Reducing Greenhouse Gas Emissions in Washington State Government

Second Biennial Progress Report Required under RCW 70.235.060

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Olympia, Washington

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Acknowledgements

The Department of Ecology acknowledges and thanks the sustainability coordinators, facility managers, fleet managers, fiscal staff, commute trip reduction coordinators, and other representatives from one-hundred twenty agencies that contributed time and effort to quantify greenhouse gas emissions, identify actions taken, and develop and implement reductions.

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Executive Summary

Background and Purpose of Report

In 2009 the Legislature put into law the State Agency Climate Leadership Act (E2SSB 5560, Chapter 519, Laws of 2009), which requires state agencies to reduce greenhouse gas (GHG) emissions to:

- 15 percent below 2005 levels by 2020.
- 36 percent below 2005 levels by 2035.
- 57.5 percent below 2005 levels by 2050.

The requirements in the Act apply to 141 state agencies, including: all administrative, legislative, and judicial agencies and elected offices; boards and commissions; community and technical colleges; universities; and The Evergreen State College.

The Act requires agencies to annually report their emissions to Ecology, project their emissions to 2035, develop a strategy to meet the reduction targets, and report every two years on actions taken to meet the targets. Starting in 2010, Ecology is required to compile a biennial report to the governor and the legislature on the total state agencies' emissions of greenhouse gases for 2005 and the preceding two years and actions taken to meet the reduction targets. [1]

This report satisfies this legislative requirement and provides an update on agency progress in reducing GHG emissions since the first report was submitted in January 2011.[2] It provides a summary of GHG emissions for 2005 and 2010-2011, as well as actions taken since 2010 to meet the reduction targets.

Report Highlights

Total state agency greenhouse gas emissions increased 5.2 percent from 2005 to 2008, and then steadily declined from 2008 to 2011. The 2011 emissions were equivalent to emissions levels in 2005.

- State agencies emitted about 1.23 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) in 2010. Emissions declined 2 percent from 2010 to 2011 to reach 1.20 MMTCO2e in 2011.
- In 2011, 85 percent of the total reported GHGs were emitted by 17 state agencies that each emits over 10,000 $MTCO_2e$. Sixty-two agencies emitted less than 1,000 MTCO2e and accounted for 1 percent of total state agency emissions.

[1] Codified in RCW 70.235.060.

[2] The first progress report issued in January 2011 is posted at http://www.ecy.wa.gov/climatechange/WAleadership.htm.

- Of the total GHG emissions from state agencies in 2011, 47 percent came from electricity and steam, 30 percent from natural gas and other fuel used in buildings, 15 percent from Washington State Ferries, and 8 percent from state vehicles and mobile equipment.
- The total state agencies' emissions represent about 1.3 percent of the total statewide GHG emissions.

State agencies developed strategies to reduce GHG emissions and have taken a number of actions since 2010 to conserve energy, improve energy efficiency, and deploy clean energy technologies. This has resulted in significant savings in utility and fuel costs.

- Agencies continue to meet or exceed LEED certification requirements for new buildings. Since the High-Performance Green Buildings Act came into effect in 2005, fifty-two state-owned projects have been LEED certified, including 2 Platinum, 29 Gold, and 22 Silver.
- Agencies are making progress in completing energy benchmarking of facilities in Portfolio Manager (an EPA energy management tool), conducting audits, and making energy efficient investments.
- Agencies continue to use Energy Savings Performance Contracting to identify, implement, and finance energy efficiency projects in their facilities, leading to significant savings in energy and utility costs.
- Agencies have implemented strategies to reduce energy use from information technology and office equipment. Server consolidation and virtualization have led to reductions in server energy use and reduced cooling costs.
- Agencies are expanding biodiesel use and taking steps to increase fuel economy in state vehicles. Agencies continue to purchase hybrid vehicles and electric vehicles and equipment. Several agencies have installed electric vehicle charging stations.
- State agencies reduced business travel through investments in video-conferencing, tele-conferencing, web conferencing, as well as expansion of commute trip reduction programs.
- Several agencies generate renewable energy onsite or purchase green power or renewable energy credits through their utility or a third-party provider.
- State agencies have taken action to reduce their environmental impact through recycling, composting, resource conservation, and environmentally preferred purchasing. Agencies have also taken action to conserve water, implement stormwater best management practices, and reduce GHG emissions from wastewater treatment.

Next Steps

To meet the 2020 GHG reduction targets, state agencies as a whole need to further reduce GHG emissions 15 percent below current levels. Aggressive action and full implementation of existing and potentially new policies will be required to meet the reduction targets. Cabinet agencies are required under Executive Order 12-06 to reduce their building energy use 20 percent below 2009 levels. If fully implemented this will achieve 40 percent of the total reductions in GHG emissions needed to meet the 2020 GHG reduction target.

Although many GHG reduction strategies are cost-effective and have short payback periods, many agencies noted a need for additional low-cost financing options and budgetary or other incentives. Agencies also reported needing staff to monitor data and manage systems, agency management support, better awareness of the goals and why this is important, better understanding of emission reduction actions, and better data on energy use. Agencies reported several factors that could affect their ability to meet the targets, such as changes in building space, staffing, population served, and agency services.

Moving forward, Ecology will continue to work with agencies to:

- Implement new and existing reduction strategies and leverage complementary efforts.
- Improve data and tracking of energy use and GHG emissions.
- Evaluate options to help achieve carbon neutrality.
- Measure and track progress and account for changes in operations.

Agencies will continue to report annual GHG emissions as well as actions taken, which will give us an indication of overall progress. Ecology will compile this information and provide an update in December 2014.

1. Introduction

State Agency Climate Leadership Legislation

In 2009 the Legislature put into law the State Agency Climate Leadership Act (E2SSB 5560, Chapter 519, Laws of 2009), which requires state agencies to reduce greenhouse gas (GHG) emissions to:

- 15 percent below 2005 levels by 2020.
- 36 percent below 2005 levels by 2035.
- 57.5 percent below 2005 levels by 2050.

The law requires agencies to report to the Department of Ecology:

- Annual GHG emission totals.
- Projected emissions through 2035.
- Actions taken to reduce GHG emissions.
- A strategy to reduce GHG emissions.[3]

The Legislature also requires Ecology to:

> By December 31st of each even-numbered year beginning in 2010, the department shall report to the governor and to the appropriate committees of the senate and house of representatives the total state agencies' emissions of greenhouse gases for 2005 and the preceding two years and actions taken to meet the emissions reduction targets.[4]

Purpose of This Report

This report satisfies this legislative requirement and provides an update on agency progress in reducing GHG emissions since the first report was submitted in January 2011.[5] It provides a summary of:

- Total state agency GHG emissions for 2005, 2010, and 2011.
- Main sources of GHG emissions.
- Strategies to reduce GHG emissions.
- Actions taken from 2010-2011 to reduce GHG emissions.

