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Growing Washington's Economy in a Carbon-Constrained World

A Comprehensive Plan to Address the Challenges and Opportunities of Climate Change

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Growing Washington's Economy in a Carbon-Constrained World

A Comprehensive Plan to Address the Challenges and Opportunities of Climate Change

It is not an exaggeration to say that the future of human prosperity hinges on finding a way of supplying the world's growing energy needs in a way that does not irreparably harm the environment. Until recently, it looked as if we had plenty of time to meet that challenge. No longer. Surging oil and gas prices have drawn attention to the physical and political constraints on raising production—and the vital importance of affordable supplies to the world economy. And the latest scientific evidence suggests that the pace of climate change resulting from man-made emissions of greenhouse gases—the bulk of which come from busing fossil fuels—is faster than predicted. The urgent need for a veritable energy revolution, involving a wholesale global shift to low-carbon technologies, is now widely recognized. (International Energy Agency, *World Energy Outlook 2008*, page 51)

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Table of Contents

List of Figures and Tables

Figures

Tables

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Executive Summary

Global climate change is the economic and environmental issue of our lifetime. The science is clear that we must move forward quickly to reduce greenhouse gas (GHG) emissions in order to mitigate its effects. Without action, climate change will negatively affect nearly every part of Washington's economy through changes in temperature, sea level, and water availability.

This report describes the comprehensive plan for Washington State to reduce our GHG emissions and expand our green economy. It presents a coordinated set of policies—including incentives, regulations, and disincentives—to meet the GHG emissions reductions adopted into law in 2008 as part of E2SHB 2815. The required reductions are designed to:

- Return to 1990 GHG emissions levels by 2020.
- Reduce emissions 25 percent below 1990 levels by 2035.
- Reduce emissions 50 percent below 1990 levels by 2050.

These actions will also help the state reach its goal of sustaining 25,000 green economy jobs by 2020, up from 8,400 in 2004.[1] Confronting climate change will unleash technological innovation and further cement Washington's position as a green economy hub now and into the future. It will allow us to be a winner in the worldwide competition in energy efficiency and clean energy, creating quality family-wage jobs here in Washington State, jobs that cannot be outsourced. But we must act quickly. If we fail to act now on climate change, we will miss many of these opportunities.

The central policy of this plan is participation in the regional cap-and-trade program designed by the Western Climate Initiative (WCI). By capping GHG emissions, we will achieve the environmental certainty scientists say is critical if we are to slow the rate of climate change. The cap-and-trade program will provide emitting industries with flexibility on how they make the needed reductions. It will make clean energy sources more competitive with fossil fuel. It will also provide the regulatory certainty needed to support long-term investments in the green economy, investments that will move us toward the low-carbon future, creating jobs along the way.

Launched in 2007, the WCI is a collaboration among seven U.S. states and four Canadian provinces to design a regional cap-and-trade program. The WCI has proposed the most comprehensive cap-and-trade program in the world to date. We estimate it will cover over 90 percent of Washington's emissions by 2015 in the following sectors:[2]

- Electricity, including imported electricity.
- Industrial and commercial combustion of fossil fuels at large sources, such as factories and refineries.
- Industrial process emissions, such as those produced at cement kilns.

[1] E2SHB 2815 can be found at http://apps.leg.wa.gov/billinfo/summary.aspx?bill=2815&year=2008.

[2] The first three sectors will be covered beginning in 2012.

- Fuels used for transportation.
- Residential and commercial fuels, such as oil and natural gas used for home heating.
- Fuels used at industrial facilities that are below the emissions threshold for direct coverage.

WCI's preliminary economic modeling of its proposed program found it will result in modest overall cost savings to the regional economy. Complementary policies—regulatory, voluntary, and incentive-based policies—improve the efficiency of cap-and-trade and make the program more cost-effective.

Within this report, we present a suite of complementary policies the state's Climate Action Team (CAT) has identified as strategies that will further reduce GHG emissions.[3] Many of the CAT recommendations will improve energy efficiency, lowering the overall cost of reducing GHG emissions. The CAT focused on reducing emissions through changes in the transportation sector, buildings and land use, and waste reduction. If fully implemented, these policies will:

- Reduce electricity and energy demand through energy efficiency programs, green building requirements, and increases in combined heat and power plants.
- Reduce transportation emissions by increasing public transit and rideshare options and promoting compact development that minimizes VMT.
- Reduce the amount of solid waste generated and disposed of through increased recycling, reuse programs, and improved product design.
- Protect Washington's working forests and agricultural lands.

Highly energy-efficient building codes show how complementary policies work with cap-and-trade to reduce GHG emissions and create jobs. The cap-and-trade program will cover electric utilities, requiring them to reduce their GHG emissions. One of the best ways to do that is to reduce demand for the electricity they provide. By requiring improved energy efficiency for new and renovated buildings, electricity demand will decrease. In turn, utilities will reduce their GHG emissions. The owners and operators of those buildings will enjoy lower electric bills, while skilled Washington labor will be used to build or renovate those buildings.

The state has already adopted a number of complementary policies that will reduce GHG emissions. Examples of these policies include:

- Standards for GHG emissions from vehicles, known as the California clean car standards.
- The renewable portfolio standard adopted in Initiative I-937.
- The requirement that utilities pursue all available conservation that is cost-effective, reliable, and feasible.

Taken together and once fully implemented, the policies already in place will achieve approximately 45 percent of the emissions reductions required for 2020. Our analysis indicates that with the regional cap-and-trade program and the current policies in place, our 2020 emissions reductions are within reach.

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[3] For more information on the Climate Action Team, see www.ecy.wa.gov/climatechange/2008CAT_overview.htm.

Much work remains on the details of the WCI cap-and-trade program. What has been recommended to date is the policy framework that outlines what must be the same across the participating jurisdictions to have a functional regional market. The framework also defines where each state or province may exercise its own discretion without distorting the carbon market. The areas of discretionary authority will be determined through legislative and administrative processes here in Washington.

This plan should not be thought of as static. To the contrary, it is vital that we be nimble, adaptive, and that we learn from the experiences of other jurisdictions. Further actions will be needed to meet our 2035 and 2050 emissions reductions. Many of the recommendations related to land use and transportation are longer-term strategies. Innovation will make things possible tomorrow that may seem out of reach today.

Transforming our economy to one that uses clean renewable power in the most efficient way possible will require all of us working together at every level—individually, as a society, and as a nation. Only with an engaged and powerful commitment will meaningful change occur.

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1. Introduction

The potential impacts of global warming dwarf those of other environmental threats.

So began the chapter on global warming in the Department of Ecology's report, *Washington Environment 2010*, issued in 1990 under then-director and now Governor Chris Gregoire. Even then, it was clear the societal threat that climate change presents is of a nature and magnitude unlike any other we have faced.

Climate change poses a significant threat to our economy but also offers enormous opportunities. Washington is well-positioned to lead a transformation to the new green economy, creating jobs and economic growth along the way. We were the first state to make workforce training a key component of our climate policy. Washington ranks fourth in the nation in private investments in clean energy. We rank fifth in wind power production. *Forbes*, the national business and financial news publisher, ranks Washington as one of the top three states in which to do business. Responding proactively to the threat of climate change has opened the door for new economic opportunities and will continue to do so.

Global climate change is the economic and environmental issue of our lifetime. It stands to negatively affect nearly every part of Washington's economy through changes in temperature, sea level, and water availability.[4] Some of those changes are already being felt. In just over three years, between January 2005 and July 2008, Governor Gregoire declared 16 weather-related emergencies—more than were declared (15) in the entire previous eight years, from 1997 to 2004. The resulting damages to property and resources cost all of us billions of dollars.

The science is clear that we must move forward quickly to reduce greenhouse gas (GHG) emissions. In 2007, the Nobel Prize-winning Intergovernmental Panel on Climate Change concluded:

- Climate change is largely the result of emissions of carbon dioxide, methane, nitrous oxide, and other greenhouse gases from human activities.
- There is a less than 10 percent chance that natural variation is causing the current rise in the earth's temperature.

John Holdren, professor of environmental policy at Harvard, director of the Woods Hole Research Center, former President of the American Association for the Advancement of Science, and President-elect Obama's nominee for science adviser, may have said it best:

> *The most important conclusions about global climate disruption—that it's real, that it's accelerating, that it's already doing significant harm, that human activities are responsible for most of it… have not been concocted by… enemies of capitalism. They are based on an immense edifice of painstaking studies*

[4] Washington Economic Steering Committee and the Climate Leadership Initiative, Institute for a Sustainable Environment, University of Oregon, *Impacts of Climate Change on Washington's Economy: A Preliminary Assessment of Risks and Opportunities*, report for the Department of Ecology and Department of Community, Trade, and Economic Development, November 2006. www.ecy.wa.gov/pubs/0701010.pdf

published in the world's leading peer-reviewed scientific journals. They have been vetted and documented in excruciating detail by the largest, longest, costliest, most international, most interdisciplinary, and most thorough formal review of a scientific topic ever conducted. [5]

Building the Economy, Creating Jobs

The world is currently facing one of the worst economic crises in history. Washington has not been immune from these problems, experiencing job losses and declines in public and private revenue. Investing in the green economy will create jobs now and is a key to our state's economic recovery. Upgrading buildings; increasing recycling; improving our infrastructure; developing, designing, and deploying green technologies; and creating a trained workforce will create family-wage jobs and reduce our GHG emissions.

To take advantage of the green economy, the state must create markets that drive investment in low-carbon technologies, reducing GHG emissions along the way. By aligning our research universities with the industry capabilities in software, biotechnology, nanotechnology, and sustainable design, we will expand the clean technology industry and create thousands of green jobs in the state. A study by the Center for American Progress found that a large investment in energy efficiency, mass transit, and renewable energy as part of an economic stimulus package has the potential to produce 40,000 jobs in Washington over the next two years.[6]

Creating these jobs will require an upfront investment from businesses and government. Many of these investments will pay themselves back, creating revenue in the long run. A report by McKinsey and Company found that a wide variety of investments such as energy efficiency measures, water heaters, and industrial process improvements fall into this category.[7] McKinsey reports that most companies can reduce their emissions 20 to 50 percent by implementing those measures that will pay for themselves, saving money and becoming more cost-effective over the long term.[8] Investing in these opportunities creates positive ripple effects throughout the economy, as money that would have been spent on energy can be reinvested in jobs and goods.

Businesses are not the only ones who will benefit from action to reduce GHG emissions. An economic analysis conducted for the Western Climate Initiative (WCI) found that implementing the WCI cap-and-trade program, along with complementary policies, will produce modest cost savings throughout the economy. Money invested to reduce emissions will be returned through savings realized by consumers using less energy and fuel each year as result of increased efficiency and options in the marketplace. The complementary policies include the vehicle tailpipe standards and efforts to reduce demand for energy and vehicle miles traveled.

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[5] Thomas L. Friedman, *Hot, Flat, and Crowded: Why We Need a Green Revolution—And How It Can Renew America* (2008), pages 124-125.

[6] Center for American Progress, *Green Recovery: A New Program to Create Jobs and Start Building a Low-Carbon Economy*, 2008. www.americanprogress.org/issues/2008/09/green_recovery.html

[7] McKinsey and Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?* 2007. www.mckinsey.com/clientservice/ccsi/pdf/US_ghg_final_report.pdf

To attract the needed investment in energy efficiency and clean energy that will create jobs and reduce household costs, we must act quickly. Worldwide competition is underway to transform to the new green economy, and Washington is currently on the leading edge. But, if we fail to act now to create needed markets, we will lose our leadership position and many of the opportunities it presents.

A Framework for Reducing Emissions

In 2008, the Washington State Legislature passed E2SHB 2815.[9] This bill created a framework for reducing GHG emissions in Washington's economy. It emphasized the importance of being a leader on climate change mitigation. By acting quickly, the legislature sought to ensure that "Washington businesses and citizens will have adequate time and opportunities to be well positioned to take advantage of the low-carbon economy."

E2SHB 2815 put into law the state's GHG emissions reductions first adopted by Governor Gregoire in Executive Order 07-02.[10] Washington must reduce emissions to:

- 1990 levels by 2020.
- 25 percent below 1990 levels by 2035.
- 50 percent below 1990 levels by 2050.

E2SHB 2815 requires Ecology to develop a comprehensive plan to achieve the required reductions and to submit that plan to the legislature in December 2008. This report provides an initial plan and focuses on the emissions reductions required by 2020.

To reach our emissions reductions, we will need to implement a central policy to address emissions throughout the economy. Ecology and CTED recommend the adoption of the WCI regional cap-and-trade program. It also includes recommendations of the Climate Action Team (CAT). The CAT recently released its final report outlining 24 "most promising" strategies for consideration by the governor and legislature. If fully implemented, the CAT recommendations will strengthen Washington's economy and reduce emissions in both the short and long term. They will also allow Washington to meet the vehicle miles traveled reduction benchmarks established as part of E2SHB 2815. An overview of the CAT's recommendations can be found in Chapter 6; the full report is available at www.ecy.wa.gov/climatechange/2008CATdocs/ltw_app_v2.pdf.

In addition, several of the CAT's Implementation Working Groups, as well as two of CTED's Policy Advisory Committees, addressed the impacts of land use and development patterns on climate change. These groups propose the overarching goal of directing growth to compact and transit-oriented communities and away from rural and resource lands. This long-range planning and development will encourage the transformations necessary for Washington to meet its 2050 emissions reductions and also help maintain the state's rural, agriculture, and forestry lands. Recommendations on land use can be found in Chapter 7.

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[9] E2SHB 2815 can be found at http://apps.leg.wa.gov/billinfo/summary.aspx?bill=2815&year=2008.

[10] RCW 70.235.020.

E2SHB 2815 also directed the Department of Ecology (Ecology) and the Department of Community, Trade, and Economic Development (CTED) to continue their participation in the WCI, a collaboration of seven states and four Canadian provinces to design a regional cap-and-trade program. By establishing firm limits on emissions, we provide the certainty businesses need to invest in reducing emissions. Cap-and-trade will make the other strategies outlined in this report more effective at reducing GHG emissions and creating the jobs that accompany those actions. The final design of the WCI cap-and-trade program can be found at www.ecy.wa.gov/climatechange/WCIdocs/092308WCI_DesignRecommendations_full.pdf.

Ecology and CTED were required by E2SHB 2815 to report the following information related to the cap-and-trade program, which can be found in Chapters 8 and 9:

- The specific recommendations for enacting the WCI cap-and-trade program, including the proposed law, funding, and schedule needed to run the program by January 1, 2012.
- Any changes to the GHG reporting law needed to enact the cap-and-trade program.
- Actions the state should take to prevent manipulation of the new market for GHG emissions.
- Recommendations on how local governments could take part in the cap-and-trade program.
- Recommendations on how forestry and agricultural lands and practices might voluntarily participate as an offset or other credit program in the cap-and-trade program. Such efforts may include afforestation; reforestation; commercial and other working forests, including accounting for site-class specific forest management practices; forest products, including accounting for substitution of wood for fossil fuel-intensive resources; and forest land set aside or managed for conservation on or after the effective date of the law.[11]
- Recommendations for how electricity or alternative fuel from landfill gas and anaerobic digesters may receive an offset or credit in the cap-and-trade program.

The actions the state already has underway (outlined in Chapter 5), together with the WCI cap-and-trade program and the policies recommended by the CAT, form the foundation for the state's comprehensive plan to meet the statutory emissions reductions.

We believe moving forward now is critical for Washington State. It will strengthen our economy and stabilize our climate, leading toward a safer, more prosperous future. The economic crisis and effects of climate change already visible in Washington require us to act and make investments in our future. Failure to act now will make future Washingtonians vulnerable to the fluctuations in energy prices, political instability, and the effects of climate change resulting from reliance on carbon-based fuels. We must challenge ourselves to find the political will to look ahead, work together, and act on their behalf.

[11] The law took effect on June 12, 2008.

2. Washington's Greenhouse Gas Emissions

Addressing climate change requires that we reduce our greenhouse gas (GHG) emissions. Therefore, our discussion about climate change policies begins with a review of the sources of the state's emissions. Only by understanding the sources of greenhouse gases can we develop a credible program to reduce them.

The Department of Community, Trade, and Economic Development (CTED) and the Department of Ecology (Ecology) published the current Washington GHG inventory in December 2007.[12] This inventory updates past inventories CTED published in 1999, 2004, and 2006. As directed by the legislature, Ecology and CTED will update the Washington inventory every two years, beginning in 2010.[13]

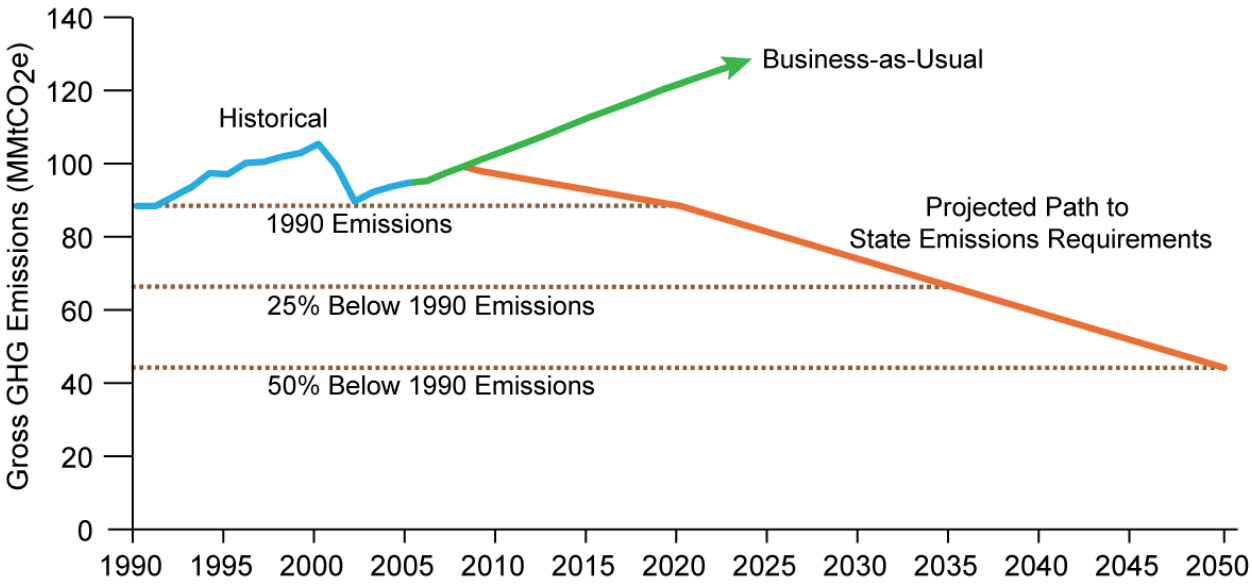

Figure 2-1. Washington's Historical GHGs and Statutory Emissions Reductions

In 1990, Washington emitted 88.4 million metric tons carbon dioxide equivalent ($MMtCO_2e$).[14] Emissions grew steadily between 1990 and 2000 (Figure 2-1). Our emissions then dropped significantly over the next two years, before resuming a steady increase between 2003 and 2005. The permanent shutdown of much of Washington's aluminum manufacturing industry created

[12] Department of Ecology; Department of Community, Trade, and Economic Development; and Center for Climate Strategies, *Washington State Greenhouse Gas Inventory and Reference Case Projections, 1990-2020*, December 2007. www.ecy.wa.gov/climatechange/ghg_inventory.htm

[13] RCW 70.235.020(2).

[14] Each of the six GHGs included in the inventory has a different effect on climate change based on its atmospheric lifetime and heat trapping properties. To look at each GHG on the same terms, they are all presented in a common metric, carbon dioxide equivalent (CO_2e). To calculate CO_2e, the amount of each gas emitted is multiplied by its contribution to global warming relative to CO_2. The result is called the "global warming potential" (GWP) of the gas. Methane, for example, is 21 times more powerful than CO_2 as a GHG.

the drop in 2001 and 2002. Producing aluminum is a large source of GHGs because of the process emissions and large energy requirements associated with its manufacture.

In 2005, Washington's GHG emissions were about 94.8 $MMtCO_2e$, a 7 percent increase over 1990, as shown in Table 2-1.

In both 1990 and 2005, Washington emissions were dominated by burning fossil fuels such as gasoline and natural gas, as shown in Figure 2-2. The main source of emissions in Washington is the transportation sector, which produces almost half of the state's GHG emissions. The next largest sector was emissions from electricity consumption, followed by combustion emissions in the industrial and residential/commercial sectors.

Our reliance on hydropower gives Washington a unique emissions profile compared with much of the United States. A much larger proportion of our emissions comes from transportation (46 percent, compared with 28 percent nationally), while electricity emissions are a much smaller component of our inventory (20 percent, compared with 34 percent nationally). Washington's per-capita emissions rate of 15 metric tons per person is also well below the national average of 24 metric tons, as a result of our clean electricity sector, early investment in energy efficiency, and moderate climate.

Our inventory calculates emissions from all electricity consumed in Washington. Overall, Washington produces more electricity than it consumes, making it a net exporter. Most electricity produced in Washington comes from hydropower, with peak production in the spring and early summer when snow melts. However, our peak demand comes in the winter when temperatures are coldest. To meet our winter needs, we must import electricity from outside the state. Most, but not all, of the state's imported power is generated from fossil fuels, making GHG emissions from power consumed in Washington larger than emissions from power produced in here.

About 15 percent of our emissions are not the result of fossil fuel combustion. Rather, they are released directly into the atmosphere from:

- **Waste management**—Methane emissions from landfills and wastewater treatment plants.
- **Agriculture**—Methane and nitrous oxide emissions from soil, livestock, and manure.
- **Industrial processes and fossil fuel fugitive emissions**—Industrial process emissions are a byproduct of chemical reactions in a manufacturing process. Cement and aluminum manufacturing are major producers of process emissions. Fugitive emissions are unintended emissions that usually come from leaks or as a byproduct at manufacturing facilities. Fugitive emissions from the fossil fuel industry are primarily methane and carbon dioxide from mining, production, transmission, and distribution of natural gas, coal, and oil. Leaks of refrigerants from consumer products are also included in this sector.

