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Summary of Best Practices for Municipal Climate Action Plans

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Date: July 3, 2024

Purpose

This memo's purpose is to give City staff and members of the Environment and Climate Committee an overview of successful greenhouse gas (GHG) reduction *strategies* – higher level objectives that the community needs to achieve to reduce its fossil fuel use – that have proven important and valuable in communities similar to Bend.

This context will help the Committee spend time thinking and talking about climate *actions* – specific policies, programs, or projects that can be implemented to help reach those objectives – that have enough scale to be meaningful in the Bend context as the City works on its 2024 Community Climate Action Plan update.

Background

Bend's first Community Climate Action Plan (CCAP) was completed in 2019. The 2019 CCAP includes climate mitigation strategies and actions for 2020-2025 and requires that the City of Bend update the Plan regularly to reflect improvements in technology, data, and forecasting. Five years later, it's time for an update.

Notable Policy Changes Since 2019

The climate action policy landscape has changed dramatically over the last five years, primarily impacting energy supply, energy use, and transportation.

Energy Supply

Bend's energy supply is provided by two electricity utilities (Pacific Power and Central Electric Cooperative) and one gas utility (Cascade Natural Gas).

Electricity

Each electric utility has a different emissions intensity (measured in metric tons of carbon dioxide equivalents per megawatt hour) based on the utility's generation portfolio. Central Electric Cooperative had a lower emissions intensity but served fewer customers in Bend than Pacific Power in 2021. See Table 1.

Table 1: Emissions intensities (MT CO_2e/MWh) and percent of electricity supplied to the Bend community by Central Electric Cooperative and Pacific Power in 2021

Electric Utility	Percent of Bend's electricity supplied by the electric utility in 2021[1]	2021 Emissions Intensity[2] (MT CO_2e/MWh)
Central Electric Cooperative	15%	0.040
Pacific Power	85%	0.599

PacifiCorp (Pacific Power) also released a **2023 update to their Integrated Resource Plan** which outlines plans for conservation energy storage, renewable resources, and other related energy content.

The **Oregon Clean Energy Targets** bill was passed in 2021 and requires investor-owned electric utilities (like Pacific Power) to reduce GHG emissions from the electricity they provide. The bill also created targets for these companies to reduce the GHG emissions from electricity sold in Oregon:

- 80 percent below baseline[3] emissions levels by 2030;
- 90 percent below baseline emissions levels by 2035; and
- 100 percent below baseline emissions levels by 2040

These targets *do not* impact Central Electric Cooperative (public utilities are exempt). However, Central Electric buys its wholesale electricity from the Bonneville Power Administration, which is responsible for marketing the electricity produced at 31 federally operated hydroelectric dams on the Columbia River and its major tributaries distributed around the Pacific Northwest. As a result, the electricity CEC provides its members with is very low emissions. Specifically, the sources of Central Electric's power generation mix is typically composed of:

- 85% from large hydroelectric projects
- 10.6% from the Columbia Generating Station, a nuclear power plant in south-central Washington
- 2.7% from non-specific power purchases by BPA, which includes some amount of emission-free renewable resources
- 1.6% from wind and other renewable sources[4]

Natural gas

The **Climate Protection Program** (CPP) is not currently in place, but would reduce natural gas emissions if the rule is reestablished after the completion of the stakeholder process. The original CPP was invalidated by the Oregon Court of Appeals in December 2023 after the

[1] Data from the Bend 2021 Community Greenhouse Gas Inventory
[2] State of Oregon Department of Environmental Quality – Greenhouse Gas Emissions From Electricity Use 2010-2022
[3] The baseline is an average of their 2010, 2011, and 2012 emissions, equal to 0.428 MT CO_2e/MWh.
[4] Central Electric Cooperative – Carbon-emission Free Hydro

Court determined that DEQ did not fully comply with notice requirements during the 2021 CPP rulemaking process. DEQ is currently redoing the stakeholder engagement process to reinstate the CPP.

The previous iteration of the Climate Protection Program set a target of 90% reduction in natural gas and other fossil fuels by 2050 and, alongside the Clean Energy Targets, would have helped to reduce Bend's GHG emissions from buildings to nearly zero by 2050[5].

