GREEN ENERGY INSTITUTE
AT LEWIS & CLARK LAW SCHOOL

COUNTDOWN TO 2050

Sharpening Oregon's Climate Action Tools

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About Us

The **Green Energy Institute** is a renewable energy policy organization within Lewis & Clark Law School's Environmental, Natural Resources, and Energy Law Program. The Green Energy Institute develops strategies and advocates for a transition to a renewable energy grid.

For more information on the Green Energy Institute, please visit our website at law.lclark.edu/centers/green_energy_institute.

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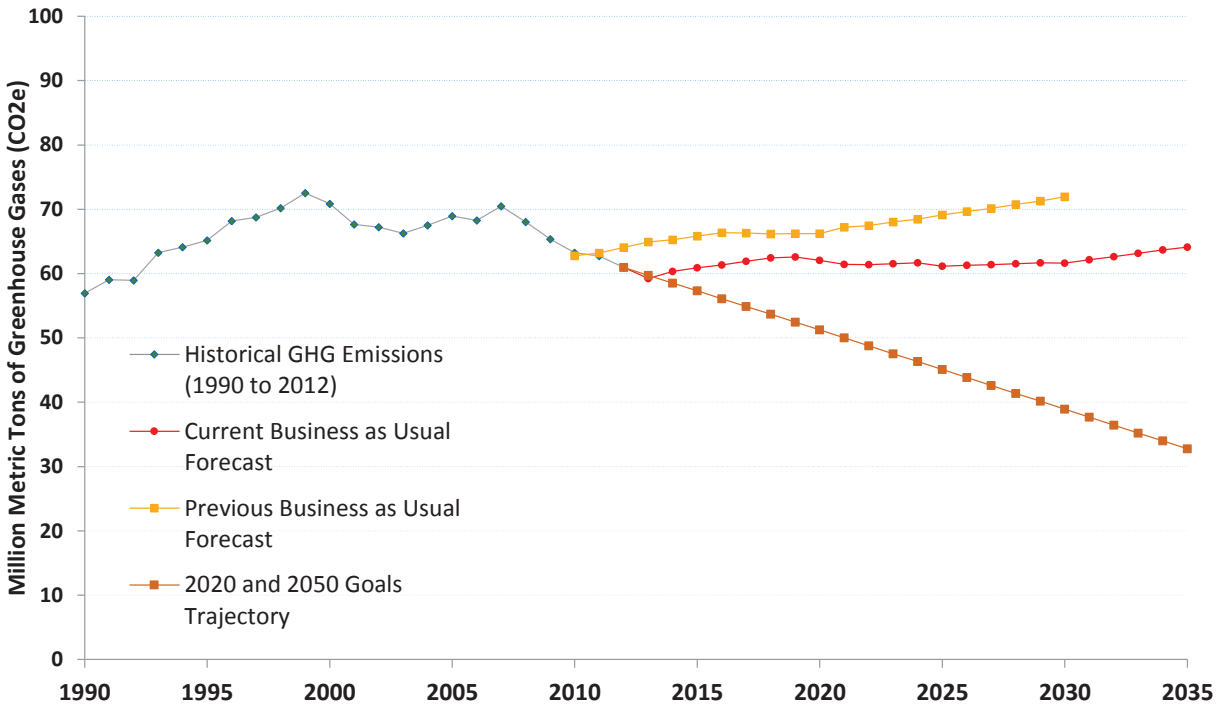
EXECUTIVE SUMMARY

2015 will likely be the warmest year on record. Oregon is already feeling the impacts of this warming, through wildfires, drought, and species loss, and climate scientists predict many more severe consequences if climate change continues unabated. Effective mitigation requires efforts from all levels of society and government. Recognizing this, Oregon's legislature has enacted a number of laws addressing climate change. However, as this report demonstrates, Oregon's efforts are inadequate to effectively reduce the state's greenhouse gas emissions.

Oregon appeared to be a leader in addressing climate change when it enacted the country's first mandatory control of carbon dioxide emissions in 1997.[i] The state again seemed ahead of the curve when it established the Oregon Global Warming Commission (OGWC) and adopted greenhouse gas emission reduction goals for 2020 and 2050.[ii] Yet, despite appearances, Oregon's climate policies are actually quite weak. In fact, a series of piecemeal policies, combined with a lack of resources and oversight, has put Oregon on a trajectory to exceed its 2020 emissions target by an estimated 11 million metric tons of CO_2e, "with the gap widening thereafter."[iii] This reality sharply conflicts with the image Oregon has cultivated as an environmentally sustainable state.

The disparity between reality and appearances, moreover, is particularly dangerous where climate change is concerned. First, by giving the appearance that it is addressing climate change, when its policies achieved comparatively little, Oregon has enabled emissions of greenhouse gases that will last decades, if not centuries, in the atmosphere—in other words, Oregon's delay allowed it to "bank" emissions that should

FIG. EX1 Oregon's Emissions Forecasts Compared to 2050 Goal Emissions Trajectory



Oregon Global Warming Commission *2015 Report to the Legislature* (2015)

never have been allowed. Second, Oregon's piecemeal policies have enabled investments in infrastructure that will accommodate increase emissions into the future or else become stranded assets as Oregon reduces its greenhouse gas emissions. Third, Oregon has failed to adequately promote investments in renewable energy, energy efficiency, and other technologies that would have made it easier for Oregon to reduce its emissions. Finally, Oregon has not created the regulatory structure necessary to facilitate a transition to a carbon-free society. It is not too late for Oregon to correct its course, and further delay will only make climate change mitigation more difficult.

Oregon therefore can and must take action to close the greenhouse gas emissions gap between the state's business-as-usual forecast and its 2050 goal. To accomplish this objective, Oregon must adopt a comprehensive climate policy framework that includes binding emissions limitations for the energy, industrial, transportation, and land use sectors. The state should task a single entity—the OGWC—with administering the state's climate law, and ensure the OGWC has sufficient regulatory authority and funding to implement and enforce Oregon's comprehensive climate framework. Finally, Oregon should require existing agencies to meet mandatory emissions reduction requirements applied on a sectoral level.

This report provides a comprehensive overview of Oregon's existing climate change laws and explains why these existing policies will ultimately fail to adequately achieve necessary emissions reductions. The report then recommends strategies for developing a comprehensive climate policy framework in Oregon that would establish binding emission reduction targets and address climate change mitigation opportunities for the energy, transportation, and land use sectors.

In accordance with these objectives, this report focuses on:

1. Oregon's existing laws addressing greenhouse gas emissions and legislative efforts to mitigate climate change;
2. Oregon's state agencies tasked with administering the state's climate-related statutes and regulating greenhouse gas-emitting economic sectors; and
3. The OGWC's efforts to guide Oregon's attempts to achieve its greenhouse gas emission reduction goals.

This report is focused on Oregon's statutory scheme to mitigate climate change. As the report makes clear, effective climate change mitigation will require a coordinated statewide approach. Thus, although some state agencies have taken discretionary actions to address climate change and local governments have undertaken important efforts to reduce local contributions to climate change, this report will focus on efforts at the state level. Without a comprehensive state effort, discretionary and local actions are likely to have only marginal impacts in reducing Oregon's climate footprint.

Efforts to mitigate climate change will not enable Oregon to avoid all consequences of climate change. Indeed, Oregon is most likely seeing the effects of climate change already, which underscores the importance of mitigating climate change before things get worse. While this report will not discuss climate change adaptation, it is clear that Oregon leaders must also be preparing to adapt to the inevitable consequences of a warming planet.

I. What is Oregon's Current Approach to Climate Change?

Oregon currently addresses climate change through a variety of laws that reduce emissions of greenhouse gases either directly or indirectly. These laws include emissions reductions requirements, programs to increase renewable energy and energy efficiency, and a handful of other strategies aimed at reducing emissions from the transportation and land use sectors. Although the quantity of laws may suggest that Oregon has an effective and robust climate mitigation strategy, a closer look at the laws reveals several gaps, weaknesses, and loopholes.

A. Oregon's Emissions Reductions Laws

- **Non-binding emission reduction targets.** In 2007, the Oregon legislature adopted long-term goals for reducing carbon emissions in the state, calling for the state to reduce greenhouse gas emissions from all sectors at least 10% below 1990 levels by 2020, and at least 75% below 1990 levels by 2050.[iv] Oregon's goals reflect the emissions reduction targets established by the United Nations that are intended to limit global temperature rise to two degrees Celsius. Many developed countries and some U.S. states, including California and Washington, have adopted similar greenhouse gas reduction targets.

  To help the state achieve its emissions reduction goals, the legislature created the Oregon Global Warming Commission (OGWC). The OGWC is comprised of 25 members, including 11 voting members appointed by the governor and 14 ex officio members. The OGWC was tasked with conducting assessments and developing recommendations to guide the adoption and implementation of Oregon's policies to address climate change. Since its creation, the OGWC has released a series of reports describing Oregon's progress in reducing greenhouse gas emissions and recommending strategies to bolster the state's mitigation efforts. Most significantly, the OGWC prepared a "Roadmap to 2020" to recommend how the state could achieve greater emission reductions,[v] and took those recommendations on a "Roadshow" to communicate its findings to Oregonians throughout the state. More recently, the OGWC reported that Oregon would likely not meet its 2020 or 2050 greenhouse gas emissions reductions goals.
- **Oregon's Carbon Dioxide Emissions Standard.** In 1997, Oregon passed legislation establishing a carbon dioxide emission standard for certain fossil fuel-fired power plants. Specifically, the law requires new baseload natural gas power plants to meet a specified emission limit or to instead comply through a "monetary path," under which power plants pay a set rate to a third-party non-profit, the Climate Trust, to obtain offsets. So far, all new facilities subject to this standard have chosen to use the "monetary path." Although the statute specifies that the rate be set at "an amount deemed sufficient to produce the reduction in greenhouse gas emissions necessary to meet the applicable carbon dioxide emissions standard,"[vi] the current rate of $1.27 per ton of CO_2 emissions[vii] is significantly less than the $4.23 average that the Climate Trust has historically paid to actually obtain offsets.[viii]
- **Greenhouse Gas Emission Standards for Utilities.** Oregon has established a CO_2

emission standard of 1,100 pounds per megawatt-hour for new electric generating facilities and prohibited Oregon utilities from entering into new long-term power purchase agreements with generators not meeting the standard.[ix] Because coal-fired power plants cannot meet the standard, the law aimed to reduce Oregon's reliance on coal in the future.

- Greenhouse Gas Registration and Reporting. Oregon law authorized the Environmental Quality Commission (EQC) to establish a program requiring certain entities to register and report the importation, sale, allocation, or distribution of greenhouse gas-emitting fuels.[x]
- Voluntary Emission Reductions. The Public Utility Commission (PUC) is authorized to create an incentive program to encourage natural gas utilities to invest in projects to reduce emissions.[xi] Participation in the program by utilities is voluntary.

B. Oregon's Renewable Energy and Efficiency Laws

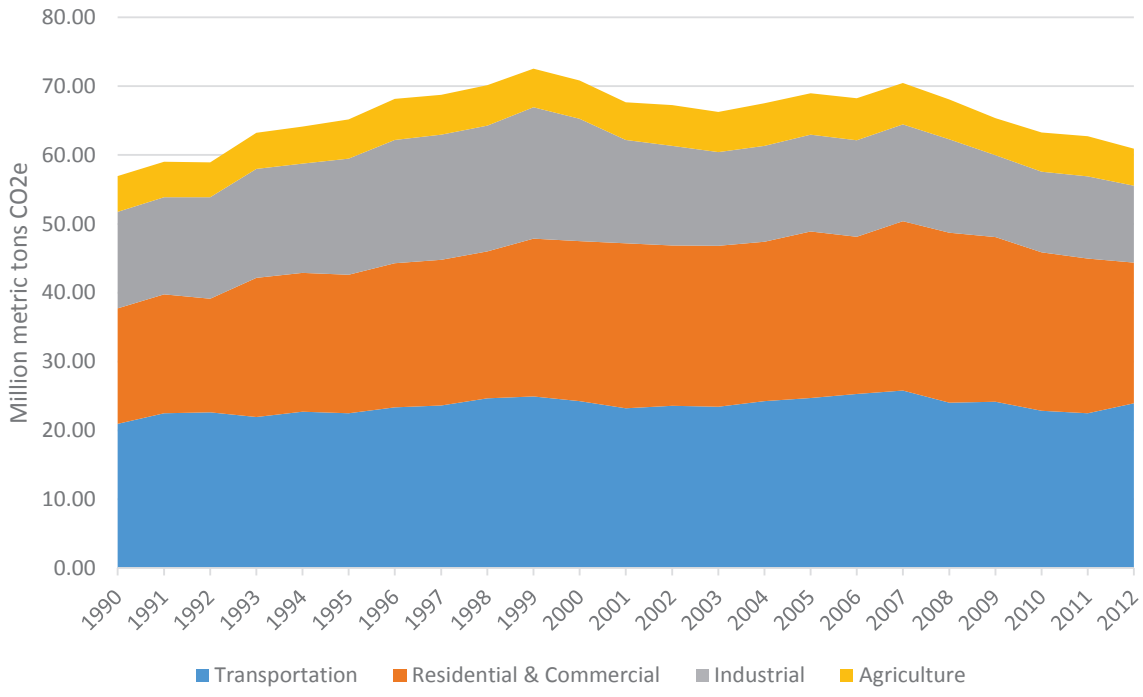
- Renewable Portfolio Standards. Oregon requires that utilities obtain set amounts of their electricity from renewable energy sources.[xii] By 2025, Oregon's investor-owned utilities must obtain 25% of their electricity from renewables. To demonstrate and facilitate compliance with this mandate, utilities can use, trade, sell, and bank "renewable energy credits."[xiii]
- Net-Metering. To encourage development of small-scale renewable energy, utility customers who have installed such systems may offset their electricity bills by the amount generated on-site.
- Solar Volumetric Incentive Rate Pilot Program. Oregon created a very limited program to allow eligible retail customers to earn incentive rates for energy produced over a 15-year period.[xiv] The program had a 27.5 megawatt cap and has reached capacity.
- Tax Incentives, Grants, and Loan Programs. Oregon has established several programs to provide financial assistance to encourage renewable development. These include the Residential Energy Tax Credit, the Energy Conservation Tax Credit, the Renewable Energy Development Grant Program, and the Energy Trust of Oregon's Solar Electric Incentive Program.
- Residential and Commercial Energy Conservation Programs. Utilities must establish plans to provide residential and commercial customers with information about energy conservation measures and offer energy audits.[xv]
- Energy Efficiency Standards. The Oregon Department of Energy is required to establish minimum energy efficiency standards for appliances and equipment.[xvi]
- Building Energy Efficiency Standards. The *Oregon Energy Efficiency Specialty Code* establishes uniform energy efficiency standards for residential and commercial buildings.

C. Oregon's Transportation and Land Use Laws

- Clean Fuels Program. Oregon authorized the EQC to require low carbon fuel standards.[xvii] The program EQC established under this law, the Clean Fuels Program, requires fuel producers and importers to register fuels and demonstrate compliance with the EQC's standards.[xviii]
- Forest Carbon Offset Program. Oregon law authorized the State Forester to develop a program to account for forestry carbon offsets.[xix] However, Oregon has never implemented this law.
- Voluntary Climate Change Consideration in Land Use Planning. Oregon's land use law requires state and local governments to adopt comprehensive land use plans that comply with mandatory statewide planning goals. These goals require that lands and land uses are managed to conserve all sources of energy. The Oregon Department of Land Conservation and Development administers the state's land use program and assists local governments with their planning efforts, including local efforts to mitigate climate change through land use planning.

As this brief summary shows, the laws that Oregon has established to address climate change are overwhelmingly focused on the energy sector. By contrast, the state has very few laws to address emissions from the industrial, transportation, or land use sectors. Moreover, even the laws that do exist fail to the adequately reduce greenhouse gas emissions, as the following section summarizes.

FIG. EX2 Oregon Emissions By Sector, 1990–2012



Oregon Global Warming Commission *2015 Report to the Legislature, fig. 1* (2015)

II. What is Not Working?

As the OGWC pointed out in its 2015 report to the legislature, Oregon's current emission trends will significantly exceed both the state's 2020 emissions goal and its 2050 goal.[xx] Based on this metric alone, it is clear that Oregon's existing approach to climate mitigation is insufficient to achieve required emission reductions. In addition, several aspects of **Oregon's existing laws are ineffective, including:**

- **Oregon does not have binding emissions reductions requirements.** Oregon's climate change laws will never be effective without a comprehensive target that binds agencies to reduce greenhouse gas emissions.
- **The OGWC lacks authority to enforce emission targets.** The OGWC's policy recommendations carry no regulatory weight. The OGWC is authorized only to advise policymakers of prudent actions to reduce emissions. The failure of policymakers to adopt many of the OGWC's recommendations in its Roadmap to 2020 report illustrates that this model is not working.
- **The OGWC lacks funding.** The OGWC has struggled to obtain funding even to develop a website, let alone carry out all its duties under the act that established it. Despite requests, the OGWC has received no direct funding from the legislature. Although it has received some private funding, that funding has not been enough to carry out the OGWC's duties.
- **The laws aimed at reducing emissions fail to address emissions from existing facilities.** Both the Carbon Dioxide Standard and the emission standard for utilities only apply to new sources. As a result, facilities (or power purchase agreements) that were already in place do not have to meet any standards. The large amount of electricity that Oregon still gets from coal[xxi] illustrates the inability of the state emission standards to address existing sources. To meaningfully reduce emissions, these dirty sources must be addressed.
- **Oregon's Carbon Dioxide Standard is poorly tailored to meet state emission reduction targets.** Every single new fossil-fueled power plant has chosen to demonstrate its compliance with the carbon dioxide emissions standard through the "monetary path" by paying the Climate Trust to obtain offsets. However, contrary to law, power plants pay less than the cost the Climate Trust pays to obtain offsets. As a result, only 45% of the total volume of offsets purchased (emissions necessary for the new facilities to meet the Carbon Dioxide Standard) has actually been offset.[xxii]In addition, most of the offsets come from out-of-state forestry projects and therefore do not assist Oregon's efforts to reduce instate emissions.
- **Oregon's renewable energy laws do not promote certainty or long-term growth.** Oregon's renewable energy laws are not ambitious enough to achieve sustained growth. First, Oregon's net-metering policy only benefits on-site renewable owners and fails to incentivize the development of community or other off-site solar development. Second, the pilot program the state established for solar development was too limited to enable widespread renewable development. Finally, the state's renewable portfolio standard is too modest and has not promoted consistent or sustained development of new renewable projects.
- **Oregon laws do not adequately reduce emissions from the transportation and land use sectors.** Oregon's climate laws are woefully inadequate when it comes to the land use and transportation

sectors, despite the large percentage of emissions from both of these sectors. Transportation and land use planners have discretion to disregard climate change in their planning decisions. The few laws that do apply to these sectors are very limited. The Clean Fuels Program will only reduce a fraction of Oregon's transportation emissions,[xxiii] and is the ongoing target of litigation and ballot initiatives aimed at getting rid of it. Meanwhile, the law authorizing the State Forester to develop a carbon offset market was never implemented.

As the above points illustrate, Oregon's laws individually are ineffective for a variety of reasons. More importantly, **the laws are also insufficient collectively.** Oregon's piecemeal climate policies do not necessarily work well together, and there is no consistent strategy between agencies to coordinate emission reductions. Oregon sorely needs comprehensive climate legislation that will ensure that policies and state agencies work together toward the goal of reducing Oregon's emissions.

III. How Do We Fix It?

This report recommends a three-step process to help Oregon get back on track to meet its 2020 and 2050 goals and earn its image as a leader in addressing climate change:

A. Enact Comprehensive Climate Legislation that Includes Enforceable Emission Mandates

The two biggest problems with Oregon's existing climate strategy are (1) it does not mandate emissions reductions, and (2) it consists of piecemeal strategies rather than a cohesive framework. A new law establishing a comprehensive policy mandating emissions reductions would help put the state back on track to meet its climate goals.

California's climate law may provide a useful model for Oregon to follow in developing a comprehensive climate policy framework. Like Oregon, California adopted stringent greenhouse gas emissions targets. However, unlike Oregon, California's emissions targets are mandatory.

Oregon's comprehensive climate legislation should establish clear targets and timetables, and include an enforcement mechanism to make compliance with those goals mandatory. A bill proposed in the Oregon House of Representatives in 2015, HB 3470,[xxiv] would have created a strong framework for reducing energy and industrial emissions. Oregon should therefore build upon HB 3470 to created mandatory emissions restrictions. In addition, Oregon's comprehensive climate legislation should include enforceable mechanisms to reduce emissions from the transportation and land use sectors as well.

B. Restructure and Fund the OGWC to Administer the State's Climate Policy

The California model illustrates the efficacy of tasking a single agency with implementing a comprehensive climate policy. It tasked a single agency—the California Air Resources Board (CARB)—with implementing its climate law. California also provided CARB with enforcement authority, agency staff, and funding to carry out its mandate. Like California, to carry out a comprehensive climate policy in this state, Oregon must task a single agency with implementation. The OGWC has the experience and the expertise to do so. It has already been developing strategies to reduce emissions from different sectors. To succeed, the OGWC needs to be given the authority and resources to enforce a comprehensive climate mitigation framework.

However, for this strategy to work, Oregon must also revise the OGWC's statutory directives and structure. Specifically, Oregon must provide the Commission with sufficient regulatory authority to promulgate and enforce regulations to implement the framework. Oregon should also restructure the OGWC to make it an effective regulatory agency. This would involve disbanding the voting members and reforming them into a set of regulatory commissioners and a stakeholder advisory council. Finally, Oregon must provide the OGWC with adequate funding and staffing to perform its job.

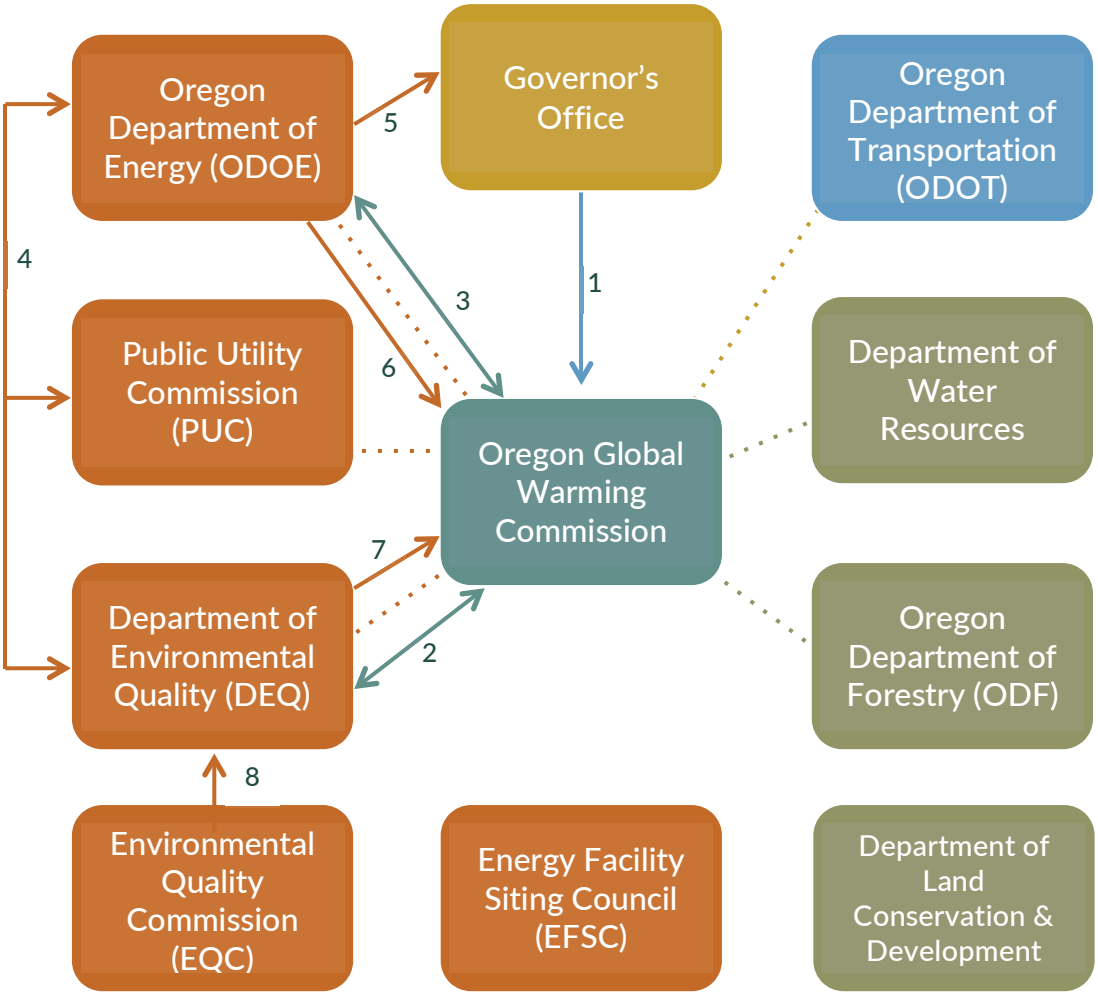
C. Give Agencies Clear Legislative Authority and Direction to Reduce Greenhouse Gas Emissions from All Sectors and Require Coordination Between Them

In addition to the central role that the OGWC will play under a comprehensive climate policy, each other agency in Oregon must be given the tools it needs to achieve emission reductions. First, Oregon's agencies must receive clear directives and authorities to address climate change impacts. Second, agencies should be required to analyze and disclose the effects of their actions on greenhouse gas emissions. Finally, to avoid the problems that the existing piecemeal approach to climate policy poses, the comprehensive climate policy should direct agencies to communicate and coordinate actions to reduce emissions and address climate change.

Conclusion

Oregon has an obligation to act to safeguard the health and safety of its communities and its environment. Delaying action today will further exacerbate the problems climate change will cause. It is time for Oregon to adopt a binding comprehensive climate policy framework.

OREGON CLIMATE CHANGE AGENCIES



Energy Sector

Transportation Sector

Land Use Sector

Agency director or chairperson is an ex officio member of the OGWC

1. Governor appoints OGWC voting members and 3 ex officio members
2. DEQ and OGWC evaluate impacts of greenhouse gases
3. ODOE and OGWC educate Oregonians on impacts of climate change
4. ODOE and PUC assist DEQ in implementing Clean Power Plan
5. ODOE submits biennial Energy Plan to governor
6. ODOE provides staff support to OGWC
7. DEQ provides staff support to OGWC
8. EQC develops rules and policies and adjudicates disputes for DEQ

I. Introduction

Oregon is already starting to feel the impacts of manmade climate change. Over the past decade, the state has experienced record high summer temperatures, snow levels well below the 30-year average, intense wildfires, and the biggest drought in decades.[1] Climate change thus presents a critical problem that requires an urgent and comprehensive response.

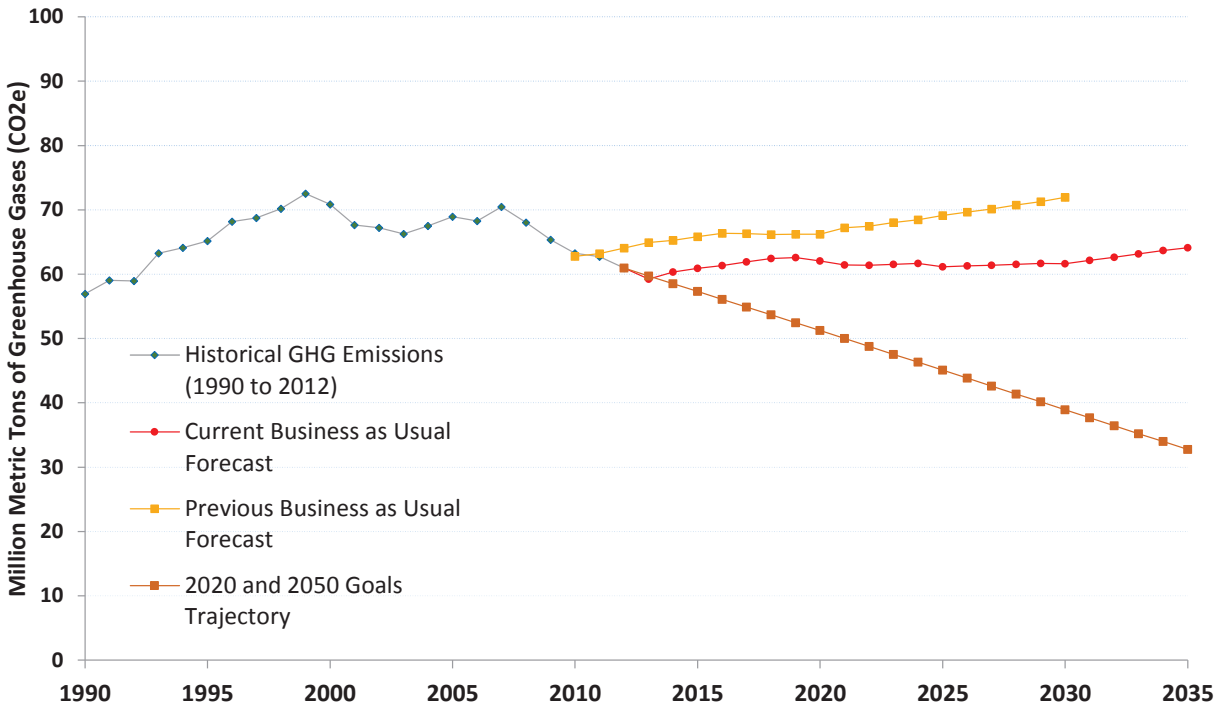
However, despite early efforts to address climate change, Oregon has failed to develop an effective legislative strategy to mitigate climate change. As this report shows, although Oregon has enacted a number of laws and policies, and enlisted a number of agencies, to address climate change, state efforts fall far short of the necessary actions Oregon must take. Oregon lacks binding statewide greenhouse emissions limitations, and it has failed to adequately empower or fund the state body, the Oregon Global Warming Commission, tasked with guiding implementation of Oregon's voluntary greenhouse gas goals. While some state laws attempt to reduce greenhouse gas emissions from specific sectors or sources, these laws are generally weak, undermined by loopholes, or designed to achieve only piecemeal results. In short, Oregon's early leadership regarding climate change has eroded, and the state's climate policies desperately need retooling. This report explains how Oregon's various climate laws fail to adequately address climate change. It then proposes strategies for fixing and funding an effective statewide climate mitigation plan.

Wildfire smoke blanketed Portland in August 2015. *Image: Tedder (2015)*

In 1997, Oregon was the first state to establish limits on carbon dioxide emissions from power plants, and in 2007, Oregon established long-term climate change goals. These non-binding goals call for the state to reduce greenhouse gas emissions at least **10% below 1990 levels by 2020** and at least **75% below 1990 levels by 2050**.[2] These goals reflect the United Nations Intergovernmental Panel on Climate Change's determination that global emissions must be reduced by 60% to 80% below 1990 levels to prevent catastrophic climate change.[3] Many developed nations have adopted similar goals, as have Oregon's neighboring states of California and Washington.

To help achieve Oregon's carbon reduction goals, the legislature created the Oregon Global Warming Commission (OGWC) to guide the adoption and

FIG. 1 Oregon's Emissions Forecasts Compared to 2050 Goal Emissions Trajectory



Oregon Global Warming Commission *2015 Report to the Legislature* (2015)

implementation of state climate policy.[4] The OGWC has successfully developed influential policy recommendations and analyses. However, the legislature has failed to allocate sufficient funding to enable the OGWC to carry out its statutory directives. The legislature has also failed to grant the OGWC the legal authority it needs to effectively direct the state's climate policy and facilitate necessary emissions reductions. As a result, Oregon is unlikely to meet its climate change goals.

