

OREGON GLOBAL WARMING COMMISSION

Report to the Legislature
January 2009



OREGON GLOBAL WARMING COMMISSION

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The Oregon Department of Energy published this report on behalf of the Oregon Global Warming Commission.

Report to the Legislature:

**OREGON GLOBAL
WARMING COMMISSION**

State of Oregon, January 2009

Report to the Legislature:
Oregon Global Warming Commission
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For copies of the report, see
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TABLE OF CONTENTS

From the Chair..... 3

Summary of Recommendations..... 5

Introduction..... 7

Part I: How Far Has Oregon Come in Achieving its Climate Change Goals? 7

Part II: Oregon Global Warming Commission: Pushing for Progress toward Oregon’s Climate Change Goals..... 19

Part III: Recommendations from the Oregon Global Warming Commission Regarding: 23

 Proposal from Agriculture Subcommittee..... 23

 Energy Efficiency Working Group..... 25

 Renewable Energy Working Group..... 27

 Governor’s Transportation Vision Committee..... 28

 Committee on Natural Resources (Adaptation Strategies)..... 31

 Western Climate Initiative and Complementary Measures..... 33

Oregon Success Stories: Working on Climate Change Solutions

 Lincoln City on Path to Become Carbon Neutral..... 8

 Biomass Project Generates Electricity, Reduces Emissions and Charges Up Josephine County Economy..... 10

 Oregon Strategy Draws Solar Manufacturers..... 12

 Moving Forward with Electric Vehicle Charging Stations..... 14

Appendix A: Oregon Global Warming Commission Committees..... A-1

Appendix B: Update to Oregon Greenhouse Gas Inventory..... B-1

Report to the Legislature:

OREGON GLOBAL WARMING COMMISSION

FROM THE CHAIR

“Global Warming is not just another environmental issue.”

With that sentence, the Governor’s Advisory Group on Global Warming provided its recommended Oregon climate change strategy to Governor Kulongoski in 2004. In its report, the Advisory Group proposed some 60 state-level initiatives designed to first arrest, then reduce, our state’s share of global greenhouse gas emissions. The Advisory Group proposed reduction goals for the state (adopted by the Legislature in 2007), that it believed were sufficiently aggressive, but also within our capabilities. It set forth guiding principles that insisted on the primacy of peer-reviewed science and invoked the discipline of economic efficiency and least-cost solutions first.

The Oregon Global Warming Commission, established by the Legislature to carry on the work of the Governor’s Advisory Group and its successor groups, is grateful that it can report on the very real progress our state has made in the ensuing five years. Wind projects are emerging from eastern Oregon farmlands, solar cells appear atop Oregon schools, and new “green energy” Oregon jobs multiply as the nation’s newest and largest solar manufacturing plants locate here. Local governments are devising the land use and transportation choices that will improve people’s lives and health, as well as community livability, while they reduce emissions. Portland has become the nation’s “green building” epicenter for architects, engineers and developers looking to ride the next economic wave. These are the first co-benefits of decisive action on emissions reductions.

These actions also are the basis for the State’s encouraging analysis that Oregon will likely meet its first adopted goal: by 2010 to arrest and reverse its historical trend of emissions rising each year. This is unvarnished good news. We should all take one long breath and congratulate ourselves.

And then – immediately – we must all resume our labors, redouble our efforts, and build new bridges to our counterparts in other states and countries, in light of new scientific findings that the world is not yet gaining in its race to reverse emissions and their grave consequences.

The Global Warming Commission in 2008 focused on working through and with other stakeholder processes to ensure that climate considerations shaped proposed State initiatives in energy efficiency, new renewables, and a proposed new transportation investment strategy. The Commission consulted closely with the Governor’s Office as Western Climate Initiative designs for capping regional carbon emissions were developed, and recommended that Oregon move forward with development of the WCI framework, while encouraging and seeking to shape effective regional and national action on carbon. Our Resolution also offers the Legislature guidance on how such a market mechanism can be designed to Oregon’s best

advantage, including complementary energy efficiency and related measures. The Commission and the Oregon Business Association together developed a proposal to examine the economic consequences of carbon cap and trade on Oregon businesses and households, then drew other stakeholders into supporting and scoping this analysis. The Commission collaborated with Metro and the Oregon Department of Transportation on the development of a new modeling tool that will help us make optimal transportation and land use choices that also reduce emissions.

In our Commission deliberations, we recruited dozens of other Oregonians, from business, industry, labor, local government, state agencies, nonprofits and others, to help Commission Members evaluate opportunities and recommend the policy choices we transmit to you today.

Notwithstanding all of these activities, our unfinished agenda looms large. In 2009 we will collaborate with the new Oregon Climate Change Research Institute on the state's research agenda, and on opportunities for joint work with neighboring states, the federal government and the private sector. Technology and policy need to intersect on issues from water management to electric vehicles to "smart" electricity grids. We hope to focus attention on the role of forests in both emissions sequestration and ecosystem resiliency. We hope to disaggregate the State's reduction goals down to local governments and work with them to design responses that will leverage their unique capabilities and access to citizens.

With the new federal Administration clearly committed to backing efforts like Oregon's with a much-needed sense of *national* purpose, we anticipate new opportunities opening and new allies emerging. The 2009 Oregon Legislature has opportunities to propel our state and nation ahead faster, building on the extraordinary productivity of its predecessor in 2007. The Commission is ready to assist and guide, and then to put our collective shoulders to the wheels the Legislature fashions for us, and to push again.

Angus Duncan
Chair, Oregon Global Warming Commission

SUMMARY OF RECOMMENDATIONS

Although the Oregon Global Warming Commission (Commission) has only just begun its work to advise the Legislature and the Governor on its climate change strategy, the Commission has already made a series of key recommendations affecting a wide range of climate change issues. These recommendations take the form of several resolutions. The resolutions most germane to the deliberations of the Legislature are summarized below,¹ and are included in their entirety in Part III of this report.

Move Forward with Western Climate Initiative Carbon Cap and Trade

The Commission recommends that Oregon continue to move “forward with development of the Western Climate Initiative’s (WCI) proposed framework for establishing a . . . regional greenhouse gas (GHG) cap and trade mechanism and complementary programmatic and regulatory measures,” at the same time encouraging meaningful and effective national action on carbon reductions as the ultimately preferable solution. Oregon’s participation in and contributions to WCI should be framed to contribute to more effective regional and national strategies that will also operate to Oregon’s advantage. The Commission has identified for the Governor and Legislature issues of concern and outstanding questions that need constructive solutions in both legislative and administrative processes, particularly with respect to: (a) designing fair, effective and transparent market mechanisms; (b) offering opportunities for Oregon households and businesses to benefit from investments in the new, low-carbon economy; and (c) ensuring that those Oregon households and businesses facing transition challenges are identified and provided with transition assistance. The Commission emphasized that “these are issues to be addressed constructively and satisfactorily resolved as we move forward,” not reasons to defer or delay acting. (Resolution Number 2009-1-009)

Promote Energy Efficiency

The Commission recommends that Oregon adopt and implement the measures proposed by the Energy Efficiency Working Group (EEWG), and adopted by the Governor in his climate change legislative package. These elements address education, financing and incentives, affordable housing and low-income weatherization, standards and regulations, and work force training. The Commission does, however, have some qualifications about its endorsement of the EEWG program elements. These qualifications include the lack of a research, development, and demonstration component and some concerns regarding education, standards and regulations, and work force development. (Resolution Number 2008-4-002)

Support Renewable Energy

The Commission recommends that Oregon adopt and implement the measures proposed by the Renewable Energy Working Group (REWG), and adopted by the Governor in his climate change legislative package. These program elements include workforce development, research, development and demonstration, incentives, and regulations. The Commission does, however, have some qualifications about its endorsement of the REWG program elements. These qualifications include expanding upon the REWG recommendations around research, development and demonstration (R, D & D), and more emphasis on work force development. (Resolution Number 2008-4-003)

¹ A few of the resolutions passed by the Commission relate to the authority granted to it in Section 8 of HB 3543 to define its own rules and standards for operation, and therefore have no bearing on policy.

Adapt to the Impacts of Climate Change

The Commission recommends that Oregon act to prepare for and adapt to impacts of climate change based on the findings developed by the Commission's Committee on Natural Resources and its subcommittees. These program elements include internalizing climate change adaptation into agency work programs; coordinating, prioritizing, and funding research; using cap and trade revenues to fund climate change work; updating the Oregon Conservation Strategy; developing an integrated water management plan; and funding efforts to reduce risks of uncharacteristic forest fires. (Resolution Number 2008-5-007)

The Commission recognizes that some of the adaptation and research work for which funding has already been sought by many agencies through various policy options packages (POPs) is consistent with the intent of this resolution. For example, in Resolution Number 2008-3-001 the Commission found that a series of requests from the Department of Agriculture were consistent with achieving the state's climate change goals.

Adopt and Implement Recommendations from the Governor's Transportation Vision Committee

Adopt and implement the proposed program elements developed by the Governor's Transportation Vision Committee including creating a fund for non-highway transportation needs; authorizing a title fee based on a vehicle's mpg ratings; providing electric vehicle charging infrastructure; creating a category of medium-speed vehicles; setting standards for vehicle tax credits; amending land use and transportation plans to reduce greenhouse gases; authorizing additional funding for the Clean Diesel program; extending the "Pay As You Drive" tax credit; supporting investment in non-highway transportation; increasing spending for bicycle and pedestrian improvements; allocating money to public transportation; authorizing districts to levy an excise tax; leveling a systems development charge for public transportation infrastructure; and authorizing additional funding for the Road User Fee Task Force. Additional administrative actions are also recommended, and qualifications to the Transportation Vision Committee recommendations are also made by the Global Warming Commission. (Resolution Number 2008-4-005)

Support Land Use Planning that Addresses Climate Change Concerns

The Commission has made a series of recommendations to the "Big Look" Task Force and Land Conservation and Development Commission in regards to land use planning that do not require legislative action, but which the Legislature should be aware of and are incorporated into this report. Those recommendations are contained within resolution number 2008-5-006 and a letter to the "Big Look" Task Force attached to the resolution. The Commission is proceeding to direct collaboration with the Land Conservation and Development Commission and staff to reshape Oregon's land use policies in ways that reflect global warming mitigation and adaptation needs.²

Fund the Oregon Global Warming Commission

House Bill 3543 gives the Commission broad responsibilities to oversee the State's efforts to meet its adopted greenhouse gas reduction goals and to prepare Oregon communities and ecosystems for the

² This resolution is not included in Part III because the recommendation was directed to the Land Conservation and Development Commission.

expected effects of climate change. A particular charge was to “develop an outreach strategy to educate Oregonians about the scientific 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.”

The Commission submitted a budget request to the Legislature for \$100,000 for the 2009-2010 biennium. The request would provide a needed base level of support to fund core activities and identified outreach strategies, and give the Commission the ability to solicit private foundation and corporate funding by leveraging such contributions with the allocated State resources. Commission members and Communications and Outreach Committee members continue to look for outside funding and in-kind support to carry out its initial communications and outreach strategy. To fund the start-up of an enhanced Web site, the Commission was awarded a \$25,000 grant from the Bullitt Foundation. The Commission and the Oregon Business Association jointly recruited funders for the ECONorthwest economic analysis of effects in Oregon of a western regional carbon cap and trade system. While these efforts will continue, they cannot substitute for a base level of funding to carry out and plan for minimal activities to meet the intent of HB 3543.

WORKING ON CLIMATE CHANGE SOLUTIONS

Lincoln City On Path to Become Carbon Neutral

Lincoln City, a popular tourist destination and home to almost 8,000 residents, sits beside the ocean at just 11 feet above sea level.

Forward-thinking Mayor Lori Hollingsworth and City Manager David Hawker know that global warming-related effects, such as large storm events and sea level rise, would impact their community.

They also see savings and economic benefits in reducing greenhouse gas (GHG) emissions from fossil fuels through energy conservation and renewable energy options. The goal, becoming carbon neutral, refers to balancing emissions with a comparable amount of carbon sequestered (stored) or offset.

Riki Lanegan was hired to do a comprehensive assessment of the city's current carbon emissions or "carbon footprint" to help inform reduction targets. She's completed the first step in determining emissions from all city government operations including heating, lighting, city vehicles, employee commuting, and other activities. Her next step is to assess emissions community-wide, a more difficult task given the current lack of adequate data available, data sources that are collected in different units or quantities, and the scarcity of accurate collection sources.

Lanegan uses emissions analysis software provided by ICLEI, an organization that supports local governments. She has consulted with several other Oregon cities also using this tool. Some of the data for city operations are relatively easy to acquire, such as kilowatt hours used and city vehicle mileage. Many local governments need additional funding to complete their full carbon footprint picture including data on residents and commercial operations.

Lincoln City has already picked some of the "lower hanging fruit" such as stepping up recycling efforts, joining Pacific Power's Blue Sky renewable energy program, requiring LEED certification for new city buildings, and other measures. The "higher hanging fruit" — more substantial and significant reduction actions — are needed to meet a carbon neutral goal. With the help of ICLEI and its software tools, the most effective reduction strategies can be uniquely tailored to the city. Further action includes mitigation efforts to offset emissions produced, such as purchasing carbon credits from a local organization that holds forested lands that store carbon. The challenges are many as municipalities chart new territory in analyzing their carbon footprints to affect a meaningful reduction and reversal of global warming.



City of Lincoln City

INTRODUCTION

In 2007 the Oregon Legislature established climate change goals for the state by passing HB 3543. These goals address both reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change. The goals call for Oregon to:

- (a) By 2010, arrest the growth of Oregon's greenhouse gas emissions and begin to reduce greenhouse gas emissions.
- (b) By 2020, achieve greenhouse gas levels that are 10 percent below 1990 levels.
- (c) By 2050, achieve greenhouse gas levels that are at least 75 percent below 1990 levels.

