Climate Action Plan 2.0

Appendix 7

Eugene Community Climate Action Plan 2.0 Additional Actions

Eugene Community Climate Action Plan 2.0 Additional Strategies

Energy Used in Buildings Strategies	Annual MT CO_2e Reduced
1. **Smart Energy Offset Program.** Move to a mandatory or automatic enrollment of NWN customers to participate in the Smart Energy Program, a carbon offset program (100% participation in 2030 modeled here).	32,000-320,000
2. **Regulate Natural Gas.** Regulate new natural gas infrastructure (residential, commercial, and industrial).	40,000
3. **Biogas and Renewable Hydrogen.** Require NWN to fuel switch to biogas and renewable hydrogen (10% switch modeled)	35,000
4. **Home Energy Score and Commercial Benchmarking Programs.** These programs require disclosure of energy performance of a building.	10,000
5. **Energy Efficiency and Fuel Switching: Support Incentives and Explore Regulatory Options.** Support existing energy efficiency programs and explore ways to require more energy efficiency building standards.	Varies
Transportation Fuels Strategies	
6. **Transportation System Plan Updated to Meet CRO Goals.** City adopts changes to the Eugene 2035 Transportation System Plan goals, policies and projects to fully meet CRO goals. *(TSP already accounts for 240,000 MT CO_2e annual reduction by 2030)*	30,000-70,000
7. **Implement Eugene's Electric Vehicle Strategy.** Electrify the community's on-road passenger vehicles and light trucks as rapidly as possible. (15,000 EVs modeled here.)	66,000
Other Strategies	
8. **Lobby for State and Federal Action.** State and federal action can have significant impact at the local level. 2019 Oregon Cap and Invest Bill (HB 2020) modeled here.	250,000**
9. **Reduce Refrigerant Loss.** Reduce refrigerant gases leaked from appliances. (25% reduction modeled)	20,000
10. **Capture biogas from organic waste.** Biogas from organic waste can be captured and used as a renewable transportation fuel. (25% food waste diversion modeled).	5,000
11. **Offset Program.** Purchase carbon offsets.	Varies
12. **Community Innovation Fund.** Support community initiatives for climate mitigation and resiliency with small grants.	Varies

*Additional policy levers around natural gas may include 1) prohibiting financial incentives for installing natural gas service; 2) prohibiting financial incentives when purchasing natural gas appliances; 3) prohibiting the installation of natural gas appliances; and reducing the term of the franchise agreement to 10 years.

**Used for illustrative purposes only. Legislation varies by year.

1. Smart Energy Offset Program

Natural Gas currently represents 27.8% of Eugene's carbon footprint. This is about 282,000 MT CO_2e in 2017, with 30% from residential use and 70% from commercial and industrial uses. Currently, Northwest Natural allows all customers to buy into their Smart Energy Program. Customers can choose from a flat rate ($5.50/month for residential customers and $10+/month for businesses) or they can pay per therm that they use. These funds are then used to invest in certified offset projects that account for the emissions created. Currently, customers can voluntarily enroll in this program. Policy options include mandatory participation or automatic enrollment (with an opt-out option to ease equity impacts).

Environmental Impacts:

- **Estimated GHG Reduction:** [1],[2]
  - **10% participation:** 32,000 MT CO_2e
  - **25% participation:** 80,000 MT CO_2e
  - **50% participation:** 160,000 MT CO_2e
  - **100% participation:** 320,000 MT CO_2e[3]

Equity Impacts:

- **Estimated Direct Cost to Community:** Average cost of $5.50 per month for residential. Option to opt out, costing $0.
- **Health:** Depending on the types of offsets projects that are funded, multiple co-benefits are possible. However, if funds are not invested locally these may be difficult to measure.

Economic Impacts:

- **Estimated Cost to the City:** Approximately $50,000 or less for city operations.
- **Business:** Dependent on use, minimum price of $10 per month. For large commercial and industrial customers these costs could be significant.