While Oregon deserves some recognition for adopting long-term climate change goals and establishing an independent commission to develop recommendations for achieving these goals, Oregon's efforts are not enough. According to the OGWC's *2015 Report to the Legislature*, Oregon's existing laws and policies will not reduce emissions to the extent required to meet the state's 2020 and 2050 greenhouse gas goals.[5] The OGWC determined that under a business-as-usual scenario reflecting the state's existing laws, the state's emissions would exceed the 2020 goal by 11 million metric tons CO_2 equivalent.[6] If Oregon fails to implement more stringent climate laws and policies, the gap between the state's emissions and its goal will increase to more than 30 million metric tons CO_2 equivalent in 2035.

One of the major impediments to Oregon's ability to meet its climate goals involves the non-binding nature of the goals themselves. Oregon's greenhouse gas emission goals, while nominally ambitious, are voluntary and thus unenforceable. Consequently, the state has not granted any agencies or commissions authority to administer Oregon's climate goals or issue regulations to facilitate emissions reductions in accordance with the goals. The OGWC

has the capacity and the drive to develop realistic strategies to achieve the state's climate goals, yet it lacks the authority and funding necessary to implement or enforce its recommendations. Other Oregon efforts are likewise inadequate. For example, the Oregon legislature has attempted to bolster the state's climate policy by adopting legislation to reduce greenhouse gas emissions from the power and transportation sectors, replace fossil fuel resources with renewable energy, and reduce electricity use through energy conservation and efficiency measures. However, even in the aggregate these individual policies are incapable of achieving the state's 2050 goal. Moreover, the state regulatory agencies tasked with administering these statutory programs, including the Department of Environmental Quality, the Department of Energy, and the Public Utility Commission, lack the necessary authorities and directives to implement Oregon's 2050 emissions goal, and thus are limited to administering piecemeal policies that address isolated sources of emissions.

Oregon can and should take swift action to close the emissions gap between the state's business-as-usual emissions forecast and its 2050 goal. To accomplish this objective, Oregon should adopt a comprehensive climate policy framework that includes binding emissions limitations for the energy, transportation, and land use sectors.

The state's comprehensive climate policy framework must also provide Oregon agencies with sufficient regulatory authority to develop, implement and enforce strategies to effectively reduce emissions. Ideally, the state should task a single entity with administering the framework. The OGWC could provide the oversight and policy guidance the state needs. The legislature could then direct the state's existing agencies to take specific actions to implement and achieve the state's 2050 goal. Finally, Oregon must provide sufficient funding and training to support the work of the agencies and the OGWC. These additional grants of authority and funding must be components of a larger comprehensive framework to address climate change.

Steps to Developing a Comprehensive Climate Policy Framework

1. Establish binding greenhouse gas emission limits for energy, transportation, and land use sectors
2. Task the OGWC with administering the policy framework and guiding the implementation efforts of other state agencies
3. Provide the OGWC and implementing agencies with sufficient regulatory authority, funding, and training to develop, implement, and enforce emission reduction strategies

The governor's office can play a pivotal role in developing such a climate policy framework for Oregon. As the head of state's executive branch, the governor's office plays a significant role in energy policy and implementation in several ways. First, the governor's office can help coordinate and direct the state's policy focus, as Governor Kitzhaber did when he convened a task force to draft Oregon's *10-Year Energy Plan*.[7] Second, the governor can engage in outreach activities and help to increase public awareness of climate change. For example, in 2004 Governor Kulongoski created an Advisory Group on Global Warming to "work with state agencies, colleges and universities, schools, non-profit organizations and businesses to develop a global warming education program that will provide information and outreach to the public."[8] Third, the governor's office can propose

legislation and encourage the legislature to adopt an ambitious greenhouse gas mandate. Finally, because the governor appoints some state agency directors and the members of Oregon's environmental commissions and councils, including the voting members of the OGWC, she can influence climate policy by selecting members with a strong position on the issue. The Governor also has an energy policy advisor that can provide recommendations and guidance to support the Governor's climate efforts.[9]

California's climate change policy framework may provide a useful model for Oregon to follow. Like Oregon, California adopted a greenhouse gas reduction goal. However, unlike Oregon, California tasked an existing state entity—the California Air Resources Board, or CARB—with implementing and achieving this goal. At first glance, CARB is not dissimilar from the OGWC. CARB is comprised of 12 public and private members appointed by the governor. However, unlike the OGWC, these memberships are funded, rather than volunteer, positions, with the Chair serving full-time and the other members serving part-time. More significantly, CARB has full-time staff to support its work. And perhaps most importantly, CARB has authority to issue rules and regulations to reduce greenhouse gas emissions, and CARB is authorized to adopt fee schedules for greenhouse gas emitters to fund its programs. California's approach illustrates how a state serious about climate change mitigation can develop a comprehensive and effective mitigation strategy. Oregon should demonstrate the same sense of purpose by strengthening its climate change goals and creating the necessary regulatory framework the state will need to effectively address climate change.

This report assesses the strengths and weaknesses of Oregon's climate change policy, the OGWC's contributions to achieving Oregon's emissions goal, and the interplay between the state's other climate change-related laws and the agencies tasked with implementing them. This analysis focuses on statewide legislative efforts to reduce greenhouse gas emissions and mitigate climate impacts from the energy, transportation, and land use sectors. These sectors are responsible for the vast majority of Oregon's greenhouse gas emissions.

For the purposes of this report, carbon dioxide emissions from Oregon's industrial sector are included in the analysis of energy sector emissions. This is because most industrial greenhouse gas emissions result from on-site electricity generation and natural gas combustion.[10] However, cement manufacturing, pulp and paper manufacturing, and semiconductor manufacturing also accounted for approximately 4% of Oregon's greenhouse gas emissions in 2012.[11] Oregon's existing climate laws do not expressly limit greenhouse gas emissions from industrial sources, but the Oregon Department of Environmental Quality has some authority to

The Governor's Climate Policy Toolbox

- Coordinate and direct Oregon's climate policy focus
- Engage in public outreach and raise awareness of climate change
- Propose legislation and encourage legislature to adopt ambitious climate mandates
- Appoint state agency directors and commission members that are committed to taking action to address climate change

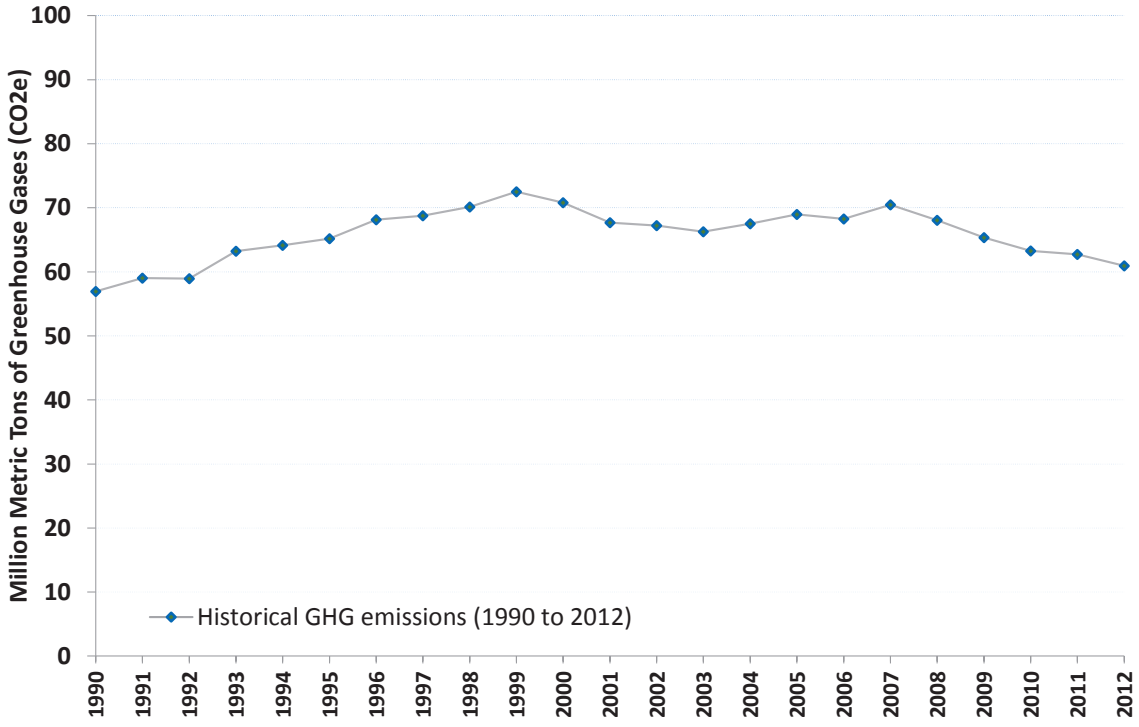
regulate these emissions under federal and state air quality programs.

This report specifically focuses on strategies to mitigate climate change through laws adopted by the state legislature. This analysis does not focus on legislative efforts to adapt to the impacts of climate change. Additionally, this report specifically focuses on statewide, rather than local, strategies to address climate change. While local efforts to reduce greenhouse gas emissions are very important, these activities are outside the scope of this report. Finally, this report advocates for comprehensive strategies to mitigate climate change, rather than piecemeal actions that lead to incremental progress with minimal long-term impact.

Part II describes Oregon's statewide greenhouse gas reduction goals, outlines the OGWC's statutory directives, and describes the Commission's structure and accomplishments to date. Part III introduces the state agencies and entities that are primarily responsible for administering Oregon's climate change policies. It also describes the legislative provisions that address climate change through reductions in greenhouse gas emissions and increased deployment of renewable energy and energy efficiency projects. Part IV then evaluates the effectiveness of Oregon's climate change policies. As this Part shows, Oregon's policies are individually and collectively inadequate to effectively reduce state greenhouse gas emissions and mitigate climate change. Part V therefore provides recommendations for retooling Oregon's climate change policies.

This report concludes that Oregon should revise its existing climate policies to establish a single, comprehensive policy framework to address climate change, and provide necessary implementation, funding, and enforcement authority to enable the state to achieve its 2050 climate goal.

FIG. 2 Oregon's Historical Total Greenhouse Gas Emissions



Oregon Global Warming Commission *2015 Report to the Legislature* (2015)

II. OREGON'S GREENHOUSE GAS EMISSIONS GOALS AND THE OREGON GLOBAL WARMING COMMISSION

In 2007, the Oregon Legislature passed House Bill (HB) 3543,[12] Oregon's first economy-wide climate change legislation. HB 3543 established statewide greenhouse gas emission reduction goals and created two state climate change entities, the Oregon Global Warming Commission (OGWC) and the Oregon Climate Change Research Institute. As the name suggests, the Research Institute primarily acts to evaluate and distribute information related to climate science and the impacts of climate change on Oregon.[13] The OGWC, in turn, was intended to help guide the design and implementation of Oregon's climate change policy. While the OGWC has performed a number of important tasks towards this objective, its effectiveness has been undermined by structural and financial limitations imposed by HB 3543. This section provides an overview of the OGWC's structure, responsibilities, and funding, and it describes the Commission's efforts to implement its statutory directives and influence Oregon's progress on addressing climate change.

A. Overview of House Bill 3543 and the OGWC

In 2007, the Oregon Legislature passed HB 3543, which declares that the policy of the state is to reduce greenhouse gas emissions in Oregon in accordance with the following goals:

1. By 2010, arrest the growth of Oregon's greenhouse gas emissions and begin to reduce greenhouse gas emissions.
2. By 2020, achieve greenhouse gas levels that are 10 percent below 1990 levels.
3. By 2050, achieve greenhouse gas levels that are at least 75 percent below 1990 levels.[14]

HB 3543 also directs state and local governments, businesses, nonprofit organizations, and individual residents to "prepare for the effects of global warming and by doing so, prevent and reduce the social, economic and environmental effects of global warming."[15]

To implement these goals and objectives, HB 3543 established the Oregon Global Warming Commission.[16] The OGWC is responsible for developing strategies and recommendations for reducing Oregon's greenhouse gas emissions. Despite the importance of this role, the OGWC operates on a purely voluntary basis and has had to obtain private funding to perform even its most basic functions, such as the creation and maintenance of a website. The composition, funding, and duties of the OGWC are described in greater detail next.

1. The Structure of the OGWC

The OGWC is comprised of 25 members. Eleven are voting members appointed by the governor, and the remaining 14 serve as ex officio non-voting members.[17] The eleven voting members are required by statute to represent the social, environmental, cultural and economic diversity of the state. These members must also represent the policy, science, education and implementation elements of Oregon's climate mitigation efforts, and they should facilitate the OGWC's efforts to reduce greenhouse gas emissions and prepare Oregon for the effects of global warming.[18] The voting members must include one individual with significant experience in each of the following areas: manufacturing, energy, transportation, forestry, agriculture, and environmental policy.[19] Voting members serve a term of four years, with opportunity for reappointment,[20] and must be residents of the state of Oregon.[21] From this group of voting members, the governor must select a chairperson and a vice-chairperson.[22]

Governor Kulongoski appointed the original eleven voting members of the OGWC in 2008.[23] As of September 2015, the voting members included Chair Angus Duncan[24] and the following members:

- Alan Zelenka, Eugene City Councilor & Director of Energy Services for Kennedy/Jenks Consultants[25]
- Catherine Mater, President, Mater Engineering[26]
- Andrea Durbin, Executive Director, Oregon Environmental Council[27]
- Jill Eiland, Oregon Corporate Affairs Manager, Intel Corporation[28]
- Jim Piro, CEO and President, Portland General Electric
- Russ Hoeflich, Vice President and Senior Policy Advisor, The Nature Conservancy's Restoring America's Forests Program[29]
- Gregg Kantor, President and Chief Operating Officer, Northwest Natural Gas[30]
- Eric Lemelson, Owner and Manager, Lemelson Vineyards[31]
- Bill Wyatt, Executive Director, Port of Portland[32]
- One voting member position is currently vacant.

The 14 ex officio nonvoting members included the following ten agency and academic officials:

- Michael Kaplan, Director of the State Department of Energy;
- Matt Garrett, Director of Transportation;
- Susan Ackerman, Chairperson of the Public Utility Commission of Oregon;
- Dick Pederson, Director of the Department of Environmental Quality;
- Katy Coba, Director of the Department of Agriculture;
- Doug Decker, State Forester;
- Tom Byler, Director of the Water Resources Department;
- Two members from the Senate and two members of the House of Representatives;[33] and
- Three additional ex officio nonvoting members appointed by the governor, each from a state agency or an academic institution. [34]

In 2015, the ex officio members from state agencies or academic institutions included Vice-Chair Dr. Mark Abbott, a Dean

and Professor in the College of Oceanic and Atmospheric Sciences at Oregon State University;[35] Bill Bradbury, a council member on the Northwest Power and Conservation Council; and Lillian Shirley,[36] the Director of the Oregon Health Department.[37]

The ex officio members from Oregon's legislative chambers must come from different political parties, and the President of the Senate and Speaker of the House of Representatives must appoint their respective legislative members. As of September 2015, these ex officio members included Rep. Jessica Vega Pederson, Sen. Bill Hansell, and Sen. Chris Edwards.[38] The fourth legislative ex officio position, which should be occupied by a Republican member of the state House of Representatives, was vacant.[39] In contrast to the eleven voting members, the legislative ex officio members serve at the pleasure of the appointing authority and may serve as long as the member remains in the chamber of the Legislative Assembly from which she or he was appointed.[40]

The OGWC also receives staff support from Jessica Shipley with the Oregon Department of Energy.

2. The OGWC's Responsibilities

The primary charge of the OGWC is to recommend ways to coordinate state and local efforts to reduce Oregon's greenhouse gas emissions consistent with the state goals and to recommend efforts to help the state (as well as local governments, businesses and residents[41]) prepare for the effects of global warming.[42] The OGWC's responsibilities primarily focus on developing strategies for Oregon agencies and citizens to address climate change. In addition, the OGWC must conduct outreach to Oregonians and submit regular progress reports to the state legislature.

In its pursuit of achieving the 2050 greenhouse gas goals, the OGWC must assess policies that have the potential to facilitate emissions reductions. HB 3543 directs the Commission to examine greenhouse gas cap-and-trade systems, including statewide and multistate carbon cap-and-trade systems and other market-based mechanisms.[43] The OGWC must also examine possible funding mechanisms to obtain low-cost greenhouse gas emissions reductions and energy efficiency enhancements.[44] HB 3543 further directs the OGWC to assess the current impacts of climate change on the state and the region. The OGWC must track and evaluate a number of informational resources, including, for example: "economic, environmental, health and social assessments of global warming impacts on Oregon and the Pacific Northwest"; existing policies and measures for reducing greenhouse gas emissions; the costs, risks and benefits of alternative strategies; Oregon's progress towards meeting its greenhouse gas reduction goals; technological advancements in low-carbon energy; and "the advancement of regional, national and international policies to reduce greenhouse gas emissions."[45] In conjunction with these substantive responsibilities, the OGWC must also develop an outreach strategy to educate Oregonians about "the scientific aspects and economic impacts of global warming and . . . ways to reduce greenhouse gas emissions and ways to prepare for the effects of global warming."[46]

HB 3543 gave the OGWC authority to "recommend statutory and administrative changes, policy measures and other recommendations to be carried out by state

and local governments, businesses, nonprofit organizations, and residents."[47] The OGWC must submit a report[48] to the Legislative Assembly by March 31 of each odd-numbered year detailing Oregon's progress towards achieving its emissions reduction goals.[49] This biennial report may discuss relevant and significant issues, including greenhouse gas emissions trends, emerging public policies, and technological advancements. The report may also explore measures the state could adopt to mitigate and prepare for climate change impacts on the state.

3. Funding for the OGWC

Despite the many expectations placed on the OGWC, the legislation that created it did not include any funding provisions, and the Oregon Legislature has not given the OGWC any direct financial support. The legislature has, however, allocated some funds for an employee with the Oregon Department of Energy (DOE) to assist the OGWC's work to a limited extent. Beyond this limited state funding, the OGWC has relied on private contributions to conduct most of its business.

In tandem with its first biennial report to the legislature in 2009, the OGWC requested $100,000 to implement the broad responsibilities tasked to the OGWC by HB 3543.[50] While the OGWC hoped to use state funding to leverage private foundation and corporate funding,[51] it nonetheless calculated that it required $100,000 biannually from the state to conduct its operations.[52]

Despite this request, the OGWC did not receive direct funding from the state. The legislature has not designated funding for appointing full-time OGWC staff or to support the OGWC's basic operations. The legislature did allocate limited funding for administrative staff support for the OGWC in its 2009-2011 appropriations to the Oregon Department of Energy, but these staff resources are split between three distinct Department of Energy programs.[53]

The OGWC also sought and received funding and in-kind support from private sources. To accomplish its initial communications and outreach strategy, the OGWC received a $25,000 grant from the Bullitt Foundation to fund the creation of an enhanced website.[54] Since the initial creation of the website, the OGWC has relied on assistance from staff from Oregon State University and in-kind support from Doug Fish of Fish Marketing to ensure the accuracy of the substantive materials presented on the Commission's website.[55] The state has not contributed funds to help the OGWC develop or operate its website.[56] Additionally, the OGWC and the Oregon Business Association jointly recruited funding for an ECONorthwest analysis of the economic effects of a western regional carbon cap-and-trade system. The OGWC also received between $60,000 to $65,000 from the Lemelson Foundation for both the *Roadmap to 2020* and the accompanying Roadshow, which are discussed below.[57] This funding enabled the Commission to hire consultants to manage the *Roadmap* process and fund the six technical committees that contributed to the report. However, despite the significant expectations placed on OGWC members, the state of Oregon has failed to fund the vast majority of the OGWC's work.

B. OGWC Accomplishments to Date

Despite the lack of state funding, the OGWC has performed a number of important functions. The Commission's accomplishments include the development of key priorities, the preparation and statewide presentation of the *Roadmap to 2020*, and the preparation of biennial reports to the legislature.

1. Early Actions

In 2008, the OGWC adopted a resolution establishing its three main priorities: 1) to decrease emissions in order to achieve Oregon's greenhouse gas reduction goals; 2) to protect the health, well-being, and resiliency of Oregon's citizens and ecosystems; and 3) to "ensure that Oregon's economy remains vibrant and healthy" and able to withstand the negative impacts of climate change.[58] The Commission subsequently adopted fourteen principles to guide the state's climate change efforts.[59] These principles state, for example, that "Oregon's greenhouse gas (GHG) reduction goals and solutions must be meaningful, firmly grounded in best available science and technology (and modified as the science evolves), and lead to effective reductions in Oregon's greenhouse gas emissions." They also dictate that "Oregon's actions will be guided by the need to protect access to reliable and affordable energy."

Also in 2008, the OGWC's Fish and Wildlife Adaptation Subcommittee issued a report, titled *Preparing Oregon's Fish, Wildlife, and Habitat for Future Climate Change: A Guide for State Adaption Efforts*.[60] The report, which was co-authored by the Defenders of Wildlife and the Oregon Department of Fish and Wildlife, introduced a plan for preparing for the impacts of climate change on fish and wildlife populations and habitat.[61]

In the following year, the OGWC created its official website, Keep Oregon Cool. The website was designed to "ensure information-sharing, engagement, collaboration and two-way communication with a range of constituencies on strategies, solutions and tools for meeting Oregon's greenhouse gas (GHG) emission reduction goals and preparing for and adapting to the effects of climate change."[62] The Commission's website thus provides Oregonians with important information and an opportunity to comment on Oregon's climate policies.

OGWC'S PRIMARY PRIORITIES

1. Decrease emissions to achieve Oregon's greenhouse gas reduction goals
2. Protect the health, well-being, and resiliency of Oregon's citizens and ecosystems
3. Ensure the health, vibrancy, and resiliency of Oregon's economy

2. The Roadmap to 2020

The OGWC's most significant accomplishment to date is arguably its preparation and distribution of its ***Roadmap to 2020*** report, which the Commission released in 2010.[63] The *Roadmap* aimed to illustrate how Oregon could achieve its 2020 emissions goals and prepare for greater emissions reductions in the future. Pursuant to the OGWC's charge to inform Oregonians about the "the scientific aspects and economic impacts of global warming and . . . ways to reduce greenhouse gas emissions and ways to prepare for the effects of global warming," the OGWC adopted a resolution requiring the development of a "roadmap" to guide the state's efforts to meet its greenhouse gas emissions reductions goals.[64] This *Roadmap* aimed to provide recommendations for how Oregon could meet its 2020 and 2050 emissions goals and transition to a clean, sustainable energy system.[65]

Six technical committees conducted the initial assessments for the *Roadmap to 2020* report.[66] These technical committees focused on six sectors: 1) energy, 2) transportation and land use, 3) industry, 4) agriculture, 5) forestry, and 6) materials management. The committee members included representatives from business, academia, non-governmental organizations, local government and state agencies. As a starting point, the six committees "envisioned what each of their sectors might look like in 2050 in an Oregon that had met its long-term reduction goal."[67] From there, the committees worked backwards to 2020 to identify and refine key actions that could help the state reach both the 2020 and 2050 goals.[68] The technical committees presented their recommendations to the OGWC on October 8, 2010. The OGWC then adopted these recommendations as an Interim[69] *Roadmap to 2020* report on October 28, 2010.[70]

The Roadmap to 2020 included four non-sector-specific recommendations addressed to the governor, legislature, congressional delegation, local governments, businesses, and residents. These recommendations included four proposals: 1) the legislature should adopt an intermediate 2030 greenhouse gas reduction goal; 2) the OGWC should develop a greenhouse gas accounting framework "to allocate and sequence carbon reduction targets by cost, sector and geography"; 3) the OGWC would communicate its support for a national carbon cap to President Obama and Oregon's congressional delegation; and 4) the OGWC should advocate for assigning "the highest priority for federal research funding to energy and infrastructure opportunities that hold greatest promise for delivering near-term greenhouse gas reductions."[71]

In addition to these four non-sector-specific recommendations, each technical committee produced an individual roadmap to 2020 outlining key sector-specific actions for the state to take. These actions included diverse recommendations for reducing emissions from the energy, transportation and land use, industrial use, agriculture, forestry, and materials management sectors.

3. The Roadshow

Recognizing that the conclusions and recommendations from the *Roadmap to 2020* would only be influential if they were effectively communicated to a majority of Oregonians, the OGWC began a "Roadshow" for the *Roadmap* in May 2011. The intent of the Roadshow was to communicate the *Roadmap's* recommendations and solicit public input from residents throughout the state.[72] Over a three-month period, the OGWC engaged in an ambitious outreach initiative. The OGWC received public input on the *Roadmap* through local government-sponsored workshops; presentations to a variety of organizations and representatives; and an online public survey.[73] During the Roadshow, the OGWC convened five public workshops, received eighty-eight detailed feedback forms, conducted 15 *Roadmap* presentations, shared information through 40 listserves, and reviewed more than 2,200 online survey responses.[74]

During the Roadshow, the OGWC found that workshop participants were generally supportive of the strategies presented in the *Roadmap*. The OGWC reported that the majority of participants supported taking action to reduce greenhouse gas emissions; however, the Commission also noted that workshop attendees tended to be highly issue-driven individuals.[75] The OGWC also saw a strong connection between participants' political interests and the issue of climate change. In light of this, the OGWC recommended that future outreach efforts could have more success by focusing on specific issues, such as utility policies, electricity regulation, or energy conservation, on which a majority of participants agree, regardless of their political or environmental views.[76] Future outreach strategies could also be targeted for specific groups ("Green, Undecided & Skeptics").[77]

4. OGWC Biennial Reports

In accordance with its legislative mandate to produce biennial reports,[78] the OGWC has produced four reports for the Oregon legislature since its creation. These reports describe Oregon's progress in meeting its greenhouse gas reduction goals and recommend policies and actions for the legislature to consider in increase the state's emissions reduction potential.

a. 2009 and 2011 *Reports to the Legislature*

The OGWC produced its first biennial *Report to the Legislature* on March 12, 2009.[79] This initial report described Oregon's progress in its efforts to achieve its greenhouse gas reduction goals and summarized the OGWC's collaborative process to engage Oregonians on climate change. The report included a series of initial recommendations to further the state's climate change mitigation efforts.

The *2009 Report* included seven recommendations: 1) to move forward with

the Western Climate Initiative's proposed carbon cap-and-trade program; 2) to promote energy efficiency; 3) to support renewable energy; 4) to prepare and adapt to the impacts of climate change; 5) to adopt and implement recommendations from the governor's Transportation Vision Committee; 6) to support land use planning practices that address climate change concerns; and 7) to fund the OGWC.[80] The Commission presented these recommendations in the form of resolutions, which it then adopted in 2008 and 2009.

The OGWC produced its second *Report to the Legislature* on March 17, 2011.[81] This report mainly described the key actions and results from the *Roadmap to 2020* report. The *2011 Report* also provided a status report regarding the state's emissions and the actions taken to meet Oregon's greenhouse gas emission reduction goals.

b. *2013 Report to the Legislature*

In its *2013 Report to the Legislature*,[82] the OGWC reported that Oregon had achieved its 2010 greenhouse gas reduction goal. The *2013 Report* also assessed the progress of the OGWC's *Roadmap to 2020* recommendations and identified other planning efforts that may affect Oregon's ability to reach its greenhouse gas emissions goals.

First, based on 2010 emissions data, the report concluded that Oregon had achieved the state's 2010 goal of arresting the growth of Oregon's greenhouse gas emissions and establishing a new trajectory of reduced emissions levels in the future.[83] While the report determined that both Oregon's in-boundary emissions (the emission produced within the state borders) and Oregon's consumption-based emissions (the emissions produced outside of the state as a result of in-state activities, such as those associated with imported goods or energy) had apparently stabilized,[84] a letter from the Chair expressed some skepticism regarding the means of achieving this goal. The letter indicated that Oregon may have achieved its 2010 goal as a consequence of the economic recession, and that additional work would be required to maintain the emissions reductions as the economy improved.[85]

Second, the *2013 Report* provided an update on the *Roadmap to 2020*. The OGWC's *2013 Report* assessed the progress of the *Roadmap* for each of the forty identified sector-specific key actions, grading them on a scale from A (on track to meet state goals or *Roadmap* outcomes) to D (significant measureable slippage away from goals or outcomes).[86] Of the forty sector-specific key actions, only five received an A.[87] Fifteen actions received a B (partial but significant greenhouse gas reductions or progress toward outcomes), nineteen received a C (business as usual; insignificant or no reductions or progress), and one received a D.[88] The action receiving a D was adopting low-carbon fuel standards, now referred to the Clean Fuels Program, within the transportation sector. In 2015, the Oregon Legislature adopted Clean Fuels legislation, but it remains to be seen how the OGWC will grade that action.

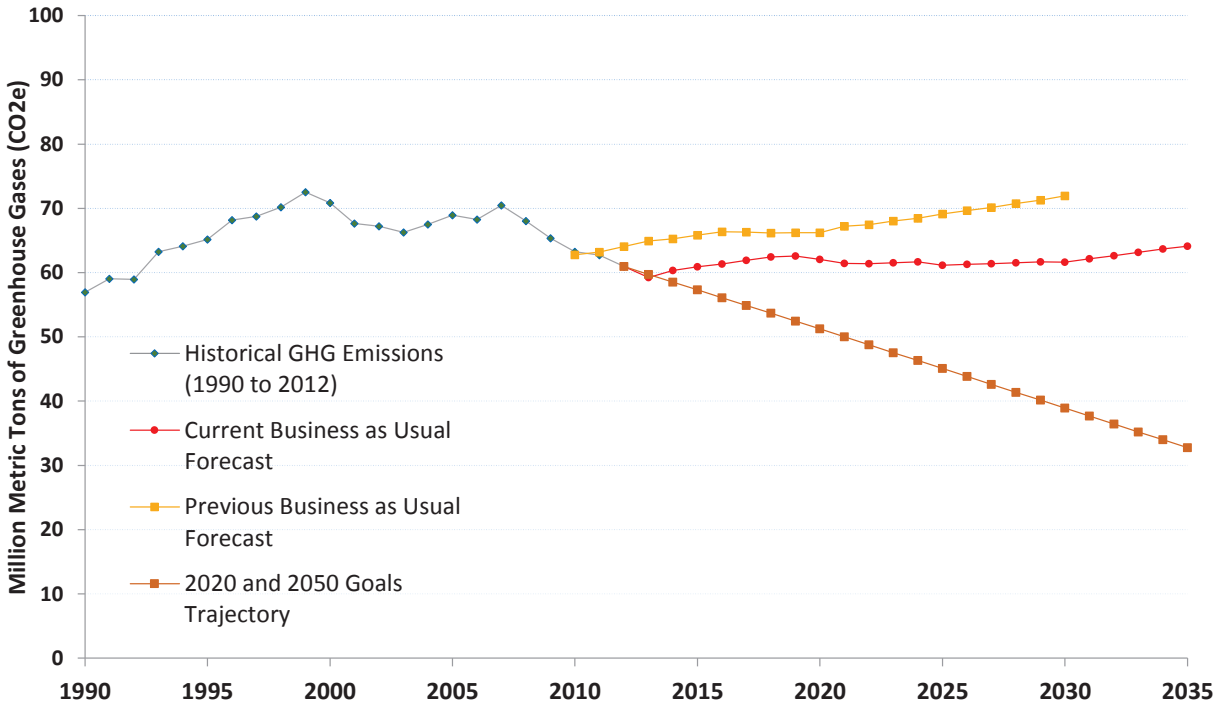
Third, the *2013 Report* acknowledged other planning initiatives that had occurred during the last biennium that will also have a significant role in achieving the greenhouse gas reduction goals. The initiatives included, for example, Oregon's *10-Year Energy Action Plan*, the *Oregon Statewide Transportation Strategy*, and the *Oregon Integrated Water Resource Strategy*. These plans are described next.

c. *2015 Report to the Legislature*

The OGWC finalized its most recent report to the legislature in September 2015.[89] The new report provides an updated inventory of Oregon's in-boundary and consumption-based greenhouse gas emissions. It also compares the current business-as-usual emissions trajectory with the emissions reductions necessary to achieve Oregon's 2020 and 2050 goals. The report concludes that under a business-as-usual scenario, Oregon's emissions will exceed the state's 2020 goal of 51 million metric tons of CO_2 equivalent ($MMTCO_2e$) by 11 million metric tons.[90] The report projects that "absent significant additional intervention," the gap between actual emissions and the state's greenhouse gas emission goal will increase to more than 30 $MMTCO_2e$ by 2035.[91] To avoid this gap, the OGWC recommends a number of strategies for the legislature to consider in facilitating additional emissions reductions.