Energy Use

Oregon's building codes were updated in 2021[6]. Commercial energy codes are in the **Oregon Energy Efficiency Specialty Code (OEESC)** and residential energy codes are in Chapter 11 of the **Oregon Residential Specialty Code (ORSC).** These changes are expected to have relatively small impacts on energy use. As with energy supply, PacifiCorp (Pacific Power) also released a **2023 update to their Integrated Resource Plan** which outlines plans for conservation energy storage, renewable resources, and other related energy content.

Additionally, the Oregon Department of Energy is currently in the rulemaking process to establish **Building Energy Performance Standards** for commercial buildings. The policy will address energy use and emissions from existing commercial buildings, which account for nearly 20% of energy use in Oregon. It will require many large commercial buildings to enhance energy management practices and implement efficiency measures to meet energy use targets. Rulemaking is expected to be complete by the end of 2024, and the new rules are anticipated to take effect in July 2025.

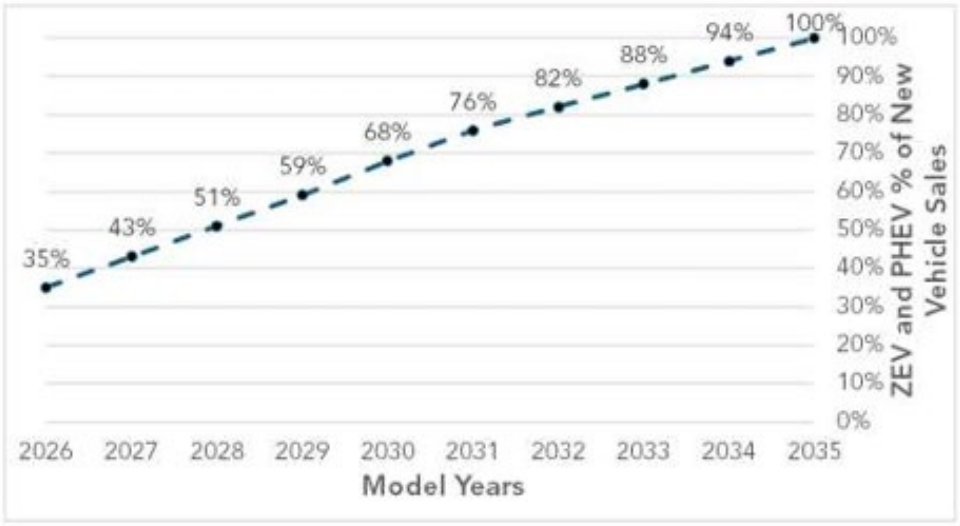
Transportation

The Oregon Department of Land Conservation and Development's **Climate Friendly and Equitable Communities (CFEC)** rulemaking launched in 2020. The program aims to reduce climate pollution, provide more transportation and housing choices, and promote more equitable land use planning outcomes by requiring communities in Oregon's eight most populated areas (including Bend) to change their local transportation and land use plans to do more to ensure Oregonians have more safe, comfortable ways to get around, and don't have to drive long distances just to meet their daily needs.

The **Advanced Clean Cars II** rules, adopted in December 2022, require auto manufacturers to produce and deliver for sale increasing percentages of new zero-emission light-duty vehicles. By 2035, all new passenger cars, SUVs, and light-duty pickup trucks must either be battery electric or plug-in hybrid electric vehicles. The phasedown schedule is shown in Figure 1.

[5] Bend 2021 Community Greenhouse Gas Inventory
[6] Oregon Department of Energy – Energy Code & the Built Environment

Figure 1: Summary of Zero-Emission Vehicle (ZEV) requirements under Oregon's Advanced Clean Cars II rules



Source: Department of Environmental Quality – Oregon Environmental Quality Commission Special Meeting, December 19 2022 – Rulemaking, Action Item A

According to ODOT, about 14% of new vehicles registered in Oregon in 2023 were EVs, up from 10% in 2022 and 7% in 2021[7].