Other Impacts:

- **Resiliency Impacts**: Natural gas provides an alternative fuel source when electricity is unavailable, such as during winter storms when electricity lines have been knocked down.
- Offset projects could be local and provide community and environmental benefits.

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[1] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

[2] Northwest Natural's Low Carbon Pathway was included in the CAP2.0 ECC forecast. NWN actions included in the Low Carbon Pathway previously scaled for mitigation potential include a 5% customer participation rate in the Smart Energy offset program. Estimated reductions in this action are in addition to those modeled in the Low Carbon Pathway.

[3] While total ghgs from natural gas were measured at 282,000 MT CO_2e in 2017, they are forecasted to grow to 320,000 MT CO_2e by 2030 if the community continues its current ghg growth trajectory.

2. Regulate Natural Gas

Natural gas currently represents 27.8% of Eugene's carbon footprint. This is about 282,000 MT CO_2e in 2017, with about 30% from residential use and 70% from commercial and industrial uses. Emissions from natural gas are forecasted to increase by 40,000 MT CO_2e by 2030 even if Northwest Natural implements its Low Carbon Pathway projects.

The City could take action to regulate or prohibit new natural gas connections (residential, commercial, or industrial). Possible pathways to accomplishing this goal may include increasing permit fees, prohibiting new infrastructure in the right-of-way, or working with the state to amend the building code at the local level.

Environmental Impacts:

- **Estimated GHG Reduction:** 40,000 MT CO_2e (12,000 MT CO_2e residential, 28,000 MT CO_2e commercial / industrial).[4]

Equity Impacts:

- **Estimated Direct Cost to Community:** Increased permit fees or changes to the building code could add to construction costs.

Economic Impacts:

- **Estimated Cost to the City:** Resources may be needed to work on code amendments, changes to permit fee structures, education, or enforcement. The amount and type of resource will vary depending on the path chosen.
- **Business:**
  - Limiting new commercial and industrial customers access to natural gas could incentivize new or expanding businesses to locate in other communities where no existing restrictions exist.
  - Increased permit fees or changes to the building code could add to construction costs.

Other Impacts:

- **Resiliency Impacts**: Natural gas provides an alternative fuel source when electricity is unavailable, such as during winter storms when electricity lines have been knocked down.
- For some applications, electricity does not provide an efficient replacement for natural gas.

[4] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

3. Biogas and Renewable Hydrogen

Natural Gas currently represents 27.8% of Eugene's carbon footprint. This is about 282,000 MT CO_2e in 2017, with 30% from residential use and 70% from commercial and industrial uses. Biogas and renewable hydrogen have a carbon footprint of that is significantly lower than fossil natural gas.[5] This action captures reductions from substituting lower-impact gases for fossil natural gas.

Regional studies have shown that biogas has the potential to replace between 5 – 18% of Oregon's annual natural gas use.[6] Hydrogen production potential for the state has not been assessed, but there is a technical maximum of hydrogen that can be blended within existing natural gas pipelines of no more than 15%. If these fuels are injected into the natural gas pipeline for transport, current research suggests that the best financial value is to use these fuels in the transportation sector due to rules in place around California's Low Carbon Fuel Standard and Oregon Clean Fuels Program.

Environmental Impacts:

- **Estimated GHG Reduction:**[7]
  10% biogas/renewable hydrogen: 35,000 MT CO_2e
  30% biogas/renewable hydrogen: 100,000 MT CO_2e

Equity Impacts:

- **Estimated Cost to Community:** This policy would likely result in higher monthly natural gas bills.

Economic Impacts:

- **Estimated Cost to the City:** This policy would likely result in higher monthly natural gas bills for City operations.

