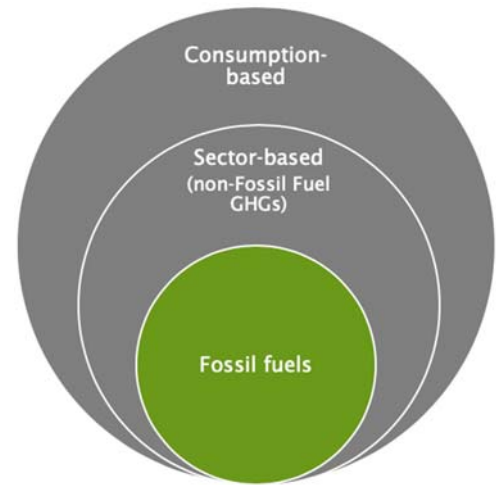


Recommendations for Additional Eugene Climate Actions to Meet Eugene’s Climate Recovery Ordinance Targets and Goals

Opportunities to Close the Fossil Fuel and Sector based Gap

Existing Fossil Fuel Gap

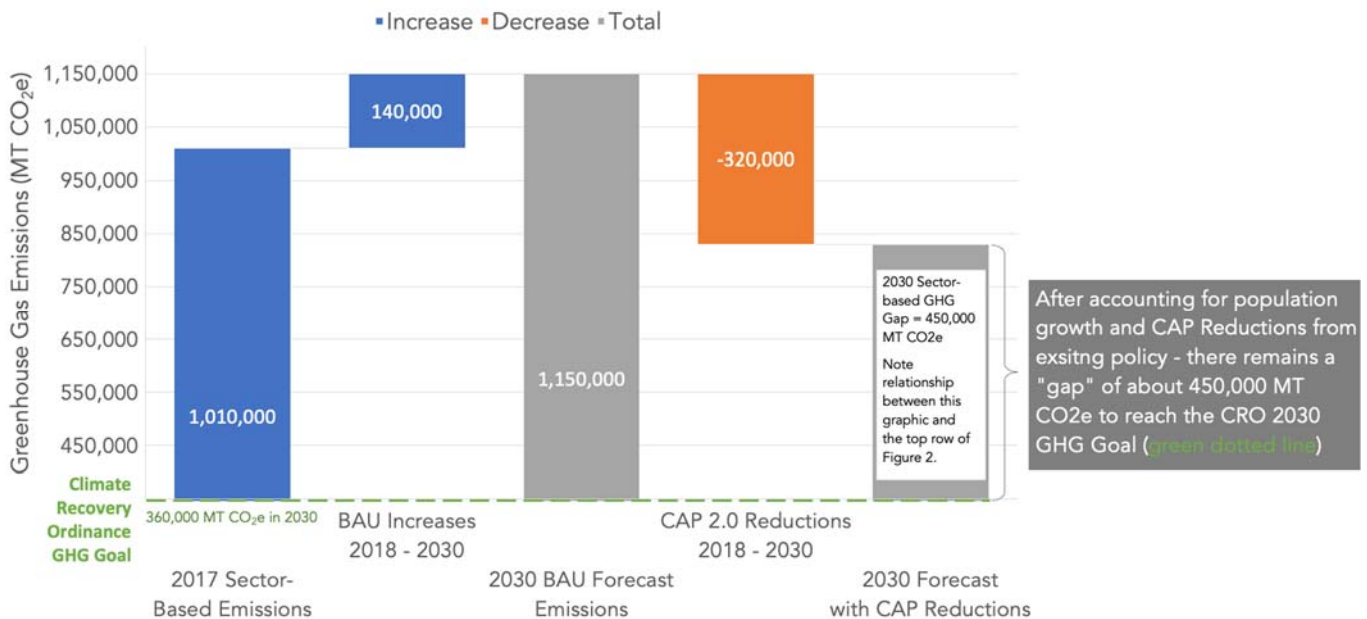
The CRO’s fossil fuel target is a 50% reduction in community fossil fuel use in 2030 compared to a 2010 baseline or an average annual reduction of 2.5% per year between 2010 and 2030. Eugene’s community 2010 fossil fuel use was equal to about 14.4 MMBTU. To meet the CRO’s fossil fuel target (50% reduction by 2030 compared to 2010), Eugene’s annual community fossil fuel consumption will need to be equal to or less than 7.2 MMBTU in 2030. Eugene’s 2030 forecast, which adjusts for community population increases and CAP2.0 large-lever shareholder (LLS) reductions, is projected to be 11.6 MMBTU, which leaves a gap of about 4.5 MMBTU that will need to be addressed with additional actions to reach the CRO targets.



