Memo

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Date: Thursday, June 18, 2025

To: Metro Council and interested parties

From: Eliot Rose, Senior Transportation Planner

Subject: Draft Comprehensive Climate Action Plan actions and results

Introduction

This memo describes the draft actions proposed for the Comprehensive Climate Action Plan (CCAP), focusing on the estimated greenhouse gas reduction benefits and costs of these actions. The July 8 work session is an opportunity to provide feedback on the draft list of climate actions being proposed for the draft CCAP prior to releasing the draft plan for public comment in August 2025.

This memo quantifies cost and benefits for each action, and also report on qualitative evaluation criteria (e.g., alignment with community priorities, implementation readiness) that the CCAP team has used to prioritize CCAP actions, and which have been the subject of prior discussions. Implementation of the proposed CCAP actions will not only address climate change, but will also create new jobs, save people money, clean the air and improve quality of life for everyone, including the region's most vulnerable community members, who are disproportionately harmed by pollution and high energy costs. This memo does not capture these co-benefits are not captured in this memo, but the draft CCAP will discuss them in more detail.

The memo consists of four sections:

- **Results by sector,** which contains a table showing:
  - **Actions** and **categories of similar actions** in each sector.
  - Ratings for the **climate benefits and cost-effectiveness** of each action. These ratings, which are based on a quantitative analysis of these actions, help to compare the benefits and costs of different actions. The CCAP team identified a range of implementation scenarios for each action to understand how costs and benefits might vary under different levels of implementation, and **the table shows ratings for both the low and high implementation scenarios to illustrate the range of potential results**.
  - Ratings for **community priority, authority to implement, and resources to implement**. These are based on a qualitative assessment of these actions and help to identify pathways to implementing each action as well as opportunities and concerns that may need to be addressed during implementation.
- **About the results,** which describes and defines the metrics and rating scales shown in each section.
- **Assumptions by scenario,** which shows the details of how implementation scenarios were defined to help readers understand the assumptions behind each action and how changing these assumptions influences results.

- **Summary of results,** which shows the combined impact of all actions on GHG emissions and discusses additional collective actions that might help make up the remaining gap between these results and the CCAP targets.

Results by sector

Actions to reduce transportation emissions

Action / category	Climate benefits (low)	Climate benefits (high)	Cost-effectiveness (low)	Cost-effectiveness (high)	Community priority	Authority to implement	Resources to implement
Compact communities	◕	●	●	●	◑	◑	●
Implement local and regional land use plans	◕	●	●	●	◑	◑	◑
Implement transit-oriented development programs	◕	●	◕	◕	◑	◑	●
Price and manage parking	○	●	●	●	○	●	●
Transit	◕	◕	○	○	●	●	◑
Implement planned transit service	◕	●	○	○	●	●	◑
Offer discounted transit passes	◕	◕	◑	◑	●	●	◑
Build high-speed rail	○	◔	○	◔	○	◑	○
Bike / ped / other	◑	◕	◑	◔	◑	◑	●
Build new bicycle and pedestrian facilities	◑	●	◔	○	◑	●	◑
Expand electric bike and scooter sharing systems	○	○	●	●	◑	◑	●
Maximize teleworking	◕	◕	●	●	○	◑	●
Transportation pricing	○	●	N/A	●	○	◑	◑
Implement roadway pricing and/or fees	○	●	N/A	●	○	◑	◑

Actions to reduce building emissions

Action / category	Climate benefits (low)	Climate benefits (high)	Cost-effectiveness (low)	Cost-effectiveness (high)	Community priority	Authority to implement	Resources to implement
Existing buildings	◑	●	◑	◑	●	●	○
Energy efficiency in existing homes	◑	●	◑	◑	●	●	○
Efficiency in commercial/industrial buildings	◑	●	◑	◑	◑	●	○
Installing electric appliances in existing homes	◕	●	◕	◕	●	●	○
Planting street trees to reduce cooling needs and sequester carbon	○	○	◔	◔	●	●	○
New buildings	◕	●	◑	◑	◑	◑	○
Increased requirements for electric appliances in new buildings	◕	◕	◕	◕	◑	◑	○
More energy-efficient building codes	◕	●	◑	◑	◑	○	○
Renewable energy	◕	●	◑	◑	◔	●	◔
Net-zero public buildings	●	●	◕	◕	○	●	◑
Rooftop solar	◕	●	◑	◑	◑	●	○