The Legislature also made clear that the state's climate change goals include, "for 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."

This initial report from the Global Warming Commission (Commission) to the 2009 Legislature will answer three key questions:

1. How far has Oregon come in achieving its climate change goals?
2. How is the Commission collaborating with state agencies, local governments, business, and citizens to facilitate progress toward achieving Oregon's climate change goals?
3. What recommendations does the Commission have for the Legislature to make further progress toward meeting Oregon's climate change goals?

PART I

HOW FAR HAS OREGON COME IN ACHIEVING ITS CLIMATE CHANGE GOALS?

Oregon's recent climate change activities are a continuation of policies and measures that the state has pursued since 1988. Early actions included adopting a state benchmark in 1992 to hold the state's carbon dioxide (CO₂) emissions to 1990 levels and adopting CO₂ emission performance standards for new energy facilities in 1997.

In 1997 the Oregon Legislature gave the Energy Facility Siting Council authority to set CO₂ emissions standards for new energy facilities. The bill (HB 3283) stemmed from a recommendation made by a seven-member task force created by the 1997 Legislature and was passed unanimously in both houses. House Bill 3283 requires developers to reduce the overall amount of CO₂ emitted from new power plants. Oregon became the first state in the nation to control CO₂ emissions.

WORKING ON CLIMATE CHANGE SOLUTIONS

Biomass Project Generates Electricity, Reduces Emissions and Charges Up Josephine County Economy

Family-owned and operated for more than 80 years, Rough and Ready Lumber Company in Cave Junction found a way to remain competitive, produce power, reduce carbon dioxide (CO₂) emissions and maintain family wage jobs. Located in Josephine County where unemployment is one of the highest in the state, Rough and Ready provides jobs for 85 employees in a

community of less than 2,000 residents.

The company installed an energy-efficient cogeneration facility that both produces electric power and captures waste heat for use in the operation's lumber drying kilns. The renewable energy project qualified for Oregon's Business Energy Tax Credit and Energy Trust of Oregon incentives. Without these

incentives, the \$5 million project costs would have been prohibitive for a company this size.

The energy-efficient 1.2 MW rated wood-fired combined heat and power (CHP) system will produce more than 10 million kWh of electricity from renewable fuel sources, enough for about 700 or more homes. The system burns its sawmill waste, plus logging debris and woody materials from forest thinning operations on nearby private and public forest lands that otherwise would have been burned without the benefit of power and heat generation.

Rough and Ready's CHP system provides public land managers with additional options for achieving forest health and economic tools that reduce the cost of thinning national forests at high risk from catastrophic wildfires. Large fires contribute significantly to CO₂ and other emissions that contribute to global warming and create health risks for Oregonians. These activities also keep \$100,000 in energy dollars per year in the community by employing locals to thin fire-prone forests or recover waste wood as fuel.



Rough and Ready Lumber Company

A number of stakeholder-based working groups and task forces have contributed to the development of Oregon's strategies and legislation to mitigate and prepare for the effects of global warming.

Governor's Advisory Group on Global Warming

Governor Theodore Kulongoski committed Oregon to reducing its greenhouse gas (GHG) emissions in cooperation with the governors of Washington and California through the West Coast Governors' Global Warming Initiative (see Regional Activity below). As part of that commitment, Governor Kulongoski established the Governor's Advisory Group on Global Warming in 2004 to develop a strategy for Oregon to complement the regional effort. The Advisory Group included 28 representatives from the business community that both deliver and use energy, farmers, environmentalists, scientists, local and state governments, the faith community and others. Stakeholders and citizens provided input during public comment opportunities at meetings, by mail and e-mail, and through scheduled public meetings.

The Advisory Group reached consensus on its strategies and actions and issued its key recommendations in its report, Oregon Strategy for Greenhouse Gas Reductions (2004) (<http://oregon.gov/ENERGY/GBLWRM/docs/GWRreport-Final.pdf>). Recommendations included a suite of policies and measures to reduce Oregon's GHG emissions and goals to guide their implementation. Some recommendations emerged as state administrative actions and others required legislative approval. The Oregon Strategy demonstrated that the means to reduce GHG emissions are available or within technological reach, and that reductions could be achieved through investments that would generate net economic returns over time, while helping businesses stay competitive in a world moving to GHG limits.

Carbon Allocation Task Force

In 2005 the Governor appointed a stakeholder group, the Carbon Allocation Task Force (CATF), to develop a load-based carbon cap and trade design that could be adopted by Oregon or used as the basis for negotiating a western regional multi-state cap and trade system. Forming this interim task force was a key recommendation of the Governor's Advisory Group on Global Warming.

In January 2007 CATF transmitted its proposal to the Governor. The proposal (<http://www.oregon.gov/ENERGY/GBLWRM/CATF-Rpt-Ltrs.shtml>) aims to meet Oregon's GHG emissions reductions goals through a mechanism that reduces carbon dioxide and other GHG emissions due to consumption of electricity, petroleum and natural gas that would be "deliberate, predictable, effective, equitable and verifiable." The proposal's cap on emissions declines over time and includes numerous market-based and flexible tools to allow regulated entities to accomplish reductions in the most cost-effective manner possible.

Climate Change Integration Group

Governor Kulongoski appointed a successor to his Advisory Group on Global Warming, the Climate Change Integration Group (CCIG), in May 2006 to develop a framework for making well-informed choices related to climate change, in Oregon. The Governor charged the CCIG to create a preparation and adaptation strategy for the state; implement and monitor mitigation measures from the 2004 *Oregon Strategy for Greenhouse Gas Reductions* and devise new strategies if appropriate; serve as a clearinghouse for Oregon climate change information; and explore new research possibilities related to climate change for Oregon's universities.

WORKING ON CLIMATE CHANGE SOLUTIONS



Solar World

Oregon Strategy Draws Solar Manufacturers

Oregon's goal is to become the top state in the U.S. for manufacturing solar energy equipment and capture a large chunk of the emerging green economy. Today's world market for solar has an estimated value of \$25 billion in annual sales, and the industry has grown by over 25 percent annually for the past 20 years. The state's strategy is to establish an integrated "cluster" of solar manufacturing in Oregon, creating an economic base with more than \$3 billion in annual gross sales by 2015, mostly as exports.

Oregon has made good progress toward its goal. The state has attracted SolarWorld, its first "anchor" business. The current output of the Hillsboro facility (100 MW/yr) is equal to 15 percent of total U.S. production, with expansion plans to increase output to 450 MW by 2013. Other Oregon-based solar manufacturers include: PV Powered (Bend), Sol-Reliant (Portland), Solaicx (Portland), Peak Sun Silicon (Millersburg), Sanyo Solar (Salem) and potentially others. By 2015 gross revenues for these companies are expected to grow to \$1.5 billion annually, providing new jobs for 2,000–4,000 Oregonians with average salaries of over \$40,000 per year.

Recruiting manufacturers is one link in a four-part solar market development chain. The other three links in this "solar chain" are the expansion of Oregon's research and development capabilities, workforce development, and end use markets for solar energy.

In January 2008 the CCIG issued its *Final Report to the Governor: A Framework for Addressing Rapid Climate Change*. (<http://oregon.gov/ENERGY/GBLWRM/docs/CCIGReport08Web.pdf>). The report identifies impacts to Oregon's infrastructure, economy and natural ecosystems. It outlines actions within 10 key areas and initiates the development of a framework to assist individuals, businesses and governments in addressing climate change.

Oregon Global Warming Commission

In March 2008 the Governor appointed members to the Oregon Global Warming Commission, which was created by the 2007 Legislature through House Bill 3543 (<http://landru.leg.state.or.us/07reg/measures/hb3500.dir/hb3543.en.html>). The Commission continues and expands upon the work of the 2004 Governor's Advisory Group on Global Warming, the Carbon Allocation Task Force, the Governor's Vehicle Emissions Workgroup, and the Climate Change Integration Group to meet the state's policy to reduce greenhouse gas (GHG) emissions according to specific reduction goals.

Commission members include eleven citizens as voting members representing the social, environmental, cultural and economic diversity of the state. They serve with 14 ex officio nonvoting members including four legislators, seven state agency directors, and three other government and university members.

The Commission's general charge is to recommend ways to coordinate state and local efforts *to reduce Oregon's GHG emissions* consistent with Oregon's goals and to recommend efforts to help the state, local governments, businesses and residents *prepare for the effects of global warming*;

The Commission may recommend statutory and administrative changes, policy measures and other actions to be carried out by state and local governments, businesses, nonprofit organizations, and residents. Additionally, the Commission tracks and evaluates: assessments of global warming impacts on Oregon and the Northwest; existing GHG reduction policies and the advancement of regional, national and international policies; costs, risks and benefits of various strategies; progress toward reduction goals; technological advances; and other related tasks.

Through an outreach strategy, the Commission will educate Oregonians about the science and economic impacts of climate change and will promote actions to not only reduce GHG emissions, but to prepare for climate change impacts.

The group solicits and considers public comment related to these recommendations through public comment periods during meetings, presentations, Web site communications, a climate change e-mail list (currently more than 500 members), public meetings and other communication strategies.

Broadened State Agency Activity

Historically, the focal point for climate change activities at the state level has been the Departments of Energy and Environmental Quality, with each addressing key sectors related to their core missions. Increasingly, however, other natural resource agencies are tackling climate change issues – especially related to preparing and adapting to the impacts of climate change, and responding to new market opportunities in a carbon-constrained world.

WORKING ON CLIMATE CHANGE SOLUTIONS

Moving Forward with Electric Vehicle Charging Stations

A network of electric vehicle (EV) charging stations is emerging in Northwest Oregon as cities search for clean, economical and sustainable transportation options and drivers consider the switch to vehicles that reduce fuel use and emissions contributing to global warming.

Charging stations in key locations will serve drivers using plug-in hybrid vehicles so they can “top off” their batteries and ensure a round trip. The stations also will test the infrastructure to guide further expansion throughout the state as technologies improve and the expected sales of hybrid-electric and all-electric vehicles increase. Nissan, for example, has selected Oregon as one of 2 states to introduce its all-electric car in 2010 for government and commercial fleets.

In December 2008 Gresham joined several municipalities offering public charging stations with the unveiling of its two-vehicle plug-in station outside City Hall. The city partnered with Portland General Electric which is developing a network of stations in the region. The PGE network includes 8 locations in Portland, Lake Oswego, Tualatin, Oregon City and Salem, with more to be added. Pacific Power has a station in Corvallis and has plans to expand.

Oregon Department of Transportation’s Innovative Partnerships Program works with PGE and other partners to encourage demand for EVs by establishing the predictable availability of charging stations at convenient, easy-to-find locations. Oregon’s Business Energy Tax Credit helps reduce the costs for businesses and other entities that install the stations.



ODOT



City of Oregon City

Oregon Department of Forestry has become increasingly involved with carbon issues, with respect to risks (larger, more intense forest fires) and mitigation (examining the interaction between Oregon forest health and carbon sequestration). A 2001 law allowed the State Forester to establish programs to market, register, transfer or sell forestry carbon offsets on behalf of the state, a trust fund, and other non-federal forest landowners. The Oregon Parks and Recreation Department is interested in coastal permitting impacts in relation to climate change. The Department of Geology and Mineral Industries is measuring shoreline impacts of sea level rise associated with global warming. The Department of Land Conservation and Development (through its Coastal Management Program) is starting outreach to coastal planners. The Water Resources Department and the Water Resources Commission are reviewing water availability for instream and withdrawal uses as precipitation and runoff patterns change, as well as the need for new conventional and unconventional storage. The Public Health Division of the Department of Human Services is working to raise the profile of climate change as a public health issue, incorporate adaptation into public health preparedness planning, engage local health departments, and facilitate research on health effects and effectiveness of efforts to promote adaptation.

The Commission has collaborated with the Oregon Department of Transportation and Metro in the development of a new modeling tool – GreenSTEP – that will help the State and local governments evaluate the consequences of greenhouse gas emissions for different transportation and land use scenarios.

Regional Activity

In 2003 Governor Kulongoski joined the governors of California and Washington in establishing the West Coast Governors' Global Warming Initiative. The Initiative provided the three states a forum for interstate cooperation on reducing greenhouse gas emissions. In November 2004 the Governors approved 36 recommendations in five areas that were jointly developed by the three states.

That effort led to the Western Climate Initiative. In February 2007, the Governors of the five Western states signed a joint memorandum of understanding to form the Western Regional Climate Action Initiative (later shortened to the Western Climate Initiative, or WCI). The WCI, which expanded to other states and most of Canada, released its recommendations in September 2008 to develop a design for a regional market-based cap and trade program to help achieve the regional reduction goal. State agencies and the Governor's Office continue to provide staff expertise to the ongoing WCI effort.

Community Involvement

Portland became the first city in the United States to develop and adopt a local action plan to fight climate change in 1993. Since that time, other cities and counties in Oregon have followed that lead and have engaged their citizens at the local level. At least five local governments in Oregon have now completed greenhouse gas inventories, and over a dozen have now taken formal action through either completing an action plan or signing on to the Mayor's Climate Protection Agreement. This agreement, started by the City of Seattle, pledges the city to support the Kyoto emission reduction goals of 7 percent below 1990 levels and for the community to take a range of actions to fight climate change. Importantly, this local activity is taking place across the state. Cities like Ashland, Bend, Corvallis, Eugene, Vernonia, and Lincoln City (see story on page 8) have all taken action.