Existing Sector-based Gap

The CRO’s greenhouse gas goal (GHG Goal) is an average annual emissions reduction of 7.6% to 2100 beginning in 2016. Eugene’s 2017 Community Sector-based GHGs are equal to about 1,000,000 MT CO₂e. Based on rate specified in by the CRO GHG Goal, Eugene’s Sector-based emissions will need to be equal to or less than 360,000 MT CO₂e in 2030. Eugene’s 2030 forecast with CAP 2.0 reductions is projected to be 830,000 MT CO₂e, which leaves a gap of about 450,000 MT CO₂e that will need to be addressed with additional actions to reach the CRO targets.

Figure 1: Local GHG Gap (Sector-based) compared to additional actions / scenarios.



Note: This document is a summary from a more extensive report from Good Company, but summarized by City of Eugene staff for purposes of discussion with City Council.

Recommended Additional Actions to Close the Fossil Fuel and GHG Gaps.

Sector-based Actions (fossil fuel only):

- **Natural Gas in buildings actions (from Regulation of Natural Gas work session)**
 - **Action 1:** Limit or prohibit new natural gas infrastructure.
 - **Action 2:** Require NWNG to incentivize customers' reduced use of natural gas or customers' purchase of emission offsets provided by NWNG's Smart Energy Program.
 - **Action 3:** Regulate the purchase and installation of natural gas fueled appliances.
 - **Action 4:** Prohibit financial incentives for installing natural gas service.
 - **Action 5:** Prohibit financial incentives for purchasing natural gas appliances.
 - **Action 6:** Prohibit installation of natural gas service for new residential, commercial and/or industrial buildings.
 - **Action 7:** Require NWNG to fuel switch to biogas and renewable hydrogen.
 - **Action 8:** Increase franchise fee and dedicate franchise fee funds to implementing a program that provides incentives to switch from natural gas to renewable.
 - **Action 9:** Reduce the term of the franchise from 20 years to 10 years.
 - **Action 10:** Create a hybrid franchise fee structure: 1) fixed portion; and 2) variable fee based on carbon footprint of the natural gas delivered to the community.
 - **Action 11:** Prohibit the expansion of natural gas services unless NWNG can demonstrate plan to decarbonize its product.
- **Additional Building Actions (from Council Home Energy Score work session)**
 - **Action 12:** Implement a Home Energy score program.
- **Transportation-Gasoline/Diesel Actions**
 - **Action 13:** City adopts more aggressive rate of implementation of the Eugene Transportation System Plan goals, policies, and projects. Two scenarios have been modeled by LCOG and used for this analysis. Of note, as Council considers additional actions to fill CRO gaps, it is important to highlight the assumption that Eugene's TSP *would have to be fully implemented by 2035 to reach CRO targets and goals.*
Existing, Obama era fuel economy standards are included in TSP modeling. Considering the current approach on these standards by the Federal government we assume that what is already included the modeling is "aggressive".
 - **Action 14:** Electrify the community's on-road passenger vehicles and light trucks as rapidly as possible, potentially via the following approaches.
 - City of Eugene works with partners (EWEB, ODOE, ODEQ, UO) to promote and enhance local financial incentives, and bulk EV purchases in a way that aligns community passenger vehicle EV adoption rates with CRO targets.
 - A new vehicle registration fee or fuel distribution fee for City of Eugene on fossil fuel vehicles (gasoline and diesel) or fuels. Fee revenue could be used to provide additional local EV incentives.
 - Prohibit the sale of fossil fuel powered passenger vehicles in Eugene after 2030.
- **Other Policy and non-fossil fuel actions**
 - **Action 15:** Reduce refrigerant loss through possible approaches such as: new service fee for refrigerant re-charge of systems due to leakage. Fee is based on global warming potential of the refrigerant lost. New fee or tax on new refrigeration equipment that contains high impact refrigerants. Credit programs for recycling/decommissioning of older refrigeration equipment.
 - **Action 16:** Capture methane from organics before disposal and/or additional effort to increase the efficiency and quantity of landfill or wastewater biogas collection.
 - **Action 17:** Oregon Cap-and-Trade program is implemented.