First, the OGWC reviewed Oregon's updated greenhouse gas emissions inventory and compared the state's historical emissions from 1990 through 2012. This analysis revealed that over a ten-year period, Oregon's in-boundary emissions peaked at 70.8 $MMTCO_2e$ in 2007, then decreased to 60.9 $MMTCO_2e$ in 2012.[92] The state's 2012 emissions were therefore not substantially higher than the state's 1990 emissions of 56.9 $MMTCO_2e$. The OGWC then reviewed the state's 2012 emissions on a sector-by-

FIG. 1 Oregon's Emissions Forecast Compared to 2050 Goal Emissions Trajectory



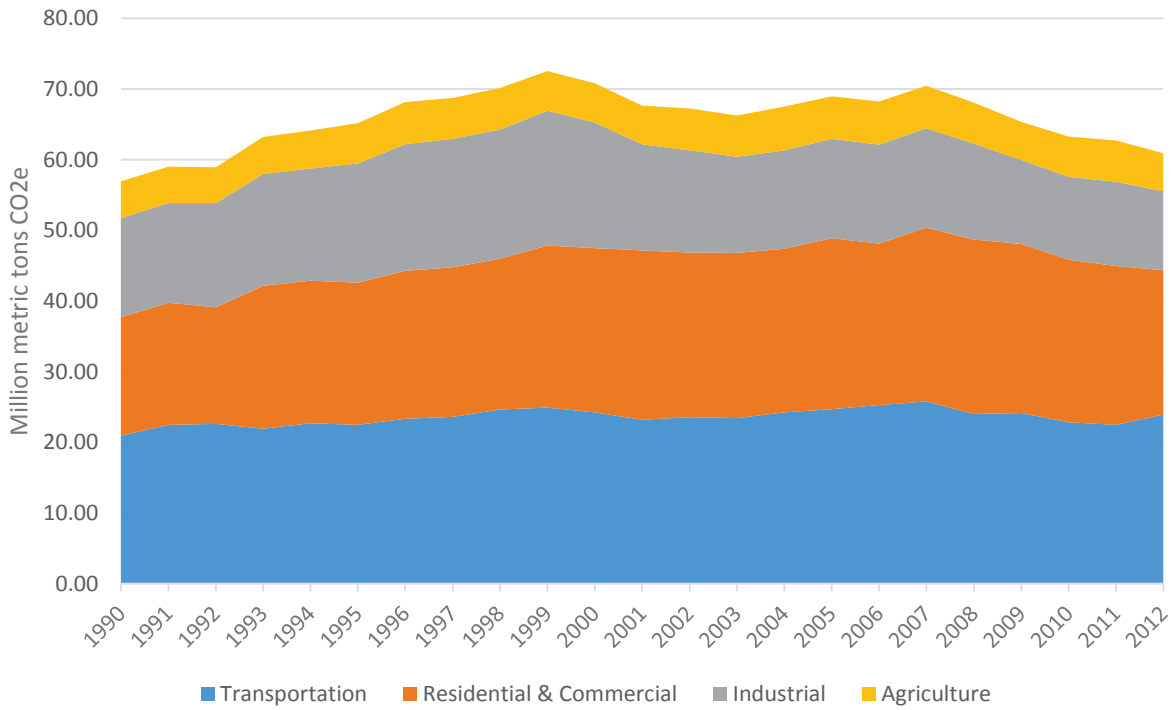
Oregon Global Warming Commission *2015 Report to the Legislature* (2015)

sector basis. The transportation sector emitted 23.92 $MMTCO_2e$ in 2012, which makes transportation the largest-emitting sector, contributing 39% of the state's emissions in 2012.[93] The residential, commercial, and industrial sectors collectively represent the second-largest source of emissions in the state, primarily due to electricity and natural gas consumption.[94] The use of electric power generated 30% of Oregon's emissions in 2012.[95] Agriculture is the lowest-emitting sector, with emissions of approximately 5.5 $MMTCO_2e$ in 2012.[96]

The OGWC then evaluated whether the state's emissions under a business-as-usual scenario could achieve the state's 2050 goal. To conduct this analysis, the Commission revised its business-as-usual forecast to reflect new policy assumptions. The 2015 forecast included assumptions that the state's utilities would comply with Oregon's renewable portfolio standard and that PGE would close the state's only coal-fired power plant in 2020.[97] The forecast also included updated assumptions regarding emissions reductions from energy efficiency, the Clean Fuels Program, and federal fuel economy standards. While this revised business-as-usual forecast resulted in lower emissions than the forecast from previous reports, the Commission concluded that the state's existing policies would not keep the state on track to meet either its 2020 or 2050 goals.

In fact, the Commission determined that Oregon's 2020 and 2050 targets may actually delay the state's progress in reducing emissions, because the 2020 goal is too close and the 2050 is too far away to inspire meaningful action. This led the OGWC to recommend that the legislature adopt and commit to an interim goal of 32.7 $MMTCO_2e$ in 2035.[98]

FIG. 3 Oregon Emissions By Sector, 1990–2012



Oregon Global Warming Commission *2015 Report to the Legislature, fig. 1* (2015)

The OGWC next conducted an analysis of measures and strategies Oregon could undertake to close the gap between the projected 2035 emissions and the proposed 2035 interim goal. These strategies include measures—or "wedges"—to increase energy efficiency and reduce emissions from transportation, power generation, agriculture, and waste. After identifying the most cost-effective reduction measures, the Commission constructed a scenario of the potential reductions these measures could achieve between 2015 and 2035.[99] The OGWC concluded that the identified measures could reduce emissions by 21.7 $MMTCO_2e$ in 2035, which still exceeded the 2035 emissions goal by 9.7 $MMTCO_2e$.[100] To close this gap, the OGWC considered adding a carbon tax as an additional strategy to reduce emissions. The resulting analysis indicated that a phased-in carbon tax starting at $10 a ton and rising $10 per year up to $60 a ton could effectively close the 9.7 $MMTCO_2e$ gap and enable the state to achieve the 2035 goal.

C. Other Climate Plans and Reports

In addition to the OGWC's work, other Oregon planning initiatives have included strategies to help the state achieve its greenhouse gas reduction goals. These include Oregon's *10-Year Energy Action Plan*, Oregon Department of Transportation's *Statewide Transportation Strategy*, the *Oregon Climate Assessment Report*, the *Oregon Climate Change Adaptation Framework*, the *Oregon Integrated Water Resource Strategy*, and the Oregon Department of Energy's *2015–2019 Strategic Framework*. While each of these efforts includes useful suggestions, none has resulted in binding requirements to mitigate climate change.

1. *10-Year Energy Action Plan*

In 2011, then-Governor John Kitzhaber convened a task force to develop a plan to organize and provide direction for Oregon's energy policy.[101] Governor Kitzhaber's *10-Year Energy Action Plan* was released in 2012. The plan aimed to identify strategies to create jobs and support the Oregon economy, develop affordable and reliable renewable energy, protect the environment, and reduce greenhouse gas emissions.[102] In accordance with these objectives, the *Plan* introduced three primary goals for the coming years:

1. Meeting 100 percent of new electric load growth through energy efficiency and conservation.
2. Enhancing clean energy infrastructure development by removing finance and regulatory barriers to attract new investment and pursue promising new technologies.
3. Accelerating the market transition to a more efficient, lower cost and cleaner transportation system, including strategies for fleet vehicle conversion and access to cleaner-burning and more efficient vehicles.[103]

The *10-Year Energy Action Plan* envisioned a future "where the state can play a lead role in innovation, policy development and market transformation."[104]

First, to achieve the goal of meeting all new electricity load growth through energy efficiency and innovation, the *Plan* included numerous action items for the state to focus on in the coming years. For example, it suggested that the state should "develop a new regulatory framework and financial mechanisms that allow for new consumer demand…to be met through energy efficiency and conservation."[105] In addition, the *Plan* proposed the creation of a "State Building Innovation Lab" to research ways to improve the energy efficiency of state-owned buildings.[106] The *Plan* also suggested updating and developing new financial tools to encourage investment in energy efficiency projects.[107]

Second, to enhance clean energy infrastructure, the *Plan* announced an intention to "buil[d] on the existing foundation of hydroelectric power, a resource that for decades has made the state one of the nation's leaders in clean, renewable energy."[108] The *Plan* stressed the importance of improving the state's infrastructure to expand the deployment of "Smart Grid" meters that help utilities and transmission operators deploy intermittent renewable energy.[109] The *Plan* also recommended researching and integrating energy storage technology.[110] To improve development of new renewable projects, the *Plan* encouraged the establishment of a "landscape-level plan" that would require renewable energy project decision-makers to "align the state's energy and land use goals" by considering the projects' effects on natural resources.[111] To streamline and bring certainty to renewable project development, the *Plan* recommended revising state law to create more uniform county-to-county siting requirements.[112]

Finally, to achieve the goal of moving the state towards a "more efficient, cleaner transportation system," the *Plan* identified quite a few strategies aimed at improving decision-making and infrastructure. For example, recognizing that Oregonians are starting to transition to electric vehicles and that electric utilities will become a growing source of transportation "fuel," the *Plan* recommends a "comprehensive alternative fuel program that allows utility-ownership of refueling infrastructure and provides incentives…for vehicle conversions."[113] The *Plan* also suggested that the Oregon legislature eliminate the sunset date for the Clean Fuels Program to promote certainty and predictability in the clean fuels market.[114]

2. Oregon *Statewide Transportation Strategy*

In 2010, the Oregon legislature directed the Oregon Department of Transportation (ODOT) to examine ways to reduce greenhouse gas emissions from the transportation sector. Senate Bill 1059 directed the Oregon Transportation Commission to consult with metropolitan planning organizations, other state agencies, local governments, and stakeholders to develop and adopt a strategy on reducing transportation greenhouse gas emissions.[115] In 2013, ODOT issued a *Statewide Transportation Strategy (STS)* that describes strategies and measures to reduce transportation sector emissions "to get as close to the 2050 goal as is plausible."[116] The *STS* is not a regulatory document and does not include any mandatory requirements or

directives. Instead, the report presents ODOT's 2050 Vision for Greenhouse Gas Emissions Reductions.

The 2050 Vision describes a suite of policies and measures to reduce emissions by 60% below 1990 levels by 2050. ODOT's 2050 Vision identifies several transportation and land use strategies that the Department's advisory committees and researchers deemed "plausible" and that "had the fewest apparent negative impacts."[117] The *STS* included 18 different emissions reduction strategies divided among six broad categories: 1) vehicle and engine technology advancements; 2) fuel technology advancements; 3) enhanced system and operations performance; 4) transportation options; 5) efficient land use; and 6) pricing and funding mechanisms. Many of the specific strategies are incorporated into the *Oregon Transportation Plan*, which is "the statewide policy document guiding transportation decisions and investments."[118] The Governor's *10-Year Energy Action Plan* also calls for many of the same policy goals.[119]

3. *Climate Assessment Report* and *Oregon Climate Change Adaptation Framework*

To complement the *Roadmap to 2020*, the Oregon Climate Change Research Institute at OSU produced the *Climate Assessment Report* in 2010.[120] The *Climate Assessment* evaluates the likely climate change impacts to Oregon's weather, water, agriculture, forests, fish and wildlife, ecosystems, public health, transportation infrastructure, and coastal communities.[121] To prepare for these impacts, Oregon released the *Oregon Climate Change Adaptation Framework* in 2010.[122] This report identified the key climate risks facing the state and evaluated measures "to reduce Oregon's vulnerability to the effects of climate variability and change."[123]

4. *Oregon's Integrated Water Resource Strategy*

The Oregon Water Resources Commission issued *Oregon's Integrated Water Resources Strategy* in August 2012.[124] The report evaluates critical issues facing the state's water resources, including current and future pressures to Oregon's water supplies. The report states that "[c]limate change will likely alter the hydrology of many streams throughout Oregon, affecting the availability and quality of water."[125] The report then includes a list of adaptation and resiliency strategies to help communities respond to climate-related water impacts. These strategies include, for example, incorporating climate change into water planning decisions, pursuing methods to conserve, store, and reuse water supplies, and investing in water forecasting and monitoring technologies.[126]

5. Oregon Department of Energy's 2015–2019 Strategic Framework

In September 2015, the Oregon Department of Energy's Planning and Innovation Division released its Strategic Framework for 2015–2019.[127] This report provides information on the agency's activities and priorities, and identifies strategies to help the state achieve its energy goals. The report focuses on activities within four energy sector focus areas: demand-side management, clean power and thermal energy, clean and efficient transportation, and resiliency and sustainability. The report identifies specific strategies within each focus area, including, for example, "reduc[ing] the cost of integrating clean energy resources"; "reduc[ing] fuel use in the transportation sector"; and "assess[ing] potential climate change mitigation strategies."[128] The Department of Energy plans to work with the Governor's office and other state agencies to implement the Framework and ensure that its recommended strategies are consistent with other state programs and initiatives. The agency also intends to "track framework outputs based on completion of deliverables as well as Oregon's energy outcomes based on a variety of high-level indicators," including, for example, the carbon content of Oregon's electricity resources and the state's historical and projected greenhouse gas emissions.[129]

D. Where We Are Now

As the descriptions above illustrate, Oregon's agencies and the OGWC have made significant strides in assessing the potential impacts of climate change and evaluating and recommending mitigation actions for Oregon to implement. However, the strategies and action plans described above generally represent policy goals, rather than binding legal mandates. Many of these strategies and recommendations may thus prove difficult to implement.

The OGWC's *2015 Report to the Legislature* provides a detailed overview of Oregon's current greenhouse gas emissions inventory and the state's emissions forecast for the coming decades. The report also compares Oregon's anticipated business-as-usual emissions to an emissions trajectory that would enable the state to meet its 2020 and 2050 goals. This comparative analysis revealed some unsettling findings about Oregon's ability to achieve its climate goals. First, the report indicates that Oregon's existing policies are incapable of facilitating the level of emissions reductions necessary to achieve the state's 2050 goal. Second, the report concludes that the state could effectively achieve an interim 2035 goal (and thus put the state on a trajectory to meet the 2050 goal) by implementing a series of additional policies and programs.

However, as Parts III and IV show, Oregon's existing laws are not going to achieve these goals. Part III describes Oregon's existing policies that address climate change and introduces the state agencies and entities that currently administer the state's climate policies. Part IV then evaluates the potential for these agencies to meaningfully reduce state greenhouse gas emissions under existing laws.

III. Oregon's Climate Change-Related Legislation and Implementing Agencies

In addition to developing greenhouse gas reduction goals and establishing the OGWC, the Oregon legislature has adopted a variety of other laws to address climate change. These other statutory programs are administered by a number of state regulatory agencies with varying degrees of authority to implement and enforce the state's climate policies. This Part briefly introduces the state agencies that are tasked with administering Oregon's climate change laws and describes the laws themselves. This discussion is organized by sector, and as this organization illustrates, the vast majority of Oregon's climate change laws aim to reduce emissions from the energy sector. In contrast, the state has made minimal progress in regulating emissions from the transportation and land use sectors.

A. The Energy Sector

Oregon's energy sector encompasses the state's electricity and natural gas sub-sectors. A number of administrative agencies and other regulatory bodies are tasked with implementing climate policies that pertain to the energy sector. Oregon's energy and environmental regulatory agencies are the primary entities responsible for administering these laws. In addition, the activities of three non-state entities—the Energy Trust of Oregon, the Climate Trust, and the Northwest Power and Conservation Council—also help support the state's climate mitigation efforts.

A number of laws work to mitigate the climate impacts from the state's electricity and natural gas sectors. These laws generally aim to achieve one of three objectives: 1) reduce energy sector greenhouse gas emissions; 2) incentivize or mandate use of low- or zero-emitting renewable energy resources; or 3) incentivize or mandate energy conservation through energy efficiency improvements.

1. Oregon Agencies Responsible for Climate Policy in the Energy Sector

In the climate change context, the Oregon Department of Environmental Quality (DEQ), the Oregon Department of Energy (ODOE), and the Public Utility Commission (PUC) of Oregon are responsible for administering the bulk of the state's climate change-related energy policies. The Environmental Quality Commission (EQC) and the Energy Facility Siting Council (EFSC) provide supporting functions for the DEQ and ODOE, respectively.

a. The Oregon Department of Environmental Quality

DEQ is a regulatory agency tasked with protecting the quality of Oregon's environment. DEQ's mission is to "be a leader in restoring, maintaining, and enhancing the quality of Oregon's air, land and water."[130] The Department is responsible for administering state and federal environmental laws. The U.S. Environmental Protection Agency delegates authority to DEQ to implement federal environmental laws, including the Clean Air Act, Clean Water Act, and the Resource Conservation and Recovery Act. DEQ administers these programs by operating inspection and permitting programs and providing technical assistance to regulated entities.

DEQ's Air Quality Division is responsible for implementing state and federal air quality programs, including programs related to climate change and reducing greenhouse gas emissions. The air quality program's mission is "to preserve and enhance Oregon's air quality to support healthy, clean air for all Oregonians."[131] The Air Quality Division administers Oregon's mandatory greenhouse gas reporting program.[132] The Division also works to inventory Oregon's greenhouse gas emissions. In 2013, DEQ, ODOE, and ODOT issued a comprehensive report on Oregon's greenhouse gas emissions through 2010.[133] DEQ is also responsible for implementing the state's Clean Fuels Program.[134] Additionally, as the agency responsible for implementing the federal Clean Air Act, DEQ (in collaboration with ODOE and the PUC) is developing a plan to implement the EPA's Clean Power Plan.[135] Finally, DEQ must work with the OGWC to evaluate the impacts of any greenhouse gases and set CO_2 equivalencies for those gases.[136]

The Director of DEQ is an ex officio member of the OGWC.[137] DEQ also employs a Greenhouse Gas Specialist in addition to a number of scientists, engineers, and environmental specialists.[138]

b. The Environmental Quality Commission

The EQC is the formal policy and rulemaking body for DEQ.[139] The EQC is a five-member citizen-based policy and rulemaking board for DEQ. EQC members are appointed by the governor to serve four-year terms.[140] The EQC adopts rules, develops policies, issues orders, judges appeals of DEQ actions, and appoints the DEQ director. Details about each Commissioner appear in Appendix A.

The EQC is responsible for issuing criteria for reporting emissions under the Clean Air Act.[141] In 2008, the EQC approved greenhouse gas reporting rules, and issued updated rules in 2010.[142] The EQC also has authority to adopt greenhouse gas emission standards for motor vehicles,[143] and is responsible for issuing rules to implement Oregon's Clean Fuels Program.[144]

c. The Department of Energy

ODOE is a state agency that aims to lead Oregon to a "safe, clean, and sustainable energy future."[145] ODOE's primary goals include encouraging investment in conservation, efficiency, and renewables; providing information and assistance on energy savings; providing technical help and financial incentives for renewable energy; demonstrating the workability of new energy technology; and siting new energy facilities. ODOE administers the state's energy tax incentive programs and provides loans and grants for renewable energy and energy efficiency projects. The Department's Energy Planning and Innovation Division provides information and other resources on renewable energy,[146] and its Energy Development Services Division provides resources on energy conservation and efficiency programs and incentives.[147] The Director of ODOE is an ex officio member of the OGWC.[148] ODOE also supplies staff support for the OGWC.[149] For example, Jessica Shipley, a senior policy analyst within ODOE's Energy Planning and Innovation Division, currently provides analytical support to the OGWC, and contributed extensively to the OGWC's *2015 Report to the Legislature*.

The legislature directed ODOE to work with the OGWC and the state's institutes of higher education to "educate Oregonians about the scientific aspects and economic impacts of global warming and to inform Oregonians of ways to reduce greenhouse gas emissions and ways to prepare for the effects of global warming."[150] ODOE must review Oregon's greenhouse gas emissions standards for consumer-owned utilities every three years. ODOE may add additional substances to the list of regulated greenhouse gases. ODOE may also set greenhouse gas emissions standards based on emissions rates from combined-cycle natural gas plants.[151] Finally, ODOE must submit a comprehensive energy plan to the governor and legislature each odd-numbered year that inventories Oregon's existing energy resources, estimates their contribution to the state's energy needs, proposes ways the government can "assist in the development and maximum use of cost-effective conservation and renewable resources."[152] ODOE issued its most recent plan in 2015, which applies to the years 2015–2017.[153] The plan identifies emission reductions as a major issue facing the state, and discusses ODOE's role in assisting the OGWC[154] and implementing the federal Clean Power Plan's emissions reduction requirements.[155]

d. Energy Facility Siting Council

EFSC was established through the same legislation establishing ODOE. EFSC "has regulatory and siting responsibility for large electric generating facilities, many high voltage transmission lines, some gas pipelines, and radioactive waste disposal sites."[156] The council is comprised of seven volunteer members appointed by the governor and confirmed by the state senate. (See Appendix A for a list of current council members.) Council members may not work for a company that owns a facility or proposed facility under EFSC jurisdiction, and they cannot have ever been employed by a

company that owns or owned a large energy facility.[157] Council members serve on a volunteer basis, and ODOE employees serve as staff for the council.

Proposed energy facilities must go through a siting review process administered by EFSC.[158] If the facility conforms with the council's siting standards, EFSC will issue a site certificate authorizing the developer to construct and operate the facility. EFSC may not issue a site certificate to a fossil fuel-fired facility that does not comply with CO_2 emissions standards established by statute or adopted by the council.[159] EFSC has authority to adopt CO_2 emissions standards for fossil fuel-fired power plants that are not baseload natural gas plants.[160]

e. The Public Utility Commission of Oregon

The PUC is a state agency tasked with regulating customer rates and services of the investor-owned electric, natural gas, and telephone utilities and certain water companies operating within the state.[161] In accordance with state and federal law, the PUC ensures that consumers receive utility services at fair and reasonable rates, while enabling regulated utilities to recover their costs and earn a reasonable rate of return on their capital investments.[162] The PUC promulgates rules and regulations to administer applicable statutory provisions.[163] The PUC also has authority to investigate the management of public and telecommunications utilities operating within Oregon.[164] The PUC's Administrative Hearings Division conducts rulemaking proceedings and contested case hearings on issues and disputes involving regulated utilities.[165] The PUC is composed of three full-time, non-volunteer members that are appointed by the governor for a term of four years.[166] The PUC also has a staff person focused on climate change issues.[167]

The Oregon legislature has directed the PUC to administer certain aspects of Oregon's greenhouse gas emissions standards and renewable energy policies. While ODOE is responsible for developing a greenhouse gas emissions standard for cogeneration facilities,[168] the PUC was directed to establish an output-based methodology for calculating greenhouse gas emissions from cogeneration facilities.[169] The PUC must also ensure compliance with the Oregon law prohibiting electric utilities and electric service providers from entering into long-term commitments (e.g., power purchase agreements) that will violate Oregon's greenhouse gas standards.

The legislature also directed the PUC to establish a voluntary emission reduction program for the state's investor-owned natural gas utilities.[170] The PUC developed eligibility criteria and an application procedure for project proposals under the voluntary program and established a rate cap for such projects.[171] The PUC must also conduct a study every two years to determine whether federal or state law or regulations "provide adequate incentives for public utilities that furnish natural gas to invest in projects that reduce emissions in the ordinary course of business."[172]

2. Other Entities Implementing Energy Sector Climate Policies

The regulatory agencies described above are directly responsible for implementing the bulk of Oregon's energy sector climate policies. However, the work of these agencies is supplemented by the efforts of three non-state entities. First, the Energy Trust of Oregon is a unique, non-profit organization that supports the state's climate change objectives through its energy efficiency and renewable energy acquisition efforts. Second, the Climate Trust administers an offset program to help facilities comply with the state's Carbon Dioxide Standard for new energy facilities. Third, the Northwest Power and Conservation Council is a regional organization that develops and updates a power plan that aims to protect and conserve the region's power supply.

a. The Energy Trust of Oregon

The Energy Trust of Oregon (ETO) is "an independent nonprofit organization dedicated to providing utility customers with low-cost, clean energy solutions."[173] In 1999, the Oregon legislature adopted an energy restructuring law that dedicated a percentage of customer utility bills (through a "public purpose charge") to support energy efficiency and renewable energy programs.[174] The ETO was established in 2001 to administer the energy efficiency and renewable energy programs supported by a portion of public purpose charge funds.

Since 2002, ETO has enabled Oregon electricity customers to save $3.10 for every $1 spent through its share of the public purpose charge. Thanks to ETO programs, PGE and Pacific Power customers have saved $1.9 billion in utility bills, and the Oregon economy has gained $1.2 billion in additional wages, $223 million in small business income, and 3,200 full-time jobs.[175] Although climate change was not an express driver for the ETO's creation, ETO programs have provided significant climate benefits by avoiding 14.6 million tons of CO_2 emissions.

b. The Climate Trust

The Climate Trust is a nonprofit organization that administers the emissions offset component of Oregon's carbon dioxide emission standard, which was adopted in 1997 as a precondition for obtaining an energy facility site certificate.[176] The Climate Trust receives funding from new fossil fuel-fired power plants constructed in Oregon and invests these funds in projects that offset carbon dioxide emissions. The Climate Trust was established in 1997 and successfully implemented its first carbon offset project in 2001.[177] It remains "the only organization qualified to administer the Oregon Carbon Dioxide Standard."[178] The majority of the Climate Trust's investments go towards carbon offset projects in Oregon. These projects offset carbon emissions in a number of sectors, including "transportation, renewable energy, forestry, biogas, energy

efficiency, and landfill & waste" sectors.[179] The Climate Trust also sells both voluntary and compliance carbon offsets from emissions reduction projects. In addition, the Climate Trust also makes capital investments in early-state agriculture, forestry, and biogas projects that will generate carbon offsets.

c. Northwest Power and Conservation Council

In 1980, the U.S. Congress passed the Pacific Northwest Electric Power and Conservation Act, which established the Northwest Power and Conservation Council (NW Council) as a regional organization responsible for crafting a Power Plan for the region that prioritizes conservation, renewable resources, and cogeneration, in that order.[180] The NW Council's mission is to "ensure, with public participation, an affordable and reliable energy system while enhancing fish and wildlife in the Columbia River Basin."[181] The NW Council has a regional focus and a long view; it works to protect the energy and environmental interests of current and future generations throughout the northwest region. The NW Council places particular emphasis on increasing energy efficiency, which it defines as an energy resource and considers a top priority for the region. The NW Council supports Oregon's efforts to achieve its greenhouse gas goals by conducting analyses and identifying actions the state can implement to meet its 2050 goal in a cost-effective manner.[182] The Council outlines its analyses and findings in its Northwest Conservation and Electric Power Plan, which is updated every five years.

The NW Council has eight full-time, paid members. Each governor of the participating Northwest states—Oregon, Washington, Idaho, and Montana—appoints two members to the Council.[183] Oregon confirmed its agreement to participate in the council through its own legislation,[184] which requires the Governor to appoint two people to serve as members of the council for three-year terms[185] and identifies qualifications of potential appointees.[186] The Oregon legislation also requires Oregon's appointed members to prepare a yearly report on the council's actions for the Governor and heads of the Oregon Senate and House.[187] NW Council Member Bill Bradbury is an ex officio member of the OGWC.

The governmental and non-governmental entities described above are tasked with administering Oregon climate change law and policies that apply to the state's energy sector. The next section describes these policies in greater detail.

The NW Power and Conservation Council conducts regional power planning for the Columbia River basin.