Table 2-1. Estimated Washington GHG Emissions by Sector ($MMtCO_2e$)

Sector	1990	2005	2020
Transportation	37.5	44.5	56.9
Electricity	16.9	18.9	24.9
Industrial	11.8	11.0	14.6
Residential/Commercial	6.8	8.4	9.8
Fossil Fuel Industry Fugitive	0.5	0.9	1.1
Industrial Processes	7.0	3.3	7.3
Waste Management	1.5	2.4	3.6
Agriculture	6.4	5.4	4.8
Total Gross Emissions	**88.4**	**94.8**	**121.9**

Source: Department of Community, Trade, and Economic Development; Department of Ecology; and Center for Climate Strategies, *Washington State Greenhouse Gas Inventory and Reference Case Projections*, 1990-2020, December 2007. www.ecy.wa.gov/climatechange/ghg_inventory.htm

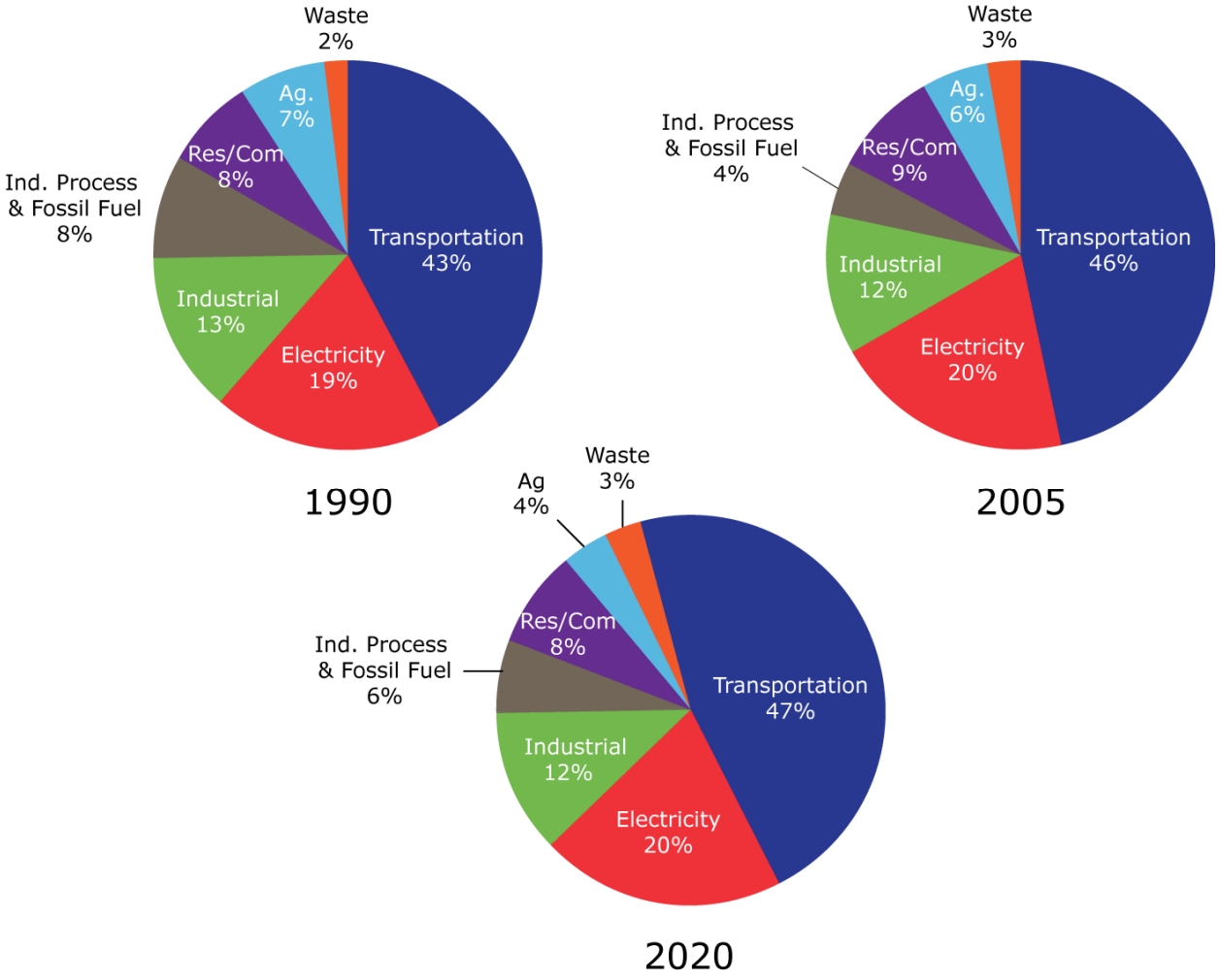

Figure 2-2. Gross GHG Emissions by Sector for Washington

Totals in this report may not equal exact sum of subtotals due to rounding.

Business-as-Usual Projection for 2020

The business-as-usual (BAU) case is a projection of Washington's emissions between 2006 and 2020, if no additional actions to reduce emissions are taken. The projection is based on sector-specific energy use, population, and employment growth rates from the federal government and state. The current BAU case does not include GHG reduction actions implemented after 2005, including new vehicle emissions standards and the renewable portfolio standard for energy generation. Chapter 5 addresses these programs.

Under BAU, the gross emissions in Washington are projected to increase nearly 29 percent to 121.9 $MMtCO_2e$ between 2005 and 2020. Burning coal, natural gas, oil, and petroleum is projected to keep producing almost 90 percent of Washington's emissions, with a similar share of statewide emissions projected from the three largest sectors in 2020 as in 2005 (Figure 2-2).

Industrial processes are projected to contribute a larger portion of Washington's emissions in 2020. Expanded use of powerful GHGs such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are responsible for most of this increase. HFCs and PFCs are used primarily as substitutes for ozone-depleting substances. These extremely potent greenhouse gases replaced chlorofluorocarbons (CFCs) as a refrigerant and aerosol propellant after a global treaty to address ozone depletion took effect in 1989.

Several developments in the past year may have changed the outlook of future energy demand, including once higher and now falling energy prices, coupled with the economic downturn. Given uncertainty about future economic growth and energy prices, we continue to use the assumptions detailed in the 2007 *Washington Greenhouse Gas Inventory & Reference Case Projections*. Using the original estimate allows us to be consistent with previous reports.[15] The state projections will be updated, along with the inventory, in 2010.

[15] For example, *Leading the Way on Climate Change: The Challenge of Our Time*, 2007. www.ecy.wa.gov/climatechange/CATdocs/020708_InterimCATreport_final.pdf

3. A Plan to Reduce Greenhouse Gas Emissions

To achieve Washington's statutory greenhouse gas (GHG) emissions reductions, we must change from our current course of steadily increasing emissions. This shift will require a wide range of strategies to reduce emissions in all sectors of Washington's economy.

To return to 1990 emissions by 2020, we will need to reduce emissions 33.5 $MMtCO_2e$ from our current business-as-usual (BAU) projection. If fully implemented, GHG emissions reductions policies adopted since 2005 will result in about 45 percent of our necessary 2020 emissions reductions, as shown in Figure 3-1.[16] The policies in place will:

- Provide consumers with fuel-efficient vehicles designed to run on clean transportation fuels grown and produced in Washington.
- Guarantee that Washington's large utilities use new clean renewable power for at least 15 percent of their electricity.
- Decrease electricity and natural gas demand through energy efficiency measures, building energy codes, and strict appliance standards.

To calculate the expected reductions from the policies in place, we assume that they will be fully implemented according to the timeline set out in statute or rule. Currently, only the California clean car standard is behind schedule for implementation. We now assume this policy will take effect in 2010; if it does not, we will need to update the emissions savings. Without the California clean car standards, we estimate the policies in place will generate 41 percent of our 2020 emissions reductions.

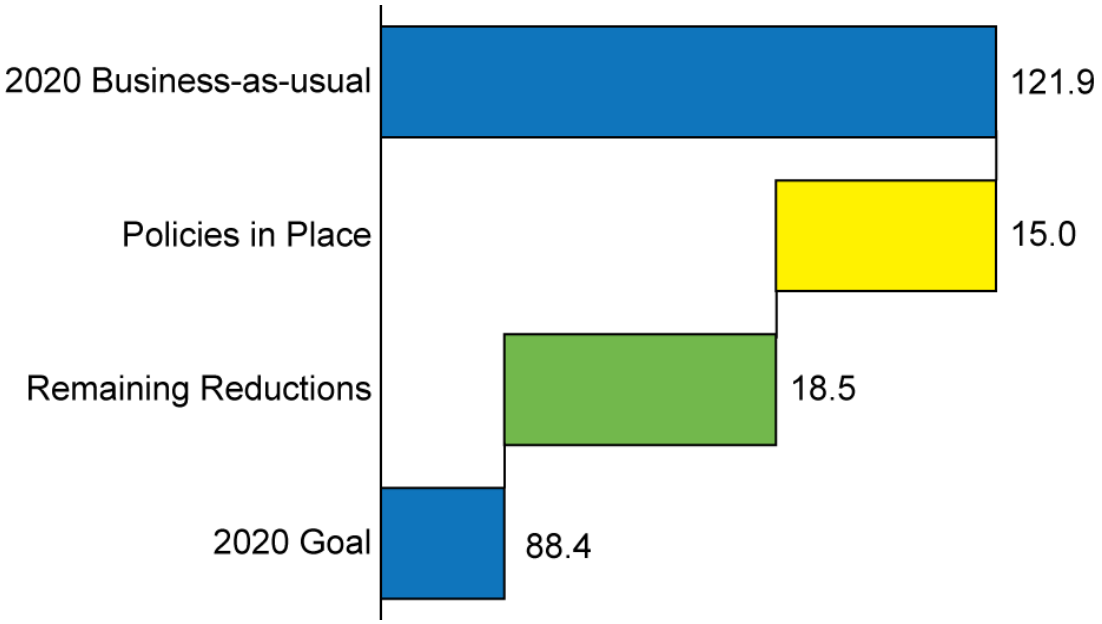

Figure 3-1. Emissions Reductions Necessary to Reach 2020 Statutory Requirements

[16] For additional information, see Chapter 5, *Actions Underway*.

Remaining Emissions Reductions

Even with our policies in place, we need to reduce emissions by an additional 18.5 $MMtCO_2e$ to meet our 2020 emissions reductions. To generate these reductions, we need a centerpiece policy to address emissions throughout the economy. We recommend implementing the WCI cap-and-trade program. A cap-and-trade program sets the total quantity of emissions permitted and ensures reductions will occur. It allows the market to determine the most cost-effective strategies to reduce emissions. By letting individual sources choose when and how to reduce their emissions, cap-and-trade fosters the development of new technology and solutions, creating jobs and expanding the green economy at the least cost. Implementing a cap-and-trade program will also provide businesses with the regulatory certainty to invest in reducing GHG emissions.

When the WCI cap-and-trade program begins in 2012, it will cover emissions from electricity, industrial manufacturing, and industrial processes. In 2015, the WCI cap-and-trade program will expand to cover emissions from the combustion of fuel used for transportation as well as residential, commercial, and industrial sources. We estimate over 90 percent of Washington's emissions will be covered under the cap by 2015.

In addition to setting a limit on emissions, the WCI cap-and-trade program was designed to work with other regulatory, voluntary, and incentive-based policies, such as those recommended by the Climate Action Team (CAT). The recommendations of the CAT will create jobs, promote investment, and make cap-and-trade work more efficiently.

The policy recommendations identified by the CAT would achieve GHG emissions reductions in many sectors of our economy. Implementing all of these strategies will generate jobs and could produce about 39 percent of the reductions necessary to meet our 2020 emissions reductions (Table 3-1). To reach this level of emissions reductions, these policies must be fully implemented in a timely manner.

If implemented, these strategies will:

- Increase public transportation and ridesharing options, providing individuals with a variety of alternatives to single occupancy vehicles.
- Direct growth and development to compact and transit-oriented areas, away from rural and resource lands.
- Create jobs by expanding energy efficiency programs, strengthening building and energy codes, and increasing the use of combined heat and power.

To realize the full potential from the CAT recommendations outlined in Table 3-1, a number of changes to existing policies and regulations will be needed to address the way our communities are built and increase transportation choices. These enabling actions do not produce any direct GHG reductions themselves; instead, they remove barriers and establish a framework in which other actions can reduce emissions.

To reach our statutory emissions reductions, we must also enact policies to reduce emissions and remove GHGs from the atmosphere from sources outside of the cap-and-trade program. Sources that will be outside the cap-and-trade program include those sectors not covered by the cap and facilities within covered sectors with emissions below the threshold for inclusion in the cap. Given the proposed scope of the WCI cap-and-trade program, these reductions will need to come

from the forestry and agriculture sectors as well as through waste reduction and recycling programs. Our recommendations concentrate on:

- Forest practices that increase the amount of carbon stored in forests and in long-lived forest products.
- Taking organic waste out of landfills.
- Reducing methane emissions from cattle manure.
- Agricultural soil carbon management.

Implementation of cap-and-trade will create incentives for GHG reductions outside of capped sectors through the regulatory offset market. Two working groups spent considerable time assessing the opportunities for forestry and agriculture lands and practices to participate in the cap-and-trade program as offsets. These working groups found many opportunities.[17]

The Agriculture Carbon Market Working Group and the Beyond Waste Implementation Working Group associated with the CAT have both proposed policies that can significantly reduce emissions from waste management through increases in recycling, reuse, and anaerobic digesters (Table 3-1).

The Forest Carbon Market Working Group on Climate Mitigation has proposed a number of recommendations on how forest lands might participate in a cap-and-trade program. Their recommendations address avoided and mitigation conversion of forest land to non-forest uses, urban reforestation, and forest management to increase carbon sequestration and storage.

We have not determined which of the CAT recommendations will be proposed for implementation in 2009. Most of these strategies have not yet been fully vetted, and thus their implementation timeline remains unclear. The strategies considered by the CAT that will produce direct emissions reductions in Washington have been included in Table 3-1. These options provide a menu for consideration by the legislature as we continue to reduce our state's GHG emissions.

As the legislature determines which of these policies will move forward, we will update our plan accordingly. As the cap-and-trade program is developed, we will be leading the efforts to develop or modify protocols for projects that will focus on forestry and agricultural lands and practices as well as waste management.

If fully implemented, we believe the strategies outlined in this report will enable Washington to meet our 2020 GHG emissions reductions. The cap-and-trade program will play an increasingly important role to meet our long-term emissions reductions for 2035 and 2050. As required by E2SHB 2815, Ecology will monitor the implementation and performance of these measures to ensure this plan produces the expected reductions. Ecology's facility-level emissions data will improve in 2010 with the introduction of mandatory reporting for major GHG sources. If it becomes apparent that additional strategies are necessary to reach the statutory emissions reductions, we will recommend additional strategies including any from the CAT processes that have not been adopted.

[17] For details, see Forestry Carbon Market Working Group and Agriculture Carbon Market Working Group reports in Appendix 6 and Appendix 7.

This plan is not static. We will continue to update it regularly to ensure Washington meets both our short- and long-term statutory emissions reductions with the greatest possible benefit to our economy and citizens.

Table 3-1. Emissions Reductions in 2020 from CAT Proposals

Proposed Strategies	**2020 Reductions ($MMtCO_2e$)**
Transportation	
Increased Transit and Rideshare	2.6
Compact and Transit-Oriented Development	1.7
Transportation Pricing	1.0
Energy Efficiency Measures	
2009 State Energy Code Improvements and 2030 Building Goals	4.7
Improved Energy Efficiency in New and Renovated Public Buildings	0.5
Expanded Implementation of Distributed Energy and Combined Heat and Power	0.3
Waste Management	
Collection and Anaerobic Digestion of Organic Municipal Solid Waste	1.5
Retailer Collaboration to Reduce Waste and Packaging	0.2
Agriculture	
Anaerobic Digestion of Manure	0.5
Forestry	
Avoided Conversion	not quantified
Urban Forestry	not quantified
Forest Management	not quantified
Proposed Strategies TOTAL	**13.0**

4. Washington's Green Economy

The transition to a new, green, and sustainable economic model will have a deep impact on business production, cost competitiveness, and investment decisions. Although it may seem counterintuitive, a strong climate change policy actually *creates* a strong business climate. Decisive leadership must continue for Washington to remain competitive in the green economy.

Our state is a strong competitor in the race to become the premier location for development and production of green economy products, but we are far from alone in this endeavor. Globally, a rush is underway to take advantage of new sustainable industries and promote "green jobs."

Our challenge is to help the State of Washington pull ahead in a crowded field.

Economic Stimulus Plans

All of the states, Washington among them, stand to receive an influx of federal stimulus monies in the new administration. Energy efficiency, renewable energy, and green jobs are likely to be a significant focus of those funds. Readiness to put these funds to work immediately, creating jobs and reducing GHG emissions, is essential to take advantage of this opportunity.

Potential for Job Creation

Strong climate change policies can improve the overall quality of life of our region and provide economic opportunities to create jobs now and jobs for the future.

Jobs Today

Washington already enjoys a high concentration of "clean tech" firms, partly as a result of our strong leadership on climate change, renewable energy, and energy efficiency.

As of 2004, Washington jobs were calculated at:

- **Energy efficiency**—4,200 jobs (a 47 percent increase in only 7 years).[18]
- **Solar**—380 jobs.
- **Wind**—110 jobs.

Even more jobs have been created since 2004. Decisive climate change policies will stimulate growth in these and additional sectors of the green economy, both now and in the future.

Tremendous opportunities exist for green jobs that do not depend on new technologies or industries. For example, energy efficiency and waste reduction both rely on many existing technologies. With implementation of this comprehensive plan, we can draw on our knowledgeable workforce and immediately create jobs in these industries and others.

[18] Department of Community, Trade, and Economic Development, *A 2005 Look at Renewable Energy, Energy Efficiency, and Smart Energy Industries in Washington State*, 2005.

Residential Weatherization

Though new green buildings command much attention, weatherization of existing residential buildings can also produce sizeable gains in building efficiency.[19] This subset of the green building industry is essential to jump-starting Washington's green economy. For every $1 million invested in weatherization programs, 79 jobs are created or sustained.[20] Additionally, energy efficiency targeted to low-income households may be more economically productive than other public investments, such as charitable fuel funds or discounts that help defray the cost of heating inefficient homes. Such energy efficiency investments return at least $7 to society for every $1 invested.[21]

Recycling

Recycling also provides a unique opportunity for immediate reductions in GHGs and job creation. Recycling creates significantly more local jobs than disposal of waste. According to the Institute for Local Self-Reliance, recycling materials creates ten times more jobs per ton than disposing of waste in a landfill. Manufacturing new products from recycled materials creates even more jobs.[22]

Jobs Tomorrow

The global market for green economy technologies is estimated to be about $1.3 trillion, according to German-based Roland Berger Strategy Consultants.[23] It is projected to rise to $2.7 trillion in 2020. The global green economy includes:

- **Energy efficiency technologies** (e.g., appliances, industrial processes, electrical motors, insulation)—$617 billion at present; $1.23 billion in 2020.
- **Waste management and recycling**—$41 billion at present; $63 billion in 2020.
- **Water supply, sanitation, and water efficiency**—$253 billion at present; $658 billion in 2020.

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[19] In the 1970s, weatherization meant only ceiling insulation, lath and plastic storm windows, caulking and weather-stripping. This was called "winterization." Now, weatherization is more technically sophisticated. New diagnostic tools and techniques such as dense pack insulation, computer energy audit tools, blower door technology, pressure pans, flow hoods, and carbon monoxide detectors were incorporated in the program to help make cost-effective weatherization decisions, identify improvement needs and choices, and prevent health and safety problems. See also McKinsey and Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?* 2007. www.mckinsey.com/clientservice/ccsi/pdf/US_ghg_final_report.pdf

[20] Information provided by Steve Payne, CTED Housing Improvements and Preservation. CTED operates the state's only publicly funded weatherization program for low-income populations and has documented this multiplier effect based on many years of experience.

[21] Jerrold Oppenheim and Theo MacGregor, *The Economics of Poverty: How Investments to Eliminate Poverty Benefit All Americans*, report developed for Entergy, 2006.

[22] Institute for Local Self-Reliance, Neil Seldman, Ph.D., *Waste to Wealth: Recycling Means Business*, 2006. www.ilsr.org/recycling/recyclingmeansbusiness.html

[23] Roland Berger Strategy Consultants, *Green Tech Made in Germany*, 2007.

- **Sustainable transport** (e.g., efficient engines, hybrids, fuel cells, alternative fuels)—$247 billion at present; $493 billion in 2020.[24]

Not only are green industries growing abroad, they are growing domestically. Clean Edge Research, which has been tracking the growth of clean energy markets since 2000, reports a 40 percent increase in our region's revenue growth for solar panels, wind, biofuels, and fuel cells between 2006 and 2007.[25]

The future looks even brighter. In all, the study found these industries have the potential to create more than 41,000 new jobs in the Pacific Northwest by 2025, as shown in Table 4-1.[26]

Table 4-1. Job Growth Projections for Oregon and Washington

Year	Solar PV Manufacturing	Wind Power Development	Green Building Design Services	Bioenergy	Smart Grid	TOTALS
2007	800	2,217	3,826	3,207	1,280	11,330
2010	1,863	3,043	4,284	3,224	1,491	13,905
2015	3,677	2,650	6,899	4,100	1,715	19,041
2020	9,260	3,408	10,137	5,688	2,209	30,703
2025	14,182	4,507	12,937	6,946	2,669	41,241

How Climate Action Helps the Green Economy

Taking immediate action to address climate change will not only create new jobs, it will help Washington's business community. Implementing this comprehensive plan to reduce GHG emissions will provide businesses with regulatory certainty, which is crucial to help firms with long-term planning.

This certainty allows firms to position themselves in the market and to direct investment strategically. Firms in Washington State need a clear sense of the competitive stakes and the true costs of continuing with business-as-usual. Likewise, they need an understanding of what opportunities are available for new products and services. The certainty of cap-and-trade also makes many investments in reducing emissions more cost-effective, encouraging their implementation.

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[24] United Nations Environment Programme, *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, accessed October 2008. www.unep.org

[25] Clean Edge, *Clean Energy Trends 2007*, 2007.

[26] Clean Edge, *Carbon-Free Prosperity*, report for Climate Solutions, 2008.

A strong policy framework to address climate change will also create a market for products that help reduce emissions and increase efficiency. Strong leadership from the state government will create a solid market for many products and encourage investments in those technologies. Anything less is risky and does not provide businesses with confidence that their investments will pay off.

In anticipation of the effect of a carbon reduction policy such as cap-and-trade, firms start to reduce their emissions voluntarily, for the following reasons:

- Head start over competitors in learning what works.
- Prepare to respond rapidly once regulations do take effect.
- Better manage the costs of emissions reductions over time.

By speeding the transition to the new green economy, we will help our businesses in the following areas:

- **Risk Management—**It is widely accepted that not addressing climate change will have costs. These losses are likely to be very serious. Large firms seeking to manage their risk will reduce emissions.
- **Efficiency—**Businesses gain advantage by holding down costs and reducing wasteful practices. Reducing emissions and becoming more efficient will make a business more competitive and profitable.
- **New Market—**Operating under a carbon reduction framework, firms not only manage risk, they also have opportunities to profit from investments in reducing emissions.