The increase in electric vehicles demands an increase in electric vehicle charging. The **Electric Vehicle (EV) Charging Station Building Standards for New Construction** are one step in the direction of increasing and ensuring access to EV charging. *As of July 2024, these standards only apply to* ***new*** *buildings.* The updated standards amend the state building code to require that 20% of parking spaces at all newly constructed commercial buildings, multifamily residences with five or more units, and mixed-use developments have the electrical capacity to support Level 2 EV charging stations. New residential construction must be able to support the installation of one Level 2 EV charging station.

Waste and Materials

The **Plastic Pollution and Recycling Modernization Act**, passed by the Oregon legislature in 2021, will update Oregon's outdated recycling system. This system-wide update will make recycling easier for the public to use, expand access to recycling services, upgrade the facilities that sort recyclables, and create environmental benefits while reducing social and environmental harms, such as plastic pollution. Recycling program changes will start in July 2025. This system update is expected to improve material recovery efforts in Oregon, helping to reduce embodied carbon emissions of upstream emissions.

[7] The Oregonian – Oregon electric vehicle sales rise again – when might they overtake gas-powered cars? (March 31, 2024)

Refrigerants

Fugitive emissions from refrigerants used in vehicles and cooling equipment can have a disproportionately large climate impact for their volume/mass. Bend's 2019 CCAP does not include strategies and actions specific to reducing emissions from refrigerants. However, Bend's 2021 GHG emissions inventory indicated a 10% increase in refrigerant emissions in Bend from 2016 to 2021.

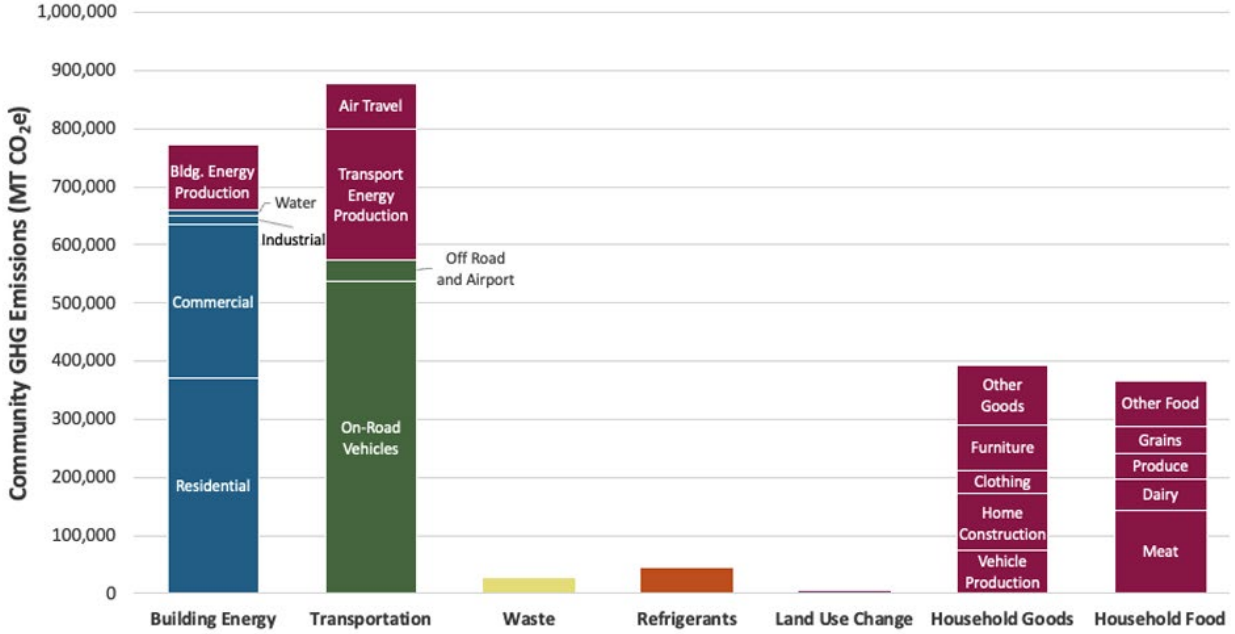
The federal **American Innovation and Manufacturing (AIM) Act** of 2020 requires a phased step-down in production and consumption of refrigerants: 10% by 2022, 40% by 2024, 70% by 2029, 80% by 2034, and 85% by 2036. The policy will limit the production and sale of common high-GWP refrigerant gases, known as Hydrofluorocarbons (HFCs).