[3] Codified in RCW 70.235.050.
[4] Codified in RCW 70.235.060.
[5] The first progress report issued in January 2011 is posted at http://www.ecy.wa.gov/climatechange/WAleadership.htm.

2. Background

Reporting State Agencies

The GHG reporting requirements apply to 141 state agencies, including:

- All administrative, legislative, and judicial agencies and elected offices.
- Boards and commissions.
- Community and technical colleges.
- Universities.

The emissions figures in this report are based on reported or estimated emissions for 121 agencies that have submitted an emissions inventory for at least one of the reporting years (2005 and 2008-2011). Twenty agencies did not report for any year, and these emissions are not included in the totals. Ecology estimates that these agencies represent less than 1 percent of the total reported state agency emissions.

Agencies used a greenhouse gas calculator developed by Ecology to meet a set of generally-accepted GHG accounting principles and guidelines, and made adjustments as needed to apply specifically to state agencies. Several higher education institutions that participate in the American College and University Presidents' Climate Commitment used a comprehensive greenhouse gas calculator tailored specifically to higher education institutions. The GHG emissions information contained in this report was compiled from annual GHG inventory reports submitted by each individual agency.

Sources of GHG Emissions

Agencies reported on sources of GHG emissions directly under their operational control or that result from activities directly controlled by the agency, including:

- Natural gas, electricity, and other fuels used in buildings and stationary equipment owned or operated by the agency.
- Diesel, gas, and other fuels used in vehicles and equipment owned and operated by the agency, including light and heavy duty on-road vehicles, non-road or off-road vehicles, ferries, boats, and aircraft.

In addition, most agencies reported GHG emissions from:

- Business travel in vehicles owned by employees.
- Air travel.
- Employee commuting.

Few agencies reported fugitive emissions (emission leaks) of refrigerants or other potent high global warming potential greenhouse gases.

GHGs included

State agencies reported on the four main GHGs emitted from state agency activities, including:

1. Carbon dioxide ($CO_{2)}$
2. Methane ($CH_{4)}$
3. Nitrous oxide (N_2O)
4. Hydrofluorocarbons (HFCs)

Agencies use a common metric, the carbon dioxide equivalent (CO_2e) to report their GHG emissions. The CO_2e metric takes into account the different potential each of the gases has to heat and warm the planet compared to CO_2, or the Global Warming Potential (GWP). The table below describes the GWP related to each type of GHG.

Greenhouse Gas	GWP
Carbon dioxide (CO2)	1
Methane (CH4)	21
Nitrous Oxide (N2O)	310
Hydrofluorocarbons (HFCs)	12-11,700
Perfluorocarbons (PFCs)	6,500-9,200
Sulphur hexafluoride (SF6)	23,900

Table 1: Global Warming Potentials

3. Total State Agency Greenhouse Gas Emissions

Trends in greenhouse gas emissions

In 2011, state agencies emitted about 1.20 million metric tons of carbon dioxide equivalents ($MMTCO_2e$) from energy used to heat and power state-owned and leased buildings and from the state vehicle fleet. This is equivalent to GHG emissions levels in 2005 and represents a 2 percent decline from 2010 levels which were around 1.23 $MMTCO_2e$. Emissions from state agencies account for 1.3 percent of total GHGs emitted in Washington State, which in 2010 were estimated at 95.8 $MMTCO_2e$.

A majority of agencies (around 60 percent) saw a decrease in GHG emissions from 2008-2011. 30 percent saw an increase in GHG emissions, and 10 percent saw relatively constant emissions. Among these agencies, higher education institutions displayed a similar trend with 55 percent experiencing declines and 45 percent experiencing increases in GHG emissions.

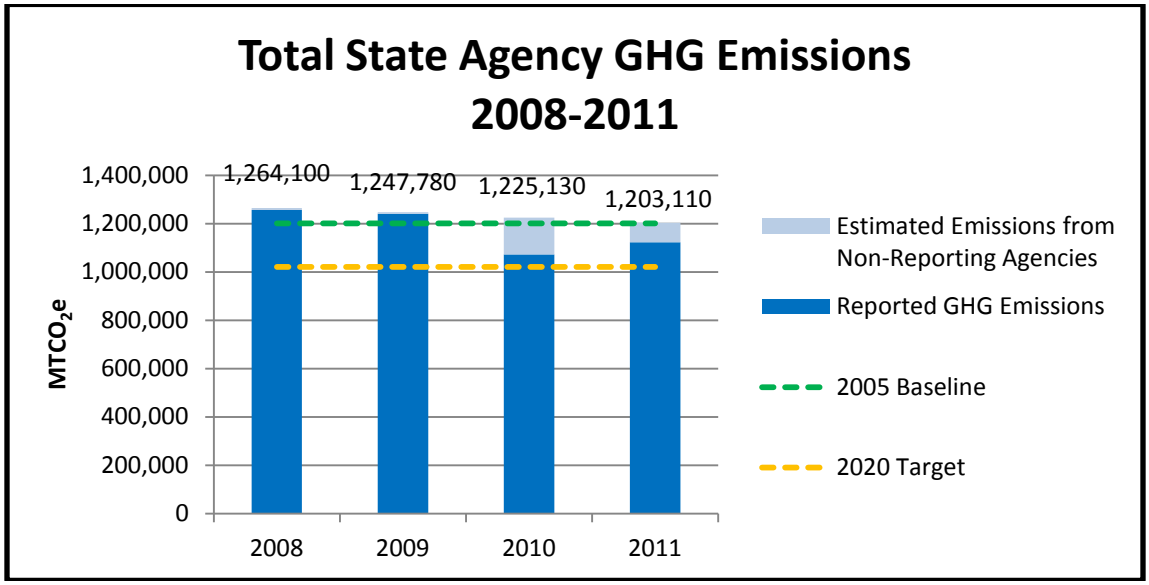

Figure 1: Total State Agency GHG Emissions, 2008-2011. This includes GHG emissions from state owned and leased buildings and the state vehicle fleet.

The reduction in GHG emissions from 2008-2011 is likely due to several factors, including:

- Continued implementation of a suite of policies to reduce energy use and GHG emissions.
- The economic downturn and reduction in state revenue, services, and staff.
- Agency reorganization and closure of some agencies.