Taking Action on the Green Economy

The 2008 Legislature recognized both the importance of and potential opportunities for expanding Washington's green economy. Section 9 of E2SHB 2815 directs named state agencies to spur development of a green economy and increase the number of green economy jobs.

Five specific issues are to be addressed:

- **Definitions—**How will we define a green economy? What is a green-collar job?
- **Labor market survey—**What kinds of jobs are out there already? Who is investing in new green jobs?
- **Workforce development planning—**What are demands for green economy skills? Where are the current and expected skill gaps? How can the workforce development system best close these gaps?
- **Strategic plan for growing a green economy—**Identify the best methods and practices to stimulate green industries and new technologies.
- **Minority and women-owned enterprises—**How can we best help all Washingtonians make a good life for themselves, their communities, and our state?

The definitions are completed and are undergoing a final review. They will be attached to the Green Economy Strategic Framework, which the Department of Community, Trade, and Economic Development (CTED) is expected to release in December 2008.

The labor market survey is underway, and the analysis is slated for completion in January 2009.

The workforce development planning has yet to be funded.[27] The workforce development system is incorporating green skill sets into some existing programs. The system also is developing some new green programs. These are scattered efforts, however, and the system is not yet positioned to bring green training to a statewide scale. Such an expansion will require funding the Green Jobs Training Account or a similar mechanism.

The evaluation of minority and women-owned enterprises, conducted by the University of Washington, is due in December 2008 and will be attached the Green Economy Strategic Framework.

Green Economy Definitions

Green economy, clean economy, green collar, and clean tech are all terms used frequently and somewhat interchangeably. To accomplish the tasks laid out in E2SB2815, we must use consistent definitions. In Washington State, we define green economy as:

> The development and use of products and services that promote *environmental protection* and/or *energy security*.

"Green" is a cross-cutting term that can be applied to activities and products that exist in virtually all of today's sectors and industries. Green is a matter of degree, and defining a job or an industry as green is not clear-cut.

In fact, the green economy is best viewed as the "greening" of our existing economy. All industries are—and will be—in a state of transition in a carbon-constrained world. Efficiencies and new energy sources will develop and be adopted over time.

It is difficult to tell where the green economy or green jobs begin and where they end. Despite this challenge, the development of definitions is crucial if Washington State is to track the impact of public policy on the economy and to design systems to support a green economy. The development of tax programs, college curriculum, and company recruitment programs benefit greatly when they are anchored by standard, well-understood definitions.

Within our definition are the following industry groupings:

- **Clean energy**—Energy efficiency, renewable energy, and alternative energy.
- **Green building**—Construction and retrofitting of buildings.

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[27] Two important but yet-to-be-funded workforce strategies were established in Section 9 of E2SHB 2815. First, the Green Jobs Training Account was established (but not funded) to competitively fund development of high-demand education and training programs for the green economy. Second, as a necessary precursor to education program development, E2SHB 2815 created pilot Industry Skill Panels targeted at green economy industries. Skill panels convene industry leaders (business and labor) to identify specific skill gaps and implement tactics for closing those gaps.

- **Transportation**—Products or systems designed to reduce the use of petroleum-fueled engines and single occupancy vehicles.
- **Environmental protection**—Waste management and water conservation.

Each of these industry groupings, with a representative sample of processes, products, firms, and jobs, will be detailed in the Green Economy Definitional List.

The Green Economy Strategic Framework

CTED's report, expected in December 2008, will be the first phase of a strategic plan for growing a green economy.[28]

Many of the recommendations, such as the development of commercial finance models and evaluating the regulatory environment, will require additional work. The framework will seek to identify products and processes that will be needed to support the recommended set of climate change policies. It will also present the economic opportunities of adoption.

In general, the framework will assess Washington's comparative advantages and disadvantages in a green economy and will identify how we might fully leverage our existing assets. Using informational interviews with industry leaders, an interagency advisory team, and literature reviews, the Green Economy Strategic Framework will provide overviews of and recommendations for: [29]

- Economic drivers—the need for deliberate action.
- Related initiatives—CAT, Puget Sound Partnership, housing initiatives, and land use.
- The challenges of growing a green economy.
- Principles for growing a green economy.
- Washington's assets—our foundation for a green economy.
- Skills and labor—talent in a green economy.
- Washington's opportunities—innovation, products and services, and global and domestic markets.
- Open for business—strategies for private-sector engagement (e.g., regulation, incentives, research and development).

[28] Another phase is required to incorporate the findings of the Employment Security Department's labor market analysis as well as the climate strategies advanced by the Climate Action Team.

[29] Employment Security Department; Community, Trade, and Economic Development; Higher Education Coordinating Board; State Board of Community and Technical Colleges; the Workforce Training and Education Coordinating Board; Washington State Labor Council; Association of Washington Business; Washington Clean Tech Alliance; and Climate Solutions.

5. Actions Underway

Policies in Place

The state already has a number of policies in place that will reduce greenhouse gas (GHG) emissions. These policies have the potential to produce approximately 45 percent of the reductions necessary to reach our 2020 emissions reductions, as shown in Table 5-1.[30] However, these strategies must continue to be implemented fully to produce these predicted reductions. Most of these regulatory and incentive-based policies reduce emissions from the transportation and electricity sectors, which together, account for almost 70 percent of Washington's total emissions.

The policies in place have also helped establish Washington as a leader in the green economy. For example, early adoption of energy efficiency programs has helped reduce energy consumption and GHG emissions, while making our state a hub for research and investment. This investment has also created over 4,000 green jobs in the state.

Table 5-1. Projected 2020 GHG Emissions Reductions from Policies in Place

Policy	2020 GHG Reduction ($MMtCO_2e$)	Portion of WA 2020 Reductions
2007 Federal CAFE Standard	3.7	11%
California Clean Car Standards	1.3	4%
State and Federal Renewable Fuel Standards	1.2	4%
Current State Energy Codes	0.5	1%
Current State and Federal Appliance Standards	1.3	4%
Utility Energy Efficiency	2.4	8%
Renewable Portfolio Standard	4.1	12%
State Fleet Efficiency Measures	0.3	0.9%
Green Building Standards for Public Buildings	0.2	0.5%
TOTAL	**15.0**	**45%**

Transportation

Three types of strategies can reduce GHG emissions from transportation:

- Clean cars, so that each vehicle is as efficient as possible.
- Clean fuels, so that each gallon of fuel used produces fewer emissions.
- Vehicle miles traveled reduction strategies, so that consumers have the opportunity to drive less.

[30] The analysis of actions needed to meet the 2035 or 2050 emissions reductions has not yet been completed.

The sections below outline the existing policies related to these three strategies.

Clean Cars: Tailpipe Emissions Standards

In 2005, the Washington State Legislature adopted California's clean car standards.[31] Washington is one of 14 states that have adopted the California standards.

The law requires that cars sold in Washington meet strict emissions standards, including limits on GHG emissions. It takes effect beginning with the 2009 model year. However, the U.S. Environmental Protection Agency (EPA) must first approve California's petition before these tailpipe emissions standards can be required. In December 2007, the EPA administrator denied California's greenhouse gas waiver request.[32] Washington and 17 other states have challenged the denial in federal court. It is widely expected to be approved under the new, incoming federal administration. To address this delay, Washington will allow a phase-in period for automakers to meet the requirements.

CAFE Standards

In December 2007, the U.S. Congress enacted the Energy Independence and Security Act of 2007 (EISA).[33] In part, this law raised the federal Corporate Average Fuel Economy (CAFE) standard for vehicles. The new CAFE standard will raise the average fuel economy of the combined fleet of passenger cars and light trucks sold in the United States to 35 miles per gallon by 2020. In April 2008, the National Highway Traffic Safety Administration proposed the CAFE standard for model years 2011-2015. [34]

Comparing Tailpipe Emissions Standards and CAFE Standards

The California Air Resources Board (CARB) reviewed the federal CAFE standards and the California tailpipe emissions standards. Applying the CARB results to Washington shows that adopting the federal CAFE standards will reduce Washington's GHG emissions by 3.7 million metric tons of carbon dioxide equivalent ($MMtCO_2e$) in 2020. The California tailpipe standards, however, are estimated to reduce GHG emissions by 5.0 $MMtCO_2e$, an additional 1.3 $MMtCO_2e$ over the federal standards in 2020 as long as they are implemented in a timely manner.[35]

If the California clean car standards are implemented before 2010, the federal and California tailpipe emissions standards will contribute 15 percent of the reductions to meet our 2020

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[31] Codified as RCW 70.120A, adopted in WAC 173-423.

[32] EPA granted a waiver for the criteria air pollutant reductions also mandated under California clean car standards, which take effect in the 2009 model year.

[33] U.S. Congress, *Energy Independence and Security Act of 2007*, H.R 6, December 2007. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h6enr.txt.pdf

[34] In April 2008, the National Highway Traffic Safety Administration (NHTSA) proposed the CAFE standard for model years 2011-2015. The standard requires new passenger cars and light trucks to meet average fuel economies of 35.7 miles per gallon (mpg) and 28.6 mpg, respectively, for a fleet average of 31.6 mpg or better.

[35] California Air Resources Board, *Comparison of Greenhouse Gas Reduction for the United States and Canada Under ARB Greenhouse Gas Regulations and Proposed Federal 2011-2015 Model Year Fuel Economy Standards*, 2008.

statutory emissions reductions. Alone, the federal tailpipe standards contribute 11 percent of the reductions to meet our 2020 emissions reductions.

Clean Fuels: Renewable Fuels

Renewable Fuel Standard

The Renewable Fuel Standard (RFS) in Washington sets minimum sales percentages of ethanol and biodiesel.[36] By November 30, 2008, biodiesel must represent 2 percent of all diesel fuel sold in Washington. This figure rises to 5 percent when Washington's feedstock production and processing capacities can satisfy a 3 percent requirement. By December 1, 2008, ethanol must represent 2 percent of all gasoline sold in Washington. The state can increase the ethanol figure to 10 percent, based on availability of sufficient raw materials within Washington to support economic production of ethanol at higher levels and continued satisfaction of federal Clean Air Act standards for ozone pollution.

As of September 2008, ethanol accounted for 6.8 percent of gasoline sales in Washington, exceeding the state requirement. The Washington State Department of Agriculture (WSDA) and Department of Ecology (Ecology) are currently assessing whether Washington's production capacity warrants raising the mandate to 10 percent ethanol.

Also as of September 2008, biodiesel sales accounted for 0.9 percent of diesel fuel sales, down from a high of 1.7 percent in July 2007. Higher prices have reduced biodiesel use. For example, due to cost overruns, King County Metro suspended its plans to use 20 percent biodiesel in its buses.

The legislature has also approved several tax incentives for the production, distribution, and use of biodiesel and other clean alternative fuels.

Federal Renewable Fuel Standard

The 2007 Energy Independence and Security Act also extended the existing federal renewable fuel standard (RFS) and encouraged development of new biofuels. The federal standard requires that transportation fuel sold in 2008 include 9 billion gallons of corn-based ethanol. The mandate rises to 36 billion gallons by 2022, with corn-based ethanol expected to top out at 15 billion gallons in 2015. Based on estimates of fuel use in 2020, the federal RFS requires ethanol to represent 17 percent of gasoline sales nationwide and biodiesel to compose a minimum of 2 percent of diesel sales.

Increasing levels of advanced biofuels are required beginning in 2009. These biofuels must have a GHG savings of 50 percent or more, throughout the life cycle, when compared with conventional gasoline. In 2020, at least 10.5 billion gallons must be cellulosic biofuels with a savings of at least 60 percent over conventional gasoline throughout the life cycle.[37] Together the federal and state renewable fuel standards are expected to reduce Washington's emissions by 1.2 $MMtCO_2e$ in 2020.

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[36] Codified as RCW 19.112.

[37] Life cycle analyses of GHGs for biofuels quantify the emissions created by the manufacture of the fuel, including its inputs, through transporting the fuel to the consumer, use and disposal. U.S. Department of Energy, Energy Efficiency and Renewable Energy, *Federal Biomass Policy*. www1.eere.energy.gov/biomass/federal_biomass.html

Biofuel Production in Washington

Sources for biofuels in Washington differ significantly from those often used to produce biofuels in other regions. According to the U.S. Department of Agriculture's Farm Service Agency, Washington currently has 13,324 acres of canola, rapeseed, mustard, and camelina, up from 7,314 acres in 2006. A portion of these crops are going to biodiesel production in the state.

WSDA reports 170,000 acres of grain corn production in Washington. At present, this corn is used almost exclusively for livestock feed rather than ethanol production. The relatively low acreage devoted to energy crops reflects the diversity of agriculture in Washington, where farmers grow over 300 high-value commodity and specialty crops.

The state has other biomass resources that may be used to develop bio-based products and fuels, including cellulosic ethanol. Washington's most abundant sources of cellulosic biomass include wood waste, agricultural biomass, and municipal solid waste. These sources are referred to as cellulosic biomass because the energy and fuel potential lies in the plant structure itself (the cellulose), rather than the seeds. Using cellulosic biomass can help address environmental and social concerns associated with traditional feedstocks by avoiding competition with food crops and improving carbon and energy efficiencies in fuel production.

Since 2006, Washington has invested over $30 million to research and develop new technologies and strategies to grow and support our bioenergy industries. These efforts are creating ways of collecting, transporting and converting biomass and other organic waste streams into energy. They are also improving existing sources of biomass, creating new sources, and developing high-value renewable products to strengthen the economy.

A Washington State University study, with funding from Ecology, indicates that biomass—from municipal solid waste, straw, animal waste, and forest residues from harvesting and thinning—could help Washington meet its energy needs. For example, if half of the available resource could be collected and converted efficiently, the resulting fuel could support nearly 25 percent of the state's transportation fuel needs.

The Energy Freedom Program helps develop bioenergy production facilities in Washington.[38] During the 2007-2009 biennium, the state provided more than $14.5 million in grants and low-interest loans to support vital bioenergy infrastructure around the state. Projects include integrated oilseed crushing and biodiesel production projects, anaerobic digesters, and combined heat and power facilities fueled by woody biomass for rural schools.

Washington now has several plants producing alternative fuels, including the nation's largest biodiesel plant in Grays Harbor. Many more are in development, with most focusing on opportunities to produce biodiesel and ethanol from cellulosic biomass and various organic waste streams.

Plug-in Hybrid Electric Vehicles and Electrification

Plug-in hybrid electric vehicle (PHEV) technology offers a lot of potential as a method to reduce GHG emissions from transportation. In 2007, the legislature directed the Department of Community, Trade, and Economic Development (CTED) and Ecology to analyze vehicle

[38] Codified as RCW 43.325.

electrification. The purpose of this program is to speed adoption of this technology, remove barriers, create incentives, support demonstration projects, and provide for the integration of PHEVs with the power transmission and transportation infrastructure.

ES2HB 2815 also directed CTED to make recommendations on "how projects funded by the green energy incentive account may be used to expand the electrical transmission infrastructure into urban and rural areas of the state for purposes of allowing the recharging of plug-in hybrid electric vehicles." At the current time, no funds are in the green energy account. In addition, plug-in hybrid vehicles are not commercial available. Even when such vehicles do become available, CTED does not believe that there will be near-term limitations on the state's electric transmission or distribution systems which would limit the ability to install recharging stations.

Clean Fuels Tax Incentives

Beginning January 1, 2009, new passenger cars, light-duty trucks, and medium-duty passenger vehicles powered by a clean alternative fuel are exempt from the state sales and use tax.[39] This tax exemption applies to purchases of new vehicles that are powered exclusively by a clean alternative fuel (such as natural gas, propane, hydrogen, or electricity). It also applies to new vehicles that use hybrid technology and have an EPA estimated highway gasoline mileage rating of at least 40 miles per gallon. The exemption is effective from January 1, 2009, to January 1, 2011.

The current state and federal renewable fuel standards contribute 4 percent of the reductions to meet our 2020 statutory emissions reductions. The reductions from other renewable fuels policies have not been quantified.

Energy Efficiency

Electric Utility Energy Efficiency

In 2006, Washington voters passed Initiative 937 (I-937), the Energy Independence Act.[40] In part, the law requires utilities serving more than 25,000 customers to adopt all cost-effective measures to promote energy efficiency in their service areas.

I-937 requires each utility to set both two-year and ten-year conservation targets by January 1, 2010. In setting its targets, each utility must use methods the Northwest Power and Conservation Council described in its *Fifth Power Plan*. The Power Plan estimates that 2,800 aMW (average megawatts) in cost-effective energy-saving measures can be adopted throughout the Northwest by 2025.[41] As a result, Washington could save an additional 60 aMW each year. This quantity is equal to the amount of electricity that about 40,000 Washington residents use each year.

By reducing energy consumption, the I-937 efficiency measures are projected to reduce Washington's GHG emissions by 2.4 $MMtCO_2e$ in 2020. I-937's efficiency measures contribute 8 percent of the reductions to meet our 2020 statutory emissions reductions.

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[39] RCW 82.08.809 and RCW 82.08.813.

[40] Codified as RCW 19.285.

[41] An average megawatt is 1000 kilowatt-hours delivered continuously for a year.

Appliance Standards

When the state legislature adopted minimum efficiency standards for 12 products in 2005, Washington became one of only ten states with standards for energy efficiency of specific products not covered by federal standards.[42] Later in 2005, federal standards preempted six of these state standards.

The 2007 Energy Security and Independence Act (EISA) set standards for ten additional products and required the U.S. Department of Energy to update a number of existing standards. With the passage of EISA, federal standards now preempt all Washington appliance standards, except those for refrigerators.

The biggest energy saver among the new federal standards is for common light bulbs. EISA requires by 2014 light bulbs to use 25 to 30 percent less energy than today's typical incandescent bulbs. By 2020, light bulbs must use at least 60 percent less energy. Several bulbs already on the market, like compact fluorescent lamps (CFLs) and light-emitting diodes (LEDs), meet these targets. The new EISA appliance and lighting standards are projected to reduce emissions 0.7 $MMtCO_2e$ below business-as-usual in 2020.

The current state and federal appliance and lighting standards contribute 4 percent of the reductions to meet our 2020 statutory emissions reductions.

Building Energy Codes

Energy codes decrease building energy use by requiring the adoption of minimum energy efficiency technologies, building techniques, and practices in new construction.

Washington's first statewide energy code was adopted in 1986. The Washington State Building Code Council develops and implements statewide residential and commercial energy codes.[43] These codes are updated every three years. Large cities can adopt energy codes for commercial buildings that are more stringent than the state's code. For example, Seattle has a more stringent energy code for commercial buildings.

State energy code changes passed in 2005 and 2007 include a number of provisions that increase both residential and commercial building energy efficiency. The next revision is currently under discussion and will be implemented in 2010.

The current state building energy codes contribute 1 percent of the reductions to meet our 2020 statutory emissions reductions. For further information and analysis on upcoming code revisions, see Chapter 6 of this report.

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[42] RCW 19.260.040.

[43] For more information, see www.sbcc.wa.gov/sbccindx.html.

Renewable Energy

Electricity Supply

Washington State leads the nation in hydroelectric power generation and in generation from all renewable resources combined.[44] We ranked fourth in the nation in 2007 in private investment (about $121 million) in clean energy, according to Thomson Financial and the National Venture Capital Association.[45]

To continue our progress toward a clean energy economy, I-937 established a renewable portfolio standard. By 2020, utilities with at least 25,000 customers must obtain 15 percent of their electricity from new renewable resources like wind and solar. The law sets interim targets of 3 percent by 2012 and 9 percent by 2016.

The current renewable portfolio standard contributes 12 percent of the reductions to meet our 2020 statutory emissions reductions.

Wind Energy

As of October 2008, eight wind projects were operating in Washington. These projects can produce more than 1,300 megawatts (MW) of power. Other projects totaling more than 250 MW are in the planning stage. Additional projects that could add another 1,000 MW to our wind power capacity have been proposed.[46] Washington currently ranks fifth in U.S. wind power production after Texas, California, Minnesota, and Iowa.[47]

Wave and Ocean Energy

Washington and Oregon have the largest wave energy resources in the lower 48 states. Several sites in Puget Sound with excellent tidal resources could be developed, with potential output of several hundred megawatts of tidal power. While no commercial wave or tidal projects have been developed in Washington, 11 projects are planned for the near future.

In December 2007, the Federal Energy Regulatory Commission (FERC) granted its first license for wave or tidal energy to a Washington project. Fenevera Renewable Ocean Energy received a five-year conditional license for a demonstration turbine to generate about 1 MW of electricity at Makah Bay. Snohomish County Public Utility District has preliminary permits for seven other potential sites for tidal power in Puget Sound.

Electric Utility Emissions Performance Standard

ESSB 6001 requires a GHG performance standard for all new electricity generation, including power purchased under contracts of five years or longer. The performance standard requires that new power sources produce no more emissions than the rate of an average new natural gas,

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[44] U.S. Department of Energy, Energy Information Administration, *State Energy Profiles*. http://tonto.eia.doe.gov/state/

[45] National Venture Capital Association, *Clean Tech Interim Report*, 2007.

[46] Northwest Power Conservation Council. www.nwcouncil.org/energy/powersupply/Default.htm

[47] American Wind Energy Association. www.awea.org/projects/projects.aspx?s=Washington

combined-cycle combustion turbine.[48] The law allows for storing (sequestering) of carbon dioxide to meet the performance standard.

In June 2008, Ecology and the Energy Facility Site Evaluation Council adopted rules to implement and enforce the Emissions Performance Standard.[49]

Government Operations

State Fleet Efficiency

In 2000, the Department of General Administration (GA) became the first state agency in the nation to contract for the purchase of Toyota Prius hybrid cars for the state fleet. Now Washington agencies can purchase hybrid Honda Civic, Toyota Camry, and Ford Escape vehicles in addition to the Prius. Public agencies have purchased nearly 1,000 hybrids through GA so far. Several local governments have been leaders in the use of hybrids. Clallam, Garfield, Island, Jefferson, King, and San Juan are the top five counties for hybrid purchases by local governments.

The 2007 Cleaner Energy Act requires all state and local government-owned vessels, vehicles, and construction equipment operate to the maximum extent practicable on electricity or biofuels by 2015.[50] According to GA's September 2008 report, biodiesel currently comprises just over 3 percent of diesel use in the state fleet. In addition, the Washington State Ferries (WSF) system is using a 20 percent biodiesel blend in three vessels as part of a successful biodiesel pilot program. WSF uses approximately 17.6 million gallons of diesel fuel annually and is the largest public user of diesel fuel in the state. In addition, the state Department of Transportation plans to introduce biodiesel use in its Eastern Washington fleet and increase biodiesel blends for the Western Washington fleet in 2009.

