

Program Development to Reduce Greenhouse Gas Emissions: Primer

September 2020

The climate crisis

Burning fossil fuels to operate factories, heat homes and run cars produces heat-trapping gases that warm the planet and change the global climate. Climate change is already impacting Oregon's environment, outdoor recreation, air and water quality, as well as our economy, and most vulnerable communities. Effects of climate change are now evident in Oregon with reduced snowpack, sea level rise, more frequent and intense wildfires, drought and more.

Without major reductions in global greenhouse gas emissions, it is increasingly likely that society will face more severe impacts and potentially irreversible changes. Global reductions in greenhouse gas emissions can slow the speed of future climate change and associated public health, environmental, and economic impacts. Meeting statewide emissions reduction goals adopted by the Oregon Legislature in 2007 and additional science-based goals established in Governor Brown's recent executive order, means Oregonians have to do our part to avoid the most catastrophic effects of climate change.

Executive order 20-04 and climate action in Oregon

On March 10, 2020, Governor Brown signed Executive Order 20-04, directing state agencies to take actions to reduce greenhouse gas emissions and consider climate change in agency planning. The executive order established science-based reduction goals for Oregon:

- Reduce emissions to at least 45 percent below 1990 levels by the year 2035
- Reduce emissions to at least 80 percent below 1990 levels by the year 2050

The order directs a number of state agencies, including the Environmental Quality Commission and the Department of Environmental Quality to take a variety of actions within existing authorities to reduce emissions and include climate change in agency planning. Each agency is conducting its own process to implement the executive order and is coordinating with other agencies for a statewide effort to take action on climate in Oregon. In addition to the executive order, many agencies have been and will continue to develop and run programs to reduce emissions, transition to cleaner energy, and do so in a just and equitable way.

One specific directive in the executive order is for the EQC and DEQ to "cap and reduce" greenhouse gas emissions from sources including:

1. Large stationary sources: this refers to businesses such as manufacturers and factories and institutional facilities such as universities.
2. Transportation fuels: this refers to the emissions from the use of gasoline, diesel, and other fuels used to power vehicles for the movement of goods and people.
3. Liquid and gaseous fuels, including natural gas: this refers to the emissions associated with the use of fuels for non-transportation purposes, such as natural gas or oil used for home and commercial heating.



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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

In addition to other ongoing emissions reduction efforts at DEQ, the EQC and DEQ are working to develop a new program to reduce greenhouse gas emissions that is ready to start at the beginning of 2022.

Please visit DEQ's webpage for more information and updates:
www.oregon.gov/deq/ghgp/Pages/capandreduce.aspx.

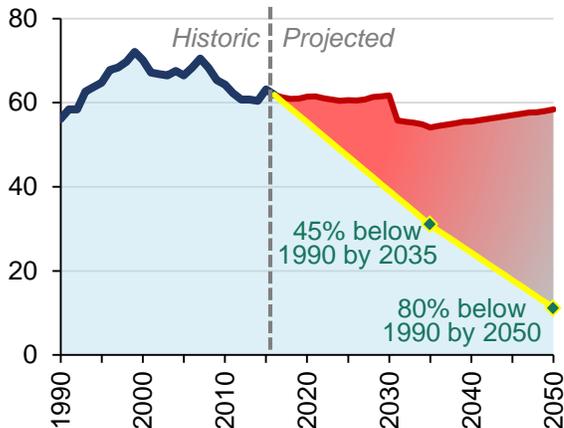
Why Oregon needs an effective new program to reduce emissions

Oregon began developing programs to reduce emissions in the 1990s, beginning with adoption of the nation's first greenhouse gas standard for new power plants. Since then, the Oregon legislature, Oregon governors, and many federal, state, and local agencies have taken steps to reduce emissions. Despite these efforts, Oregon is not meeting its goals and additional actions, like those directed by Governor Brown, are needed to meet science-based reduction targets.

Greenhouse gas emissions come from nearly all parts of a diverse economy such as Oregon's. These include industrial manufacturing activities, fuels used in furnaces to heat homes and offices, and in engines to run cars, trucks, and other equipment powered by gasoline and diesel.