As the economic recovery progresses, some agencies could see their GHG emissions start to stabilize or increase. Reducing emissions and meeting the statutory targets will likely require

more aggressive action by state agencies. Full implementation of existing and new state and federal policies will help many agencies continue to reduce GHG emissions.

In September 2012, Governor Gregoire issued Executive Order 12-06, "Achieving Energy Efficiency in State Buildings." This EO directs cabinet agencies to complete energy benchmarking, audit, and energy efficiency investments required under RCW 19.27A, and reduce building energy use 20 percent below 2009 levels by 2020. A 20 percent reduction of building energy use from cabinet agencies will reduce total state agency GHG emissions by around 72,200 MTCO2e. This represents 40 percent of the 181,770 MTCO2e reduction needed from 2011 levels to meet the 2020 target.

Greenhouse gas emissions by agency size

In 2011, nine state agencies emitted over 25,000 $MTCO_2e$ and accounted for around 75 percent of total state agency emissions. These agencies include:

- Department of Transportation
- University of Washington-Seattle
- Washington State University-Pullman and Energy Extension offices (statewide)
- Department of Corrections
- Department of Social and Health Services
- Washington State Patrol
- Department of Enterprise Services
- Western Washington University, and
- Central Washington University

Sixty-two agencies emitted less than 1,000 $MTCO_2e$ and accounted for 1 percent of total state agency GHG emissions. A breakdown of agencies by size of GHG emissions is included below.

Table 2: 2011 Agency Size and Percentage of Total GHG Emissions

AGENCY CATEGORY	TOTAL GHG EMISSIONS BY CATEGORY	PERCENT OF TOTAL GHG EMISSIONS	NUMBER OF AGENCIES
Over 25,000 $MTCO_2e$	897,915	74.6%	9
10,000 to 25,000 $MTCO_2e$	120,875	10%	8
1,000 to 10,000 $MTCO_2e$	173,040	14.4%	42
100 to 1,000 $MTCO_2e$	10,390	0.9%	25
Less than 100 $MTCO_2e$	890	0.1%	37
TOTAL	**1,203,110**	**100%**	**121**

State agencies carry out a variety of activities to achieve their mission and deliver services to constituents. Because the type of buildings and fleets each agency has are different, the agencies GHG emissions are not directly comparable. When reviewing the agencies' GHG emissions, it is important to acknowledge and consider this variation and the resulting differences in GHG emissions levels and strategies needed to achieve the mandatory reduction targets.

GHG Emissions by Source

The largest single source of emissions in 2011 is from electricity and steam consumed in state owned and leased buildings and other fixed equipment, such as traffic lights and streetlights. The second largest source is from natural gas and other fuels consumed to heat and power buildings ("stationary sources"). Diesel used in the Washington State Ferry system and gasoline and diesel consumed in the state fleet together account for 23 percent of state government emissions.

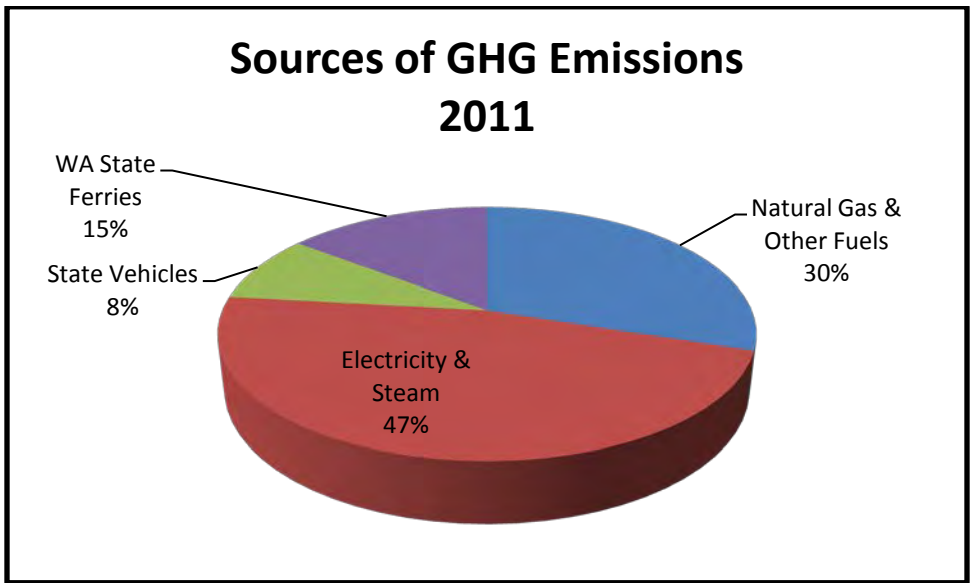

Figure 2: Sources of GHG Emissions, 2011

GHG emissions from electricity and steam declined 9.3 percent from 2009 to 2011, whereas GHG emissions from natural gas and other fuels used in stationary equipment increased 3.7 percent. GHG emissions from Washington State Ferries increased 1.7 percent, and GHG emissions from state vehicles declined 1.9 percent.