Actions to reduce food, goods, and services emissions

Action / category	Climate benefits (low)	Climate benefits (high)	Cost-effectiveness (low)	Cost-effectiveness (high)	Community priority	Authority to implement	Resources to implement
Composting	◔	◕	◕	◕	●	◑	◑
Expanded residential composting	◔	◕	◕	◕	●	◑	◑
Procurement / construction[1]	●	●	◔	◔	○	◑	○
Requiring low-carbon construction materials in new buildings	●	●	◔	◔	○	◑	○
Low-carbon government procurement	●	●	◑	●	◑	●	○
Reusing / preventing waste	◕	◕	◑	◑	●	●	●
Prevent and recover business food waste, with a focus on prevention	◑	◕	◕	◕	◑	●	●
Increase reuse of products and materials	◕	◕	◑	◑	●	●	●

[1] Emissions from procurement and construction are a relatively new focus for climate action planning and are not covered by many local or regional climate plans. Results and implementation scenarios for these actions are based on an initial research report developed by Oregon Department of Environmental Quality (https://www.oregon.gov/deq/mm/Documents/mm-SEITechnicalReport.pd) exploring policy options for reducing these emissions. This means that they are not constrained to existing authority and resources in the same way that other actions in this sector are, which may lead this memo to overestimate their benefits and cost-effectiveness.

About the results

The tables above rate the draft recommended CCAP actions with respect to several different criteria. This section describes how these ratings are based on and what the rating scales mean.

Criteria definitions and data sources

Climate benefit is based on the estimated cumulative greenhouse gas (GHG) reductions due to the action between the years 2025 and 2050—i.e., the total GHG reductions over this 25-year period covered by the CCAP. These reductions are measured as million metric tons (MMT) of cumulative GHG (in carbon dioxide equivalents, or CO_2e). The impact of these actions changes over time as they are fully implemented, and the "GHG gap" that the CCAP is seeking to close also changes over time as our metropolitan area grows and changes and as state climate policies and programs take effect. Measuring cumulative emissions helps to account for these changes over time.

The CCAP team reviewed a broad range of climate research to quantify the climate benefit for each action. The CCAP is required to estimate the climate benefit of each action therein, and the team only included actions if there was a sound, well-established method to quantify climate benefits and the necessary data to support this method. That said, these methods originate from different fields and sources, and the CCAP team cannot guarantee that the results are comparable for different actions. The draft CCAP will include detailed methods and calculations for each action.

Cost-effectiveness is based both on the climate benefit results described above and on the estimated cumulative costs of implementing each action over a 25-year period (measured in 2024 dollars). Cost-effectiveness is measured in the average dollars spent per metric ton of GHG reductions achieved by a given action, and is commonly used in climate action planning to compare the effectiveness across actions with wide-ranging costs and benefits.

The cost estimates on which these results are based only capture the up-front costs of implementing actions, with a focus on capturing the costs to the public agencies implementing the action—they do not capture the (often significant) savings that people see as a result of the many actions in the table above that help people use less electricity or fuel, nor do they always capture the full cost to individuals or to the private sector of implementing actions. The draft CCAP will include more comprehensive information on costs and savings.

Cost estimates are based wherever possible on regional plans like the Regional Transportation Plan and Metro's Regional System Facilities Plan that outline anticipated resources and priorities. In other cases, they are based on prevailing practices for estimating costs. This means that cost-effectiveness results are not comparable between sectors, because practices for estimating costs vary. For example, transportation sector cost estimates typically focus on the cost of capital projects, operations and maintenance to public agencies; whereas building sector cost estimates typically include the cost to the private sector of complying with new green building requirements.