Oregon Greenhouse Gas Emissions

Million Metric Tons of Carbon Dioxide Equivalent (CO₂e)

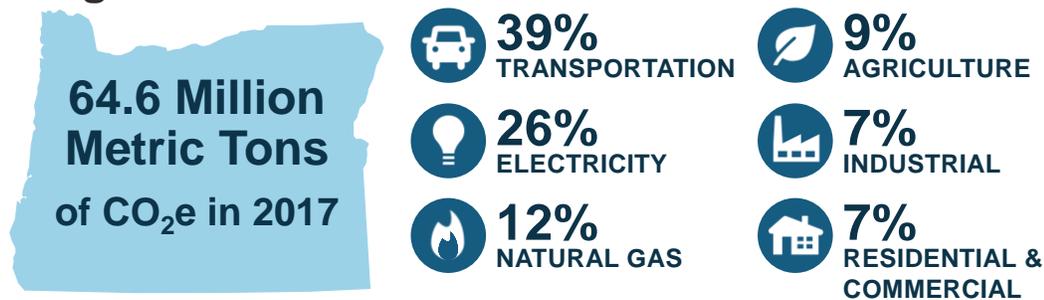


Greenhouse gas emissions in Oregon

Since 2010, DEQ has collected emissions information annually from fuel distributors, electricity suppliers, and industrial facilities. DEQ collects this data to better understand emissions sources in Oregon, produce a statewide inventory, and inform reduction policy development.

In Oregon, emissions were on a steady decline between 2007 and 2012. However, in the last seven years emissions flattened and have begun increasing again. Recent annual emissions are roughly 15 percent above 1990 levels. The transportation sector is the single largest source of emissions in Oregon, accounting for approximately 39 percent of emissions statewide. In addition to being the largest source, transportation related emissions have also been on the rise in recent years. Energy used in residential, commercial, and industrial buildings accounts for much of the remaining emissions.

•• Oregon Greenhouse Gas Emissions •••••



The sectors, as illustrated in the graphic above, represent a variety of activities. Emissions inventory data can be used to assess these activities in more detail, including the use of specific fuels and their impact on emissions. For example, most fuels are used for transportation, but oil and natural gas are also used to heat residences and commercial buildings, while gasoline and diesel also power stationary equipment, not just cars and trucks on the road. By understanding more specifics about the data, DEQ can design programs to effectively target and reduce emissions.

The complete GHG emissions inventory and underlying data are available at: www.oregon.gov/deq/aq/programs/Pages/GHG-Inventory.aspx.

Environmental justice

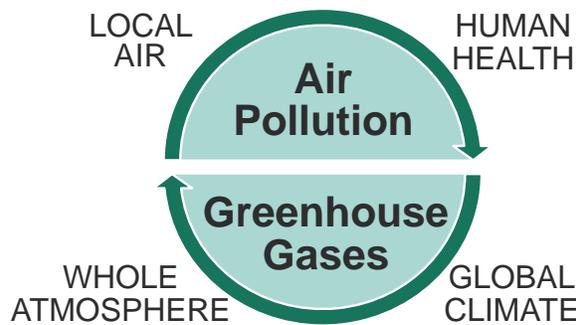
DEQ and the EQC are committed to creating processes, policy and programs that both allow for meaningful engagement and result in proposed rules that provide equitable treatment. DEQ and the EQC recognize that environmental justice and impacted communities have experienced disparate environmental and public health impacts in Oregon. Developing a new program to reduce emissions is an opportunity for DEQ and the EQC to learn from impacted communities, incorporate their needs, promote benefits and alleviate burdens in the program design.

We face two key threats from air contaminants in our atmosphere: poor air quality impacting health, and increasing levels of greenhouse gases impacting global climate. Greenhouse gases and air quality pollutants are co-pollutants that are often emitted at the same time from one source. Greenhouse gas emissions may be a global challenge, but the processes and activities resulting in those emissions often also emit toxic air contaminants, as well as pose local and regional health risks. Certain communities have experienced systemic neglect when it comes to addressing air quality, and are also experiencing some of the first and worst impacts of the changing climate.