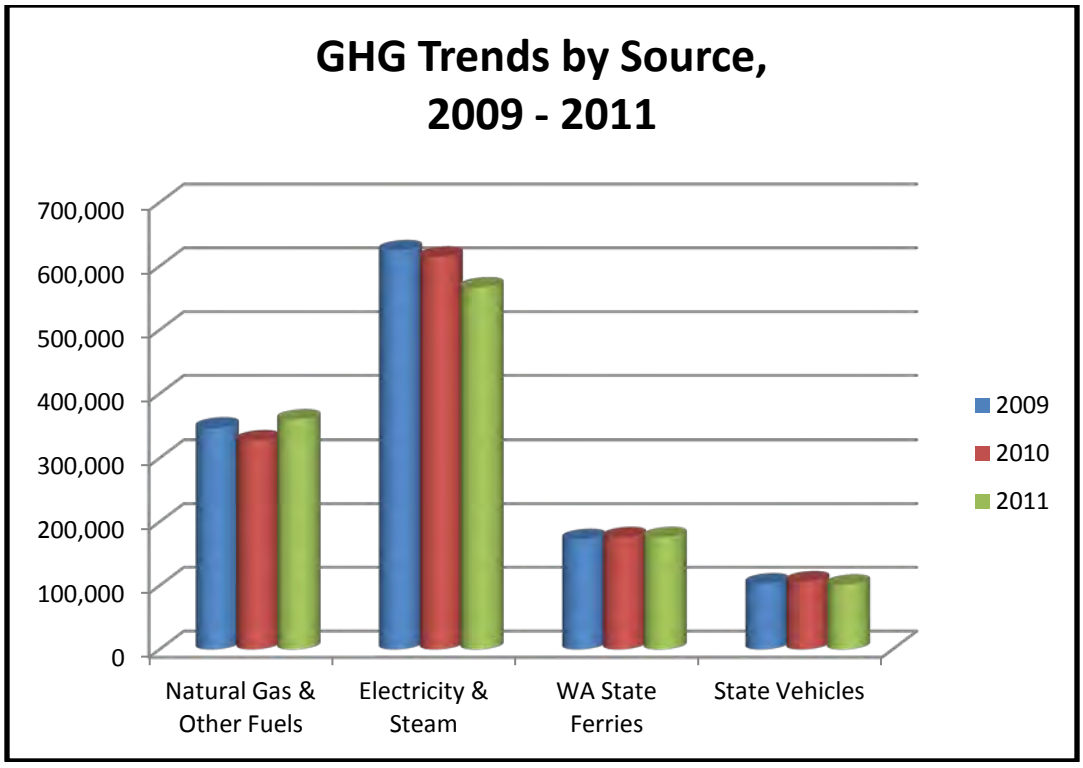

Figure 3: GHG Trends by Source, 2009-2011

Agencies also quantified other sources of emissions from business travel in private vehicles, air travel, employee commuting, and fugitive emissions. These were not included in the totals above, and are described in more detail starting on page 12.

Energy use in buildings and fixed equipment

In 2011, state agencies emitted about 926,050 metric tons (MTCO2e) from energy used to power and heat state-owned and leased buildings and fixed equipment, such as traffic and street lights. This represents a 1.8 percent decline from 2010 levels. Each agency reported for energy consumed in agency-owned buildings and privately leased space. The Department of Enterprise Services (DES) calculated GHG emissions from energy used in all DES owned buildings, both on and off the capitol campus. Fifteen agencies account for around 80 percent of the total state agency GHG emissions from buildings and fixed equipment.

All state agencies used a consistent emissions factor, the EPA Emission and Generation Resource Integrated Database (eGRID) for the Northwest Power Pool (NWPP) sub-region, to quantify GHG emissions from electricity consumption. This factor reflects the GHG emissions associated with the fuel mix used to generate electricity in the NWPP sub-region. The sub-region includes all of Washington, Oregon, Idaho, and Utah, major portions of Nevada, Montana, and Wyoming, and a portion of Northern California. About 47 percent of the electricity within the NWPP sub-region is from hydropower, 30 percent is from coal, 15 percent is from other fossil fuel sources, 3.8 percent from wind, 2.5 percent from nuclear, and 0.6 percent from geothermal.

The grid has become cleaner since 2005 and this has resulted in a reduction in GHG emissions from electricity use. In 2009, the output of carbon dioxide emissions per megawatt hour of electricity generated declined 9.2 percent from 2005 levels.

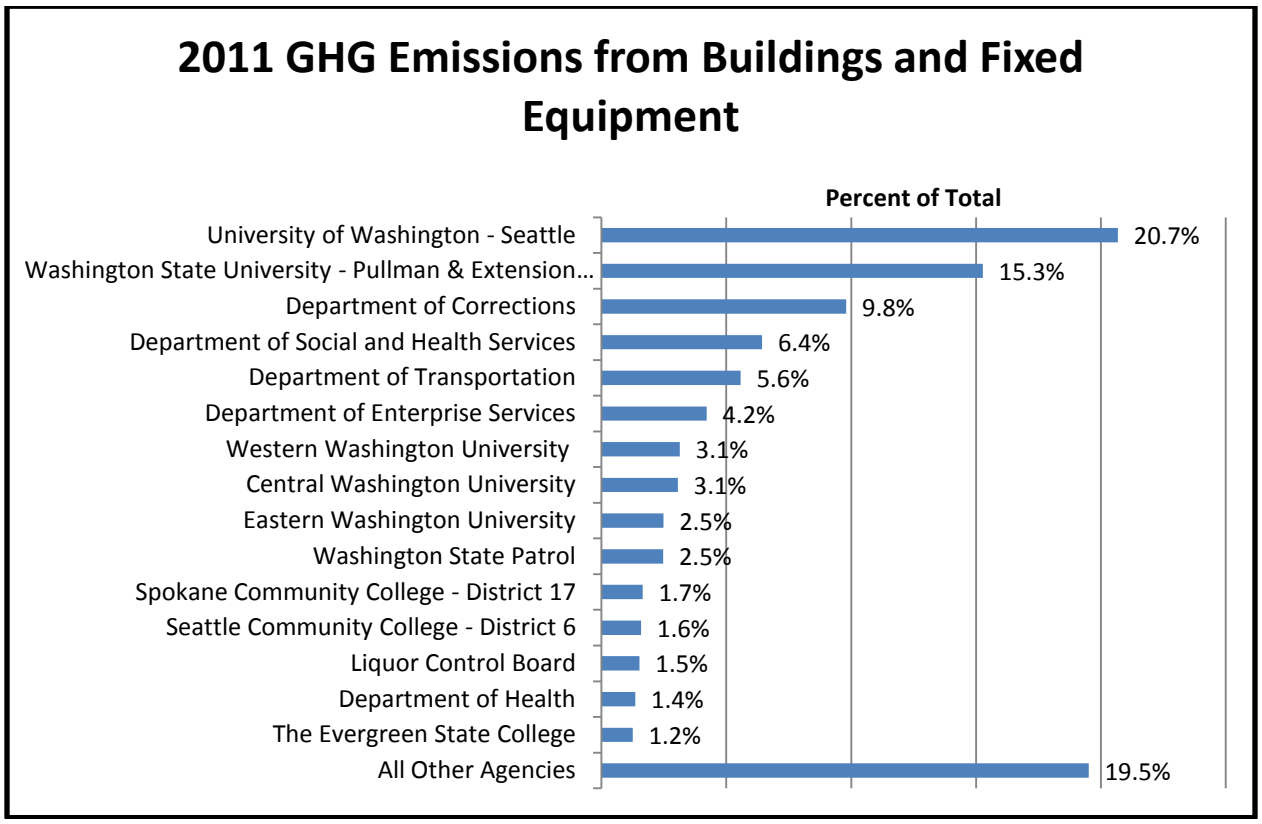

Figure 4: 2011 GHG Emissions from Buildings and Fixed Equipment

State vehicle fleet

State agencies emitted about 277,060 $MTCO_2e$ from state-owned motor vehicles in 2011. This represents a 1.9 percent reduction from 2010 levels. About 63 percent of the 2011 total is from the Washington State Ferry (WSF) system, the nation's largest ferry system run by Washington State Department of Transportation (WSDOT). Thirty-seven percent or 101,300 $MTCO_2e$ are from other state fleet vehicles, which includes:

- On-road light duty and heavy-duty vehicles
- Off-road vehicles and equipment
- Non-WSF ferries
- Boats
- Aircraft

Five state agencies account for 89 percent of total GHG emissions from the state fleet. Each agency reported GHG emissions from agency owned fleet and from use of the motor pool.