Community priority assesses whether actions are perceived as beneficial by community members. These ratings are based on outreach and engagement to understand community benefits of different climate actions conducted by the CCAP team and by the many agencies in the region that have created community-focused climate action plans for their communities. The CCAP team held an online open house during winter 2024-25 during which respondents identified the actions in each sector that most

benefit them and their communities. The project team also reviewed adopted climate actions plans from within the metropolitan area to identify which actions were prioritized by community members during engagement and outreach that shaped development of those plans.

Authority to implement assesses whether local and regional agencies and community partners in the metropolitan area have the authority to implement an action. It is based on a review of climate action plans and of the plans that were used to develop implementation scenarios for each action, which typically discuss how actions would be implemented and who has the authority to do so.

Resources to implement assesses whether local and regional agencies and community partners in the metropolitan area have the necessary resources to implement an action. It is based on the same plans that were used to develop estimates of cost and cost-effectiveness (see discussion above). These plans typically identify the resources that are available to implement different actions.

Rating scales

The previous sections use Harvey balls to rate and summarize how each action and category of actions performs with respect to the criteria listed above. Ratings for climate benefit and cost-effectiveness are based on a detailed quantitative analysis of GHG reductions and costs for each action, and present results for both low and high implementation scenarios using a more detailed 5-point rating scale that captures the nuances of the underlying analysis. Ratings for community priority, authority to implement, and resources to implement are based on a qualitative assessment, and use a simpler 3-point rating scale to rate actions across all implementation scenarios. The table below shows how ratings are defined for each of these criteria.

Ratings are provided both for individual actions and for categories of actions. When summarizing results for a category that includes actions with widely varying costs and benefits, the CCAP team gives more weight to costlier and more impactful actions.

Rating	Climate benefit (million metric tons [MMT] GHG reductions)	Cost-effectiveness ($/MT GHG reductions)	Community priority (qualitative)	Authority to implement (qualitative)	Resources to implement (qualitative)
●	>3 MMT	(cost-neutral / money-earning)	Action was rated as one of the top 3 in its sector at the winter online open house *and* identified as a community priority in multiple partner plans	Local and regional partner agencies have the authority to fully and consistently implement this action across the region.	Regional plans identify funding for the action and this funding is adequate to achieve the low implementation scenario.
◕	1-3 MMT	$0-100 $/MT	(not used)	(not used)	(not used)
◑	0.5-1 MMT	$100-1,000 $/MT	Action was rated as one of the top 3 in its sector at the winter online open house *or* identified as a community priority in multiple partner plans	Local and regional partner agencies have partial / varying authority to implement this action.	Regional plans identify funding for the action, but this funding is not adequate to achieve the low implementation scenario.
◔	0.25-0.5 MMT	$1,000-10,000 $/MT	(not used)	(not used)	(not used)
○	<0.25 MMT	>$10,000 $/MT	Action was not identified as a priority in the winter online open house nor in partner plans	Local and regional partner agencies do not have the authority to implement this action.	Regional plans do not identify a funding source that could support this action.