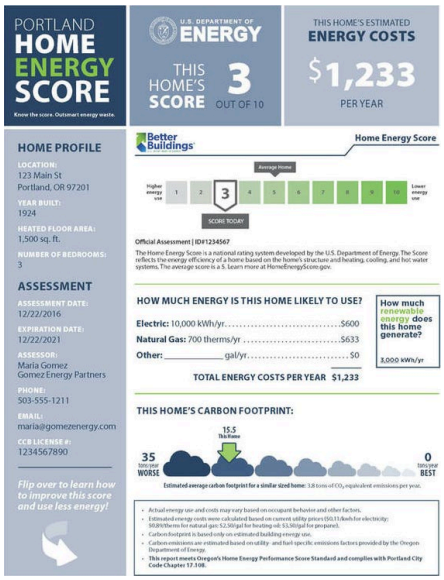
Other Impacts:

- **Resiliency Impacts**: Natural gas provides an alternative fuel source when electricity is unavailable, such as during winter storms when electricity lines have been knocked down.

This is an emerging technology. More research has become available since the date this document was published. The City is monitoring these developments and will take new research into consideration in its decision-making processes.

[5] The carbon footprint of fuels can vary dramatically depending on the energy feedstock and processing.
[6] https://www.oregon.gov/energy/Data-and-Reports/Documents/2018-RNG-Inventory-Report.pdf
[7] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

4. Home Energy Score and Commercial Benchmarking Programs



A Home Energy Score (HES) is a value given to a home by a contracted inspector that estimates the energy-related use, associated costs, and cost-effective solutions to improve the home's efficiency. HES are used during a home's sales process to provide important cost and comfort information to all parties. The adoption of a HES program has the potential to provide a market-based incentive for homeowners to invest in energy efficiency improvements.

A commercial benchmarking program could be implemented to track and annually report energy performance to the City for commercial buildings. Typically, these programs focus on large buildings (e.g. 20,000 square feet and larger). This information is made available in an online map as information to be used by building owners, sellers, buyers, tenants, and policy makers.

Environmental Impacts:

- **Estimated GHG Reduction:** 10,000 MT CO_2e for both programs[8]

Equity Impacts:

- **Estimated Direct Cost to Community:** HES audits cost about $150-200 in Portland, Oregon. Staff expect a similar price range in Eugene.
- HES at the time of sale on a home provides better information to all parties involved about the true cost of energy for the home.
- If HES and Commercial Benchmarking programs lead to energy efficiency upgrades, community members may end up with more comfortable and affordable homes and businesses.

Economic Impacts:

- **Estimated Cost to the City:** $75,000/annually.
- **Business:** Detailed commercial energy audits costs vary from $0.12 up to $0.50 per square foot depending on size and complexity of the building[9].

[8] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

[9] https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20956.pdf

5. Energy Efficiency: Support Incentives and Explore Regulatory Options

EWEB and Northwest Natural both offer financial incentives to fund conservation and energy efficiency projects for homes and business. The budget for these programs is limited. The City of Eugene could contribute additional funds to help support these programs for low-income customers and/or support other loans for small home improvements required to qualify for utility energy efficiency programs. This action would leverage existing programs, with the goal of minimizing administrative costs.

The City could also explore regulatory options around energy efficiency such as requiring rental properties to meet specific energy efficiency standards.

Environmental Impacts:

- **Estimated GHG Reduction**: [10] Varies based on investment.

Sample of Actions	Rebate available	Average Cost	MT CO_2e Reduced Per Unit
Electric Ductless Heat Pump	$3,800 *Owner occupied* $1,000 *Rental*	$3,800 one head system; $5,000 for two head	Annual GHG savings[11] = 0.07 Cumulative GHG savings = 1.4
Natural Gas Ductless Heat Pump	$1,000		Annual GHG savings = 0.7 Cumulative GHG savings = 13.0[12]
Insulation for poorly insulated home (must have electric heat)	100% of eligible insulation costs, in lieu of loan		Annual GHG savings = 0.12 Cumulative GHG savings = 2.5[13]
Windows (must have electric heat)	$20/ft^2 of glass with U-factor ≤ 0.30 *Owner Occupied* $10/ft^2 of glass with U-factor ≤ 0.30 *Rental*		Annual GHG savings = 0.08 Cumulative GHG savings = 1.7[14]
Heat Pump Water Heater	$1,000 for Tier 3 units, 50+ gallon tank		Annual GHG savings = 0.03 Cumulative GHG savings = 0.7[15]

Equity Impacts:

- **Estimated Direct Cost to Community:** None or self-determined.
- **Affordability and Comfort:** These investments lower utility bills and increase comfort, especially for low- and middle-income customers.