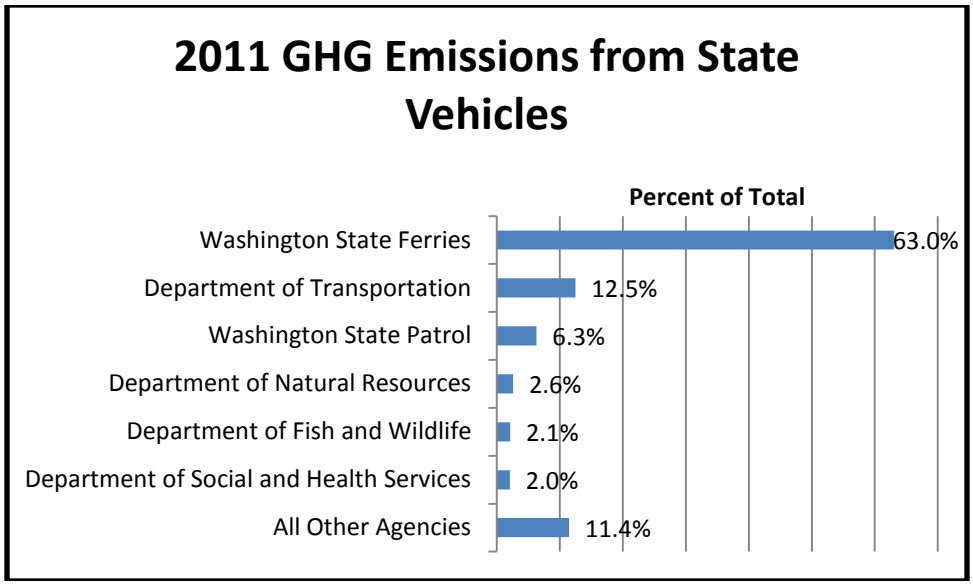

Figure 5: 2011 GHG Emissions from State Vehicles

Other Sources of GHG Emissions

Most state agencies reported GHG emissions for several other sources, including:

- Business travel in private vehicles, including employee owned vehicles and air travel.
- Employee commuting.

These are not included in the total state agency GHG emissions because data was not available or was poor for 2005, the baseline year. Many agencies have taken steps to improve tracking of this data but significant challenges remain. Also, agencies have less control over emission reduction decisions.

Although these emissions are not included in the total, agencies achieved and continue to pursue significant reductions from these sources. Moving forward, Ecology will work with agencies to determine what sources the reduction targets should apply to and how to include other sources of emissions in the baseline.

Business travel in private vehicles

State agencies reported about 51,250 $MTCO_2e$ from business travel in 2011. This figure is likely low because many agencies have decentralized records or limited data on air travel. Also, the data does not include estimated emissions from non-reporting agencies. The 2011 emissions represent a 17 percent increase over reported levels for 2010. The actual change in GHG emissions could be significantly lower, however. As data and tracking improve, more agencies could start reporting GHG emissions and reported levels could continue to increase.

GHG emissions from business travel in private vehicles are limited to emissions from air travel and business travel in vehicles owned by employees. GHG emissions from employee travel by taxi, car rentals, rail, ferry, or bus are not included in this estimate.

Employee commuting
State agencies also reported 112,500 $MTCO_2e$ from employee commuting for 2011. This figure is incomplete and does not include estimates for non-reporting agencies and for worksites that are not a part of the Commute Trip Reduction (CTR) program run by WSDOT. This represents a 21 percent decline over reported emissions for 2010. However, the 2010 and 2011 figures are not comparable because data reported from agencies was incomplete.

WSDOT began to quantify GHG emissions for CTR worksites in 2009. In 2009, the Legislature added requirements for all state agencies located in Thurston County to participate in a Joint Comprehensive CTR Plan. For future years, more agency worksites in Thurston County will have data on GHG emissions from employee commuting. WSDOT estimated emissions from employee commuting for commuters driving alone, carpooling, vanpooling, or motorcycling as determined by commute trip survey data. Commuting emissions do not include student commutes or commuting by rail, transit, or ferry.

Fugitive emissions
Five agencies reported 3,650 MTCO2e "fugitive" emissions, or gas leaks from:

- Commercial refrigeration
- Commercial air conditioning equipment and heat pumps
- Fire suppression equipment
- Other types of equipment

Many refrigerants and compressed gases are potent high global warming potential (GWP) gases that have GWPs that are 140 to 11,700 times that of carbon dioxide. Ecology and other agencies will evaluate expanding fugitive emissions reporting in future years. Data collection for many agencies continues to present challenges.

Additional Sources Reported by Higher Education Institutions
Most of the universities, community and technical colleges, and the Evergreen State College participate in the American College and University Presidents' Climate Commitment, and use a comprehensive greenhouse gas calculator tailored specifically to higher education institutions. This calculator includes additional sources of emissions not included by other agencies, such as student commuting, solid waste, and other sources. To provide a consistent basis for comparison, these sources are not included in the emissions totals in this report.

Higher education institutions also often account for purchases of renewable energy credits (RECs) or offsets in their inventories. However, for this report, reductions in emissions from RECs or offsets are not factored in for several reasons:

- To provide agencies an incentive to focus on energy reductions from operations, which allow the state to save money and improve efficiency over the long-term.
- The quality and rigor of offsets and RECs varies and in some cases it is difficult to determine if they lead to actual reductions in GHG emissions.
- The protocols for quantifying GHG reductions from offsets, RECs, and green power are complex and vary in accuracy.

Moving forward, Ecology will work with agencies to determine if and how to best account for reductions from RECs or offsets.

4. Existing and Planned Actions to Reduce Greenhouse Gas Emissions

Actions taken since 2010 to reduce GHG emissions

The Act requires agencies to report biennially on actions they have taken to reduce GHG emissions in the past two years.[6] Ecology developed a web survey using Survey Monkey for agencies to use for reporting. Fifty-seven agencies responded and completed the web survey.