Draft CCAP climate actions: assumptions by scenario

Actions to reduce transportation emissions

Action / category	Low scenario assumptions	High scenario assumptions
Compact communities		
Implement local and regional land use plans	• The forecasted share of regional growth (38.4%) occurs in regional centers. • Centers develop at current average densities (6.5 DU/ac residential, 3.7 jobs/ac employment)	• A higher-than-forecasted share of regional growth (41.2%) occurs in regional centers. • Centers develop to Hollywood-level residential densities (12.1 DU/ac) and Lake Grove-level job densities (20/6 jobs/ac)
Implement transit-oriented development programs	Metro TOD program is implemented at 2023 levels (113 units per year, 100% affordable)	Metro TOD program is implemented at 2020 levels (996 units per year, 75% affordable)
Price and manage parking	• Applies to places that already price parking • Assumes prices remain at current levels	• Applies to places that already price parking and Climate-friendly areas • Assumes parking management only in most CFAs • Prices increase at inflation + 1.5% each year beginning in 2025
Transit		
Implement planned transit service	2023 RTP constrained transit service (39% increase over current levels)	2023 RTP Target 1 scenario (145% increase over current levels; additional service is assumed to be funded through re-investment of congestion pricing revenues in additional transit service)
Offer discounted transit passes	Assumes that a certain share of people living in areas that are well-served by travel options receive free transit passes (consistent with 2023 RTP update)	Assumes that a certain share of people living in areas that are well-served by travel options receive free transit passes (consistent with 2023 RTP update)
Build high-speed rail	• High speed rail is complete in 2045 • Longer timeline leads to increased costs	• High speed rail is complete in 2035 as planned • Shorter timeline minimizes costs
Bike / ped / other		
Build new bicycle and pedestrian facilities	• Based on the RTP short-term constrained project list • 15% increase in bike facility miles • 13% increase in ped facility miles) • Assumes proportional increase across the MSA	• Applies to facilities in the RTP bike-ped vision (129% increase in bike facility miles, 135% increase in ped facility miles) • Assumes proportional increase across the MSA
Expand electric bike and scooter sharing systems	Assumes current levels of bike/scooter sharing coverage (46% of region's households have access)	Assumes bike/scooter sharing systems expand to communities with medium/high densities and bike/ped infrastructure levels (71% of region's households have access)
Maximize teleworking	Teleworking is at lower range of Metro's 2023 RTP projections (14% full-time, 26% full time)	Teleworking is at higher range of Metro's 2023 RTP projections (33% full time, 24% part time)
Transportation pricing		
Implement roadway pricing and/or fees	No congestion pricing	• STS pricing on the throughway network (avg $0.17/mi.) • Other STS per-mile fees (avg $0.20/mi.)

Actions to reduce building emissions

Action / category	Low scenario assumptions	High scenario assumptions
Existing buildings		
Energy efficiency in existing homes	• Resource navigator (technical assistance) • Rollout over 20 years • 5% of households (oldest homes and lowest income homeowners, relative to ETO's current numbers)	• Rollout over 20 years • 20% of households • Includes home energy benchmarking
Efficiency in commercial/industrial buildings	• Resource Navigator • 5% of Owner-occupied buildings only, ETO efficiency measures	• 20% of buildings upgraded • Benchmarking
Installing electric appliances in existing homes	• Resource navigator (TA) • Air and water heating/cooling • 5% of houses upgraded	• Resource navigator (TA) + Higher Incentives • 20% of houses upgraded
Planting street trees to reduce cooling needs and sequester carbon	• Public agencies plant 1,500 trees per year 2026 - 2050 • Assume that trees are placed to maximize cooling and cared for appropriately to maximize life of tree • Trees planted are slow growing conifers	• Public agencies plant 3,000 trees per year • Assume that trees are placed to maximize cooling and cared for appropriately to maximize life of tree • Trees planted are fast growing hardwoods
New buildings		
Increased requirements for electric appliances in new buildings	• 43% increase in electric space and water heating = 50% decrease in emissions from natural gas used for space/water heating in all new homes	• 100% of all new homes have all electric appliances = 100% decrease in emissions from residential natural gas usage (no new residential natural gas allowed). Includes space/water heating, stoves, fireplaces, etc.
More energy-efficient building codes	• 50% of agencies adopt reach codes (EPA Energy star certified homes) for new residential construction yielding 10% energy reductions	• 100% of agencies align with Washington's green building code (assuming successfully advocacy to adopt WA building code) yielding 67% energy reductions in new buildings
Renewable Energy		
Net-zero public buildings	• Public buildings purchase 100% Renewable Energy Credits (RECs)/offsets for electricity and natural gas usage by 2035. • Scales up slowly over 10 years from 2026 – 2035. • RECs are no longer needed after 2044 when region-wide grid emissions factor (EF) is 0.	• Public buildings purchase 100% RECs/offsets for electricity and natural gas usage by 2026. • RECs are no longer needed after 2044 when region-wide grid EF is 0.
Rooftop solar	• 5X current residential solar production • 10% installed per year (over 10 years) beginning in 2026	• 10X current residential solar production • 20% installed per year (over 5 years) beginning in 2026