Bend's Updated Greenhouse Gas Emissions Inventory

In 2022, Bend updated its GHG Emissions Inventory using 2021 data. The updated GHG inventory found that Bend's largest sources of local (sector-based) emissions include building energy use (50%) and transportation (44%).

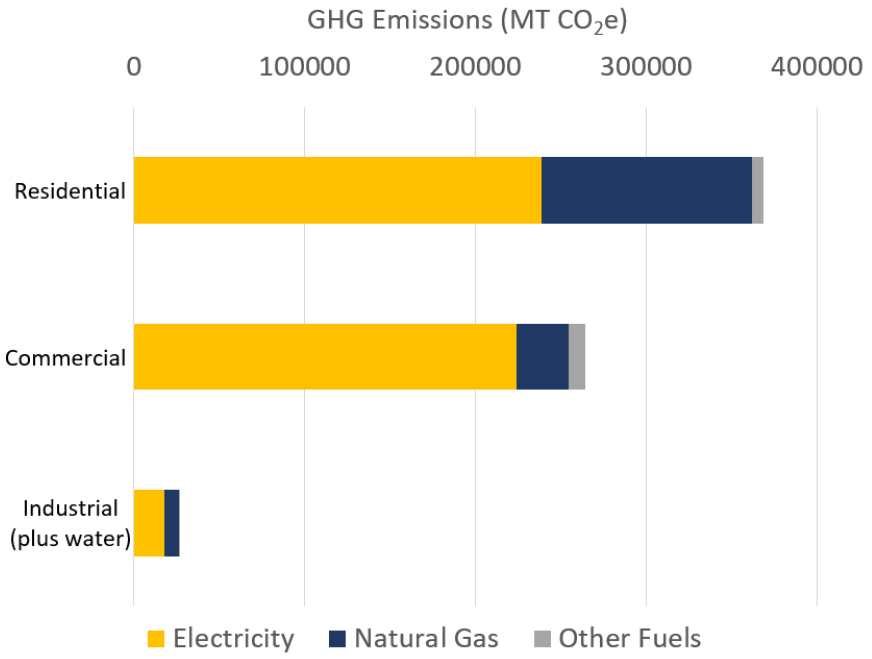
For buildings, electricity is the largest source of emissions (73%); followed by natural gas (24%); and other fuels (3%). Smaller local sources of emissions include refrigerant loss from buildings and vehicles (3%) and waste disposal (2%). Lastly, land use development emissions (<0.5%) were included – a newly available emissions source since 2016. See Figure 2 for a breakdown of all of Bend's community-wide emissions sources, and Figure 3 for a breakdown of Bend's residential, commercial, and industrial building energy emissions.

Figure 2: Bend's 2021 Community GHG Emissions. Local emissions (primary colors) with imported emissions (magenta).
Note: this report uses market-based accounting for electricity.



Source: Bend 2021 Community Greenhouse Gas Inventory

Figure 3: Breakdown of Bend's 2021 emissions from building energy.



Source: Bend 2021 Community Greenhouse Gas Inventory

Best Practices by Sector

Bend's 2019 CCAP includes strategies and actions to address emissions across four sectors that make up the bulk of Bend's carbon emissions: Energy Supply, Energy Use, Transportation, and Waste and Materials. This memo includes a list of **best practices** along with considerations for mechanisms for moving best practices forward, equity, climate resilience, and co-benefits for each of the four sectors included in Bend's CCAP. Note: Best practices are listed in order of scale, not necessarily in terms of speed or cost of implementation.

Mechanisms refer to the ways in which the best practice may move from idea to action. The mechanisms included here are not exhaustive but are meant to provide ideas to the Environment & Climate Committee. Some best practices will require multiple mechanisms to make progress on emissions reduction.