State Agencies and Entities Responsible for Implementing Oregon's Climate Policies Within the Energy Sector

Oregon Department of Environmental Quality

- Administers federal and state environmental laws, including statutes designed to protect air quality, such as the Clean Air Act

Environmental Quality Commission

- Policy, rulemaking, and adjudicatory body for DEQ
- Issues criteria for reporting emissions under the Clean Air Act
- Implements Oregon's Low Carbon Fuel Standard

Department of Energy

- Administers energy tax incentive, grant, and loan programs
- Provides information and resources on energy conservation and efficiency programs
- Reviews greenhouse gas emission standards for utilities
- Submits biennial comprehensive energy plan to the Governor

Energy Facility Siting Council

- Issues site certificates to new energy facilities that conform to EFSC emission standards
- May adopt CO_2 emission standards for certain fossil fuel-fired power plants

Public Utility Commission

- Regulates electricity rates and services for public utilities
- Ensures power purchase agreement compliance with emissions standards
- Established and implements voluntary emission reduction program for natural gas utilities

Energy Trust of Oregon

- Independent nonprofit organization
- Invests public purpose charge revenue in eligible renewable energy and energy efficiency projects

The Climate Trust

- Independent nonprofit organization
- Administers the emission offset component of Oregon's CO_2 emission standard

Northwest Power and Conservation Council

- Regional organization that creates regional power plan for states within the Columbia River basin

3. Key Statutory Directives Addressing Climate Change in the Energy Sector

Although HB 3543 is Oregon's official climate change policy, a number of other laws either expressly or implicitly focus on mitigating climate impacts from the energy sector by reducing greenhouse gas emissions, changing energy sources, or promoting energy efficiency. However, these laws do not comprehensively regulate greenhouse gas emissions from the electricity and natural gas sectors. For example, several laws only apply to new sources, while others address only a portion of the problem, and others are purely voluntary. Nonetheless, because many of the laws introduced below are mandatory and enforceable, they do fill some of the gaps created by Oregon's voluntary climate change goals and the limited authority of the OGWC.

a. Laws Expressly Focused on Reducing Greenhouse Gas Emissions

Oregon has adopted legislation that directly addresses climate change by explicitly focusing on reducing greenhouse gas emissions from the energy sector. These laws include emission standards, emissions monitoring and reporting requirements, and a voluntary emission reduction program.

i. Carbon Dioxide Emissions Standard for New Energy Facilities

Oregon expressly recognizes climate change in a statute defining site certificate approval requirements for EFSC.[188] Since the 1970s, Oregon has regulated the construction of energy facilities by requiring EFSC site certification.[189] EFSC must issue certificates to proposed energy facilities, including power plants with a generating capacity of 25 megawatts or more, as well as transmission lines, nuclear installations, pipelines, solar photovoltaic power generation facilities, and storage facilities.[190] In 1997, the Oregon legislature added a certification requirement that imposes a limit on carbon dioxide emissions from proposed facilities.[191] This legislation established the Oregon Carbon Dioxide Emissions Standard, which was the first law in the United States to limit carbon dioxide emissions.[192] To issue a certificate to a fossil-fueled power plant, EFSC must determine whether, based on a "preponderance of the evidence," the facility will comply with all applicable carbon dioxide emission standards.[193] For baseload electric generating power plants fueled by natural gas, the statute set the initial emissions limit at 0.70 pounds of CO_2 per kilowatt-hour of net electric power input.[194] The law allows EFSC to adjust that rate to be 17% lower than the most efficient baseload natural gas

plant operating in the U.S. For other kinds of fossil-fuel plants, the statute required EFSC to adopt its own emission standards, which it did in 1999.[195] The current emissions rates are as follows:

- Baseload natural gas power plants: 0.675 pounds of CO_2 per kilowatt-hour[196]
- Non-baseload power plants: 0.675 pounds of CO_2 per kilowatt-hour[197]
- Non-generating energy facilities, such as transmission lines, pipelines, or storage facilities: 0.504 pounds of CO_2 per horsepower-hour[198]

Proposed facilities can demonstrate compliance with emission limitations in three ways. First, a facility can choose to use cogeneration to displace its CO_2 emissions. Second, a facility can arrange to offset its emissions on its own. Third, the statute allows a facility to pay a one-time fee of "an amount deemed sufficient to produce the reduction in greenhouse gas emissions necessary to meet the applicable carbon dioxide emissions standard" at a "monetary offset rate."[199] The monetary offset rate was set by statute at $0.57 per ton of CO_2 emitted, but was amended by EFSC in 2007 to a rate of $1.27 per ton of CO_2 emissions.[200] EFSC may increase or decrease the monetary offset rates to reflect actual offset costs, so long as the new rate will be "economically achievable" for natural gas plants.[201] However, it cannot alter the offset rate by more than $0.50 in any two-year period.[202]

Under this "monetary path," proposed facilities must pay the offset price to the Oregon Climate Trust, a third-party non-profit recognized by EFSC as the official offset-providing organization in the state. As of 2014, all facilities have chosen the monetary path and have opted to pay the Climate Trust to obtain the required offsets.[203] The Climate Trust spends an average of $4.32 to offset each metric ton of CO_2 emissions.[204] Thus, energy facilities currently pay less than 30 percent of the actual costs of the offset program.

ii. Greenhouse Gas Emission Standards for Utilities

Two years after Oregon passed HB 3543 to create the OGWC and establish non-binding emission reduction goals, the Oregon legislature enacted a carbon dioxide emission standard for electric utilities. The 2009 law establishes an emissions standard of 1,100 pounds of CO_2 per megawatt-hour (lbs. CO_2/MWh) for new electricity generating facilities.[205] The standard applies to investor-owned electric companies and electric service suppliers,[206] as well as consumer-owned utilities. Because coal-fired power plants are unable to meet this standard, the law effectively prohibits the construction of new coal-fired power plants in Oregon.[207]

To ensure that utilities cannot purchase power from out-of-state generators that are not subject to the emissions standard, Oregon's law prohibits electric companies and electric service suppliers,[208] consumer-owned utilities,[209] and the PUC[210] from entering into new long-term power purchase agreements for baseload power from generating facilities with emissions rates that exceed 1,100 lbs. CO_2/MWh. This effectively prohibits utilities from entering into new long-term purchase agreements with coal-fired power plants outside the state.

iii. Greenhouse Gas Registration and Reporting Requirements

Oregon law also authorizes, but does not require, the EQC to create a program to require registration and reporting of importation, sale, allocation, or distribution of electricity or fossil fuels that emit greenhouse gases.[211] To fund the program, the law authorizes the EQC to establish reporting fees for emitters that hold air quality permits.[212] The EQC exercised this discretionary authority and established a greenhouse gas reporting program in 2008, which it subsequently updated in 2010.[213] The program applies to air quality permit holders that emit more than 2,500 metric tons or more of CO_2 per year, solid waste disposal facilities, wastewater treatment facilities, any fuel importers, investor and consumer-owned utilities, propane importers, and natural gas suppliers.[214] However, the program also gives DEQ broad discretion to "defer or exempt specific processes or categories of sources, or specific types of greenhouse gas emissions…if the DEQ determines that adequate protocols are not available or that other extenuating circumstances make reporting unfeasible."[215] Acting as DEQ's rulemaking body, the EQC has exercised this discretion to exempt propane imports, largely because it does not have the resources to create a registration and reporting system for that sector.[216]

iv. Voluntary Emissions Reduction Program

In 2013, the Oregon Legislature added Senate Bill 844 to its series of energy sector laws aimed at reducing emissions. This law directs the PUC to establish a program to incentivize public natural gas utilities to invest in projects that reduce emissions.[217] The PUC must establish eligibility requirements, create a process for submitting proposed projects, and establish a rate cap for utilities with authorized projects. The PUC subsequently established a Voluntary Emissions Reduction Program in 2014.[218] Natural gas utilities that choose to participate in the program must submit complete project applications that include a description of the project's eligibility, measures to reduce emissions, the project's estimated life, cost recovery information, and an Emissions Reduction Verification Plan that describes the methods by which emissions will be measured and monitored.[219] Utility participation in the program is voluntary. To incentivize utilities to participate in the program, the PUC can grant incentive payments for a project, so long as they do not cost taxpayers more than a quarter of the "project cap,"[220] defined as 4% of the utility's last approved retail revenue requirement.[221] As discussed below, these incentives have not spurred significant investments in greenhouse gas emissions reduction projects.

b. Laws Focused on Encouraging Renewable Energy Development

In addition to direct regulation of energy sector greenhouse gas emissions, Oregon has adopted laws that indirectly address climate change by incentivizing or requiring development and installation of renewable technologies. The Oregon legislature has promoted renewable development through a renewable portfolio standard, a net metering policy, a pilot feed-in-tariff program to incentivize solar energy, and various tax credits, loans, and grants.

i. Renewable Portfolio Standard

Oregon adopted a renewable portfolio standard (RPS) in 2007. The RPS requires electric utilities to obtain a specified amount of their electricity from renewable energy sources by 2025.[222] For large utilities,[223] the RPS dictates that 25% of total retail electricity sales must come from qualifying renewable sources by 2025.[224] Small electric utilities that provide less than 1.5% of the state's total retail electricity sales are subject to a 5% RPS. [225] Small utilities that provide between 1.5% and 3% of the state's total retail electricity sales must meet a 10% RPS.[226] As a means of compliance with the mandate, the statute allows utilities to use renewable energy certificates (RECs), and directs ODOE to establish a system for using, trading, selling, or banking these RECs.[227] Pursuant to ODOE's REC regulations, each MWh of qualifying renewable electricity creates one REC, and utilities can purchase RECs to satisfy their RPS obligations.[228]

Electric utilities subject to the RPS must develop implementation plans for meeting their respective standards and file their plans with the PUC.[229] Utilities must review and update these implementation plans every two years. Each electric company and electric service provider subject to the RPS must also submit annual compliance reports to the PUC.[230]

ii. Net-Metering

Oregon enacted net-metering legislation in 1999 to encourage development of small-scale distributed renewable energy systems.[231] The law allows utility customers who have installed distributed energy systems, such as solar photovoltaic systems, to offset their electricity bills by the amount of energy they generate onsite. When a customer-sited system is generating electricity, the customer's electric meter essentially runs backwards, and the customer-generator only pays the utility for "net" electricity consumption during a billing period. The law is intended to incentivize consumers to invest in renewable energy systems by enabling net metering customers to effectively earn retail rates for the power generated by their systems, up to the point where their on-site generation equals their on-site electricity consumption.

Oregon's net metering policy applies to customer-sited generation from solar power, wind power, fuel cells, hydroelectric power, landfill gas, digester gas, waste, dedicated energy crops available on a renewable basis, geothermal energy, renewable marine energy, and low-emission, non-toxic biomass.[232] Oregon's net metering legislation only applies to qualifying renewable energy systems up to 25 kW in capacity. However, the law also authorizes the PUC to issue net metering rules for larger systems owned by customers of the state's investor-owned utilities.[233] PUC regulations currently allow systems up to 2 MW to qualify for net metering and establish additional eligibility requirements for net-metered renewable energy systems.[234] The net metering statute requires electric utilities to provide, at their own expense, meters that are capable of registering the flow of electricity both to and from the customer-generator.[235]

Dennis Schroeder, NREL (2011)

Net metering enables on-site solar power to offset retail electricity costs.

iii. Solar Incentive Pilot Program

Oregon also adopted legislation to encourage investment in solar photovoltaic systems generally. In 2009, the Oregon legislature directed the PUC to "establish a pilot program for each electric company to demonstrate the use and effectiveness of volumetric incentive rates and payments for electricity or for the non-energy attributes of electricity, or both, from solar photovoltaic energy systems that are permanently installed in this state by retail electricity consumers."[236] The PUC complied with this directive and established a solar Volumetric Incentive Rate (VIR) pilot program in 2010. PUC regulations set out specific qualifications for participating in the program and created mechanisms for operating the VIR program. Under the VIR program, eligible retail electricity customers with solar photovoltaic systems of up to 500 kW could earn incentive rates for each kWh they generate over a 15-year period.[237] However, the entire program was limited to 27.5 MW in total qualifying systems, and participation in the program was available via a lottery system during specified enrollment periods.[238] In July 2014, the VIR program had resulted in more than 23 MW of installed solar energy capacity,[239] and the PUC ordered that the remaining 4.5 MW in eligible capacity be installed by March 1, 2016.[240] The program is currently on target to meet its 27.5 MW cap by the end of 2015.

iv. Tax Incentives, Grants, Loans, and Rebate Programs

As a further means to promote energy efficiency, conservation, and renewable development, Oregon has adopted several laws that establish tax incentives, grants, and loan programs for investments in renewables and energy efficiency. The state's current tax credits include a Residential Energy Tax Credit (RETC), Energy Conservation Tax Credits for both individuals and corporations, and a biomass producer or collector tax credit.[241] The state also offers competitive grants and low-interest loans for eligible renewable energy projects. In addition to these state-administered incentive programs, customers of PGE and Pacific Power can receive cash rebates from the ETO for eligible renewable energy and energy efficiency investments.

The RETC offers homeowners income tax credits for eligible renewable energy and energy efficiency technologies.[242] The Energy Conservation Tax Credits offer personal and corporate tax credits for up to 35% of the cost of qualifying energy conservation projects, or a maximum of $7,000 for eligible projects with a total cost of less than $20,000.[243] The biomass producer or collector tax credit provides a corporate tax credit for agricultural producers or collectors of eligible biomass.[244]

Oregon also offers grants and loans for renewable energy projects. The state provides grants for installation or construction of renewable energy systems up to 35MW.[245] The state's Renewable Energy Development Grant Program offers competitive grants for eligible renewable energy projects; the grants are funded by the proceeds of tax credit auctions organized by ODOE and the Oregon Department of Revenue.[246] In addition to grants, Oregon law also offers low-interest loans for eligible renewable energy projects. Since 1979, Oregon's Small Scale Energy Loan Program has provided over $611 million[247] in low-interest loans to promote energy conservation and renewable energy resource development.[248]

In addition to these state tax credits, grants, and loans, customers of PGE and Pacific Power can also collect rebates for eligible investments in renewable energy and energy efficiency projects through the ETO. For example, ETO's Solar Electric Incentive Program allows residential solar owners to receive rebates of up to $6,600 (for Pacific Power customers) or $8,000 (for PGE customers) and offers generous rebates for larger solar projects installed by the utilities' commercial, industrial, agricultural, non-profit, and government customers.[249] These rebates are funded through the public purpose charge established by Oregon's 1999 energy restructuring law.[250]

c. Laws Focused on Energy Conservation and Energy Efficiency

In 1975, the Oregon legislature began to enact legislation aimed at increasing energy efficiency and promoting energy conservation. The earliest legislation recognized the growing demand for fossil fuels and the associated environmental, social, and financial impacts on the state and its residents. The Oregon legislature thus

declared a goal to promote efficient and sustainable use of resources for the benefit of future generations and created ODOE to influence these goals.[251] While the 1975 law did not intentionally address global warming or climate change, more recent energy laws explicitly aim to mitigate climate change by reducing the total amount of energy consumed in the state. The Oregon legislature adopted legislation in 1981 that directs utilities to have residential and commercial energy conservation and efficiency programs. More recently, the state adopted energy efficiency standards for certain appliances. In addition, the public purpose charge established through Oregon's 1999 electricity restructuring act funds energy efficiency programs administered by ETO.

i. Residential and Commercial Energy Conservation Programs

The Residential Energy Conservation Act, enacted in 1981, requires investor-owned utilities[252] and publicly owned utilities[253] to have conservation programs in place for residential customers. These energy conservation programs must provide consumers with information about energy conservation measures and available financing.[254] The programs must also offer energy audits and other technical advice on energy conservation.[255] The statute also requires utilities to provide financing options for energy efficiency upgrades, which include offering low-interest loans or small cash payments.[256] The utilities must verify by inspection that utility-financed conservation measures are installed.[257]

Oregon law also directs utilities to establish conservation programs for commercial customers.[258] Gas and electric utilities must develop plans that outline how the utilities will provide commercial customers with information about conservation measures, offer energy audits, and notify customers of these services.[259] The utilities must submit these plans to the PUC for approval, and they must actively notify customers of the availability of the services the utility provides under the program.

ii. Energy Efficiency Standards

Oregon has adopted energy efficiency standards for appliances and equipment and established a process for adopting energy conservation and efficiency standards for new and reconstructed buildings.

In 2005, the Oregon legislature adopted House Bill 3363, which established energy efficiency standards for certain new products and appliances[260] and directed ODOE to periodically review and update those standards.[261] ODOE complied with this requirement in 2008 and adopted regulations establishing minimum energy efficiency standards for, among other things, televisions, commercial clothes washers, traffic signal modules, commercial and walk-in refrigerators and freezers, and unit heaters.[262] These products must be registered as compliant on a multi-state compliance website to be sold or installed in Oregon.[263]

In 2009, Oregon adopted Senate Bill (SB) 79, which included a number of provisions designed to increase energy efficiency in

buildings.[264] SB 79 directed the Director of the Department of Consumer and Business Services to adopt uniform energy conservation standards to include in the state building code.[265] The Director must periodically review these standards and propose updates to "encourage continual improvements in building energy efficiency."[266] The Director must also consult with ODOE and adopt amendments to the state building code to increase energy efficiency in new and renovated buildings.[267] The *Oregon Energy Efficiency Specialty Code* establishes uniform energy efficiency standards for residential and commercial buildings.[268] The *Code*, which largely follows the *2009 International Energy Conservation Code*, was adopted by the Oregon Building Codes Division pursuant to the directives established by SB 79.[269]

SB 79 further required the Director of the Department of Consumer and Business Services to adopt and administer a separate code, known as the REACH Code, to increase energy efficiency in "newly constructed, reconstructed, altered, or repaired" buildings.[270] The REACH Code establishes "a set of statewide optional construction standards and methods that are economically and technically feasible."[271] The REACH Code is largely based on the *International Green Construction Code*.[272]

iii. The Public Purpose Charge and Energy Trust of Oregon Energy Efficiency Programs

Oregon's 1999 energy restructuring law established an annual expenditure standard for Oregon's electric companies to fund "new cost-effective local energy conservation, new market transformation efforts, the above-market costs of new renewable energy resources and new low-income weatherization."[273] Under the 1999 restructuring law, Oregon's investor-owned utilities must collect a public purpose charge equal to 3% of the utilities' annual retail revenues, and must allocate 63% of these funds towards energy conservation and market transformation.[274] Today, the public purpose charge revenues fund residential and commercial energy conservation and renewable energy programs administered by ETO.[275]

Oregon's 1999 restructuring law also established a 2009 sunset date for the public purpose charge. The Oregon Renewable Energy Act of 2007 (SB 838) subsequently extended the public purpose charge through January 1, 2026.[276] In addition to establishing Oregon's RPS, SB 838 also authorized the PUC to allow investor-owned utilities to recover their expenditures for cost-effective energy conservation measures and weatherization programs through from ratepayers.

Under the energy efficiency programs administered by ETO and funded through the public purpose charge, residential customers of Oregon's investor-owned utilities can receive cash incentives for investments in energy efficient lighting, water heating, weatherization (including insulation, efficient windows, and air duct sealing), heating, showerheads, and appliances.[277] Commercial customers can receive cash incentives for energy efficient equipment upgrades, remodels, and new construction.[278] ETO also provides industrial and agricultural businesses with technical assistance and cash incentives to increase energy efficiency.[279]

The Energy Trust may only invest public purpose charge revenue in "cost-effective"

energy efficiency measures. In 1994, the PUC established cost effectiveness guidelines that currently direct ETO's cost calculations for energy efficiency investments.[280] Under UM 551, ETO must apply a "total resource cost test" to "determine if energy efficiency measures and programs are cost effective."[281] ETO has adopted a cost effectiveness policy that applies two tests to determine whether energy efficiency measures comply with the PUC's cost effectiveness criteria.[282] These tests aim to measure the total costs associated with an efficiency measure, including costs to ETO and participants. The tests then compare the total costs to the measure's benefits, which include, for example, the avoided cost of the electricity and/or natural gas energy that is saved through deployment of the efficiency measure, and any non-energy benefits resulting from the measure.[283]

In addition to establishing the total resource cost test for efficiency investments, UM 551 also established a series of exceptions that allow utility and ETO programs to include energy efficiency measures that are not cost effective.[284] Under these exceptions, ETO can provide incentive payments for a measure that, for example, "produces significant non-quantifiable non energy benefits" or "helps to increase participation in a cost effective program."[285] Guidelines adopted by the PUC and ETO in 2005 further establish that ETO "pilot projects, educational programs, demonstrations, or similar endeavors" need not be cost effective.[286]

When ETO seeks to offer an incentive for an efficiency measure that appears eligible for one of the exceptions under UM 551, it requests approval from the PUC. The PUC has granted exceptions for a number of energy efficiency measures, including residential ceiling insulation, air and duct sealing in manufactured homes, certain water

heaters, and spa covers.[287] However, ETO's *2015–2019 Strategic Plan* indicated that the PUC's cost-effectiveness criteria may limit ETO's investments in efficiency projects.[288] According to the *Strategic Plan*, ETO projects could save an additional 25 average megawatts of electricity and 4.5 million annual therms of natural gas "if several promising technologies become cost-effective in the next five years, one or more large electric efficiency opportunities emerge, and the OPUC reinterprets or revises cost-effectiveness criteria."[289]

The PUC's cost-effectiveness requirement is largely dictated by Oregon's statutory energy conservation policies, which require that "cost-effectiveness be considered in state agency decision-making relating to energy sources, facilities or conservation."[290] The statute further states that "'cost-effective' means that an energy resource, facility or conservation measure during its life cycle results in delivered power costs to the ultimate consumer no greater than the comparable incremental cost of the least cost alternative new energy resource, facility or conservation measure."[291] If the cost-effectiveness requirement is indeed limiting energy efficiency investments, the PUC should consider whether it has discretion to include the cost of carbon in its calculation of the least-cost alternative resource.

B. The Transportation Sector

Oregon's transportation sector includes the state's ground, freight, and air transportation systems. The Oregon Department of Transportation (ODOT) is the state agency responsible for administering Oregon laws relating to the transportation sector, except for the Clean Fuels Program.[292] ODOT has authority to develop strategies to address greenhouse gas emissions from the state's transportation systems. It has exercised this authority primarily through the Sustainable Transportation Initiative discussed below. DEQ, in turn, has complemented ODOT's efforts with its work to implement the Clean Fuels Program.

1. The Oregon Department of Transportation

ODOT develops programs relating to the state's public transportation systems and services. ODOT's mission is to "provide a safe, efficient transportation system that supports economic opportunity and livable communities for Oregonians."[293] ODOT aims to "balance economic, environmental and community well-being in a manner that protects the needs of current and future generations." The Director of ODOT serves as an ex officio member of the OGWC.[294]

The Oregon Sustainable Transportation Initiative[295] required the Oregon Transportation Commission[296] to develop a strategy for the transportation sector to help achieve the state's greenhouse gas emissions reduction goals. The law requires ODOT to work with the Department of Lands, the EQC, and ODOE to develop alternative land use and transportation strategies to reduce greenhouse gas emissions. In 2013, ODOT issued the *Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reduction*.[297] The report offers strategies for the state's transportation sector to meet Oregon's goal to reduce greenhouse gas emissions 75% below 1990 levels by 2050. However, ODOT's strategy would attain only a 60% reduction by 2050, which represents the level of emissions reductions ODOT considers "plausible" for the transportation sector. The report's key strategies included increased fuel efficiency, use of low-carbon fuels, systems and operations performance improvements that increase efficiency and reduce emissions, increased use of mass transit, efficient land use and development, and alternative pricing, funding, and market mechanisms and incentives.

2. Oregon Clean Fuels Program

The Oregon legislature enacted and recently renewed a law aimed at reducing emissions from the transportation sector. In 2009, House Bill 2186 authorized, but did not require, the EQC to adopt regulations requiring low-carbon fuel standards for gasoline, diesel gas, and gasoline substitutes.[298] The EQC promulgated regulations implementing the "Oregon Clean Fuels Program" that same year.[299] DEQ is responsible for implementing the EQC's Clean Fuels Program regulations.[300]

The purpose of Oregon's Clean Fuels Program is to reduce the amount of greenhouse gas emissions in transportation fuels by 10% below 2010 levels within 10 years.[301] To achieve this goal, the program requires all fuel producers or importers to register each fuel type they offer with the state and to demonstrate compliance with defined standards[302] by either importing cleaner fuel or by obtaining offsets.[303] The program exempts a number of fuel types from regulation. For example, fuels produced in small volumes and fuels used in aircraft, racecars, military vehicles, locomotives, certain ocean-going vessels, farm tractors, implements of husbandry, and logging trucks are exempt from the program.[304]

The Clean Fuels Program was originally scheduled to sunset in 2015. However, the legislature extended this sunset date through its adoption of Senate Bill 324 in 2015.[305] During the remainder of the 2015 legislative session, Oregon lawmakers debated repealing the Clean Fuels Program in favor of an alternative transportation bill.[306] While the program survived this legislative challenge and a lawsuit filed in federal court, oil and transportation companies have sought to eliminate the program through a lawsuit pending in state court, as well as several proposed ballot initiatives.[307] Thus, the future of Oregon's Clean Fuels Program remains uncertain.

State Agencies Responsible for Implementing Oregon's Climate Policies Within the Transportation Sector

Oregon Department of Transportation

- Develops transportation programs for Oregon's vehicle, rail, and public transportation systems
- Issued the Oregon Statewide Transportation Strategy: A 2050 Vision for Greenhouse Gas Emissions Reduction

Oregon Department of Environmental Quality

- Implements Oregon's Clean Fuels Program

C. The Land Use Sector

Oregon's anthropogenic land use sector emissions primarily derive from the state's agriculture and forestry industries, as well as other land management, development, and conversion practices that release greenhouse gas emissions. The primary agencies responsible for administering Oregon climate laws pertaining to the land use sector include the Oregon Department of Forestry, the Oregon Department of Agriculture, the Oregon Water Resources Department, and the Oregon Department of Land Conservation and Development. The Oregon legislature has not adopted any comprehensive legislation to address greenhouse gas emissions and climate impacts relating to the land use sector. However, Oregon law does authorize the Department of Forestry to develop a forest carbon offset market, and the state's comprehensive land use planning law authorizes the Oregon Department of Land Conservation and Development and the state's local governments to develop land use plans that address climate change impacts.

1. The Forestry Sector

The Oregon Department of Forestry (ODF) is the state agency that regulates activities on public and private forestlands within the state. ODF's mission is to "serve the people of Oregon by protecting, managing, and promoting stewardship of Oregon's forests to enhance environmental, economic, and community sustainability."[308] The Department manages 818,000 acres of state-owned forestlands and administers the Oregon Forest Practices Act, which regulates forest management practices on state and private land. ODF works to coordinate statewide forest resource policies among the state's natural resource agencies. The State Forester,[309] who is appointed by the State Board of Forestry, directs ODF and is an ex officio member of the OGWC.

The Oregon legislature has been slow to adopt policies to address greenhouse gas emissions from the land use sector. Although Oregon adopted legislation in 2001 that attempted to create a market for forest carbon offsets, it has not been implemented. The law allows the State Forester to enter into agreements with nonfederal forest landowners to buy or sell forest carbon offsets.[310] The legislation also directs the State Forester to develop an accounting system for this market,[311] and it authorizes the State Board of Forestry to "develop administrative rules defining principles and standards relating to creation, measurement, accounting, marketing, verifying, registering, transferring, and selling…forestry carbon offsets from nonfederal forestlands."[312] Although the State Forester's duty to develop an accounting system is mandatory under the language of the statute, the State Forester has discretion to promulgate rules implementing the carbon offset program and to actually enter into offset agreements. To date, the only mention of carbon offsets in ODF's rules is the statement that "the State Forester may establish an interest in the rights to Carbon Offsets accruing to the Forest Stand through… [agreements for forestry carbon offsets], provided such action by the State Forester does not interfere with

or affect the Harvest and sale of Forest Products by the Landowner."[313]

The State Forester has not implemented Oregon's Carbon Offset program. Instead, Oregon has relied on a California forest carbon offset protocol to establish standards for Oregon forests. In 2011, California developed a compliance offset protocol to comply with the California Global Warming Solutions Act (AB 32) and its implementing regulations. AB 32 (discussed in greater detail in Part V) allows regulated parties to use compliance offsets from forest CO_2 sequestration activities in any state in the contiguous United States, so long as the offsets satisfy California's offset protocol. [314] Rather than develop its own program—which would arguably be pointless due to the weak offset incentives in Oregon—ODF has essentially allowed California's protocol to govern offset requirements within Oregon.

2. The Agriculture Sector

The Oregon Department of Agriculture is a state agency that regulates activities within the agricultural sector. The Department's mission is to "ensure food safety and provide consumer protection; protect the natural resource base for present and future generations of farmers and ranchers; and promote economic development and expand market opportunities for Oregon agricultural products."[315] The governor appoints the Department of Agriculture's Director,[316] who serves as an ex officio member of the OGWC. A 10-member state Board of Agriculture advises and provides recommendations to the Department of Agriculture on policy issues.[317] Oregon has not enacted laws aimed specifically at reducing emissions from the agriculture sector or increasing the sector's ability to serve as a more robust "sink" for CO_2.

3. Water Resources

The Oregon Water Resources Department is a state agency tasked with protecting the state's water resources. This Department is responsible for administering rules established by Oregon's Water Resources Commission governing supply and management of Oregon's surface and groundwater resources.[318] The Department's Director is appointed by the governor for a four-year term and also serves as an ex officio member of the OGWC. As noted above, the Water Resources Department has conducted analyses of the impacts of climate change on Oregon's water resources and proposed strategies to adapt to these impacts. The Department has not focused on climate change mitigation.

4. Comprehensive Land Use Planning

Oregon has adopted a land use law that requires comprehensive land use planning on the state and local levels. The law directs state and local governments to adopt comprehensive land use plans for cities, counties, regional areas, and the state.[319] These plans must provide "the basis for more specific rules and land use regulations which implement the policies expressed through the comprehensive plans."[320] Oregon's land use law also declares, "the land use program should, but is not required to, help communities achieve sustainable development patterns and manage the effects of climate change."[321]

The Oregon Department of Land Conservation and Development (DLCD) administers the statewide land use program, which requires all of Oregon's cities and counties to adopt comprehensive land use plans that comply with 19 mandatory Statewide Planning Goals.[322] The comprehensive plans must identify the cities' or counties' energy and environmental needs.[323] The Planning Goals also state that lands and land uses "shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles."[324] The DLCD's Planning Services division provides "technical expertise and services" to assist local governments with their planning efforts, which includes efforts to mitigate climate change.[325]

SB 1059, which was enacted in 2010, also directed the DLCD to work with ODOT and local metropolitan governments to develop strategies to reduce greenhouse gas emissions through land use and transportation planning. [326] The law also directed the DLCD to set targets for greenhouse gas emissions from vehicles in the state's five metropolitan planning regions. In addition, SB 1059 directed the DLCD to assist ODOT and the Oregon Transportation Commission in developing Oregon's *Statewide Transportation Strategy*.

State Agencies Responsible for Implementing Oregon's Climate Policies Within the Land Use Sector

Oregon Department of Forestry
- Coordinates forest resource policies
- Has authority to develop a forest carbon offset program

Oregon Department of Agriculture
- Regulates activities within Oregon's agricultural sector

Oregon Water Resources Department
- Implements policies regulating Oregon's water supply and management

Oregon Department of Land Conservation and Development
- Administers Oregon's comprehensive land use planning program

IV. Analysis of Oregon's Existing Climate Policies

Oregon's existing climate policies are not comprehensive, coordinated, or ambitious enough to effectively put the state on a trajectory to achieve its 2050 greenhouse gas reduction goals. According to the OGWC's *2015 Report to the Legislature*, if the state continues on its current, business-as-usual emissions trajectory (which reflects the emissions reductions achieved under Oregon's current climate policies), it will exceed its 2020 goal by 11 million metric tons of CO_2e, and exceed its interim 2035 goal by 32 million metric tons of CO_2e.[327] Oregon's lack of a mandatory, comprehensive climate policy significantly limits the state's ability to effectively address climate change. Oregon's greenhouse gas reduction goals are not mandatory or enforceable, and the state lacks a comprehensive climate policy framework that addresses emissions from all sectors. In addition to this impediment, several features of Oregon's existing climate policies impede the state's ability to meet its greenhouse gas reduction goals. First, the OGWC lacks the necessary regulatory authority and funding that would enable it to effectively implement or enforce Oregon's emissions reduction goals. Second, Oregon's policies addressing energy sector emissions lack sufficient strength, scope, and ambition to meaningfully reduce emissions from this sector. Finally, Oregon has failed to adequately address and control emissions from the transportation and land use sectors. The following sections describe the strengths and weaknesses of Oregon's existing climate policies in greater detail.

A. The Strengths and Weaknesses of the Oregon Global Warming Commission

Since its creation in 2007, the OGWC has accomplished a great deal. Its *2020 Roadmap* laid out a clear framework for reducing Oregon's greenhouse gas emissions, and the Roadshow created an essential format for public outreach and communications. In addition, the OGWC's biennial reports to the legislature have provided detailed and useful information about Oregon's progress and setbacks in meeting its 2020 and 2050 greenhouse gas goals. The OGWC's accomplishments are particularly impressive due to the volunteer status of its members and the fact that it receives no direct public funding and very little public support. However, the current

structure and funding of the OGWC are not sustainable over the long-term, and they will constrain the OGWC's capacity to support Oregon's efforts to achieve its greenhouse gas reduction goals.

1. The OGWC Lacks Legislative Authority

The OGWC is both a policy body and an analytical resource. In its role as a policy body, the OGWC conducts objective analyses of the state's key policy and programmatic initiatives and determines whether such policies and initiatives are consistent with Oregon's climate change goals.[328] In its role as an analytical resource, the OGWC provides policymakers, stakeholders, and the general public with information and data on climate change and its impacts in Oregon. In these roles, the OGWC endorses state policies and initiatives that help Oregon achieve its climate goals, and, if appropriate, recommends that policymakers revise or repeal policies that conflict with the state's climate objectives.[329] This dynamic, in which the OGWC is tasked with making policy recommendations concerning complex scientific processes with significant economic and political implications for the state, has both strengths and limitations.

As a strength, the broad language of HB 3543[330] provides the OGWC with substantial flexibility. Under the terms of the legislation, the OGWC may pursue a variety of actions and may choose to address greenhouse gas emission reduction efforts that range from all encompassing to very specific. However, this broad authority also acts as a double-edged sword. The OGWC's charge is quite vague, which leaves it in the position of defining its own responsibilities to reduce Oregon's emissions and assess and prepare for the effects of global warming. Although the OGWC has exercised its discretion very effectively so far, too much discretion may impede the OGWC's ability to focus or achieve results if different OGWC members have conflicting priorities.