Actions to reduce food, goods, and services emissions

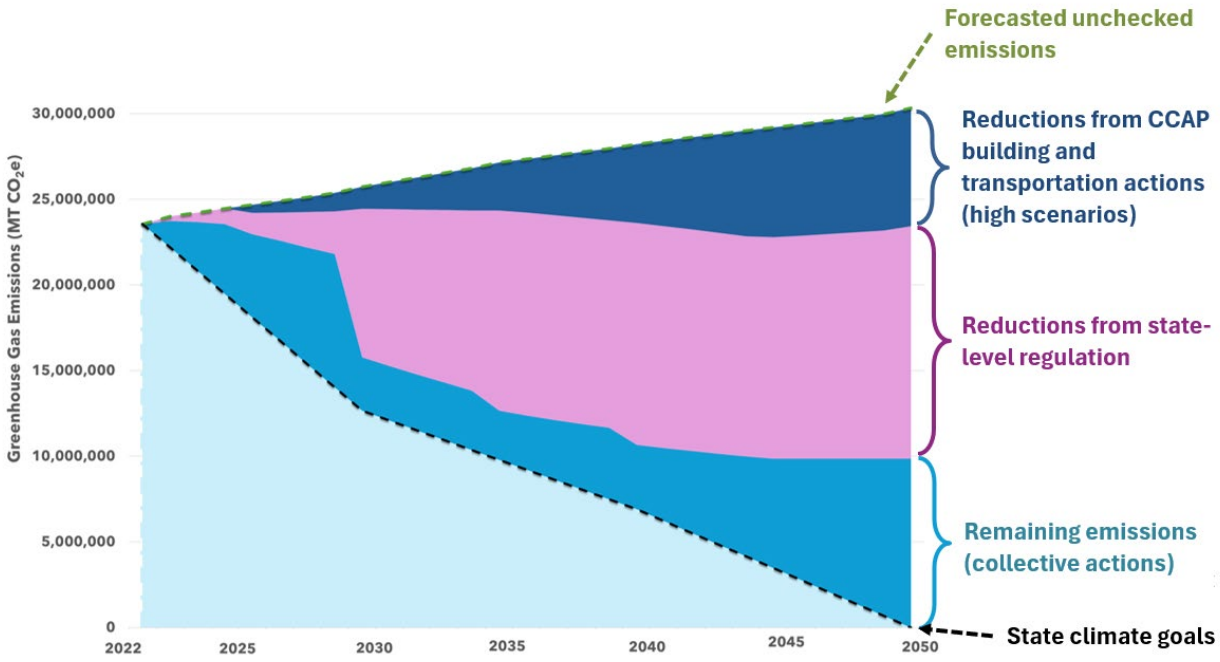
Action / category	Low scenario assumptions	High scenario assumptions
Composting		
Expanded residential composting	• 50% of the single-family home (SFH) population that currently lack residential composting get composting service	• 100% of the single-family home (SFH) population that currently lacks residential composting gets composting service • 100% of the multifamily home population in areas that currently have SFH coverage get composting service
Procurement / construction[2]		
Requiring low-carbon construction materials in new buildings	• Applies to business capital and inventory only (non-governmental commercial)	• Assumes total non-government potential per Oregon DEQ's Consumption Based Inventory.[3]
Low-carbon government procurement	• Achievable construction reductions from local government (30% reduction)	• Science Based Target Initiative (SBTI) from all local government supply chain (up to 90% reduction in 2050)
Reusing / preventing waste		
Prevent and recover business food waste, with a focus on prevention	• New policies require businesses to better manage food waste and prohibit landfill disposal of food waste • Medium levels of investment in program support, technical assistance, grants, and good waste prevention education ($1.6m/year at full implementation)	• New policies require businesses to better manage food waste and prohibit landfill disposal of food waste • Medium levels of investment in program support, technical assistance, grants, and good waste prevention education ($3.5m/year at full implementation)
Increase reuse of products and materials	• New reuse and recycling facilities capture 10% fewer materials and a less carbon-intensive mix of materials than envisioned in Metro's Regional Systems Facilities Plan • $1m devoted to partnerships with community organizations to increased reuse	• New reuse and recycling facilities capture 10% more materials and a more carbon-intensive mix of materials than envisioned in Metro's Regional Systems Facilities Plan • $2.7m devoted to partnerships with community organizations to increased reuse