The current state fleet efficiency program will contribute 0.9 percent of the reductions to meet our 2020 statutory emissions reductions if fully implemented in a timely manner.

Diesel Emissions Reduction Projects

The Cleaner Energy Act also extended an incentive program that encourages replacing school buses that are 1994 models or older with new models. Ecology will provide $350,000 to replace 20 of the oldest, most polluting school buses in the state with new more efficient models by the summer of 2009.

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[48] This rate is approximately 0.5 metric tons carbon dioxide equivalent per megawatt hour of electric power.

[49] Ecology rules can be found at WAC 173-407 and WAC 173-218; EFSEC's rules can be found at WAC 463-80 and WAC 463-85.

[50] House Bill 1303, *Cleaner Energy Act*, Section 202. Codified as RCW 43.19.648.

School bus replacement is in addition to a number of other diesel emissions reduction projects in Washington. These programs concentrate on reducing particulate emissions from diesel engines, a major public health concern. The key piece is a joint program between Ecology and local air agencies that pays the cost to retrofit school buses and other publicly or privately owned diesel equipment. School districts have retrofitted at least 5,600 diesel school buses to reduce their emissions. The program is now concentrating on local government vehicle feels and has already provided funds to retrofit over 1,000 diesel vehicles in city, county, port, and transit authority fleets.

Ecology has also funded a number of programs that reduce fuel use in heavy diesel vehicles throughout Washington. These programs include providing idle reduction technologies to one public vehicle fleet and a number of switchyard and short-haul locomotives.

Ecology has also helped fund electrification projects at the Port of Seattle and two truck stops. These projects allow docked cruise ships and long-haul trucks parked overnight to use electricity to run equipment instead of idling their diesel engines. The port electrification program alone is projected to reduce diesel fuel use by 35 metric tons per ship call. Emissions reductions from diesel projects were not quantified, but they are expected to be modest.

Green Public Buildings

Government Offices

In April 2005, Governor Gregoire signed the High-Performance Public Buildings Act, setting green building requirements for construction of state-funded projects larger than 5,000 square feet.[51] It requires that these buildings reach at least the Leadership in Energy and Environmental Design (LEED) Silver standard of the U.S. Green Building Council.[52] Green building standards result in major energy savings and other improvements.

Before the 2005 law, the state owned or leased 14 LEED-certified buildings. Since then, 47 state buildings have applied and are waiting for LEED system certification.

The current green building practices for public buildings will contribute 0.5 percent of the reductions to meet our 2020 statutory emissions reductions.

High-Performance Schools

The Office of the Superintendent of Public Instruction (OSPI) developed the Washington Sustainable Schools Protocol (WSSP) to define high-performance schools in Washington. As of July 2007, all new K-12 school projects in districts with more than 2,000 students must be built to either the WSSP or LEED Silver standard. Projects in smaller school districts were required to meet the same requirements beginning in July 2008.

To test the protocol, OSPI chose five construction projects for a pilot program. All of the pilot schools opened in September 2008, and four achieved certification under the WSSP standard.

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[51] Codified as RCW 39.35D

[52] LEED stands for Leadership in Energy and Environmental Design and is a trademarked program of the U.S. Green Building Council.

While schools can choose between WSSP and LEED, all schools have chosen WSSP so far. One school did both and achieved LEED Gold.

Calculation of GHG emissions reductions from this program are included in the above number for reductions from public buildings.

Affordable Housing

CTED is providing grant funding to 39 affordable housing projects aiming for LEED Silver certification or higher. The GHG savings attributed with this effort were not calculated, although they are expected to be modest.

Vehicle Emissions Labeling

In 2008, the legislature passed the Greenhouse Gas Emissions—Disclosure—New Vehicles Act, SSB 6309, requiring automobile manufacturers to label certain new vehicles to show how much GHG each model produces or emits.[53] The law applies to all new passenger cars, light-duty trucks, and medium-duty passenger vehicles sold in Washington. The label must compare the vehicle's GHG emissions to other vehicles in the same model year. The law takes effect with the 2010 model year.

The label must include a rating that shows both numbers and visual information related to GHG emissions. SSB 6309 directs Ecology to consult with stakeholders on label design and adopt rules to implement the program. The law also requires Ecology to update the program as needed to keep the public informed and to review requests from automakers for alternative labels.

Under the law, Ecology is allowed to adopt a GHG label that is approved for use in California. During testimony on the bill, automakers strongly urged Washington to adopt the California label to limit the number of labels they will need to produce. In June 2008, the California Air Resources Board adopted a rule requiring an "Environmental Performance" label. Figure 5-1 shows the California label, which is a model for the Washington program. The California rule also takes effect for the 2010 model year.

Given the clear preference from auto manufacturers, Ecology decided that further consultation was not necessary. Ecology is proceeding to adopt California's rule and expects that the rule will be in place in January 2009.

[53] Codified in RCW 70.120A.

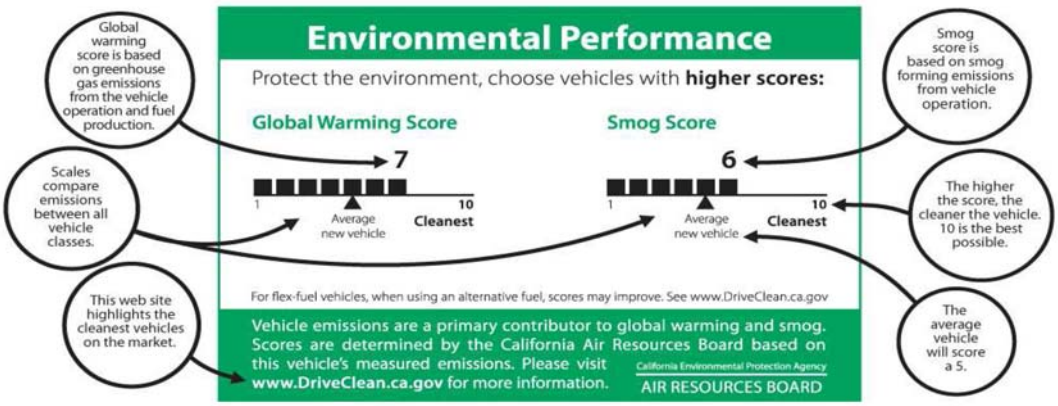

Figure 5-1. Sample Vehicle Label From California Showing Emissions Scores

GHG Emissions Reporting

As required by E2SHB 2815, Ecology is in the process of adopting a mandatory GHG reporting rule.[54] The data reported under this rule will be used to refine the Washington inventory, determine compliance with regulations, and track progress toward meeting our statutory emissions reductions.

The rule will require the following owners or operators to report their total annual emissions of GHGs, beginning with the reporting of 2009 emissions in 2010. Facilities will be required to report if they have annual emissions from either:

- A fleet of on-road motor vehicles with emissions of at least 2,500 metric tons of GHGs, expressed as carbon dioxide equivalent.
- Stationary emissions sources or mobile emissions sources used to transport people or cargo with emissions of at least 10,000 metric tons of GHGs, expressed as carbon dioxide equivalent.

Ecology's Air Quality Program convened a rule advisory committee made up of a broad cross-section of stakeholders to assist with development of the rule. The committee held its first meeting in September 2008 and is expected to continue meeting on a monthly basis through February 2009. In an effort to engage additional stakeholders and interested parties, Ecology established a rule website and also sends periodic email updates on the progress of the rule making to a rule list-serve as well as a broader climate change list-serve.[55]

Ecology is also participating in the WCI as it develops a model rule for mandatory reporting of GHGs for the regional cap-and-trade program. Ecology will incorporate relevant elements from WCI into Washington's reporting rule. Additionally, The Climate Registry (TCR) is currently

[54] E2SHB 2815 is codified as RCW 70.94.151. The rule will establish a new chapter, WAC 173-441.

[55] The rule website includes advisory committee meeting information and can be accessed at www.ecy.wa.gov/programs/air/globalwarm_RegHaze/GreenHouseGasreporting_rule.html.

developing a common database system to support mandatory reporting for states and provinces. Ecology is working with TCR to assure the common system meets Washington's mandatory reporting needs.

Ecology anticipates having a draft rule available for public review and comment in spring 2009 and to adopt a final rule in summer 2009.

6. Climate Action Team Recommendations

The Climate Action Team (CAT) was established in 2007 as part of Governor Gregoire's Climate Change Challenge. The CAT, a broad-based group of Washington business, academic, tribal, state and local government, labor, religious, and environmental leaders, worked throughout 2007 to develop a comprehensive set of state-level policy recommendations to meet the state's statutory emissions reductions. The CAT created the "Comprehensive Climate Approach," defining 12 targeted areas and 45 sets of mitigation strategies that Washington could undertake to reduce greenhouse gas (GHG) emissions efficiently and effectively.[56]

In 2008, E2SHB 2815 directed the CAT to continue its work and recommend "most promising actions to reduce emissions of greenhouse gases or otherwise respond to climate change." This chapter summarizes the recommendations of the Implementation Working Groups convened by the CAT to reduce emissions in the built environment, from waste management, and in transportation.

The CAT also convened an Implementation Working Group to examine the role of the State Environmental Policy Act (SEPA) in climate change. SEPA currently lacks specific guidance on how to address climate change. Thus, the CAT's SEPA Implementation Working Group (SEPA IWG) made recommendations to include climate change explicitly in SEPA processes and documents.

For a more detailed look at the CAT recommendations, please see the full report at www.ecy.wa.gov/climatechange/2008CATdocs/ltw_app_v2.pdf.

The CAT recommendations provide a number of strategies that will create jobs and drive new investment in Washington's economy. These strategies will also reduce emissions in both the short and long term.

Energy Efficiency and Green Buildings

Building and community design decisions have a major impact on Washington's ability to meet its long-term requirements for reducing emissions. Both new construction and existing buildings will contribute to GHG emissions through their energy use. Their design and renovation will also affect the amount of those emissions.

By 2030, new buildings constructed in the preceding two decades (since 2010) will account for 20 to 25 percent of all commercial building floor area and more than 20 percent of all housing units. Over the same 20-year period, it is expected most existing buildings will undergo some type of renovation, install new equipment, and will add or replace many energy-using devices. Thus, the time is right to improve the efficiency of our public and private building stock.

[56] Climate Action Team, *Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State: Recommendations of the Washington Climate Advisory Team*, February 2008. www.ecy.wa.gov/climatechange/CATdocs/020708_InterimCATreport_final.pdf

To increase energy efficiency of new and existing buildings, the Energy Efficiency and Green Building Implementation Working Group (EEGB IWG) developed a set of policy recommendations.[57] The policies aim to strengthen the energy efficiency and green building industries and to help reach the state's green economy job goals.

Using energy more efficiently is the quickest, cheapest, and most environmentally sound way to meet our future energy demands. By improving efficiency, we can forgo building costly new power plants and reduce GHG emissions. In addition, many strategies to increase energy efficiency create green jobs and pay for themselves through energy savings.

The policy recommendations summarized below include near-term opportunities to increase building energy efficiency and long-term strategies to help Washington meet its statutory emissions reductions.

Energy Efficiency Incentives

This recommendation calls for legislation to create incentives to foster the design, construction, and operation of buildings to levels of superior energy performance. It also encourages the use of combined heat and power, distributed electricity generation, and other distributed and district energy and water systems, including district heating and cooling. This approach would reward actual demonstrated energy performance with tax credits. The two types of incentive programs are summarized below.

Energy Efficiency Quality Investment Program (EEQUIP)

The proposed Energy Efficiency Quality Investment Program (EEQUIP) has a number of elements outlined below.

Near-term high-priority legislative concepts for this action include:

- Use Public Utility Tax (PUT) credits for non-residential buildings that meet specific levels of energy performance based on actual utility data. The utilities serving the building will provide 50 percent of the PUT credit.
- Modify the law related to Local Improvement Districts (LID) to add energy efficiency as a qualifying activity. This change will allow LIDs to issue bonds to fund the upfront cost of energy efficiency investments. Homeowners who voluntarily receive funds will pay them back as part of their property taxes.

Other most promising future legislative concepts for this action include providing partial sales tax refunds for:

- New non-residential buildings that achieve energy performance standards equivalent to an ENERGY STAR Target Finder rating of 90, under the U.S. Environmental Protection Agency (EPA) program.
- New and existing residential buildings that meet a level of energy performance equivalent to an ENERGY STAR Northwest-rated home.

[57] For additional information, see full EEGB IWG Report in Appendix 2.

These ideas are designed to work with familiar programs of merit (LEED, ENERGY STAR, Built Green, or other verifiable third-party or independent certifications) that have gained acceptance in the commercial and residential buildings market. In addition, standards to qualify for incentives become increasingly stringent over time to drive the market in Washington toward more energy-efficient building design, construction, and operation.

Combined Heat and Power (CHP) and Distributed Energy Systems

This recommendation offers tax incentives to support the development and use of combined heat and power (CHP) and other distributed energy systems. Potential incentives include:

- Business and occupation (B&O) tax credits.
- PUT credits for buildings and industries that use CHP or other distributed energy systems.
- Sales tax exemptions on machinery and equipment used in CHP and distributed energy systems.
- Property tax exemptions for distributed energy and water systems.

In the short term, sales tax exemptions on purchases of equipment used in distributed energy and water systems—consistent with the existing manufacturing and retail sales tax and use exemptions (which include exemptions for CHP systems used in manufacturing)—are the simplest to apply.

This recommendation also includes:

- Efficiency requirements for CHP systems.
- Similar eligibility criteria for incentives for other distributed energy systems. The Department of Community, Trade, and Economic Development (CTED) will set criteria based on the effectiveness of the system and incentive models established for CHP.
- For district water projects, a baseline amount of water demand reduction needed to receive incentives. The proposal uses a tiered approach so higher percentage reductions qualify for higher incentives.
- Ways to address barriers to completion of distributed energy systems, including interconnection with the electricity grid, dispatching of generation resources, split incentives between project owners and tenants, and compliance with local and state rules.

Energy Efficiency, Benchmarking, and Performance Disclosure

Public Buildings

The EEGB IWG recommends legislative action to upgrade the energy efficiency and sustainability of publicly constructed and operated buildings, including both new and existing buildings. The proposed bill includes different provisions for state agencies, colleges, universities, and school districts and for cities, counties, and other taxing authorities.

Key elements include the following:

- Require benchmarking, auditing, and adoption of energy efficiency measures in existing public buildings. These energy efficiency requirements become stricter over time using a tiered or phased approach.
- Require that new and substantially renovated public buildings meet strict energy performance standards, again with requirements becoming stricter over time using a tiered or phased approach.
- Emphasize education and promotion as central to the success of the program.
- Leverage existing programs and funding in state and local governments.
- Partner with EPA's ENERGY STAR program. This key step is already underway.

Private Buildings

This recommendation on energy benchmarking and energy performance disclosure includes two major parts:

- Develop, use, and require public disclosure of an energy benchmark (e.g., energy use per square foot) for private non-residential and residential buildings at time of sale or lease.
- Let potential building buyers and users know that a system of Energy Performance Certificates should be created and used in Washington.

State Energy Code Improvements and 2030 Building Goals

This recommendation aims to improve energy efficiency in new buildings. We are proposing two strategies that include updating current energy codes and establishing a long-term building energy reduction plan. The sections below summarize these two strategies.

Revision of Washington State Energy Code

Revise the current Washington State Energy Code (WSEC) as part of the scheduled 2009 revision cycle to:

- Achieve a 30 percent reduction in new building energy use, compared to the 2006 edition of the WSEC.
- Provide efficiency advances in the code for remodeling, retrofit, and equipment replacement.
- Set a process for periodic review and improvement of building energy codes.
- Consider how codes affect the availability of incentives through utility demand-side management programs.
- Provide education and technical assistance in applying the updated codes.

Establishment of 2030 Building Goals

The EEGB IWG recommends legislative action to provide direction in creating and using a long-term State Building Efficiency and Carbon Reduction Strategy. A bill would direct CTED to develop a 2010 State Strategy for Building Energy Efficiency and Carbon Reduction. This strategy would set targets for building energy use intensity and a target for new buildings similar to the Architecture 2030 Challenge.

This strategy would review several methods including the following options:

- State codes and appliance standards.
- Emerging technologies.
- User incentives.
- Education and technical assistance.
- Measurement.

The EEGB IWG recommended CTED update the strategy every three years before the routine code review development and adoption process for state buildings.

In addition to reducing GHG emissions, short- and long-term efficiency improvements to buildings and use of CHP and distributed/district energy systems can provide these additional benefits:

- Reduce emissions of non-GHG air pollutants.
- Reduce water use.
- Increase the use of in-state renewable fuels and reduce the use of imported fossil fuels.

District energy systems can also play a role in promoting compact development to reduce transportation demands. Savings in energy costs are expected to exceed the costs to state and local governments, building owners, and developers. Enacting the recommendations will require commitments and sustained, coordinated efforts from both government and the private sector.

Table 6-1 summarizes the strategies for energy efficiency and green building and their projected emissions reductions in 2020.

Table 6-1. Summary of Energy Efficiency and Green Building Strategies

Strategies	Projected 2020 Reductions ($MMtCO_2e$)
Energy Efficiency Quality Investment Program (EEQUIP)	0.8
Expanded Implementation of Distributed Energy and Water, Combined Heat and Power (CHP), and Renewable Energy	0.3
Energy Efficiency in Existing, New and Renovated Public Buildings, and Energy Benchmarking and Energy Performance Disclosure in Public and Private Buildings	1.2
State Energy Code Improvements and Establishment of 2030 Building Goals	6.4
TOTAL Gross Emissions Reductions	8.7
TOTAL Estimated Overlap Among Energy Efficiency and Green Building Options and Recent Actions	3.2
TOTAL Net Emissions Reductions[58]	**5.5**

Waste Reduction and Recycling

The disposal of solid waste produces GHG emissions in a number of ways:

- Decay of waste in landfills produces methane, a GHG 21 times more potent than carbon dioxide.
- Burning (incineration) of waste produces carbon dioxide as a byproduct.
- Transporting wastes to disposal sites produces emissions from fuel.

In addition, throwing away materials means new raw materials must be mined, manufactured, or otherwise obtained, often leading to increased GHG emissions in those sectors of the economy as well.

Washington has long been a leader in waste management. In 1989, the state legislature passed the Waste Not Washington Act, setting a 50 percent recycling goal for the state by 1995.[59] Washington now diverts about 48 percent of solid waste generated in the state to reuse, recycling, and other beneficial uses. Our recycling rate exceeds the national average of 33 percent.

The Beyond Waste Implementation Working Group (BW IWG) recommended five strategies to reduce and recycle "the next 50 percent"—the remaining half—of solid waste in Washington.[60]

[58] Total Net Emissions Reductions are projected if all of the Implementation Working Group recommendations and all policies in place are fully implemented together. Many of these policies reinforce each other and thus overlap. See each IWG's final report for a full accounting of the overlap between policies.

[59] RCW 70.95.

[60] See full Beyond Waste IWG report in Appendix 3.

These strategies will work together to reduce waste, increase recycling, and reduce GHG emissions.

Their recommendations begin with setting a new state recycling goal of 80 percent. They then focus on ways to reach that goal by 2020. They build on the parts of the current waste management system that are working well, and they target products and organic materials with the largest potential to reduce GHG emissions.

Using these strategies, Washington could reduce GHG emissions by 6 $MMTCO_2e$ per year by 2020. Because many materials and products consumed in Washington are produced around the world, not all of these reductions will occur within the state. As a result, we cannot include the full potential of these reductions in meeting Washington's GHG emissions reductions. Given the global nature of climate change, however, the BW IWG believes that any actions Washington takes to reduce worldwide emissions are worthy activities.

Enhance the Collection of Recyclable Materials

To meet the new goal to recycle 80 percent of the overall solid waste stream by 2020, recyclable materials must first be collected. The existing waste collection system should be improved to decrease the quantity of recyclable materials and products, organic materials, and construction and demolition debris that is sent to landfills.

The BW IWG strategies include the following:

- Residents and businesses should separate their solid wastes into at least three categories:
  - Recyclable materials and products.[61]
  - Organic materials, including yard, garden, and food wastes.
  - Remaining solid wastes that cannot be recycled or composted.
- Local governments should update their comprehensive solid waste management plans, which describe the services that will be provided. Participation would be optional for small rural counties and small population areas.
- Affected local governments should develop reuse and recycling policies for construction and demolition wastes as part of their solid waste management plans.
- The state should provide financial and other incentives to the private sector to foster capital investment in the infrastructure needed to support this action.

Market Development for Diverted Organics

In addition to diverting organic materials from landfills, the state should also provide end uses for organic waste and byproducts. The BW IWG strategies focus on raising the value of organic materials and building markets for compost and recycled organics by:

[61] Recyclable materials must at a minimum include recoverable paper, container metals, container glass (with some exceptions), and plastics (PET and HDPE, codes 1 and 2).

- Encouraging anaerobic digestion of compostable organics—including food scraps, manures, and food processing wastes—through incentives.
- Expanding use of composts and other organic materials by:
  - Changing purchasing laws and regulations to expand the types of organic materials allowed in making compost for the Washington State Department of Transportation.
  - Providing subsidies to farmers, through the Conservation Districts, to promote agricultural use of composted organics suitable for land application.
  - Using both voluntary and regulatory offset markets to provide incentives for local governments and businesses to conduct organics diversion projects. Waste management has been identified as a priority for offset credits in the WCI cap-and-trade program design.

Environmentally Preferable Purchasing Programs in Government

The governor, through a new executive order, should create a workgroup to find ways to change purchasing laws, rules, and practices to make sure that all levels of government conduct environmentally preferable purchasing (EPP). Current government purchasing follows three criteria: price, availability, and physical performance. The BW IWG recommends adding a fourth criterion to the list: environmental performance. The workgroup created by the new executive order would develop strategies to integrate this fourth criterion.

The proposed strategies could include legislation that would focus first on purchasing products with reduced GHG emissions. Other environmental factors, such as lowest possible toxicity, could also be included.

Team With Retailers to Reduce Consumer Waste

Waste prevention reduces more GHG emissions than recycling. The BW IWG recommended creating a voluntary program with major retailers to reduce waste from the products and packaging they sell. Current estimates find that at least 50 percent of household wastes come through retailers. This program has the potential to produce major reductions in waste generated throughout the state.

Teaming with retailers provides an effective way to reach producers, suppliers, and consumers of products. These projects can often also benefit retailers through reduced shipping costs of lighter weight packaging and less spoilage of food.

Two example programs have shown success in the United Kingdom.

