implementation)							
#	Action	Annual MTCDE reduced	Bend	Redmond	Madras	Prineville	% reductions compared to 2022 total
BE-1	Upgrade building envelopes based on audit findings to improve energy efficiency.	-992	-854	-113	-17	-8	-9%
BE-2	Upgrade HVAC equipment in campus buildings with smart and/or high efficiency hardware options.	-756	-651	-86	-13	-6	-7%
BE-3	Upgrade lighting controls using mechanisms like occupancy sensors and/or timers (stand alone or energy management system/EMS-interfaced).	-291	-251	-32	-5	-3	-3%
BE-4	Electrify existing gas heating systems.	-1,971	-1,694	-233	-35	-10	-17%
BE-5	Electrify existing gas cooking systems.	-72	-72	0	0	0	-1%
BE-6	Install additional photovoltaic (PV) solar.	-305	-296		-9		-3%
BE-7	Install battery storage systems to utilize more electricity from COCC-owned solar panels.	-1,346	-1,305		-41		-12%
	Subtotal	**-3,880**	**-3,519**	**-257**	**-88**	**-16**	**-34%**
PR-1	Purchase RECs for electricity use that cannot be otherwise mitigated or offset at this time.	-2,128	-1,671	-409	-10	-39	-19%
PR-2	Purchase verified carbon offsets for natural gas use that cannot be mitigated based on efficiency measures alone.	-449	-375	-62	-9	-3	-4%
	Subtotal	**-2,577**	**-2,046**	**-470**	**-19**	**-41**	**-23%**
T-1	Support faculty, staff, and students to use climate-friendly commute options.	-470	-366	-86	-5	-14	-4%
T-2	Provide incentives for taking transit, using active transportation, carpooling, or the vanpool to get to and from campuses.	-125	-95	-26	-1	-4	-1%
	Subtotal	**-596**	**-461**	**-111**	**-6**	**-17**	**-5%**
PBC-1	Adopt and enforce college-wide energy conservation policies and procedures.	-276	-238	-31	-5	-2	-2%
PBC-2	Encourage climate-friendly behaviors.	-207	-179	-23	-3	-2	-2%
	Subtotal	**-483**	**-417**	**-54**	**-8**	**-4**	**-4%**
	Total excluding Purchased Reductions actions	**-4,959**	**-4,396**	**-423**	**-103**	**-37**	**-44%**
	Total for full implementation of CAP	**-7,536**	**-6,443**	**-893**	**-121**	**-79**	**-67%**

Figure 6. Full Implementation Projected GHG Emissions Reductions by Action

Buildings and Energy

The Buildings and Energy category includes emissions from natural gas, electricity, and upstream fuel production. These sources account for 73% of COCC's emissions. This category includes seven priority actions. The actions focus on reducing the amount of energy used through efforts that improve energy efficiency, as well as on using lower-emission energy sources including converting natural gas uses to electric and producing on-site renewable energy.

Switching from natural gas appliances to electric appliances will increase the College's electricity use. Although Pacific Power is required to reduce the emissions intensity of its electricity to 80% below baseline by 2030, 90% below baseline by 2035, and 100% below baseline by 2040 thanks to Oregon's Clean Energy Targets,[12] it essential that organizations such as COCC increase on-site generation and storage to help meet these targets and reduce reliance on the existing utility grid

[12] Oregon Clean Energy Targets, https://www.oregon.gov/deq/ghgp/pages/clean-energy-targets.aspx

mix. As of October 2024, Oregon's gas utilities are not subject to similar emissions-reduction targets. The benefits of the two electrification actions, BE-4 and BE-5, do not rely on Oregon's Clean Energy Targets, but without additional solar electricity or REC purchases, the benefit would be reduced.

BE-1: Upgrade Building Envelopes to Improve Energy Efficiency

Description

As buildings receive roof replacements and other significant maintenance, weatherization measures such as air sealing and additional insulation (under roofs, inside walls, basements) should be added. These improvements can reduce energy used by HVAC systems by an estimated 26%.

Table 4. BE-1: Upgrade Building Envelopes to Improve Energy Efficiency

Annual GHG Reduction Potential	Implementation Timeline
First 5 years 248 MTCDE (2% reduction over baseline). **Full implementation** Maximum GHG reduction potential of 992 MTCDE (9% reduction over baseline).	**First 5 years** Assume nine roofs (~25%) will be replaced, including building envelope upgrades and weatherization, starting with those in poor condition. **Full implementation** 20 years to full implementation if 25% of roofs continue to be replaced every 5 years.

MTCDE = metric tons of carbon dioxide equivalent

A building envelope is the physical barrier that separates the interior of a building from the exterior environment (see Figure 7). It includes components such as walls, roofs, windows, and doors, and it plays a crucial role in regulating indoor temperatures, controlling moisture, and improving air quality. Well-constructed building envelopes contribute to a more comfortable and sustainable living or working environment, enhance energy efficiency, and reduce utility costs by providing insulation and minimizing air leaks. Individual upgrades for building envelope and weatherization include upgrades to the following building elements:

- Building envelope
  - → Insulation in roof, attic, and walls
  - → Slab/crawl space insulation
  - → Windows
  - → Doors
- Weatherization
  - → Door seals/jams
  - → Building infiltration
  - → Window seals

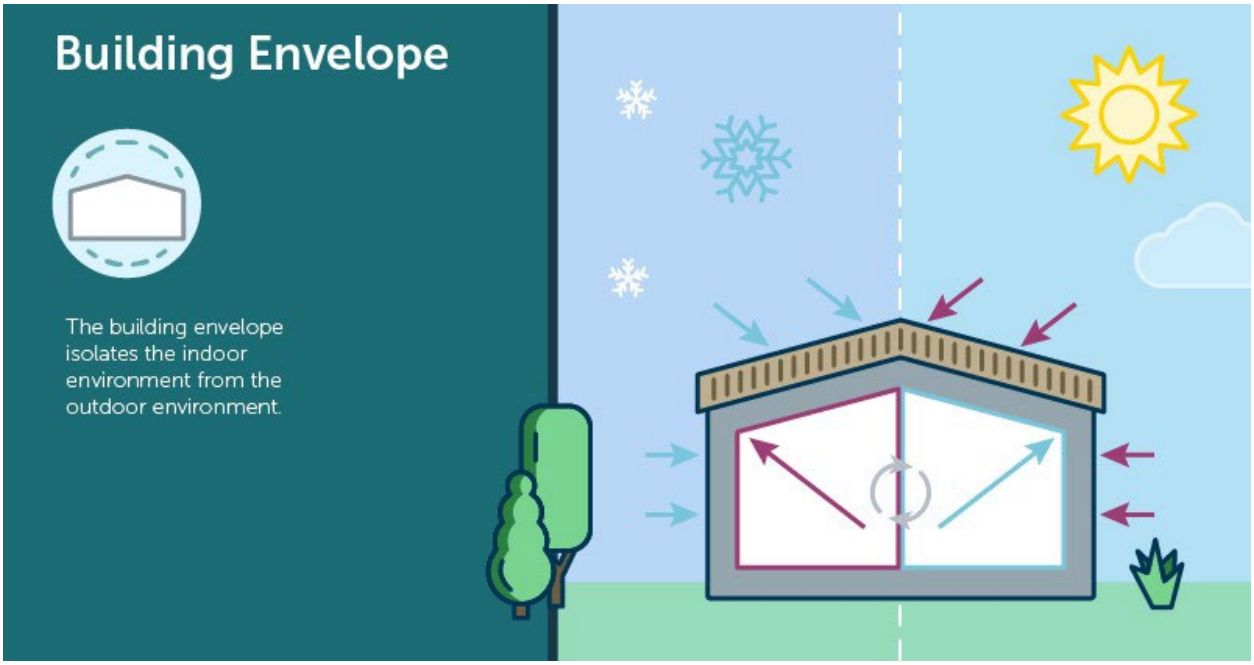

Figure 7. Building Envelope Illustration from Second Nature
Source: Second Nature, et al. is licensed under CC BY-SA 4.0

Co-Benefits

- Cost savings: This action will reduce ongoing utility costs for HVAC usage.
- Improved air quality: This can also improve indoor air quality in the face of wildfire smoke, leading to improved public health outcomes.
- Enhanced resilience: Improved building envelopes can help keep indoor spaces cool during extreme heat events and warm during winter storms.

Implementation Strategy

Opportunities and Barriers

- Opportunities: The third-party Facility Condition Assessment reports conducted in 2022 indicated that most COCC building envelopes were in fair condition. Building envelope improvements are likely already planned or on the horizon given this assessment. It is more cost-effective to add on efficiency improvements when performing substantial envelope improvements such as roof replacements. Planned improvements should optimize efficiency to see the greatest benefit.
- Barriers: Limited resources (staff capacity, funding) and conflicting priorities mean that maintenance such as building envelope improvements often get deferred. Highly variable ages and building types across the four campuses require different upgrades or treatments and prevent a more streamlined, systematic approach.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Update Capital Improvement Plan (CIP). Specify high-efficiency envelope improvements as maintenance occurs.

Support

- Sustainability Team – Support Facilities Team and serve as liaison to other programs.
- Finance Office – Budgeting process to incorporate building envelope upgrades based on the CIP.

Costs – overall cost savings

- Upgrading building envelopes and weatherization efforts will result in additional upfront costs of improved materials and insulation. These upgrades are expected to reduce operational electricity and natural gas use and provide cost savings on utility bills.

Funding and Resource Availability

Internal Funding and Resources

- Facilities or capital improvements budget.
- Leveraging energy savings to help pay for some of the improvements.

External Funding and Resources

- Energy Trust of Oregon incentives and Strategic Energy Management[13] program rebates.
- Oregon Cash incentives for insulation.
- Energy Services Companies (ESCOs)[14] can provide a guaranteed energy savings to help pay for improvements.

Potential Tracking Metrics

- Number or percentage of roof replacements completed annually.
- Dollars budgeted for roof replacements and other building envelope upgrades.

Next Steps

1. Identify the buildings that are in the poorest condition(s).
2. Of those buildings, determine which buildings have the largest square footage to heat or cool.
3. Replace nine roofs (25%) and complete associated building envelope upgrades by 2029.
4. Determine type of improvements needed and estimated costs.

[13] https://www.energytrust.org/industry-agriculture/industry-strategic-energy-management/

[14] Energy Services Companies are businesses that design and implement comprehensive energy efficiency solutions for buildings and facilities, typically guaranteeing energy savings through performance-based contracts that require little to no upfront capital investment from the client.

5. Conduct research and gather quotes to determine which specific roofing and building envelop choices are most cost-effective for each unique building.
6. Work through the budgeting and CIP process to budget for the buildings that are in the worst condition with the largest amount of square footage.
7. Implement upgrades to building envelopes for at least 25% of roofs in fair or poor condition by 2029.

BE-2: Upgrade HVAC Equipment in Campus Buildings with Smart and/or High Efficiency- Hardware Options

Description

Upgrade HVAC equipment with smart technology (e.g., connected systems, sensors, Wi-Fi connectivity, automation, smart settings) and energy efficient hardware such as Energy Star–certified equipment, reducing an estimated 20% of HVAC energy use. Pairing this action with action BE-4, Electrify existing gas heating systems, will optimize the emissions reductions and reduce costs for both actions by replacing the equipment once during its planned replacement schedule.

Table 5. BE-2: Upgrade HVAC Equipment in Campus Buildings with Smart and/or High-Efficiency Hardware Options

Annual GHG Reduction Potential	Implementation Timeline
First 5 years 189 MTCDE (2% reduction over baseline). **Full implementation** Maximum GHG reduction potential of 756 MTCDE (7% reduction over baseline).	**First 5 years** Assume 25% of HVAC units are replaced in the first 5 years, starting with those in fair or poor condition. **Full implementation** 20 years to full implementation if 25% of HVAC units continue to be replaced every 5 years.

MTCDE = metric tons of carbon dioxide equivalent

Heating, Ventilation and Air Conditioning (HVAC) systems are energy-intensive and contribute nearly one-third of building energy demands. Investing in HVAC upgrades improves system efficiency overall and offers the opportunity to reduce energy use and emissions (see Figure 8). This generates savings from reduced operational maintenance and energy bills, which could be funneled back into COCC's Green Revolving Fund to help pay for future energy efficiency improvements and sustainability efforts. Energy savings in this action result from a combination of retro commissioning, enhanced sequence of operations, and purchasing more efficient equipment. Retro commissioning is a systematic process of evaluating, testing, and analyzing an existing building's systems to identify operational improvements and ensure optimal performance. Enhanced sequence of operations refers to standardized, advanced control sequences for HVAC systems designed to maximize energy efficiency, provide control stability, and enable real-time fault detection and diagnostics.