Economic Impacts:

- **Estimated Cost to the City:** City determines investment amount. This strategy could leverage existing partnerships with Northwest Natural and/or EWEB, minimizing administrative costs.

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[10] Assumptions apply to 1,000 square feet of space. Emission reduction source: https://www.oregon.gov/energy/energy-oregon/Documents/2012%20Energy%20Action%20Plan%20Modeling%20Report.pdf . Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

[11] ODEQ 2017 EWEB 0.017 MT CO_2e/MWh. Assumes electric baseboard heat to heat pump. Measure R-61 from Source Document.

[12] Source: Energy Information Administration's *2015 Residential Energy Consumption Survey*. Shows natural gas furnace performance at 98% versus a heat pump that has 115% performance, or a 17% performance increase. Assumes average annual use of natural gas is 72.2 MMBTU.

[13] Assumes attic + floor R-0 to R-19. Attic and floor are each about 50% of savings. Measure R-83, 88 from Source Document.

[14] Assumes single pane to double pane windows. Measure R-93 from Source Document.

[15] Measure R-103 from Source Document.

6. Transportation System Plan Updated to Meet the CRO Goals

The Eugene 2035 Transportation System Plan was included in the CAP2.0 ECC Actions and is the most impactful action the City can take (240,000 MT CO2e). The forecasted impact of implementing a TSP that includes the goals, policies and projects needed to fully meet CRO goals is an additional emissions reduction of 30,000-70,000 MT CO2e. **Modeling is in progress to understand the additional scope of work associated with this action.** The following projects, all part of the TSP, are currently in the planning or construction phase:

- Amazon Active Transportation Corridor
- 13th Avenue Bikeway
- Moving Ahead
- Central Eugene in Motion

There are also non-construction plans and projects that will have an impact on greenhouse gas emissions from transportation in Eugene:

- Transit Tomorrow
- SmartTrips: Downtown
- New Mobility including micro-transit, bike share and electric scooters
- Transportation Demand Management requirements for developers and employers

Environmental Impacts:

- **Estimated GHG Reduction:** 30,000 - 70,000 MT CO_2e [16]

Equity Impacts:

- **Estimated Direct Cost to Community:** Funding for projects and programs tends to come from existing revenue streams including the voter approved street bond, gas taxes, and systems development charges. Access to increased transportation options may lower transportation expenses.
- **Health benefit:** Using active transportation often coincides with increased physical activity. This has positive health impacts for many people.

Economic Impacts

- **Estimated Cost to the City:** The base cost for the TSP is included in the table below. **Modeling is in progress to understand the additional scope of work associated with this action.**

Table 6.2: 20 year system cost

Project category	Cost ($2014)
Projects within 20 Years	
Roadway and multimodal projects	$161,200,000
Complete streets upgrades to existing streets	$45,600,000
Rail projects	$28,400,000
Pedestrian and bicycle projects	$72,000,000
Transit projects in multimodal corridors (multimodal corridor bundle)	$171,400,000
Upon Development Projects	$134,200,000 (total) / $67,100,000 (city-funded)
Traffic Signal System Improvements	$21,200,000
Total 20 Year System Cost	**$634,000,000**
Total ODOT and City-Funded Cost (excluding transit and 50% of upon development projects)	**$395,500,000**

Note: (1) City-funded share of 'upon development' project costs is an estimate for use in comparing costs to forecast revenues. Assessments for development will be developed separately. (2) Often, operational projects are not included in system plans. Some are included in this funding estimate, however, due to the reliance on operational improvements to address system performance needs.