Building energy use actions

Forty agencies provided survey responses on a number of actions taken since 2010 to reduce energy in buildings. Key actions include:

- Constructed new or renovated buildings to meet green building standards. Since the High-Performance Green Buildings Act came into effect in July 2005, fifty-two state-owned projects have been LEED certified, including 2 Platinum, 29 Gold, and 22 Silver.
- Completed energy performance benchmarking in Portfolio Manager, conducted audits, and made investments in energy efficiency.
- Upgraded and renovated their buildings to add energy saving measures such as retrofitted HVAC, efficient indoor and outdoor lighting, and weatherization and occupancy sensors.
- Used Energy Savings Performance Contracting to identify and implement energy efficiency projects.
- Switched to more energy efficient appliances.
- Substituted low-carbon fuels for fossil fuels.
- Installed solar photovoltaics (PV).

UW Seattle is part of a $178 million five-year federal demonstration project in five western states to make the energy grid smarter. UW is installing 235 electrical meters on campus, as well as energy monitoring devices in students' rooms. UW is designing energy controls to automatically make adjustments based on the predicted price of power.

For more information, see http://seattletimes.com/html/localnews/2019505610_smartgrid24m.html .

As a result of virtualization of servers in the DNR data center, physical servers were reduced from 140 to 45.

Seattle Community College IT Services automatically shuts down computers that remain on after normal business hours. Three campuses share servers that are housed at the district office.

[6] Information on actions taken from 2005 to 2010 to reduce GHG emissions is posted at http://www.ecy.wa.gov/climatechange/WAleadership.htm.

Office equipment and information technology actions

Since 2010, agencies have implemented strategies to increase energy efficiency and reduce energy consumption from office equipment and information technology. Key actions include:

- Implemented server virtualization and consolidated and eliminated some servers.
- Used energy star computers, monitors, printers, and copiers.
- Installed software on desktop and laptop computers that automatically puts the computer into a lower power setting or hibernation mode when not in use.
- Deployed software to track and reduce printer usage and reduce the cost of printing.
- Reduced number of printers and copiers.
- Installed video conferencing systems.
- Promoted paperless systems and use of electronic communications instead of printed materials.

As part of its Master Transportation Plan, WSU has made a considerable commitment to provide more mobility options.

- In February 2011 WSU contracted with Zimride to provide a social network for ridesharing, and in August 2011 WSU launched a partnership with Zipcar to provide car-sharing.
- Transit ridership increased in 2011 to over 1.5 million rides.
- WSU is working to create a Bicycle and Pedestrian Plan with the goal of transforming WSU Pullman to create a more friendly and safe environment for active transportation.

State fleet actions

Since 2010, key actions to cut costs and reduce fuel use and GHG emissions from the state fleet include:

- Disposed old vehicles and purchased more fuel efficient vehicles, hybrids, flex-fuel vehicles, and/or smaller vehicles.
- Instituted preventative maintenance schedules and fleet management practices.
- Implemented limits on idling.
- Expanded biodiesel use.
- Expanded purchase of hybrid or electric vehicles and equipment.
- Installed electric vehicle charging stations.
- Implemented business trip reduction policies.
- Invested in video-conferencing and expanded use of web conferencing.
- Expanded carpooling to business meetings or conferences.

WSDOT is currently evaluating strategies to reduce fuel use in ferries, including:

- Retrofit ferries to use cleaner burning LNG instead of diesel
- Profile routes to identify optimum speeds and save fuel.
- Reduce number of engines operating on certain vessel classes.
- Reduce on-board fuel storage to minimize weight load.
- Install heat recovery.

WSDOT retrofitted 21 sedans, vans, and light-duty work trucks with dual fuel capabilities – powered primarily by propane with gasoline as the backup fuel. Fuel use is reduced by an estimated 30 to 50 percent per vehicle each year.

Business travel in private vehicles and employee commuting actions

Since 2010, key actions to reduce GHG emissions from business travel in private vehicles and employee commuting include:

State Parks vehicle fleet includes over 30 hybrid vehicles. 26 parks use electric vehicles for in-park duties, and 43 parks use bicycles for in-park duties.

- Encouraged employees to use agency-owned or motor pool vehicles for business travel.
- Restricted out of state travel restrictions and implemented business trip reduction policies.
- Invested in video-conferencing and expanded use of web conferencing.
- Expanded carpooling to business meetings or conferences.
- Expanded CTR reduction program to new worksites in Thurston County.

Additional actions

Many state agencies are committed to reducing their impact on the environment through:

State procurement criteria were adjusted in 2012 to include the flexibility to consider environmental attributes.

- Purchased green power or renewable energy credits (RECs).
- Implemented paper conservation and recycling programs.
- Implemented waste reduction activities and expanded recycling and composting.
- Expanded purchase of environmentally preferred products.
- Conserved water, implemented best management practices for reducing stormwater runoff, and reduced GHG emissions from wastewater treatment.

The Evergreen State College set a goal of Zero-waste by 2020.

- Implemented employee engagement and behavior change campaigns.

The GHG emissions from these activities were not calculated because of a lack of established methods and a lack of data. All of these actions have a direct effect on Washington's environment and help reduce GHG emissions state-wide.

GHG Reduction Strategies

Agencies have already taken many actions to reduce GHG emissions, conserve energy, and increase energy efficiency in buildings. However, meeting the reduction targets will require significant dedication and investment. The State Agency Climate Leadership Act required agencies to develop and submit to Ecology strategies to reduce GHG emissions by June 30, 2011. Ecology received strategies from 71 agencies – each strategy uniquely addresses the

operations and profile of a specific agency. Agencies are encouraged to monitor and update the strategies periodically to account for changing conditions.

Agencies considered the cost-effectiveness of various actions to reduce GHG emissions and the payback period of the actions. No or low-cost actions were given priority for implementation. Agencies also examined actions with short payback periods and actions that will require major public investments.

Moving forward, agencies will continue to implement strategies that are funded, have low-cost financing options, and those required by law. Some strategies are not currently funded or are significantly underfunded, and full implementation of the strategies could be challenging. For example, WSDOT estimated that implementation of strategies to achieve the 2020 reduction target could cost an additional $45 million beyond regularly anticipated appropriations.

With existing and planned actions, around 44 percent of the agencies surveyed anticipate they will be able to meet the 2020 reduction target.