Figure 8. HVAC Illustration by Second Nature

Co-Benefits

- Cost savings: HVAC upgrades can be expensive up front, but the resulting energy savings provide high financial returns with little risk. HVAC upgrades should be made at the end of the equipment's useful life to further optimize savings.
- Public health and well-being: HVAC upgrades can provide more efficient and comprehensive heating and cooling resulting in comfortable indoor spaces during both cold and hot weather.

Implementation Strategy

Opportunities and Barriers

- Opportunities: The third-party Facility Condition Assessment reports conducted in 2022 indicated that most COCC HVAC systems were in fair condition. This means that replacements will be necessary over the coming years.
- Barriers: Facilities staff indicated that historically, HVAC upgrades have been more reactionary than proactive due to financial constraints. Delays in upgrading older equipment will delay the emissions reduction benefits.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Update CIP.

Support

- Sustainability Team – Support Facilities Team and serve as liaison to other programs.
- Finance Office – Budgeting process to schedule HVAC upgrades based on the CIP.

Costs – overall cost savings

- Upgrading HVAC systems will result in additional upfront costs for higher efficiency systems. These high efficiency systems are expected to reduce operational electricity and natural gas use and provide cost savings on utility bills.

Funding and Resource Availability

Internal Funding and Resources

- Facilities or capital improvements budget.
- Leveraging energy savings to help pay for some of the improvements.

External Funding and Resources

- Energy Trust of Oregon incentives and Strategic Energy Management program rebates.
- Oregon Cash Incentives for HVAC and water heating equipment.

Potential Tracking Metrics

- Number of HVAC replacements completed annually.
- Dollars budgeted for HVAC replacements.

Next Steps

1. Identify priority HVAC units for replacement (those that are in the worst condition).
2. Of the priority HVAC units identified, determine which are responsible for heating and cooling the largest areas (square feet).
3. Determine the energy use index of each site based on energy use and square footage.
4. For the units that are in poor condition and heat/cool the largest areas, identify smart and/or high-efficiency replacement options and estimate replacement costs.
5. Work through the budgeting/CIP process to budget for HVAC replacements.
6. Upgrade at least 25% of HVAC units that are in fair or poor condition by 2029.

BE-3: Upgrade Lighting Controls Using Mechanisms like Occupancy Sensors, Photo-Sensors, and/or Timers (Stand-Alone or Energy Management System/EMS-Interfaced)

Description

Upgrade lighting controls with features to dim or turn off unnecessary lighting, reducing an estimated 38% of lighting energy use. Ideally, this will be coupled with upgrades to energy-efficient LED lighting, which are already underway or implemented at most COCC facilities. Features can include occupancy sensors, timeclocks, energy management system (EMS), workstation/room

dimmers, wireless switches, workstation-specific controls, preset scene controls, photosensors, dimmable ballasts, and dimmers and switches used to control group lighting.

Table 6. BE-3 Upgrade Lighting Controls Using Mechanisms like Occupancy Sensors, Photo-Sensors, and/or Timers (Stand-Alone or Energy Management Systems/EMS-Interfaced)

Annual GHG Reduction Potential	Implementation Timeline
First 5 years 145 MTCDE (1% reduction over baseline). **Full implementation** Maximum GHG reduction potential of 291 MTCDE (3% reduction over baseline).	**First 5 years** 50% of buildings (by square footage) to be updated with lighting controls. This action is already underway. **Full implementation** 10 years to full implementation in all buildings receive lighting control upgrades every 5 years.

MTCDE = metric tons of carbon dioxide equivalent

Educational facility buildings spend around 17% of their energy on lighting.[15] COCC has already made progress to replace about 70% of inefficient incandescent light bulbs with LEDs to reduce campus electricity demand from lighting. In addition to LED replacement, installing lighting controls such as occupancy sensors, dimming controls, and daylight sensors can improve lighting efficiency. Some lighting control upgrades are already in progress at COCC, including upgrading lighting controls in the buildings that use a digital addressable lighting interface (DALI) system. The current DALI systems prevent COCC from replacing incandescent bulbs with LEDs, and COCC is working toward replacing DALI systems with nLight AIR networked lighting controls that integrate time-based, daylight-based, sensor-based, and manual controls through a digital interface that is easy to use (see Figure 9 for an example system).

[15] https://secondnature.org/solutions-center/lighting/

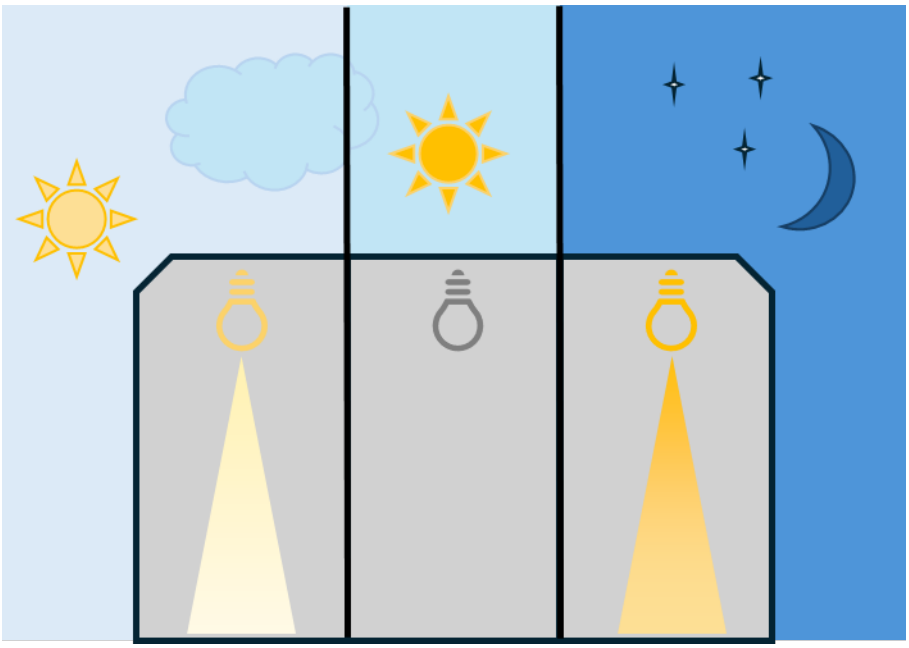

Figure 9. Daylight Based Lighting Controls

Co-Benefits

- Cost savings: Reducing energy use for lighting will yield energy cost savings.

Implementation Strategy

Opportunities and Barriers

- Opportunities: The Facilities Team is already planning to install lighting controls in the near future, and about 30% of bulbs still need to be upgraded to LEDs. Computer labs may be a good candidate for occupancy sensors, while atriums and entries may be good candidates for daylight harvesting technology.
- Barriers: Upfront cost and staff time to make these upgrades may be barriers.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Implement lighting control upgrades.

Support

- Sustainability Team – Support Facilities Team and serve as liaison to other programs. Engage building managers to identify waste, and tailor the lighting schedule to conserve energy while meeting occupant needs.
- Finance Office – Budgeting process to incorporate upgrading lighting controls based on the CIP.
- Site/building managers – Engage Sustainability Team to identify waste, and tailor lighting schedules to conserve energy while meeting occupant needs.

- Program directors.
- Custodial team.

Costs – overall cost savings

- Adding lighting controls will result in upfront installation costs. These high efficiency lighting control systems are expected to reduce operational electricity use and provide cost savings on utility bills.
- This action may also require additional staff time to manage the controls system.

Funding and Resource Availability

Internal Funding and Resources

- Facilities or capital improvements budget.
- Leverage energy savings to help pay for some of the improvements.

External Funding and Resources

- Energy Trust of Oregon incentives and Strategic Energy Management program rebates. *Note: ETO's Lighting and Lighting Controls incentives are on hold as of August 2024, but they may be a future option for external funding for lighting efficiency projects.*

Potential Tracking Metrics

- Number or percentage of buildings with upgraded lighting controls.
- Actual electricity demand (kWh).
- Intensity metric such as electricity demand per class-hours per building.

Next Steps

1. Complete LED upgrades for remaining 30% of campus lighting fixtures.
2. Audit existing lighting controls and schedules to identify needed repairs and schedule changes.
3. Repair broken equipment and update lighting schedules based on audit findings.
4. Complete and note lessons learned from planned lighting controls upgrades in progress (e.g., buildings using the DALI system, the Redmond Technology Center).
5. Determine which other buildings would be good candidates for receiving lighting control upgrades during the first 5 years of plan implementation. Consider tenant needs, operating hours, available technology, and cost.
6. Upgrade 50% of buildings with lighting controls by 2029.

BE-4: Electrify Existing Gas Heating Systems

Description

Replace current natural gas–powered HVAC equipment during the natural replacement schedule with electric HVAC equipment, reducing 100% of space-heating fossil-fuel use. This strategy is assumed to be coupled with solar PV electricity generation and/or REC purchases, which is

important until 2030 when Oregon's Clean Energy Targets will require Pacific Power to reduce electricity emissions intensity. The benefits of this action do not rely on the Clean Energy Targets, but without additional solar electricity or REC purchases, the benefit would be reduced by roughly 20%.

Table 7. BE-4: Electrify Existing Gas Heating Systems

Annual GHG Reduction Potential	Implementation Timeline
First 5 years 493 MTCDE if coupled with renewable electricity (4% reduction over baseline). **Full implementation** Maximum GHG reduction potential of 1,971 MTCDE if coupled with renewable electricity (17% reduction over baseline).	**First 5 years** In conjunction with BE-2, 25% of HVAC units are electrified during replacement in the first 5 years, starting with those in fair or poor condition. Includes upgrading to electric panel capacity as needed. **Full implementation** 20 years to full implementation if 25% of HVAC units continue to be replaced and electrified every 5 years.

MTCDE = metric tons of carbon dioxide equivalent

Natural gas is COCC's second-largest source of emissions (22% of all emissions), and about 79% of the natural gas used on campus is estimated to be used for space heating. COCC can considerably reduce its emissions from natural gas by switching from space heating appliances that use natural gas to electric space heating appliances.

Electrifying gas heating systems would mean swapping out gas-powered heating systems for their electric counterparts (such as heat pumps [see Figure 10]) when it is time to replace them.

Figure 10. Air Source Heat Pumps
Source: Energy.gov.

Co-Benefits

- Cost savings: Ductless heat pumps support control over smaller zones than most ducted gas furnaces. The ability to manage heating zones better can help avoid heating unoccupied areas, reducing energy use and providing cost savings.
- Improves air quality: Maintenance issues and leaks in gas equipment can cause carbon monoxide and methane gas exposure. Electric equipment does not pose this risk.

Implementation Strategy

Opportunities and Barriers

Opportunities

- The Redmond Tech Center already uses ductless heat pumps to meet its space heating needs. Facilities staff and some COCC community members are already familiar with this technology.
- The third-party Facility Condition Assessment reports conducted in 2022 indicated that most COCC HVAC systems were in fair condition. This means that replacements will be necessary over the coming years.

Barriers

- Existing electric panels may not have the capacity needed to support the additional electricity demand of new HVAC equipment. Upgrading electric panels poses an additional cost to consider.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Update CIP.

Support

- Sustainability Team – Support Facilities Team and serve as liaison to other programs.
- Finance Office – Budgeting process to replace gas heating systems with electric options based on the CIP.

Costs – overall cost savings

- Replacing gas heating systems with electric will result in additional upfront capital costs. The electrification will reduce natural gas usage and costs and increase electricity usage and costs. The net result of electrification will provide operational cost savings and result in overall cost savings for the action.

Funding and Resource Availability

Internal Funding and Resources

- Facilities or capital improvements budget.

External Funding and Resources

- Energy Trust of Oregon incentives and Strategic Energy Management program rebates.
- Oregon Cash Incentives for HVAC and water heating equipment include some all-electric options.

Potential Tracking Metrics

- Number or percentage of HVAC units that have been replaced with electric options.