Common mechanisms for action found in other municipal climate action plans include:

- **Education & outreach** to increase awareness about climate-friendly options and spur behavior change.
- **Financing options & incentives** to make climate-friendly changes more appealing to individuals and businesses by reducing the financial burden of making those changes.
- **Regulation or policy changes** to require climate-friendly changes or make them the default option.
- **Research or analysis** to identify gaps or understand feasibility of climate actions in the local context.

Equity considerations look at how the benefits or burdens of the best practices included here might be distributed within the community.

Climate resilience considerations provide information about how a best practice might help or hinder the community's ability to adapt to climate change.

In addition to adaptation and resilience and social equity, **co-benefits** from the 2019 CCAP include **economic vitality, affordability, supporting the natural environment, and community health and safety**.

Energy Supply

Energy supply refers to the sources of the energy we use to power and heat our buildings, power our modes of transportation, and produce the materials we use and foods we consume – primarily electricity and natural gas, but can include other fuels, too.

Policy changes impacting energy supply emissions

- The **Oregon Clean Energy Targets** will impact electricity emissions from Pacific Power customers, but not customers of the Central Electric Cooperative.
- The **Climate Protection Program** is currently on hold due to lawsuits from the natural gas utilities over process rules and is under way per the proper process. The need for local action to reduce emissions from natural gas may be more important than previously thought but the outcome of the process is to be determined.

PacifiCorp (Pacific Power) also released a **2023 update to their Integrated Resource Plan** which outlines plans for conservation energy storage, renewable resources, and other related energy content.

Best practices

Table 2 provides an overview of best practices to reduce emissions from energy supply, including consideration of equity, climate resilience, and co-benefits.

Table 2: Best practices to reduce emissions from energy supply

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Automatically enroll all buildings served by Pacific Power in the utility's **renewable energy program** or negotiate for a green tariff program for the community	Financing options & incentives (e.g. provide financial support for low-income residents) Regulation or policy changes (e.g. establish opt-out program)	Provide an opt-out option for those who are concerned about the higher cost to be enrolled in the program Note: this would apply to Pacific Power customers, not Central Electric Cooperative customers	N/A	Community health & safety (in fossil energy generation communities)
Expand use of residential and commercial rooftop solar photovoltaics (PV)	Education & outreach Financing options & incentives (e.g. waive	Rooftop solar may be unattainable for renters and/or lower-income residents	Local electricity generation may be better equipped to	Affordability Community health & safety

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
	permitting fees for solar)	Consider providing financial incentives and technical support to reduce barriers to access for traditionally underserved populations; this should include incentives for landlords to avoid raising rent	withstand electricity grid disruptions, especially with in-building energy storage	
Explore low-carbon electricity generation opportunities appropriate to the local geography (e.g. geothermal)	Research or analysis (e.g. feasibility study)	Maintains local jobs in a lower-carbon economy	Local electricity generation may be better equipped to withstand electricity grid disruptions, especially with local energy storage	Supporting the natural environment
Electrification of residential and commercial appliances at end of life (space heating, water heating, laundry, cooking)	Education & outreach Financing options & incentives (e.g. provide rebates)	This keeps appliances in place and helps avoid the costs of new equipment before the equipment ages out Recommended where electrification is viable	During a winter storm where electricity is lost, gas heat provides heat in a fireplace or on the stove top the way a woodstove does, but with lower air toxics	