From the actions of the OGWC thus far, it is clear that it has effective policymaking capabilities, as illustrated by its creation of noteworthy plans of action such as the *Roadmap to 2020* and more. However, the OGWC does not have any regulatory authority. It only has the authority to make policy recommendations for others to adopt and implement.[331] The OGWC lacks the ability to transform its findings and conclusions, many of which are vital to meeting Oregon's goals, into action. Accordingly, the OGWC is dependent on Oregon's agencies and policymakers to implement its recommendations. The effects of these limitations are evident in Oregon's failure to enact many of the recommendations presented in the OGWC's *Roadmap to 2020*. The OGWC's *2013 Report to the Legislature* indicated that Oregon remains on a business-as-usual emissions trajectory and revealed that nearly half of the key actions outlined in the *Roadmap* had not been implemented by the state.[332] Despite these findings, however, the OGWC's only real remedy was to report these shortfalls to the legislature.

In assessing the authority of the OGWC, it is also essential to recognize the underlying limitations of the greenhouse gas emission goals established under HB 3543. Oregon's greenhouse gas emission reduction goals are non-binding and do not mandate specific action. Rather, they are designed to influence and guide the actions of the state

government, local businesses, nonprofit organizations and Oregonians in general. Because HB 3543 failed to create firm and enforceable greenhouse gas emissions targets, the OGWC's potential to affect meaningful change is substantially constrained.

2. The OGWC Lacks Sufficient Funding

The OGWC's lack of state funding is a major impediment to its work. The OGWC receives no funding for any full-time staff fully devoted to the OGWC. The OGWC's members volunteer their time and only receive funded staff assistance when employees at other agencies, such as ODOE, have availability to work on OGWC projects. Moreover, members of the OGWC have had to invest their own time and energy seeking outside resources from charitable organizations to fund basic operational functions, such as creating a website and conducting the Roadshow.[333] These fundraising obligations diminish the OGWC's ability to perform its substantive work and deplete the already-taxed capacity of the OGWC's volunteer taskforce.

The impacts of limited funding can be seen in the OGWC's own reports. For example, in its *2013 Report to the Legislature*, the OGWC noted that its work was limited by budget constraints.[334] Furthermore, in the compiled *Roadmap to 2020* survey results—a survey that was funded through private sources—the OGWC also noted that its limited financial resources were not sufficient to support the OGWC's ambitious goals.[335]

Private funding alone cannot substitute for government funding to provide the base level of support required by the OGWC. The OGWC requires financial resources to plan for and carry out the activities necessary to accomplish its legislative directives and satisfy the intent of HB 3543.[336] For the OGWC to succeed, the state must provide additional support.

3. Ability to Influence

The OGWC has exercised its influence in a few key ways. First, the OGWC has evolved into a platform for proposing and developing strategies to achieve Oregon's greenhouse gas goals and for maintaining a public focus on these goals. Second, the OGWC has collaborated with other organizations in various efforts to address climate change. For example, the OGWC participated in the development of Governor Kitzhaber's *10-Year Energy Action* Plan and the *Statewide Transportation Strategy*. According to the OGWC's *2013 Report to the Legislature*, a number of the OGWC members were involved in these major stakeholder processes.

Third, the OGWC's most influential accomplishment has been the development of the *Roadmap to 2020*. The recommendations incorporated in the *Roadmap* have been described as "exemplary" and the *Roadmap* has influenced several Oregon agencies and actions.[337] Both the *Statewide Transportation Strategy*[338]and ODOE's *GHG Marginal Abatement Cost Curve*[339] referenced and used data presented

in the *Roadmap*. Additionally, utility integrated resource plans reference the *Roadmap's* goals.[340] More recently, the Clean Fuels Program was kept alive in part thanks to the *Roadmap's* recommendation to use the program to advance the objectives of HB 3543. Thus, the OGWC clearly has the ability to influence other Oregon actors.

However, neither the *Roadmap* nor the other work of the OGWC has substantially impacted business-as-usual activities or reformed existing agency practices. This policymaking inertia is not surprising. As Part III explained, Oregon's agencies have their own legislative mandates to fulfill, and unless they are bound by clear legislative directives to reduce greenhouse gas emissions from all sectors, climate change will not necessarily be a priority. Agencies have discretion to disregard any OGWC recommendations that seem to conflict with the agencies' own substantive mandates. Moreover, as the following section explains, Oregon's sector-specific climate laws fall far short of the practices the OGWC has recommended. Unless and until a comprehensive climate policy framework is adopted in Oregon that requires mandatory mitigation action, and unless and until the OGWC has the authority and funding it needs to develop and implement enforceable recommendations, the OGWC's work will not achieve the objectives described in HB 3543.

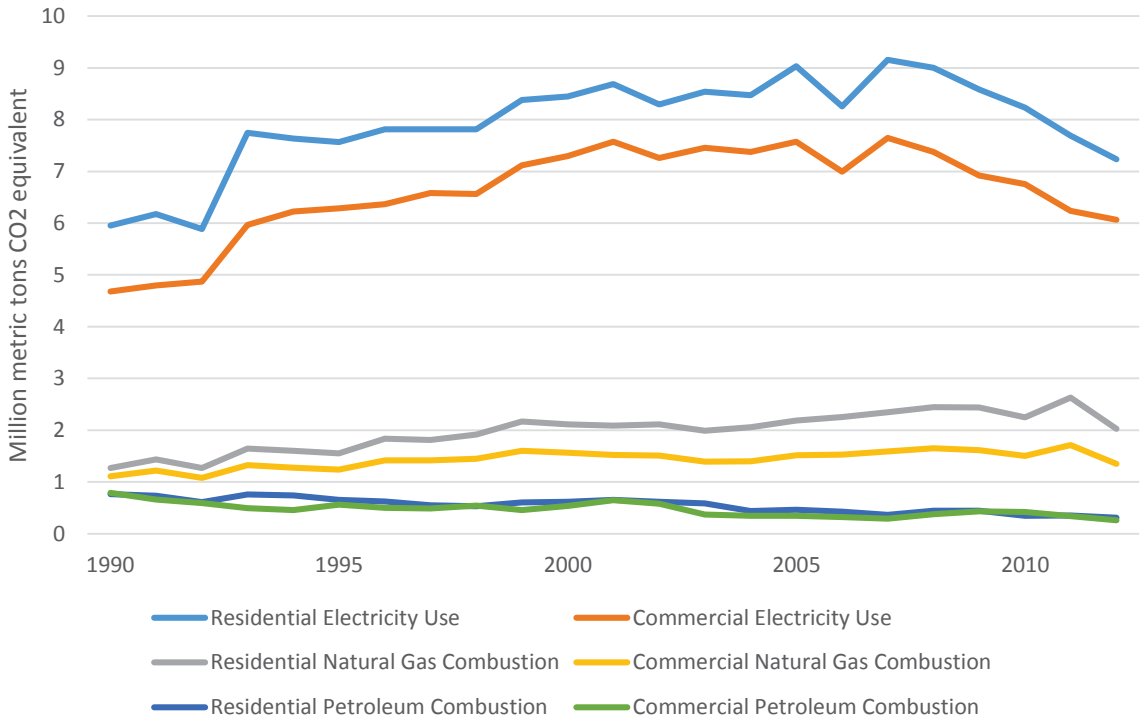
B. Analysis of Oregon's Sector-Specific Climate Policies

The vast majority of Oregon's existing climate policies aim to reduce greenhouse gas emissions from the state's energy sector. The Oregon legislature has followed two distinct approaches to control energy sector emissions. First, the state has adopted legislation that directly limits emissions from fossil fuel-fired electricity generation. Second, the state has attempted to reduce emissions by replacing fossil fuel generation with renewable energy and reducing demand for fossil fuel generation through energy conservation and efficiency. While these two strategies generally have the potential to drastically reduce the emissions intensity of the energy sector, Oregon's policies fail to achieve their full potential. Beyond the energy sector, Oregon has failed to adequately address emissions from the transportation and land use sectors.

1. Energy Sector

The energy sector is the most heavily regulated sector under Oregon's existing climate laws and policies. This sector includes electricity generation, as well as natural gas for home heating. As discussed above,[341] Oregon has adopted a number of strategies to address emissions from this sector. To summarize, the state regulates energy sector CO_2 emissions through an emission standard for new natural gas power plants, an emission standard for coal-fired power plants, and a voluntary emission reduction program for natural gas utilities. In addition, the Oregon legislature has adopted a number of laws and programs to require or incentivize investments in renewable energy and energy efficiency. However, these

FIG. 4 Oregon Residential and Commercial Energy Sector Emissions



Oregon Global Warming Commission *2015 Report to the Legislature, fig. 4* (2015)

strategies alone are not likely to achieve Oregon's greenhouse gas reduction goals.

To achieve the state's greenhouse gas goals, the OGWC's *2015 Report to the Legislature* proposed that Oregon's two largest electric utilities, Pacific Power and Portland General Electric (PGE), reduce their emissions by 80% below 2005 levels by 2035.[342] The OGWC estimated that both utilities could achieve their interim 2035 goals if they switched their percentages of Oregon load currently served by coal-fired power to natural gas-fired power. However, according to the OGWC's report, even if Pacific Power and PGE replaced all their coal-fired generation with natural gas-fired generation, complied with their renewable portfolio standards, and continued their energy efficiency programs, the utilities are not expected to meet the emission reduction goals defined in the *2015 Report*.[343] This is because Oregon's electricity consumption is projected to increase between 2035 and 2050, and the emissions from the utilities' replacement natural gas-fired generation would likely exceed the levels necessary to achieve the 2050 goal.[344]

This section explains why Oregon's existing energy-sector laws are not sufficient to reduce greenhouse gas emissions by 80% by 2050. The emission limitations for natural gas and coal-fired electricity, as well as natural gas for heating, are weak and ineffective. Moreover, Oregon's renewable policies are not strong enough to encourage adequate development of renewable energy. Finally, even with the implementation of the federal Clean Power Plan in Oregon, the state is unlikely to reach its 2050 emission reduction goal.

a. Oregon's Emission Reduction Laws for the Energy Sector are Weak and Ineffective

Oregon has three policies that regulate emissions from different sources within the energy sector. The first policy limits emissions from coal-fired power plants. The second policy limits emissions from new natural gas power plants. Finally, the third policy creates a purely voluntary emission reduction program for natural gas utilities that provide gas for heating. All three laws, which are described in Part III above, are ineffective to meet Oregon's emission goals.

i. Oregon's Emissions Limits for New Coal-Fired Power Plants Do Not Address Existing Sources

First, with respect to coal-fired power plants, investor-owned and consumer-owned utilities are prohibited from building any new power plants or entering into new power purchase agreements unless the plant's emission rate is 1,100 lbs. CO_2/MWh or less.[345] Because new coal-fired power plants generally cannot meet this standard,[346] this law effectively prohibits new long-term power purchase agreements for coal-generated electricity. While the standard laudably prohibits the construction of new coal plants in the state, it does nothing to actually reduce Oregon's existing in-state and imported coal-fired power emissions. It does not prohibit the use of coal in existing power plants owned by the utilities, nor does it prohibit the purchase of coal-fired power through purchase agreements made prior to the law's passage in 2009. Indeed, Oregon still gets over 30% of its electricity from coal,[347] much of which is generated outside of Oregon, yet consumed inside the state. This failure to address existing in-state plants, utility-owned out-of-state plants, and existing power purchase agreements contributes to the state's trajectory to greatly exceed its 2050 goal, particularly when consumption-based emissions are taken into account. To produce a decrease in emissions necessary to meet Oregon's emission targets, Oregon needs a mechanism to address these sources.

ii. Oregon's CO_2 Emissions Standard for Fossil Fuel-Fired Plants is Poorly Designed

Second, with respect to baseload natural gas-fired power plants and non-baseload power plants, EFSC siting certification requirements mandate that new energy facilities meet certain emission standards or purchase offsets to meet these standards.[348] Like the standard for coal-fired plants, the standard for natural gas plants only applies to new plants, and the law's siting limitations only apply to facilities located in Oregon. Out-of-state natural gas-fired generating units do not require EFSC certification, even if the facilities are owned by Oregon utilities and produce power that is consumed within the state's borders.

Oregon's CO_2 emissions standards for new electricity generating facilities are also inadequate due to offset rules. The law allows power plant owners to purchase emissions offsets to meet their standards, but the statutorily prescribed cost to obtain these offsets is far less than the actual cost of implementing projects to offset the plants' emissions. As discussed above,[349] EFSC requires new energy facilities to demonstrate compliance with carbon dioxide emission standards. All new facilities to date have chosen to demonstrate their compliance by paying a monetary offset rate "deemed sufficient to produce the reduction in greenhouse gas emissions necessary to meet the applicable carbon dioxide emission standard." [350] The funds collected through this so-called "monetary path" to compliance are paid to the Climate Trust, which then uses 80% of the money to secure project contracts to offset emissions, and the remaining 20% to monitor those projects.[351] The process by which the Climate Trust obtains offsets is neither quick nor cheap. After receiving the funds from proposed new energy facilities, the Climate Trust must solicit contracts for offset projects, respond to proposals, conduct due diligence, present findings to and get the project approved by the Climate Trust programs committee, and monitor and verify that the project is actually moving forward and producing offsets.[352]

The monetary offset rate of $1.27/ton of CO_2[353] falls well short of the average of $4.32/ton average the Climate Trust has historically paid to actually obtain the offsets.[354] In practice, this means that the amount of offsets necessary to meet the statutory emission standards are never actually obtained. According to its most recent report to EFSC, the Climate Trust has only been able to secure 45% of the total volume of emission reductions for new facilities to meet the statutory emissions standard.[355] This speaks to the failure of the statute and of EFSC to ensure that the monetary rate is actually set at a rate "sufficient to produce the reduction in greenhouse gas emissions necessary to meet the applicable carbon dioxide emission standard." [356]

In addition, the statute is not well tailored to help Oregon meet its greenhouse gas emissions targets because it fails to ensure that offsets occur within the state. While the statutory offset provision may help achieve the larger goal of mitigating global climate change, it does not ensure that emissions within Oregon are offset by projects located in Oregon. Because the statute does not contain a geographic requirement, many of the emissions reductions achieved by the Climate Trust's projects have occurred outside of Oregon. According a Climate Trust report, although 51% of the Climate Trust's funds from the program have been spent instate,[357] only 11% of the tons of CO_2 retired from active projects actually offset Oregon's in-state emissions.[358] Thus, not only does the statute fail to ensure that emission reductions actually occur within the state, but it also fails to provide the Climate Trust with enough capital to obtain those in-state offsets, which may be more costly than out-of-state offsets.

Finally, the statute does not contain any requirements regarding the types of projects that qualify to offset emissions, how these offsets must be verified, or how permanent the projects must be. The Climate Trust has recently focused on forestry-related offset projects,[359] which currently account for 79% of the applied CO_2 emissions from active projects.[360] These types of projects presumably enable the Climate Trust to obtain the greatest amount of offsets with the limited amount of capital it receives under the statutory scheme. However, forest carbon sequestration projects are susceptible to fire, disease, and pest outbreaks, which can quickly negate a project's emissions

offsets.[361] While the forest offset projects funded by the Climate Trust incorporate measures to protect the integrity of their offsets, such as buffer pools, easements, and other binding agreements to account for unexpected events and protect against certain risks,[362] these efforts cannot entirely ensure the permanence of the projects' offsets.

Since fossil fuel-fired power plants must only pay the Climate Trust once to obtain EFSC certification, the risks that offsets will fail are passed onto society, rather than to the plant owners. Thus, although the Climate Trust has many innovative and valuable offset projects currently operating to reduce emissions, the existing statutory scheme is poorly designed to help Oregon meet its emission reduction goals.

iii. Oregon's Voluntary Emissions Reduction Program is Ineffective

Oregon's third law regulating energy sector emissions, the voluntary emission reduction program, is ineffective without meaningful incentives. As discussed above, Oregon created a program in 2013 to incentivize natural gas utilities to invest in projects to reduce emissions.[363] As part of the program, the PUC was directed to study and report to the legislature on whether existing law provides adequate incentives for natural gas utilities to actually invest in such projects voluntarily.[364] In its first report, the PUC unequivocally concluded "that no law, rule, or regulation now provides adequate incentive for Oregon's natural gas utilities to invest in projects that reduce [greenhouse gas] emissions in the ordinary course of business."[365] The PUC expressed hope that with the proper financial incentives, natural gas utilities would voluntarily reduce emissions. NW Natural, Oregon's largest natural gas utility, met with the PUC and other stakeholders to discuss possible emission reduction projects, but as of early 2015 these projects were still in the investigatory phase.[366] Since these emission reduction projects would not otherwise be economical under current market conditions, the PUC interpreted NW Natural's decision to investigate the projects as a sign that voluntary program has potential for success. However, because the program is entirely voluntary and financial incentives are determined on a case-by-case basis, it does not create sufficient regulatory certainty to achieve meaningful, long-term emission reductions.

Oregon's policies focused directly on reducing emissions from the energy sector are not comprehensive, tailored, or ambitious enough to enable Oregon to meet its emission goals. Under the state's existing laws, coal will not be retired quickly enough, compliance with standards for new fossil fuel-fired power plants occurs through a poorly designed offset scheme, and natural gas utilities have only a voluntary program to reduce emissions. Oregon is not on track to meet its reduction goals for the energy sector, and these laws cannot put the state on track for successful emissions reductions.

b. Oregon's Renewable Energy Mandates and Incentives are Not Ambitious or Effective Enough to Encourage Widespread Deployment of Low-Carbon Generation

Oregon's renewable energy policies also have the potential to be more effective. First, Oregon's net metering law is too restrictive to enable community solar projects or encourage investments in solar projects that are not installed on a utility customer's own property. Second, Oregon's generous solar volumetric incentive rate pilot program is expiring. Third, Oregon's RPS is not ambitious enough to incentivize the level of renewable energy deployment that would enable Oregon to meet its 2050 goal. Finally, Oregon's piecemeal renewable energy policies create an uncertain regulatory environment that discourages investment in renewable energy projects.

First, Oregon's net-metering policy discourages a substantial amount of solar development, because it only allows for on-site net metering. As discussed in more detail above,[367] the law allows solar owners to earn a credit from utilities for the surplus renewable energy they generate on-site. While the law certainly provides an incentive for some utility customers to install solar panels, it requires that the customer have a suitable site for solar development, such as an un-shaded roof. In fact, a 2008 study by the National Renewable Energy Laboratory found that only 22% to 27% of the country's total residential rooftop area is suitable for solar PV installation.[368] Moreover, prospective solar owners who live in condominiums or other units without separate roofs may want to support a shared rooftop solar array. Other states, such as Colorado, have seen an explosion of "community solar" projects or "solar gardens" where people without solar-suitable roofs can pool resources and construct solar off-site.[369] Oregon law, however, currently impedes community solar development, because unlike Colorado,[370] Oregon does not allow "virtual" net metering. Virtual net metering allows customers to get a credit on their utility bills for energy produced by a shared, off-site solar project, in proportion to their ownership of that project. This kind of net metering greatly expands the number of utility customers that can take advantage of the benefits of distributed renewable power generation. Under Oregon's existing net metering statute, community solar participants cannot benefit from net metering, because the systems do not directly offset their onsite electricity use. Without virtual net metering, a shared solar array installed on the roof of an apartment building would still not be eligible for net metering, because the system would offset electricity use from multiple units rather than a single household. Oregon's prohibition against virtual net metering thereby limits the potential for future development of distributed solar projects in the state.

Second, Oregon's solar volumetric

Community solar installation on low-income housing in Colorado. *U.S. Dept. of Energy, 2011*

incentive rate pilot program will expire in 2016 and is already unavailable to new participants. This program has allowed participating utility customers to earn incentive rates for the output from qualifying solar PV systems.[371] The program has been successful in encouraging new solar development, but was only enacted as a pilot program and will reach its programmatic cap on eligible solar capacity in the very near future.[372] This program is emblematic of the flaws associated with piecemeal renewable incentive policies. Policies that include built-in limits on participation and predetermined sunset dates do not promote a meaningful transition to renewable energy. While the incentive rate program will lead to an additional 27.5 MW of installed solar PV capacity by its 2016 sunset date,[373] it will not create long-term momentum to maintain this rate of development.

Perhaps most significantly, Oregon's existing Renewable Portfolio Standard (RPS)[374] is insufficient to adequately encourage the switch to renewable electricity. Oregon is currently on track to meet its RPS obligations, despite the fact that the state's investor-owned utilities have not invested in significant renewable capacity additions in recent years. This is largely because Oregon's RPS allows utilities to meet their obligations through some existing low-impact hydropower and RECs generated from efficiency upgrades to hydroelectric facilities that became operational after 1995.[375] By allowing efficiency upgrades at existing hydropower facilities to qualify for RPS compliance, rather than requiring utilities to procure output from new renewable facilities, the statute has failed to incentivize sufficient new renewable development and capacity additions. More importantly, the lack of ambition in Oregon's RPS targets has stilled demand for new renewable energy facilities of all types. Oregon has not added new wind capacity since 2012, and while solar development has grown in recent years, solar provides a small fraction of the state's power. By maintaining weak renewable energy mandates through 2025, Oregon allows existing fossil fuel plants to remain online and may even accommodate investment in new fossil fuel-fired power plants.

Finally, Oregon's piecemeal renewable energy policies have created an uncertain regulatory environment for Oregon's utilities and independent renewable power producers. Renewable energy development thrives under policy regimes that establish clearly defined, long-term mandates or incentives that provide certainty and stability for investors and developers. Unless Oregon develops a clear, comprehensive and long-term strategy for renewable energy expansion, it will not meet its greenhouse gas goals.

Although Oregon has seen growth in renewable development, and in the wind industry in particular,[376] the state is not deploying enough new renewable capacity quickly enough to help it reach its 2050 climate goal. Oregon's renewable energy policies fail to encourage significant new renewable energy development that will put the state on a trajectory to meet its emission reduction goals. Renewable energy is a necessary component of Oregon's strategy to reduce emissions. OGWC's *2015 Report to the Legislature* therefore rightfully concludes that Oregon must "add substantially to [its] actions to date, considering both programmatic measures (e.g., mandating more utility renewable energy) and incentives."[377]

c. Interaction of Oregon Laws with the Clean Power Plan

While Oregon currently does not regulate CO_2 emissions from existing power plants under state law, new federal regulations will require the state to regulate these emissions starting in 2022. The Environmental Protection Agency's final Clean Power Plan establishes federal emission guidelines for CO_2 emissions from existing electric generating units (EGUs). The final rule provides states with substantial flexibility in implementing the rule's directives and achieving the prescribed emission reductions. Although this flexibility has various benefits, it may stifle necessary investment in renewable and carbon-free energy.

Under the Clean Power Plan, states can choose to implement either 1) nationally uniform category-specific emission performance rates [378] or 2) state-specific rate-based[379] or mass-based emission goals[380] established by EPA. The federally enforceable emission performance rates apply to two subcategories of electric generating units subject to the rule. Fossil fuel-fired electric steam generating units (e.g. coal plants) must meet a final emissions rate of 1,305 pounds of CO_2 per megawatt-hour of generation (lbs. CO_2/MWh), and stationary combustion turbines (e.g. natural gas plants) must meet a final rate of 771 lbs. CO_2/MWh.[381]

The Clean Power Plan also gives states the flexibility to aggregate all covered sources' emissions obligations into a statewide program that applies a state-specific rate-based or mass-based emission target. The statewide rate-based emission goals represent the weighted aggregate of the federal emission performance rates applied to each state's affected generating units. EPA calculated these rate-based goals by determining how much electricity each state generated from natural gas and from coal or oil in 2012, and multiplied the respective percentages by the federally enforceable emission performance rates. For example, if a state generated 60% of its electricity from coal and 40% of its electricity from natural gas in 2012, EPA would first calculate the weighted emission rate for the state's coal power by multiplying the federal rate of 1,305 lbs./MWh by 60%. 1,305 lbs./MWh multiplied by 0.60 (i.e. 60%) equals 783 lbs./MWh. EPA would then conduct the same calculation for the state's natural gas power. 771 lbs./MWh multiplied by 0.40 (40%) equals 308 lbs./MWh. Finally, EPA would add these two rates together to calculate the state's final 2030 rate-based goal. In our example, the final goal would be 1,091 lbs. CO_2/MWh (783 lbs./MWh + 308 lbs./MWh= 1,091 lbs./MWh). So long as all covered sources in a state will collectively meet this average emissions rate of 1,091 lbs. CO_2/MWh, the state can reallocate emissions rates to covered sources as the state chooses. For example, one of the state's coal plants may be allowed to emit 1,400 lbs. CO_2/MWh, so long as other covered sources reduce their emissions rates below the federal standards.

The statewide mass-based emission goals impose a cap on the total CO_2 emissions each state's generating units may collectively emit during the compliance period. This goal resembles the type of fixed emissions cap common in cap and trade programs. The mass-based goal establishes the total allowable emissions for all regulated sources as a single number. For example, under Oregon's mass-based goal, combined annual emissions from the state's regulated sources cannot exceed 8,118,654 tons of CO_2 in 2030.

The Clean Power Plan allows states to impose emissions limitations directly on affected sources. In this scenario, each

covered source will need to comply with the federal standards independently. For Oregon sources, the impending closure of the PGE-owned Boardman coal-fired power plant makes the federal emissions rate for coal-fired power plants irrelevant. However, Oregon's existing natural gas-fired power plants would need to each meet the federal standard of 771 lbs. CO_2/MWh.

In addition to allowing states to develop overall state emissions limitations, the Clean Power Plan also allows states to implement a "State Measures Approach" that incorporates a variety of on-site and off-site measures to reduce emissions by decreasing electricity generation at affected facilities. To benefit from this flexibility, states must first show that they have policies in place that can successfully achieve their required emission reductions.

If Oregon opts to follow the State Measures Approach, the state will have the authority to include its existing energy and climate policies in its proposed implementation plan. For example, Oregon could use its existing RPS as a compliance mechanism, so long as it can demonstrate that renewable energy facilities installed for RPS compliance purposes result in emissions reductions during the Clean Power Plan's compliance period. However, the Clean Power Plan does not require Oregon to significantly depart from its business-as-usual emissions trajectory,[382] so the rule is unlikely to spur major emissions reductions or investment in renewables or energy efficiency.

Moreover, the Clean Power Plan does not require states to achieve additional emissions reductions after 2030. While the Clean Power Plan may place Oregon's electric utilities on a path to achieve their share of the state's 2035 goal,[383] the rule will not keep the utilities on track to achieve the 2050 goal.

Finally, the Clean Power Plan is not a comprehensive, multi-sector climate policy, and the emissions reductions called for under the rule represent only a small portion of the state's total emissions. The Clean Power Plan only regulates electricity sector emissions, while other sectors in Oregon contribute substantial emissions of CO_2. The Clean Power Plan will therefore not have a substantial impact on the state's ability to achieve its economy-wide 2035 goal of 32.7 million tons CO_2.

What about Industrial Emissions?

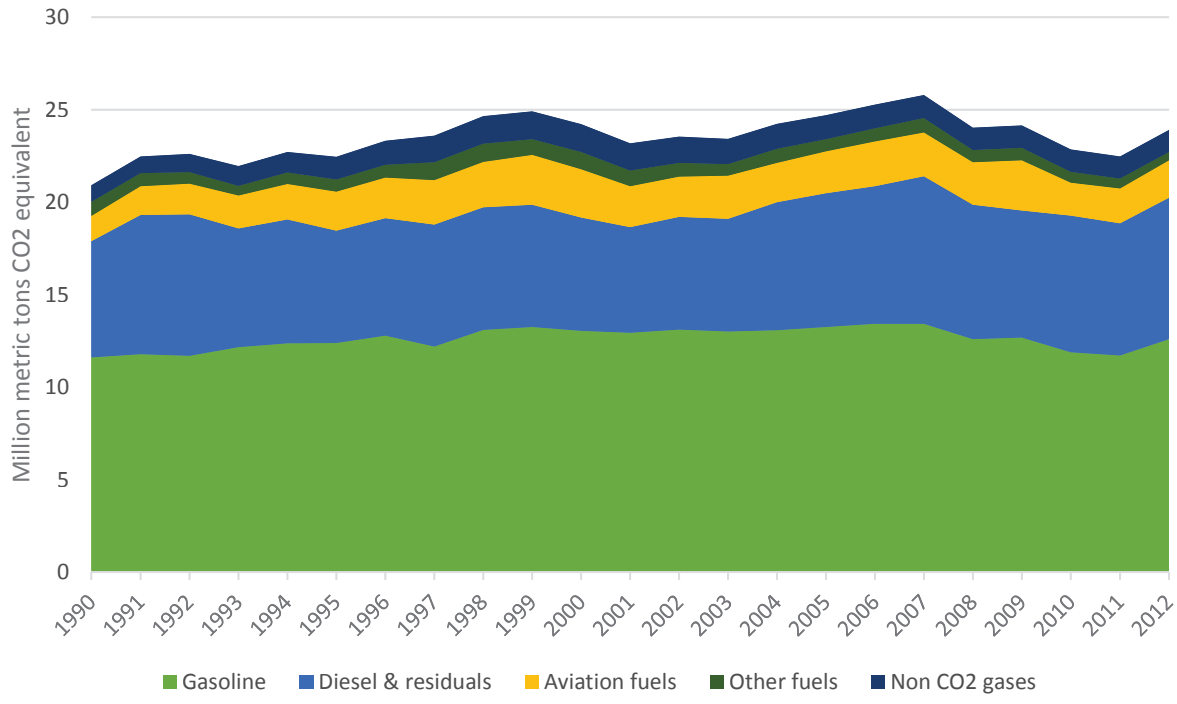
Oregon's existing climate statutes do not expressly limit emissions of greenhouse gases from industrial sources. As the agency charged with implementing the federal Clean Air Act's Prevention of Significant Deterioration (PSD) program, DEQ must establish emissions limitations that reflect the Best Available Control Technology for greenhouse gas emissions from new and modified major polluting sources, but only if those sources would have required emissions controls for pollutants other than greenhouse gases. This limited federal authority to regulate, combined with DEQ's own regulations that are designed to allow facilities to avoid triggering PSD requirements, has left industrial sources largely exempt from greenhouse gas emissions requirements.

2. The Transportation Sector

The transportation sector is responsible for 39% of Oregon's greenhouse gas emissions.[384] New federal fuel economy standards requiring new cars and light trucks to achieve an average fuel economy of 54.5 miles per gallon by 2025 will help to mitigate some of Oregon's transportation-related emissions.[385] Oregon's Clean Fuels Program will further help reduce transportation sector emissions, but only to a limited extent. In fact, after accounting for these additional reductions in its business-as-usual emissions forecast, the OGWC projected that the state will still dramatically exceed its 2035 emissions goal.[386] Oregon therefore must adopt additional policies and programs to further reduce transportation sector emissions.

In 2015, climate change advocates claimed victory (or issued a sigh of relief) when the Clean Fuels Program survived both a legislative attempt to repeal it in favor of a transportation bill,[387] and a challenge in federal court.[388] Notwithstanding these victories, the program will still face several hurdles. The Western States Petroleum Association has challenged in state court DEQ's most recent rules implementing the Clean Fuels Program.[389] That challenge is still pending, but a similar challenge in California succeeded in stalling that state's low-carbon fuel standard for several years.[390] In addition, three petitions have been filed through the 2016 ballot initiative process that aim to either repeal or weaken Oregon's Clean Fuels Program.[391] In light of these repeated

FIG. 5 Oregon Emissions from Transportation Fuel Use



Oregon Global Warming Commission *2015 Report to the Legislature, fig. 2* (2015)

attempts by the oil and trucking industries to repeal, delay, or weaken the Clean Fuels Program, its future is uncertain until these challenges are resolved.