- **The "Love Food, Hate Waste" campaign**, which engages retailers and producers in designing packaging for longer safe food storage. Retailers also provide information about how to store food properly. More than one-third of food purchased is currently thrown away, so the potential for savings is high.
- **The GlassRite bottle initiative**, where retailers work with wine producers to use lightweight wine bottles. The program also imports bulk wine and bottles it in country, closer to the point of sale. Both of these strategies reduce shipping costs and GHG emissions.

Product Stewardship Framework

This program would expand the Washington electronics recycling program to other products such as carpet, mercury-containing lighting and thermostats, paint, and rechargeable batteries.[62] A new law would be needed make producers of covered products responsible for their products from cradle-to-grave, or from manufacture to end of life. The BW IWG did not obtain input on this strategy from affected groups, including product manufactures and other industry representatives. The group understands this input would be needed before moving forward on this strategy.

Manufacturers have the most influence on product design, manufacturing, and use. Accordingly, as with the electronics recycling program, this strategy would hold them responsible for reducing environmental and health impacts of their products.

The strategy recommends that Ecology be responsible for identifying the products to be covered by this program based on their impact on the environment and public health. Manufacturers would then be required to set up and run the product stewardship programs for their products. Such efforts would be designed to reduce the environmental and health impacts of products in all stages of their life cycle, including GHG emissions.

Table 6-2 summarizes the Beyond Waste strategies and their projected emissions reductions in 2020.

Table 6-2. Summary of Beyond Waste Strategies

Strategies	Projected 2020 Reductions ($MMtCO_2e$)*
Optimize the Collection of Recyclable Materials	0.08
Product Stewardship Framework	N/A
Market Development for Diverted Organics	1.65
Government Environmentally Responsible Purchasing	N/A
Collaborate with Retailers to Reduce Consumer Waste	0.65
TOTAL Gross Emissions Reductions	2.3
TOTAL Estimated Overlap Among Beyond Waste Options and Recent Actions	0.9
TOTAL Net Emissions Reductions	**1.4**

**Only includes projected emissions reductions in Washington State. See* Beyond Waste IWG *report in Appendix 3 for full GHG accounting of these recommendations.*

[62] For more information on Washington State's electronics recycling program, see www.ecy.wa.gov/programs/swfa/eproductrecycle/index.html.

Transportation Choices and Reducing Emissions

Transportation accounts for nearly half of Washington's total GHG emissions. To meet its statutory emissions reductions, Washington must reduce transportation-related GHG emissions.[63] To do so, the state must meet its short- and long-term benchmarks for reducing vehicle miles traveled (VMT).[64]

Washington faces a crisis in transportation funding that requires urgent action. The challenge facing the state is how to reach Washington's requirements to reduce GHG emissions and VMT, given limited budgets. At the same time, the state needs to address:

- Effects of the current revenue shortage on state and local transportation infrastructure.
- Operating expenses and the ability of transit agencies to provide appropriate levels of service.

Washington's gas tax funds transportation projects. This link creates a dilemma because, as the state makes progress in reducing VMT and increasing the efficient use of fuel, the funding available to provide transportation service will further diminish.

Given this challenge, the Transportation Implementation Working Group (TIWG), as part of the CAT, found an opportunity to rethink transportation in Washington. Their recommendations seek to move Washington toward a future where:

- Citizens can choose public transportation, walking, bicycling, or ridesharing for their daily activities.
- Transportation choices that are more environmentally friendly, easier to use, more reliable, safer, and less expensive for the user than the current system are readily available.
- Future funding decisions foster reductions in GHG and VMT, promote Washington's economic competitiveness, and reduce fuel imports.

To achieve this vision, Washington must review how all levels of government make investments in transportation infrastructure and services.

The TIWG recommendations are summarized below. For additional details on the recommendations and specific proposals, see the full TIWG report in Appendix 4.

Transit, Rideshare, and Commuter Choice

This recommendation consists of three programs to meet the demands of three different types of areas: large urban, small urban, and rural. Reducing VMT per person will be easiest in denser areas with land use and development patterns that support bicycling, walking, and public transit use. These areas also have a larger share of total statewide VMT.

[63] For additional information, see final TIWG report in Appendix 4.

[49] According to E2SHB 2815, vehicle miles traveled (VMT) is the number of miles that vehicles less than 10,000 pounds are driven. VMT is a proxy for GHG emissions from the transportation sector.

Success with these strategies also requires coordination among Regional Transportation Planning Organizations, cities, counties, the Washington State Department of Transportation (WSDOT), transit agencies, and transportation stakeholders.

Develop and Enhance a Washington State Transportation Access Network

A "Washington State Transportation Access Network" is a strategy to ensure that public transportation provides vital connections to enable travel throughout Washington and to provide affordable alternatives to a car-dependent lifestyle. Given the different land use and transportation demands in Washington, the access network will have different features in various areas around Washington.

The TIWG recommends several actions for state and local agencies to overcome existing barriers and implement this statewide public transportation system.

Enhance Urban Commute Trip Reduction and Rideshare Programs

- Expand the number of urban commute trips by vanpool, carpool, and telework. Implement compressed work week schedules statewide.
- Invest in vans and "park-and-pool" sites, where people can park their cars and ride together in a carpool or vanpool.
- Invest in ride-matching technology, outreach, and incentive programs—such as commute trip reduction, Growth and Transportation Efficiency Centers (GTECs), and residential-based trip reduction—to support growth in all commute options.

Create a Statewide Residential Trip Reduction Program

- Recommend an outreach and incentive strategy to encourage all travelers, not just commuters, to use ways other than driving alone for their trips.
- Use tailored marketing strategies to inform travelers of their options and broaden the state's trip reduction efforts beyond the commute.[65]

Compact and Transit-Oriented Development

Compact and Transit-Oriented Development (CTOD) provides the density, infrastructure, and amenities to encourage the use of forms of transportation besides single occupancy vehicle. Washington's Growth Management Act (GMA) already enables, but does not require, local government planning to promote urban centers or CTODs.

The following recommendations focus on five specific elements of CTOD that represent the most promising ways to reduce per-person VMT:

[65] Over 75 percent of all trips taken are for other purposes than commuting to and from the workplace. In urban areas, many trips are short trips (five miles or less), and over 50 percent of the shortest trips (one mile or less) are made in cars.

Promote and Support Housing and Employment Density

- Legislatively expand the Multi-Family Tax Exemption to allow any city planning under GMA to leverage and maximize the use of this tool.
- Adjust grant criteria to support CTODs, including creating new revenue sources to fund them—such as tax credits, loans, and revolving funds. Identify new finance mechanisms that support increased density in CTODs.
- Develop measures to reduce per-person VMT. Involve the public in preparing these measures for inclusion in the Regional Transportation Plans. WSDOT should conduct this work with Regional Transportation Planning Organizations and Metropolitan Planning Organizations.

This recommendation goes with several recommendations from the Land Use and Climate Change (LUCC) committee outlined in Chapter 7: land use consistency with regional transportation plans, financing tools for developer incentives, and new funding targeted to urban centers.

Develop and Provide Parking Incentives and Management

- Make regional parking maximums a requirement of Regional Transportation Plans.
- Develop parking management education programs and assistance that recognizes the importance of parking management in CTODs.
- Explore revenue and funding options, such as a parking tax for dense urban locations. Use these funds for projects and programs in the CTOD and tax credits for lower parking ratios.
- Provide regional transportation funding for transit and multimodal facilities, such as transit centers, in return for developers increasing development density and minimizing project parking.
- Prohibit the construction of principal-use long-term parking. Allow shared parking, such as between businesses and residents at a mixed-use complex.
- Maintain state grant support for trip reduction programs focused on CTODs.

Encourage Bicycle and Pedestrian Accessibility

The legislature should affirm that walking and bicycling for transportation offer many benefits to individuals, their communities, and the state, including better health for people and no harmful pollution. As part of a balanced transportation system, walking and bicycling will reduce car trips and the GHG emissions they cause.

The legislature should adopt policy based on the concepts identified in the Complete Streets national movement, while recognizing certain conditions (such as high cost for particular elements).

Encourage Urban Brownfield Redevelopment

State funding and a grant program should be included to enhance the state's brownfield revolving loan fund to promote compact development.

Transportation Concurrency

The TIWG and CTED's LUCC committee developed recommendations related to transportation concurrency.[66] The specific LUCC recommendations that align with the TIWG concurrency recommendations are:

- Better enable GMA Transportation Concurrency to address all modes of transportation.
- Provide assistance and guidance to local governments on how to support multimodal improvements or strategies in their transportation concurrency regulations.
- Require local governments to consider multimodal improvements or strategies in their transportation concurrency regulations.

Funding Criteria and New Revenue Sources

The transportation funding recommendation includes two parts:

Align Transportation Investments and Operations With E2SHB 2815

State, regional, and local transportation investments and operations should be aligned with the statutory reductions for VMT and GHG emissions in E2SHB 2815. Harmonizing these efforts will mean reviewing not only proposed new investments but also existing investments. The review should ensure that Washington's transportation policies can achieve GHG and VMT reductions as well as meet other objectives of transportation funding.

Pursue New Revenue Sources to Support Transportation Choices

Washington State should seek new revenue sources to support transportation choices, particularly transit options. The state needs to make system-wide improvements in distributing funds to meet the existing objectives of Washington's transportation sector. In addition, Washington needs a funding approach to transportation that produces revenue sufficient to provide those options—including support for transit—that are vital to meeting Washington's GHG emissions and per-person VMT reduction benchmarks. The current local and state transportation funding sources are not adequate or stable. The gas tax cannot supply revenue to support increased local transit needed to reduce GHG emissions and per-person VMT.[67]

Creating new transportation funding options based on user fees other than the gas tax provides the best opportunity to produce future revenue for system improvement, operation, and maintenance. Such an approach can also help reduce demand for single occupancy vehicle travel and support transportation options.

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[66] Transportation concurrency means that transportation infrastructure (e.g., roads) must be available to carry the traffic of a proposed new development at designated level-of-service standards. Local governments can require developers to pay impact fees to help cover the cost of the necessary infrastructure improvements.

[67] Of Washington State's transportation funding, 79 percent is generated through the state's 37.5 cent per gallon gas tax and the federal gas tax. The transportation sector's dependence on gas consumption for revenue creates a paradox: as citizens contribute to climate solutions by driving less and using more fuel-efficient vehicles, the revenue available for transportation projects declines, including potentially for those projects designed to reduce GHG emissions and per-capita VMT. Moreover, external factors such as unstable fuel prices and improving fuel economy standards result in less fuel usage, further reducing revenue.

The 2007 CAT identified several revenue tools for the legislature to consider. The TIWG prepared a recommendation on transportation pricing (see below) proposed for the 2009 legislative session. The original list from 2007 remains relevant, however. It contains revenue tools worthy of more consideration, including user fees, local option taxes, and statewide revenue sources.

Transportation Funding and Pricing Strategies

Transportation pricing strategies are recommended to meet three goals:

- Reduce per-person VMT and GHG emissions.
- Raise needed revenue.
- Manage the system for better efficiency and reliability.

Usage-based pricing strategies—such as tolls, parking charges, and VMT or gasoline taxes—cause travelers to adjust their travel habits and reduce per-capita VMT and GHG emissions accordingly. Pricing strategies can contribute to more reductions in GHG emissions and VMT per person when they fund alternatives such as transit, ridesharing, bicycling, and walking. They can also provide incentives to invest in more fuel-efficient vehicles.

The following recommended actions could increase the effect of pricing to achieve the per-person VMT and statutory GHG emissions reductions:

- **Consider per-person VMT and GHG emissions reductions as a third objective** to WSDOT's existing tolling objectives of revenue generation and efficient traffic management.[68] Include this objective in project design, development of pricing strategies and actions, and regulation of toll rates.
- **Use toll revenues to fund more sustainable travel patterns**, such as public transit and carpooling. The legislature should direct WSDOT to include transit operations and other sustainable transportation investments, such as improved freight mobility in urban corridors, as part of tolling decisions.
- **Design toll strategies to provide incentives for individuals to reduce their VMT** and GHG emissions. The Washington State Transportation Commission should establish toll rate policies that encourage drivers to make fewer and shorter trips, use less polluting vehicles, and consider alternative modes besides driving alone.
- **Apply tolling more broadly** to promote revenue, efficiency, and GHG emissions reductions. Two specific recommendations include:
    - In 2009, the legislature should grant authority for tolling of the cross-Lake Washington corridor, including both State Route 520 and Interstate-90.

[68] E2SHB 1773 established a legislative policy framework for tolling. This framework provides the legislature with authority to impose tolls and maintains the Transportation Commission's role to set toll rates for tolled facilities. By law, Washington State's objectives for tolling include both generating revenues for transportation and providing a mechanism to help manage traffic volumes and congestion.

    - In 2010, the legislature should establish a task force to review tolling authority. The group should explore how to move toward a system-wide tolling policy, rather than a project-by-project approach.

- **Establish a task force on state and local transportation funding** to propose tolls and other pricing mechanisms. These funds could support transportation and transit needs and create price incentives to reduce per-capita VMT and GHG emissions. Passing expanded legislation on transportation pricing and funding should be the goal. The pricing mechanism should be designed to:
    - Give priority to transit and freight operations to improve the movement of people and goods.
    - Be fair, consistent, and transparent, so that users can see the value of the pricing. Pricing mechanisms should provide users with reasonable alternatives, such as improved transit service and reliability. Stakeholders, such as freight interests, should receive direct benefits from their user fees.

Non-VMT Actions to Reduce Transportation Emissions

We need a multi-part way to address the climate impacts of the transportation sector, one which can be scaled to meet the size of Washington's need. Building on the work of the 2007 CAT, five additional transportation policies are recommended. (See the full TIWG report for a list of potential specific projects and actions.)

- **Increase the use of rail for the movement of both passengers and freight.**
- **Encourage GHG emissions reductions and fuel-efficiency improvements in diesel engines** by enacting the original 2007 CAT strategy (T-7: *Diesel Engine Emission Reductions and Fuel Efficiency Improvements*).
- **Implement a package of Transportation Systems Management strategies.** The TIWG has built on the work of the 2007 CAT and identified the potential GHG emissions reductions from transportation system management strategies. The TIWG is not making a recommendation beyond that of the 2007 CAT.
- **Speed the availability and use of Plug-In Hybrid Electric Vehicles** (PHEVs) and electric vehicles.
- Ecology and other affected agencies should seek resources from the 2010 legislature to **evaluate and adopt a Low Carbon Fuel Standard** (LCFS) appropriate for Washington. (Note that a 2010 request would come after the implementation of the California LCFS and allow Washington to benefit from California's experience).

Table 6-3 summarizes the transportation strategies and their projected emissions reductions in 2020.

Table 6-3. Summary of Transportation Strategies

Strategies	Projected 2020 Reductions ($MMtCO_2e$)
Transit, Rideshare, and Commuter Choice	2.6
Compact and Transit-Oriented Development	1.7
Climate Change and Transportation Funding	N/A
Transportation Pricing	1.0*
Non-VMT Reduction Strategies	Not Quantified
TOTAL Gross Emissions Reductions	5.3
TOTAL Estimated Overlap Among Beyond Waste Options and Recent Actions	0
TOTAL Net Emissions Reductions	**5.3**

**Quantified as part of 2007 CAT Report.*

State Environmental Policy Act

The State Environmental Policy Act (SEPA) provides a way to identify possible environmental impacts, including the effects of greenhouse gas (GHG) emissions, that may result from governmental decisions. These decisions may be related to issuing permits for private projects; constructing public facilities; or adopting rules, policies or plans.

Information provided during the SEPA review process helps agencies, applicants, and the public understand how a proposal will affect the environment. This information can be used to change a proposal to reduce likely impacts or to deny or place conditions on a proposal when adverse environmental impacts are identified.

The growing concern about GHG emissions and the recognition of their significant adverse impacts on the climate and the environment have placed a new focus on the SEPA review and decision-making process.

Many states and local governments have adopted policies, rules, and guidance to address climate change in their environmental review processes. Some have done so to help avoid court challenges. In Washington State, many public agencies—along with businesses and community groups—are facing pressure to identify and address potential effects of GHG emissions from proposed actions and projects. These entities are seeking clear, consistent, and predictable ways to address how proposed actions affect GHG emissions or climate change.

The SEPA Implementation Working Group was formed to provide guidance for considering climate change in public decision making.[69] The recommendations focus on how state agencies, local governments, and the private sector should analyze, disclose, and mitigate GHG emissions and the effects of climate change on actions under SEPA. The recommendations also describe ways to use SEPA to provide incentives for "climate friendly" plans, policies, and projects.

[69] For additional information, see full SEPA IWG report in Appendix 5.

Some recommendations require more work—mainly by Ecology and its stakeholders—as the effort to provide clarity on how to address climate change under SEPA continues. Some areas also relate to topics covered elsewhere, such as land use and transportation. These areas may need follow-up work before they can be put into action.

GHG Emissions Measurement and Disclosure

Methods for measuring GHG emissions are rapidly evolving, and measurement tools are proliferating. The SEPA IWG recommends that Ecology provide clear direction to SEPA project sponsors and public agencies about what to measure and how to measure under SEPA, especially for typical types of projects and other non-project actions such as SEPA review of planning documents. Lead agencies would have flexibility, when needed, to address projects and proposals with different sources of emissions. To provide clear direction to public agencies and project sponsors Ecology needs to:

- Revise the SEPA Environmental Checklist to include climate change factors.
- Provide guidance on measuring GHG emissions from projects and non-project actions. The SEPA IWG prepared an initial set of criteria on what to measure and a list of 16 emissions sources.
- Work with other state and local agencies, SEPA project sponsors, and the public to develop and update easy-to-use tools to measure GHG emissions.
- Provide guidance to project sponsors and public agencies on how to use qualitative analyses of GHG emissions when quantitative tools are not appropriate for some types of proposals.

Develop Approach to Threshold Determination

The *threshold of significance* is a standard or set of criteria a SEPA lead agency uses to determine if the environmental effects of particular project are significant enough to require preparation of an Environmental Impact Statement (EIS) under SEPA. If the proposed action exceeds the significance threshold, the SEPA project sponsor can offer voluntary mitigation to reduce the emissions below the threshold to avoid the need for an EIS. The SEPA IWG recommends that Ecology develops an approach to threshold determination under SEPA based on the following points:

- All lead agencies should adopt a significance standard.
- Washington should create a statewide standard of significance for lead agencies that lack their own standard.
- Lead agencies should have the option to set their own standards, subject to minimum requirements set in guidance, rule, or statute.
- Project sponsors should have options for obtaining a Determination of Non-Significance (DNS) for climate impacts.
- Significance standards should be linked to the statewide requirements for GHG emissions reductions.

Guidance on Mitigation

A state or local agency with authority over a proposal can require actions to mitigate (lessen) adverse environmental impacts. To support the required mitigation, the agency must have "substantive SEPA" policies in place and identify them in its review. Mitigation is voluntary at the threshold determination stage. At the point of final decisions on proposals, agencies have the power to require mitigation but are not required to do so under SEPA.

The SEPA IWG recommends that Ecology should assist public agencies and project sponsors by:

- Defining criteria or methods for measuring the effectiveness of existing and "newly" identified mitigation strategies (for example, how many tons are mitigated).
- Providing information on costs and savings from each strategy, if and when available.

Conceptual Ideas for Leveraging SEPA

The SEPA IWG recommends four ideas for using SEPA to provide incentives to promote climate friendly development. This "leveraging of SEPA" is an area for future work. The SEPA IWG recommends the following four ideas to leverage SEPA to reduce GHG emissions:

- **Neighborhood and District-Level Exemptions—**This "exemption" would be for certain areas within an urban growth area (UGA), where property owners agree to comply with minimum standards for sustainable development set in statute.
- **Upfront SEPA—**This idea would allow the use of programmatic SEPA review and adoption of rules that address and mitigate impacts of climate change. The Land Use Climate Change Advisory Committee has a similar recommendation.
- **Voluntary Mitigation List and "Green List" Projects—**Under this idea, projects that include mitigation measures contained on a "green list" can be fully or partially exempt from further GHG reduction requirements.
- **Regional Planning—**This idea involves adoption of a statewide EIS for a regional or statewide Climate Change Plan, which could then be adopted into local plan-level EISs.

Future Vulnerabilities in the Environmental Checklist

The SEPA IWG recommends that Ecology should take the following actions:

- Revise the SEPA Environmental Checklist to include analysis of how predicted changes in the existing environment due to climate change, combined with proposed actions, may create additional impacts on the natural and built environment.
- Provide guidance on how to conduct the analysis outlined above. The required analysis should be based on readily available tools and resources and not require project sponsors to conduct new studies.

As future work and recommendations are put into action to include climate provisions under SEPA, these additional concerns should be considered:

- Resources, capacity, and constraints of the local governments charged with enacting the new policies.
- Training and funding for lead agencies and applicants.

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7. Land Use and Climate Change

By 2025, we expect 1.5 million more people will live in Washington. To meet emissions and vehicle miles traveled (VMT) reductions, we need to direct this growth to compact urban developments, while also reducing low-density development. The Climate Action Team (CAT) and other policy committees working on climate change agree that priorities for action are to integrate land use and transportation planning and development.

Focusing on these priorities will help reduce VMT and greenhouse gas (GHG) emissions related to transportation. They will also help protect rural and resource lands from conversion for development. Several compatible land use and transportation-related actions are being recommended from these various efforts, with widespread support from diverse perspectives and stakeholders. These ideas clearly point to the need for an integrated climate change strategy on land use that covers planning, environmental review (under the State Environmental Policy Act, SEPA), development standards, incentives, guidance, and voluntary tools.

The decisions we make about how we develop and use land directly affect transportation options available to residents, including how far they need to travel from their homes to get to work, shopping, and other family activities. We need to slow down development of farm and forestland, and instead to direct development into higher density urban areas. This change can reduce VMT per person by 20 to 40 percent and transportation-related GHG emissions by 7 to 10 percent by 2050.[70]

The recommendations and ideas in this chapter have been generated by, and are consistent with, the collective thoughts of the workgroups below.

- The **Climate Action Team** (CAT) has three Implementation Working Groups that addressed land use topics: Transportation (TIWG), Energy Efficiency and Green Building (EEGB), and the State Environmental Policy Act Implementation Working Group (SEPA IWG).
- CTED's **Land Use and Climate Change** Policy Advisory Committee (LUCC)[71]
- The **Forest Sector Workgroup on Climate Mitigation (FSW)**[72]
- CTED's **Transfer of Development Rights** (TDR) Policy Advisory Committee

These various strategies and recommendations also reinforce a number of other major public policy initiatives underway in Washington, including the Action Agenda of the Puget Sound Partnership (PSP), and Ecology's Mitigation that Works Forum (MTWF).

[70] Urban Land Institute, *Growing Cooler: The Evidence on Urban Development and Climate Change*, October 2008.