The Commission intends to seek opportunities for direct collaboration with Oregon's local governments as it shifts focus from 2008's attention to the legislative agenda. An example of such an opportunity would be scaling the GreenSTEP modeling tool (noted above) and simplifying its use so it becomes a planning tool for local governments in addition to Metro.

Business and Industry Leadership

Not only has Oregon been a national leader in innovative climate change policy, it also is home to a number of businesses and industries that are ahead of the curve in their efforts to reduce greenhouse gas (GHG) emissions and respond to challenges posed by climate change. Nike has established itself as perhaps the world leader in understanding and inventorying how GHG emissions propagate through its entire supply chain, and how they can best manage those emissions. Intel has taken a number of steps to reduce its impact by reducing its reliance on specialized gases that have a large impact on the climate. Oregon forest companies like Roseburg Forest Products and other companies have captured key market share by focusing on sustainable harvesting techniques and other methods that increase overall carbon sequestration in Oregon's forests. The forest industry has also focused on new opportunities related to biomass energy as interest increases in "carbon neutral" energy production (see story on page 10).

The Commission has sought to recruit business and labor views and expertise into its committee-level work on climate actions. As a result, the resolutions conveyed to the Legislature and Governor in 2009 have gained much in practicality and internal economic consistency. Oregon's largest business associations and its utilities participated in funding and scoping the ECONorthwest study of carbon cap and trade effects in Oregon, together with the Commission and the Oregon Economic and Community Development Department.

Results to Date of Oregon's Climate Change Response

Oregon's response to climate change spans several decades, and we're now seeing tangible results. Increased economic growth and new technological opportunities have become part of a new Oregon landscape of "green-collar jobs" and an increasingly diverse infrastructure oriented toward supporting new, cleaner industries and a more efficient economy. These new jobs and new industries have become especially prevalent in just the past several years, with the most notable example being the decision of SolarWorld to locate in Oregon (see story on page 12). Other companies, such as PV Powered in Bend, have been here for a number of years and have been growing steadily. Also important is the increasing number of renewable energy and climate change professional firms that have located in Oregon. Portland has become the wind energy capital of the West, along with a large number of consulting firms related to renewable energy and climate change. Oregon is also home to an increasing amount of new technology research and demonstration projects, such as the state's increasing involvement in the movement toward plug-in hybrid vehicles (see story on page 14).

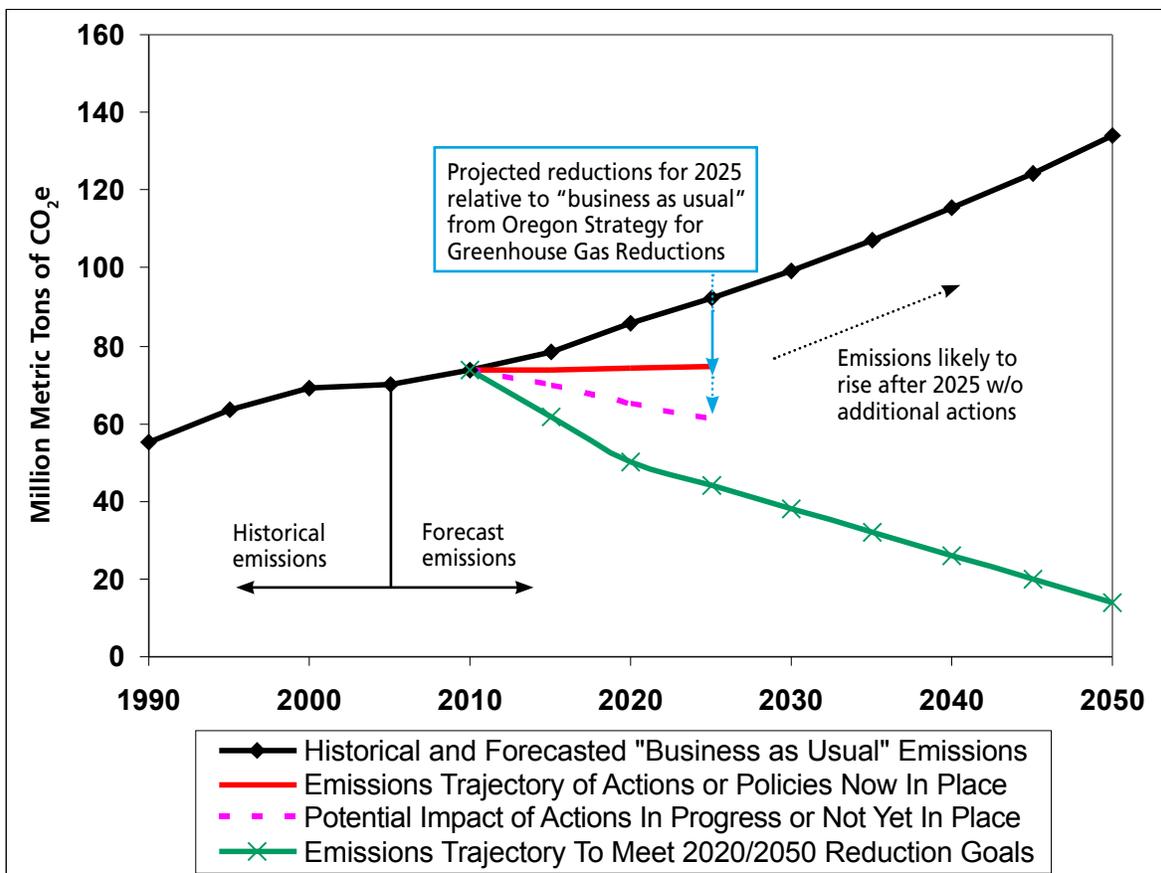
What has all this activity across the state meant in terms of meeting Oregon's climate change goals? The results are encouraging. As can be seen in the figure on page 18, with all the actions now in place, Oregon appears to be on its way to achieving the first of its climate change reduction goals in 2010 by arresting the growth of greenhouse gas emissions. It is important to note, however, that the goal has not yet been met, and even the current projection does not predict an ongoing flat emission trajectory

from 2010 onward, especially in the absence of accelerating efforts to reduce emissions. Nonetheless, in general, Oregon appears to be on track to meet that first 2010 goal. The same can not be said, however, of Oregon's future goals in 2020 and 2050 based on the current progress assessment.

At this point it would also seem premature to state that Oregon is on track to meet the stated goal of the Legislature that Oregonians be in a position to prepare for and adapt to the impacts of climate change. Work in this area has only just begun in many sectors, and also within the state agencies that work with those sectors of the economy. Some key Oregon companies (most notably Nike) are national leaders in this area, but statewide, most private and public sector institutions are behind the curve in understanding, preparing for, and adapting to the serious impacts of climate change facing the state.

PROGRESS TOWARD OREGON'S GREENHOUSE GAS REDUCTION GOALS: *Analysis Based on Emission Trajectories from 2025 Reduction Point Estimates*

The *Oregon Strategy for Greenhouse Gas Reductions* lists actions to reduce greenhouse gas emissions and reduction estimates for those actions in the year 2025. In the final report of the Climate Change Integration Group,* an assessment was made as to which of these actions were “in place” (i.e., legislated or otherwise being implemented); “in progress” (i.e., on their way to being put in place); or inactive. Based on this assessment, the estimated impacts in 2025 (relative to the “business as usual” emission forecast) of actions now in place, and a hypothetical estimate if all the actions “in progress” come to fruition, are plotted in the figure below. By using 2010 as a starting point for reductions (a reasonable simplification), and examining the slope of the “emissions trajectories” between estimated emissions in the years 2010 and 2025, it can be seen by virtue of the policies now “in place” that Oregon appears to be on track to meet its first goal of arresting the growth of greenhouse gas emissions by 2010. However, it can also be seen that even if all the actions now “in progress” are completed by 2020, the state will likely fall well short of meeting its 2020 emission reduction goal, and, by extrapolation, clearly is not on track to meet its 2050 goal. In fact, it is likely that without additional actions put in place by 2025, the emissions trajectory will begin rising, because the impact of key reduction policies will have peaked by that time period.



* *A Framework for Addressing Rapid Climate Change*, Final Report to the Governor, Climate Change Integration Group, State of Oregon, January 2008. For more information regarding this methodology please see pp. 34-36.

PART II

OREGON GLOBAL WARMING COMMISSION: PUSHING FOR PROGRESS TOWARD OREGON'S CLIMATE CHANGE GOALS

The Global Warming Commission is collaborating with State agencies, local governments, businesses, and citizens to make progress toward achieving Oregon's climate change goals. That progress is being made at two levels. The formal work of the Commission is largely taking place through meetings of the Commission and its committees, which involve a large number of stakeholders and interested citizens, and through Commission members participating in existing stakeholder processes in which climate change is a critical consideration. The Commission is also beginning to engage in an outreach effort beyond its formal processes in order to engage Oregonians in a two-way conversation about climate change and the efforts needed to address the challenges that it presents.

Current Status of the Commission

The Commission has met six times since its inception, with the first meeting occurring on March 17, 2008. To begin with, Commission members were given a series of briefings; the first meeting focused on the history of climate change work in Oregon and the second focused on the economic implications of climate change. Organizational issues also were a key focus of these early meetings, as the Commission sought to interpret its mission as defined by HB 3543. Commission members ultimately came to agreement that its role can be seen as roughly analogous to the role played by a legislative fiscal office; but rather than providing objective financial analysis, the Commission should provide objective analysis as to whether key policy and programmatic initiatives are consistent with Oregon's climate change goals. Because the Commission is a policy body as well as an analytical resource, it would also endorse initiatives that move Oregon toward its climate goals, and, if appropriate, it would recommend further statutory or administrative actions to that same end.

With its role more clearly defined, the Commission met three more times in 2008, and, to date, once more in 2009. During these meetings the Commission passed its first formal resolutions and began offering a more formal perspective on ongoing processes and upcoming legislation. By the end of 2008 the Commission had passed eight resolutions by consent of all voting members, six of which provided policy guidance for legislative and agency processes, and two of which addressed process needs of the Commission. A ninth resolution supporting Oregon's participation in a Western Climate Initiative carbon cap and trade program was passed at the first meeting of 2009 by roll call vote (7 yes, 1 no). The substance of the policy resolutions passed by the Commission is addressed in Part III of this report.

A key to the Commission's success in moving forward quickly has been its decision to establish committees to address its key needs. Seven committees, expressly designed to broaden stakeholder participation in the State's climate policy development, were formed in the initial meetings as follows:

- Natural Resources Committee³
- Transportation and Land Use Committee⁴

³ Four subcommittees include: Agriculture, Water, Fish and Wildlife, and Forestry

⁴ Technical subcommittee: Modeling

- Communications & Outreach Committee
- Energy, Utilities, Stationary Source (EUSS) Committee
- Science & Technology Committee
- Public Health Committee
- Executive Committee (the Chair and Vice-Chairs of the Commission)

Appendix I provides a list of committee members.

Public Involvement

Stakeholders and citizens have played a key role in the Commission's activities to date. Commission meetings and committee meetings are open to the public, with opportunities for input and public comment. Citizens have taken advantage of that opportunity to offer a wide variety of views. Opportunities for public comment also are available through the Commission's e-mail address (Oregon.GWC@state.or.us) and through correspondence mailed to the Oregon Department of Energy.

In accordance with both the direction given in HB 3543 and the commitment from Commission members, the Commission is expanding on its initial communication and outreach plan. The intent is 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. To this end, the Commission received a \$25,000 grant from the Bullitt Foundation for developing an interactive Web site that will reach out to Oregonians with the information they need, and with the opportunity to weigh in on Oregon's policy choices.

Priorities of the Oregon Global Warming Commission

In a resolution adopted by the Commission, they determined to focus their recommendations and research efforts using the criteria outlined below.⁵ While the criteria help to prioritize the Commission's actions, all three strategies and approaches are pursued simultaneously.

- Decrease greenhouse gas emissions – both reductions and removals from the atmosphere – in order to meet Oregon's GHG goals. It is recognized that these reductions may not occur immediately, but over time. GHG reductions should begin with the most cost-effective solutions, broadly defined to include near-term and long-term environmental, social and economic considerations, as well as those that have the capacity to decrease in cost as their deployment becomes more widespread.
- Protect the health and well-being of Oregonians and the health and resiliency of Oregon's ecosystems impacted by global warming. This priority includes developing and devising adaptation plans and strategies to prepare for the threats directly posed by global warming.
- Ensure that Oregon's economy remains vibrant and healthy; that Oregon's key economic sectors have the tools, information and assistance they need to plan for and adapt to a changing climate; that

⁵ These priorities were recognized in Resolution Number 2008-5-008 adopted by the Commission.

they be better positioned economically to withstand the negative consequences of global warming; and that they participate in the benefits.

Commission Agenda

The Commission has begun to address many of the most serious climate change issues that the Legislature asked it to make progress on. Its preliminary recommendations on a range of topics are summarized in Part III of this report. The Commission and its committees will be addressing the following areas of concern in the upcoming year:

Research — A key mission of the Commission in the upcoming biennium will be interacting with, informing and supporting the activities of the Oregon Climate Change Research Institute (OCCRI), the Oregon University System research center housed at Oregon State University. The OCCRI was established by HB 3543 along with the Commission. The Commission participated in the OCCRI Director selection process and is continuing to refine the means by which it can help the OCCRI prioritize its work through the Commission's Science and Technology Committee.

Transportation and Land Use — Already a high priority of the Commission, the Transportation and Land Use Committee is expected to discuss disaggregating State GHG reduction goals to the community level and developing needed tools (such as GreenSTEP) and capabilities to integrate transportation, land use, and climate change considerations in local planning. One important area in which the Commission hopes to collaborate is with the Land Conservation and Development Commission and local governments to better anticipate, prepare for, and adapt to the impacts of climate change by revisiting land use classifications and management practices to account for these impacts.