[2] Emissions from procurement and construction are a relatively new focus for climate action planning, and are not covered by any local regional plans. Results and implementation scenarios for these actions are based on an initial research report developed by Oregon Department of Environmental Quality (https://www.oregon.gov/deq/mm/Documents/mm-SEITechnicalReport.pd) exploring policy options for reducing these emissions. This means that they are not constrained to existing authority and resources in the same way that other actions in this sector are, which may lead to overestimating their benefits and cost-effectiveness.

[3] https://www.oregon.gov/deq/mm/Documents/mm-Reporton2021CBEI.pdf

Summary of results

The graphic below summarizes the overall impact of the CCAP actions alongside the impact of state-level regulations already underway. It highlights an important point—**even under the most optimistic scenarios, the actions in the CCAP do not fully meet state climate goals**. In other words, the metropolitan area needs to pursue all of the actions discussed above and more in order to do its part in meeting state climate goals. Below we discuss what each line and wedge in this chart represents, and what additional actions might help the metropolitan area reach its goals.



State climate goals (dark dashed line): This represents statewide climate goals that have been adopted in Washington and recommended in Oregon, which call for a 95% reduction in GHG emissions below 2005 levels by the year 2050. This is an ambitious goal that essentially calls for creating a carbon-free economy in the Pacific Northwest.

Forecasted unchecked emissions (green dashed line): This represents estimated emissions under a hypothetical "business as usual" scenario that assumes that local, regional, or state agencies never have taken nor will take steps to reduce GHG emissions. It represents baseline GHG emissions; all GHG reductions are applied to this baseline.

Reduction from CCAP building and transportation actions (high scenarios) (dark blue wedge): This represents the maximum potential impact of all building and transportation actions listed above under the high implementation scenarios described in the previous section. This wedge does not include GHG reductions from actions in the food, goods and services sector because these results are based on a different type of GHG inventory and analysis than the rest of the data in this chart.[4]

[4] There are two types of GHG inventories used in climate action plans. Sector-based GHG inventories capture GHG emissions that are produced within the metropolitan area—for example, from people burning gasoline in vehicles

Reductions from state-level regulation (pink wedge): This captures reductions due to state-led climate policies and that are already in place in Oregon and Washington, including:

- Clean energy policies that aim to eliminate emissions from electricity use in buildings by 2040-45.
- Clean vehicle standards that require all new vehicles sold in Oregon and Washington to be zero-emission vehicles by 2035.
- Clean fuel policies that aim to reduce the carbon content of vehicle fuel by 20-37% below 2015 levels by 2034-35. This will mainly affect emissions from the older, non-zero-emission vehicles that are still on the road.
- Cap and reduce/invest policies that aim to reduce emissions from the use of natural gas, solid fuels, liquid fuels and process emissions in distribution and manufacturing by 90-95% below 1990 levels by 2050.

The impact of state-led actions is larger than the impact of the actions in the CCAP because states have much broader authority to regulate climate pollution than local or regional agencies do and can, therefore, take more significant action to reduce GHG emissions. That said, climate plans in both Oregon and Washington both acknowledge that local and regional action is necessary to meeting state goals.

Remaining emissions (collective actions) (light blue wedge): This represents the remaining GHG reductions that are needed to meet state goals after accounting for the recommended CCAP actions and for existing state-level regulations. Collectively, these actions get roughly two-thirds of the way toward meeting 2050 climate goals; leaving a gap of one-third of projected 2050 GHG emissions (just shy of 10 million MT CO_2e). These remaining emissions come largely from two specific energy sources—diesel and natural gas. Existing state regulations do not focus as much on these energy sources as they do on others like gasoline and electricity, and local and regional agencies have limited authority to address diesel and natural gas emissions. Recent research also suggests new opportunities to reduce emissions in the food, goods and services sector, but more work needs to be done at all levels to identify the policies and programs that can unlock these opportunities.