More importantly, there simply are not enough programs or funds in place to effectuate meaningful emissions reductions from Oregon's transportation sector. The OGWC's *2015 Report* recommends a number of strategies to reduce transportation emissions from ground transportation, freight, and air travel.[392] In addition, ODOT's *STS 2050 Vision* identified a number of strategic priorities that policymakers should consider when designing policies to reduce transportation sector emissions.[393] However, these recommendations will not produce results without funding, resources, and sustained work. First, despite ODOT's emphasis that successful implementation of the *STS* requires adequate funding to support system operations and performance and to provide additional transportation options, the state lacks a sustainable source of funding for sector and infrastructure improvements. Second, Oregon has not developed adequate programs and incentives to encourage vehicle efficiency and use of lower-emitting fuels, or adequate policies to promote the development of new infrastructure to support advanced technologies, such as electric vehicle charging stations. Third, the legislature has not followed ODOT's recommendation to evaluate barriers and opportunities for increasing low-carbon transportation options, such as public transit, biking, and shipping goods by barge or rail. Finally, the legislature has not adequately adopted effective state policies to encourage efficient land use at local and regional levels. In short, although the state knows what it should do, it has not created a strategy to reform the transportation sector.

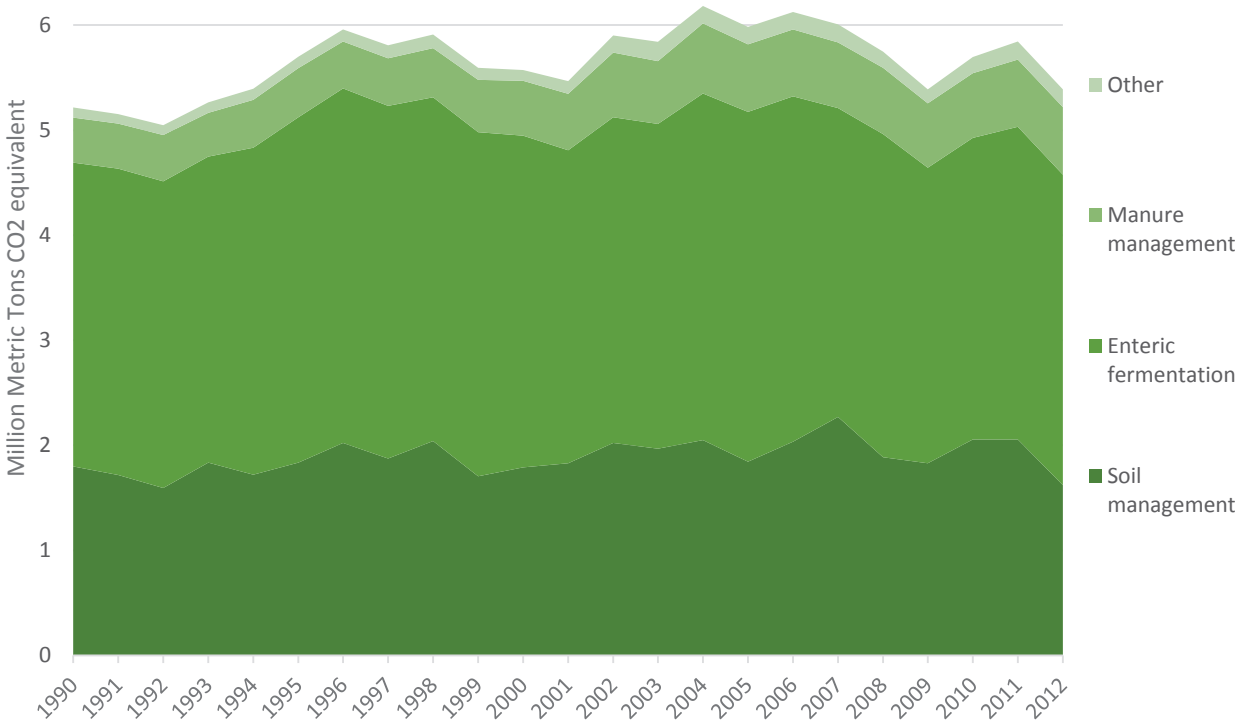
3. The Land Use Sector

Similarly, Oregon's laws do little to address climate impacts from the land use sector. Agricultural practices currently account for 8% of Oregon's greenhouse gas emissions.[394] Moreover, the state's forests serve an essential role in sequestering carbon. The OGWC's *2015 Report* made several recommendations for how Oregon could alter its agricultural practices to help reduce emissions, including increasing deployment of anaerobic digestion at dairy farms and improving "nutrient management through precision agriculture."[395] However, the legislature has yet to directly address these strategies at the state level. In the forestry context, Oregon law authorizes the creation of a market for forest carbon offsets, but the Department of Forestry has not implemented this statutory provision.[396] Oregon's cities and counties are permitted, but not required, to address climate change mitigation and adaptation in their comprehensive land use plans,[397] but the law's focus on local land use planning makes it difficult to comprehensively address land use emissions on a statewide level. Oregon's statewide land use planning program is primarily implemented through city and county comprehensive plans.[398] State agencies must conduct their activities in accordance with these local land use plans. According to the DLCD's Strategic Plan, "[s]tate agency plans and programs must be developed and implemented consistently with both the statewide planning goals and the comprehensive plans of cities and counties."[399] However, while state agency actions must conform to local land use plans,

the DLCD does not have authority to direct local governments to address climate change mitigation in their land use plans.

The land use sector thus represents a relatively unregulated sector in the context of climate change, and the Oregon legislature should explore opportunities to reduce emissions related to this sector.

FIG. 6 Oregon Agricultural Sector Emissions



Oregon Global Warming Commission *2015 Report to the Legislature, fig. 6* (2015)

As this paper has demonstrated, Oregon's climate change laws fall far short of their potential. First, Oregon's greenhouse gas emissions goals, while laudatory, are merely advisory, and the OGWC's analyses indicate that Oregon will likely fail to achieve these goals under the state's current business-as-usual practices. Second, despite the important role the OGWC is intended to play, its organizational structure and lack of funding limit its effectiveness. Third, Oregon's laws addressing specific emissions sources and sectors are inadequate, either because they suffer from a lack of ambition, are undermined by exemptions and loopholes, or fail to send proper market signals to major emitters. Fourth, although many Oregon agencies have responsibility for regulating key emission sectors, they do not always coordinate with each other may not have the regulatory authority to mandate emissions reductions. In short, Oregon's climate change laws and policies operate on a piecemeal level and fail to create a comprehensive, cohesive, long-term strategy for reducing Oregon's greenhouse gases and facilitating a transition to a low-carbon economy.

V. RECOMMENDATIONS FOR REFORM

To remedy the weaknesses of Oregon's existing climate change laws, this Part identifies several strategies Oregon can and should take to ensure that it reduces statewide greenhouse gas emissions. These recommendations focus on general strategies Oregon should adopt to create a more effective framework for emissions reductions. Although Oregon will ultimately need to focus on specific policy designs, its first priority should be to establish clear statewide greenhouse gas emissions mandates and a comprehensive policy framework for reducing greenhouse gases from all sectors. The state should then restructure and fund the OGWC and direct it to administer Oregon's comprehensive climate policy framework. Oregon should also give its agencies clear regulatory authority and direction to reduce greenhouse gas emissions from the sectors they regulate. Finally, Oregon should require and support improved coordination and collaboration among these agencies. The following discussion briefly expands on each of these requirements.

RECOMMENDATIONS FOR REFORMING OREGON CLIMATE POLICY

1. Adopt binding greenhouse gas emissions targets and establish a comprehensive policy framework for reducing emissions from all sectors
2. Restructure the OGWC and direct it to administer the comprehensive policy framework
3. Give state agencies clear regulatory authority and direction to reduce emissions from relevant economic sectors
4. Require and support coordination and cooperation among agencies implementing programs within the comprehensive framework

A. Oregon Should Enact Comprehensive and Enforceable Climate Legislation with Strict Emissions Mandates

Above all, Oregon should revise its existing greenhouse gas reduction goals and adopt a comprehensive climate policy framework that establishes comprehensive, mandatory, and enforceable greenhouse gas emissions targets for all sectors. The state's existing voluntary emissions goals simply do not create enough of an impetus to actually invest in technologies and practices that could facilitate necessary emissions reductions. By adopting strict and enforceable emissions mandates that apply to all sectors, the state and its emitters would be forced to achieve meaningful greenhouse gas emission reductions.

The Oregon legislature has the capacity and authority to establish enforceable greenhouse gas mandates for the state. The Governor's office can also play a pivotal role in developing a climate policy framework for Oregon.

In developing its greenhouse gas mandates, Oregon can look to California as an example. In fact, as Section V.A.2 below suggests, Oregon's recent efforts to develop its own mandatory emissions limitations demonstrate that the state has the capacity to develop binding statewide greenhouse gas mandates.

1. California's AB 32 Could Serve as a Model for Oregon

Nearly a decade ago, the California legislature passed the California Global Warming Solutions Act of 2006, more commonly known as Assembly Bill (AB) 32.[400] AB 32 tasked the pre-existing California Air Resources Board (CARB) with implementing and achieving a greenhouse gas emissions target equal to the state's 1990 emissions levels by 2020. Among other things, AB 32 directed CARB to identify the 1990 emissions levels that would serve as the 2020 target and to identify early actions to achieve this target. The Act further directed CARB to develop emissions monitoring and reporting requirements and to monitor and enforce compliance with the program. CARB ultimately decided to implement AB 32 through an emissions trading, or cap-and-trade, program.[401]

AB 32 first directed CARB to establish a mandatory greenhouse gas emissions reporting program for sources of emissions within the state.[402] Second, AB 32 directed CARB to establish a binding emissions target that the state must reach by 2020.[403] Third, AB 32 gave CARB authority to issue rules and regulations to achieve "cost-effective greenhouse gas emission reductions."[404] Finally, AB 32 directed CARB to enforce compliance with its emissions limits and supporting regulations, and empowered CARB to impose penalties on violators.[405] AB 32 thus created a framework for CARB to establish mandatory greenhouse gas emissions reductions, but gave CARB discretion to define and enforce the program's implementation mechanisms.

2. Oregon's Proposed HB 3470 Was a Step in the Right Direction

During Oregon's 2015 legislative session, a bill was proposed to establish a mandatory climate policy in the state. House Bill 3470, titled the Climate Stability and Justice Act of 2015 and modeled after AB 32, aimed to set legally binding greenhouse gas limits and tasked the EQC with developing an action plan and rules to meet those limits.[406] The bill included a funding provision and redefined the role of the OGWC. The proposed legislation would have added cohesiveness to Oregon's current piecemeal climate policy by tasking a single agency with coordinating the state's emission reduction efforts. Unfortunately, while HB 3470 received "do pass" recommendations from two House committees, it did not make it out of the House Ways and Means Committee before the legislature adjourned in July 2015. [407]

HB 3470 attempted to establish a binding emissions cap for Oregon. Much like AB 32, the bill directed DEQ to determine Oregon's 1990 greenhouse gas emissions and establish these emissions as the baseline for future reductions.[408] The bill then directed the EQC to adopt mandatory greenhouse gas emissions limits requiring a 10% reduction below 1990 levels by 2020, and a 75% reduction by 2050. HB 3470 would have required the EQC to develop an action plan in coordination with state agencies, local governments, other states, and the federal government. The bill also would have provided the EQC with discretion to determine the mechanisms for meeting the mandatory emissions targets and suggested adopting a market-based compliance system. To track the state's progress towards the emissions targets, the bill would have allowed the EQC to supplement the existing greenhouse gas reporting requirements to ensure complete monitoring of emissions. Finally, to fund the implementation of the program, the bill authorized the EQC to adopt a schedule of fees for emitters that are currently required to register under the EQC's rules. Finally, while the bill did not include an explicit enforcement provision, it did require the EQC to ensure that emissions reductions achieved under the program are "real, permanent, quantifiable, verifiable, and enforceable."[409] The proposed bill tasked the DEQ with administering the final program adopted by the EQC.

Although HB 3470 would have tasked the EQC with developing and DEQ with implementing Oregon's mandatory emissions reduction program, it retained the OGWC under slightly modified directives. Under the proposed legislation, the OGWC would have

HB 3470 Key Provisions

- **Mandatory emissions targets:** 10% below 1990 levels by 2020; 75% below 1990 levels by 2050
- **Implementation:** Action Plan developed by the EQC; EQC determines mechanisms to achieve emissions reductions
- **Tracking progress:** EQC may supplement existing emissions monitoring and reporting requirements
- **Funding:** Schedule of fees for emitters
- **Enforcement:** emissions reductions must be real, permanent, quantifiable, verifiable, and enforceable

researched suggested policy changes and provided recommendations to meet the new emission limits. However, because the bill would have made the emission limits mandatory, rather than discretionary, the OGWC's policy recommendations would likely carry considerably more weight than under existing law.

Both the House Energy and Environment and House Rules committees recommended passing HB 3470, and House Speaker Tina Kotek referred the bill to the House Ways and Means Committee on June 26, 2015.[410] However, HB 3470 did not make it out of that committee before the legislature adjourned on July 6, 2015. The bill's sponsor, Representative Phil Barnhart, intends to introduce the bill again in the 2016 session and reportedly has gained several new supporters of the bill in both the House and Senate.[411] Although HB 3470 was not quite as strong or ambitious as AB 32, it nevertheless represents an effort by the Oregon legislature to pass much-needed legislation establishing a mandatory emissions limit and helping to coordinate state efforts to mitigate climate change.

3. Recommendations for Future Actions in Oregon

As this report has repeatedly emphasized, Oregon's voluntary emissions reduction goals have been insufficient. To achieve meaningful reductions in greenhouse gases, the state must enact mandatory targets and timetables and establish mechanisms to both monitor and enforce those targets. In addition, the state should adopt a comprehensive planning mechanism to ensure that efforts to reduce emissions address all sources of emissions, not just stationary sources within the energy and industrial sectors. Although proposed HB 3470 was a step in the right direction, the state should enact comprehensive legislation that is more carefully tailored to address each of the above concerns.

First, Oregon should enact legislation that redefines the voluntary goals established by HB 3543 and adopts mandatory greenhouse gas emissions reduction targets and timetables. In addition, the targets and timetables should include a short-term goal to encourage early emissions reductions, an interim goal to ensure that reductions stay on track, and a long-term goal that reflects the level of emissions reductions needed to prevent dangerous climate change, as determined by the best available science. As the OGWC's *2015 Report to the Legislature* highlighted, the long gap between Oregon's existing 2020 and 2050 goals may delay the state's progress in reducing emissions,[412] making it difficult to ensure that the state stays on track to reach its ultimate long-term goal. Thus, Oregon should enact legislation that carefully selects mandatory reduction targets and establishes a timetable including short term, intermediate, and long-term targets.

Second, Oregon's greenhouse gas emissions reduction policy must incorporate mechanisms to ensure that emissions reductions actually occur. Oregon's climate legislation must include an enforcement mechanism. As discussed above, California's climate change legislation does not only empower its implementing agency to enforce compliance with its rules—AB 32 actually requires CARB to enforce its compliance framework. Likewise, Oregon climate legislation should direct the implementing agency to enforce the law by enjoining violators and imposing penalties for non-

compliance. Without this enforcement mechanism, any targets and timetables established by the legislation would have similar effect to that of the state's existing voluntary goals, because there would be no means of ensuring compliance with the new mandatory requirements. To further ensure compliance with the state's emissions mandate, Oregon's climate legislation must also include a mechanism to monitor regulated entities.

Finally, Oregon's climate legislation should recognize that stationary sources are not the only sources of greenhouse gas emissions and should include a comprehensive planning mechanism that ensures that emissions reductions occur within the energy, transportation and land use sectors as a whole. The state should direct each relevant agency to conduct a thorough assessment of the behavioral changes within all emitting sectors that will be necessary to achieve Oregon's greenhouse gas targets. The legislation should then give the implementing agency authority to issue and enforce rules requiring the relevant sectors to implement practices and measures to achieve the necessary reductions. Moreover, as described next, the legislation should ensure that each agency's efforts are subject to oversight by a reconfigured OGWC.

Recommendations for Future Action

1. Adopt mandatory greenhouse gas emissions reduction targets and timetables
2. Establish mechanism to enforce compliance with mandatory targets
3. Include comprehensive planning mechanism to achieve emissions reductions from all sectors

B. Strengthen the Role of the OGWC: The California Model

Oregon can gain some important insights from California's climate policy regime. First, California's climate regime established binding emissions limits and created an institutional structure to guide the administration and implementation of the state's emission reduction policies. Second, California's climate regime provided the regime's administering agency with sufficient regulatory authority, staff, and resources to effectively achieve necessary emissions reductions.

Oregon should follow California's lead and establish a comprehensive climate policy framework that includes binding emission reduction requirements. The state should direct the OGWC to administer this policy framework and coordinate the implementation efforts of Oregon's existing state agencies. This section explains the structure and function of California's climate policy, and explains how it could serve as a model for Oregon.

1. Implementation of California's Climate Change Strategy

As effective as AB 32 has been on a substantive level, the institutional structure created under the bill to implement its substantive provisions is arguably just as important. First, AB 32 delegated authority to CARB, an established agency with air regulation expertise, to implement the law's requirements. In addition, AB 32 enabled CARB to create a funding mechanism to carry out its functions. Meanwhile, AB 32 kept California's Climate Action Team, which was established in 2005, in place to continue creating biannual progress reports and to help coordinate the state's comprehensive climate policies. The following three sections 1) describe the structure and function of the Climate Action Team and CARB; 2) explain how these entities support California's efforts to achieve its emission reduction target; and 3) discuss the additional actions California has taken on climate change since adopting AB 32.

a. California's Climate Action Team

Governor Schwarzenegger's 2005 executive order called for the Secretary of the California Environmental Protection Agency to coordinate efforts to reach the state's emissions target with the directors and chairs of the following agencies and commissions: the Transportation and Housing Agency, the Department of Food and Agriculture, the Resources Agency, the Air Resources Board, the Energy Commission, and the California Public Utilities Commission. These agencies and their administrators made up the original "Climate Action Team."

Although AB 32 ultimately granted CARB the sole authority to implement the state's emissions reductions program, the legislature expressly retained the Climate Action Team to "continue its role in coordinating overall climate policy."[413] The Climate Action Team still coordinates California's emissions reduction policies and issues reports on the state's progress. The Climate Action Team was also instrumental in helping CARB craft a plan to reduce emissions through enforceable regulations. In addition, the Team's annual "report cards" list the measures each Climate Action Team agency has taken to reduce emissions, identify the resulting emissions reductions, list additional measures the agency expects to take to meet reduction targets, and include a year-to-year comparison of reductions achieved by each member agency.[414]

b. California Air Resources Board (CARB)

While AB 32 kept the Climate Action Team in place to coordinate the state's climate policies, the Act gave CARB the authority to enforce compliance with the state's emission reduction targets. CARB was established as a state agency in 1967, when then-governor Ronald Reagan combined the Bureau of Air Sanitation with the Motor Vehicle Pollution Control Board to form a new California Air Resources Board within the California Environmental Protection Agency.[415] CARB consists of 12 members

appointed by the governor. CARB's membership must include: a member with "training and experience in automotive engineering or closely related fields;" a member with "training and experience in chemistry, meteorology, or related scientific fields, including agriculture or law;" a "physician and surgeon or an authority on health effects of air pollution;" two "public members;" one member that either has special training in automotive engineering, science, air pollution control, or is a public member; and six elected officials from specified air pollution control districts. [416] In addition to the board members, CARB employs more than 1,000 scientists, attorneys, technicians, information specialists, administrative analysts, and clerical support staff members,[417] which are organized into 11 divisions.[418]

With the exception of the CARB chairperson, who serves full-time,[419] each board member is part-time and earns approximately $3,600 per month in compensation.[420] Members must be approved by the California State Senate.[421] Each member serves at the pleasure of the governor and is not subject to limits on terms or years of service. For example, the current chair, Mary Nichols, has held the position since 2007, and had previously served as chair from 1979–1983.[422] Thus, the current chair has served through both Republican and Democratic administrations.

Before the passage of AB 32, CARB's duties had included setting air quality standards for certain air pollutants and setting emission standards for passenger vehicles. Upon passage of AB 32, the California Legislature tasked CARB with a number of additional responsibilities to help the state achieve its 2020 emissions target. For example, CARB was directed to maintain a reporting system, conduct a study to determine 1990 emissions levels, develop a scoping plan, craft regulations to meet targets, and monitor and enforce compliance with all its requirements. To ensure CARB had the capacity to fulfill these duties, AB 32 included a critical funding mechanism. This funding mechanism is described in greater detail below.

c. Funding

CARB required additional resources to implement the various duties and directives imposed upon it by AB 32. According to CARB, implementation of the Act costs an average of $50 million dollars per year.[423] While California's economy is much larger than Oregon, and thus the cost of its program likely exceeds the costs Oregon would face to implement a comparable program, AB 32 established a funding provision that Oregon should consider adopting. To pay for its implementation activities, AB 32 authorized CARB to adopt a schedule of fees to collect from regulated greenhouse gas emitters.[424] CARB subsequently adopted an AB 32 Cost of Implementation Fee Regulation in 2009, and began collecting fees in 2010.[425] The fee regulation creates a somewhat complicated formula to determine the amount owed by each emitter, which is based on a "Common Carbon Cost," or the annual cost per metric ton of carbon dioxide equivalent emitted.[426] CARB determines this cost by dividing its total required revenue by the total annual emissions from each regulated emitter. For example, in 2014, the Common Carbon Cost emitters were required to pay $0.12 per metric ton of CO_2e emitted.[427] As the program's initial loans and startup costs have decreased, CARBs fees have decreased.

2. Lessons from California: Oregon Should Authorize the OGWC to Oversee Implementation of its Comprehensive Climate Policy

For Oregon to have any hope of achieving its greenhouse gas reduction goals, it must follow California's lead and adopt a comprehensive climate policy framework establishing binding emission reduction requirements for all relevant sectors. Oregon should also adopt California's model and task a single entity with administering and enforcing its climate policy framework. A restructured OGWC with regulatory authority and sufficient resources could be optimally suited to administer the state's comprehensive climate framework and oversee the implementation efforts of relevant state agencies. Under this structure, the OGWC would receive authority to issue regulations implementing the components of the climate framework. State agencies would then administer and enforce these regulatory directives in the sectors they currently regulate. This structured approach would make the best use of Oregon's existing agency structure, facilitate compliance with Oregon's comprehensive climate targets, and ensure accountability. For this approach to succeed, however, the OGWC would require a structural reorganization, as well as full-time support staff and sufficient funding.

a. The OGWC as Regulator

The OGWC is well suited to administer Oregon's comprehensive climate policy framework due to its expertise and experience in guiding the state's efforts to achieve its emission reduction goals. Effective statewide climate mitigation necessarily requires emissions reductions from multiple economic sectors. None of Oregon's existing state agencies is currently structured or staffed to administer and oversee a comprehensive climate policy framework. The OGWC, in contrast, has experience designing and evaluating economy-wide greenhouse gas emissions policies. The OGWC also understands how different sectors may enhance or impede progress towards climate change mitigation. Based on this understanding, the OGWC has developed comprehensive emissions reductions strategies to enable Oregon to reach its current 2050 climate goal. In short, the OGWC has already demonstrated its potential to oversee a comprehensive climate policy. With the proper restructuring, staffing, funding, and authority, the OGWC could leverage its existing expertise into effective regulation.

Placing the OGWC in the driver's seat would allow the state's existing agency framework to remain in place and thus create less administrative disruption than delegating implementation responsibility to any single existing agency. As noted above, each agency has expertise in particular areas, but most agencies have limited authority and often have little experience with sectors outside of their control. For example, while DEQ is currently responsible for implementing Oregon's environmental statutes, including emissions reduction programs established by state and federal law, DEQ does not engage in energy,

transportation, or land use planning. Likewise, ODOT has little to no experience regulating forestry-related emissions, and ODF has little to no experience regulating the transportation sector. In short, no existing agency is positioned to oversee statewide climate policy. The OGWC, in contrast, has the expertise needed to guide other agencies. Thus, the OGWC would coordinate Oregon's overall compliance strategy, and existing state agencies would continue to implement sector-specific requirements.

In administering a comprehensive policy framework, the OGWC could function similarly to the EQC, but have broader regulatory reach. Under Oregon's existing regulatory structure, the EQC oversees DEQ's implementation of Oregon's environmental statutes. The EQC is also the formal policy and rulemaking body for DEQ. The OGWC could play a similar, but broader, role, by acting as the formal policy and rulemaking body for Oregon's comprehensive climate policy.

This proposal would deviate somewhat from the CARB model and Oregon's proposed HB 3470, both of which treat greenhouse gas emissions as industrial pollutants subject to environmental regulation. While stationary source regulation is a necessary component of Oregon's comprehensive climate framework, Oregon should go beyond this model. The OGWC is the best entity to implement the comprehensive scheme.

To ensure the OGWC has adequate power, the legislature should give the OGWC authority to oversee the implementation of Oregon's comprehensive climate policy framework and to issue regulations to further the framework's objectives. With this rulemaking authority, the OGWC could coordinate the implementation activities of Oregon's other agencies and establish enforceable emission reduction mandates.

b. A Restructured OGWC

Before Oregon delegates regulatory and oversight authority to the OGWC, the state must restructure the OGWC and provide it with sufficient staff and financial resources. First, the state should restructure the OGWC to disband the voting members and replace them with a smaller group of professional, paid, full-time Commissioners who are appointed by the governor. These Commissioners would possess regulatory authority and the capacity to resolve disputes between agency regulators and regulated entities as needed. To protect the functionality of this structure, the state should limit the number of professional Commissioners on the OGWC. (The PUC, for example, has three full-time Commissioners.) The remaining former voting members could serve on an advisory council to help guide the Commissioners' activities.

The new advisory council would include representatives from various stakeholders, such as utilities, resource users, renewable energy producers, scientists, and non-governmental organizations. The advisory council would serve as a liaison between the OGWC's Commissioners and the public, including these stakeholder groups.

The 14 non-voting members should serve as regulatory advisors and liaisons between the Commission and the state agencies. In determining how to structure the relationship between the Commissioners and the non-voting members under this proposal, Oregon can learn from the relationship between California's Climate Action Team and CARB. Under California's climate

legislation, the Climate Action Team, which is made up of state agency heads, helps to coordinate state policy and provides CARB with recommendations for implementing emission reduction targets. The non-voting members of the OGWC could play a similar advisory role.

c. Sufficient Staff and Funding

In addition to restructuring the OGWC, the state must provide the OGWC with sufficient resources to carry out its operations, hire experienced personnel, and compensate members for their service. The OGWC's voting members are currently uncompensated for their work, and the OGWC lacks necessary staff and funding to carry out its directives. In contrast, CARB has a staff of over 1,000 people[428] and a budget of $50 million a year to carry out its duties.[429] CARB's members also earn $3,600 per month in compensation for their service. Because Oregon's economy is much smaller than California's, the OGWC would not require nearly as many resources as CARB requires. However, if Oregon adopts a comprehensive climate policy framework that includes mandatory emission targets and tasks the OGWC with administering this framework, the Commission will require funding and staff resources. Oregon therefore must allocate sufficient funding to the OGWC to carry out its duties and compensate its members and support staff.

C. Direct Agencies to Use Existing and New Authorities to Mitigate Climate Change

While Oregon's comprehensive climate policy framework must establish binding emissions limitations on greenhouse gas-emitting sources, the framework must also employ strategies to reduce end-use and demand side emissions as well. These strategies, which may include climate-focused electricity regulation; energy efficiency programs; and improved energy, transportation, and land use planning, are necessary to significantly reduce Oregon's greenhouse gases. Given the scope of these regulatory programs, various state agencies must be tasked with implementing the individual programs and provisions that make up Oregon's policy framework.

As Part III illustrated, many agencies have already taken important steps to reduce greenhouse gas emissions from the sectors they regulate. Agencies such as the PUC, DEQ, and ODOT have developed expertise that will provide an essential foundation for future mitigation strategies. Oregon must tailor its comprehensive climate policy to make use of each agency's particular expertise and ensure that the actions of each agency are supporting Oregon's progress towards reaching its climate goals. To accomplish these objectives, the framework must first ensure that each agency has the necessary authority and directives to effectively implement their respective

emissions reduction programs. Second, the framework must ensure that one agency's actions will not create unintended climate impacts or lead to an increase in emissions within other regulated sectors. Finally, the framework must ensure that the state agencies are coordinating their emissions reduction activities with one another.

1. Provide Agencies with Additional Authorities and Resources to Address Climate Change

As the above sections indicate, Oregon legislation provides relatively little authority for agencies to act to reduce greenhouse gas emissions or otherwise help mitigate climate change. In many cases, climate change is either ignored or is a mere afterthought for agencies that have other responsibilities. Even where legislation does give agencies express authority to address aspects of climate change—through, for example, emissions offset requirements or renewable portfolio standards—agency authority is often piecemeal, incomplete, or weak.

To remedy these shortcomings, Oregon's comprehensive climate policy should clarify that agencies have authority to reduce greenhouse emissions and establish clear directives for how each agency should do so. The state's climate policy framework should therefore include sector-specific climate laws that provide tailored mitigation requirements for relevant agencies.

Oregon's HB 3470 and California's AB 32 exemplify strategies to reduce emissions from stationary sources, such as power plants, factories, and other industrial emitters. DEQ, overseen by the EQC, is best situated to implement a cap-and-trade program to reduce emissions from such sources. Thus, Oregon should proceed with its efforts to pass and strengthen HB 3470.

However, Oregon must do more to regulate other emitting sectors through additional programs. For example, Oregon could again follow California's lead by adopting a law modeled off of California's Sustainable Communities Strategy and Climate Protection Act. The Act, which was established through the passage of SB 375 in 2008,[430] aimed to reduce transportation-related greenhouse gas emissions caused by short-sighted land use planning and sprawl.[431] To reduce these emissions, SB 375 established coordinated transportation and land use planning requirements designed to promote sustainable community development. First, SB 375 directed CARB to adopt regional greenhouse gas reduction targets for passenger vehicle use. Next, SB 375 directed the state's metropolitan planning organizations to each create a "sustainable communities strategy" (SCS) as a component of their regional transportation plan. This SCS must include transportation, land use, and housing strategies that would enable the region to meet its greenhouse gas reduction target. The planning organizations must submit their SCSs to CARB for approval, and the regions' transportation policies and investments must conform to its SCS. A law like this in Oregon would facilitate meaningful emissions reductions from the transportation and land use sectors.

The Oregon legislature should also ensure that agencies have necessary resources to implement the state's policies. These resources include staff with relevant expertise, access to training for staff, and sufficient funding to implement state programs. Adequate resources are essential to effectively reduce emissions, and the legislature should view the provision of such resources as a key priority to help Oregon effectively respond to climate change.