Energy and Industry — The role of the energy and industrial sectors in mitigating greenhouse gas emissions will clearly be a dominant discussion topic among Commission members in the coming years, particularly in light of the imminent arrival of cap and trade legislation. In 2008 the Commission helped assemble a business and environmental stakeholders group to fund and scope an economic analysis of the effects in Oregon of cap and trade (due out in early 2009). The Commission began 2009 by adopting a resolution addressing the design recommendations of the Western Climate Initiative (www.westernclimateinitiative.org). It will remain engaged as cap and trade or other policy proposals are brought forth, both in Oregon and in the federal government.

Public Health — Although not widely recognized, the public health impacts of climate change have the potential to impact a broader range of people than some other more well-known impacts. The Commission is planning to delve into these impacts in greater detail in the coming years, and to encourage community public health strategies to address these impacts.

Forestry — Recognizing the importance of forests to Oregon, the Commission is planning to focus attention in 2009 on issues related to forestry and climate change impacts on Oregon's forests. The ongoing health of Oregon's forests and watersheds, as well as the impacts of traumatic events such as forest fires, are both affected by climate change and will be addressed through the Commission's Natural Resources Committee. Opportunities in the forestry sector, such as increased biomass utilization, are also being considered for their greenhouse gas mitigation potential.

Agriculture — Climate change will impact the agriculture sector in Oregon in diverse ways, and the Commission is working to ensure that those impacts are understood and addressed. In the upcoming biennium the Commission hopes to highlight significant gaps in understanding and public outreach that pose a barrier to preparing for and adapting to climate change in this important sector – for example, how climate shifts may favor new crop choices or farming practices. In addition, new economic opportunities will present themselves in the deployment of renewable energy production and in carbon sequestration or other offset strategies.

Water Resources — A key issue facing the Commission in the next biennium will be integrating human and watershed demands on increasingly stressed water resources resulting from climate change. Better water data collection, brainstorming innovative conservation strategies, and analyzing other water supply choices are all areas that the Commission hopes to address in its ongoing work. It is expected that water issues – instream consumptive uses, efficiency opportunities, storage and management – will be a dominant area of discussion in the Natural Resources Committee.

Fish & Wildlife — The impacts of climate change on habitats is being addressed by the Commission in a variety of ways. Already the subject of a Commission report, strategies to prepare for and adapt to these impacts will be vigorously pursued by the Commission in the upcoming biennium. One important focus will be how to best integrate climate change concerns into existing planning and policy processes, such as the Oregon Conservation Strategy. Additional research needed in this area will also be a key Commission focus in the upcoming biennium.

Communications and Outreach — To meet its Legislative mandate and the desires of Commission members, the Communications and Outreach Committee will carry out its interim outreach and communications strategy and further develop that strategy to meet the following goals:

- **Develop a Robust Public Engagement Campaign:** Ensure that Oregonians have a sound understanding of the causes, consequences and solutions to global warming by developing a state-wide, public engagement campaign that fosters multi-directional dialogue and information sharing.
- **Provide Policy and Legislative Education:** Develop credible climate-literacy among key industries and their representatives, local governments, households and other institutions to allow for informed policy debates in the legislative process.
- **Provide Access to a Climate Toolbox:** Encourage and enable Oregonians to adopt climate-friendly behaviors by developing education, resources, and tools around mitigation and preparation for residents, businesses, schools, organizations and local governments.
- **Track and Report:** Issue a biennial report to the Legislature tracking progress towards Oregon's global warming goals statewide as mandated with the requirements laid out in the Global Warming Commissions statutory charge.

PART III

RECOMMENDATIONS FROM THE OREGON GLOBAL WARMING COMMISSION: WHAT NEXT STEPS SHOULD THE LEGISLATURE FOCUS ON TO ACHIEVE OREGON'S CLIMATE CHANGE GOALS?

Following are the resolutions passed by the Oregon Global Warming Commission through its first meeting of 2009 in which recommendations are made in whole or in part to the Oregon Legislature. Note that the Commission passed other resolutions in 2008 that either were internal (related to setting rules or procedures for the Commission) or were recommendations made to other policy- or rule-making bodies in the state (e.g., other boards and commissions).

Typically these resolutions consist of specific recommendations (e.g., supporting the work of another stakeholder process or set of policies), qualifications to the recommendations made by the Commission, and a statement of what expectations the Commission may have as to how its recommendations are to be considered (“outcomes”). The Commission may also make a “consistency determination” in order to state whether a policy, plan, or program is consistent with meeting the state’s climate change goals in the opinion of the Commission.

The sub-committees formed by the Natural Resources Committee in the summer of 2008 developed specific proposals related to the 2009 legislative cycle. Later these proposals were combined into Resolution 2008-5-007, but early on the Commission voted to exercise its ability to state that this particular proposal was consistent with the state’s climate change goals.

Resolution Number: 2008-3-001

Origin: Natural Resources Committee

Finding of Consistency for Proposal from Agriculture Sub-Committee

Resolved, that the Oregon Global Warming Commission finds the proposal from the Agriculture Sub-committee of the Natural Resources Committee of the Commission — as described in the September 15, 2008 memorandum to the Commission from the Sub-committee co-chairs — to be **consistent, with Commission qualifications as detailed below**, with Oregon’s greenhouse gas mitigation and climate change preparation needs and goals.

Qualifications

This finding is made with the qualification that the Commission intends to later submit an integrated and prioritized research strategy that addresses the combined needs of the natural resource sub-committees of the Commission. Therefore, this finding does not indicate any sense of priority relative to the needs of other natural resource sub-committees or a broader research agenda related to climate change. The Commission also recognizes that much of the activity in the proposal is not focused on research, but

rather centered on climate change preparation and adaptation activity. preparation and adaptation activity.
The September 15th memorandum referenced in this resolution is attached.

MEMORANDUM

TO: Global Warming Commission Members
FROM: Andrea Durbin and Katy Coba, Co-Chairs, Agriculture Subcommittee
DATE: September 15, 2008
SUBJECT: Agriculture and Climate Change Recommendations

At its meeting on July 17, 2008, the Agriculture Subcommittee identified several strategies to help Oregon agriculture adapt to climate change, reduce greenhouse gas emissions, and sequester carbon. We have worked with subcommittee members to identify the following high priority strategies and funding needs for the 2009-11 biennium. More detailed recommendations, along with additional funding needs, are described in the document titled “Global Warming and Agriculture: 2009 Agenda Proposal.”

1. Support the following Program Option Packages for the 2009-11 biennium. Oregon State University and Oregon Department of Agriculture have submitted several Program Option Packages that will help Oregon agriculture reduce greenhouse gas emissions, take advantage of emerging carbon markets, and adapt to climate change. We recommend fully funding the following Program Option Packages (POPs).

- a. OSU POP for research to assess the most cost-effective methods to reduce greenhouse gas emissions and increase carbon sequestration, establish a baseline for carbon sequestration rates based on cropping/land use systems, work with producers to determine the incentives needed to adopt carbon management practices, and quantify greenhouse gas emissions reductions from different practices. Funding request: \$800,000
- b. ODA POP for a climate change specialist and research dollars to help the industry understand climate change issues, create linkages with carbon trading programs, and collaborate with OSU on climate research. Funding request: \$375,000
- c. OSU/AES POPs for 2 plant protection FTEs for research into maintaining plant health in response to changing pest regimes. Funding request: \$600,000
- d. ODA POPs for Invasive Pest and Plant Management Program and Invasive Species Council support. Funding request: \$1.25 million
- e. OSU POP to conduct research into new crops, crop varieties, and crop rotations that will be more resilient in the face of changing climate conditions and limited water availability. Funding request: \$600,000

- f. ODA POP for a water quantity position to address upcoming challenges related to water availability. Funding request: \$190,846
- g. ODA POP for an air quality specialist and research on best management practices to reduce emissions, including greenhouse gas emissions. Funding request: \$1,375,000

2. Provide funding for additional short-term research needs at Oregon State University.

- a. Provide additional funding for research on best practices for carbon management and mitigation tools. Short term needs include providing flexible resources to fund technical assistance and to buy time for existing researchers until the additional FTEs outlined in the original request can be hired. Funding request: \$150,000
- b. Provide additional funding for research into agricultural adaptation strategies, including management and monitoring programs to address invasive species, plant protection systems to address pests and disease, water conservation and supply development strategies, and cost-effective water supply management strategies. Funding request: \$300,000
- c. Provide funding to support technical assistance to producers on energy efficiency, renewable energy alternatives, and carbon management/markets. Funding request: \$100,000

In Fall 2008, the Commission was briefed on and chose to largely endorse those outputs of the Energy Efficiency Working Group (EEWG) that received the most support from that group. This resolution reflects that broad support for the majority of the work of the EEWG.

Resolution Number: 2008-4-002 Origin: Energy, Utilities, Stationary Source Committee

Recommendations from the Energy Efficiency Working Group

Resolved, that the Oregon Global Warming Commission recommends that the Oregon Legislature and the Governor adopt and implement the proposed program elements developed by the Energy Efficiency Working Group (EEWG), and adopted by the Governor in his climate change package, subject to the qualifications noted below. These program elements include:

- **Education.** Provide information and education so individuals and businesses can make appropriate behavioral changes and purchasing decisions to reduce their energy use and carbon footprint. The Commission places particular emphasis on development of an Energy Performance Standard, subject to the qualification noted below.
- **Financing and incentives.** Provide the financial tools and assistance to help people and businesses afford major energy efficiency improvements in their homes and buildings. The Commission places particular emphasis on the following program elements: (1) Local Improvement District Financing, subject to the qualification noted below; (2) increase BETC to 50% for industrial energy efficiency projects.

- **Affordable housing/low-income weatherization.** Expand tools that effectively address energy efficiency for low-income households, including the EEWG-supported “Energy Matchmakers” initiative addressing low-income housing efficiency improvements.
- **Standards and regulations.** Improve codes and other standards for new homes and buildings and major renovations and, where appropriate, for consumer equipment and appliances used in homes and buildings. It could also include requirements for utilities, although the group did not move forward with any particular proposal in that context. The Commission places particular emphasis on the “2030 carbon neutral Buildings” State goal, subject to the qualifications noted below.
- **Work force training.** Provide work force training to ensure Oregon has the skills and capacity to deliver energy efficiency required to meet its reduction goals.

Qualifications

- **Research, Development, and Demonstration.** In support of meeting Oregon’s greenhouse gas reduction and energy efficiency goals, and to promote economic development in this key cluster area, the Commission urges that the State — agencies and university system — coordinate closely with the private sector to identify targeted opportunities for creating, leveraging, or expanding energy efficiency research, development, and demonstration efforts in Oregon. This will require Legislative support for key research initiatives in agency budgets, and in the higher education budget, while recognizing that constrained State revenues have put a premium on prioritizing initiatives. The Commission, in collaboration with the Oregon Climate Change Research Institute, will report to the Legislature in 2009 on progress in setting Oregon’s research efforts within a strategic framework, with priorities and complementary funding strategies.
- **Education.** The Commission recommends modifying the proposed Energy Performance Standard to permit the Departments of Energy, Transportation and Land Conservation and Development to develop and provide consumer information on locational (transportation and land use) as well as building efficiency characteristics as the agencies’ ability to fairly represent these characteristics evolves.
- **Standards and regulations.** The Commission supports linking an aspirational goal for new construction to the state’s adopted carbon targets. Milestones for code development will help ensure this goal is attainable. If stair stepping towards this goal with reach codes unduly burdens homeowners in times of economic difficulties such as we’re now experiencing, there must be well articulated off ramps to protect buyers from economic hardship. Even during these periods, when code advances may be delayed, the aspirational goal may still help drive new technologies and incentives that in better times permit us to recover the lost ground and stay on course to meeting the State’s GHG reduction goals.
- **Work force development.** Work force development and the creation of green jobs should be a key element considered by the 2009 Legislature.

Outcomes

In forwarding these recommendations, the Commission urges upon the Legislature the paramount importance of energy efficiency in meeting the State’s Greenhouse Gas reduction goals, strengthening

consumer abilities to cope with rising energy costs, and developing business products and workforce skills that will advantage Oregonians in a climate-constrained economy. All credible analysis describes energy efficiency as the keystone in any mitigation strategy that seeks to insulate consumers and businesses from the effects of predictably higher energy prices. Beginning with the 2004 Report of the Advisory Group on Global Warming, Oregon has been urged to build its 21st Century jobs, products and services strategies on the foundation of new green infrastructure and efficiency retrofits of existing buildings and processes. This Commission believes the needs and opportunities previously identified have become only more urgent and potentially advantageous with the intervening years.

***In Fall 2008** the Commission was briefed on and chose to largely endorse those outputs of the Renewable Energy Working Group (REWG) that received the most support from that group. This resolution reflects that broad support for the majority of the work of the REWG.*

Resolution Number: 2008-4-003 Origin: Energy, Utilities, Stationary Source Committee

Recommendations from the Renewable Energy Working Group

Resolved, that the Oregon Global Warming Commission recommends that the Oregon Legislature and the Governor adopt and implement the proposed program elements developed by the Renewable Energy Working Group (REWG), and adopted by the Governor in his climate change package, subject to the qualifications noted below. These program elements include:

- **Workforce Development** — Develop a comprehensive program to create jobs in the clean energy industry and establish strategies that can be used to promote green job growth.
- **Research, Development and Demonstration** — Provide assistance to help develop and improve renewable energy technologies in Oregon (see Qualification below).
- **Incentives** — Provide the financial tools and structures to ensure that renewable energy projects will be developed in Oregon. This includes clarifications and expansions of existing tax credit programs, as well as new potential incentive programs. The Commission places particular emphasis on REWG recommendations to improve the transferability of the Business Energy Tax Credit.
- **Regulations** — Expand the existing solar and wind net metering statute to include other renewable resources and technologies.