Cost Information Summary:

- Action 1,4,6, and 11
 - Source: <https://www.eia.gov/consumption/residential/data/2015/c&e/pdf/ce4.20.pdf>
 - See the values provided in the “Main Heating Fuel” section of the Table CE4.20
 - Utility infrastructure costs are unknown
 - Residential Equipment costs – Assumed to be comparable for gas and electric
 - Residential Average Annual Household Energy Costs
 - Natural gas (main heating fuel)
 - Space heating: \$457 / year
 - Water heating: \$614 / year
 - **Total Household Energy Expenditures: \$1,626 / year**
 - Electricity (main heating fuel)
 - Space heating: \$386 / year
 - Water heating: \$545 / year
 - **Total Household Energy Expenditures: \$1,505 / year**
 - Conclusion: Based on U.S. Energy Information Administration’s 2015 residential energy consumption survey, households in the **Western region of the U.S.** that use electricity as their main heating fuel have lower annual energy costs than households served by natural gas.
- Action 2
 - Assuming credits at \$15 per tonne. Current CA market price (https://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf)
 - 2017 residential GHGs = 85,079 MT CO₂e
 - Cost to offset 100% GHGs = \$1,275,000 (@\$15 / tonne)
 - # of residential customers = 25,944
 - **Average cost per residential customer = \$50 / year**
 - 2017 Commercial GHGs = 90,538 MT CO₂e
 - Cost to offset 100% GHGs = \$1,358,000 (@\$15 / tonne)
 - # of commercial customers = 3,759
 - **Average cost per commercial customer = \$360 / year**
 - 2017 Industrial GHGs = 106,516 MT CO₂e
 - Cost to offset 100% GHGs = \$1,597,000 (@\$15 / tonne)
 - Industrial customers = 78
 - **Average cost per industrial customer = \$20,500 / year**
 - Cost to the City is assumed to be minimal. Data collection and reporting for this action can be included with community GHG reporting.
- Action 3 and 5
 - Since the fees described in Action 3 and 5 are based on offsetting emissions. Costs for this type of program will be similar to those described for Action 2.
- Action 7 and 10
 - Costs to procure large substitutions of biomethane or renewable hydrogen for conventional natural gas are unknown at the scales being considered in these actions.
- Action 12
 - Additional City costs. Based on the experience of Portland Oregon, 1 FTE can be expected for the initial 1.5 years for community implementation. After that it is assumed that 0.5 FTE is required for program reporting and maintenance.
 - Costs and savings between home sellers and home buyers are difficult to assess. The building sellers will bear the cost of home energy upgrades to improve the buildings “score”. The cost of

these improvements will presumably be recovered by the seller during the sales process as home buyers value the energy score favorably when comparing properties. After the sale the home buyer will benefit from reduced operational energy costs. The net of these financial transactions is difficult to quantify given currently available data.