Next Steps

1. Identify existing gas heating systems that are in poor or fair condition or are in need of replacement in the next 5 years.
2. From this list, determine square footage of buildings being heated and electrical capacity of the buildings.
3. Identify suitable electric replacement options to meet the needs of the building and its occupants and the associated costs.
4. Work through the budgeting and CIP process to budget for replacement electric heating systems.
5. Implement 25% of replacements by 2029.

BE-5: Electrify Existing Gas Cooking Systems

Description

Work with the Cascade Culinary Institute faculty and COCC food service staff to shift away from gas-powered cooking systems and toward electric options as the existing gas systems reach end of life. The benefits of this action do not rely on Oregon's Clean Energy Targets, but they need to be coupled with additional solar electricity generation or REC purchases; this action is not recommended without either or both.

Table 8. BE-5: Electrify Existing Gas Cooking Systems

Annual GHG Reduction Potential	Implementation Timeline
First 5 years 12 MTCDE (0.1% reduction over baseline). **Full implementation** Maximum GHG reduction potential of 72 MTCDE (1% reduction over baseline).	**First 5 years** Replace two gas stoves with induction stoves and integrate induction cooking into the Cascade Culinary Institute's curriculum. **Full implementation** 10+ years.

MTCDE = metric tons of carbon dioxide equivalent

Natural gas is COCC's second-largest source of emissions (22% of all COCC emissions), and about 7% of the natural gas used on campus is estimated to be used for cooking. COCC's gas cooking equipment can be found in its cafeterias and in the Cascade Culinary Institute. In addition to the GHG impacts of natural gas use, burning gas indoors contributes to lower indoor air quality.

Electrifying gas cooking systems would mean swapping out gas-powered appliances for their electric counterparts, such as induction stoves (see Figure 11), when it is time to replace them.

Figure 11. Induction Stove Illustration by Second Nature

Co-Benefits

- Improves air quality: One of the by-products of burning gas is nitrogen dioxide (NO_2), and gas-powered cooking appliances can increase indoor levels of NO_2, which is known to have impacts on respiratory health.[16] Electric cooking appliances do not contribute to indoor air quality issues. This is especially beneficial during wildfire smoke events.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Replace gas stoves with induction stoves at the end of the existing stoves' useful life.
- Equipment efficiency gains will result in energy cost savings.
- Improve indoor air quality.
- As of fall 2024, the Dining Hall at the Bend Campus has panel capacity to electrify.
- A pilot program that electrifies the stoves—as feasible—in the Cascade Culinary Institute would allow students to learn to cook using different equipment.
- Provide energy-efficient training for culinary students.
- Cascade Culinary Institute could be a leader in the adoption of commercial electric cooking technology.

[16] The Health Risks of Gas Stoves Explained - https://www.scientificamerican.com/article/the-health-risks-of-gas-stoves-explained/

Barriers

- The Cascade Culinary Institute's panel could only handle up to two electric stoves as of fall 2024.
- Electric panel upgrades are large projects that require significant capital and coordination to complete.
- Induction stoves may not yet be an industry standard in the culinary industry. The Cascade Culinary Institute is unlikely to support full electrification of gas cooktops unless and until it becomes an industry standard.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Update CIP.

Support

- Sustainability Team – Support Facilities Team and serve as liaison to other programs.
- Finance Office – Budgeting process to replace gas cooking systems with electric options based on the CIP.
- Cascade Culinary Institute and campus food service operations – Vet and sign off on suitable electric cooking equipment options.

Costs – overall cost

- Replacing gas cooking systems with electric will result in additional upfront capital costs. The electrification will reduce natural gas usage and costs and increase electricity usage and costs. The net result of electrification will provide operational cost savings. The upfront marginal costs are estimated to outweigh the operational cost savings and result in an overall cost for the action.

Funding and Resource Availability

Internal Funding and Resources

- Facilities or capital improvements budget.
- Cascade Culinary Institute equipment replacement budget.

External Funding and Resources

- Energy Trust of Oregon incentives and Strategic Energy Management program.
- Oregon Cash incentives for Food Service and Lodging Equipment.

Potential Tracking Metrics

- Number or percentage of gas stoves replaced with electric options.

Next Steps

1. Identify the remaining useful life of gas-powered cooking appliances.
2. Determine which appliances will be up for replacement in the next 5 years.

3. Determine electric panel capacity of the buildings where those appliances are housed.
4. Meet with relevant stakeholders (e.g., dining hall managers, food service staff, Cascade Culinary Institute faculty and staff) to receive their feedback and answer questions or address concerns related to the electrification of cooking systems and how this action might affect the curriculum and daily operations at COCC.
5. Replace two gas cooking stoves with induction stoves by 2029.

BE-6: Install Additional Photovoltaic (PV) Solar

Description

Install solar PV systems to generate renewable electricity.

Current assumptions model three planned projects at the Madras and Bend Campuses. This strategy is critical to provide COCC with renewable electricity, which is important until 2030 when Oregon's Clean Energy Targets require Pacific Power to reduce electricity emissions. Solar generation reduces the amount of REC purchases needed to reduce electricity emissions. The full potential of this action will require battery storage (BE-7) to use the generated electricity at a time when COCC needs it. Without battery storage, COCC will need to continue to purchase retail electricity when solar generation is not available and will be responsible for the associated scope 2 emissions.

Table 9. BE-6: Install Additional Photovoltaic (PV) Solar

Annual GHG Reduction Potential	Implementation Timeline
First 5 years Maximum GHG reduction potential of 305 MTCDE (3% reduction over baseline).	**First 5 years** All three planned solar PV projects to be completed within the 5-year period.
Full implementation Additional solar PV installation opportunities are yet to be determined.	**Full implementation** There is opportunity for more solar. Additional solar PV installation opportunities are yet to be determined.

MTCDE = metric tons of carbon dioxide equivalent

Solar PV systems generate electricity using energy from the sun. The three most common solar installations for a campus environment are ground-mount, rooftop, and carport. COCC currently has two solar PV systems: one small rooftop solar array at the Prineville Campus (3-kW capacity) and another, larger array at the Redmond Campus (504-kW capacity).

As of October 2024, COCC is considering installing additional solar PV at its Madras Campus (two systems, estimated at 50-kW and 84-KW capacity, respectively) and at the Bend Campus (estimated 1,853-kW capacity, plus battery storage). Per GHG reporting protocol, the full GHG emissions reduction potential of this action will require battery storage (BE-7) in order to use the generated electricity at a time when COCC needs it.

Each installation type has a unique combination of technical considerations and environmental and economic benefits. Recent downward price trends for solar technologies have made the cost of solar PV competitive with other electricity generation sources.

Solar Agreement Types

A power purchase agreement is a long-term contract between COCC and an electricity generator, where the customer buys electricity at a predetermined price. All maintenance is covered by the solar company.

A solar lease agreement is a contract between a solar company and COCC that outlines the terms and conditions for installing and operating panels on the landowner's property. All maintenance is covered by the solar company.

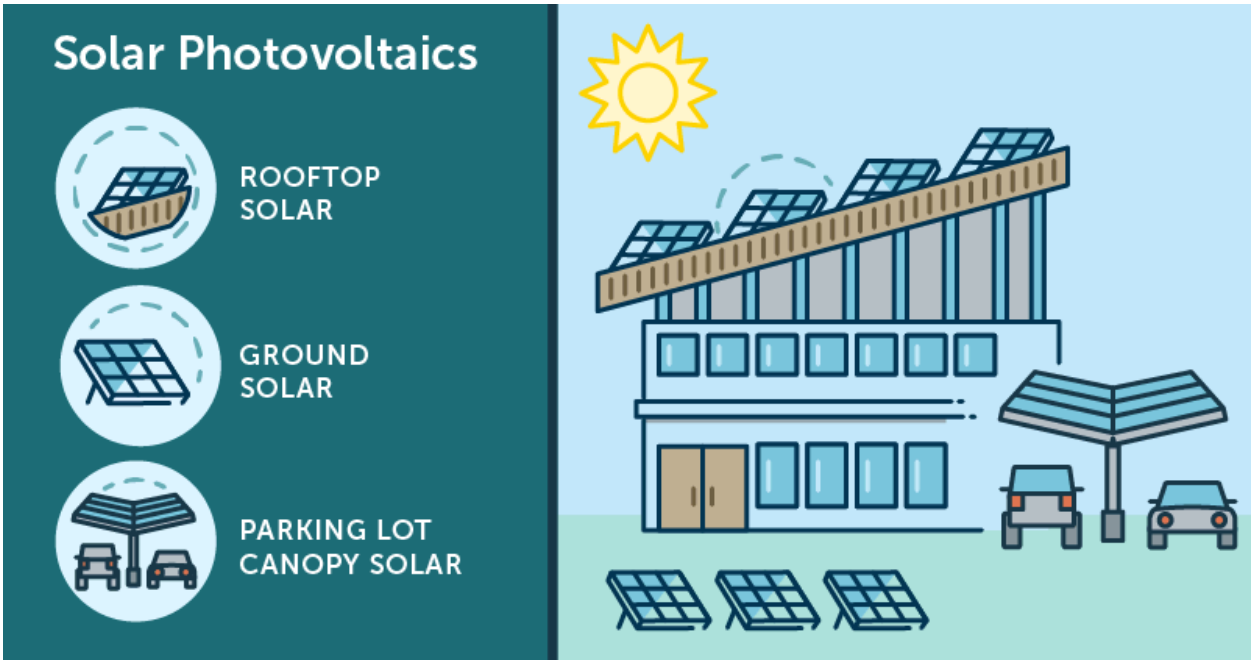

Figure 12. Solar Photovoltaics Illustration by Second Nature

Source: Second Nature, et al. is licensed under CC BY-SA 4.0

There are some complexities around GHG accounting for renewable energy generation when energy is sold back to the electric utility. According to Greenhouse Gas Protocol's Scope 2 Guidance:[17]

> *Many markets utilize "net metering" for these systems, which allows grid purchases to be measured only as net of any energy exported to the grid. This net number may also be the basis for how costs are assessed.*
>
> *For accurate scope 2 GHG accounting,* ***companies shall use the total—or gross—electricity purchases from the grid rather than grid purchases "net" of generation for the scope 2 calculation****. A company's total energy consumption would therefore include… total electricity purchased from the grid (electricity). It would exclude generation sold back to the grid.*

[17] Greenhouse Gas Protocol, Scope 2 Guidance, used by SIMAP https://ghgprotocol.org/scope-2-guidance - emphasis added

In other words, solar sold to the grid reduces COCC's electricity expenses but does not reduce emissions. Using market-based accounting, COCC is responsible for all electricity emissions purchased or imported from the grid unless RECs are purchased in their place. Figure 13 illustrates this concept which highlights the importance of rightsizing the solar generation and pairing it with local battery storage, and/or purchasing RECs until these actions are achieved to have this action count in GHG accounting.

Total energy production from on-site system	On-site energy consumption from on-site system	Energy exported from the on-site system to the grid	Energy imported from the grid
100 kWh	50 kWh	50 kWh	70 kWh
Total energy consumption (to be reported separately) = 120 kWh 50 kWh consumed from on-site system + 70 kWh imported from grid			
"Net" grid consumption= 20 kWh (70 kWh imported from grid - 50 kWh exported)			

Figure 13. Greenhouse Gas Protocol Scope 2 Guidance: Comparison of Gross and Net Energy Consumption

Source: GHG Protocol Scope 2 Guidance

Co-Benefits

- Cost savings: The sale of excess energy produced by solar PV systems can reduce electricity bills and provide cost savings over time. Additionally, on-site solar PV systems can help protect against utility rate increases by establishing set electricity costs and increase property values through infrastructure improvements. Tax incentives and rebates can help offset initial installation costs, improving the overall return on investment for solar PV projects.
- Enhanced resilience: Development of solar PV resources can help reduce electricity peak load requirements, and distributed energy resources help make the overall electric grid more able to meet the demand of the community. When paired with battery storage, solar PV systems can also provide critical backup power during grid outages and extreme weather events. Distributed power generation reduces vulnerability to large-scale disruptions and helps maintain essential services during emergencies.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Site conditions across COCC campuses are favorable for additional projects to generate more renewable energy on-site.
- Avoid paying rising utility costs by generating and using solar energy on-site.
- External funding is available for solar PV projects, and COCC has received external funding previously (e.g., Madras solar project in 2023).

- Opportunity for the nine roofs that are assumed for replacement as potential good solar opportunities.