Closing the remaining emissions gap will take significant and potentially challenging collective action. Collective action involves a coordinated effort by individuals, communities, businesses, and governments to transition to cleaner energy sources and goods through a combination of policy changes, technological advancements, and behavioral changes. Many of the policies that can drive these actions work to create a market for lower-carbon energy sources and goods, and they are generally more effective when they create as large a market as possible, so they ideally need to be implemented consistently across a broad geographic area (i.e., statewide or across multiple states). These actions are

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as they travel through the metro area or from buildings within the metro area consuming electricity from the grid. They differ from consumption-based GHG inventories, which account for emissions generated outside of the metro area from producing and transporting goods and services that people use here. Both types of inventories are important—sector-based inventories are traditionally used in climate action plans and capture the majority of emissions from transportation and buildings; consumption-based inventories are an emerging practice that better capture emissions from food, goods and services—but they do not produce comparable results. The grant that funds the CCAP requires the plan to include a sector-based inventory and analysis. This includes consumption-based results where relevant in order to capture as broad of a set of climate actions as possible, but due to the inconsistency between sector- and consumption-based inventories we cannot include them in this chart.

not included in the CCAP because neither local/regional agencies nor even state agencies or can implement these actions unilaterally without significantly increasing people's cost of living. Implementation involves coordination between local, regional and state agencies; with the private sector and potentially across multiple states.

Potential collective actions include:

- **Addressing natural gas emissions**: Natural gas is the largest single remaining source of projected emissions in 2050. Natural gas utilities are working to decrease the carbon intensity of their product, and these efforts are not captured in the chart above, but it would be challenging to reduce the carbon intensity of natural gas to zero. Achieving a transition away from natural gas involves a coordinated effort that could include developing new cleaner sources of natural gas, prioritizing these sources for the cases where natural gas is most necessary, and shifting from natural gas to electric appliances where feasible, all while ensuring that there is capacity to deliver the energy that people need without significantly increasing the cost for end users.
- **Switch to renewable diesel**: Diesel and other fossil transportation fuels (e.g., propane, aircraft fuel) are the next largest contributor to remaining emissions; diesel alone makes up three-quarters of remaining transportation emissions. The City of Portland already requires local pumps to sell R99 (renewable diesel) and if the entire region followed suit, the final emissions could in theory be reduced by an additional 3 million MT CO_2e. However, the supply of renewable diesel is limited, and the Metro region is a relatively small market compared to neighboring states like California, which has a robust market-based low-carbon fuel standard that offers significant financial incentives to renewable fuel suppliers. This means that even if the region requires broader use of renewable diesel, the metropolitan area may not be able to attract enough supply to avoid a significant increase in fuel prices. Coordinating with the states of Oregon and Washington to get more robust state-level low-carbon diesel policies in place that mirror those in California could help address this issue.
- **Decrease the carbon intensity of food consumed in the region**: Beef and dairy are some of the highest carbon intensity foods that people eat. If people in the region decreased their consumption of beef and dairy, it could lead to a significant climate benefit, and also improve people's health. In 2024, the Oregon Department of Environmental Quality prepared a report for the Legislature that identified various opportunities to reduce consumption-based greenhouse gas emissions.[5] Some of the most impactful solutions involve implementing new taxes or fees on meat and dairy. This could further increase the cost of food, which has gone up considerably during recent years. If such taxes or fees were implemented only within the metropolitan area, people would likely leave the region to purchase food to avoid the resulting cost increases. These policies would need to be implemented economy-wide in a way that minimizes additional costs for consumers to be successful.

The states of Oregon and Washington are also developing CCAPs, and the CCAP team will coordinate with state staff to develop a shared understanding of how to best advance these actions at both the state and local/regional level.

[5] Opportunities to Reduce Greenhouse Gas Emissions Caused by Oregon's Consumption (2024), Oregon Department of Environmental Quality.