[71] Created with the passage of SB 6580. For additional details, see final report at www.ecy.wa.gov/climatechange/2008GMAdocs/2008LUCC_finalreport.pdf.

[72] The Forest Sector Workgroup on Climate Change Mitigation report is available in Appendix 6.

Compact Urban Development

Promoting compact urban development and reducing low-density development is already Washington's policy as stated in the Growth Management Act (GMA).[73] All local communities in Washington can achieve compact urban development at a scale appropriate for them. Compact urban development refers to areas intentionally selected to:

- Promote high density of housing and jobs.
- Provide efficient transportation options and connections, including transit, walking, and bicycling.
- Include a full range of land uses.
- Incorporate strong provisions addressing building design, effective street design, and a full range of amenities (e.g., parks/open space, "complete streets") that attract people to walk.
- Include various housing types, particularly affordable housing options for different economic segments of the community, including vulnerable populations.

In many cases, compact urban development may also include these additional features:

- Regional public and institutional uses, such as libraries or schools.
- A receiving area for transfer of development rights (TDR), in jurisdictions where a TDR program is in place.[74]
- Parking management, to reduce the amount of land used for parking.

Benefits of Compact Urban Development

Directing growth to compact urban centers can provide the following benefits:

- Decreasing the need to travel by private vehicle and vehicle miles traveled.
- Decreasing transportation-related GHG emissions.
- Conserving resource lands, including agricultural, forestry, and mineral lands of long-term commercial value.
- Preserving rural areas, including priority habitat for fish and wildlife.
- Providing public and private infrastructure and services more efficiently.
- Decreasing energy use per capita.
- Promoting economic development and jobs in close proximity to a majority of residents in urban areas.

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[73] RCW 36.70A.020 (1) and (2).

[74] A receiving area is designated for high-density development in a TDR program. Developers in receiving areas can purchase development rights from landowners in areas designated for preservation to allow them to develop areas at higher density than would otherwise be allowed.

- Improving water quality in nearby water bodies by reducing runoff and through higher quality and more efficient stormwater management.
- Providing various housing types more likely to be affordable than a dominant pattern of single-family housing.
- Promoting recreation and tourism industries in rural and natural resource lands.

Recommendations

Planning

These recommendations make the connection between land use planning, transportation, VMT, and GHG emissions. Local governments need help to make progress in reducing GHG emissions and VMT through smarter land use patterns. The next updates to local comprehensive plans under GMA are due starting in 2011. Near-term action on these ideas is needed to help provide the tools that local communities need to address climate change and reduce VMT through land use and development.

- Amend the environment goal in the Growth Management Act (GMA) to address climate change. Cities and counties would be required to consider climate change issues in their comprehensive plans (LUCC).
- Require counties and the cities within them to set policies for addressing climate change (LUCC).
- Require local governments to consider all modes of transportation in their planning efforts (LUCC, TIWG).
- Require local comprehensive plans to be consistent with the regional transportation plans (LUCC, TIWG).
- Provide technical guidance to local governments on:
    - Planning multimodal transportation systems and transportation concurrency (LUCC, TIWG).
    - Voluntary incentives for developers that local governments can use to encourage compact development in urban growth areas or designated urban centers (LUCC).

Leveraging SEPA to Promote Compact Urban Development

The review process under the State Environmental Policy Act is another tool for promoting compact urban development. We recommend leveraging SEPA to:

- Encourage greater use of SEPA during planning for neighborhoods and subareas to streamline project-specific environmental analysis for compact development (LUCC, SEPA IWG).
- Fund and amend the Planning and Environmental Review Fund (PERF) to become a revolving loan fund to fund SEPA reviews “upfront” (LUCC, PSP).

- Prioritize PERF funds to support compact urban development projects (LUCC, PSP).
- Allow local governments to charge back SEPA review costs to developers (LUCC, PSP).
- Develop lists of voluntary mitigation and "green" projects (SEPA IWG). *Note this conceptual idea is recommended for further consideration.*
- Develop a statewide Environmental Impact Statement (EIS) on GHG emissions, impacts, and mitigation that can be adopted into local EISs (SEPA IWG). *Note this conceptual idea is recommended for further consideration.*
- Include future vulnerabilities and adaptation measures in EISs (SEPA IWG). *Note that this idea is not a recommendation, but an idea advanced for further analysis by Ecology.*

Additional Tools, Requirements, and Incentives

The following recommendations are also made related to compact urban development.

- Support regional transfer of development rights programs to encourage compact development in urban areas and conserving farms, working forests, rural lands, and open space (LUCC, TDR, PSP, FWG, MTWF).
- Encourage biking and walking, including adoption of the concepts in the Complete Streets national movement (TIWG).
- Parking incentives and management designed to decrease car trips (TIWG).
- Promote redevelopment of polluted "brownfields" to encourage infill and promote economic activity (TIWG, PSP).
- Provide incentives for housing and employment density, including expanding use of the multi-family tax exemption in HB 1910, maximizing financing to support existing infrastructure and development, and using public/private partnerships (TIWG, LUCC).[75]
- Establish incentives and code requirements to increase energy efficiency and green building techniques (EEGB, FWG).

All of these recommendations and ideas share the same goals:

- Promoting well-planned density and infill development in existing urban areas.
- Providing housing near jobs and services.
- Increasing access to and use of climate-friendly transportation options.

Broadly, these recommendations and ideas share the goal of promoting higher density development that provides a range of uses and a variety of multi-modal transportation options. Helping communities plan for and build these compact communities is a key part of meeting the state's required reductions in GHG emissions and benchmarks for VMT reduction.

[75] Codified as RCW 84.14.

8. Western Climate Initiative Cap-and-Trade

Launched in 2007, the Western Climate Initiative (WCI) includes seven states and four Canadian provinces, as shown in Figure 8-1. Together, the WCI represents more than 70 percent of the Canadian economy and 20 percent of the U.S. economy. This chapter summarizes the WCI design for a cap-and-trade program to create a regional market and reduce greenhouse gas (GHG) emissions.

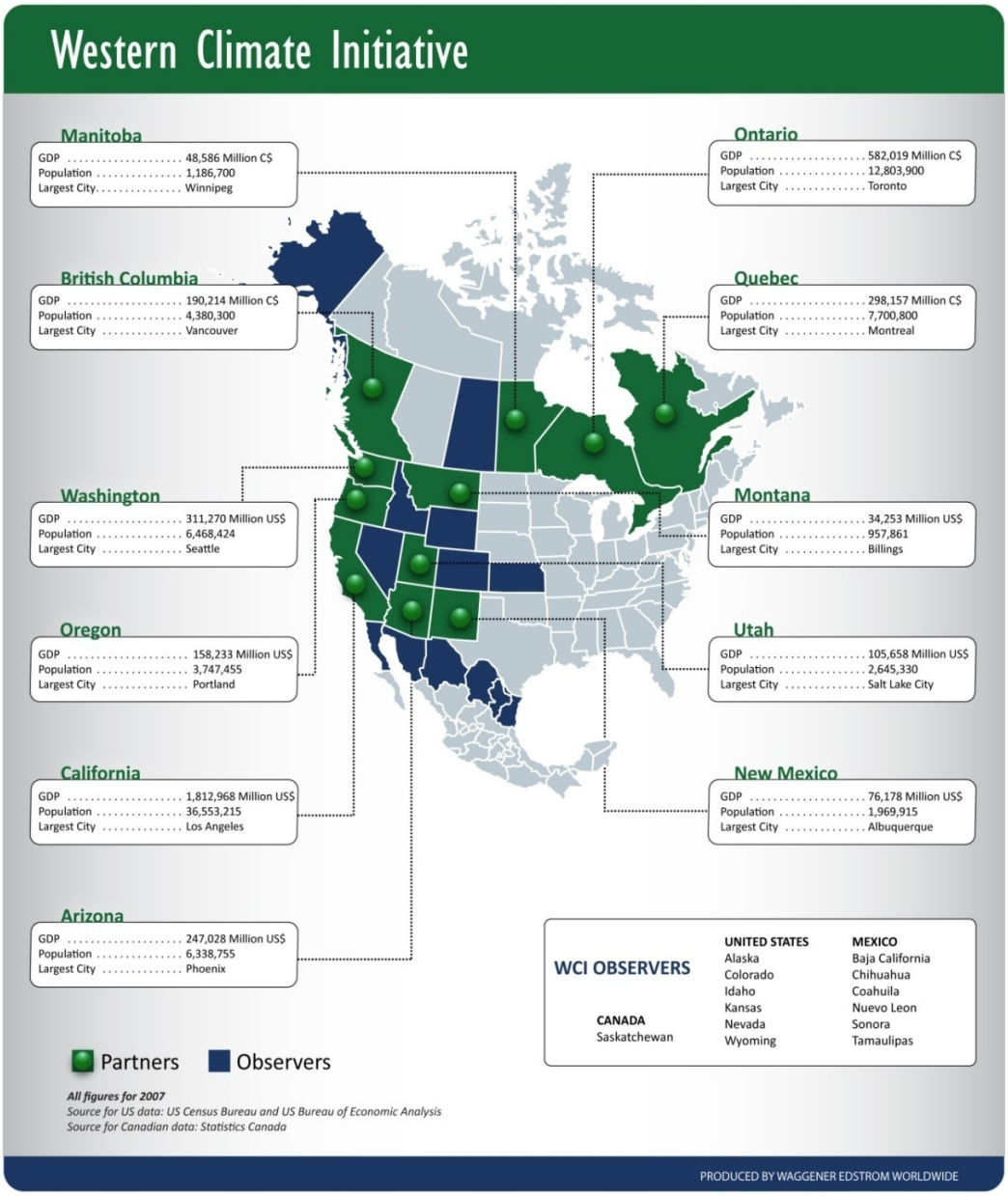

Figure 8-1. Map of WCI States and Provinces

WCI Cap-and-Trade Design

E2SHB 2815 directed the Department of Ecology (Ecology) and the Department of Community, Trade, and Economic Development (CTED) to provide the legislature with:

- The cap-and-trade program designed by the WCI.
- The legislation and budget to implement it on January 1, 2012.
- Recommendations on how to prevent manipulation of the allowance market created by the program.
- Any changes needed to the mandatory reporting rule included in the bill.
- Recommendations on how certain elements of the Washington economy can voluntarily participate in that market.

This chapter presents a summary of these issues. The legislation and budget will be delivered separately.

The recommended cap-and-trade program designed by the WCI will create the most comprehensive cap-and-trade program in the world to date. By 2015, we estimate the WCI will cover over 90 percent of Washington's emissions, as shown in Figure 8-2. The WCI has done some preliminary economic modeling of the design. That modeling found that the program will result in a modest overall cost savings to the economy. The upfront investment to reduce emissions is returned to businesses and individuals through savings on energy bills.

Much work remains to do on the details of the WCI cap-and-trade design. What has been recommended to date is the policy framework that largely outlines what must be the same between the participating jurisdictions to have a functional regional market, and where each state and province may exercise its discretion without distorting the market. The specific details for the cap-and-trade program will be determined through administrative and legislative processes.

WCI Cap-and-Trade Program Highlights

Under the recommended design, the program will set a total limit (or "cap") on GHG emissions for each of the jurisdictions participating in the regional program. The state will issue allowances (tradable permits for emissions) in an amount that equals the estimated total emissions from capped sectors, as shown in Figure 8-2. These distributions will likely happen on a quarterly basis each year. The cap will decline over time to levels specified by Washington State's statutory emissions reductions. The steady decline in emissions ensures that Washington will meet its statutory reductions for GHG emissions in 2020.

Below is a brief summary of the WCI cap-and-trade program design. For a full explanation of these and other elements of the program, see the full *WCI Design Recommendations*.[76]

[76] Available at www.ecy.wa.gov/climatechange/WCIdocs/092308WCI_DesignRecommendations_full.pdf.

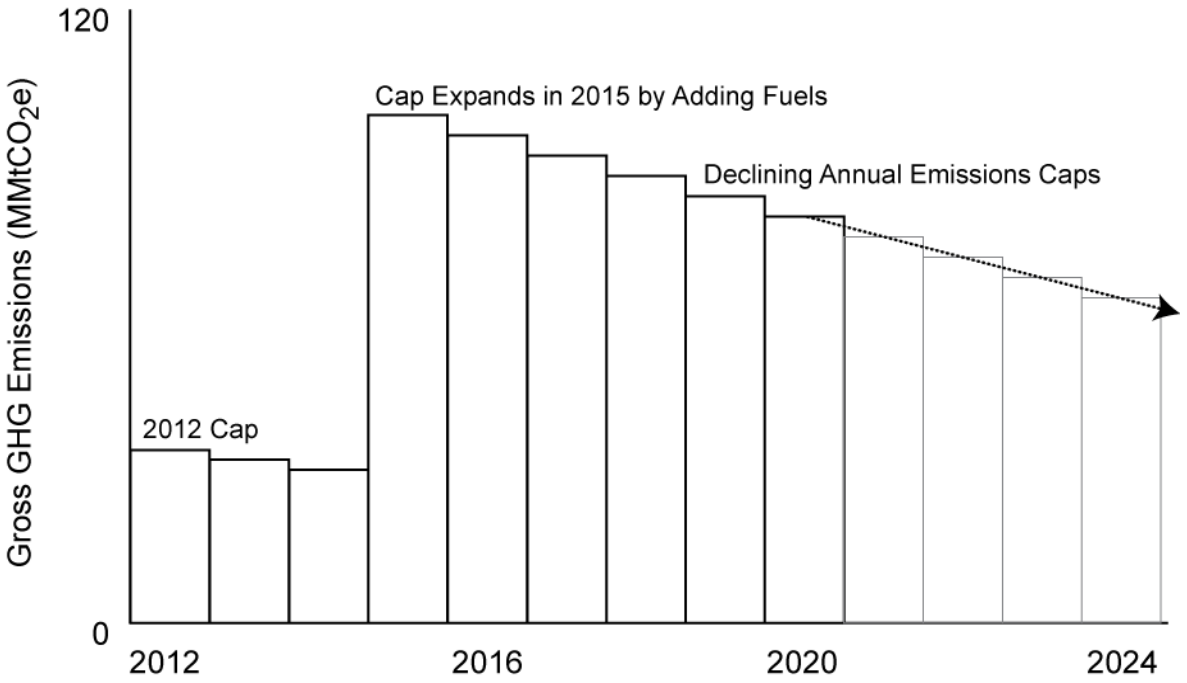

Figure 8-2. Annual Washington Emissions Cap Under WCI Cap-and-Trade

Regional Cap and Budgets

The WCI regional cap will establish the combined limit on GHG emissions in the whole WCI. Each participating state and province will receive a share of that regional cap, called a budget, which is based in part on its own GHG reduction goal.

In 2012, the first year of the program, a one-time adjustment to each WCI state or province budget will be made. Each jurisdiction will contribute 1 percent of its initial budget into a common pool. That common pool of allowances will then be redistributed among the participating jurisdictions based on the amount of electricity it generates and consumes, its population growth, and its share of the total emissions between 2001 and 2005.

Early Reduction Allowances

Another one-time adjustment will be made in 2012 that will recognize certain early actions to reduce emissions. A facility or entity covered by the program that reduces its GHG emissions between 2008 and 2012 (or the day before the program starts) may receive allowances for those early reductions if they meet certain criteria. The WCI states and provinces are currently developing those criteria. These allowances are in addition to the state and province budgets and are referred to as “Early Reduction Allowances.” They will have the same value and use as any other allowance in the system.

Program Coverage

The WCI program covers all six major GHGs and the following sectors of the economy, as shown in Figure 8-3: [77]

- Electricity, including imported electricity (beginning in 2012)
- Industrial and commercial combustion of fossil fuels at large sources, such as factories and refineries (beginning in 2012)
- Industrial process emissions, such as those produced at cement kilns (beginning in 2012)
- Gasoline and diesel fuel used for transportation (beginning in 2015)
- Residential and commercial fuel use, such as oil and natural gas used for home heating (beginning in 2015)
- Industrial fuels sold to facilities below the emissions threshold for direct coverage (beginning in 2015)

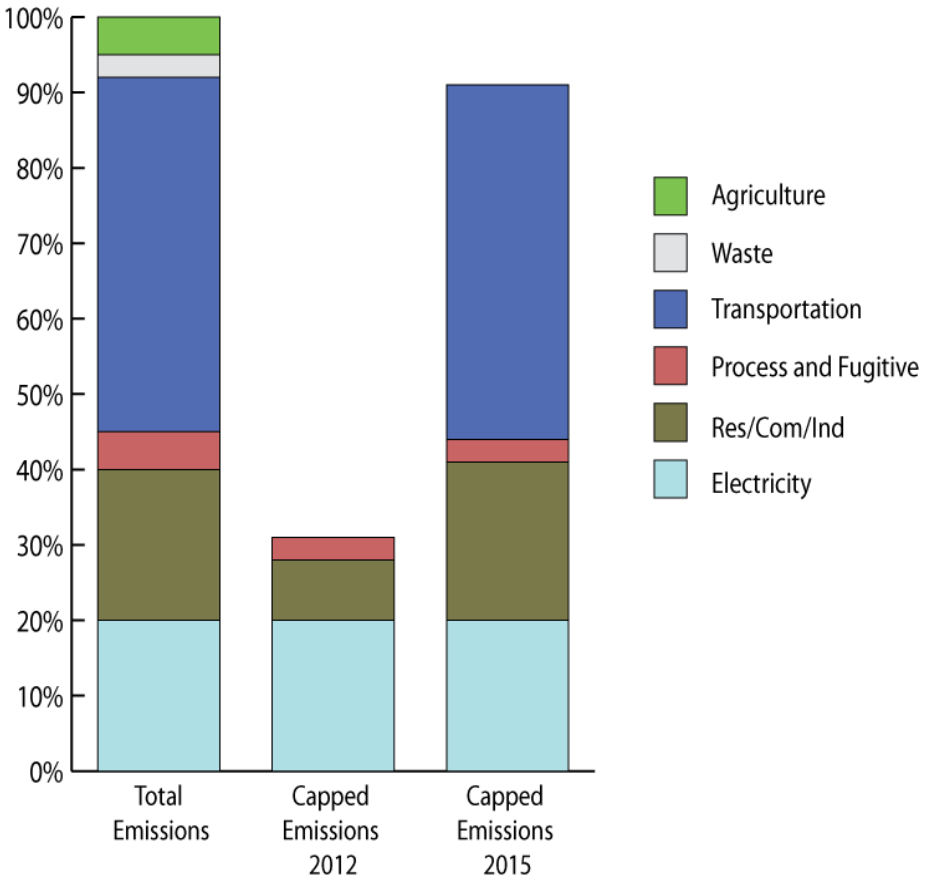

Figure 8-3. Washington's Total GHG and Capped Emissions for 2012 and 2015

[77] The six primary GHGs covered in the program include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF_6).

Reporting and Compliance

Consistent with the direction in E2SHB 2815, the program will start in 2012. Facility emissions reporting for the WCI must begin in 2011 for 2010 emissions. Under the current Washington law, reporting from facilities whose emissions exceed 10,000 metric tons of the covered greenhouse gases (expressed in metric tons of carbon dioxide equivalents, or $MtCO_2e$) annually will begin in 2010 for 2009 emissions, consistent with the WCI requirement.

The WCI cap-and-trade program will regulate facilities that emit more than 25,000 metric tons of the covered greenhouse gases each year. Beginning in 2015, the cap will also cover facilities that deliver transportation, residential and commercial fuels as well as industrial fuels to users below the threshold. Each covered entity will need to submit to the state enough allowances to cover its emissions during the preceding three-year "compliance period." (The initial three compliance periods are 2012 to 2014, 2015 to 2017, and 2018 to 2020.)

Compliance Flexibility

The proposed WCI design contains a great deal of flexibility, which will further enable covered facilities to make reductions when and where they are most cost effective. Cap-and-trade is itself a flexible compliance mechanism as it does not mandate where reductions occur. The multi-year compliance periods also provide flexibility as do the Early Reduction Allowances. In addition, the design recommends the acceptance of offset credits. Those are credits for projects that reduce emissions outside the capped sectors or at facilities that are within a capped sector but whose emissions are below the threshold.

Allowances may be indefinitely banked between compliance periods, although borrowing from future compliance periods will not be allowed. A limited amount of allowances from other cap-and-trade programs will also be accepted to help meet a compliance obligation.

Offset Projects

The WCI recommends that forestry, agriculture, and waste management be the priority areas for development of offset projects. The program limits the use of offset credits to 49 percent of the total reductions required. This limit will ensure a majority of the reductions come from within the capped sectors and increases the potential that the capital investments needed to achieve reductions and the jobs associated with those investments occur in Washington.

Individual WCI states and provinces may have lower limits on the use of offset credits. There will be no limitation on the location of offset projects. The WCI will develop or modify existing protocols for offset projects to ensure that the credits issued for those projects are fully fungible throughout the WCI region.

Auctions

Finally, the design recommends that a minimum of 10 percent of the allowances be auctioned and that the auctions be coordinated throughout the region to minimize any market distortions. This percentage is recommended to increase to at least 25 percent by 2020.

Some amount of auctioning is necessary for price discovery, which helps prevent manipulation in the secondary allowance market. Beyond that, however, the WCI believes that the maximum auction level should be determined by each state and province, taking into account the potential

economic impacts on the industries that would have to participate in that auction, the potential for job leakage or manufacturing slow down if there are shifts to states that are not limiting greenhouse gas emissions or auctioning allowances, and the potential revenue that may be generated by the auctions.

What Elements Must Be the Same in Each State and Province

For the WCI to have a functioning regional market, certain elements of the program must be the same in each state or province.[78] Generally, these elements are those areas of the program that affect the value and tracking of allowances or offsets, including the reporting requirements that assure all covered emissions are reported, measured or calculated in the same way, and that reductions or increases in emissions are properly captured. The elements of the cap-and-trade program that must be the same in each of the jurisdictions are:

- Minimum reporting requirements.
- Sectors and gases covered by the program.
- Where specific fuels and emissions are regulated (referred to as the point of regulation).
- How GHG emissions are calculated at the state and facility level.
- How to set the cap for the entire region and distribute allowances to the states and provinces.
- The length of the compliance periods.
- Policies on banking and borrowing of allowances.
- Criteria for recognizing early actions.
- Criteria and protocols for offsets.
- Maximum amount of offset credits allowed.
- Rules for holding auctions, including how to set the auction reserve price.
- Links to other cap-and-trade programs.

What Elements Can Be Different Between the States and Provinces

Other elements of the program can be tailored to the individual state or province without affecting the functioning of the market. Each WCI state or province has complete discretion for determining those elements, which include:

- The allocation of allowances within the state: free, auctioned, or a combination.
- To whom allowance should be allocated: covered sources, individual citizens, or any combination.
- The maximum percentage of allowances auctioned.