Barriers

- High capital costs of new infrastructure.
- The GHG inventory protocol requirements for net metering of on-site electricity generation mean that COCC may not receive the full GHG emissions reduction benefit of the solar electricity being produced (as described above).
- Energy demand is higher in the winter months when solar panels do not produce as much energy due to seasonality.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Oversee the development of proposed solar projects.

Support

- Sustainability Team – Identify and propose projects to COCC leadership. Facilitate and write grant proposals to secure external funding.
- Finance Office – Support grant administration for externally funded projects.

Costs– overall cost savings

- The solar PV projects in the 5-year plan are estimated to have no net upfront costs for COCC. The planned agreements also provide ongoing operational cost savings.

Funding and Resource Availability

Internal Funding Sources

- Facilities or capital improvements budget.

External Funding Sources

- Oregon Community Renewable Energy Grant Program – COCC was awarded a $70,360 grant from this program to install ground-mounted solar at the Madras Campus in 2023.
- Inflation Reduction Act for direct pay to COCC of 30% of the cost of the solar project.

Potential Tracking Metrics

- On-site power generation in kW.

Next Steps

1. Complete planned solar PV projects.
2. Identify additional opportunities for solar PV.
   - Consider alignment with planned construction and renovation projects.
   - Assess all remodeled roofs and buildings for solar installation.

- Assess additional solar-potential sites including parking areas.

3. Identify location for generation capacity matched to remaining electricity demand at COCC for full implementation.
4. Complete all three planned solar projects by 2029.

BE-7: Install Battery Storage Systems to Utilize More Electricity from COCC-Owned Solar Panels

Description

Installation of battery storage systems to store surplus generated renewable electricity from solar PV. This strategy is critical to provide COCC with renewable electricity, which is important until 2030 when Oregon's Clean Energy Targets require Pacific Power to reduce electricity emissions. Improved energy efficiency reduces the amount of solar generation and battery storage needed to reduce electricity emissions. Limitations in this modeling include challenges to modeling time-of-use and seasonality needs as well as unknown CAP implementation, limiting this analysis to average daily solar generation potential.

Table 10. BE-7 Install Battery Storage Systems to Utilize More Electricity from COCC-Owned Solar Panels

Annual GHG Reduction Potential	Implementation Timeline
First 5 years Maximum GHG reduction potential of 150 MTCDE (1% reduction over baseline) – only applicable when combined with solar generation, which is already in place at the Redmond Campus. **Full implementation** Maximum GHG reduction potential of 1,346 MTCDE (12% reduction over baseline) – only applicable when combined with solar generation.	**First 5 years** Installation of battery storage systems with planned solar PV systems for Bend and Madras. **Full implementation** Installation of battery storage to match all installed solar PV.

MTCDE = metric tons of carbon dioxide equivalent

Pairing battery storage systems with solar panels provides the following benefits:[18, 19]

- Provides backup power during a power outage.
- More energy cost savings and greater reduction in GHG emissions than solar systems alone, because surplus energy from the daylight hours can be used after dark instead of purchasing electricity from the grid.
- The potential for better energy generation and usage monitoring, depending on the system.

[18] https://www.energy.gov/eere/solar/articles/should-i-get-battery-storage-my-solar-energy-system

[19] https://www.facilitiesnet.com/energyefficiency/article/4-Benefits-of-Pairing-Solar-with-Battery-Storage-for-Commercial-Facilities--20287

Figure 14. A Solar PV System Paired with Battery Storage
Source: Energy.gov.

Co-Benefits

- Cost savings: Pairing solar PV projects with battery storage increases the potential energy cost savings for the project.
- Enhanced resilience: Battery storage paired with on-site renewable energy generation can help to ensure COCC has electricity even if the power goes out.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Access backup electricity during a power outage.
- Increased GHG emissions reductions than with solar alone. This is due to GHG inventory accounting protocol which includes emissions from all retail electricity purchases.
- Improve energy generation and usage monitoring.

Barriers

- High capital costs of new infrastructure.

- Availability of raw materials for battery production.
- May be technically challenging to integrate battery storage into existing solar systems.
- Energy demand is higher in the winter months when solar panels do not produce as much energy due to seasonality.

Roles and Responsibilities

Implement

- Implementation Lead: Facilities Team – Oversee the development of proposed solar with battery storage projects.

Support

- Sustainability Team – Identify and propose projects to COCC leadership. Facilitate and write grant proposals to secure external funding.
- Finance Office – Support grant administration for externally funded projects.

Costs – overall cost

- Adding battery storage paired with solar PV will result in upfront installation costs. Storing the solar PV electricity that is produced on-site will result in reducing the electricity purchased from the utility and reduced operational costs. The upfront installation costs are estimated to outweigh the operational cost savings and result in an overall cost for the action.

Funding and Resource Availability

Internal Funding Sources

- Facilities or capital improvements budget.

External Funding Sources

- Oregon Community Renewable Energy Grant Program.
- The Inflation Reduction Act will pay for 30% of battery storage.
- Pacific Power involvement for potential investment in resilient communities.

Potential Tracking Metrics

- On-site power storage in kW.
- Percentage of solar power generation retained for use by COCC.

Next Steps

1. Complete planned solar with battery storage project at the Bend Campus (as defined in the project proposal).
2. Coordinate the addition of battery storage with planned Madras solar PV project.
3. Identify additional opportunities for installing battery storage alongside new solar PV projects.
4. Identify mission-critical buildings and systems for backup battery storage and duration of need (4 hours vs. 8 hours).

5. Based off that feedback, the following priority list for the connected loads would be created:
    - Server room
    - Communication systems
    - Office equipment
    - Plug loads
    - HVAC
    - Domestic water
6. Install battery storage system with planned Bend and Madras projects by 2029.

Purchased Reductions

The Purchased Reductions category includes actions for purchasing RECs or carbon offsets for electricity and natural gas emissions that cannot be otherwise mitigated or offset at this time.

- **Renewable Energy Certificates** (also often called renewable energy credits) are nontangible commodities that represent the property rights to the environmental and social benefits of renewable energy. Every megawatt hour of electricity produced through renewable sources produces one REC. One must own RECs to make renewable energy claims until the electric utility (or power purchase agreements) is confirmed to sell 100% carbon-free electricity. A required characteristic of this electricity is the concept of *additionality*, meaning the electricity purchased via RECs is from a newer generation source to verify "new" electricity is generated to meet demand rather than changing "ownership" of existing renewable electricity. RECs are verifiable and regulated and are a best practice for immediate climate action.
- **Carbon offsets** are a tradable instrument that represents the reduction or removal of one MTCDE. Unlike RECs which specifically represent clean electricity generation, carbon offsets fund a broader range of projects that reduce GHG emissions. These projects range from natural carbon removal (e.g., reforestation and soil carbon sequestration) to methane capture (e.g., landfill gas systems and agricultural digesters) to energy efficiency and clean cooking initiatives (primarily in developing countries). Offsets can be bought and sold in open markets to transfer climate benefits between entities.

Note: RECs and carbon offsets are different financial and legal tools that organizations can use to reduce their emissions, but they work in different ways. COCC considers these tools to be part of the final stages of CAP implementation and will first focus on reducing emissions on campus and from campus activities before pursuing RECs and carbon offsets.

PR-1: Purchase RECs for Electricity Use that Cannot be Otherwise Mitigated or Offset at This Time

Description

If renewable electricity cannot be generated to meet COCC's electricity demand, renewable electricity can be purchased. This strategy accounts for the planned 5-year CAP implementation net

effects on COCC's electricity consumption (both electricity reductions and additions) and models REC purchases to reduce the remaining electricity emissions to zero.

Table 11. PR-1: Purchase RECs for Electricity Use that Cannot be Otherwise Mitigated or Offset at this Time

Annual GHG Reduction Potential	Implementation Timeline
First 5 years Expected GHG reduction potential to reduce remaining 3,579 MTCDE if all CAP actions are implemented (33% reduction over baseline). This action is highly adjustable to account for as much or as little electricity as is needed. If no CAP actions are implemented, roughly 4,500 MTCDE would need REC purchases to avoid all Scope 2 emissions. **Full implementation** (can occur at any time) With full implementation of all CAP actions, only 2,128 MTCDE would need REC purchases.	**Full implementation** Purchasing RECs can be implemented at any time to reduce remaining electricity emissions to zero while COCC implements the rest of the climate actions in this plan. Purchasing RECs would be an administrative or financial decision that does not require ongoing education, construction of new infrastructure, or maintenance of existing infrastructure.

MTCDE = metric tons of carbon dioxide equivalent

While efficiency improvements, equipment changes, and energy conservation efforts will help to reduce COCC's electricity use (and thus its electricity emissions), COCC will still need to purchase electricity from Pacific Power to operate its campuses. Pacific Power's energy supply portfolio is becoming increasingly renewable, but it is not required to supply zero-emission electricity until 2040.[20] Purchasing RECs could help COCC reduce its remaining electricity emissions in the short term while COCC is working on installing on-site solar energy and Pacific Power is working toward meeting its emissions reduction targets.

Utility customers can purchase RECs through their utility or other verified third-party vendors to reduce their electricity emissions. Green-e.org is a third-party certifier that does not sell RECs but offers links to retailers that do.

[20] Oregon Clean Energy Targets, https://www.oregon.gov/deq/ghgp/pages/clean-energy-targets.aspx.

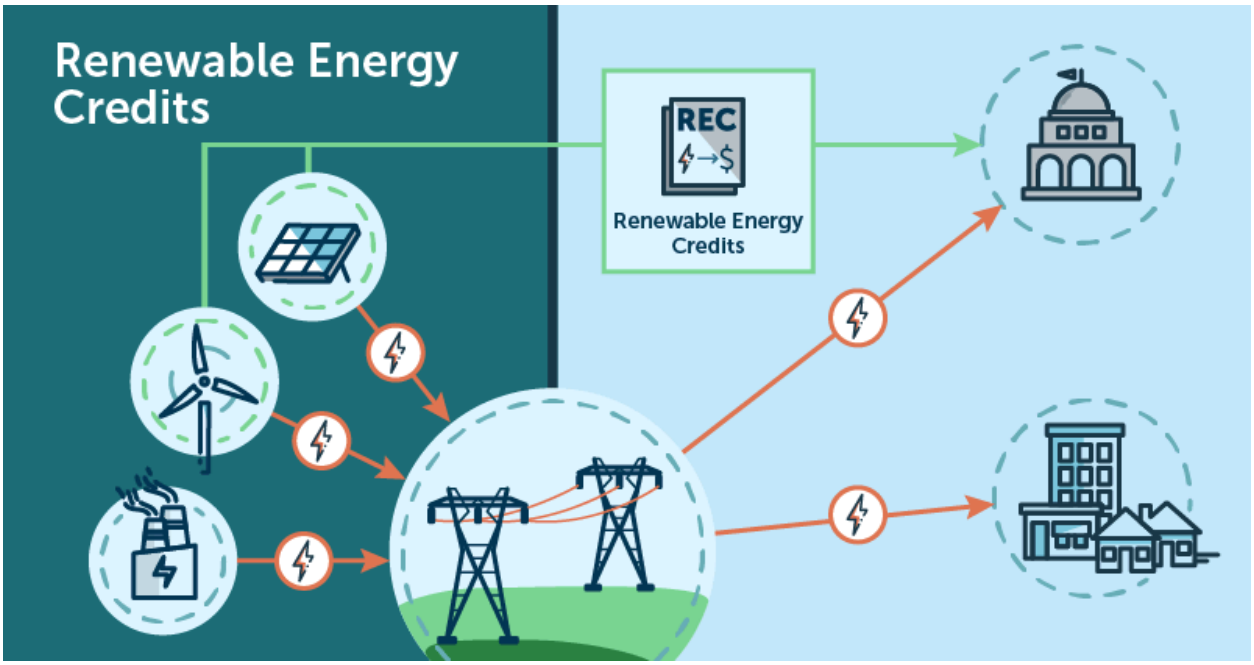

Figure 15. Renewable Energy Credits Illustration by Second Nature

Co-Benefits

- Enhanced resilience: Supports the widespread development of renewable energy resources by providing an additional revenue stream.

Implementation Strategy

Opportunities and Barriers

Opportunities

- One of the easiest and most flexible ways to mitigate purchased electricity related emissions if budget is available.
- Minimal cost with no long-term contract required. The number of RECs purchased can be rightsized for changing electricity usage over time.