Qualifications

- **Research, Development, and Demonstration.** In support of meeting Oregon's greenhouse gas reduction and renewable energy goals, and to promote economic development in this key economic development cluster area, the Commission urges that the State — agencies and university system — coordinate closely with the private sector to identify targeted opportunities for creating, leveraging, or expanding renewable energy research, development, and demonstration efforts in Oregon. This will require Legislative support for key research initiatives in agency budgets, and in

the higher education budget, while recognizing that constrained State revenues have put a premium on prioritizing initiatives. The Commission, in collaboration with the Oregon Climate Change Research Institute, will report to the Legislature in 2009 on progress in setting Oregon's research efforts within a strategic framework, with priorities and complementary funding strategies.

- **Work force development.** Work force development and the creation of green jobs should be a key element considered by the 2009 Legislature.

Outcomes

In forwarding these recommendations, the Commission urges upon the Legislature the importance of maintaining and strengthening Oregon's momentum in renewable technologies and project development. Our state is well-positioned nationally to be one of the technology and manufacturing leaders, in significant part because public policies here are aligned with resource opportunities. The cooperative work of the 2007 Legislature and the Governor have been instrumental in this positioning, but leads evaporate if they are not continually supported and refreshed. The proposed legislative package, together with ongoing agency and university system support including workforce training and development – promise to deliver these. An increasingly critical limiting condition is the constrained electrical grid and inability to store, shape and deliver wind and other variable resources. The State must vigorously advocate with federal and private transmission system owners and operators the upgrading of grid capabilities to support the renewable resource targets of Oregon and other western States.

Throughout 2008 the GWC was highly active in examining the ongoing Transportation Vision process, with considerable crossover between the GWC and the Vision groups. The Commission weighed in that group's recommendations through this resolution.

Resolution Number: 2008-4-005

Origin: Transportation and Land Use Committee

Recommendations from the Governor's Transportation Vision Committee

Resolved, that the Oregon Global Warming Commission recommends that the Oregon Legislature and the Governor adopt and implement the proposed program elements developed by the Governor's Transportation Vision Committee and pertinent to the State of Oregon meetings its greenhouse gas goals, subject to the qualifications noted below. These program elements include:

Legislative Actions for 2009

1. Create a fund statutorily dedicated to investments in Oregon's non-highway transportation needs.
2. Authorize a graduated first time title fee based on a vehicle's mpg ratings and other factors.
3. Enable state agencies to provide electric vehicle charging infrastructure at state expense.
4. Create a category of medium-speed vehicles with maximum speed of 35 mph on roads posted 35 mph or less.

5. Give the Department of Energy rulemaking authority to set standards for vehicle tax credits.
6. Provide state funding and technical support for amending land use and transportation plans to reduce greenhouse gases, and require Metropolitan Planning Organizations (MPO's) and affected local governments to do so. Local communities outside of MPO's may also apply for state funding and technical support in order to adjust their land use and transportation plans to encourage a reduction in greenhouse gases.
7. Authorize additional funding for the Clean Diesel program to reduce emissions from truck, bus and heavy equipment engines.
8. Extend the "Pay As You Drive" tax credit for insurance companies offering this program.
9. Support investment in non-highway transportation (air, marine port, public transportation, rail passenger and rail freight.)
10. Increase the required minimum spending level for bicycle and pedestrian improvements within highway rights of way from 1.0% to 1.5%.
11. Allocate additional flexible federal transportation money to public transportation and other eligible non-highway purposes.
12. Authorize mass transit and transportation districts to levy an excise tax based on the number of commercial parking spaces, subject to a maximum level of ten cents per space per day.
13. Authorize mass transit and transportation districts to level a systems development charge for public transportation infrastructure.
14. Authorize additional funding for the Road User Fee Task Force.

Administrative Actions

15. Develop a least cost transportation model (that includes analysis of least carbon alternatives) for use by the State, MPO's and local governments.
16. Implement a congestion-pricing pilot to demonstrate the potential of pricing to reduce demand.
17. Increase the Oregon Department of Environmental Quality efforts to help Oregon's trucking industry save fuel and reduce emissions with new technology.
18. Initiate a project to identify potential logistical hubs for multimodal freight connections.
19. Broaden use of environmental performance standards to all transportation projects funded with state money.

Qualifications

- **Research, Development, and Demonstration.** In support of meeting Oregon's greenhouse gas reduction and energy efficiency goals, and to promote economic development and employment supported by the state's transportation infrastructure, the Commission urges that the State — agencies and university system — coordinate closely with the private sector to identify targeted opportunities for creating, leveraging, or expanding transportation energy efficiency research, development, and demonstration efforts in Oregon. In particular areas such as low-carbon

transportation fuels and their supporting supply and service infrastructure are critical needs, and at the same time opportunities for Oregon to demonstrate leadership. This will require Legislative support for key research initiatives in agency budgets, and in the higher education budget, while recognizing that constrained State revenues have put a premium on prioritizing initiatives. The Commission, in collaboration with the Oregon Climate Change Research Institute, will report to the Legislature in 2009 on progress in setting Oregon's research efforts within a strategic framework, with priorities and complementary funding strategies.

- **Education.** The Commission recommends incorporating into the Building Energy Performance Certification Process (proposed by the Energy Efficiency Working Group) authorization for the Departments of Energy, Transportation and Land Conservation and Development to develop and provide consumer information on locational (transportation and land use) as well as building efficiency characteristics as the agencies' ability to fairly represent these characteristics evolves.
- **Federal Funding for Non-Highway and Low Carbon Transportation Infrastructure Investments.** The Commission recommends that Oregon anticipate the availability of economic stimulus funding commitments to infrastructure from the next Congress and Administration, and aggressively seek resources to support the State's energy efficiency and carbon-reducing infrastructure strategies.
- **MPO/Community Greenhouse Gas Reduction Targets.** With respect to Program Element #6 above, the Commission recommends setting a target date of June 30, 2011, for MPO's to adopt effective transportation and land use strategies for meeting their proportionate shares of the State's 2020 greenhouse gas reduction goal (keyed to 2005 base period emissions). The target date assumes that modeling tools and funding are available to support this work in a timely fashion. The State or this Commission may develop community-level greenhouse gas reduction goals that supersede a simple proportional goal.

Outcomes

In forwarding these recommendations, the Commission urges upon the Legislature the paramount importance of energy efficiency in meeting the State's Greenhouse Gas reduction goals within the transportation sector, from which arise fully one-third of Oregon's greenhouse gases. The right planning tools and investment criteria, land use regulations and incentives, and consumer information, incentives and financing tools, will place Oregon in the best position to bring about reductions in these emissions. We commend the Transportation Vision Committee for its commitment to integrating these elements into its transportation recommendations to the Governor.

The Natural Resources Committee of the GWC formed four sub-committees that met through the Summer of 2008. From those meetings key elements of each sub-committee process where consensus was found across groups were combined into this unified statement on preparing for and adapting to the impacts of climate change in Oregon.

Resolution Number: 2008-5-007

Origin: Committee on Natural Resources

Recommendations from the Committee on Natural Resources

Resolved, that the Oregon Global Warming Commission (Commission) recommends that the Oregon Legislature and the Governor consider, adopt, and implement the following program elements developed by the Committee on Natural Resources and its sub-committees. These program elements include:

Define Climate Change Adaptation: As defined by the Intergovernmental Panel on Climate Change, climate change adaptation is adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts.⁶

Internalize Climate Change Adaptation into Agency Work Programs: As appropriate and advisable, to support maintaining, restoring, and enhancing economic and ecosystem services resiliency in the long term and at large scales, the Oregon Global Warming Commission recommends that all appropriate Oregon agencies⁷ analyze all existing programs and identify changes in programs, methods, activities tools, or priorities that would increase and accelerate the state's capacity to adapt to climate changes. The Commission recommends enabling and encouraging agencies to incorporate adaptive management mechanisms into their programs in order to increase their capacity to adapt to climate change. Contingent upon the availability of additional resources, in the 2009-2011 budget the Commission further recommends agencies develop staff capacity to begin to understand the needs of the state with respect to climate change adaptation and to provide guidance to design needed changes in programs and activities that will better prepare Oregon and its natural systems to adapt to climate changes in the next century. To improve coordination among state agencies, we recommend the creation of an interagency task force.

Coordinate, Prioritize, and Fund Research: Working in coordination with the Oregon Climate Change Research Institute and contingent upon additional resources, the Commission recommends Oregon natural resource agencies and Oregon universities conduct coordinated research, monitoring, and analysis to detect and accurately describe anticipated climate change impacts. Research should address (a) agricultural, forest management, water management, and habitat protection adaptation strategies; (b) monitoring and analysis to detect and map shifts in aquatic and terrestrial species distribution, invasive species, habitat and hydrological impacts, sea level rise, snowpack levels, glacial melt, precipitation patterns; (c) plant protection systems to address pests and disease; (d) water conservation and supply strategies that contemplate both passive and active means, and; (e) monitoring Oregon's concentrations of greenhouse

⁶ United Nations Intergovernmental Panel on Climate Change, *Working Group Report II, Impacts, Adaptation, and Vulnerability*.
<http://www.ipcc.ch/ipccreports/ar4-wg2.htm>

⁷ Oregon CORE state agencies have been identified as agencies whose work programs have direct impacts on watersheds. For information, see <http://www.oregon.gov/OPSW/teams/coreteam.shtml>

gas emissions and best practices mitigation and sequestration. The research should assist policymakers and natural resource agencies in their efforts to establish climate change adaptation and mitigation priorities, and provide information useful to an evaluation of the effectiveness of climate change response policies.

Cap and Trade Revenues to Fund Climate Change Work: Should Oregon adopt a greenhouse gas emissions cap and trade program, the Commission recommends a portion of the revenues derived from the auction of allowable permits be dedicated to funding climate change adaptation and mitigation.

Update the Oregon Conservation Strategy: The Commission recommends the 2009-2011 budget provide funding to update the Oregon Conservation Strategy to address climate change adaptation, and accelerate implementation of the highest priority actions needed to improve ecological resilience.

Integrated Water Management Plan: The Commission recommends developing an integrated water management plan with the goal of managing Oregon's water resources in the face of climate change to support long-term hydrologic and ecologic integrity and contemplate community and economic objectives. Contingent on available resources, the Commission recommends the following steps to begin plan development:

- a) Fully implement the Oregon Water Resources Commission's Water Measurement Strategy by 2012 and examine additional water-use measurement strategies, and:
- b) Evaluate strategies for meeting existing and future water needs including:
 - i. Evaluate climate change effects on surface and ground water, water quantity and quality, interactions between water and land, and relationships between water and community and economic development;
 - ii. Implement near-term pilot projects and conduct monitoring and analysis of the conservation goals of these projects;
 - iii. Fund ongoing development of water demand forecasts and water resource data including basin yield, instream, peak and ecological flows, and ground water analyses, and;
 - iv. To meet water needs, explore for 'no regrets' strategies, including but not limited to conservation/efficiency projects and other environmentally appropriate supply projects.

Fund Efforts to Reduce Risks of Uncharacteristic Forest Fires: Consistent with the Oregon Federal Forestland Advisory Committee's recommendation to the Oregon Board of Forestry, the Commission recommends the Governor and the state Legislature support federal agency and local community efforts to improve federal forest resiliency to the anticipated effects of climate change.

The Energy, Utilities and Stationary Sources Committee devoted most of the summer and fall of 2008 to negotiating the language contained in this resolution. In contrast to the previous resolutions, which all passed by consensus of the voting members, this resolution passed with seven Commissioners voting yes, one voting no, and three were not present to vote at the meeting. Please note letters following resolution.

Recommendations Regarding Western Climate Initiative Greenhouse Gas Proposals and Complementary Emissions Reductions Measures⁸

Resolution Number: 2009-1-009 Origin: Energy, Utilities, and Stationary Sources Committee

Resolved, that the Oregon Global Warming Commission recommends that Oregon continue to move forward with development of the Western Climate Initiative (WCI) proposed framework for establishing a western States and Canadian Provinces (“States”) regional greenhouse gas (“GHG”) cap and trade mechanism⁹, and complementary programmatic and regulatory measures, with additional work in 2009 to include further definition of market design and WCI-member-specific decisions on critical framework details including the qualifications noted below.

In making this recommendation the Commission reaffirms its support for a fair and effective national solution to achieving greenhouse gas reduction goals comparable to Oregon’s, one that employs marketplace tools such as a cap and trade mechanism, as ultimately preferable to regional or state-based initiatives; and the Commission’s intent, by offering this Resolution, to participate in shaping that solution.

Qualifications

- 1. Allocation of Allowances Among States:** The Commission recommends that Oregon receive GHG emissions allowances in amounts consistent with an Oregon obligation to meet the WCI *regional emissions goal*, while seeking to strengthen that regional goal to the levels adopted by the Oregon legislature in 2007.
- 2. Allocation of Allowances – Transition Issues:** The Commission recommends that Oregon temporarily reserve some part of allowances from initial allocations, and make these available to regulated entities that meet pre-established economic hardship criteria.
- 3. Use of Auction Proceeds:** The Commission recommends that auction or other program revenues should be used for actions (including related research) that will avoid GHG emissions in Oregon in the capped sectors and assist regulated entities to meet their compliance obligations while preserving jobs in those sectors; to assist workers and low-income energy consumers adversely affected by higher energy prices or job losses attributable to emissions regulation; and to support adaptation activities in Oregon’s communities and its natural environment.
- 4. Point of Regulation:** The Commission concurs with the WCI that the point of regulation of GHG emissions for all sources, whether emitted within the WCI or associated with energy imports, must be within the WCI’s borders, and within the State’s regulatory jurisdiction.
In establishing a point of regulation, it is important that electric system reliability not be impaired.