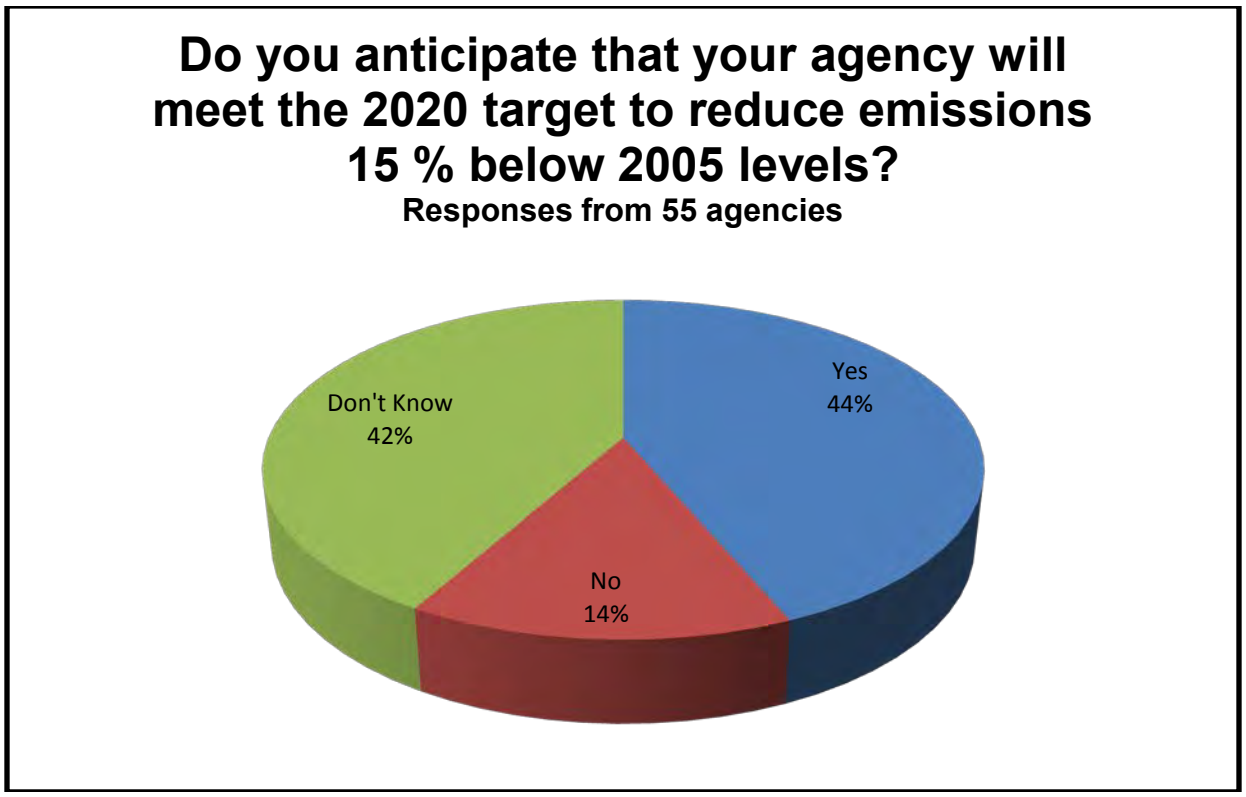

Figure 6: Percent of Agencies that Expect to Meet the 2020 Reduction Target

Fifty-four percent of agencies responding to the survey reported that the implementation of strategies to reduce energy use and GHG emissions was an important factor in contributing to emission reductions. Some agencies reported that finding additional reductions could be difficult because they have already done so much and remaining actions are less cost-effective.

Other factors contributing to changes in emissions include:

- Increase/decrease in agency building space, staff, population served, and/or agency services.
- Agency reorganization.
- Improved data collection or correction of older data.
- Restrictions on out-of-state travel.
- Expansion of CTR program to new worksites.
- Several higher education institutions noted that higher enrollment and campus expansions would make it more difficult to meet the reduction targets, despite the fact that the new buildings are more energy efficient.

Agencies reported several factors that would help them meet the GHG reduction targets:

- Funding mechanisms.
- Staff assigned to sustainability and staff to monitor and analyze data and systems.
- Agency management support.
- Greater awareness of state goals and activities.
- Changes in agency culture and awareness of targets and why they are important.
- Better understanding of emission reduction actions.
- More sub-metering and better data on energy use.

Agencies provided several recommendations for budgetary or other incentives to reduce emissions. A summary is provided below. Note that Ecology hasn't evaluated or prioritized these recommendations.

- Low interest rate loans.
- Allow agencies to retain all or a portion of their utility savings for energy efficiency improvements in their facilities.
- Funding specifically allocated each budget cycle for sustainable projects.
- An internal agency carbon tax that feeds back into reduction and mitigation programs for the agency.
- Continue aggressive capital budget to address capital repair and replacement schedules.
- Moving out of buildings with low Energy Star ratings.
- Additional ESCO Projects.
- Reduce grant restrictions that require local match funding.
- More incentives for CTR, such as STAR transit passes for all Thurston County state employees and ORCA pass for travel on Central Puget Sound transit services.
- Strict travel policies and CTR programs. Establishment of a centralized CTR program so that incentives and policies are consistent and economies of scale are leveraged.

- Provide budgetary rewards or penalties for agencies for meeting GHG reductions from employee travel.
- Set budgetary rewards and penalties for agencies
- Awards for meeting reduction targets.
- Cap and trade system within state government.

5. Next Steps

Agencies have taken several actions over the past couple of years to reduce energy use, lower costs, and deploy cleaner, more efficient technologies. However, meeting the reduction targets will be challenging and will require significant dedication and investment. Some agencies expect to achieve continued reductions in GHG emissions, whereas other agencies are expanding and may find it difficult to meet the reduction targets.

Continue to implement new and existing reduction strategies and leverage complementary efforts

Continued implementation of new and existing policies to conserve energy and fuel, increase energy and fuel efficiency, and deploy advanced technology is critical for agencies to reduce GHG emissions and meet the targets.[7] Ecology will continue to coordinate with other agencies and the Governor's office to leverage complementary efforts that will result in emissions reductions and improve data coordination.

Continue to improve data and tracking

Additional effort is needed by some agencies to improve tracking of energy use and collect more accurate data. Key challenges and opportunities include:

- Records of utility energy consumption are often decentralized, making it difficult for large agencies with multiple worksites and utility accounts across the state to track energy use for the agency as a whole.
- Agencies continue to work with utilities to obtain more accurate information on building energy use and download data directly into Portfolio Manager.
- Some agencies have multiple buildings metered by a single meter, which limits the information available to strategically manage utility use by building.
- Departments of Ecology, Commerce, and Agriculture are working to improve biofuel tracking; however, tracking biodiesel content for bulk fuels remains a challenge.
- Records on air travel are often decentralized and data to accurately measure GHG emissions is lacking.
- The CTR program is being expanded to all worksites in Thurston County; however, estimation methods and tools are needed for worksites not included in the CTR program.
- GHG reporting replaced the sustainability reporting required by cabinet agencies. More effort is needed to better integrate and track sustainability practices, such as agency water use, solid waste and recycling, composting, environmentally preferred purchasing, and other sustainable practices.