2. Require Climate Analyses for Agency Actions with Significant Effects on Oregon's Greenhouse Gas Emissions

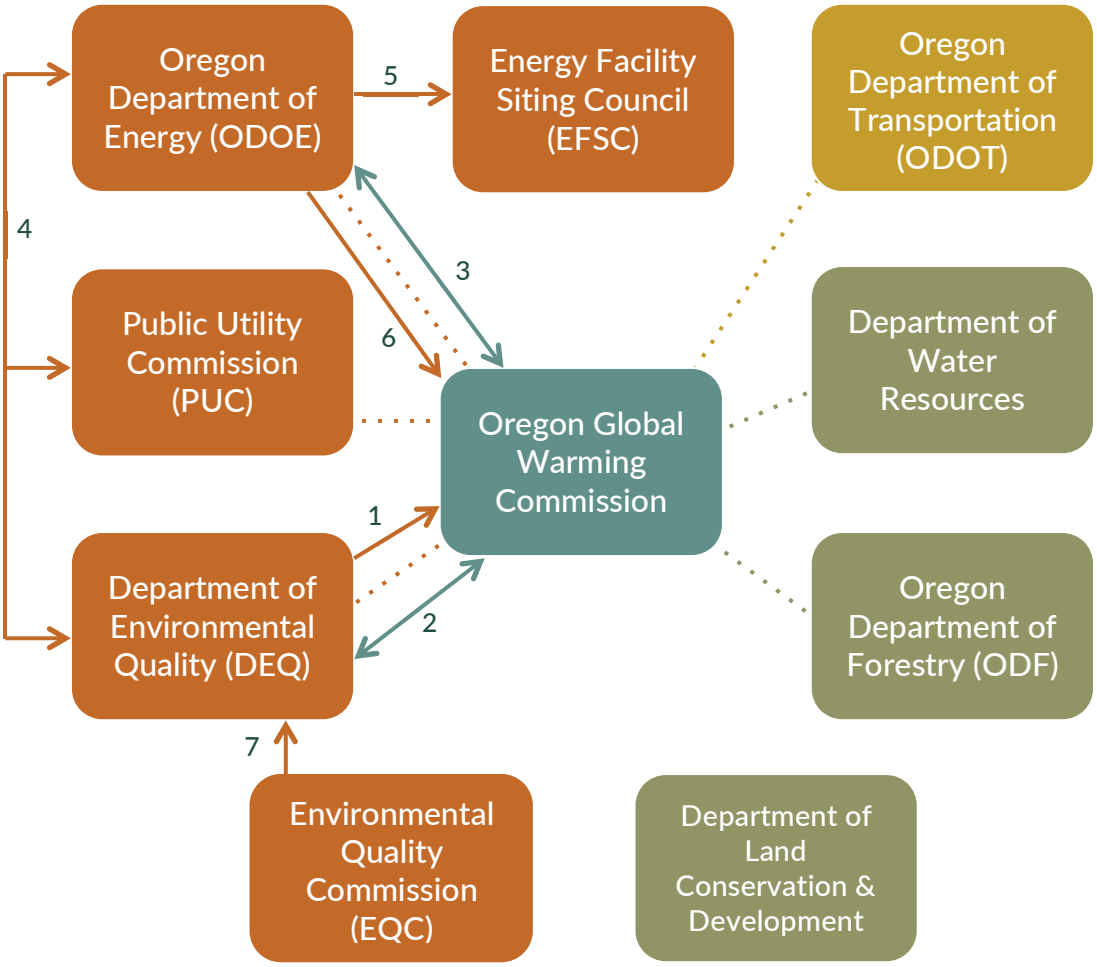
Oregon currently does not require state agencies to analyze how their actions will contribute to or help mitigate climate change. Without such analysis, agencies cannot predict or understand the impacts of their own actions or the actions of other agencies. Nor can the public have a full accounting of how various agency actions contribute to or help prevent climate change. This lack of understanding and accountability undermines efforts to develop effective solutions.

To remedy this problem, Oregon's comprehensive climate policy should direct agencies to fully analyze and disclose the climate impacts of their actions. This analysis could resemble the environmental impact statement required by federal agencies under the National Environmental Policy Act (NEPA)[432] or the environmental impact report required by public agencies under the California Environmental Quality Act.[433] These laws both require agencies to analyze and disclose the impacts of activities that will have significant environmental impacts. Regulations and guidelines implementing these laws also expressly require agencies to include climate change in their environmental analyses. In 2007, for example, California amended the California CEQA to require local agencies to consider the climate impacts of projects subject to CEQA review.[434] By creating a similar requirement in Oregon, the state legislature would send a clear message to agencies that they must consider climate change when they take various actions. Such disclosures would also improve the amount and quality of information in the state.

3. Require Interagency Consultation and Coordination for Agency Actions with Significant Climate Change Impacts

Finally, Oregon's comprehensive climate policy should direct agencies to consult and coordinate with each other regarding actions that will contribute to climate change, as well as efforts to mitigate climate change. Although some of Oregon's agencies already participate in some coordinated efforts to address climate change—for example, DEQ, the PUC, and ODOE have worked together on the Clean Power Plan—agencies would benefit from much greater coordination and cooperative planning. Optimally, the OGWC would serve as the body overseeing this agency coordination and cooperation. The OGWC could, for example, convene monthly or quarterly meetings in which agencies identify upcoming projects and actions that might affect statewide climate goals and intersect with other agencies' activities. The OGWC could also require regular reports from individual agencies and compile the reports into informative updates for all agencies. Finally, to the extent an agency's action may potentially undermine another agency's efforts, the OGWC could help the agencies develop proposals that will work in harmony with each other and Oregon's overall climate objectives.

OREGON'S EXISTING CLIMATE REGULATORY STRUCTURE



Energy Sector

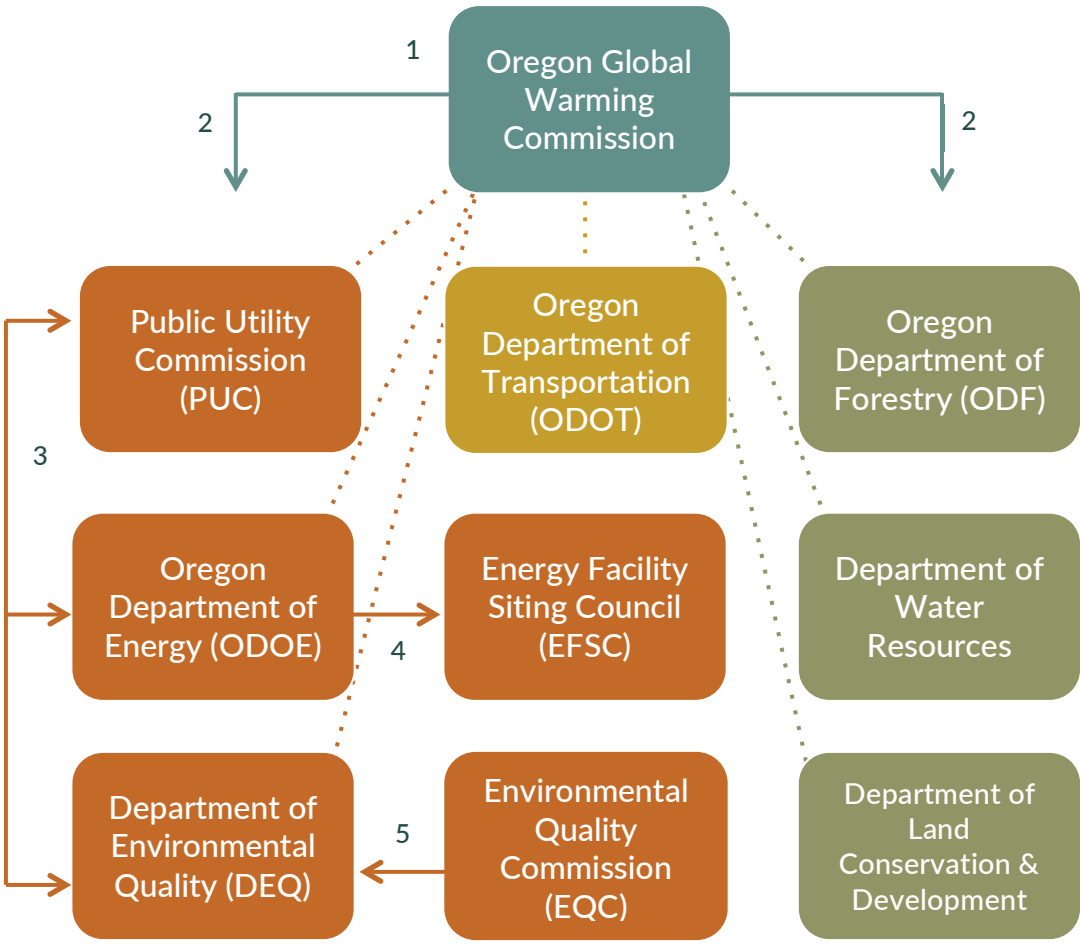
Transportation Sector

Land Use Sector

Agency director or chairperson is an ex officio member of the OGWC

1. DEQ provides staff support to OGWC
2. DEQ and OGWC evaluate impacts of greenhouse gases
3. ODOE and OGWC educate Oregonians on impacts of climate change
4. ODOE and PUC assist DEQ in implementing Clean Power Plan
5. ODOE provides staff resources for EFSC
6. ODOE provides staff support to OGWC
7. EQC develops rules and policies and adjudicates disputes for DEQ

OREGON'S RECOMMENDED CLIMATE REGULATORY STRUCTURE



Energy Sector

Transportation Sector

Land Use Sector

Agency director or chairperson is a regulatory advisor to the OGWC

1. OGWC administers Oregon's comprehensive climate policy framework
2. OGWC oversees agency implementation of programs within the comprehensive framework
3. ODOE and PUC assist DEQ in implementing Clean Power Plan
4. ODOE provides staff resources for EFSC
5. EQC develops rules and policies and adjudicates disputes for DEQ

VI. Conclusion

Oregon has established long-term climate change goals and created the OGWC to help guide the development and implementation of future climate policies in the state. However, the OGWC has neither the legal authority nor the funding to effectively direct Oregon's climate policies or help the state achieve the emissions reductions necessary to meet its 2050 greenhouse gas emissions reduction goal. Moreover, Oregon's climate change laws are generally not ambitious or effective enough to facilitate meaningful emissions reductions, and the state's piecemeal policy framework creates an unstable and uncertain regulatory environment that likely deters investments in low carbon energy resources and infrastructure. If Oregon truly aims to achieving its 2050 greenhouse gas emissions goal, the legislature must adopt a comprehensive climate policy framework that provides a single government entity—ideally the OGWC—with sufficient funding and regulatory authority to develop, implement and enforce strategies to effectively reduce emissions.

To be sure, the details of Oregon's comprehensive climate policy framework require careful deliberation and planning. Without clear direction and oversight from a single regulatory entity, it is unlikely that Oregon could effectively plan and implement a truly comprehensive framework. Thus, the creation of comprehensive greenhouse gas emission reduction mandates and reorganization of the OGWC are just the beginning of the many additional steps Oregon must take to address climate change.

ENDNOTES

[1] *See* Oregon Climate Change Research Institute, *Oregon's Network of Climate Knowledge,* http://occri.net (last
[2] H.B. 3543, 74th Leg. Assem., Reg. Sess. (Or. 2007) (codified at O.R.S. §§ 468A.200–260 (2014)).
[3] GOVERNOR'S ADVISORY GROUP ON GLOBAL WARMING, OREGON STRATEGY FOR GREENHOUSE GAS REDUCTIONS 6 (2004), *available at* http://www.oregon.gov/energy/GBLWRM/docs/GWReport-FInal.pdf.
[4] H.B. 3543, 74th Leg. Assem., Reg. Sess. (Or. 2007).
[5] OREGON GLOBAL WARMING COMMISSION, 2015 REPORT TO THE LEGISLATURE (2015), *available at* http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/OGWC_Rpt_Leg_2015_final.pdf [hereinafter 2015 REPORT TO THE LEGISLATURE].
[6] *Id.* at 7.
[7] *See supra* section II.C.1.
[8] GOVERNOR'S ADVISORY GROUP ON GLOBAL WARMING, OREGON STRATEGY FOR GREENHOUSE GAS REDUCTIONS 44 (2004), *available at* http://www.oregon.gov/energy/GBLWRM/docs/GWReport-FInal.pdf.
[9] Oregon Blue Book, *office of the Governor: Agency Subdivisions, http://bluebook.state.or.us/state/executive/Office_Governor/office_gov_subdiv.htm.* Ruchi Sadhir, a former senior policy advisor with Oregon Public Utility Commission, is currently serving as Governor Kate Brown's energy policy advisor. Denis C. Theriault, *Kate Brown Replaces Energy Advisor with Ties to Kitzhaber Scandal*, OREGONLIVE.COM, Sept. 28, 2015, http://www.oregonlive.com/politics/index.ssf/2015/09/kate_brown_replaces_energy_adv.html.
[10] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 22–23.
[11] *Id.*
[12] H.B. 3543, 74th Leg. Assem., Reg. Sess. (Or. 2007) (codified at O.R.S. §§ 468A.200–260 (2014)).
[13] *Id.* §15.
[14] *Id.* §2(1)(a)-(c)
[15] *Id.* §2(2)
[16] *Id.*
[17] *Id.* §4(1).
[18] *Id.* §4(2).
[19] *Id.*
[20] *Id.* §4(4).
[21] *Id.* §4(5).
[22] *Id.* §4(3).
[23] Oregon Global Warming Commission, *About the Commission,* KEEPOREGONCOOL.ORG, http://www.keeporegoncool.org/content/oregon-global-warming-commission.
[24] Angus Duncan was appointed by Governor Kulongoski in 2008 as an original member of the OGWC. Mr. Duncan has served as Chair since 2008.
[25] Alan Zelenka was appointed by Governor Kitzhaber in 2012.
[26] Catherine Mater was appointed by Governor Kitzhaber in 2013.
[27] Andrea Durbin was appointed by Governor Kulongoski in 2008 as an original member of the OGWC.
[28] Jill Eiland was appointed by Governor Kulongoski in 2008 as an original member of the OGWC.
[29] Russ Hoeflich was appointed by Governor Kulongoski in 2008 as an original member of the OGWC.
[30] Gregg Kantor was appointed by Governor Kulongoski in 2008 as an original member of the OGWC.
[31] Eric Lemelson was appointed by Governor Kulongoski in 2008 as an original member of the OGWC.
[32] Bill Wyatt was appointed by Governor Kulongoski in 2008 as an original member of the OGWC.
[33] H.B. 3543 §5(2).
[34] *Id.* §5(1).

[35] Dr. Mark Abbott was appointed by Governor Kulongoski in 2008 as an original member of the OGWC. Dr. Abbott has served as Vice Chair since 2008.
[36] Oregon Global Warming Commission, *Ex Officio Commission Members,* KEEPOREGONCOOL.ORG, http://www.keeporegoncool.org/content/ex-officio-commission-members.
[37] *Id*.
[38] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 44.
[39] Oregon Global Warming Commission, *Ex Officio Commission Members,* KEEPOREGONCOOL.ORG, http://www.keeporegoncool.org/content/ex-officio-commission-members.
[40] H.B. 3543 §5(3).
[41] *Id.* §2(2).
[42] *Id.* §9.
[43] *Id.* §10(2).
[44] *Id.* §10(3).
[45] *Id.* §12(1).
[46] *Id.* §11.
[47] *Id.* §10.
[48] Note that O.R.S. § 192.245 (2014) establishes the manner in which the report must be provided.
[49] H.B. 3543 §14.
[50] OREGON GLOBAL WARMING COMMISSION, REPORT TO THE LEGISLATURE 6 (2009) *available at* http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/09CommissionReport.pdf [hereinafter 2009 REPORT TO THE LEGISLATURE].
[51] *Id.* at 7.
[52] OREGON GLOBAL WARMING COMMISSION, LEGISLATIVE CONCEPT 2 (2008), *available at* http://www.keeporegoncool.org/sites/default/files/meeting-supporting-files/OR_budget_request_0910_draftv2_082508.pdf [hereinafter OGWC LEGISLATIVE CONCEPT].
[53] The legislature specifically allocated "[s]upport for the Department's existing efforts in renewable energy totaling $577,651, including two limited duration positions and one permanent position for the purposes of administering the Community Renewable Energy Feasibility (CREF) fund, administrative support to the Global Warming Commission, and a permanent Operations and Policy Analyst position to provide research and support for efforts related to solar and biomass energy." State of Oregon Legislative Fiscal Office, *Analysis of the 2009-11 Legislatively Adopted Budget* 288 (September 30, 2009).
[54] *Id.*
[55] *Id.*
[56] OREGON GLOBAL WARMING COMMISSION, REPORT TO THE LEGISLATURE 68 (2011) *available at* http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/2011Report.pdf [hereinafter 2011 REPORT TO THE LEGISLATURE].
[57] *Id.* at 15.
[58] Ad Hoc Committee on Priority Setting, *Resolution of the Oregon Global Warming Commission # 2008-5-008* (2008), *available at* http://www.oregon.gov/ENERGY/GBLWRM/GWC/docs/Resolutions/OGWC_Res_2008_5_008_Adopted.pdf.
[59] Oregon Global Warming Commission*, About the Commission,* KEEPOREGONCOOL.ORG, http://www.keeporegoncool.org/content/oregon-global-warming-commission.
[60] OREGON GLOBAL WARMING COMMISSION SUBCOMMITTEE ON FISH, WILDLIFE, AND HABITAT ADAPTION, PREPARING OREGON'S FISH, WILDLIFE, AND HABITAT FOR FUTURE CLIMATE CHANGE: A GUIDE FOR STATE ADAPTION EFFORTS (2008), *available at* http://www.defenders.org/publications/oregon_adaptation_efforts.pdf.
[61] *Id.* at 1.
[62] 2009 REPORT TO THE LEGISLATURE, *supra* note 50, at 20.
[63] OREGON GLOBAL WARMING COMMISSION, ROADMAP TO 2020 (2010), *available at* http://www.keeporegoncool.org/sites/default/files/Integrated_OGWC_Interim_Roadmap_to_2020_Oct29_11-19Additions.pdf [hereinafter ROADMAP TO 2020].

[64] Oregon Global Warming Commission, Resolution No. 2010-1-013, *available at* http://www.keeporegoncool.org/sites/default/files/OGWC_Res_2010_1_013_Adopted.pdf.
[65] ROADMAP TO 2020, *supra* note 63, at 3.
[66] *Id.*
[67] OREGON GLOBAL WARMING COMMISSION, REPORT TO THE LEGISLATURE 2013 at 13 (2013), *available at* http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/OGWC_2013_Rpt_Leg.pdf [hereinafter 2013 REPORT TO THE LEGISLATURE].
[68] *Id.* at 13.
[69] This "interim" document has not been revised or updated, so this paper will simply refer to the Interim Roadmap as the *Roadmap*.
[70] OREGON GLOBAL WARMING COMMISSION, OGWC ROADMAP TO 2020 PHASE 1 SUMMARY REPORT (2011), *available at* http://www.keeporegoncool.org/sites/default/files/OGWC_Roadmap_2020_Roadshow_Survey_Phase_1_Report_Combined.pdf [hereinafter ROADMAP TO 2020 PHASE 1 REPORT].
[71] ROADMAP TO 2020, *supra* note 63, at 5–6.
[72] OGWC 2013 REPORT, *supra* note 67, at 41.
[73] Oregon Global Warming Commission, *Roadmap to 2020,* KEEPOREGONCOOL.ORG, http://www.keeporegoncool.org/content/roadmap-2020.
[74] ROADMAP TO 2020 PHASE 1 REPORT, *supra* note 70, at 1.
[75] *Id.* at 9.
[76] *Id.* at 16.
[77] *Id.*
[78] H.B. 3543, 74th Leg. Assem., Reg. Sess. § 14 (Or. 2007).
[79] 2009 REPORT TO THE LEGISLATURE, *supra* note 50.
[80] *Id.* at 5–7.
[81] 2011 REPORT TO THE LEGISLATURE, *supra* note 56.
[82] 2013 REPORT TO THE LEGISLATURE, *supra* note 67, at 6.
[83] Oregon Global Warming Commission. *Report to the Legislature*. 2013. pg. 6.
[84] *Id.*
[85] *Id.* at 8–11.
[86] *Id.* at 7, 14–40.
[87] The five recommended sector-specific key actions receiving an A include: (1) energy efficiency within the energy sector, (2) keep urban footprints compact within the Transportation and Land Use sector, (3) establish GHG leadership recognition program within the Industrial sector, (4) develop manure to energy methods within in the Agriculture sector, and (5) conduct research to develop a consumption-based GHG inventory and inventory methodology/consider integration with State's conventional inventory, identify high-carbon product categories within the Materials Management sector. The only sector that did not receive a rating of A in regards to its recommended key actions is the Forestry sector.
[88] Note, within the energy sector the recommended action to "ramp down emissions associated with coal generation" received a score of B/C. This accounts for the additional scoring results of the forty key actions.
[89] 2015 REPORT TO THE LEGISLATURE, *supra* note 5.
[90] *Id.* at 7.
[91] *Id.*
[92] *Id.* at 17.
[93] *Id.* at 11, 20.
[94] *Id.* at 21–22.
[95] *Id.* at 11.
[96] *Id.* at 24.
[97] *Id.* at 30.
[98] *Id.* at 33. This goal reflects the emissions reductions halfway between the state's 2020 and 2050 goals.
[99] *Id.* at 35.

[100] *Id.* at 47.
[101] 10-YEAR ENERGY PLAN TASK FORCE, 10-YEAR ENERGY ACTION PLAN 7 (2010), *available at* http://www.oregon.gov/energy/Ten_Year/Ten_Year_Energy_Action_Plan_Final.pdf [hereinafter 10-YEAR ENERGY ACTION PLAN].
[102] *Id*. at 4–5.
[103] *Id*. at 11–13.
[104] Oregon Department of Energy, *Oregon's 10-Year Energy Action Plan,* OREGON.GOV, http://www.oregon.gov/energy/pages/ten_year/ten_year_energy_plan.aspx.
[105] 10-YEAR ENERGY ACTION PLAN, *supra* note 101, at 17.
[106] *Id*. at 18–19.
[107] *Id*. at 22–24.
[108] *Id*. at 26.
[109] *Id*. at 26–27.
[110] *Id*.
[111] *Id*. at 29.
[112] *Id*. at 30–31.
[113] *Id*. at 36.
[114] *Id*. at 37.
[115] OREGON DEPARTMENT OF TRANSPORTATION, OREGON STATEWIDE TRANSPORTATION STRATEGY 11 (2013), *available at* http://www.oregon.gov/ODOT/TD/OSTI/docs/STS/Oregon_Statewide_Transportation_Strategy.pdf [hereinafter STS 2050 VISION]; S.B. 1059, 75th Leg. Assem., Spec. Sess. (Or. 2010) (codified at O.R.S. § 184.889 (2014)).
[116] *Id.*
[117] *Id.* at 13.
[118] *Id.* at 14; *see* OREGON DEPARTMENT OF TRANSPORTATION, OREGON TRANSPORTATION PLAN (2007), *available at* http://www.oregon.gov/ODOT/TD/TP/pages/otp.aspx.
[119] 10-YEAR ENERGY ACTION PLAN, *supra* note 101.
[120] OREGON CLIMATE CHANGE RESEARCH INSTITUTE, OREGON CLIMATE ASSESSMENT REPORT (2010), *available at* http://occri.net/wp-content/uploads/2013/11/ClimateChangeInTheNorthwest.pdf.
[121] *Id.*
[122] OREGON CLIMATE CHANGE ADAPTATION FRAMEWORK (2010), *available at* http://www.oregon.gov/energy/GBLWRM/docs/Framework_Final_DLCD.pdf.
[123] *Id.* at v.
[124] OREGON WATER RESOURCES DEPARTMENT, OREGON'S INTEGRATED WATER RESOURCES STRATEGY (2012), *available at* http://www.oregon.gov/owrd/LAW/docs/IWRS_Final_2.pdf.
[125] *Id.* at 54.
[126] *Id.* at 59.
[127] OREGON DEPARTMENT OF ENERGY PLANNING AND INNOVATION DIVISION, 2015–2019 STRATEGIC FRAMEWORK (2015), *available at* http://www.oregon.gov/energy/P-I/docs/PI_Strategic_Framework.pdf.
[128] *Id.* at ii–iii.
[129] *Id.* at 19–20.
[130] Oregon Department of Environmental Quality, *About Us,* OREGON.GOV, http://www.oregon.gov/deq/Pages/about_us.aspx.
[131] DEQ Air Quality, OREGON.GOV, http://www.oregon.gov/DEQ/AQ/pages/index.aspx.
[132] *See* Oregon Department of Environmental Quality, *Greenhouse Gas Reporting Home,* OREGON.GOV, http://www.deq.state.or.us/aq/climate/greenhousegas.htm.
[133] COLIN MCCONNAHA, ET AL., OREGON'S GREENHOUSE GAS EMISSIONS THROUGH 2010 (2013), *available at* http://www.oregon.gov/deq/AQ/Documents/OregonGHGinventory07_17_13FINAL.pdf.
[134] *See* Oregon Department of Environmental Quality, *Oregon Clean Fuels Program,* OREGON.GOV, http://www.deq.state.or.us/aq/cleanFuel/index.htm.

[135] *See* Oregon Department of Environmental Quality, *Oregon's Plan to Reduce Carbon Pollution from Power Plants,* OREGON.GOV, http://www.deq.state.or.us/aq/climate/co2standard.htm.
[136] O.R.S. § 468A.250(2)(A) (2014).
[137] The current Director of DEQ is Dick Pederson. Department of Administrative Services, *State Agency Directory, Office of the Director,* OREGON.GOV, http://dasapp.oregon.gov/statephonebook/display.asp?agency=34000&division=00005.
[138] Oregon Department of Environmental Quality, *About Us,* OREGON.GOV, http://www.oregon.gov/deq/Pages/about_us.aspx. Colin McConnaha is currently the GHG Specialist with DEQ.
[139] DEQ Rules and Regulations, *Rules and Regulations,* OREGON.GOV, http://www.oregon.gov/deq/RulesandRegulations/Pages/default.aspx.
[140] DEQ Environmental Quality Commission, *Oregon DEQ's Policy and Rulemaking Board,* OREGON.GOV, http://www.oregon.gov/DEQ/EQC/pages/index.aspx.
[141] O.R.S. § 468A.315(2)(c).
[142] Oregon Department of Environmental Quality, *Greenhouse Gas Reporting Home,* http://www.deq.state.or.us/aq/climate/greenhousegas.htm.
[143] O.R.S. § 468A.270.
[144] S.B. 324, 78th Leg. Assem., Reg. Sess. (2015).
[145] Oregon Department of Energy, *About Us,* OREGON.GOV, http://www.oregon.gov/energy/Pages/about_us.aspx.
[146] Oregon Department of Energy, *ODOE: Renewable Energy,* OREGON.GOV, http://www.oregon.gov/ENERGY/Renew/pages/index.aspx.
[147] Oregon Department of Energy, *ODOE: Energy Conservation,* OREGON.GOV, http://www.oregon.gov/ENERGY/CONS/pages/index.aspx.
[148] The current Director of ODOE is Michael Kaplan.
[149] Jessica Shipley is a senior policy analyst within ODOE's Energy Planning and Innovation Division; she contributes to the Oregon Global Warming Commission Report to the Oregon legislature.
[150] O.R.S. § 468A.245.
[151] O.R.S. § 757.528(4).
[152] O.R.S. § 469.060.
[153] OREGON DEPARTMENT OF ENERGY, 2015-2017 STATE OF OREGON BIENNIAL ENERGY PLAN (2015), *available at* http://www.oregon.gov/energy/docs/reports/legislature/2015/Energy_Plan_2015-17.pdf
[154] *Id*. at 5.
[155] *Id*. at 29; *See also infra* § III.A.1.c.
[156] Oregon Department of Energy, *ODOE: Energy Facility Siting,* OREGON.GOV, http://www.oregon.gov/ENERGY/Siting/pages/index.aspx.
[157] Oregon Department of Energy, ODOE: Energy Facility Siting, *About Oregon's Energy Facility Siting Council,* OREGON.GOV, http://www.oregon.gov/ENERGY/Siting/Pages/sitehm.aspx.
[158] Oregon Department of Energy, ODOE: Energy Facility Siting, *About Oregon's Energy Facility Siting Council,* OREGON.GOV, http://www.oregon.gov/ENERGY/Siting/Pages/sitehm.aspx.
[159] O.R.S. § 469.503(2).
[160] *Id.* § 469.503(2)(b).
[161] Public Utility Commission, *About Us,* http://www.puc.state.or.us/Pages/about_us.aspx.
[162] F.P.A. § 205; O.R.S. § 756.040(1) (2014).
[163] O.R.S. § 756.060.
[164] *Id.* § 756.070.
[165] Public Utility Commission, *About Us,* http://www.puc.state.or.us/Pages/about_us.aspx.
[166] O.R.S. § 756.014(1).
[167] As of November 2015, Jason Salmi Klotz is the Climate Change Lead for the PUC.
[168] O.R.S. § 757.528(3).
[169] *Id.* § 757.524.
[170] *Id.* § 757.539.
[171] *Id* § 757.539(3)–(5).

[172] *Id.* § 757.539(11).
[173] Energy Trust of Oregon, *About Us,* http://energytrust.org/about/.
[174] Energy Trust of Oregon, *Who We Are,* http://energytrust.org/about/who-we-are/.
[175] Energy Trust of Oregon, *Who We Are,* http://energytrust.org/about/who-we-are/.
[176] O.R.S. § 469.503 (2014).
[177] The Climate Trust, *History,* CLIMATETRUST.ORG, https://www.climatetrust.org/about/history/.
[178] The Climate Trust, *We Buy,* CLIMATETRUST.ORG, https://www.climatetrust.org/work/we-buy/.
[179] *Id.*
[180] 16 U.S.C. § 839b.
[181] Northwest Power and Conservation Council, *About Us—Mission and Strategy*, NWCOUNCIL.ORG, https://www.nwcouncil.org/about/mission/.
[182] NORTHWEST POWER AND CONSERVATION COUNCIL, NORTHWEST CONSERVATION AND ELECTRIC POWER PLAN 11-2 (2010), *available at* https://www.nwcouncil.org/media/6347/SixthPowerPlan_Ch11.pdf.
[183] The current members to the Council include Chair Phil Rockefeller (Wash.), Vice-Chair Bill Booth (Ida.), Jennifer Anders (Mont.), Bill Bradbury (Ore.), Tom Karier (Wash.), Henry Lorenzen (Ore.), Pat Smith (Mont.), and Jim Yost (Ida.).
[184] O.R.S. § 469.803.
[185] *Id.* § 469.805.
[186] *Id.* §§ 469.805, 469.810.
[187] *Id.* § 469.485.
[188] *Id.* § 469.503.
[189] For details on EFSC, see section III.A.1.d.
[190] O.R.S. § 469.300(11)(a) (2014).
[191] *Id.* § 469.503.
[192] *See* The Climate Trust, *History,* CLIMATETRUST.ORG, https://www.climatetrust.org/about/history/.
[193] O.R.S. § 469.503 (2014).
[194] *Id.* § 469.503(2)(a).
[195] O.A.R. § 345-024-0500 *et seq*.
[196] O.A.R. § 345-024-0550.
[197] *Id.* § 345-024-0590.
[198] *Id.* § 345-024-0620.
[199] O.R.S. § 469.503(2)(c)(C).
[200] O.A.R. § 345-024-058.
[201] O.R.S. § 469.503(2)(c)(C).
[202] *Id*.
[203] THE CLIMATE TRUST, PLOWING NEW PATHWAYS: DEVELOPING QUALITY OFFSETS IN A MATURING MARKET, THE CLIMATE TRUST'S FIVE-YEAR REPORT TO THE OREGON ENERGY FACILITY SITING COUNCIL 3 (Oct 2014), http://www.climatetrust.org/wp-content/uploads/2014/11/2014-Oregon-5-Year-Report-EMAIL-141117-CAM-FNL.pdf.
[204] *Id*.
[205] O.R.S. § 757.524.
[206] *Id.*
[207] *Id.* § 757.528.
[208] *Id.* § 757.531.
[209] *Id.* § 757.533.
[210] *Id.* § 757.536.
[211] O.R.S. § 468A.280.
[212] *Id.* § 468A.050.
[213] O.A.R. § 340-215-0010 *et seq*.