Policy changes aimed at reducing these emissions can bring both local health benefits to communities, and global benefits to the environment. Additionally, policies targeted at reducing one type of air contaminant can result in reductions of the other. For example, exhaust from cars and trucks is the largest source of greenhouse gases, but is also a source of carbon monoxide, nitrogen oxides, particulate matter, and other toxic pollutants. DEQ will continue its work to identify and advance new and existing policies and programs that address the risks caused by these co-pollutants.

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The effects of climate change are expected to disproportionately impact communities of color, low-income communities, and rural communities.¹ For example, low-income households, particularly those of color, are more likely to be without air conditioning to aid in withstanding the heat waves that Oregon is likely to continue to experience more frequently.² People of color and low-income people are less likely to have access to modes of transportation necessary to reach safe ground in the event of an emergency. They are also more likely to be exposed to the health risks posed by climate change³ and less likely to have health insurance to deal with the consequences.⁴ In rural Oregon communities, homes and jobs are at risk from increasing numbers and intensities of wildfire, with these impacted communities also less able to avoid or otherwise cope with periods of smoke and its associated public health concerns.

Additionally, emissions reduction policies also have the potential for disproportionate costs to impacted communities. An emissions reduction program will need to address the fact that lower income households spend a higher portion of their income on transportation, heating, and other energy costs; all of which are major sources of emissions. Relatedly, rural households and industries may have fewer low-carbon alternatives available to them for certain tasks, making it difficult to avoid paying increased energy costs resulting from programs aimed at reducing emissions through economic incentives.

As DEQ develops new programs and expands others to reduce emissions, the agency will work with these impacted communities to identify strategies to address both the disproportionate impacts of climate change and the cost of reduction policies. DEQ will also focus on including program design elements that can provide direct benefits for impacted communities. Program design elements can also be included to contain costs

¹ Rachel Morello-Frosch, et al. 2009. "The Climate Gap: Inequalities in How Climate Change Hurts Americans and How to Close the Gap." *available at* http://dornsife.usc.edu/assets/sites/242/docs/The_Climate_Gap_Full_Report_FINAL.pdf, *archived at* <http://perma.cc/7JJ-LAAV>.

² Dalton, M.M., P.W. Mote, and A.K. Snover [Eds.]. 2013. *Climate Change in the Northwest: Implications for Our Landscapes, Waters, and Communities*. Washington, DC: Island Press. http://ocri.weebly.com/uploads/8/7/9/4/87945130/climate_change_in_the_northwest.pdf.

³ Oregon Climate and Health Profile Report, Oregon Health Authority, Public Health Division, 2014. <https://public.health.oregon.gov/HealthyEnvironments/climatechange/Documents/oregon-climate-and-health-profile-report.pdf>.

⁴ Cathy Schoen, et al. 2013. "Health Care in the Two Americas: Findings from the Scorecard on State Health System Performance for Low-Income Populations." *available at* <http://www.commonwealthfund.org/Publications/Fund-Reports/2013/Sep/Low-Income-Scorecard.aspx?page=all>, *archived at* <http://perma.cc/JMS8-DVCK>.

associated with a new reduction program, especially in an effort to protect impacted communities that might see a disproportionate impact from climate change itself, air quality and health impacts from hazardous co-pollutants emitted alongside greenhouse gases, and any costs that come from the regulation. As part of the program scoping process, DEQ is working to focus on impacted communities, their needs, and creative design elements within EQC's existing authorities that can help mitigate or remove economic and air quality burdens to Oregonians in impacted communities.