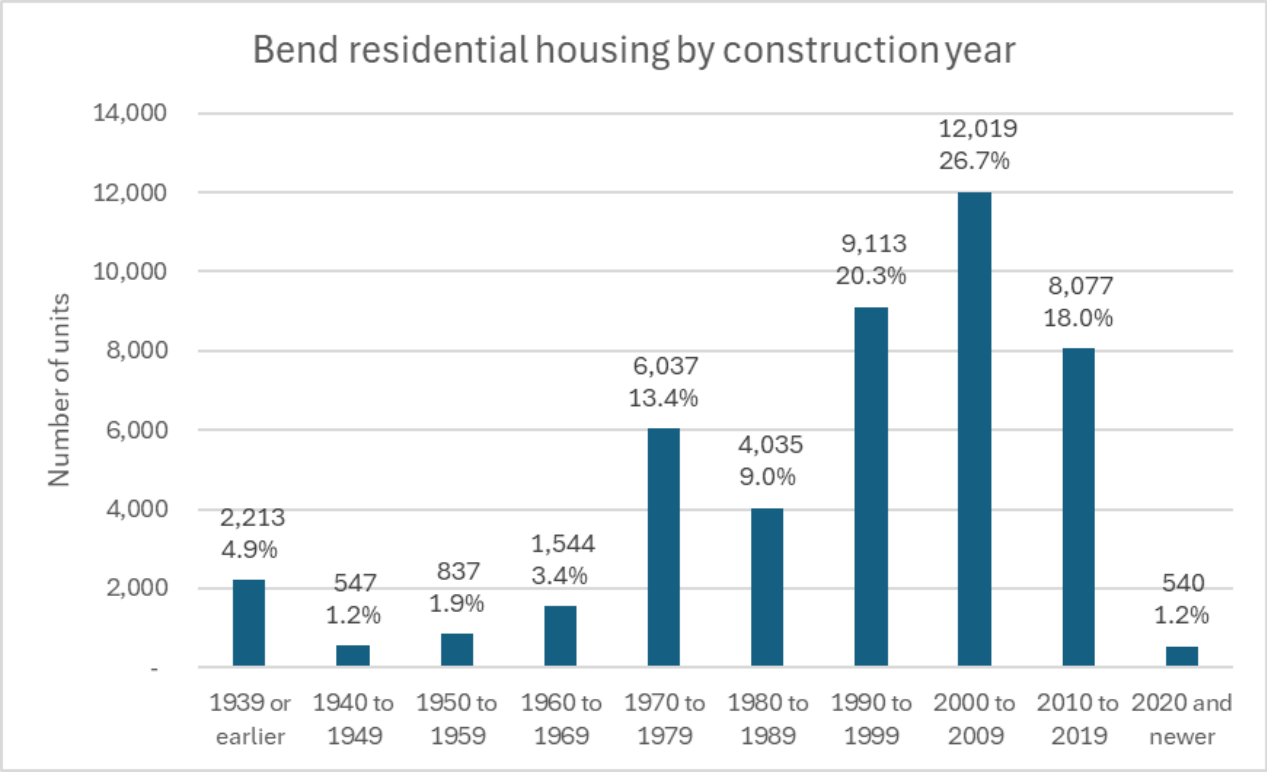
Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Purchase renewable natural gas (RNG), hydrogen, or credits through the gas utility, if possible, for industrial uses or where electrification is not viable	Education & outreach	This keeps existing appliances in place and helps avoid the costs of new equipment before the equipment ages out Recommended for industrial uses or where electrification is not viable	N/A	Economic vitality (no capital costs for switching equipment before the end of existing equipment's useful life)
Purchase carbon offsets through the gas utility if natural gas alternatives are not available to purchase	Education & outreach	Additional cost to purchase offsets	During a winter storm where electricity is lost, gas heat provides heat in a fireplace or on the stove top the way a woodstove does, but with lower air toxics	Economic vitality (no capital costs for switching equipment before the end of existing equipment's useful life)
Onsite hydrogen generation for industrials and other thermal storage	Education & outreach Research or analysis (e.g. feasibility study)	Maintains local jobs in a lower-carbon economy Improved air quality at work and nearby for workers and neighbors The transition will require capital	Can generate it locally and onsite, reducing risk of transmission failure	Economic vitality (keeps the same jobs here)

Energy Use

Energy use refers to the energy used to turn on the lights, heat and cool buildings, and power appliances and electronics. Reducing emissions from energy use relies on improving energy efficiency and conserving energy.

Newer buildings tend to be more efficient than older buildings due to improved building codes over time.[8] Over 65% of Bend's residential building stock was built after 1990, leaving about 35% of residential buildings in greater need of efficiency improvements (Figure 4).