Barriers

- COCC was previously enrolled in the Blue Sky program, but funding was prioritized for direct campus climate and sustainability initiatives.
- REC costs vary and have the potential to increase over time.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – Secure authorization and budget to mitigate purchased electricity emissions through purchased RECs.

Support

- COCC Leadership Team – Provide support and authorization to mitigate purchased electricity emissions through purchased RECs.
- Finance Office – Facilitate the budgeting and accounting for the cost of purchasing RECs.

Costs – overall cost

- Total cost of approximately $80,000 annually. Pricing varies by vendor and RECs are more affordable if purchased in bulk.

Funding and Resource Availability

Internal Funding Sources

- There are no readily available internal funding sources for this action.

External Funding Sources

- Not applicable.

Potential Tracking Metrics

- Number and percentage of megawatt hours of renewable energy purchased via REC purchases.

Next Steps

1. The Sustainability Team researches REC options, drafts a proposal for leadership consideration, and presents the proposal to the Leadership Team.
2. The Leadership Team considers granting approval for the purchase of RECs.
3. Negotiate REC purchase price and quantity with desired REC provider.
4. Track annual electricity purchase from utility and purchase the appropriate number of RECs.

PR-2: Purchase Verified Carbon Offsets for Natural Gas Use that Cannot be Mitigated Based on Efficiency and Electrification Measures Alone

Description

After implementing climate action to reduce natural gas emissions, verified carbon offsets can be purchased. This strategy calculates the planned 5-year implementation plan's effects on natural gas consumption and models offset purchases to reduce remaining natural gas emissions to zero. Offsets are not a preferred emissions reduction strategy for COCC, but they can be a helpful tool for addressing emissions sources that cannot otherwise be reduced in the short term.

Table 12. PR-2: Purchase Verified Carbon Offsets for Natural Gas Use that Cannot be Mitigated Based on Efficiency and Electrification Measures Alone

Annual GHG Reduction Potential	Implementation Timeline
First 5 years Expected GHG reduction potential of 1,987 MTCDE if all CAP actions are implemented (18% reduction over baseline). This action is highly adjustable to account for as much or little as is needed. **Full implementation** Installation of battery storage to match all installed solar PV.	**First 5 years** Offsets purchased for all remaining natural gas after implementing 5-year plan. **Full implementation** Purchasing offsets is an administrative and financial decision that requires ongoing support each budgeting cycle. As CAP actions are implemented, the budgeting needs for offsets are reduced.

MTCDE = metric tons of carbon dioxide equivalent

The quality and impact of carbon offsets can vary significantly depending on factors such as geographic proximity, emissions matching, credibility, third-party verification standards, project performance, and whether the reductions would have happened anyway or not (additionality).

Green-e.org is a third-party certifier that does not sell offsets but offers links to retailers that do.

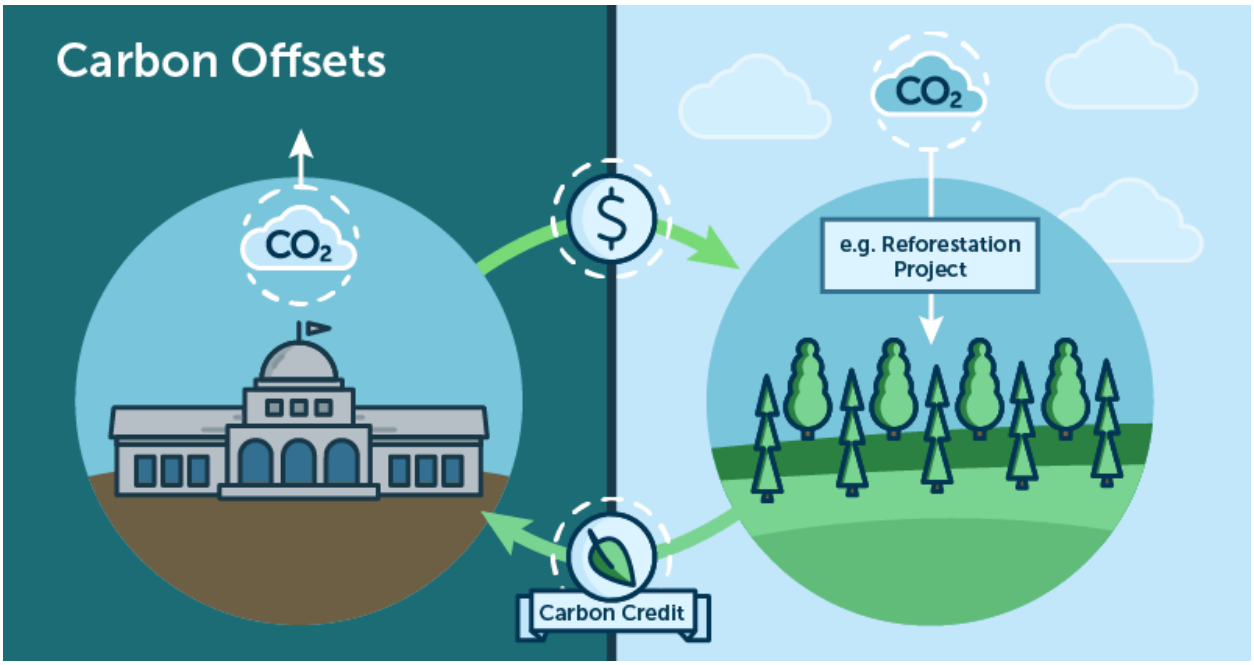

Figure 16. Carbon Offsets Illustration by Second Nature

Source: Second Nature, et al. is licensed under CC BY-SA 4.0

Note: Carbon offsets and RECs are different financial and legal tools that organizations can use to reduce their emissions, but they work in different ways. COCC considers these tools to be a last resort and would prefer to focus on reducing emissions on campus and from campus activities before pursuing RECs and carbon offsets.

Co-Benefits

- The variable and often distant nature of carbon offsets means that they do not tend to provide local co-benefits.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Purchasing offsets can speed up COCC's ability to claim carbon neutrality. Offset credits can provide flexibility for meeting climate goals in the short and long term.

Barriers

- The carbon offset market is controversial, and further research would be needed to determine which offsets are high quality and worth purchasing.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – Secure authorization and budget to support progress toward net zero emissions through purchased carbon offsets.

Support

- COCC Leadership Team – Provide support and authorization to support progress toward net zero emissions through purchased carbon offsets.
- Finance Office – Facilitate the budgeting and accounting for the cost of purchasing carbon offsets.

Costs – overall cost

- Costs could be higher depend on offset quality, characteristics, and quantity. In 2023, the average cost for offsets was $6.53/MTCDE, with costs ranging from $3 to $20 per MTCDE avoided.[21]

Funding and Resource Availability

Internal Funding Sources

- There is no readily available internal funding source for this action.

External Funding Sources

- Not applicable.

Potential Tracking Metrics

- The number of metric tons of carbon dioxide reduced or removed from the atmosphere from offset purchases.

[21] Ecosystem Marketplace – State of the Voluntary Carbon Market 2024

- Percentage of unmitigated GHG emissions offset.

Next Steps

1. The Sustainability Team researches verified carbon offset options, drafts a proposal for leadership consideration, and presents the proposal to the Leadership Team.
2. The Leadership Team considers granting approval for the purchase of offsets.
3. Track annual offset purchase from provider and purchase the appropriate quantity of offsets.

Transportation

The Transportation category includes emissions from the production and use of gasoline, diesel, and electricity used in vehicles for student, faculty, and staff commuting; COCC's operational fleet vehicles; and air travel on behalf of COCC. These emissions account for about 25% of COCC's emissions and mostly come from single-occupancy vehicle use.

T-1: Support Faculty, Staff, and Students to use Climate-Friendly Commute Options

Description

This action helps COCC prioritize which climate-friendly commute options to support to help promote, educate, and advocate for modes of transportation that reduce transportation emissions, aiming to reduce an estimated 20% of car commute emissions.

Table 13. T-1: Support Faculty, Staff, and Students to use Climate-Friendly Commute Options

Annual GHG Reduction Potential	Implementation Timeline
First 5 years (full implementation complete) 470 MTCDE (4% reduction over baseline).	**First 5 years** Policies and/or a plan to be developed and implemented. **Full implementation** Ongoing refinement and implementation.

MTCDE = metric tons of carbon dioxide equivalent

The following climate-friendly commute options are available to students, faculty, and staff at COCC:

- Public transit.
- Vanpool or carpool.
- Active transportation.
  - → Walking, biking, rolling (including e-bikes and e-scooters).
  - → Shared micromobility (Bend bikeshare).
- Electric vehicle (EV) adoption.

- Telework or hybrid work, online classes, and flexible scheduling.

The COCC CAP Transportation Workshop discussed key themes across all climate-friendly commute options as well as barriers, solutions or opportunities, follow-up items, and implementation roles for COCC departments and partner organizations for this action. Additionally, the Policy and Behavior Workshop discussed the faculty and staff perspectives of barriers and opportunities for supervisors to consider in supporting their teams to use climate-friendly modes. For fleet analysis, see Pacificorp Central Oregon Community College Fleet Assessment Report dated December 19, 2024.

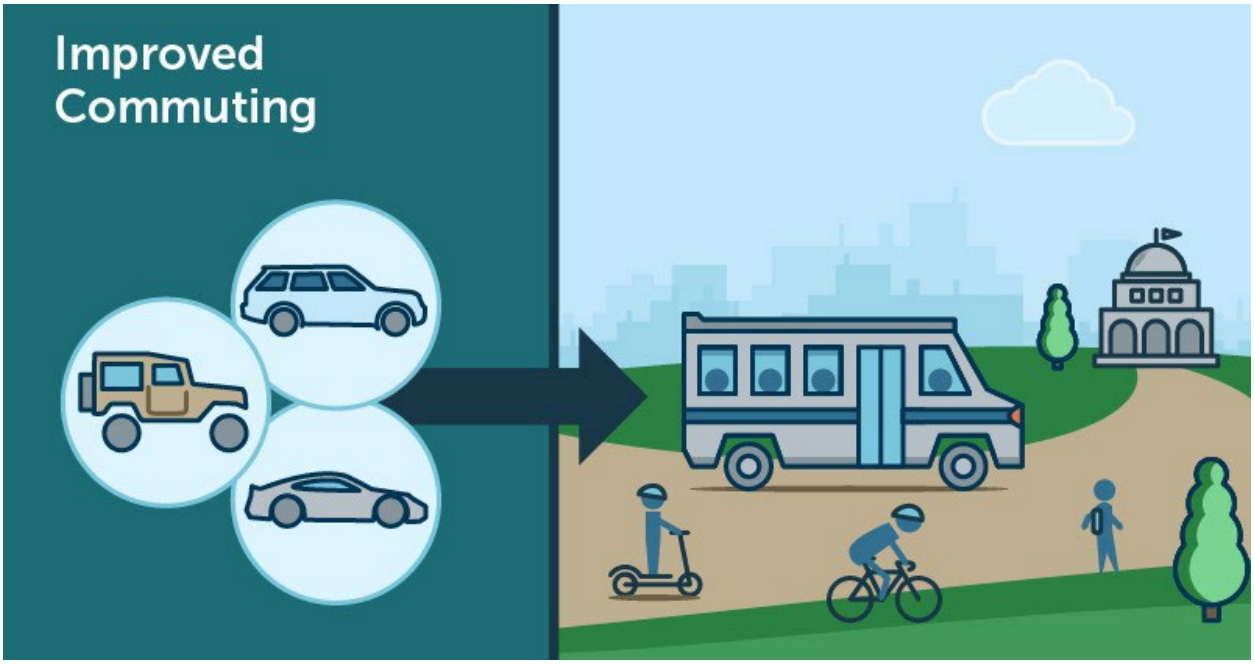

Figure 17. Improved Commuting Illustration by Second Nature

Co-Benefits

- Public health and well-being: Active transportation modes provide health benefits for staff and students. Reduced traffic congestion also reduces the amount of time spent commuting, which is linked to improved well-being. Additionally, active transportation is known to connect commuters to their place more and create a stronger sense of community.
- Improved air quality: Reducing fuel consumption for commuting has the additional benefit of reducing the other air pollutants from the combustion of gasoline and diesel.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Commuters can experience cost savings when using alternative modes to driving alone.
- Health benefits of active commutes.
- Improved air quality and noise reduction.

- Stronger partnerships with Strategic Scheduling, Cascades East Transit, and/or the Cities of Bend, Madras, Prineville, and Redmond.