Developing a program to reduce emissions

The DEQ can look to many existing policies and programs when designing a new emissions reduction program. Policies and programs aimed at reducing emissions usually fall into one of two categories:

- **Direct regulation:** refers to mandates or standards that establish limits on emissions from specific activities. An example of a direct regulation on emissions in Oregon is regulation of emissions from solid waste facilities. Landfill gas contains methane, a potent greenhouse gas. The rules specify which facilities need to follow these regulations, establish specific ways for monitoring emissions, set emissions limits and identify the technologies that facilities can use to control emissions.
- **Market-based approach:** refers to emissions reductions strategies that offer incentives and disincentives for facilities or other regulated entities to make significant changes in operations that result in fewer or no emissions. Market-based approaches provide regulated entities the flexibility to pursue the most cost effective reductions. An example of a market-based approach in Oregon is the Clean Fuels Program. The program reduces emissions by establishing a standard for allowable emissions across fuels used for transportation. The standard incentivizes investment in and use of lower-carbon transportation fuels, while dis-incentivizing fuels with higher carbon emissions, such as conventional gasoline and diesel.

Both direct regulation and market-based approaches can be used to reduce traditional air pollution and greenhouse emissions while ensuring fair and equitable treatment for communities. Either approach, or a policy that includes elements of both, can address the needs of and provide benefits to communities. In considering which program design elements to include in a new program to reduce emissions, DEQ and the EQC must consider policies to reduce the cost of the program on businesses and consumers while maximizing GHG emissions reduction and prioritizing the needs of impacted communities.

Policymakers consider which approach to use depending on the nature of the emissions, the economic sectors to be covered by program regulations, and the needs of communities impacted by emissions. In fact, around the world, many of the most comprehensive programs for reducing emissions involve multiple policies and a combination of flexible market-based programs, such as cap and trade, alongside more prescriptive direct-regulation measures.

In recent years, the Oregon legislature has considered a specific market-based approach to broadly reduce emissions in Oregon referred to as cap and trade. This type of program sets a limit, or cap, on GHG emissions. That overall limit is enforced by requiring regulated entities to turn in permits equal to the amount of greenhouse gases

they emit. Since the state issues permits in an amount equal to that cap, then the overall emissions limit is achieved. This approach would not necessarily require specific amounts of emissions reductions at individual sources or even from individual sectors. As the overall cap declines over time, so too do the number of permits available. With a limited number of permits to emit, businesses become motivated to reduce their emissions.

Once issued, those permits can be traded among the regulated entities so that those with easier and more cost-effective emissions reductions make those investments and can then trade or sell permits to entities with more expensive emissions reductions options. Some prominent examples of jurisdictions with existing cap and trade programs include the Western Climate Initiative members such as California and Quebec, the countries participating in the European Union Emissions Trading Scheme, and the Northeastern U.S. states participating in the Regional Greenhouse Gas Initiative. These jurisdictions have firm emissions reduction targets and have adopted market-based programs as a way to assure flexible, cost-effective progress toward those targets.

Market-based policies, and specifically a cap and trade-like system, provide a number of advantages, including:

- Establishing an overall limit on emissions, so that emissions will be reduced over time to meet declining caps
- Providing flexibility and rewarding cost-effective reduction strategies through economic incentives that reward emissions reductions, which ultimately lowers the cost of reducing emissions for all
- Motivating technological innovation by requiring industries to reduce emissions, which will help Oregon's economy remain competitive while making progress toward the state's emissions reduction goals

Market-based policies can include flexibility and cost control features to help make reducing emissions easier and less expensive for businesses, but using these features does not mean that emissions reduction goals will be compromised. These features can also mean that emissions reduction targets can be met at lower costs to the consumer, as well.

DEQ and EQC regulatory process

The Environmental Quality Commission is a rulemaking body that adopts proposed rules into administrative law. DEQ is responsible for proposing rules for EQC consideration. DEQ develops proposed rules and conducts a rulemaking process that adheres to the public process requirements established in the Oregon Administrative Procedures Act. DEQ's rulemaking process generally includes at minimum the following elements:



DEQ has committed to conducting a rulemaking to develop a new greenhouse gas emissions reduction program in a robust and inclusive way that provides enhanced opportunities for engagement. The Program Options to Cap and Reduce Greenhouse Gas Emissions final report to the Governor details the ways in which DEQ proposed to engage the public and stakeholders throughout the rulemaking process. That report is available at: www.oregon.gov/deq/ghgp/Documents/ghgCapRedf.pdf.