⁸ Note that the resolution as passed had no formal title. This title is for purposes of clarity in this report only.

⁹ As generally laid out in the WCI Design Recommendations dated September 23, 2008.

- 5. Transition to Federal Carbon Emissions Reduction System:** The Commission concurs with the WCI in recognizing the importance of anticipating national GHG regulation, and adopting a WCI design that can both influence national regulation, and be adapted readily into that regulation so it is not duplicative of Federal requirements.
- 6. Complementary Public and Private Sector Actions:** The Commission has already acted to recommend to the Legislature and Governor new initiatives in energy efficiency, renewable energy, transportation efficiency and land use that also rely on individual and private sector participation. The Commission recommends the Oregon Public Utility Commission, the Oregon Department of Energy and Consumer-Owned Utility governing boards undertake processes to identify the technical potential, anticipated GHG avoided emissions benefits and associated costs, and new programmatic and regulatory measures at a minimum in the following key strategic areas:
- a. Electricity and gas energy efficiency;
 - b. Smart Grid designs, costs and benefits;
 - c. Combined heat and power facilities;
 - d. Small- and medium-scale renewable energy facilities (e.g. solar photovoltaic, micro hydro, biomass, solar hot water)
 - e. Automobile and light duty truck electrification and other low-carbon transportation strategies.

The primary goal of adopting new strategic programmatic and regulatory measures is to achieve avoided emissions prior to and during implementation of a cap-and-trade program.

Outstanding Questions

[NOTE: The following is not an exhaustive list of outstanding questions, but represent issues the Commission particularly wishes to bring to the attention of the Governor and Legislature. The Commission emphasizes that these are issues to be addressed constructively and satisfactorily resolved as we move forward with the development of proposals for carbon cap and trade.]

- 1. Economic Effects of a WCI Carbon Cap & Trade:** The Commission recognizes the potential for both economic opportunity and economic dislocation from implementing a regional carbon cap and trade mechanism. The Commission, in partnership first with the Oregon Business Association, initiated an Oregon-specific economic impact analysis that now includes co-sponsorship from the State and other business and environmental interests. That analysis will look at both opportunities and risks of Oregon's participation in the WCI framework, building on a larger regional WCI analysis. There are other analyses underway as well that are seeking to identify economic outcomes as well as effects on individual Oregon companies subject compliance requirements, the findings of which will be increasingly useful as greater clarity is achieved on the questions we identify below. The Commission will review these as well, and provide its evaluations to the Legislature as they become available. The Commission may empanel an Economists Advisory Board to peer-review selected studies and make its findings available to the Commission, the Governor and the Legislature. The Commission may also examine whether there could be electric system reliability consequences of programmatic and regulatory proposals, either favorable or adverse.
- 2. Allocation of Allowances within Oregon:** How should carbon emissions allowances be allocated within the State of Oregon? What part of the allowances should be free, and what part subject to auction? If regulated and consumer-owned utilities receive most or all allowances free,

should other companies subject to the cap be treated the same or differently? If some allowances are to be auctioned (WCI stipulates at least 10% of allowances are to be auctioned), should these come “off the top” before allocation of allowances to all other parties subject to the cap?

3. Allocation of Allowances Among States: Should allowance allocation methods be parallel among the WCI States to avoid creating competitive imbalances that could be expected to occur if like companies subject to emissions regulation have unequal access to allowances?

4. Greater Clarity on Reduction Expectations for Potential Regulated Entities: The WCI does not represent the proposed regional cap and trade framework as complete. Acknowledging this, the Commission particularly encourages greater clarity on how reductions requirements will apply to individual regulated entities. Some of the outstanding questions include:

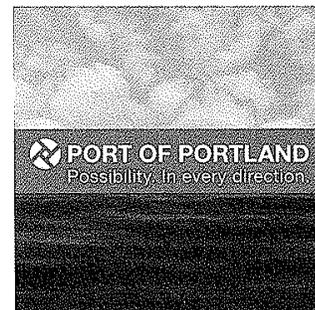
- How soon will the promised estimate of 2012 base period emissions be provided so entities can plan from that base emissions level?
- How will reduction obligations be allocated to regulated entities from that base level; and if reductions among regulated entities are not simply proportional to Oregon or regional WCI goals, what adjustments will be made, and for whom?
- How will other adjustments to overall and individual allowance allocations be made – for example, treatment of emerging and of departing emitters within a State or within WCI, or allocating the effects of Early Reduction Allowances?
- How will Combined Heat/Power (CHP) facilities be treated?
- Should Oregon deem its in-state biomass combustion as carbon neutral?
- Should companies subject to the cap be treated differently if there are no immediately available substitutable processes for the industrial processes that result in the regulated emissions? If so, how (e.g., recognition in distribution of allowances)? If the company has made investments in its processes within the last (10 years?), and those processes place it in the top quartile for GHG efficiency per unit of output, should it merit different treatment under the cap? If so, how?

5. Distribution of Compliance Costs: Since carbon emissions are a product of most of our business and personal activities, an equitable distribution of costs is critical to the success of and public support for any strategy. Our ability to accomplish this may depend on the following:

- Can we assure that all significant producers of carbon emissions subject to the WCI cap & trade framework must participate in reductions, not just the easiest to regulate. Thus while electric utilities may be most accessible to new regulation, the Commission concurs with WCI that other sources – most particularly industrial emitters and transportation – must be included as well.
- Can design of WCI carbon markets assure that participants are neither unduly benefited nor penalized? Thus, equitable access to allowances may need to be ensured for regulated emitters with relatively less market power, such as smaller consumer-owned utilities (but that still exceed the 25,000 tonne threshold subject to the WCI cap and trade). If free allowances are issued to any participant, can this be done under rules that prevent windfall profits from accruing as a consequence of carbon allowance trading? If unregulated third parties are permitted to participate in auctions or market transactions to increase market liquidity, can this be done under rules that prevent market manipulation or limit access to allowances by participants with less market power?

- Under a cap and trade, higher energy costs may disproportionately affect low-income consumers. How will provision be made for targeted assistance to these parties, particularly through energy efficiency investments that reduce consumer energy *costs* even as *prices* may be rising?
 - Under a cap and trade, workers may be displaced as a result of employer responses to carbon regulation. How will provision be made for targeted public assistance such as retraining, extended unemployment benefits, and, other forms of financial transition support?
6. **Competitiveness and Leakage Issues:** There is legitimate concern over the ability of a regional cap and trade to prevent leakage (e.g., emissions and production of goods relocating from inside the capped WCI region to outside, thwarting real overall emissions reductions). Many of Oregon’s primary manufacturing employers produce global commodities (e.g., steel, cement, pulp and paper). These companies are price takers in global markets, not price setters, and may be disadvantaged competitively by such leakage effects. How can Oregon and other WCI participants anticipate and address economic hardship to these companies that may be materially and adversely affected by competition from areas not subject to WCI cap and trade regulation? How can Oregon and other WCI participants deal with carbon content from goods imported from areas not subject to WCI cap and trade regulation?
 7. **Compliance Flexibility Tools; Consideration of a “Circuit Breaker”:** The Commission appreciates that WCI Design Recommendations includes significant market flexibility tools to manage economic impacts on regulated entities, including banking of allowances and use of offsets. WCI and the State may wish to consider as well a limited “circuit breaker” mechanism that could temporarily cap the compliance costs a regulated company would see in extraordinary circumstances such as a breakdown in allowance market functioning. Such a mechanism should be designed to trip only rarely in order to preserve market predictability, and designed to resume normal market function — and progress toward meeting Oregon’s GHG reduction goals — when costs fall back below the established threshold. Oregon would need to negotiate any such instrument with its WCI partners.
 8. **Availability and Use of Offsets:** It is generally recognized that offsets may present low cost greenhouse gas reduction opportunities and that the wider the market from which offsets may be acquired, the lower average prices should be. How extensively should emitters subject to the cap be able to use offsets to meet compliance obligations in lieu of direct reduction of GHG emissions? Should there be geographic as well as quantitative limitations on accessing offsets, in addition to the requirement for rigorous tracking and verification? There is also concern that the rigor of tracking and verification of offsets may suffer as offsets are increasingly relied upon for compliance purposes, and as their sourcing becomes increasingly global (e.g., third world “Clean Development Mechanism/CDM” offsets).
 9. **Legal Review:** Can we assure stakeholders that all significant legal issues have been addressed within the final GHG cap-and-trade design? The ultimate purpose of a cap-and-trade mechanism — to reduce emissions — would be frustrated if it were delayed or ultimately overturned by a Federal lawsuit. Legal risk is one of the most significant initial objectives to consider when finalizing the details of a proposed WCI framework. It behooves Oregon to subject any WCI or Oregon cap-and-trade design or rule to careful legal review for consistency with Federal and State Constitutional and statutory obligations, and to invite stakeholder comment on that analysis.
 10. **Carbon Content of Imported Products:** Should Oregon address the very substantial emissions associated with products (beyond energy) imported from non-WCI jurisdictions for use by Oregonians? What additional analytic or regulatory tools might be required to accomplish this?

Mission: To enhance the region's economy and quality of life by providing efficient cargo and air passenger access to national and global markets.



MEMORANDUM

**TO: Angus Duncan, Chair
Oregon Global Warming Commission (OGWC) Members**

FROM: Annette Price

RE: Comments on Cap and Trade Resolution

DATE: January 22, 2009

Since our Executive Director Bill Wyatt is unable to attend today's (OGWC) meeting Bill wanted to share his concerns in writing to facilitate the discussion on the draft cap and trade resolution. Bill would like these comments to be included in the meeting record.

A great deal of consideration has gone into this cap and trade resolution and he feels it will ultimately help further Oregon's ability to meet its greenhouse gas reduction goals.

The Port of Portland has long been a supporter of Oregon's goals and has implemented, and continues to pursue creative projects throughout its marine and aviation operations aimed at reducing greenhouse gas and diesel particulate emissions, including; energy efficiency projects, the purchase of electricity from sustainable sources, computerized and automated systems to reduce vehicle idling, and alternative fuel vehicles.

General concerns with the draft resolution have to do with

- 1) import regulation;
- 2) transportation, specifically the role of the industry in developing regulations to be promulgated by Oregon Department of Energy and the Public Utility Commission; and
- 3) the level of economic analysis to be conducted in support of the cap and trade and complimentary measures.

More specifically, import regulation will be very difficult to achieve without also treating Oregon exports in a similar manner and adversely affecting trade-dependent Oregon businesses. Oregon imports and exports are a vital part of Oregon's economy.

The resolution should provide clarity on the scope of transportation electrification whether it is intended to address the development of plug in vehicles or whether it is intended to include the broader transportation sector. If it is intended to address

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503 944 7000

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transportation on a broad level, the transportation sector needs to be engaged in the role of evaluating and developing transportation related complimentary measures such as electrification. Studies on electrification at Ports, for example, have shown that the feasibility of electrification is highly variable and is heavily dependent on operational variables (i.e. types of vessels, frequency of calls, terminal agreements [or lack thereof]). Electrification technology is relatively capital intensive and operational costs are high as compared to conventional air emission abatement technologies. Where not feasible, air quality objectives are being addressed through other measures.

The resolution should be clear that a detailed economic analysis will be conducted for all complimentary measures considered. Complimentary measures are important in helping Oregon meet its goals. However, it is also important that Oregon evaluate the economic impacts of complimentary measures, especially those which will not be adopted across all Western Climate Initiative jurisdictions (seven U.S. states and four Canadian provinces).

Bill very much appreciates the effort and quality put into this draft resolution. These comments are intended to be constructive in helping to develop a product that can be enthusiastically embraced, and Bill looks forward to working closely with the Commission members on providing further clarification on the resolution.



Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204
PortlandGeneral.com

January 22, 2009

Mr. Angus Duncan
Chairman
Oregon Global Warming Commission
Salem, OR 97301

Dear Chairman Duncan and fellow commissioners:

We write to express our concerns with the proposed WCI resolution that is scheduled to be considered by the full Commission today. We truly appreciate the many efforts the Energy/Utility/Stationary Source Committee members have made over the last several weeks to address PGE's concerns with the language of this resolution. Unfortunately, the resolution before the Commission continues to endorse a WCI process that remains flawed and not in the best interest of PGE's customers.

We have long supported a cap and trade system at the federal level. We feel this offers a better opportunity to achieve real reductions in greenhouse gases at a reasonable pace with acceptable rate impacts to our customers. We are encouraged that the new Administration and the Congress have made it clear that it will be a priority to address this issue early on. Much can be done at the state level to complement such a program and to ensure Oregon is well positioned to move toward a low carbon economy. The concepts forwarded by the Renewable Energy Working Group and the Energy Efficiency Working Group, which were discussed by this Commission in prior meetings, could form the basis for immediate state-driven leadership to reduce greenhouse gases. A state or regional cap and trade system, however, is problematic because of the inherent difficulties in ensuring a consistent and level playing field between states.

We have attached copies of PGE's memo to Governor Kulongoski on the WCI process from September of last year, as well as a more recent joint utility statement on climate issues to which PGE was a contributor. These two documents explain in greater detail our many concerns on moving ahead with a state-driven cap and trade system in the current WCI context.