Barriers

- High rate of student turnover by nature of being a 2-year college. Continuous education and culture-building will likely be required.
- Improving commuting infrastructure such as bike paths, walking paths, and transit routes and schedules can be expensive and is not fully within COCC's control.
- Variability in class schedules.
- Less control over schedules and timing when relying on public transportation.
- Safety concerns about commuting via non-car modes.
- Winter weather, extreme heat, or poor air quality may deter people from using alternative modes that require them to spend more time outside than they would if they drove.

Additional Considerations

Active transportation and transit commute options may become more challenging as Central Oregon experiences more days of extreme heat or localized flooding due to heavy precipitation events. There may be an increased need for sheltered bus stops, access to shade, and raised pathways for biking and walking due to local climate impacts.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – Liaison.

Partner

- Cascades East Transit – Work with COCC staff to identify and implement changes to transit routes or schedules that could better serve COCC students, staff, and faculty.
- City of Bend – Invite COCC representatives to participate in City engagement related to the transportation system (e.g., transportation system plan update).

Educate

- Sustainability Team – Share up-to-date information about climate-friendly commute options.

Costs – nominal cost

- There is a potential need for additional staff time to implement this action.

Funding and Resource Availability

Internal Funding Sources

- TBD – Depends on the specifics of the policies and/or plans that are developed and adopted.

External Funding Sources

- TBD – Depends on the specifics of the policies and/or plans that are developed and adopted.

Potential Tracking Metrics

- Percentage of alternative mode (non-drive-alone) trips by students, faculty, and staff as reported through a tracking system such as a commute survey

Next Steps

1. Review Transportation Workshop Summary and Policy and Behavior Workshop Summary documents and determine which climate-friendly commute options to prioritize for promotion.
2. Of those options, choose which follow-up items to complete and assign lead individuals and supports to each one. Example follow-up items are listed below:
   - Public transit
     - → Share COCC class schedule and data with Cascades East Transit once strategic scheduling initiative has been implemented to advocate for better-aligned scheduling.
     - → Prioritize setting consistent start and end times for courses.
     - → Continue to foster collaboration and discussion between Cascades East Transit and COCC leadership.
     - → Participate in State Transportation Improvement Fund advisory meetings.
     - → Advocate for local and regional infrastructure improvements to improve bus stop and transit amenities and routes.
   - Vanpool, carpool
     - → Promote the existing vanpool program.
     - → Encourage carpooling and vanpooling by building for employees and facilitate student carpooling through a cohort-based model.
   - Active transportation
     - → Partner with the Cities of Bend, Redmond, Madras, and Prineville to improve bike lanes.
     - → Consider implementing a bike borrowing system for students, faculty, and staff.
   - EV adoption
     - → Improve communication about existing EV charging stations.
     - → Promote faculty and staff use of COCC-owned fleet EVs through an easier access and check-out process.
   - Hybrid/telework, online classes, and flexible scheduling
     - → Implement flexible scheduling and remote work options (such as 4-day work weeks or allowing faculty to count bus commute time as work).
     - → Explore additional options for strategic scheduling (i.e., more remote options in the winter when active transportation faces weather challenges).
3. Conduct a commuting survey or collect additional data from students, faculty, and staff to track progress compared to the 2022 baseline.

4. Promote climate-friendly modes to achieve a 4% reduction over baseline emissions by 2029.

T-2: Provide Incentives for Taking Transit, Using Active Transportation, Carpooling, or the Vanpool to get to and from Campuses

Description

To complement the Cascades East Transit free bus fare program, this strategy models impacts on additional incentives to commute to campus using low-emission modes, aiming to double the number of students, staff, and faculty that commute to campus via transit or other non-single-occupancy vehicle modes.

Table 14. T-2: Provide Incentives for Taking Transit, Using Active Transportation, Carpooling, or the Vanpool to get to and from Campuses

Annual GHG Reduction Potential	Implementation Timeline
First 5 years (full implementation complete) 125 MTCDE (1% reduction over baseline).	**First 5 years** Policies and/or a plan to be developed and implemented. **Full implementation** Ongoing refinement and implementation.

MTCDE = metric tons of carbon dioxide equivalent

This action helps COCC promote existing incentives and consider providing additional incentives for climate-friendly transportation modes such as public transit, active transportation, carpooling, and vanpool. Colleges and universities across the United States have successfully increased student transit ridership with various strategies such as the following:

- Promoting carpool-matching tools and promoting intercampus carpooling.
- Partnering with the local transit agency to provide bus passes to students. (As of fall 2024, Cascades East Transit provides free transportation services such as fixed-route buses and on-demand services.)[22]
- Adding park-and-ride lots that cost much less than standard on-campus parking. (Parking is currently free across all COCC campuses, so this is not currently a viable option for COCC; however, we could consider providing park-and-ride lots to make it easier to use public transit or to carpool between campuses.)
- Providing a student-run shuttle program.[23]

Providing incentives was mentioned frequently during the CAP engagement workshops as a useful tool for changing behavior. Different types of incentives could be considered for students, faculty, and staff.

[22] https://cascadeseasttransit.com/fares/

[23] UC Davis – Unitrans shuttle: https://unitrans.ucdavis.edu/

For example, COCC could provide additional paid time off time to faculty and staff for certain levels of participation or reduce room and board fees for students living on campus. Another suggestion was to include promotional information about transportation options in new employee and student orientation guides and at events to promote existing incentives such as free bus passes and the Commute Options Get There Oregon program.

Figure 18. Cascades East Transit Buses
Source: Bend Bulletin.

Co-Benefits

- Public health and well-being: Active transportation modes provide health benefits for staff and students. Reduced traffic congestion also reduces the amount of time spent commuting, which is linked to improved well-being. Additionally, active transportation is known to connect commuters to their place more and create a stronger sense of community.
- Improved air quality: reducing fuel consumption for commuting has the additional benefit of reducing the other air pollutants from combustion of gasoline and diesel.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Partner with Strategic Scheduling and Cascades East Transit to identify opportunities to streamline transit services to better serve the needs of COCC students, faculty, and staff.
- Integrate transportation options education into the curriculum.
- Develop unified messaging for promoting transportation options across agencies.

Barriers

- Transit is already free. COCC needs to identify what other barriers prevent students, staff, and faculty from using transit that incentives can help overcome.

- There is lack of awareness and low participation in the existing incentive programs/options such as Vanpool and Get There Oregon.
- There is constant student turnover due to being a 2-year college, so there is a constant need for new outreach and educational efforts.
- It is difficult to track and measure transportation behavior.

Roles and Responsibilities

Implement

Implementation Lead: Sustainability Team – Identify available incentives and opportunities to provide additional incentives. Communicate with faculty, staff, and students.

Support

- Finance Office – provides input on any new proposed incentives.
- Transportation Services – Coordination with existing partners and programs.

Partner

- Cascades East Transit – Collaborate with COCC staff.
- Get There Oregon –Provide updated information, outreach, and education materials regarding incentive programs.

Costs – nominal cost

- There is a potential need for additional staff time to implement this action. Monetary incentives would pose an additional cost.

Funding and Resource Availability

Internal funding sources

- TBD – Depends on the specifics of the incentives that are developed and provided.

External funding sources

- Get There Rewards Program

Potential Tracking Metrics

- Percentage of non-car trips reported by students, faculty, and staff.

Next Steps

1. Review Transportation Workshop Summary and Policy and Behavior Workshop Summary documents and determine which climate-friendly commute incentive options to promote.
2. Of those options, choose which follow-up items to complete and assign lead individuals and supports to each one.
3. Conduct a commuting survey or collect additional data from students, faculty, and staff to track progress compared to the 2022 baseline.
4. Provide or create additional incentives to achieve a 1% emissions reduction by 2029.

Policy and Behavior Change

While this CAP emphasizes actions to reduce emissions from buildings and energy use and transportation (as these are COCC's main sources of emissions), there are also campus-wide behaviors, policies, and procedures that can be implemented to additionally reduce emissions. These behaviors, policies, and procedures are the focus of the Policy and Behavior Change category.

These actions begin to address emissions from consumption activities including the purchase of goods and services, individual changes to reduce energy use, dietary choices and climate-friendly lifestyle changes, as well as waste disposal. Waste emissions accounted for about 1% of COCC's emissions. Supply-chain emissions from the purchase of goods and services were not estimated in COCC's 2022 GHG emissions inventory and are not required by the Second Nature Climate Commitment, but they should be estimated in future inventories to establish a baseline and better track progress.

PBC-1: Adopt and Enforce College-Wide Energy Conservation Policies and Procedures

Description

Adopt policies and procedures to require energy use behavior changes and reductions and promote awareness, reducing an estimated 4% of energy use.

Table 15. PBC-1: Adopt and Enforce College-Wide Energy Conservation Policies and Procedures

Annual GHG Reduction Potential	Implementation Timeline
First 5 years (full implementation complete) 276 MTCDE (2% reduction over baseline).	**First 5 years** Policies and/or a plan to be developed and implemented. **Full implementation** Ongoing refinement and implementation.

MTCDE = metric tons of carbon dioxide equivalent

Energy conservation should be a campus-wide effort, and COCC can adopt policies and procedures to weave a culture of conservation into its organizational and community fabric. One small example COCC has already implemented is switching copier machines from using motion sensors that turn the machine on whenever someone walks by to being in energy efficiency mode where the machine only turns on when a touchpad is activated.

There are examples of other colleges adopting policies to build a culture of conservation. Policies vary between campuses in terms of their goals, scope, guidelines and procedures, and the strategies they employ. Some campuses, such as Portland Community College (PCC), have adopted energy management guiding principles, track energy use performance metrics, purchase energy-efficient appliances, tune operations and maintenance schedules with efficiency in mind, and engage occupants. PCC also has a policy that all new campus construction will be built to at least a LEED Silver standard or equivalent. Others, such as Willamette University, have more specific guidelines that facilities staff and building occupants are expected to follow. For example, "The heating season

starts around Oct. 1st and runs to May 15th depending on the weather. Heating set points will be 68 – 72 degrees during occupied hours. This is accomplished using the campus Building Automation System (BAS) and setting local thermostats and locking them."

Figure 19. Energy Savings
Source: xreflex/stock.adobe.com

Co-Benefits

- Cost savings: The cost to COCC for implementing behavior change and creating a culture of conservation is nominal and can result in energy savings that can reduce operational costs.
- Enhanced resilience: Reducing electricity demand can help to ease some strain on the grid as more competing uses come online (e.g., EV charging and electric appliances).

Implementation Strategy

Opportunities and Barriers

Opportunities

- Streamline standards for heating, cooling, and lighting across campus buildings.
- Provide incentives for staff, faculty, and students that encourage behavior changes. Identify energy- and water-saving opportunities that can be implemented by COCC.
- Establish seasonal policies and procedures (e.g., a summer energy policy distinct from the rest of the year).

- Provide education such as a visual scorecard to track performance vs. baseline emissions over time.
- Shut down buildings when not in use, consider consolidating College operations into fewer buildings, as appropriate.
- Unplug devices over the holidays and summer break.

Barriers

- Likely difficult to ensure compliance or enforce policies that rely on behavior change (as opposed to those that can be standardized via a building management system).
- Communication and buy-in needed across COCC community.
- Multiple campuses and buildings with unique systems.
- Many buildings have individual controls for thermostats, printers, heaters, lights, etc.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – Researches and prepares a proposal for a College-wide energy conservation policy and procedures.

Support

- Facilities Team – Provides input on proposed policy and procedures.
- COCC Leadership Team – Considers and adopts College-wide energy conservation policy.

Educate

- Sustainability Team –Educates staff, faculty, and students about the new policy and procedures, if adopted.
- Faculty and staff – Model good behavior for students. Enforce policy and procedures.
- Facilities Team – Educates tenants about the new policy and procedures, if adopted.

Costs – nominal cost

- There is a potential need for additional staff time to implement this action.

Funding and Resource Availability

Internal Funding Resources

- Sustainability Team staff time.

External Funding Resources

- Energy Trust of Oregon and Strategic Energy Management program support.

Potential Tracking Metrics

- Number of educational campaigns completed.
- Number of educational activities completed (e.g., number of classroom visits).