Other Impacts: **Resiliency Impacts:** Multiple modes of transportation increase the resiliency of the community in extreme weather events.

[16] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

7. Implement Eugene's Electric Vehicle Strategy

About 50% of Eugene's local emissions come from the transportation sector. Electric vehicles offer a low carbon option to help reduce the emissions impact of the transportation sector.

Environmental Impacts:

- **Estimated GHG Reduction:** 4.4 MT CO_2e per EV that displaces a gas-powered car.

Number of EVs	MT CO2e Reduced
5,000	22,000
10,000	44,000
20,000	88,000

Equity Impacts:

- **Estimated Direct Cost to Community:** Varies. In many cases, the overall cost of ownership of an EV is estimated to be lower than gasoline powered vehicles.

Sample of lower cost EVs*	MSRP	With Federal Tax Credit
2018 Smart EQ fortwo	$24,550	$17,050
2019 Nissan Leaf	$30,875	$20,875
2019 Volkswagen e-Golf	$31,390	$21,390
2019 Kia Soul EV	$34,845	$24,845

**Used EVs will likely become a significant part of the market over time. Source: Forth*

- Access to EVs is limited in part by access to charging infrastructure. Distribution of public charging infrastructure and/or policies that result in access to charging for people living multifamily housing will be an important piece of this strategy.
- Reduces local air pollutants, an important health measure

Economic Impacts:

- **Estimated Cost to the City:** TBD/variable. Expected costs include charging infrastructure, staff time for policy and code development, community engagement, and education.
- **Estimated Cost to Business:** Varies. In many cases, the overall cost of ownership of an EV is estimated to be lower than gasoline powered vehicles.

8. Lobby for State and Federal Action

State and Federal action can lead to significant emissions reductions at the local level. The 2019 Oregon Cap and Invest Bill (HB 2020) and Federal policies such as maintaining emission standards for cars and light trucks, increased incentives for the electrification of transportation, and choosing to re-commit to the Paris Accords would result in deep cuts in Eugene's emissions.

Environmental Impacts:

- **Estimated GHG Reduction:** [17]
  - Paris Accord re-commitment: 150,000 MT CO_2e average annually through 2030
  - Oregon Cap and Invest (based on HB2020, 2019): 130,000 MT CO_2e average annually (represents roughly estimated reductions beyond existing ECC plans)

Equity Impacts:

- **Estimated Direct Cost to Community:** Varies. Oregon Cap and Invest was estimated to impact each family approximately $100/annually.
- Mechanisms like cap and invest systems and carbon taxes are often regressive. These impacts can be mitigated to some degree with policy solutions.

Economic Impacts:

- **Estimated Cost to the City:** Unknown. Cost varies based on the policy.

[17] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

9. Reduce Refrigerant Loss

Refrigerant gases are used in appliances such as air conditioners, refrigerators, commercial refrigeration systems, etc. Refrigerants have a very large impact on the atmosphere when they leak from their cooling systems. In some cases, loss of a single kilogram of gas can result in 1 MT CO_2e in climate impact. Approximately 90% of the losses occur during disposal. The Montreal Protocol includes a phase-out schedule for some high-impact refrigerants[18], which will likely have a positive future effect. But refrigerant emissions continue to grow as a source in the State of Oregon's GHG inventory[19]. The City could develop a program to address this issue, convening industry professionals to help address the problem. Alternatively, a regulatory approach could be taken.

Environmental Impacts:

- **Estimated GHG Reduction**: 20,000 MT CO_2e (25% reduction modeled)[20]

Equity Impacts:

- **Estimated Direct Cost to Community:** Varies based on type of program.

Economic Impacts:

- **Estimated Cost to the City:** Varies based on type of program.
- **Business:** Varies based on type of program.