Sincerely,

Peggy Fowler
co-CEO and President

Jim Piro
co-CEO and President



COORDINATED UTILITY POSITION ON
CLIMATE ISSUES FOR THE 2009 LEGISLATIVE SESSION

- 1) We support reducing greenhouse gas emissions through programs that include emissions reporting, energy performance standards, increased energy efficiency programs, demand reduction programs, transmission and distribution improvements, electric vehicles and carbon offset programs.
- 2) We believe that the Oregon legislature should direct the Oregon Public Utility Commission and the local governing boards of the consumer-owned utilities to achieve real reductions, at a reasonable pace, with acceptable rate impacts. These carbon reduction actions should be considered as early actions under federal cap and trade legislation.
- 3) Any carbon tax or cap and trade established for the reduction of GHG should be enacted at the federal level. Only a federal system will ensure state-to-state parity when it comes to economic effects and will avoid many of the technical and legal problems inherent in a regional system.
- 4) Oregon utilities oppose legislation to direct the Department of Environmental Quality to develop a cap and trade program that links to the Western Climate Initiative.
- 5) Utilities cannot support the Western Climate Initiative proposal as currently drafted. The WCI process is incomplete. It does not address a number of fundamental objections.



Portland General Electric

MEMORANDUM:

TO: Governor Kulongoski
Chip Terhune
Brian Shipley
Dave Van't Hof

FM: Dave Robertson

DA: September 5, 2008

RE: PGE WCI Thoughts

Thank you for meeting with us to discuss PGE's perspectives on Oregon's energy future and our concerns about the Western Climate Initiative. We appreciate your commitment to addressing climate change and share your belief that the state must get on the path to achieving real greenhouse gas reductions. Much can be done to reduce emissions and to prepare for a carbon-constrained world. Indeed, we think it is essential that Oregon enact provisions in the 2009 legislative session that will enable our citizens and our businesses to make this transition smoothly and at the lowest cost possible.

While we remain convinced that cap and trade is best done at the federal level, we recognize that a well-designed regional cap and trade program, as part of a full spectrum of complimentary measures designed to reduce greenhouse gas emissions, could prove to be a useful tool for achieving emissions reductions in the West. However, the WCI Draft Design has such significant flaws that PGE would not be able to support it in its current form. Our specific concerns with the program design are detailed below.

DESIGN FAILS TO CREATE A LEVEL PLAYING FIELD

First and foremost, a regional cap and trade program must create a common reduction goal and a common set of market rules. The WCI Draft Design encourages just the opposite, however, by allowing individual states to set fundamental market rules on a state-by-state basis. Creating market rules on a state-by-state basis will impose unequal carbon costs on utilities and other regulated entities solely on the basis of entities' locations within the WCI region. Perhaps more importantly, the actions of any one state could create market distortions that will affect carbon and power markets throughout the West. We need only look to the western power crisis to see the profound effects that one state's energy policy decisions had on power markets, utilities and customers throughout the West. The WCI Draft Design suggests that the Partners may consider harmonizing rules for some sectors at some point after the program is implemented. However, this harmonization, and the hard work of setting common rules on allowance allocation, percentage of allowances to be auctioned, cost-containment and other key program design features, must occur before program implementation in order to avoid the possibility of market distortion and potential manipulation.

Reduction Goals: Each WCI partner state must have the same reduction target under the cap and trade program. The current proposal does not provide a common goal; instead the partners have created an aggregate regional goal from individual state goals that were not adopted with a larger, regional context in mind. Without serious debate as to the consequences, the WCI framework requires Oregon to achieve an emissions reduction target under the cap and trade program that is significantly higher than most of the other partners' targets. This bootstrapping of an aspirational state goal into the WCI framework imposes a real, unfair and unreasonable burden on Oregon citizens and businesses – both in terms of per capita costs and as a percentage of state gross domestic product. A truly regional reduction program should not impose widely varying reduction requirements on similarly situated entities based solely on the state in which they reside. Disparate reduction requirements encourage those who are capable of

moving to a more favorable jurisdiction to do so, and unfairly burden and disadvantage those who cannot.

Apportionment and Allocation: The Draft Design does not propose a specific methodology for apportioning allowances between states and provinces, or allocating allowances within the partner jurisdictions. However, we must note again the importance of Partners' setting clear and consistent program rules for the WCI as a whole. We strongly oppose the recommendations to allow individual state partners to set fundamental market rules on a state-by-state basis. This is particularly important in the utility sector where an interconnected system and regional power markets continuously move power across state lines.

Despite the obvious political challenges, the Partners should agree in advance of program implementation on allocation methodologies and auction percentages. PGE believes that utility sector allowances should be allocated at no cost to rate regulated utilities on the basis of their historic emissions to help mitigate cost increases on customers. We further believe that auctions, at least in the early years, should be limited to 3 to 5% of the available allowances. Requiring rate regulated utilities to purchase allowances at auction needlessly increases the costs of program compliance for utility customers.

Retirement of Allowances: PGE strongly opposes giving Partners the discretion to retire allowances. This would allow a single jurisdiction to unilaterally lower the cap for the entire WCI since those allowances – which are fungible across the WCI - would no longer be available for compliance. It would also have the effect of empowering a single jurisdiction to drive up the market price of allowances for market participants across the WCI because allowance retirements will increase scarcity. Because these impacts would affect regulated entities across the entire WCI, the Partners should reconsider and reject the proposal to allow individual jurisdictions to retire allowances.

COST CONTAINMENT PROTECTIONS ARE NOT INCLUDED

It is essential that the WCI minimize the risks of market dysfunction and soaring carbon and power prices. PGE has urged the WCI to include a “safety valve” provision to protect consumers and the wider economy from design flaws and price spikes that may result from a new and largely untested carbon emissions market. A provision that caps emission allowance prices under extreme economic conditions would limit cost impacts on the economy and would provide the cost-certainty that will allow regulated entities to make better long-term planning decisions. This also serves to protect consumers from price shocks that can result from unchecked market manipulation and speculators. Unfortunately, the WCI Draft Design contains no such provision.

POINT OF REGULATION WORKS FOR CALIFORNIA BUT NOT FOR THE NORTHWEST

PGE opposes using the first jurisdictional deliverer (FJD) approach as the point of regulation for the utility sector. Unfortunately, this is the approach included in the latest WCI Draft Design, largely at the urging of the California utilities. FJD would require substantial changes in regional markets in order to identify power purchases by specific generation facility. This is extremely problematic for the Northwest where our markets operate on system sales. A system sale is a sale made from a group of generating resources or the seller's entire system. By utilizing system sales, the utility can back up the sale with other resources should a specific unit trip off line, avoiding interruption of energy deliveries. This has important operational, market efficiency and reliability benefits for the region. FERC recently recognized the importance of system sales for our region when it granted Northwest utilities an exception to a new federal rule requiring sellers to track deliveries from the source (generator) to the sink (end-user). While we appreciate the WCI Partners' concern with addressing emissions from non-jurisdictional generating resources, we believe the risks, costs and difficulties associated with implementing FJD are too great and that the WCI should adopt a generator point of regulation for the utility sector. The generator point of regulation has the additional benefit of being consistent with the federal cap and trade system that will eventually succeed our regional initiative.

OFFSETS ARE LIMITED UNNECESSARILY

PGE has objected to the Draft Design's limitation of offsets for regulatory compliance. The essential purpose of a cap and trade program is to reduce greenhouse gases at the lowest possible cost. Limiting the quantity of

offsets that may be used to meet a compliance obligation and limiting the locations from which they can be sourced serves only to increase compliance costs for regulated entities like PGE, and at the end of the day, to increase costs for our customers. WCI should allow unlimited offsets and should focus on the quality of offset projects rather than their provenance.

SCOPE – LARGEST EMITTING SOURCES ARE LEFT OUT

PGE objects to the delay in the inclusion of transportation fuels and residential and commercial fuels under the cap until 2015. Every sector that contributes to the problem must contribute to the solution, as quickly as possible, so that we can achieve the reductions that scientists say are necessary. Therefore, all of these fuels should be included within the cap from the start of the program, not phased in over time.

FEDERAL REGULATION – NO TRANSITION TO FEDERAL SYSTEM CONTEMPLATED

The Partners have not provided for transition to federal regulation of greenhouse gases. A federal compliance system is only a few years away and will, by virtue of its national scope, provide a more efficient regulatory framework for addressing this global problem. The regional system must be designed to integrate smoothly into the federal system, once it is in place.

CONCLUSION

We support continued efforts to improve the WCI cap and trade design, but do not believe the current design is on the right track. PGE has considered how the current WCI system could be modified to avoid the problems we have listed, but we are unable to see how Oregon legislation could be shaped to avoid the fundamental flaws in the overall system, many of which are dependent on the actions of other states. At this late time in the WCI process, it seems unlikely that the serious differences between the Western States will be reconciled. For example, California's approach to regulation of utility emissions – the first deliverer point of regulation – may work in a power market with an Independent System Operator that already manages power transactions for utilities and generators, but it does not work in the Pacific Northwest where there is no ISO and system sales are recognized as the best practice. In addition, Washington utilities, which are predominately hydro generation users, have strongly and openly advocated at the state and federal levels for allowance and allocation formulas that severely disadvantage Oregon utilities and their industrial and commercial customers. Thus far, WCI negotiators have been unable to reconcile those differences in a way that does not disadvantage Oregon. Until differences like these are resolved, Oregon should not sign onto WCI and should instead concentrate on other means of reducing greenhouse gases, such as enhanced energy efficiency, carbon capture and storage projects, renewable energy development and building code changes. Creation of a workable cap and trade mechanism should be left to Congress. Should development of a federal solution truly fail, negotiations among the Western States should continue and concentrate on creating a true level playing field between the participants.

Thank you again for the opportunity to share our concerns about this important issue. We look forward to continued discussions with you and your staff about Oregon's path to a low-carbon future.

January 22, 2009

Angus Duncan, President
Bonneville Environmental Foundation
240 SW 1st Ave
Portland, OR 97204-3503

Dear Angus,

As I mentioned I have had our Cap and Trade Team review the Oregon Cap and Trade Draft and submit to you and Gregg our unedited comments and ask that you review this body of work which I hope you find helpful in fine tuning the document up for consideration on Thursday.

The Nature Conservancy Cap and Trade Team has a few specific comments on Oregon's draft resolution that you and the Commission might find useful:

1) CRITICAL: We're very happy to see that the draft includes support for adaptation under the "Use of Auction Proceeds" point (#3) in the qualifications. With many changes to the climate system already happening, and additional changes expected from GHGs that have already been emitted, adaptation is a key piece of any program to address climate change. It is vital that enough funding is directed towards natural system adaptation.

In response to some of the outstanding questions:

2) MINOR: Question 2 poses a question about allocation of allowances. While TNC does not have a official position on this issue at the state and regional level, it is important to note that achieving the goals outlined in the "Qualifications" section numbers 3 and 6 (including support for adaptation and for complementary measures) may be supported by auction revenue. At the federal level, we have taken the position that there should be some free allocation to regulated entities during a transition period, but that this free allocation should be phased out. If the Commissions wants more details, we can get you more details about our position for federal legislation.

3) IMPORTANT: Question 4, 5th bullet point: "Should Oregon deem its in-state biomass combustion as carbon neutral?"

We provided detailed comments on the WCI design draft regarding this issue. In short, the answer is no - while the CO2 coming directly from the biomass burning was recently sequestered out of the atmosphere during the growth of that biomass, there may be additional upstream emissions that need to be accounted for. For a complete answer that represents TNC's position on this issue, please see the second page of the attached WCI comments, point 1.3. The answer is directed in part to biofuels, but all the relevant issues are the same in biomass burning for power or heat generation as well.

4) CRITICAL: Questions 7 ("Compliance Flexibility Tools") and Question 8 ("Availability and Use of Offsets") We agree that cost containment is an important piece of any cap-and-trade program to address GHG emissions and global warming. Compliance flexibility mechanisms, such as banking of allowances and use of offsets, can provide strong cost containment.

Offsets help protect the integrity of the program by containing costs by providing low-cost emission reductions while low-carbon technologies advance and are deployed. Reducing a ton of CO2 emissions through offsets has the same impact on the atmosphere as a ton of reductions from covered sectors. Criteria must be established to ensure

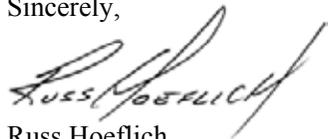
all offsets are environmentally additional, verifiable, permanent, measurable, and enforceable. Forest carbon in particular can be an important source of offsets, and TNC has demonstrated, through our on-the-ground work in Belize, Bolivia, and Brazil, that emission reductions from reduced deforestation are real and can be credibly measured, validated, and verified.

We recommend that Oregon adopt the maximum WCI recommended offset provision, set at 49% of reductions.

We do not support the type of "circuit breaker" mechanism that would cap compliance costs by raising emissions caps. However, at the federal level, we have supported proposals such as a "strategic reserve" that would set aside a portion of future allowances at the outset of the program, which could then be sold into the market if certain price levels are reached (to release some price pressure). In addition to this type of "system-wide borrowing" of allowances, a strategic reserve could also be filled by government purchases of offsets on the national and international market, similarly available to be sold in the event of excessively high allowance prices.

I hope the Commission finds these points helpful, and if you have any questions about them or need anything additional, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "Russ Hoeflich". The signature is written in a cursive style with a large, sweeping initial "R".

Russ Hoeflich
Vice President & Oregon State Director

APPENDIX A

OREGON GLOBAL WARMING COMMISSION COMMITTEES

Note: Oregon Global Warming Commission Members are noted with an asterisk.