In a rulemaking process, DEQ prepares proposed rules in response to or in alignment with specific legal authorities granted to the EQC by the state legislature. Working within the confines of existing legal authorities means the program developed by DEQ likely will not have the same features as cap and trade proposals considered by the legislature. For example, the EQC has clear authority to regulate greenhouse gas emissions as air contaminants and can therefore set limits or “caps” on those emissions. The EQC may also regulate emissions from sources mentioned in the executive order such as large stationary sources and suppliers of liquid and gaseous fuels. However, EQC’s authority to reduce emissions is constrained in important ways. For example, the EQC may not be able to charge a price for emissions, such as through a program that generates revenue by auctioning or selling permits to emit greenhouse gases.

Program design elements

The executive order does not describe the type of programs or policies the EQC might adopt to reduce emissions. Both direct-regulation and market-based approaches are policies worth considering for this new program. A direct regulation approach would likely include set limits of allowable emissions for each individual source of emissions or regulated entity. Additional flexibility and cost containment elements would have to be considered in order to create a program that works for Oregon using this approach.

Recent efforts to broadly reduce emissions in Oregon as well as the design of successful emissions reduction programs in other jurisdictions can help inform how the agency pursues program design. Importantly, the EQC must adopt a program within its existing legal authority. There are many program elements that are available to DEQ and the EQC to create a program that reduces emissions and benefits communities.

- **Emissions cap:** The program can be far-reaching and cover major sectors of emissions in Oregon. A single limit, or cap on emissions across multiple regulated sources or sectors increases the potential for the lowest-cost reduction opportunities, lowering the overall cost of the program. A cap on emissions for

each regulated entity could encourage co-pollutant emissions reductions and directly improve air quality in certain neighborhoods.

- **Emissions permits:** In order to track that emissions limits are being met, the EQC could require an entity to hold a permit for each ton emitted. Emissions cap programs typically allow for a total number of emissions permits in an amount corresponding to the total cap. The number of available permits declines with the cap, creating scarcity and sending a signal to reduce emissions which spurs innovative emissions reduction opportunities.
- **Permit trading:** The ability for regulated entities to sell or trade permits to emit incentivizes early and sustained emissions reductions. An entity that can find inexpensive emissions reductions frees up excess permits that can be sold to other regulated entities whose own reduction efforts are more expensive. This results in a less expensive program overall and an economic incentive to find emissions reductions early.
- **Additional flexibility and cost containment elements:** Regulated entities that reduce emissions early may be able to save or bank unused permits for use in future years when permits become scarcer as the cap declines. Relatedly, additional permits to emit could be kept in reserve by DEQ in case of emergency and could be released for use in the program on an as-needed basis. Separately, the program could recognize emissions reductions outside the scope of this regulation as an alternative to reductions by directly regulated entities as in-scope reductions may be technologically difficult or expensive to achieve. These options could be additional strategies used to increase cost-effectiveness and flexibility in complying with the program, while ensuring there are still emissions reductions.
- **Benefits to impacted communities:** The EQC can include program design elements that provide incentives for regulated entities to ensure impacted communities see benefits from the program, whether it be through project investments made for these communities or air quality improvements achieved in these communities.

In designing a program to reduce emissions in Oregon, DEQ will rely on policy concepts discussed in the legislature, input and feedback from the public and stakeholders, and lessons learned in other jurisdictions with comprehensive approaches to reducing emissions.

Next steps

DEQ is hosting a pre-rulemaking scoping phase during summer and fall of 2020. The scoping phase included six technical workshops in August and September to discuss policy and program options. Future opportunities to engage will include three town hall public meetings in October to hear comments and what program success means to Oregonians.

Please visit DEQ's webpage specific to this topic for updates and more information: www.oregon.gov/deq/ghgp/Pages/capandreduce.aspx.

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.