[78] The WCI states and provinces are in the process of developing a joint work plan to address these issues, including how stakeholders can be more actively involved in them. The budget request from the Department of Ecology includes a request to participate in this joint development process.

- More stringent limits on the use of offset credits.
- Setting aside allowances for specific uses such as for new entrants.
- Recognition of reductions for early actions that do not meet the requirements for Early Reduction Allowances.

Preventing Manipulation of the Allowance Market

Preventing market manipulation is a top priority of Ecology and CTED. Operating under a contract with Ecology, ICF International was asked to examine the potential for manipulation of the allowance market and recommend options for limiting this type of behavior.[79] There are three primary areas of the allowance market that are of concern:

- Auction design and operation.
- Market oversight.
- How and when certain information is disclosed.

The general findings were:

- There is no evidence of market manipulation in existing cap-and-trade programs (U.S. SO_2, NO_x, or the European Union Emissions Trade Scheme).
- The Commodities Futures Trading Commission, Federal Energy Regulatory Commission, and the Security and Exchange Commission will likely have oversight responsibility for some portion of the WCI allowance market.
- Allowance markets bear no resemblance to electricity markets because:
    - Carbon allowances will be much more broadly owned, making it difficult for a handful of bad actors to create a shortage.
    - Carbon allowances can be banked unlike electricity, which cannot be banked.
    - There are no "critical" times for carbon allowances—there is a three-year compliance period that allows ample time for covered facilities and entities to acquire the necessary allowances. Electricity demand on the other hand must be met instantly to maintain system reliability.

Specific recommendations from ICF included that the WCI should:

- Contract with an independent market monitor to provide monitoring and oversight as did the Regional Greenhouse Gas Initiative (RGGI).[80]
- Adopt the "beneficial ownership" disclosure requirements, also as did RGGI.[81]

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[79] The paper is now available on the climate change page of the Department of Ecology website. For more information on ICF, see their website at www.icfi.com.

[80] RGGI is a regional cap-and-trade program for electricity GHG emissions that includes Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont

- Use the "single-round, uniform price" method for any auctions conducted.[82]

The WCI has formed a new committee on Market Operations and Oversight. Preventing manipulation and excessive speculation are part of the primary tasks of this committee. The WCI will work with RGGI on lessons learned from its initial auction and how it oversees its allowance market. The WCI also expects to work with EPA, which has successfully operated the sulfur dioxide (SO_2) and nitrogen oxides (NO_x) cap-and-trade programs.

Alternatives to Cap-and-Trade

To reach our statutory emissions reductions, we believe it is necessary to implement a centerpiece policy to reduce GHG emissions. Ecology and CTED recommend adopting the WCI cap-and-trade program for many of the reasons outlined above. Two other centerpiece policies that could be used to regulate GHG emissions either in place of cap-and-trade or in addition to cap-and-trade are discussed below.

Carbon Tax

Some legislators and stakeholders have expressed interest in pursuing a carbon tax to reduce GHG emissions instead of adopting a cap-and-trade program.[83] The two policies are not mutually exclusive and can be implemented side-by-side. This approach is most effective when both set an equivalent price on GHG emissions.

Under an emissions tax, policymakers would levy a fee for each ton of carbon dioxide-equivalent emitted or for each ton of carbon contained in fossil fuels. Companies and individuals would be motivated to cut back on their emissions if the cost of doing so was less than the cost of paying the tax. The general rule of thumb is that each $1 in tax will add about 1 cent to the cost of gasoline. With a carbon tax, the price for emissions is certain but the amount of reductions are not. Indeed, it is possible that a carbon tax would cause no reduction in GHG emissions.

In contrast, under a cap-and-trade program, policymakers set a limit on total emissions, which ensures reductions in emissions happen. Permits to emit, or allowances, would be bought and sold in the marketplace. The price for emissions would fluctuate with market demand and the use of other cost-containing design measures such as offsets and banking of allowances.

Both of these market mechanisms work by internalizing the cost of GHG emissions, rather than requiring companies or individuals to adopt specific technologies or behaviors to reduce pollution. Accordingly, market mechanisms provide compliance flexibility to the regulated community.

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[81] This approach requires that every participant must disclose the party sponsoring or benefiting from the agent's activities in the allowance market, if it was other than themselves or their immediate employers.

[82] This auction method is used by RGGI and the U.S. Treasury. Details of RGGI's auction design can be found at www.rggi.org/docs/rggi_auction_final.pdf.

[83] This discussion relied on the following reports: ICF Consulting, *Economic Analysis of a Cap-and-Trade Program: Combining Cap-and-Trade with Other Policy Instruments*, August 2008; Congressional Budget Office, *Policy Options for Reducing CO_2 Emissions*, February 2008, www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf; Pew Center on Global Climate Change, www.pewclimate.org.

Neither approach is inherently more complex than the other. Both require monitoring and enforcement, either to determine taxable emissions and guarantee payment in the case of a tax, or to ensure that allowances match overall emissions in the case of cap-and-trade. Both approaches also must address the question of how to distribute costs and benefits. Under a tax, that means determining who pays and what to do with the revenue; for cap-and-trade, it means determining how to distribute emissions allowances. If allowances are auctioned, policymakers will also need to decide what to do with that revenue. Both can be designed to target emissions either *upstream*, where fuels enter the economy, or *downstream*, where emissions occur.

On July 1, 2008 British Columbia instituted a carbon tax.[84] The tax applies to nearly all fossil fuels used in the province. The tax is currently $10 per metric ton. It will rise in increments to a limit of $30 per metric ton by 2012. Currently, there is no mechanism to adjust the tax to ensure it is sending the same price signal as the allowance prices established through the cap-and-trade program. The tax is considered revenue-neutral as any funds collected are returned to individuals and businesses, although not necessarily at the same level that the carbon tax may be paid by a specific individual or business.

The state is recommending a cap-and-trade program as the centerpiece of our GHG reduction policy because we believe it provides greater benefits overall: the cap assures reductions and the trading provides an incentive for all sectors of the economy—those covered by the program and those that are not—to reduce GHG emissions. Excess reductions, which include increased sequestration of GHGs, can be sold in the market place, whether in the form of emissions allowances or offset credits. A carbon tax does not provide any of these benefits.

Advantages of a Carbon Tax

The main advantage of a carbon tax is that it sets a clear price on emissions. This price provides companies and individuals with more certainty about the financial return of projects that reduce emissions. This price certainty may help lower the risk of investment and provide a stronger incentive for creating new technologies to reduce emissions.

A carbon tax also does not create a new market that has the potential to be manipulated.

Disadvantages of a Carbon Tax

The major disadvantage of a carbon tax is that it does not guarantee a specific amount of emissions reductions, which the science says is critical if we are to stem the tide of climate change. If the tax is not set at the right level, or the price response to the tax is not estimated accurately, the intended reductions may not be reached. Taxes are also considered more difficult politically to put into place than cap-and-trade. Finally, a tax does not create an offset market, which can help promote reduction or sequestration projects outside the taxed sectors of the economy.

[84] More information can be found at www.bcbudget.gov.bc.ca/2008/backgrounders/backgrounder_carbon_tax.htm.

Combining Cap-and-Trade and Carbon Taxes

Depending on whether and how a carbon tax interacts with a cap-and-trade program, the combination of these policies can either further reduce emissions or raise costs and be duplicative. For the two methods to work together, the price of an emissions allowance in cap-and-trade and of the carbon tax must be the same throughout the economy.

A tax and a cap-and-trade program can interact in two ways:

- **Direct Interaction.** The tax is levied directly on emissions already covered under the trading program.
- **Indirect Interaction.** The tax is not on entities covered in the cap-and-trade program, but it still affects the costs for those sectors.

It may be possible to avoid any interaction, if a tax is completely independent of the cap-and-trade program. In practice, however, this independence is likely difficult to achieve especially with an economy wide cap-and-trade program. These three options are discussed below in the following sections.

Direct Interaction

Direct interaction between a tax and a cap-and-trade program typically increases the cost to meet the emissions cap, without further reducing overall emissions. For example, consider a cap-and-trade program that covers gasoline for transportation, as currently recommended for WCI. This cap tends to raise the price of gasoline by internalizing the cost of the GHG emissions in the price of the fuel. If a carbon tax on gasoline is also applied, the price of gasoline would rise further, increasing the price signal to consumers. If the stronger price signal causes more reductions in gasoline demand, then those additional reductions may take the place of other, lower-cost reductions in other covered sectors that are under the cap.

The result would make it easier for facilities and entities in other sectors that are covered by the cap to meet their obligations, since more allowances have been made available by the decrease in gasoline demand. As a result, the overall level of emissions does not change, but the cost of the whole system increases because the tax distorts the market; substituting higher-cost reductions in emissions from gasoline for other, lower-cost options.

Indirect Interaction

Like direct interaction between a tax and a cap-and-trade program, indirect interaction can increase costs without further reducing emissions. For example, consider the combination of a tax on electricity consumption with a cap-and-trade program that covers electricity generators. The tax on electricity consumption increases the price of electricity, reducing electricity demand. As a result, electricity generators would substitute the reduced electricity demand for other, potentially lower-cost abatement options, such as instituting energy efficiencies. Accordingly, the tax on electricity consumption would not reduce the overall level of GHG emissions. Instead, it would change the mix of technologies used to meet the emissions cap. [85] In this example, the

[85] It is possible that overall emissions could decrease under certain circumstances, such as if a cap-and-trade program covered only electricity generators and if the electricity tax was particularly high.

cap-and-trade program directly affects electricity generators and the tax on electricity consumption affects them indirectly.

No Interaction

Combining a carbon tax with a cap-and-trade program can achieve more efficient emissions reductions than a cap-and-trade program alone if the policies do not interact. Interaction can be prevented or minimized by either:

- Taxing a sector that is neither covered under the emissions trading program nor an influence on the trading program.
- Equalizing the amount of the tax and the price of an emissions allowance in the trading program.

Meeting the first criterion above may be difficult to achieve due to the broad scope of the proposed WCI program.

To understand how the second mechanism works, consider the example of a cap-and-trade program that does not cover process-related emissions from cement manufacturing. A carbon tax that was the same cost per ton as allowances in the cap-and-trade program would send roughly the same price signal that may result in cement manufacturers reducing their process-related emissions more or less than they otherwise would have if those emissions were covered under the trading program. According to economic theory, if the tax is levied at the same rate as the trading program's allowance price, additional emissions reductions will be achieved without any loss of efficiency.

Under a cap-and-trade program, this same cement manufacturer might be encouraged to reduce his emissions more than he would under a carbon tax because of the ability to sell excess allowances.

As a general rule, if there is potential for interaction between a tax and a trading program, using only one policy for carbon pricing will be more efficient in reducing emissions.

Clean Air Act and Greenhouse Gases

Regulating GHG emissions under the authority of existing air quality regulations is also possible. A regulatory approach can be used in lieu of or in conjunction with market-based mechanisms.

The U.S. Environmental Protection Agency (EPA) is working to address climate change under the federal Clean Air Act. In April 2007, the U.S. Supreme Court ruled in *Massachusetts v. EPA* that EPA was required under the federal Clean Air Act to regulate greenhouse gases from motor vehicles if it found they "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare."

In its work to address motor vehicles, EPA is also looking for ways to reduce GHG emissions from stationary sources. The act already contains proven approaches for reducing emissions from, power plants and other large industrial sources, which together with mobile sources, emit the majority of greenhouse gases. Many actions needed to make these reductions could begin fairly soon since the basic structure of the federal act is set and well-understood.

Using the federal Clean Air Act to regulate GHGs from these sources, however, poses some challenges that changes to the federal act could remove, such as raising the emissions threshold. Until EPA decides how to apply the federal Clean Air Act to GHGs, Ecology is reviewing its authority under the state's clean air act to help meet its GHG reduction requirements. However, regulation under the Washington Clean Air Act is not the state's preferred approach. We prefer the flexibility and incentive for innovation provided by a cap-and-trade program or carbon tax.

Regulating GHG Emissions Under Washington Clean Air Act

The legislature has set binding GHG emissions reductions for 2020, 2035, and 2050, but it has not specified how to meet those requirements. Under the Washington Clean Air Act, Ecology can:

- **Adopt air quality standards to control amounts of GHG emissions in the outdoor air.** Because GHGs from sources in and outside the state mix in the atmosphere, it will be hard to meet a particular overall outdoor level of greenhouse gases.
- **Adopt rules that limit the amount of GHG emissions from specific sources or categories** of sources. This approach may include setting overall emissions standards and applying the standards to sources throughout the state to reach the 2020 requirements.
- **Adopt rules or require permits to impose certain kinds of emissions standards** on existing sources. Options include Reasonably Available Control Technology (RACT) or Reasonable and Available Control Measures (RACM), as specified under the Clean Air Act.
- **Adopt rules under the New Source Review (NSR) program to set an emissions threshold** for requiring a source to obtain a permit. These sources include commercial and industrial facilities. Covered facilities would have to obtain a permit when building or modifying a facility. The requirements would likely only apply to emissions from sources in the state. If a source is subject to NSR, Ecology can issue an order of approval (permit) only if it finds that the new source will achieve Best Available Control Technology (BACT).

Ecology cannot directly regulate all GHG emissions in the state under the Washington Clean Air Act through permits. For example, such an approach does not apply to the nearly half of Washington's GHG emissions which are generated by transportation sources. Certain in-use, operational standards may provide other options for reducing GHG emissions from these sources.

In addition, the Transportation Implementation Working Group (TIWG) formed under the CAT has examined various ways to reduce GHG emissions from the transportation sector. Ecology could enact some of these measures under the state's Clean Air Act, such as anti-idling, diesel retrofits, and perhaps a low carbon fuel standard.

In summary, though not ideal, the state's Clean Air Act would provide a way for the state to reduce GHG emissions in some parts of the economy. Discussions are underway in Washington, D.C. regarding amendments to the federal Clean Air Act that would make it better suited for reducing GHGs.

9. Regulatory Offsets and Other Credits

As part of the Western Climate Initiative (WCI) cap-and-trade program, Washington will participate in creating a strong regulatory offset program for the region. An "offset" is a project that reduces greenhouse gas (GHG) emissions or stores additional carbon in sources that are not included in the cap-and-trade program. These sources are either outside the capped sectors or below the emissions threshold for inclusion. Other reduction projects may not meet the offset criteria, but they can still contribute to GHG reductions, including increased carbon storage. Allowance set-asides or auction revenues can support these types of projects.

The WCI cap-and-trade program recommends three areas as priorities for the development of offset projects: forestry, agriculture, and waste management. In 2008, the legislature directed the Department of Ecology (Ecology) and the Department of Community, Trade and Economic Development (CTED) to recommend:[86]

- How local governments might participate in the cap-and-trade program designed by the Western Climate Initiative.
- The circumstances under which generation of electricity or alternative fuel from landfill gas and gas from anaerobic digesters might receive an offset or credit in the program.
- How forestry and agriculture lands and practices might participate voluntarily as an offset or other credit in the program.

Ecology contracted with the World Resources Institute to help form the recommendations for local governments, landfill gas, and anaerobic digester projects.[87]

In addition, the Washington State Department of Natural Resources (DNR), Washington State Department of Agriculture (WSDA), and Ecology established two stakeholder working groups on carbon markets, one for agriculture and one for forestry. Both groups have contributed greatly to the state's understanding of the issues surrounding these types of projects.

Finally, the Climate Action Team's (CAT) Beyond Waste Implementation Working Group also recommended strategies for anaerobic digestion of compostable organic materials, which has been incorporated into this discussion.

[86] RCW 70.235.030(3).

[87] WRI is a leading think tank that works on environmental and climate change issues. For more information, see www.wri.org.

Agency Recommendations for Offset Development

Opportunities exist for local governments, landfill gas, anaerobic digester gas, and forestry and agriculture lands and practices to participate voluntarily as offsets in a mandatory cap-and-trade program.

Local Government

- Collection and combustion of methane from landfills, wastewater treatment plants, or other waste facilities.
- Policies to cluster development in urban or rural growth areas, reducing its size. Landowners with clustered development can then sell the resulting offsets.
- Transfer of development rights (TDR) programs that result in more density in urban growth areas and conserve working forests. Local governments can partner with the state to develop these programs. The state may be able to pool and sell the resulting offset credits, and then it can provide revenue back to local governments to run the enhanced TDR programs.
- Local government expansion of urban forests.

Electricity and Alternative Fuel

- Combustion of methane from landfills and anaerobic digesters used to produce heat or electricity.

Forestry, Agriculture, and Farming

- Improved soil carbon and nitrogen management on both working agricultural and conservation lands.
- Cattle manure management that captures and destroys methane.
- Forestry practices that increase the amount of carbon stored in the forest or in long-lived wood products.

All of these projects need further evaluation and preparation of protocols. As the WCI develops protocols for these offset projects, the state agencies recommend that local industry representatives and members from the Forestry and Agriculture Carbon Market Working Groups continue to advise Washington State and other WCI states and provinces.

WCI Design for Offsets

The WCI recommends agriculture, forestry, and waste management projects as the priorities for participation in its offset program. The WCI states and provinces will jointly set the standards to ensure offset projects meet the strict criteria outlined below. The states and provinces will set clear standards in an open way before the cap-and-trade program starts in 2012.

The standards will ensure the emissions reductions and storage (sequestration) are counted accurately and not double-counted. The jurisdiction issuing the credit must be able to verify its

offset projects, and the jurisdiction accepting the offset credit must be able to enforce it. Each WCI state or province will accept offset credits meeting these standards for compliance within its jurisdiction, regardless of where the credit was issued. Offsets that do not meet the WCI standards will not be accepted.

The WCI also recommends that each state or province use part of the value of its allowance budget to promote emissions reductions and storage in agriculture, forestry, and other uncapped sectors. The design also allows each state or province to set aside allowances from its allowance budget to use as it sees fit. A state or province may decide to set aside allowances and use their value to support reductions and storage projects of GHGs in the uncapped sectors that do not meet the requirements for regulatory offsets.

Overview of Offset Criteria and Standards

The WCI requires emissions reductions projects to meet five basic criteria to qualify for offset credits.[88] If the project meets all five criteria, the agency managing the cap-and-trade program may issue a credit to the project. That credit may then be sold to an entity included in the cap to help it comply, in place of an emissions allowance (tradable permit). Offsets can reduce the costs of a cap-and-trade program by giving entities more options for complying. Offsets also provide incentives for sources not included in the cap to reduce or store GHG emissions.

Mandatory Offset Criteria

To qualify for a credit, offsets must be:

- **Real.** An offset credit must represent an actual net reduction in GHG emissions. In practice, methods for counting emissions reductions must be conservative enough to avoid overstating a project's effect. It also means that a project's effects on GHG emissions must be measured fully.[89] Offsets must be designed to minimize leakage, or ensure that emissions reductions at one source do not cause emissions to increase at other sources.
- **Additional/Surplus**. Only emissions reductions that occur in response to incentives from a carbon offset market can be certified as offsets. Reductions that would occur regardless of an offset market, such as those resulting from "business-as-usual" practices, which includes regulatory requirements, do not count as an offset. Since offset credits allow regulated sources in a cap-and-trade program to increase their emissions (because they are being "offset" by reductions made elsewhere) offset reductions must be "additional" to maintain net emissions levels.

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[88] Adapted from Derik Broekhoff and Kate Zyla, World Resources Institute, *Opportunities and Quantification Requirements for Local Government Participation in Greenhouse Gas Emissions Trading Markets*, prepared for Department of Ecology, July 8, 2008. www.ecy.wa.gov/climatechange/2008CTdocs/10102008_LocalGovernmentsGHGtrading.pdf.

[89] For a full elaboration of quantification and accounting principles for offset projects, see World Resources Institute and World Business Council for Sustainable Development, *The Greenhouse Gas Protocol for Project Accounting*, Washington, D.C., and Geneva, 2005, Chapter 4. www.ghgprotocol.org

- **Verifiable.** Carbon offsets must result from projects whose performance and effects can be readily monitored and verified. Verification shows emissions reductions have truly occurred and can be used to offset emissions increases at regulated sources. Projects whose effects cannot be verified easily or measured with confidence are not suitable for carbon offsets.
- **Permanent.** Since emissions increases are enduring (for example, fossil fuel emissions cannot be put back in the ground), offsets must be permanent as well. Most existing offset programs require emissions reductions to last at least 100 years. Permanence is an issue where a project can be reversed, such as forestry projects where fires or other causes can release carbon stored in trees or soils to the atmosphere. It may be possible to create a discount or some other accounting mechanism for offset projects where permanence is an issue.
- **Enforceable.** Rules and tracking systems that define the creation of an offset project and its ownership are necessary for offsets and provide transparency in the market. Clear ownership is key to enforcement. In the case of energy-efficient light bulbs, for example, several parties may claim credit for the emissions reductions the bulbs produce, including the manufacturer, installer, building owner, and utility that provided incentives to encourage their use. Rules must define who can claim emissions reductions, who is responsible for ensuring results, who is responsible for verification, and who is liable for any reversals.

Offset Standards

To create a market for carbon offsets that is as uniform as possible, standards and protocols must address the above criteria. In such a market, one offset credit equals one ton of carbon dioxide-equivalent emissions reductions, regardless of its source. The agency responsible for certifying and issuing offset credits must oversee these standards. Three related sets of standards are needed to define a carbon offset commodity:[90]

- **Procedural and technical standards.** These standards relate to validation, monitoring, and verification of offset projects as well as certification and crediting of GHG reductions. Procedural and technical standards ensure that offsets are *verifiable*.
- **Contractual standards**. These standards cover property rights related to carbon offsets, information sharing, and liability. They can include terms for payment and delivery, allocation of risk, and compensation where emissions reductions are not realized. Contractual standards are needed to avoid double-counting of reductions or credits and to ensure that offsets are *enforceable*.
- **Accounting standards.** These standards relate to counting of carbon offsets. Accounting standards will set methods for handling quantification boundaries, baseline emissions, and

[90] In addition to these standards, many carbon offset programs will set eligibility criteria for offset projects to ensure they are compatible with goals beyond simply reducing GHG emissions. Eligibility criteria may exclude certain types of projects based on secondary environmental or social concerns (e.g., nuclear waste, community displacement caused by hydropower reservoirs), or they may ensure that projects contribute to additional social, economic, and environmental objectives (e.g., sustainable development). While these criteria are in addition to defining a carbon offset's climate change impacts, they help to define the "commodity" within a particular program and may be important in linking to other trading programs.

unintended changes in emissions (including "leakage" outside the market). Accounting standards also cover ways to prove "additionality." Finally, they may set methods for comparing reversible GHG reductions with permanent reductions. Accounting standards ensure that "a ton is a ton" and that offsets are *real*, *additional/surplus*, and *permanent*.