Figure 4: Bend residential housing by construction year



Source: Energy Trust of Oregon – Bend City Report (2023)

[8] Building Energy Codes Program

Policy changes impacting energy use emissions

Oregon's building codes were updated in 2021[9]. Commercial energy codes are in the **Oregon Energy Efficiency Specialty Code (OEESC)** and residential energy codes are located in Chapter 11 of the **Oregon Residential Specialty Code (ORSC).** PacifiCorp (Pacific Power) also released a **2023 update to their Integrated Resource Plan** which outlines plans for conservation energy storage, renewable resources, and other related energy content.

The Oregon Department of Energy is currently in the rulemaking process to establish **Building Energy Performance Standards** for commercial buildings. It will require many large commercial buildings to enhance energy management practices and implement efficiency measures to meet energy use targets. Rulemaking is expected to be complete by the end of 2024, and the new rules are anticipated to take effect in July 2025.

Best practices – energy use

Table 3: Best practices to reduce emissions from energy use

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Replace furnaces with ductless (or ducted) heat pumps when furnaces fail.	Education & outreach Financing options & incentives Regulation or policy changes (e.g. require the switch then utilize electrical permit process to enforce)	Conduct targeted outreach to historically underserved communities and landlords regarding financial incentives for heat pumps to reduce the financial burden of equipment replacement.	In addition to heating, heat pumps also provide permanent, efficient cooling. May need a backup heating supply for peak cold snaps.	Affordability (energy cost savings over time)

[9] Oregon Department of Energy – Energy Code & the Built Environment

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Replace water heaters with heat pump water heaters or other high efficiency options when they fail	Education & outreach Financing options & incentives (e.g. rebates) Regulation or policy changes (e.g. require the switch then utilize plumbing permit process to enforce)	Conduct targeted outreach to historically underserved communities and landlords regarding financial incentives for heat pumps to reduce the financial burden of equipment replacement	May need a backup water heating option for peak cold snaps	Affordability (energy cost savings over time)
Focus weatherization efforts on buildings built before 1990	Education & outreach Financing options & incentives Regulation or policy changes (e.g. establish building performance standards)	Conduct targeted outreach to historically underserved communities and landlords regarding financial incentives for weatherization, helping to reduce energy burden for lower income residents	Weatherization results in lower energy needs to keep buildings cool during the warm months or warm during the cold months	Affordability (energy cost savings over time)
Replace incandescent and fluorescent lights with LED lighting	Education & outreach Financing options & incentives	Conduct targeted outreach and/or provide incentives to historically underserved communities to encourage the use of LEDs	N/A	Affordability (energy cost savings over time)
Replace appliances with high efficiency	Education & outreach Financing options & incentives	Conduct targeted outreach and/or provide incentives to historically underserved communities	N/A	Affordability (energy cost savings over time)

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
options (e.g. EnergyStar)		to encourage the use of high efficiency appliances		

Transportation

Transportation emissions made up 44% of Bend's greenhouse gas emissions in 2021. These come from the tailpipes of passenger vehicles, commercial service vehicles, freight vehicles, and transit vehicles, and include both Bend residents and visitors. However, most emissions from transportation are from passenger cars and trucks owned by Bend residents.

Policy changes impacting transportation emissions

Oregon's **Advanced Clean Cars II** regulation requires auto manufacturers to produce and deliver for sale increasing percentages of new zero emission light-duty vehicles. **By 2035, all new passenger cars, SUVs, and light-duty pickup trucks must either be battery electric or plug-in hybrid electric vehicles.**

Best practices – transportation

Table 4: Best practices to reduce emissions from transportation

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Increase electric vehicle (EV) charging infrastructure	Education & outreach Financing options & incentives Regulation or policy changes	Focus on increasing the availability of charging infrastructure at multifamily housing and workplaces	N/A	Community health & safety (reduced air pollution)
Increase use of low-carbon fuels like renewable diesel (R99)	Education & outreach	Diesel fuels with higher renewable content result in less particulate matter than	N/A	Community health & safety (reduced air pollution)