[18] https://www.epa.gov/sites/production/files/2015-07/documents/phasing_out_hcfc_refrigerants_to_protect_the_ozone_layer.pdf

[19] From *Oregon's Greenhouse Gas Emissions though 2015: An assessment of Oregon's sector-based and consumption-based greenhouse gas emissions* DEQ website

[20] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

10. Capture biogas from organic waste

There is opportunity to produce biogas from organic material separated (such as food waste) from the solid waste stream. Anerobic biodigesters accelerate the decomposition process in a closed environment so that methane produced can be collected and used as a renewable transportation fuel or combusted for electrical or heat generation. Short Mountain Landfill already captures biogas from landfilled organic materials. Anerobic digesters could be added to the process to capture biogas and reduce material volume prior to the composting process. Options could include developing a stand-alone Anerobic digesters facility or utilizing existing community wastewater system capacity. Potential partners Lane County and MWMC are already exploring this idea.

Environmental Impacts:

- **Estimated GHG Reduction:** 5,000 MT CO_2e annual reduction from 25% of food waste to Anaerobic Digestion.[21]
- Captured methane would be used to reduce fossil fuel use.

Equity Impacts:

- **Estimated Direct Cost to Community:** Community members may pay more for their waste management and/or wastewater fees.

Economic Impacts:

- **Estimated Cost to the City:** Dependent on partnerships – explore opportunities with community partners. Initial costs include staff time and consultant work.

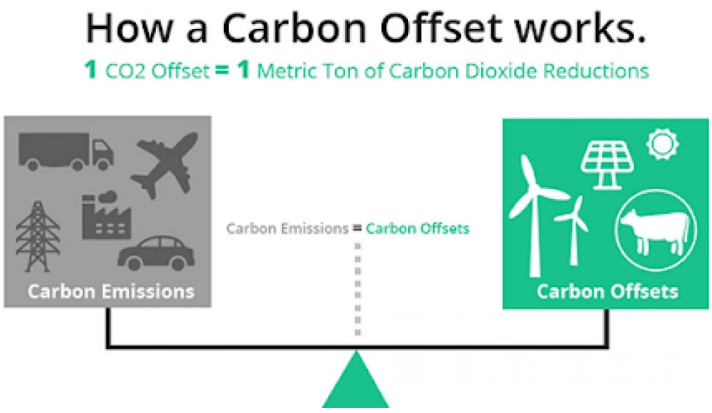
Other Impacts:

- Improved gas capture could result in lower odor impacts near the wastewater facilities.

[21] Estimated GHG Reduction is equal to the annual reduction in 2030 adjusted for anticipation population growth.

11. Offset Program

Carbon offsets are a reduction in emissions of carbon dioxide or other greenhouse gases by purchasing ownership of ghg reductions from verified carbon offset projects. This is done to compensate for ghgs the community has already emitted. The City can choose to invest in a project locally or globally that reduces the equivalent amount of ghgs.



Environmental Impacts:

- **Estimated GHG Reduction:** Scalable**.**
- **Benefits:** Carbon offset programs provide funding for projects that absorb or reduce an equivalent amount of emissions (net-zero emissions).
- **Drawback:** Carbon offsets do not reduce the amount of fossil fuel consumed or emissions released.

Equity Impacts:

- **Estimated Direct Cost to Community:** Unknown; depends on mechanism used to pay for offsets.

Economic Impacts:

- **Estimated Cost to the City:** Scalable ($5-$15/MT CO_2e)

Other Impacts:

- These projects can have co-benefits such as increased water quality, shade, habitat protection, job creation, renewable energy, and long-term cost savings.

12. Community Innovation Fund

Many community groups have innovative ideas for projects that could help the community reach its emissions goals. In many cases, a small amount of money is needed to pay for materials, supplies, and other minor expenses. A fund could be created to help support these community initiatives.

Environmental Impacts:

- Dependent on the project.

Equity Impacts:

- **Estimated Direct Cost to Community:** None.
- Community members, including those from marginalized communities, could have easier access to funds to implement community-driven solutions.

Economic Impacts:

- **Estimated Cost to the City:** Variable.

Other Impacts:

- **Resiliency Impacts**: Empowers neighborhoods to develop local programs to help mitigate emissions and increase resilience.