Communication and Outreach Committee

Co-Chairs:

Bill Bradbury*	Secretary of State
Jim Rue*	Businessman

Members:

Len Bergstein	Northwest Strategies, Inc
Bishop David Brauer-Rieke*	Oregon Synod of the Evangelical Lutheran Church in America
Bob Doppelt	Director, Climate Leadership Initiative, Institute for a Sustainable Environment
Angus Duncan*	President, Bonneville Environmental Foundation
Jill Eiland*	Intel Corporation
Kira Higgs	KH Consulting
Eric Lemelson*	Lemelson Vineyards
Peter Murchie	National Policy Consensus Center/Oregon Solutions-PSU
Martin Tull	Formos
Kat West	Multnomah County Sustainability Program

Energy, Utility and Stationary Source Committee

Co-Chairs:

Angus Duncan*	President, Bonneville Environmental Foundation
Gregg Kantor*	President and COO, Northwest Natural

Members:

Jim Abrahamson	Energy Partnership Coordinator, Community Action Partnership of Oregon
Lisa Adatto	Oregon Director, Climate Solutions
Lee Beyer*	Commission Chairman, Oregon Public Utility Commission
Rep. Ben Cannon*	State Representative, Oregon State Legislature
Tom Chamberlin	President, AFL-CIO
Kyle Davis	PacifiCorp
Michael Early	Industrial Customers of NW Utilities
Peggy Fowler*	President and CEO, Portland General Electric
Michael Grainey*	Director, Oregon Department of Energy
Bob Jenks	Executive Director, Citizens' Utility Board of Oregon
Eric Lemelson*	Owner, Lemelson Vineyards
Tom O'Connor	Oregon Municipal Electric Utilities Association
Dick Pedersen*	Director, Oregon Department of Environmental Quality

Paula Pyrom
John Savage
Thomas R. Wood

Northwest Industrial Gas User
Commissioner, Oregon Public Utility Commission
Stoel Rives LLP

Natural Resources Committee

Co-Chairs:

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Katy Coba* Director, Oregon Department of Agriculture
Andrea Durbin* Executive Director, Oregon Environmental Council
Eric Lemelson* Owner, Lemelson Vineyards
Jim Rue* Businessman
Phil Ward* Director, Oregon Department of Water Resources

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Co-Chairs: Roy Elicker, Director of Oregon Department of Fish and Wildlife
Sara Vickerman, Senior Director of Biodiversity Partnerships, Defenders of Wildlife

Forestry Subcommittee

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Dr. Mel Kohn* Acting Director and State Health Officer, Department of Human Services, Public Health Division

Members:

Mark Abbott* Dean/Professor, College of Oceanic and Atmospheric Sciences, Oregon State University
Andrea Durbin* Executive Director, Oregon Environmental Council

Science and Technology

Chair:

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Oregon State University

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Bishop David Brauer-Rieke★ Oregon Synod of the Evangelical Lutheran Church in America
Angus Duncan★ President, Bonneville Environmental Foundation
Andrew Fountain Portland State University
Burke Hales Oregon State University
Dave Hulse University of Oregon
Greg Jones Southern Oregon University
Dr. Mel Kohn★ Acting Director and State Health Officer for the Department of Human
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Andy Cotugno Metro
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Lisa Gardner City of Eugene
Matt Garrett★ Director, Oregon Department of Transportation
Dick Pedersen★ Director, Oregon Department of Environmental Quality
Cathy Reheis-Boyd Western States Petroleum Association
Bob Russell Oregon Trucking Association
Richard Schmid Mid-Willamette Valley COG and Salem/Keizer MPO
Bob Stacey 1000 Friends of Oregon
Richard Whitman Oregon Department of Land Conservation and Development

APPENDIX B

For an explanation of the methodology, see Appendix 1: Inventory and Forecast of Oregon's Greenhouse Gas Emissions in the Climate Change Integration Group's *Final Report to the Governor: A Framework for Addressing Rapid Climate Change (January 2008)* at <http://oregon.gov/ENERGY/GBLWRM/docs/CCIGReport08Web.pdf>.

Update to Oregon Greenhouse Gas Inventory

Gross Emissions in Million Metric Tons of Carbon Dioxide Equivalent (MMTCo₂e) for 1990 through 2005 (Consumption Basis for Electricity)

Emissions (MMTCo ₂ e)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Carbon Dioxide: CO₂																
Direct Combustion																
Residential	2.038	2.186	1.896	2.415	2.353	2.220	2.474	2.371	2.460	2.789	2.752	2.765	2.777	2.664	2.584	2.682
Commercial	1.880	1.855	1.651	1.797	1.706	1.775	1.891	1.885	1.961	2.027	2.064	2.127	2.053	1.737	1.776	1.842
Industrial	5.308	5.513	6.190	6.565	6.501	6.924	6.716	6.662	6.338	7.618	7.068	6.932	7.167	6.474	7.317	6.711
Transportation	20.045	21.615	21.630	20.877	21.655	21.236	21.971	22.094	23.083	23.320	22.594	21.596	21.868	21.675	22.798	23.387
On-road Gasoline	11.578	11.626	11.795	12.284	12.400	12.298	12.771	12.184	13.160	13.428	13.156	13.088	13.331	13.244	13.194	13.295
On-road Diesel	3.441	3.425	3.382	3.544	3.457	3.615	3.946	4.069	4.279	4.373	4.308	4.226	4.672	4.997	5.328	5.466
Other Transportation Fuel Use	5.025	6.564	6.453	5.049	5.798	5.323	5.254	5.842	5.644	5.519	5.131	4.282	3.865	3.434	4.277	4.626
Electricity Consumption																
Residential	5.976	6.197	5.906	7.765	7.656	7.588	7.835	7.836	7.835	8.398	8.470	8.709	8.314	8.562	8.495	9.423
Commercial	4.398	4.512	4.592	5.676	5.888	6.000	6.069	6.405	6.403	6.935	7.111	7.372	7.058	7.474	7.394	7.902
Industrial	6.022	5.943	5.876	6.982	7.010	7.367	7.719	7.697	6.544	6.560	7.605	6.510	5.824	5.774	5.641	6.517
Transportation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.008	0.009
Other (non-specified use)	0.303	0.307	0.298	0.309	0.361	0.313	0.321	0.201	0.185	0.218	0.221	0.239	0.238	0.000	0.000	0.000
Industrial Processes																
Cement Manufacturing	0.216	0.225	0.228	0.196	0.214	0.207	0.360	0.379	0.399	0.457	0.447	0.429	0.430	0.370	0.422	0.444
Lime Manufacturing	0.068	0.108	0.125	0.140	0.147	0.157	0.172	0.156	0.171	0.160	0.145	0.098	0.074	0.077	0.097	0.095
Limestone and Dolomite Use	0.009	0.009	0.009	0.009	0.007	0.013	0.006	0.012	0.011	0.013	0.009	0.006	0.008	0.005	0.007	0.007
Soda Ash	0.031	0.030	0.031	0.031	0.031	0.032	0.032	0.033	0.033	0.032	0.032	0.032	0.033	0.032	0.032	0.032
Ammonia & Urea	0.077	0.076	0.080	0.073	0.077	0.080	0.089	0.080	0.082	0.081	0.074	0.058	0.075	0.066	0.072	0.069
Iron & Steel Production	0.704	0.704	0.704	0.704	0.704	0.704	0.704	0.811	0.747	0.640	0.750	0.573	0.440	0.429	0.429	0.340
Waste Incineration	0.274	0.274	0.270	0.273	0.320	0.310	0.304	0.297	0.289	0.252	0.267	0.276	0.289	0.222	0.315	0.356
Liming of Agricultural Soils	0.030	0.025	0.027	0.029	0.031	0.033	0.035	0.038	0.040	0.042	0.044	0.038	0.033	0.034	0.039	0.043
Total Gross CO₂	47.378	49.579	49.513	53.841	54.658	54.958	56.699	56.956	56.581	59.542	59.652	57.758	56.680	55.603	57.427	59.858

Methane: CH₄																
Stationary Combustion	0.100	0.102	0.097	0.110	0.103	0.103	0.112	0.104	0.095	0.097	0.100	0.138	0.136	0.137	0.144	0.145
Mobile Combustion	0.056	0.055	0.057	0.056	0.054	0.051	0.048	0.048	0.047	0.043	0.040	0.036	0.034	0.030	0.029	0.026
Natural Gas and Oil Systems	0.576	0.582	0.588	0.595	0.601	0.607	0.614	0.620	0.626	0.633	0.639	0.647	0.654	0.662	0.671	0.680
Enteric Fermentation	1.998	2.016	1.999	1.983	2.118	2.211	2.271	2.249	2.200	2.185	2.133	2.020	2.113	2.049	2.203	2.146
Manure Management	0.257	0.257	0.266	0.256	0.272	0.276	0.268	0.276	0.281	0.287	0.306	0.313	0.365	0.407	0.409	0.412
Burning of Agricultural Crop Waste	0.003	0.003	0.003	0.004	0.003	0.003	0.004	0.004	0.003	0.002	0.003	0.002	0.002	0.003	0.003	0.003
Waste in Landfills	1.036	1.041	0.991	0.979	0.961	0.930	0.983	1.039	1.076	1.087	1.119	1.168	1.196	1.257	1.294	1.262
Municipal Wastewater	0.191	0.197	0.201	0.206	0.210	0.214	0.218	0.222	0.225	0.228	0.230	0.234	0.236	0.238	0.241	0.244
Fruits & Vegetables Wastewater	0.006	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.007
Red Meat Wastewater	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Poultry Wastewater	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Pulp & Paper Wastewater	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total CH₄	4.229	4.264	4.211	4.198	4.333	4.407	4.529	4.573	4.564	4.573	4.581	4.568	4.747	4.793	5.004	4.929

Emissions (MMTCO ₂ e)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Nitrous Oxide: N₂O																
Stationary Combustion	0.108	0.106	0.095	0.096	0.097	0.097	0.105	0.106	0.097	0.095	0.100	0.097	0.086	0.084	0.086	0.090
Mobile Combustion	0.513	0.525	0.578	0.612	0.611	0.615	0.611	0.643	0.649	0.625	0.597	0.536	0.500	0.462	0.427	0.382
Nitric Acid Production	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Manure Management	0.107	0.108	0.107	0.098	0.085	0.094	0.081	0.084	0.101	0.107	0.119	0.125	0.128	0.146	0.159	0.134
Agricultural Soil Management	2.063	1.961	1.908	2.248	1.841	2.082	2.302	2.134	2.231	1.899	1.965	2.008	2.076	2.038	1.987	2.124
Burning of Agricultural Crop Waste	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
N ₂ O from Settlement Soils	0.057	0.055	0.057	0.056	0.062	0.061	0.066	0.072	0.071	0.053	0.040	0.058	0.082	0.094	0.090	0.083
Waste Incineration	0.023	0.023	0.023	0.023	0.024	0.024	0.026	0.027	0.028	0.028	0.027	0.029	0.030	0.032	0.033	0.034
Municipal Wastewater	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Total N₂O	2.873	2.781	2.771	3.137	2.723	2.978	3.196	3.070	3.181	2.811	2.852	2.857	2.906	2.859	2.786	2.852

High Global Warming Potential Gases: HFC, PFC, and SF6																
Ozone-Depleting Substance Substitutes	0.004	0.007	0.034	0.090	0.179	0.385	0.541	0.696	0.795	0.889	0.986	1.083	1.186	1.289	1.405	1.525
Semiconductor Manufacturing	0.291	0.291	0.291	0.364	0.401	0.496	0.551	0.632	0.767	0.836	0.783	0.598	0.628	0.627	0.679	0.620
Electric Power Transmission and Distribution Systems	0.430	0.411	0.402	0.391	0.363	0.331	0.311	0.282	0.223	0.228	0.223	0.204	0.187	0.179	0.175	0.168
Aluminum Production	0.317	0.270	0.128	0.281	0.250	0.256	0.270	0.272	0.279	0.280	0.195	0.191	0.000	0.000	0.000	0.000
Total HFC, PFC, and SF6	1.042	0.980	0.855	1.126	1.192	1.468	1.673	1.882	2.064	2.234	2.187	2.076	2.002	2.095	2.260	2.313

Gross Emissions (Consumption Basis for Electricity)	55.522	57.603	57.350	62.303	62.906	63.811	66.097	66.482	66.390	69.160	69.272	67.260	66.335	65.351	67.476	69.951
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Inventory Notes:

Data generated from the EPA State Inventory Tool (SIT) except for electricity consumption (ODOE) and waste/materials (ODEQ). Zeroes in some columns may mask emissions that are in the hundreds of metric tons and don't show up above.

An emerging consensus is for greenhouse gas inventories to attribute energy emissions to the jurisdiction in which the energy is consumed. The Western Regional Air Partnership and the Western Climate Initiative use this convention. Using emissions attributable to in-state power generation (rather than power consumption) is done by the federal government for national data and US DOE state-level reporting. For purposes of comparison data using this "production based" method are below:

Gross Production Emissions																
Add In-state Electric Power Generation	1.795	3.610	4.513	4.309	5.453	2.725	3.197	2.700	6.189	6.221	7.339	8.520	6.375	8.048	8.029	8.045
Remove Electricity Consumption Total	(16.698)	(16.960)	(16.671)	(20.731)	(20.915)	(21.267)	(21.945)	(22.139)	(20.967)	(22.112)	(23.407)	(22.830)	(21.434)	(21.818)	(21.538)	(23.850)
Gross Emissions, Production Basis	40.619	44.254	45.191	45.881	47.445	45.269	47.350	47.043	51.613	53.269	53.204	52.951	51.276	51.580	53.968	54.146

Note: US EPA data for in-state power generation emissions (used in the SIT and thus the above production based data) varies from US DOE in-state generation emissions data. Inventories using the US DOE data therefore will not match these data.

For information on net emissions and sequestration in Oregon see: *Baseline Greenhouse Gas Emissions and Removals for Forest and Agricultural Lands in Oregon* at http://oregon.gov/ENERGY/GBLWRM/docs/WESTCARB_Oregon_Sequestration_Report.pdf