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
while decreasing use of fossil-based diesel in fleets and heavy-duty vehicles	Financing options & incentives Regulation or policy changes	fossil-based diesel when combusted, resulting in less air pollution Ensure renewable diesel blends are available in higher equity needs areas to help improve air quality		
Promote remote work and/or alternative work schedules; consider for higher education as well	Education & outreach	The option to work remote or on an alternative schedule is not available to all workers	N/A	Affordability
Increase active transportation, including walking, biking, and micromobility options like electric bikes and scooters.	Education & outreach Regulation or policy changes (e.g. updates to the Transportation System Plan that prioritize active transportation)	Ensure that transportation planning processes include equitable community engagement opportunities. Ensure that transportation infrastructure is designed to be accessible to users of all abilities.	Increased exposure to climate hazards like extreme heat or poor air quality for individuals that use active transportation.	Affordability (reduced fueling and maintenance costs for community members) Supports the natural environment Community health & safety (health benefits of active transportation)

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Increase transit use	Education & outreach Regulation or policy changes (e.g. updates to the Transportation System Plan that prioritize transit)	Equitable planning processes. Accessible transit infrastructure.	Increased exposure to climate hazards like extreme heat or poor air quality for individuals that use transit.	Economic vitality (access to jobs and local economy). Affordability (reduced fueling and maintenance costs for community members).

Waste and Materials

The Waste and Materials sector includes emissions from the production, consumption, and disposal of food, clothing, electronics, furniture, fuel, and building materials. In 2021, **47% of Bend's emissions came from consumption of goods, food, and services.** Identifying places where reduced material and food consumption can reduce the upstream footprint and encourage the recovery of goods and waste to the highest and best use.

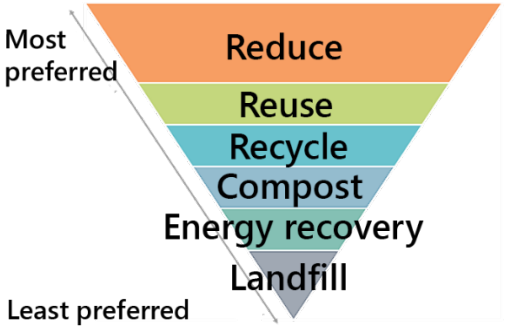
Policy changes impacting waste & materials emissions

The recycling system updates made because of the **Plastic Pollution and Recycling Modernization Act** are expected to improve material recovery efforts in Oregon, helping to reduce embodied carbon emissions of upstream emissions. These changes should help set the stage for an improved market for recycled materials.

Best practices – waste and materials

The best way to reduce emissions from materials is to follow the materials management hierarchy (Figure 5), focusing first on reducing consumption (buy less, share, or borrow whenever possible), followed by reusing existing goods and materials (repair or buy used whenever possible), recycling and using goods made from recycled content, composting, then energy recovery and sending items to the landfill as a last resort.

Figure 5: Materials Management Hierarchy



Source: Oregon Department of Environmental Quality

Table 5: Best practices to reduce emissions from waste and materials

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Create/support more opportunities for sale and exchange of used goods	Education & outreach Financing options & incentives (e.g. storefront matching grants)	Opportunity to make money and save money	N/A	Affordability Economic vitality Supporting the natural environment
Create/support more opportunities for repair of goods	Education & outreach Financing options & incentives (e.g. storefront matching grants)	More local jobs	N/A	Affordability Economic vitality Supporting the natural environment
Reduce edible food waste	Education & outreach	Reduced food waste increases affordability of food	N/A	Affordability Supporting the natural environment (Reducing agricultural needs for food production)
Purchase goods made from recycled materials	Education & outreach	Provide educational materials in multiple languages	N/A	Supporting the natural environment (reduce demand for new resources)
Improve recycling options	Education & outreach	Provide educational materials in multiple languages	N/A	Supporting the natural environment (potential to reduce demand for new resources downstream)

Best practice	Mechanism(s)	Equity considerations	Climate resilience considerations	Co-benefits (+ or -)
Increase opportunities for composting food waste and other organic matter.	Education & outreach Regulation or policy changes (e.g. require composting at restaurants and grocery stores)	Ensure that the option to compost is made available to residents of multifamily housing and that landlords and residents receive targeted outreach.	N/A	Supporting the natural environment
Eat more plant-based foods.	Education & outreach	Education efforts around the climate impacts of food should be culturally and socioeconomically sensitive.	N/A	Community health & safety Supporting the natural environment