[214] *Id.* § 340-215-0030.
[215] *Id.* § 340-215-0030(7).
[216] Telephone Interview with Elizabeth Elbel, Greenhouse Gas Data Verification Specialist, Oregon Department of Environmental Quality, Sept. 8, 2015.
[217] S.B. 844, 77th Leg. Assem., Reg. Sess. (Or. 2013) (codified at O.R.S. § 757.539 (2014)).
[218] O.A.R. § 860-085-0500 *et seq*.
[219] *Id.* § 860-085-0600.
[220] *Id.* § 860-085-0750.
[221] *Id.* § 860-085-0700.
[222] O.R.S. §§ 469A.050, 469A.010.
[223] Large Utilities are those "providing three percent or more of all electricity sold to retail electricity consumers." *Id.* § 469A.052(1).
[224] *Id.* § 469A.052.
[225] *Id.* § 469A.055.
[226] *Id.*
[227] *Id.* §§ 469A.130, 469A.140.
[228] O.A.R. § 330-160.0005 et seq.
[229] O.R.S. § 469A.075(1).
[230] *Id.* § 469A.170(1).
[231] LEGISLATIVE COMMITTEE SERVICES, BACKGROUND BRIEF ON OREGON RENEWABLE ENERGY RESOURCES 4 (2013), *available at* https://www.oregonlegislature.gov/citizen_engagement/Reports/BB2014OregonRenewableEnergy.pdf.
[232] O.R.S. § 757.300.
[233] *Id.* § 757.300(8).
[234] See O.A.R. §§ 860-039-0015, 860-039-0020.
[235] O.R.S. § 757.300(2).
[236] *Id.* § 757.365.
[237] *Id.*
[238] *Id.*
[239] OREGON PUBLIC UTILITY COMMISSION, SOLAR PHOTOVOLTAIC VOLUMETRIC INCENTIVE PROGRAM: 2015 REPORT TO THE LEGISLATIVE ASSEMBLY (2015), *available at* http://www.puc.state.or.us/docs/2015%20Solar%20Report.pdf.
[240] Investigation into Pilot Programs to Demonstrate the Use and Effectiveness of Volumetric Incentive Rates for Solar Photovoltaic Systems, Order No. 14-025 at 2 (Or. Pub. Util. Comm'n, Jan. 22, 2014).
[241] Oregon also offered a Business Energy Tax Credit (BETC) that helped bring many new renewable energy projects online from 2008–2012. However, the BETC was controversial and has been phased out.
[242] O.R.S. §§ 469B.130–469B.169; O.A.R. §§ 330-070-0010 to 330-070-0097.
[243] O.R.S. §§ 469B.270–469B.306; O.A.R. §§ 330-210-0000 to 330-210-0150.
[244] O.R.S. § 469B.403; O.A.R. §§ 330-170-0010 to 330-170-0070.
[245] O.R.S. § 469B.253.
[246] *Id.* §§ 469B.250–469B.265; O.A.R. §§ 330-200-0000 to 330-200-0150.
[247] OREGON DEPARTMENT OF ENERGY, SMALL SCALE ENERGY LOAN PROGRAM, BIENNIAL REPORT TO THE OREGON LEGISLATURE (2015), *available at* http://www.oregon.gov/energy/docs/reports/legislature/2015/SELP_13-15_LegislativeReport.pdf
[248] O.R.S. § 470.060
[249] *See* Solar Electric Incentive Program, DSIRE.ORG, http://programs.dsireusa.org/system/program/detail/936.
[250] S.B. 1149, 70th Leg. Assem., Reg. Sess. (Or. 1999).
[251] O.R.S. § 469.010.
[252] O.R.S. § 469.633.
[253] *Id.* § 469.651.
[254] *Id.* §§ 469.633(1)–(2), 469.651(1)–(2).
[255] *Id.* §§ 469.633(1)–(2), 469.651(1)–(2).

[256] *Id.* §§ 469.633(3), 469.651(3).
[257] *Id.* §§ 469.633(4), 469.651(4).
[258] *Id.* § 469.860 *et seq*.
[259] *Id.* §§ 469.863, 469.865, 469.885. The PUC regulations further define the requirements for commercial energy conservation programs. For example, the regulations require utilities to actively promote energy audit services and require utilities to provide audits to commercial building customers using more than 4,000 kWh of electricity per month. O.A.R. § 330-066-0015.
[260] H.B. 3363, 73rd Leg. Assem., Reg. Sess. (Or. 2005) (codified at O.R.S. § 469.233 (2014)).
[261] *Id.* § 469.261.
[262] O.A.R. § 330-092-0015.
[263] *Id.* § 330-092-0030.
[264] S.B. 79, 75th Leg. Assem., Reg. Sess. (Or. 2009).
[265] O.R.S. § 455.505 (2014).
[266] *Id.*
[267] *Id.* § 455.511.
[268] 2014 OREGON ENERGY EFFICIENCY SPECIALTY CODE (2014), *available at* http://ecodes.biz/ecodes_support/free_resources/Oregon/14_Energy/14_OREnergy_main.html.
[269] *Id.* at vi.
[270] *Id.* § 455.500.
[271] *Id.* § 455.500(2).
[272] 2011 OREGON REACH CODE (2012), *available at* http://ecodes.biz/ecodes_support/free_resources/Oregon/11_Reach/11_ORReach_main.html.
[273] S.B. 1149, 70th Leg. Assem., Reg. Sess. (Or. 1999).
[274] *Id.* § 3.
[275] Energy Trust of Oregon, *Who We Are,* http://energytrust.org/about/who-we-are/.
[276] S.B. 838, 74th Leg. Assem., Reg. Sess. (Or. 2007).
[277] Energy Trust of Oregon, *Energy Savings at Your Fingertips,* http://energytrust.org/residential/.
[278] Energy Trust of Oregon, *Take Control of Your Energy Costs,* http://energytrust.org/commercial/.
[279] Energy Trust of Oregon, *Put Us on Your Energy Team,* http://energytrust.org/industrial-and-ag/.
[280] In the Matter of Energy Trust of Oregon, Request for Approval of Exceptions to Cost Effectiveness Guidelines, Order No. 15-140, UM 1622, at 5 (Or. Pub. Util. Comm'n, Apr. 23, 2015) (quoting Order No. 94-590, UM 551 at 14 (Or. Pub. Util. Comm'n, Apr. 6, 1994)).
[281] *Id.*
[282] Energy Trust of Oregon, *Cost-Effectiveness Policy and General Methodology for Energy Trust of Oregon,* 4.06.000-P at 2 (2011), *available at* https://energytrust.org/library/policies/4.06.000.pdf.
[283] *Id.* at 2–3.
[284] Order No. 94-590, UM 551 at 18 (Or. Pub. Util. Comm'n, Apr. 6, 1994).
[285] *Id.*
[286] In the Matter of Energy Trust of Oregon, Request for Approval of Exceptions to Cost Effectiveness Guidelines, Order No. 15-140, UM 1622, at 6–7 (Or. Pub. Util. Comm'n, Apr. 23, 2015).
[287] *See, e.g.,* In the Matter of Energy Trust of Oregon, Request for Approval of Exceptions to Cost Effectiveness Guidelines, Order 14-332, UM 1622, (Or. Pub. Util. Comm'n, Oct. 1, 2014); In the Matter of Energy Trust of Oregon, Cost Effectiveness Exception Request for Electric Measures, Order No. 15-029, UM 1696 (Or. Pub. Util. Comm'n, Jan. 29, 2015).
[288] ENERGY TRUST OF OREGON, 2015–2019 STRATEGIC PLAN (2014), *available at* https://energytrust.org/library/plans/2015-2019_Strategic_Plan0.pdf.
[289] *Id.* at 5 (emphasis added).
[290] O.R.S. § 469.010(2)(f).
[291] O.R.S. § 469.020(3).

[292] Because the Clean Fuels program involves regulating emissions from motor vehicles, the legislature tasked DEQ with administering the program, rather than ODOT.
[293] Oregon Department of Transportation, *About Us,* OREGON.GOV, http://www.oregon.gov/ODOT/Pages/about_us.aspx.
[294] The current Director of ODOE is Michael Garrett.
[295] S.B. 1059, 75th Leg. Assem., Spec. Sess. (Or. 2010).
[296] The Oregon Transportation Commission establishes the state's transportation regulations and "guides the planning, development and management of a statewide integrated transportation network that provides efficient access, is safe, and enhances Oregon's economy and livability." Oregon Transportation Commission, OREGON.GOV, http://www.oregon.gov/odot/comm/pages/otc_main.aspx.
[297] OREGON DEPARTMENT OF TRANSPORTATION, OREGON STATEWIDE TRANSPORTATION STRATEGY: A 2050 VISION FOR GREENHOUSE GAS EMISSIONS REDUCTION (2013), *available at* http://www.camsys.com/pubs/STSReport.pdf.
[298] H.B. 2186, 75th Leg. Assem., Reg. Sess. (Or. 2009).
[299] O.A.R. § 340-253-0000 *et seq*.
[300] H.B. 2186, 75th Leg. Assem., Reg. Sess. (Or. 2009).
[301] O.A.R. § 340-253-0000(2).
[302] These standards appear in tables in O.A.R. §§ 340-253-8010 & 340-253-0820.
[303] *Id.* § 340-253-0100(6).
[304] *Id.* § 340-253-0250.
[305] Denis C. Theriault, *Kate Brown Makes it Official, Signs Bill Pushing Oregon's Low-Carbon Fuel Standard,* OREGONLIVE.COM, Mar. 12, 2015, http://www.oregonlive.com/politics/index.ssf/2015/03/kate_brown_makes_it_official_s.html; S.B. 324, 78th Leg. Assem., Reg. Sess. (Or. 2015).
[306] Ian K. Kullgren, *Transportation Deal Revealed: Lawmakers Agreed to Ax Clean Fuels for Road Fixes, Documents Show,* OREGONLIVE.COM, June 19, 2015, http://www.oregonlive.com/politics/index.ssf/2015/06/transportation_deal_revealed_l.html.
[307] Ian K. Kullgren, Clean Fuels Controversy: Energy, Trucking Groups Sue to Block Low-Carbon Standard, OREGONLIVE.COM, Mar. 24, 2015, http://www.oregonlive.com/politics/index.ssf/2015/03/clean_fuels_controversy_energy.html.
[308] Oregon Department of Forestry, *About Us*, OREGON.GOV, http://www.oregon.gov/odf/Pages/about_us.aspx.
[309] Doug Decker was appointed State Forester in 2011. *Id.*
[310] O.R.S. § 526.780.
[311] *Id.* § 526.783.
[312] *Id.* § 526.786.
[313] O.A.R. § 629-022-0070.
[314] California Air Resources Board, *Compliance Offset Protocol U.S. Forest Offset Projects*, CA.GOV, March 27, 2015, http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm.
[315] Oregon Department of Agriculture, *Mission and Values,* OREGON.GOV, http://www.oregon.gov/ODA/AboutUs/Pages/Mission.aspx.
[316] Katy Coba was appointed ODA Director in 2003 by governor Ted Kulongoski. Oregon Department of Agriculture, *ODA Director: Katy Coba*, OREGON.GOV, http://www.oregon.gov/ODA/AboutUs/Pages/Director.aspx.
[317] Oregon Department of Agriculture, *Board of Agriculture*, OREGON.GOV, http://www.oregon.gov/ODA/AboutUs/Pages/BoardAgriculture.aspx.
[318] Oregon Water Resources Department, *About Us,* OREGON.GOV, http://www.oregon.gov/owrd/Pages/about_us.aspx.
[319] O.R.S. § 197.010.
[320] *Id.*
[321] *Id.*
[322] Oregon Department of Land Conservation and Development, *About Us,* OREGON.GOV, http://www.oregon.gov/LCD/Pages/about_us.aspx.
[323] Oregon Statewide Planning Goals and Guidelines, Goal 2: Land Use Planning, O.A.R. § 660-015-0000(13).

[324] Oregon Statewide Planning Goals and Guidelines, Goal 13: Energy Conservation, O.A.R. § 660-015-0000(13).
[325] OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, STRATEGIC PLAN 2014–2022 at 2 (2014), *available at* http://www.oregon.gov/LCD/docs/publications/StrategicPlan2014-22_Draft.pdf [hereinafter OREGON STRATEGIC PLAN].
[326] OREGON TRANSPORTATION AND GROWTH MANAGEMENT PROGRAM, COOL PLANNING: A HANDBOOK ON LOCAL STRATEGIES TO SLOW CLIMATE CHANGE 4 (2010), *available at* http://www.oregon.gov/lcd/tgm/docs/cool_planning_handbook.pdf.
[327] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 32.
[328] 2009 REPORT TO THE LEGISLATURE, *supra* note 50, at 19.
[329] *Id.*
[330] H.B. 3543, 74th Leg. Assem., Reg. Sess. § 9 (Or. 2007).
[331] *Id.* §10 (The OGWC "*may recommend* statutory and administrative changes, policy measures and other recommendations *to be carried out by* state and local governments, businesses, nonprofit organizations or residents.")
[332] 2013 REPORT TO THE LEGISLATURE, *supra* note 67, at 7.
[333] OGWC LEGISLATIVE CONCEPT, *supra* note 52, at 2.
[334] 2013 REPORT TO THE LEGISLATURE, *supra* note 67, at 6.
[335] ROADMAP TO 2020 PHASE 1 REPORT, *supra* note 70, at 1.
[336] 2009 REPORT TO THE LEGISLATURE, *supra* note 50, at 7.
[337] PETER ERICKSON, CHELSEA CHANDLER, & MICHAEL LAZARUS, REDUCING GREENHOUSE GAS EMISSIONS ASSOCIATED WITH CONSUMPTION: A METHODOLOGY FOR SCENARIO ANALYSIS (2012), *available at* http://sei-us.org/Publications_PDF/SEI-WP-2012-05-Reducing-GHGs-Consumption.pdf.
[338] STS 2050 VISION, *supra* note 115.
[339] OREGON DEPARTMENT OF ENERGY & THE CENTER FOR CLIMATE STRATEGIES, 10-YEAR ENERGY ACTION PLAN MODELING (2012), *available at* http://www.oregon.gov/energy/GBLWRM/docs/Energy_Plan_GhG_MACC__Foundational_Modeling_Final_Report.pdf.
[340] PACIFICORP, 2011 INTEGRATED RESOURCE PLAN 38 (2011), *available at* http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2011IRP/2011IRP-MainDocFinal_Vol1-FINAL.pdf.
[341] *See supra* § III.A.3.
[342] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 45. Although Oregon's statutory emission target is set in terms of a 1990 baseline, the report used 2005 as a baseline year to be more "realistic [and] fair" since Oregon's Trojan nuclear facility closed in 1993, forcing the two utilities to get a larger percentage of their electricity from fossil fuels.
[343] *Id*. at 45–47.
[344] *Id*. at 47.
[345] *See supra* § III.A.3.a.
[346] The average emission rate for a coal-fired power plant in the United States is 2,249 pounds of CO_2 per megawatt-hour. US EPA, *Air Emissions*, http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html.
[347] Oregon Department of Energy, *Where Does Oregon's Electricity Come From?*, http://www.oregon.gov/energy/pages/oregons_electric_power_mix.aspx.
[348] *See supra* § III.A.3.a.
[349] *See supra* § III.A.3.a.
[350] O.R.S. § 469.503(2)(c)(C).
[351] THE CLIMATE TRUST, PLOWING NEW PATHWAYS: DEVELOPING QUALITY OFFSETS IN A MATURING MARKET, THE CLIMATE TRUST'S FIVE-YEAR REPORT TO THE OREGON ENERGY FACILITY SITING COUNCIL 19 (2014), *available at* http://www.climatetrust.org/wp-content/uploads/2014/11/2014-Oregon-5-Year-Report-EMAIL-141117-CAM-FNL.pdf.
[352] *Id*. at 23.
[353] O.A.R. § 345-024-058.

[354] THE CLIMATE TRUST, *supra* note 351, at 3.
[355] *Id*. at 45.
[356] O.R.S. § 469.503(2)(c)(C).
[357] THE CLIMATE TRUST, *supra* note 351, at 45.
[358] *Id*. app. 1, tbl. A.1.
[359] *Id*. at 29.
[360] *Id*. app. 1, tbl. A.1.
[361] This is especially troubling considering that most of the tons retired by the Climate Trust from active projects took place in Alaska, which saw a record fire season destroy over 5 million acres. *See* ALASKA INTERAGENCY COORDINATION CENTER SITUATION REPORT: FRIDAY, OCT. 2, 2015 (2015), *available at* http://fire.ak.blm.gov/content/aicc/sitreport/current.pdf.
[362] THE CLIMATE TRUST, *supra* note 351, at 63.
[363] *See supra* § III.A.3.a.
[364] O.R.S. § 757.539(11).
[365] OREGON PUBLIC UTILITY COMMISSION, SENATE BILL 844 PROGRESS REPORT 1 (2015), *available at* http://www.puc.state.or.us/meetings/pmemos/2015/012815/ca9.pdf.
[366] *Id*. at 7–8.
[367] *See supra* Part III.
[368] PAUL DENHOLM & ROBERT MARGOLIS, SUPPLY CURVES FOR ROOFTOP SOLAR PV-GENERATED ELECTRICITY FOR THE UNITED STATES, NAT'L RENEWABLE ENERGY LAB. TECH. REPORT (2008), *available at* http://www.nrel.gov/docs/fy09osti/44073.pdf.
[369] JASON COUGHLIN, ET AL., A GUIDE TO COMMUNITY SHARED SOLAR: UTILITY, PRIVATE, AND NONPROFIT PROJECT DEVELOPMENT 34 (2012), *available at* http://www.nrel.gov/docs/fy12osti/54570.pdf.
[370] Minnesota, Delaware, Massachusetts, Connecticut, the District of Columbia, Maryland, New Hampshire, Rhode Island, Vermont, and California also allow some form of virtual net metering. Institute for Local Self-Reliance, *Virtual Net Metering*, https://ilsr.org/virtual-net-metering/.
[371] For a detailed description of this program, *see* Part III.
[372] *See supra*, Part III.
[373] OREGON PUBLIC UTILITY COMMISSION, SOLAR PHOTOVOLTAIC VOLUMETRIC INCENTIVE PROGRAM: 2015 REPORT TO THE LEGISLATIVE ASSEMBLY (2015), *available at* http://www.puc.state.or.us/docs/2015%20Solar%20Report.pdf.
[374] *See supra*, Part III.
[375] O.R.S. § 469A.020.
[376] Oregon is now the seventh highest ranking state in terms of installed wind capacity, at over 3,100 MW. AMERICAN WIND ENERGY ASSOCIATION, OREGON WIND ENERGY FACT SHEET, *available at* http://www.awea.org/resources/statefactsheets.aspx?itemnumber=890
[377] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 52.
[378] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60) [hereinafter Clean Power Plan]. The rule officially adopts emission performance rates of 1,305 lbs. CO_2/MWh for electric steam generating units and 771 lbs. CO_2/MWh for stationary combustion turbines, but these source categories generally combust coal and natural gas, respectively. *Id.* at 64,742.
[379] Oregon's final rate-based emission goal is 871 lbs. CO_2/MWh; if the state chooses this option, all affected EGUs within the state must collectively achieve this emission rate by 2030. *Id.* at 64,824, tbl. 12.
[380] Oregon's mass-based goal is 8,118,654 short tons of CO_2; if the state chooses this option, the total emissions from the state's affected EGUs cannot exceed this mass in 2030. *Id.* at 64,825, tbl. 13.
[381] *Id.* at 64,742.
[382] The final rule's rate-based goal requires Oregon to reduce its emissions rate by 20% below 2012 levels by 2030, and the rule's mass-based goal actually allows the state to increase its CO_2 emissions by 458,879 short tons between

2012 and 2030. *See* E&E Publishing Power Plan Hub, *Oregon,* EENEWS.NET, Sept. 15, 2015, http://www.eenews.net/interactive/clean_power_plan/states/oregon.
[383] Oregon's Clean Power Plan mass-based goal is 8,118,654 short tons of CO_2, or 8,822,053 tons CO_2 if the state chooses to regulate new sources under the rule. Oregon's interim 2035 targets for PGE and Pacific Power are 4 million tons CO_2e and 5.6 million tons CO_2e, respectively. Clean Power Plan, *supra* note 378, at 64,889, tbl. 14.
[384] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 57.
[385] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62,624 (Oct. 15, 2012) (codified at 40 C.F.R. pts. 85, 86, and 600, and 49 C.F.R. pts. 523, 531, 533, 536, and 537).
[386] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 30, 32.
[387] Ian K. Kullgren, *Transportation Deal Revealed: Lawmakers Agreed to Ax Clean Fuels for Road Fixes, Documents Show*, THE OREGONIAN, June 26, 2015, http://www.oregonlive.com/politics/index.ssf/2015/06/transportation_deal_revealed_l.html.
[388] Ian K. Kullgren, *Federal Court Sides with Environmental Advocates, Upholds Oregon's Clean Fuels Program*, THE OREGONIAN, Sept. 24, 2015, http://www.oregonlive.com/politics/index.ssf/2015/09/federal_court_upholds_oregons.html.
[389] Saul Hubbard, *Federal Lawsuit Challenging 'Clean Fuels' Program Dismissed*, THE REGISTER-GUARD, Sept. 21, 2015, http://registerguard.com/rg/news/local/33541942-75/federal-lawsuit-challenging-clean-fuels-program-dismissed.html.csp.
[390] *Id*.
[391] Ian K. Kullgren, *Clean Fuels Foes Take Fight to 2016 Ballot*, THE OREGONIAN, May 20, 2015, http://www.oregonlive.com/politics/index.ssf/2015/05/clean_fuel_foes_take_fight_to.html.
[392] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 40–43.
[393] STS 2050 VISION, *supra* note 115, at 17.
[394] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 56, tbl. 7.
[395] *Id.* at 43–44.
[396] *See supra*, § III.C.1.
[397] O.R.S. § 197.010. However, Oregon Land Conservation and Development Commission regulations set greenhouse gas targets for metropolitan areas in the state, and require local governments to consider those targets in their land use and transportation plans. O.A.R. § 660-044-000 *et seq*.
[398] OREGON STRATEGIC PLAN, *supra* note 325, at 3.
[399] *Id.*
[400] A.B. 32, 2006 Gen. Assem., Reg. Sess. (Cal. 2006).
[401] 17 C.C.R. §§ 95801–96022.
[402] Cal. Health & Safety Code § 38530(a).
[403] *Id.* § 38550. This 2020 emissions target must mirror the state's greenhouse gas emissions in 1990.
[404] *Id.* § 38560.
[405] *Id.* § 38580(a).
[406] H.B. 3470, 78th Leg. Assem., 2015 Reg. Sess. (Or. 2015).
[407] The Oregonian, *Your Government—House Bill 3470,* OREGONLIVE.COM, http://gov.oregonlive.com/bill/2015/HB3470/.
[408] H.B. 3470, 78th Leg. Assem., 2015 Reg. Sess. (Or. 2015).
[409] *Id.* § (8)(6).
[410] The Oregonian, *Your Government—House Bill 3470,* OREGONLIVE.COM, http://gov.oregonlive.com/bill/2015/HB3470/.
[411] Email from Representative Phil Barnhart's Office to Andrea Lang, GEI Energy Fellow (Sept. 21, 2015).
[412] 2015 REPORT TO THE LEGISLATURE, *supra* note 5, at 33.
[413] Cal. Health & Safety Code § 38501(i).
[414] *See, e.g.,* CLIMATE ACTION TEAM, 2015 STATE AGENCY GREENHOUSE GAS REDUCTION REPORT CARD (2015), *available at* http://www.climatechange.ca.gov/climate_action_team/reports/2015_CalEPA_Report_Card.pdf.

[415] California Air Resources Board, *History of the Air Resources Board*, http://www.arb.ca.gov/knowzone/history.htm.
[416] Cal. Health & Safety Code § 39510.
[417] California Air Resources Board, *Human Resources*, http://www.arb.ca.gov/personnel/personnel.htm#background.
[418] California Air Resources Board, *Organization of the California Air Resources Board,* http://www.arb.ca.gov/html/org/org.htm.
[419] Cal. Health & Safety Code § 39511.
[420] Telephone Interview with Julie Dunwoody, Classifications and Transactions Manager, California Air Resources Board (September 17, 2015).
[421] Cal. Health & Safety Code § 39510(b).
[422] California Air Resources Board, *Mary D. Nichols Chair, California Air Resources Board*, http://www.arb.ca.gov/board/bio/marynichols.htm.
[423] California Air Resources Board, *A.B. 32 Cost of Implementation Fee Regulation*, http://www.arb.ca.gov/cc/adminfee/adminfee.htm.
[424] Cal. Health & Safety Code § 38597.
[425] California Air Resources Board, *A.B. 32 Cost of Implementation Fee Regulation*, http://www.arb.ca.gov/cc/adminfee/adminfee.htm.
[426] 17 C.C.R. § 95203.
[427] California Air Resources Board, *A.B. 32 Cost of Implementation Fee Regulation Fact Sheet*, http://www.arb.ca.gov/cc/adminfee/ab32coifactsheet.pdf.
[428] *See supra* n.374.
[429] *See supra* n.380.
[430] Sustainable Communities and Climate Protection Act of 2008, S.B. 375, 2008 Cal. Legis. Serv. Ch. 728 (2008) (codified at Cal. Gov't Code §§14522.1 *et seq.* (2012)) [hereinafter SB 375].
[431] Stephen Miller, *Legal Neighborhoods*, 37 HARV. ENVTL. L. R. 105, 137 (2013).
[432] 42 U.S.C. § 43332(C).
[433] Cal. Pub. Res. Code § 21002.1.
[434] Senate Bill No. 97 (Cal. 2007), *available at* http://opr.ca.gov/docs/SB_97_bill_20070824_chaptered.pdf.

EXECUTIVE SUMMARY ENDNOTES

[i] O.R.S. § 469.50.
[ii] H.B. 3543, 74th Leg. Assem., Reg. Sess. (Or. 2007) (codified at O.R.S. §§ 468A.200–260 (2014)).
[iii] OREGON GLOBAL WARMING COMMISSION, 2015 REPORT TO THE LEGISLATURE at 53 (2015), *available at* http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/OGWC_Rpt_Leg_2015_final.pdf [hereinafter 2015 REPORT TO THE LEGISLATURE].
[iv] O.R.S. § 468A.205(1).
[v] OREGON GLOBAL WARMING COMMISSION, ROADMAP TO 2020 (2010), *available at* http://www.keeporegoncool.org/sites/default/files/Integrated_OGWC_Interim_Roadmap_to_2020_Oct29_11-19Additions.pdf [hereinafter ROADMAP TO 2020].
[vi] O.R.S. § 469.503(2)(c)(C).
[vii] O.A.R. § 345-024-058.
[viii] THE CLIMATE TRUST, PLOWING NEW PATHWAYS: DEVELOPING QUALITY OFFSETS IN A MATURING MARKET, THE CLIMATE TRUST'S FIVE-YEAR REPORT TO THE OREGON ENERGY FACILITY SITING COUNCIL 3 (Oct 2014), http://www.climatetrust.org/wp-content/uploads/2014/11/2014-Oregon-5-Year-Report-EMAIL-141117-CAM-FNL.pdf.
[ix] O.R.S. § 757.524.
[x] O.R.S. § 468A.280.
[xi] O.R.S. § 757.539.
[xii] O.R.S. §§ 469A.050, 469A.010.
[xiii] *Id.* §§ 469A.130, 469A.140.
[xiv] O.R.S. § 757.365.
[xv] O.R.S. §§ 469.633, 469.651, 469.860.
[xvi] O.R.S. § 469.233.
[xvii] H.B. 2186, 75th Leg. Assem., Reg. Sess. (Or. 2009).
[xviii] O.A.R. § 340-253-0000 *et seq*.
[xix] O.R.S. § 526.780 *et seq*.
[xx] 2015 REPORT TO THE LEGISLATURE, *supra* note iii, at 53.
[xxi] Oregon still gets 30% of its electricity from coal. Oregon Department of Energy, *Where Does Oregon's Electricity Come From?*, http://www.oregon.gov/energy/pages/oregons_electric_power_mix.aspx.
[xxii] THE CLIMATE TRUST, *supra* note viii, at 45.
[xxiii] 2015 REPORT TO THE LEGISLATURE, *supra* note iii, at 30, 32.
[xxiv] 420 H.B. 3470, 78th Leg. Assem., 2015 Reg. Sess. (Or. 2015).

APPENDIX A

Oregon Commissions and Councils 2015

Oregon Global Warming Commission

Voting Members

- Chair Angus Duncan, President, Bonneville Environmental Foundation. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC. Mr. Duncan has served as Chair since 2008.
- Alan Zelenka, Eugene City Councilor & Director of Energy Services for Kennedy/Jenks Consultants. Appointed by Governor Kitzhaber in 2012
- Catherine Mater, President, Mater Engineering. Appointed by Governor Kitzhaber in 2013.
- Andrea Durbin, Executive Director, Oregon Environmental Council. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- Jill Eiland, Oregon Corporate Affairs Manager, Intel Corporation. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- Jim Piro, CEO and President, Portland General Electric. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- Russ Hoeflich, Vice President and Oregon Director, the Nature Conservancy. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- Gregg Kantor, President and Chief Operating Officer, Northwest Natural Gas. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- Eric Lemelson, Owner and Manager, Lemelson Vineyards. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- Bill Wyatt, Executive Director, Port of Portland. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC
- One voting member seat is currently vacant

Ex Officio Members

- Vice-Chair Dr. Mark Abbott, Dean, College of Oceanic and Atmospheric Sciences, Oregon State University. Appointed by Governor Kulongoski in 2008 as an original member of the OGWC. Dr. Abbott has served as Vice-Chair since 2008
- Michael Kaplan, Director, Oregon Department of Energy
- Matt Garrett, Director, Oregon Department of Transportation
- Susan Ackerman, Chairperson, Public Utility Commission of Oregon
- Dick Pederson, Director, Department of Environmental Quality
- Katy Coba, Director, Oregon Department of Agriculture
- Doug Decker, State Forester, Oregon Department of Forestry
- Tom Byler, Director, Department of Water Resources
- Representative Jessica Vega Pederson
- Senator Bill Hansell
- Senator Chris Edwards
- Bill Bradbury, Council member, Northwest Power and Conservation Council

- Lillian Shirley, Director, Oregon Health Department
- One ex officio seat, which should belong to a Republican Oregon House representative, is currently vacant.

Environmental Quality Commission

- Jane O'Keefe, a rancher from Adel, Oregon; she was appointed to the EQC in 2008.
- Ed Armstrong. Commissioner Armstrong has a background in education; he was appointed to the EQC in 2012.
- Morgan Rider, an environmental engineer specializing in corporate sustainability planning and environmental compliance; she was appointed to the EQC in 2012.
- Colleen Johnson, an economics professor at Easter Oregon University and the former mayor of La Grande, Oregon; she was appointed to the EQC in 2012.
- Melinda Eden, a senior policy advisor for the Northwest Energy Efficiency Alliance. From 2003 to 2011, she served on the Northwest Power and Conservation Council. She was appointed to the EQC in 2013.

Energy Facility Siting Council

- Chair Barry Beyeler, appointed by Governor Kulongoski.
- Vice Chair Renee Dowlin, appointed by Governor Kitzhaber.
- Jack Billings, appointed by Governor Kitzhaber.
- Hanley Jenkins II, appointed by Governor Kitzhaber.
- John Mohlis, appointed by Governor Kitzhaber.
- Trey Senn, appointed by Governor Kulongoski
- Betty Roppe, appointed by Governor Brown.

Public Utility Commission

- Chair Susan Ackerman, serving her second term on the PUC; she is up for reappointment in 2016. She also serves as an ex officio member of the OGWC.
- John Savage, serving his fourth term on the PUC; he is up for reappointment in 2017.
- Stephen Bloom serving his first term with the PUC; he is up for reappointment in 2015.

Northwest Power and Conservation Council

- Chair Phil Rockefeller (Washington)
- Vice-Chair Bill Booth (Idaho)
- Jennifer Anders (Montana)
- Bill Bradbury (Oregon); ex officio member of the OGWC.
- Tom Karier (Washington)
- Henry Lorenzen (Oregon)
- Pat Smith (Montana)
- Jim Yost (Idaho)