- Action 13
 - Additional cost information for infrastructure and City staff time is unavailable for Eugene TSP “What if” scenarios.
- Action 14
 - Costs for passenger vehicles were assessed thoroughly during the development of City of Eugene’s Fleet Internal Climate Action plan. Downloaded 1/19 at <https://www.eugene-or.gov/DocumentCenter/View/38211>. The analysis compared new vehicle purchase prices, fuel use, and vehicle maintenance for plug in electric vehicles (EV) versus an internal combustion engine vehicle that gets 35 miles per gallon.
 - **With Federal and State tax credits it was found that an EV could save about \$9,000 over the life of the vehicle from reduced fuel and maintenance costs.**
- Action 15
 - For comparison, current CA market prices are \$15 per tonne (https://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf)
 - **At \$15 / metric tonne the emissions reductions in 2030 as a result of Cap-and-invest (about 80,000 MT CO₂e) have a market value of about \$1.2 million, or about \$18 per Eugene household annually.**
- Action 16
 - Costs for the Oregon Cap-and-Invest program are dependent on how GHGs are valued within the program’s systems in order to achieve program goals.
 - For comparison, current CA market prices are \$15 per tonne (https://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf)
 - **At \$15 / metric tonne the emissions reductions in 2030 as a result of Cap-and-invest (about 430,000 MT CO₂e) have a market value of about \$6.5 million, or about \$100 per Eugene household annually.**

Eugene CAP 2.0 – CRO Reduction Forecast Gaps Analysis

Figure 2: Sector-based GHG and Fossil Fuel Use Gap compared to additional actions / scenarios.

Annual Gap - Sector-based GHGs and Fossil Fuel Use		450,000	MT CO ₂ e	4,500,000	MMBTU
		MT CO ₂ e	% of Gap	MMBTU	% of Gap
Building Actions					
Action Number					
1, 4, 6, 11	Scenario 1: NWNG - 50% Reduced NG infrastructure investment	(20,000)	-4%	(300,000)	-7%
	Scenario 2: NWNG - 100% Reduced NG infrastructure investment	(40,000)	-9%	(700,000)	-16%
2	Scenario 1: NWNG SmartEnergy - 50% participation	(160,000)	-36%	*Action does not reduce FF use	
	Scenario 2: NWNG SmartEnergy - 100% participation	(310,000)	-69%	*Action does not reduce FF use	
3, 5	Scenario 1: NG Appliance Fee, 2020 - 2030	(130,000)	-29%	(2,400,000)	-53%
7, 10	Scenario 1: Reduce Carbon Intensity of NWNG Product (25% biomethane)	(80,000)	-18%	(1,500,000)	-33%
	Scenario 2: Reduce Carbon Intensity of NWNG Product (50% biomethane)	(160,000)	-36%	(2,900,000)	-64%
8	Scenario 1: Prohibit Financial Incentives for New NG Equipment	More information required			
9	Scenario 1: Increase franchise fee to fuel switch away from NG	Not modeled per staff guidance			
12	Scenario 1: Home Energy Score	(20,000)	-4%	(190,000)	-4%
Transportation Actions					
13	Scenario 1: TSP What if 1 (in addition to Adopted)	(30,000)	-7%	(400,000)	-9%
	Scenario 2: TSP What if 2 (in addition to Adopted)	(70,000)	-16%	(1,000,000)	-22%
14	Scenario 1: 25,000 additional EVs beyond TSP	(110,000)	-24%	(1,300,000)	-29%
	Scenario 2: 50,000 additional EVs beyond TSP	(220,000)	-49%	(2,500,000)	-56%
	Scenario 3: 75,000 additional EVs beyond TSP	(330,000)	-73%	(3,800,000)	-84%
Produce Use Actions					
15	Scenario 1: Refrigerant recharge fee to purchase carbon offsets for 100% of GHGs	(80,000)	-18%	*Action does not reduce FF use	
Waste Actions					
16	Scenario 1: Landfill gas capture efficiency increases by 10%	(10,000)	-2%	*Action does not reduce FF use	
	Scenario 2: Landfill gas capture efficiency increases by 25%	(20,000)	-4%		
Overarching Actions					
17	Scenario 1: Oregon Cap-and-Invest (Draft SB 557, Section 4 goals) <i>Note: This "action" is predicated on many of the other actions already considered in Eugene's CAP LLS (e.g. Eugene TSP), and therefore there is considerable overlap and double counting between this and other actions.</i>	(430,000)	-96%	(7,200,000)	-160%