Next Steps

1. Review Policy and Behavior Workshop Summary document and determine which policy or procedure opportunities to prioritize.
2. Of those options, determine which individuals and departments (such as the following) will need to be involved in the decision-making and implementation process:
   - Campus services, student services.
   - Senior Leadership Team.
   - Site and building managers.
   - Program directors.
   - Maintenance and janitorial staff.
   - College affairs.
3. Adopt and enforce policies to achieve a 2% emissions reduction by 2029.

PBC-2: Encourage Climate-Friendly Behaviors

Description

Promoting energy use change and communicating energy patterns and best practices to bring awareness, reducing an estimated 3% of energy use. Intervention methods can include social comparison (e.g., interactive data displays), moral appeal (e.g., visible best practices displays), monetary or nonmonetary incentives (e.g., contests), information/feedback provided (e.g., data displays for staff and dorm residents based on data analysis), and technological intervention (e.g., data dashboards). Additional emissions reductions may also result from activities to shift food choices, such as reducing meat and dairy consumption, or through better goods choices that have lower embodied emissions and reduce waste. These additional emissions are not included in the GHG reduction potential, since supply chain emissions were not estimated in COCC's GHG emissions inventory.

Table 16. PBC-2: Encourage Climate-Friendly Behaviors

Annual GHG Reduction Potential	Implementation Timeline
First 5 years (full implementation complete) 207 MTCDE (2% reduction over baseline)	**First 5 years** Policies, campaign, and/or a plan to be developed and implemented. **Full implementation** Ongoing refinement and implementation.

MTCDE = metric tons of carbon dioxide equivalent

While policies and procedures shape the campus environment, individual behaviors also have a role to play in reducing campus emissions and there are many ways that the College can encourage climate-friendly behaviors. Encouraging the use of existing programs and resources such as public transit, carpool/vanpool, walking, and biking—as well as considering options for reducing meat consumption in dining facilities—were emphasized as the most relevant and applicable

climate-friendly behaviors for COCC to consider in the CAP Policy and Behavior workshop. Additional examples discussed included expanding the workorder request process to help prioritize HVAC and energy efficiency building upgrades needed across campuses, as well as providing informational nudges and prompts to encourage climate-friendly behaviors (such as taking the stairs vs. riding an elevator).

Figure 20. Sample Energy Conservation Posters from the University of Cambridge Green Challenge

Co-Benefits

- Cost savings: The cost to COCC for encouraging climate-friendly behaviors is nominal and can result in energy savings that can reduce operational costs.
- Enhanced resilience: Reducing electricity demand can help to ease some strain on the grid as more competing uses come online (e.g., EVs and electric appliances).

Implementation Strategy

Opportunities and Barriers

Opportunities

- Foster a culture of sustainability in which students, staff, and faculty take ownership over and work together to reduce COCC's collective environmental footprint.
- Provide information and education to raise awareness about climate-friendly behaviors.
- Offer options such as one meat-free meal a day or one meat-free day a week in campus dining facilities. Reducing consumption of animal products can significantly reduce emissions. For example, it is estimated that a diet that omits beef can reduce emissions by

24% compared to an average diet in the United States, while a vegetarian diet can reduce emissions by 32% compared to an average diet in the United States.[24]

- Provide clear, building-specific directions on temperature controls and set points and messages to dress appropriately for those temperatures.
- Provide incentives or rewards for climate-friendly behaviors. Consider scorecards or competitions by building or department.
- Include sustainability and environmental stewardship statement on all job postings, hirings, etc.

Barriers

- High rate of student turnover by nature of being a 2-year college. Continuous education and culture-building are likely required.
- There is a strong culture of meat-eating that might be hard to change.
- Faculty and staff members currently rely on space heaters and open windows for individual temperature regulation.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – Identify and support faculty, staff, and student advocates that can amplify climate-friendly behaviors.

Support

- Faculty and staff – Educate students about climate-friendly behaviors at COCC by integrating into curricula and class projects. Model climate-friendly behaviors.
- Student leaders – Educate fellow students about climate-friendly behaviors at COCC. Model climate-friendly behaviors.

Educate

- Sustainability Team – Educate faculty and staff about climate-friendly behaviors at COCC. Model climate-friendly behaviors.

Costs – nominal cost

- There is a potential need for additional staff time to implement this action.

Funding and Resource Availability

Internal Funding Sources

- Sustainability budget and/or the Green Revolving Fund.

External Funding Sources

- Not applicable.

[24] https://www.greeneatz.com/foods-carbon-footprint.html

Potential Tracking Metrics

- Number of educational campaigns or activities completed.

Next Steps

1. Review Policy and Behavior Workshop Summary document and determine which climate-friendly behaviors to prioritize.
2. Of those options, determine which individuals and departments (examples are listed below) will need to be involved in the decision-making and implementation process.
   - Deans, department chairs, and program directors.
   - Human Resources.
   - Sodexo and MPR for messaging and implementing meatless or hybrid food options.
3. Implement education, behavior changes, and or incentives to reduce emissions by 2% by 2029.

PBC-3: Develop Environmental, Social, and Governance (ESG) Purchasing Policies

Description

A set of purchasing policies to avoid or reduce emissions, that focuses on the highest-emissions products and services relevant to COCC. Specific policies to be developed and implemented. Initial focus should be on emissions-intensive and relevant supply chain products and services with known alternatives, such as fleet vehicle electrification and right-sizing. Additionally, consider reducing the purchase of new materials, equipment, or furniture; animal-based food and beverages; and office supplies. Note that this action does not have directly associated emissions reductions. As this policy is implemented and COCC makes choices that reduce GHG emissions in the future, those choices will provide additional contribution to COCC's efforts toward net zero emissions beyond what is estimated in this plan.

Table 17. PBC-3: Develop Environmental, Social, and Governance (ESG) Purchasing Policies for Campus Administrative Assistants

Annual GHG Reduction Potential	Implementation Timeline
Not modeled; no quantitative baseline for comparison.	**First 5 years** Policies to be developed and implemented. Initial focus should be on emissions-intensive and relevant supply chain products and services with known alternatives, such as fleet vehicles. Additionally, consider reducing the purchase of new materials, equipment, or furniture; animal-based food and beverages; and office supplies. **Full implementation** Ongoing refinement and implementation.

For organizations such as COCC, the purchase of goods and services is a significant source of emissions. This category can be challenging because while COCC has direct control over what it purchases, it does not control how those things are produced. Establishing ESG purchasing policies

that direct faculty and staff to use a "avoid, reduce, reuse, recycle" mindset when selecting and purchasing goods and services that are lower impact and produce more benefits is one way that COCC can reduce emissions and use its spending power for good.

While many larger colleges and universities have established ESG purchasing policies that can serve as examples, COCC's commitment to climate action is on the leading edge for colleges of its size. Additionally, other public agencies such as cities and counties have purchasing policies that COCC could look to. Larger peer organizations that have established ESG purchasing policies that can serve as an example to COCC, include the following:

- Portland Community College
- University of Washington
- Stanford University

Figure 21. Sustainable Procurement Illustration by Second Nature

Co-Benefits

- Cost savings: Many climate-friendly purchases result in reduced life-cycle costs such as reduced energy consumption or reduced need for maintenance.
- Improved air quality: Common ESG purchasing policies include guidelines that promote low- or non-toxic goods—such as interior furnishings—that can improve indoor air quality.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Create a webpage or database of unused equipment that departments could "rent" or "buy" from to avoid redundant purchases.
- COCC could consolidate purchasing across departments to avoid redundant purchases and streamline the process.
- Create a checklist of questions for individuals to review before purchasing an item.
- Create an online purchasing portal that only offers climate-friendly alternatives.
- Train the main purchasers in each department and send regular reminders regarding purchasing procedures.
- Create policies or procedures to reduce the need to purchase supplies in the first place, as there is not currently a centralized inventory or tracking system in place of all existing supplies and goods across the campuses.

Barriers

- There is not currently an inventory or central system for tracking all the supplies owned by COCC.
- Need to evaluate programs with high material use including, but not limited to, nursing, the Cascade Culinary Institute, manufacturing, and aviation to determine purchasing needs.
- There is not currently a culture of sharing equipment or supplies across departments.
- There is a need for centralized purchasing or an easy checklist to follow for more sustainable purchasing policies.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – Help coordinate policy changes and provide education across campuses.

Support

- Procurement – Help draft and update the procurement policy.
- Administrative assistants – Responsible for much of the purchasing.
- Career and Technical Education tool room managers and purchasers – Make many of the larger equipment purchases.
- Fiscal department and FIAT (College budget committee) – Set policies and procedures.

Costs – nominal cost

- There is a potential need for additional staff time to implement this action.

Funding and Resource Availability

Internal Funding Sources

- Not applicable.

External Funding Sources

- Not applicable.

Potential Tracking Metrics

- ESG purchasing policy adopted and implemented.

Next Steps

Implementing ESG purchasing policies tend to include the following steps:

1. Convene a working group. Consider sustainability and procurement peer groups and professional associations for guidance.
2. Review sample policies from peer organizations.
3. Develop ESG criteria such as the following:
   - Environmental factors (e.g., GHG emissions and waste reduction).
   - Social considerations (e.g., fair labor practices and supplier diversity).
   - Governance aspects (e.g., transparency and ethics).
4. Create a sustainable supplier list.
5. Prioritize climate-friendly products.
6. Develop guidelines, training, and resources.
7. Align with broader institutional goals.

PBC-4: Adopt a Green Building Policy

Description

A green building policy involves creating a set of rules and guidelines that inform construction and maintenance of facilities and structures. The green building policy defines materials, processes, and principles that are environmentally responsible and resource-efficient throughout a building or facility's life cycle. A comprehensive green building policy would address siting, tree and natural area preservation, design, construction, operation, maintenance, renovation, and deconstruction. The goal is to reduce the overall impact of the built environment on human health and the natural environment by efficiently using energy, water, and other resources, protecting occupant health, and reducing waste, pollution, and environmental degradation. Note that this action does not have directly associated emissions reductions. As this policy is implemented and COCC makes choices that reduce GHG emissions in the future, those choices will provide an additional contribution to COCC's efforts toward net zero emissions beyond what is estimated in this plan.

Table 18. PBC-4: Adopt a Green Building Policy

Annual GHG Reduction Potential	Implementation Timeline
Not modeled; no quantitative baseline for comparison. Green building policies can reduce building energy emissions by up to 51%[a] for remodels and 15% for new construction.	**First 5 years** Policy to be developed and implemented. **Full implementation** Ongoing refinement and implementation.

a Canada Green Building Council, 2021. Decarbonizing Canadas Large Buildings: Summary Report. 2021_CaGBC_Decarbonization-Retrofit-Costing-Study_2DEC21_EN.pdf

Green building policies can vary in their level of detail. Some organizations develop specifications for key materials that have significant embodied emissions, such as concrete, or have a significant impact on building use emissions, (e.g., roof, insulation, windows, HVAC, lighting). In other cases, organizations simplify the green building policy by referring to established building standards or certifications that help guide the overall construction process. Examples of these standards or certifications include LEED, Earth Advantage, and Oregon Reach Code among others. Generally, there are distinct, defined standards for both new construction and major renovations, and defining the minimum size of a qualifying project, generally by square footage, is best practice. Siting is another important consideration for a green building policy. Whether the facility is a building, outdoor space, or other construction such as a solar PV installation, the green building policy should provide guidance for the location of the facility. For example, the policy may include tree canopy preservation, stormwater, or other GHG emissions and resilience considerations. In addition to the cities and counties that have established green building policies, some local peer organizations that can serve as an example to COCC include the following:

- Lane Community College
- Portland Community College

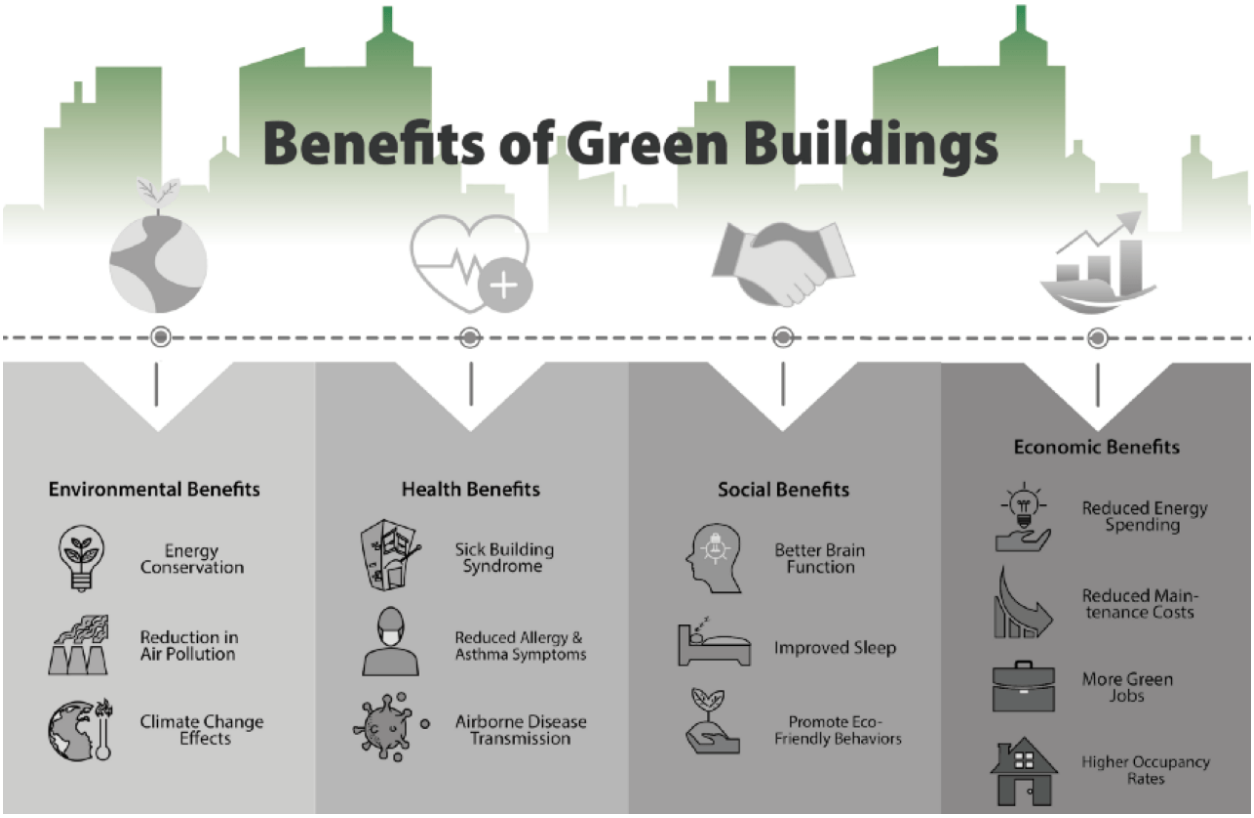

Figure 22. Benefits of Green Buildings Illustration

Source: Sustainable Building: Important Goals And Benefits Of Green Buildings | The Design Gesture

Co-Benefits

- Cost savings: Building more efficient, climate-friendly, and sustainable buildings most often results in lifetime cost savings. In some cases, green building materials may have a higher marginal capital cost over conventional materials; however, the reduced operational costs and utility bills from energy efficiency gains most often are greater than that marginal upfront cost.
- Improved air quality: Common green building policies include guidelines that promote low- or non-toxic goods such as interior finishings and furnishings that can improve indoor air quality.
- Public health and well-being: Common green building policies include guidance for features such as natural lighting and air flow that can enhance occupant health and productivity.
- Enhanced resilience: Green buildings often include elements such as durable materials, thoughtful site selection, rainwater collection, stormwater management, and renewable energy generation. They are often also engineered to withstand extreme weather events.

Implementation Strategy

Opportunities and Barriers

Opportunities

- Additional conservation, such as of water and waste.
- Implementing green building practices can serve as a learning tool for students and staff and promote sustainability education.

Barriers

- Upfront costs of green building materials and technologies can sometimes be higher than conventional options.
- The construction project managers and facilities managers must also support and be knowledgeable on green building practices for successful implementation of a green building policy.

Roles and Responsibilities

Implement

- Implementation Lead: Sustainability Team – help coordinate policy changes and provide education across campus.

Support

- Administration: Provide leadership and allocate resources for green building initiatives. Ensure policies align with COCC's sustainability goals.
- Facilities Management: Oversee the implementation of green building practices in new construction and renovation. Maintain and monitor building performance.
- Students: Participate in sustainability initiatives and provide feedback on green building projects. Advocate for sustainable practices on campus.

Costs – nominal cost

- There is a potential need for additional staff time to develop a green building policy to implement this action. Once the green building policy is in place, some future purchases may result in higher upfront capital costs. Green building policies can reduce building energy use and utility costs and may result in overall cost savings.

Funding and Resource Availability

Internal Funding Sources

- Not applicable.

External Funding Sources

- Not applicable.

Potential Tracking Metrics

- Green building policy adopted and implemented.

Next Steps

1. Convene working group to draft green building policy.
    - Review sample policies from partner organizations.
    - Identify type of policy: defined specifications and materials, reference to existing standards or certifications, hybrid.
    - Set thresholds for qualifying new construction and major renovation projects.
2. Integrate green building policy in documents and procedures, such as capital planning, facilities management, procurement templates, etc.
3. Develop and conduct training.
4. Conduct pilot projects to begin implementing green building policy.
5. Establish a system to monitor and track progress, as well as highlight successes.
6. Review and refine: Continuously evaluate the policy and make adjustments based on outcomes and experience with implementation.
7. Align with broader institutional goals.

Looking Ahead: Embracing a Culture of Sustainability and Climate Action

For COCC to be successful in achieving our climate goals and targets, it is essential to embrace a culture of sustainability and climate action across our campuses and engage the whole COCC community in these initiatives. Oberlin College states the following in its CAP:

> *Oberlin College's commitment to carbon neutrality will succeed only to the extent that students, faculty, staff, administrators, trustees, and the larger community with which it interacts adopt a culture of environmental stewardship. Similarly, good policies are most likely to succeed when executed by dedicated individuals well versed in the principles that underlie those policies. In order to implement the recommendations contained in this Climate Action Plan, the College must educate individuals responsible for its operations and actively encourage the culture necessary to achieve compliance and support across the campus community.*

Ongoing Education, Outreach, and Engagement

The development of this plan was informed by engagement with members of the COCC community and external partners, and the plan itself includes several actions that will require ongoing education, outreach, and engagement to share information, encourage changes in behavior, and gather feedback from students, staff, faculty, and partner organizations.

Incorporating Climate into our Curriculum

As of fall 2024, COCC offers several courses as part of its Sustainability Curriculum:

> *The College recognizes the importance of sustainability literacy, which according to the United Nations is 'the knowledge, skills, and mindsets that allow individuals to become deeply committed to building a sustainable future and assisting in making informed and effective decisions to this end.'*
>
> *Sustainability literacy is promoted via two course designations. The first is the* ***Sustainability Designated (SD)*** *course list, which highlights courses that have adopted a moderate-to-strong emphasis on sustainability content. The second course designation is the* ***SUS prefix****, which identifies courses that were created with a specific and central focus on sustainability. Sustainability course designations are intended to meet student and community needs and interests, and to create a more just and equitable world. Many SD and SUS courses also fulfill general and discipline studies requirements (e.g., health, cultural literacy, social sciences, and science lab).*

The Ponderosa Project is based on a national model (the Piedmont Project) for faculty development and curricular innovation around sustainability. The Ponderosa Project is a 2-day workshop that features guest speakers, peer-to-peer discussions, community-building, field trips, and experiential learning. Faculty participants leave with the knowledge, skills, inspiration, and support to incorporate sustainability into their existing courses or create new courses. The workshop will be offered in May 2025 to tenured, adjunct, and part-time faculty from across COCC. Participation in the workshop and subsequent sustainability curriculum development will be compensated by the COCC Strategic Plan, the Center for Advancing Faculty Excellence, and the Sustainability Committee.

Because the causes and the effects of climate change intersect with all aspects of life, COCC faculty have an opportunity to incorporate sustainability and climate into even more academic programs at COCC. From Business Administration and Economics to Chemistry and Natural Resources to Psychology and Public Health, students will benefit from learning about the interdependent relationships between humans and the environment.

Partnerships

Climate action cannot happen in a vacuum. COCC began engaging with potential implementation partners during the development of this CAP and will need to continue to partner with other organizations to achieve our climate goals.

Potential partners include the following:

- Bend Bikes.
- Bend-La Pine School District and associated K-12 schools.
- Cascades East Transit.
- Cities of Bend, Madras, Redmond, and Prineville.
- Commute Options.
- Energy Trust of Oregon.
- The Environmental Center.
- OSU Cascades.

Research

COCC is not a research institution, so its ability to contribute to climate research is limited.

Tracking Progress

To meet our long-term goal of achieving carbon neutrality by 2050, we will need to continue to track progress and adjust accordingly.

The Second Nature Carbon Commitment requires signatories to take the following actions:

1. Develop a CAP to achieve carbon neutrality,
2. Review and revise (if necessary) the CAP at least every 5 years.
3. Submit an annual progress evaluation, including an updated GHG emissions inventory.

The CAP and annual evaluations should be submitted to Second Nature's reporting system and will be made publicly available.

GHG emissions tracking will improve over time as data needs are identified and gaps are addressed.

COCC's first CAP update will occur no later than fall 2029 if an update is necessary at that time.

Glossary

Additionality: A way to assess whether an activity provides something new or additional in terms of a greenhouse gas emissions-reduction benefit. Additional projects would not have occurred without the incentive being provided by activities such as carbon offset credit revenues.

Carbon neutral/neutrality: Achieving a balance between the greenhouse gases (GHGs) emitted and those removed from the atmosphere, resulting in no net operational GHG emissions. This is often referred to as achieving net-zero emissions.

Carbon offset: A tradable instrument that represents the reduction or removal of one metric ton of carbon dioxide equivalent. Unlike renewable energy certificates —which specifically represent clean electricity generation—carbon offsets fund a broader range of projects that reduce greenhouse gases. These projects range from natural carbon removal (e.g., reforestation and soil carbon sequestration) to methane capture (e.g., landfill gas systems and agricultural digesters) to energy efficiency and clean cooking initiatives (primarily in developing countries). Offsets can be bought and sold in open markets to transfer climate benefits between entities.

Climate action plan: A plan adopted by an institution that sets a target date for achieving a GHG emissions reduction goal and a set of climate actions that will support meeting that goal.

Climate actions: Specific activities, programs, policies, and procedures and so forth that aim at reducing the severity of human-induced climate change and its impacts.

Emissions scopes: Greenhouse gas emissions sources can be categorized into three different scopes.

- **Scope 1 emissions** are referred to as *direct* emissions and they are calculated from the amount of fossil fuels burned in boilers, central heating plants, in campus-owned vehicles, and in on-campus power plants, etc. This energy is typically used to heat and cool buildings or to directly generate electricity used on campus.
- **Scope 2 emissions** are produced off-campus by burning fossil fuels to generate energy (typically electricity) that is purchased by the campus or the campus's utility consumption. Renewable energy typically has no, or very little carbon emissions related to its purchase.
- **Scope 3 emissions** are referred to as *indirect* emissions. The Carbon and Climate Commitments require two scope 3 emissions sources: commuting and air travel.

Environment, Social, and Governance (ESG): ESG refers to a framework of using these three key areas to evaluate an organization's sustainable and ethical performance. Environmental refers to impacts to the natural environment including climate change and emissions. Social refers to people, culture, and communities including human rights and diversity. Governance refers to how organizations are directed, such as executive compensation, succession planning, board management practices and shareholder rights.

Greenhouse gases (GHGs): Gases that trap heat in the atmosphere by absorbing infrared radiation.

Greenhouse gas emissions: The release of GHGs either by combustion or uncontrolled releases of substances such as refrigerants and methane gases into the atmosphere.

Greenhouse gas inventory: An inventory of GHGs measures gases in units of carbon dioxide equivalent (MTCDE). Also known as a carbon footprint.

Greenhouse gas accounting protocols: Accounting protocols are standardized frameworks and methodologies used to measure, calculate, and report an organization's greenhouse gas emissions. The Greenhouse Gas Protocol standards and guidance developed by the World Resource Institute and World Business Council for Sustainable Development are the most widely used global reporting protocols.

Renewable Energy Certificates (RECs): Nontangible commodities that represent the property rights to the environmental and social benefits of renewable energy. Every megawatt hour of electricity produced through renewable sources produces one REC. One must own RECs to make renewable energy claims until the electric utility (or power purchase agreements) is confirmed to sell 100% carbon-free electricity.

Sustainability: The ability to meet the needs of the present without compromising the ability of future generations to do the same. Includes consideration of environmental, social, and economic dimensions.