Most carbon offset programs set accounting standards in the form of "protocols" or "methodologies" describing quantification requirements for specific types of projects. In its report to Ecology on opportunities for local governments in GHG trading markets, WRI lists various project types and identifies which existing offset programs have adopted protocols for different project categories.[91]

Quantification and Ownership Issues for Carbon Offsets

In theory, any activity that reduces (or stores) GHG emissions at uncapped sources can yield carbon offset credits. In practice, regulators of a GHG market are likely to consider some types of activities more favorably than others. Whether an activity makes a good offset project depends on how much confidence regulators have that it will meet the criteria outlined above.

Other Credits

Offsets are not the only way to reward activities that benefit the climate. Many worthwhile projects should be pursued that cannot meet the offset criteria. Any WCI state or province can set its own criteria to support these projects. To do so, a state or province can use the value of emissions allowances, including revenue from any auctions. It can also set aside allowances for the developers of specific projects. These projects would not result in any kind of credit that would be tradable within the regional market.

Set-asides

A set-aside occurs when the cap-and-trade program gives allowances free of charge to certain entities to support specific strategies to reduce or store emissions. Facilities and entities that receive set-asides can sell these allowances and use the revenue to fund the specific projects.

Allowance Value

The state could direct the holders of some allowances to use part of the proceeds from the sale of excess allowances for specific purposes. In addition, some allowances may be auctioned rather than given away free of charge.[92] To the extent allowances are auctioned, the state may use revenues to support policies that reduce emissions or increase carbon storage. For example, the state may use auction revenue to provide incentives for forest landowners to commit to long-term carbon storage, where the reduction does not qualify as an offset.

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[91] Derik Broekhoff and Kate Zyla, World Resources Institute, *Opportunities and Quantification Requirements for Local Government Participation in Greenhouse Gas Emissions Trading Markets*, prepared for Department of Ecology, July 8, 2008. www.ecy.wa.gov/climatechange/2008CTdocs/10102008_LocalGovernmentsGHGtrading.pdf

[92] The WCI calls for a minimum auction of 10 percent in 2012, increasing to 25 percent by 2020. Any WCI state or province may auction more than this minimum percentage.

Quantification

Counting GHG emissions reductions under a set-aside, or where allowance value is used, does not need to be as exact as for regulatory carbon offsets. Errors in measuring reductions will not affect the total emissions mandated under the cap-and-trade program, nor will they affect the market price of allowances and offsets. Understanding the effects of different measures on GHG emissions, however, will help choose the right amount of funding and ensure public funds are spent wisely.

Role of Local Governments

Local governments that operate landfills, wastewater treatment plants, or other waste facilities that generate methane may conduct methane capture and combustion projects that could result in offset credits. Local governments can also expand urban forests, which could be an offset in a cap-and-trade program.[93]

Local governments play another key role in reducing GHG emissions in their communities. Adopting measures that create climate-friendly communities will reduce emissions from capped sectors. It will help regulated entities meet their reduction requirements, reducing the total cost of the system. These measures may create large GHG reductions but likely would not qualify as offsets. The state government can support such efforts through set-asides and auction revenue.

Local governments may own and operate facilities, such as wastewater treatment or power plants, which exceed the threshold for inclusion in the cap-and-trade program. They will be required to make reductions just like the owners of any other capped facilities.

Local governments have the ability to adopt local land use ordinances that establish Transfer of Development Rights (TDR) programs and allow for clustering of development. Such programs may be eligible for offsets as a result of increasing density or having a smaller footprint associated with development. The resulting offset credits, when compared to business-as-usual development, can be sold on the regulatory market.

Landfill Gas and Anaerobic Digesters

Capturing and burning methane from landfills and anaerobic digesters for manure management benefits the environment. Methane is a powerful greenhouse gas with a global warming effect 21 times greater than carbon dioxide. Heat from burning methane can produce steam or electricity. We expect that these projects will meet the offset criteria and be eligible to receive an offset credit within a cap-and-trade program.[94]

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[93] The full WRI report on local government participation in GHG trading can be found at www.ecy.wa.gov/climatechange/2008CTdocs/10102008_LocalGovernmentsGHGtrading.pdf.

[94] The full WRI report on landfill gas and anaerobic digesters can be found at www.ecy.wa.gov/climatechange/2008CTdocs/10102008_LandfillGas_anaerobicDigesters.pdf.

Currently, the United Nations Clean Development Mechanism, U.S. EPA's Climate Leaders program, and Regional Greenhouse Gas Initiative in the eastern U.S. have or are writing guidelines for three offset projects to reduce GHG emissions. In addition, the Chicago Climate Exchange (CCX) issues tradable Carbon Financial Instrument contracts to owners and collectors of eligible projects on the basis of sequestration, destruction, or displacement of GHG emissions. The CCX requirements have not been evaluated to determine if they are sufficient for use in a mandatory GHG reduction program.

Washington should conduct an inventory of landfills to identify how the facilities can benefit from an offset program. The inventory should include the following information about each landfill:

- The stage in the landfill gas generation cycle.
- The final landfill cover types.
- The gas control systems in use.

According to the Agriculture Carbon Market Workgroup, Washington has about 450 dairies consisting of nearly 350,000 cattle.[95] According to U.S. EPA, current technology for anaerobic digesters is most effective at dairies with 500 cows or more.[96] Of Washington's dairies, EPA estimates that about 135 are large enough to consider for an anaerobic digester project.

WCI Design Considerations

WCI will not include carbon dioxide emissions from burning biogas (biofuels) under the cap but will require reporting of these emissions. Two other elements of the WCI design relate to these emissions:

- Emissions associated with landfills will be covered in the cap-and-trade program once an adequate method for quantification exists.[97]
- Providing offset credits for alternative sources of electricity could result in double-counting the reduction or conflict with the use of Renewable Energy Credits.[98]

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[95] Agriculture Carbon Market Workgroup Report can be found in Appendix 7.

[96] U.S. Environmental Protection Agency, *Market Opportunity for Biogas Recovery Systems—A Guide to Identifying Candidates for On-Farm and Centralized Systems*, EPA 430-8-06-004, 2006.

[97] The WCI design recommendations include chemical and biological industrial process emissions within the cap. Emissions associated with waste management would be a biological industrial process emissions source. However, the design also states that adequate quantification methods will be set for emissions sources before they are included in the program. An assessment of existing protocols was done, and the WCI found that waste management process and fugitive emissions sources do not have adequate protocols available at this time. Should adequate quantification methods be developed for waste management emissions, they will be included in the cap-and-trade program and would not be eligible to receive an offset credit.

Agriculture

Agricultural management practices play a fundamental role in global carbon and nitrogen cycles, with clear impacts on direct and indirect emissions of carbon dioxide, methane, and nitrous oxide as well as the "entrapment" or "sequestration" of atmospheric carbon dioxide in soils. Conventional agricultural management, characterized by regular soil disturbance, fallow periods, and uniformly prescribed nutrient management leads to additional greenhouse gas emissions as well as losses of carbon from soils to the atmosphere.

Improved agricultural management, characterized by reduced disturbance, improved crop management, and site- and time-specific nutrient management can both reduce greenhouse gas emissions as well as increase carbon storage in soils. In cases where these improved management strategies can be documented to create positive changes in the emissions balance from agriculture, they could be creditable as offset projects.

The Agricultural Sector Carbon Market Workgroup (ASCMW) has provided guidance on how to increase the rigor and reliability of methodologies for measuring and documenting GHG improvements from agricultural carbon management on both working and conservation lands, reductions in nitrogen fertilizer-related greenhouse gas emissions, and reductions in methane emissions associated with the anaerobic digestion of manure.[99] It is also important to note that the improved agricultural management strategies discussed by the ASCMW would lead to *significant* "upstream" emissions reductions from fuel, electricity, and fertilizer production that are not likely to be creditable as offsets, though they would clearly further the state's goals in reducing greenhouse gas emissions.

Forestry

The multi-stakeholder Forest Sector Workgroup on Climate Change Mitigation was chartered in April 2008 by the Director of the Department of Ecology and the Commissioner of Public Lands to make recommendations in response to direction from the Washington State Legislature in E2SHB 2815.[100] The Workgroup met intensively and collaboratively for six months and reached consensus on a series of recommendations for how Washington forest landowners can participate voluntarily in an offset or other credit mechanism under a regional greenhouse gas cap-and-trade program. While most Workgroup members have a variety of important reservations about some

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[98] It is important to consider the interaction of an offset program for these types of projects with Renewable Energy Credits, or RECs. RECs are created when renewable power generators sell their electricity as conventional electricity and then sell the environmental attributes of their power separately through a certificate. For example, consumers may purchase conventional electricity from their utility and then separately purchase RECs to subsidize renewable energy elsewhere. Starting in 1999, the National Association of Attorneys General (NAAG) considered the interaction of RECs and offsets. NAAG issued Environmental Marketing Guidelines for Electricity, which concluded that project developers that obtain and use both RECs and offsets for the same activity may be violating consumer protection laws. Just this year, the Federal Trade Commission (FTC) began a regulatory review of its environmental marketing guidelines, also known as the Green Guides. The FTC's public notice included addressing the marketing of carbon offsets and RECs. Therefore, projects that create electricity must to be examined carefully to avoid overlap with either the cap-and-trade program or renewable energy mandates.

[99] Agriculture Carbon Market Workgroup Report can be found in Appendix 7.

[100] Forest Sector Workgroup on Climate Change Mitigation report can be found in Appendix 6.

of the recommendations, all members agree this package of recommendations represents a significant step in encouraging Washington to lead in larger-scale efforts so as to appropriately recognize the forest sector's positive contributions to mitigate climate change. The members therefore agree to support these recommendations. The recommendations are expected to be forwarded to the legislature for its deliberation and, if adopted, set the stage for more detailed design work later. Workgroup members are proud to have participated and look forward to future similar opportunities.

The Workgroup is recommending a mix of carbon offset proposals, other carbon incentive proposals, and several related recommendations. The offset and other credit recommendations address avoided and mitigation conversion of forest land to non-forest uses, urban reforestation, and forest management to increase carbon sequestration and storage.

Avoided Conversion

The Workgroup recommends two offset opportunities related to retaining forest lands while accommodating inevitable development on a smaller cleared "footprint."

- In one opportunity, developers could create a marketable offset by clustering legally allowed development on a smaller portion of a developable parcel in the urban or rural zone, permanently protecting the remaining working or conservation forests as forest.
- In the other opportunity, local governments, with the state, could create a marketable offset by creating and implementing a Transfer of Development Rights (TDR) program that succeeded in permanently conserving otherwise developable forest land by transferring development rights to lands within urban growth areas and compensating forest land owners for the transferred rights. The forest land would remain as working or conservation forest land. State start-up funding would be needed for local programs. Revenue from state sale of aggregated offsets would go to local governments to administer TDR programs and transactions.

Urban Forests

The Workgroup recommends that local governments be able to create marketable offsets by establishing and implementing urban tree-planting programs meeting specific requirements based on a new California protocol, but tailored to Washington State.

Forest Management

The Workgroup recommends a dual offset and non-offset approach to increasing and/or retaining carbon storage through forest management, including recognizing and incentivizing forest landowners for current significant contributions to carbon storage.

- The offset approach would be based on a "business-as-usual" baseline, with marketable offsets created by forest management projects that ensure carbon storage above that baseline, persisting for at least 100 years. Contractual and regulatory safeguards would guarantee project performance against reverses. Administrative simplicity would also be a program goal. Workgroup agreement to this approach on baseline is contingent, as described below.

- Storage can be a combination of in-forest storage and storage in harvested wood products. All storage pools with significant change would be subject to accounting.
- The non-offset approach is a recommended Complementary Carbon Storage Incentive Program. It would provide incentives for landowners whose forests meet a yet-to-be-developed eligibility criterion, who commit to maintaining a level of carbon storage. During periodic enrollment periods, state funding for incentives could come from revenues derived from operation of the cap-and-trade program, as described in Western Climate Initiative recommendations. Payback would be required for losses of credited carbon storage or landowner withdrawal from the program. This program recognizes a range of important ecological benefits accompanying carbon storage in forests. This program is also an attempt to help meet legislative direction to not disadvantage the state relative to states with lower forest practices regulations, an inherent part of a "business-as-usual" baseline.
- If the Complementary Program is not created and appropriately funded, Workgroup members agree that another effort should be made to meet the goal of incentivizing broad forest landowner participation to meet Washington's emissions reductions. This effort may include using discounting for offsets created above an enrollment threshold.

Data Needs

The forest sector workgroup agreed that funding support for the Washington State Parcel and Forestland Database was a necessary component of tracking offsets or other carbon incentive proposals.

Other Related Recommendations

The Workgroup discussed several other topics that fell outside the Workgroup's scope or about which consensus on detailed recommendations was not achieved, but which the Workgroup believes should be further developed in other venues due to their indirect forest carbon benefits. These include:

- Improved life cycle analysis of embodied greenhouse gases in building materials, along with a labeling program and potential mitigation under the State Environmental Policy Act.
- Further discussion on guiding foreseeable growth in rural and resource lands.
- Possible creation of ecosystem service districts to formalize mutually beneficial relationships between forest landowners providing ecosystem services and the beneficiaries of those services.
- Incentives for landowners undertaking forest treatments that improve forest health and reduce the risk of uncharacteristic wildfires.

The Workgroup did not have sufficient time to develop recommendations on several other priority topics including indirect emissions reductions through energy resource substitution and building material product substitution by forest-derived materials.

10. Conclusion

Climate change presents a major threat to our economy and environment. We should be proud of what we have already accomplished. Existing policies, if aggressively implemented, will achieve 45 percent of the emissions reductions required by 2020. To achieve our statutory emissions reductions in 2020 and beyond, however, we must do more.

We believe that moving forward now is the right thing to do. Transformation of today's fossil fuel-based economy to one based on clean renewable energy is the best and quickest path to economic recovery. Implementing many of the Climate Action Team (CAT) recommendations will produce jobs now. By showing leadership on climate change and investing in the green economy, we will create the green jobs of tomorrow.

Washington is well-positioned to take advantage of this opportunity. We are home to two world-class research universities and a national laboratory performing research related to climate change. The nationally recognized University of Washington Climate Impacts Group is unique in its focus on the intersection of climate science and policy. Researchers at Washington State University and Pacific Northwest National Laboratory are conducting groundbreaking research on energy efficiency technologies, renewable energy, and biofuels. With these resources, we are well-positioned to continue our leadership role in energy efficiency, green job growth, and protection of our natural resources.

We must also act now to maintain our seat at the table with the federal government. Federal action on climate change is not certain and will take years to accomplish. The best way for us to encourage federal leadership, and to make sure that the federal cap-and-trade program does not disadvantage Washington, is to continue to move our regional cap-and-trade program forward.

The Department of Ecology and Department of Community, Trade, and Economic Development are recommending a number of policies for the 2009 legislative session. Our recommendations build on the strategies outlined by the CAT. We are focusing on those policies that create jobs and economic stimulus as well as reduce emissions.

These policies will be made more effective by implementing the Western Climate Initiative cap-and-trade program. Cap-and-trade provides the regulatory mechanism and certainty businesses need before they invest in emission-reducing technologies. Without cap-and-trade as a centerpiece policy, we will not be able to ensure emissions reductions needed to achieve our statutory requirements.

The reductions called for in E2SHB 2815 are well within our grasp. This plan proposes a number of solutions and possibilities to meet the reduction requirements, while growing the green economy of the future. This plan will be revised and improved over time. It is important that we be nimble and adaptive as we move forward, learning from experiences in other states, regions, and countries.

Now is the time for Washington to do its part to strengthen our economy, stabilize our climate, and to lead the globe toward a safer, more prosperous future. The economic crisis and effects of climate change already visible in Washington require us to act and make an investment in our future. Failure to act now will make future Washingtonians vulnerable to the fluctuations in energy prices, political instability, and the effects of climate change that result from reliance on

carbon-based fuels. We must challenge ourselves to find the political will to look ahead, work together, and act on behalf of the future. Strong leadership will speed this transition to the greener, post-industrial, and more sustainable economy we need for a healthy future in Washington and around the globe.

Glossary and Acronym List

Advanced biofuels—Any renewable fuels, other than ethanol derived from corn, that reduce greenhouse gas emissions 50 percent compared to gasoline throughout the life cycle. Also referred to as second- or third-generation biofuels.

BAU—Business-as-usual

Benchmarking—Documenting and measuring performance according to national standards; in this context, benchmarking applies to whole-building energy efficiency and performance.

Beyond Waste—Ecology's waste and toxics reduction plan for Washington State

Biodiesel—A renewable fuel for diesel engines derived from vegetable oils or animal fats (e.g., soybean oil, recycled restaurant grease). Can be used as a substitute for or blended with petroleum-based diesel fuel.

Bioenergy—Energy or electricity produced using biomass (renewable biological material such as plant or tree matter) as a fuel.

Biofuels—A liquid fuel derived from biomass such as ethanol and biodiesel

BW IWG—The CAT's Beyond Waste Implementation Working Group

Cap-and-trade program—A market-based mechanism for reducing emissions. A cap or limit is placed on emissions from specific sectors and an emissions market is developed where entities in these sectors can purchase, sell, or trade emissions credits, or allowances.

CAFE—Corporate Average Fuel Economy

CARB—California Air Resources Board

CAT—Climate Action Team (previously Advisory)

CCS—Carbon capture and storage. An emerging technology to sequester or store carbon dioxide in geologic formations (see *Sequestration*).

Cellulosic ethanol—Renewable fuel made from cellulosic material, such as corn stalks, rice straw, and wood and grass.

CHP—Combined heat and power, also known as cogeneration, refers to the simultaneous production of power and usable heat from a combustion process.

CH_4—Methane

CFL—Compact fluorescent light bulb

CO_2—Carbon dioxide

CO_2e—Carbon dioxide equivalent

CTED—Washington State Department of Community, Trade, and Economic Development

Ecology—Washington State Department of Ecology

EFSEC—Energy Facility Site Evaluation Council

EISA—Energy Independence and Security Act

Emissions tax—A tax levied on emissions, such as a carbon tax. The government sets an amount of tax that polluters must pay for each unit of pollution produced. An emissions tax can be used as a substitute to or in tandem with other emissions reduction policies.

EO—Executive Order

EPA—U.S. Environmental Protection Agency

EPS—Emissions Performance Standard

Ethanol—A renewable liquid fuel derived from plant matter (starch or sugar) that is used as a substitute or as an additive to gasoline.

E2SHB—Engrossed Second Substitute House Bill

Feedstock—Corn, soybeans, or other raw materials used to produce biofuels

GA—Department of General Administration

GHG—Greenhouse gas(es). The six major GHGs that contribute to global warming are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

GWP—Global Warming Potential. The ratio of heat trapped by one unit of mass of a greenhouse gas to that of one unit of mass of carbon dioxide over one hundred years. Used to convert all emissions to carbon dioxide equivalent.

HOV—High occupancy vehicle. A vehicle with more than one passenger, such as a carpool, vanpool, or bus.

HFC—Hydrofluorocarbon

Infill development—Building and developing in vacant areas in city centers or urban settings. Promotes compact urban development and leaves rural areas and open spaces undeveloped.

IPCC—Intergovernmental Panel on Climate Change

IWG—Implementation Working Group, part of the CAT

LCA—Analysis and valuation of the environmental impacts of a product or service across the complete life cycle including mining materials, manufacture, product use, and disposal.

LCFS—Low carbon fuel standard

LED—Light-emitting diode

LEED—Leadership in Energy and Environmental Design, a voluntary rating system of the U.S. Green Building Council. Ratings include Platinum, Gold, Silver, Bronze, and Certified.

LUCC—CTED's Land Use and Climate Change Policy Advisory Committee

MMtCO_2e—Million metric tons carbon dioxide equivalent

Mpg—Miles per gallon

MTWF—Ecology's Mitigation that Works Forum

MW—Megawatt(s)

N_2O—Nitrous oxide

NWPCC—Northwest Power and Conservation Council

ODS Substitutes—Ozone Depleting Substance Substitutes. Fluorinated greenhouse gases—such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—have high global warming potentials and are sometimes used as substitutes to ozone depleting substances that contribute to the ozone hole in the Earth's stratosphere.

OSPI—Washington Office of the Superintendent of Public Instruction

Park-and-ride—A parking area for drivers transferring to buses, vanpools, or other alternative forms of transportation.

PFC—Perfluorocarbon

PSP—Puget Sound Partnership

RCW—Revised Code of Washington

RGGI—Regional Greenhouse Gas Initiative, a regional cap-and-trade program for the electricity sector in the eastern United States

RFS—Renewable fuel standard

SF_6—Sulfur hexafluoride

Sequestration—Processes that remove or store greenhouse gases from the atmosphere; e.g., trees and plants absorb carbon dioxide from the atmosphere, and carbon capture and storage (CCS) is an emerging technology to sequester or store carbon dioxide in geologic formations.

SSB—Substitute Senate Bill

SEPA—State Environmental Policy Act

SEPA IWG—The CAT's State Environmental Policy Act Implementation Working Group

SOV—Single occupancy vehicle. A vehicle with a solo driver.

SUV—Sport-utility vehicle

Telework—Conduct work at home or away from the office using telecommunication

TDR—Transfer of Development Rights

TIWG—The CAT's Transportation Implementation Working Group

USDA—U.S. Department of Agriculture

VMT—Vehicle miles traveled

WAC—Washington Administrative Code

WCI—Western Climate Initiative. Regional cap-and-trade program that includes seven states and four Canadian provinces

WRI—World Resources Institute

WSDA—Washington State Department of Agriculture

WSDOT—Washington State Department of Transportation

WSSP—Washington Sustainable Schools Protocol

WSU—Washington State University

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Appendices

The following appendices to this report are available online at this location, www.ecy.wa.gov/climatechange/2008CompPlan.htm:

- Appendix 1. *Leading the Way: Implementing Practical Solutions to the Climate Change Challenge 2008. Final Report of the 2008 Climate Action Team*
- Appendix 2. *Energy Efficiency and Green Building Implementation Working Group (IWG) Final Report*
- Appendix 3. *Beyond Waste IWG Final Report*
- Appendix 4. *Transportation IWG Final Report*
- Appendix 5. *State Environmental Policy Act (SEPA) IWG Final Report*
- Appendix 6. *Forest Sector Workgroup on Climate Change Mitigation Final Report*
- Appendix 7. *Recommendations for the Development of Agricultural Sector Carbon Offsets in Washington State*
- Appendix 8. *Emissions Reductions Quantification Assumptions and Methodologies* (forthcoming)