*This column shows max cumulative potential in 2030

*This column shows max cumulative potential in 2030

Opportunities to Close the Consumption-based Gap

Existing Gap

The CRO's greenhouse gas goal (GHG Goal) is an average annual emissions reduction of 7.6% to 2100 beginning in 2016. Eugene's 2013 Community Consumption-based GHGs are equal to about 2,750,000 MT CO₂e (using market-based electricity accounting). Based on the CRO GHG Goal Target, Eugene's annual community fossil fuel consumption will need to be equal to or less than 720,000 MT CO₂e in 2030. Eugene's 2030 forecast with CAP 2.0 reductions are projected to be similar to 2013 emissions, which leaves a gap of about 2,000,000 MT CO₂e that will need to be addressed with additional actions to reach the CRO targets.

Recommended Additional Actions to Close the Gap

Achieving CRO goals as applied to 100% of Eugene's consumption-based (CB) emissions inventory is the most challenging of any of the CRO targets and goals. This is because roughly 66% of Eugene's consumption-based emissions occur outside of Eugene's geographic boundaries (and direct control) during production of imported goods and food consumed in Eugene.

Reducing consumption-based emissions requires a combination of public-led actions, individual household decision-making, and domestic and international climate policy. Public agencies can establish infrastructure to support the reduction of CB emissions, but ultimately large-scale reduction of these emissions will require a combination of household-level decision making and large-scale transformation of the global energy system towards sources of renewable energy.

Consumption-based Actions:

- City to support development of a state-level program to reduce the carbon intensity of products imported into Oregon.
- **Action 18:** Community reduces the average square footage of single-family detached homes developed between 2019 – 2030. Smaller home size reduces emissions from a number of sources including: production of building materials (used to build and maintain the house), other consumer goods (used to fill the house), as well as reducing the homes energy use.
- City and local partners expand existing programming to extend building material lifespans.
- **Action 19:** Eugene optimizes the solid waste system to minimize GHGs
- **Action 20:** Community shifts dietary choices from high-impact to low-impact food types
- **Action 21:** Community reduces all possible edible food waste
- **Action 22:** City and community to reduce the carbon intensity of concrete products.
- **Action 23:** City to advocate for aggressive state, federal, and international climate policy that will increase the use of renewable energy in locations that produce the goods and food consumed in Eugene.

Figure 3: Consumption-based GHG gap compared to the reduction potential for additional action

Annual Gap - Consumption-based GHG Gap		2,000,000	MT CO ₂ e
		MT CO ₂ e	% of Gap
Consumption and Materials Management Actions			
Action Number			
18	Reduce the average size of new single-family homes (from 2,300 to 1,600 sqft.)	(50,000)	-3%
19	Eugene optimizes the solid waste system to minimize GHGs	(90,000)	-5%
20	Scenario 1: 25% of community reduces meat and dairy by 25%	(10,000)	-1%
	Scenario 2: 50% of community reduces meat and dairy by 50%	(40,000)	-2%
	Scenario 3: 100% of community reduces meat and dairy by 100%	(170,000)	-9%
21	Community reduces 100% of edible food waste	(50,000)	-3%
22	Community reduces the carbon intensity of concrete products	<i>Data not readily available</i>	
23	International Commitments to Paris Accord for future reductions (roughly a 25% reduction by 2030)	(270,000)	-14%

*This column shows max cumulative potential in 2030