Several agencies have updated their prior GHG emission inventories with improved data. Agencies' GHG emissions may fluctuate over the next few years as agencies continue to improve data management and tracking.

Ecology encourages agencies to review their greenhouse gas reduction strategies periodically to evaluate their progress and actions needed to meet the GHG reduction targets.

[7] A list of statutory requirements applicable to state agency GHG reductions is posted here: http://www.ecy.wa.gov/climatechange/docs/2010leadership/app2.pdf.

Carbon neutral government

In a December 2009 news release,[8] following her trip to the United Nations climate summit in Copenhagen, Governor Gregoire challenged Ecology to lead Washington state government to achieve carbon neutrality by 2020. Carbon neutrality means that we reduce our emissions as much as possible. All remaining emissions must be offset by purchasing RECs or implementing projects outside of state government operations that will reduce emissions by an equal amount.

Achieving carbon neutrality will be costly for agencies. Ecology continues to encourage agencies to achieve the maximum cost-effective reductions from their operations before purchasing offsets and RECs from others. In the future, Ecology will continue to work with agencies to evaluate whether and how to incorporate offsets and RECs into the GHG reporting and reduction program.

Measure progress and account for changes in operations

Ecology will continue to work with agencies to take into account agency reorganization and significant changes in agency operations that result in significant increases or decreases in emissions from the baseline level. Some agencies could meet the targets without taking significant action because of organizational changes and through reductions in staffing and services. Other agencies will continue to grow and expand programs and services, making it more difficult to meet the targets.

To track progress over time, it is important for agencies to institutionalize the process and to establish internal performance measures that tie to their specific activities, operations, and energy profile. Complementary efforts by agencies to establish energy benchmarking scores for buildings in Portfolio Manager and to track fleet fuel efficiency will assist agencies in tracking their progress in improving efficiency and reducing GHG emissions. Agencies can work to institutionalize sustainability and to consider energy consumption and emissions in Government Management Accountability and Performance (GMAP), strategic plans, policies, budgets, and mission statements.

Report annual GHG emissions and actions taken

Agencies will continue to report their GHG emissions to Ecology each year, which will help in evaluating progress in meeting the reduction targets. By September 30, 2014, agencies will report on their progress in implementing the reduction strategy and actions taken to reduce GHG emissions. By December 31, 2014 Ecology will report to the Governor and the Legislature the total state agencies' emissions of GHGs and actions taken to reduce emissions in the last two years.

DUE DATE	REPORTING REQUIREMENT
September 30, 2013	**Agencies submit to Ecology estimates of 2012 emissions**
September 30, 2014	**Agencies submit to Ecology estimates of 2013 emissions, survey of actions taken to reduce GHG emissions in 2012-2013, and progress in implementing the reduction strategy**
December 31, 2014	**Ecology reports to Governor and Legislature total state agencies' emissions for 2005, 2012 and 2013 and actions taken to meet the emission reduction targets**

[8] www.governor.wa.gov/news/news-view.asp?pressRelease=1401&newsType=1

Glossary of Terms and Acronyms

CH_4 – Methane

CO_2 – Carbon dioxide

CO_2e – Carbon dioxide equivalent – the universal unit for comparing emissions of different GHGs expressed in terms of the GWP of one unit of carbon dioxide.

CTR – Commute trip reduction – a program to reduce vehicle miles traveled and drive alone vehicle trips.

eGRID – Emission and Generation Resource Integrated Database – an EPA database with comprehensive information on U.S. electricity generation and emissions.

Emissions factor – The emissions from a unit of activity, such as the emissions from the consumption of one kilowatt of electricity.

ESCO – Energy services company – a company that conducts an energy audit of a facility, designs installs, commissions, and finances energy efficiency projects selected by the facility owner, and guarantees both the maximum project cost and the projected energy savings.

Fugitive emissions – Emissions of gases leaked from commercial refrigeration, commercial air conditioning equipment, heat pumps, fire suppression equipment, and other types of equipment. Many refrigerants and compressed gases are high global warming potential (high GWP) gases that have GWPs which are 140 to 11,700 times that of carbon dioxide.

GHG – Greenhouse gas – there are six main GHGs recognized internationally in the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Green power – Several utilities have green power programs that allow customers to support renewable energy projects, such as wind and solar.

GWP – Global warming potential – the degree of warming to the atmosphere that would result from the emission of one unit of a given GHG compared to one unit of carbon dioxide.

HFC – Hydrofluorocarbon – highly potent greenhouse gases used for refrigeration and other commercial purposes.

LEED – Leadership in Energy and Environmental Design – a third party certification system and benchmark developed by the U.S. Green Building Council for the design, construction, and operation of high performance green buildings.

N_2O – Nitrous oxide

$MTCO_2e$ – Metric ton carbon dioxide equivalent. One metric ton equals 2,204.62 pounds.

Portfolio Manager – An EPA Energy Star tool to benchmark the energy performance of buildings and track energy and water consumption in buildings.

RECs – Renewable energy credits – a credit for the generation or purchase of one megawatt hour of renewable power. Also known as green tags.

RCM – Resource Conservation Manager – a staff position dedicated to creating and managing an agency's resource conservation program. The position focuses on managing agency resources, (including electricity, natural gas, water, solid waste, recycling, and others) to reduce operating costs, increase efficiency, and promote sustainable operations.

Stationary combustion emissions – Emissions from the combustion of fossil fuels to produce electricity or heat using boilers, furnaces, or other equipment in a fixed location.

Appendices

Appendix 1. GHG Emissions by Agency, 2005 and 2010-2011

Appendix 2. Summary of Actions Taken to Reduce GHG Emissions

Appendix 1: Greenhouse Gas Emissions for Washington State Agencies for 2005 and 2010-2011

Arranged from highest to lowest 2011 Emissions (All Units in $MTCO_2e$)

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
Department of Transportation	**261,122**	**269,976**	**262,005**	**0.3%**	**221,954**	**15.3%**
University of Washington main campus	**207,445**	**209,615**	**193,008**	**-7.0%**	**176,328**	**8.6%**
Washington State University - Pullman Research & Extension Statewide[1]	*137,363*	**139,659**	**144,132**	*4.9%*	*116,759*	*19.0%*
Department of Corrections	**115,479**	**105,508**	**95,440**	**-17.4%**	**98,157**	**0.0%**
Department of Social and Health Services	**72,959**	**71,992**	**65,020**	**-10.9%**	**62,015**	**4.6%**
Washington State Patrol	**21,455**	**31,604**	*40,381*	**88.2%**	**18,237**	**54.8%**
Department of Enterprise Services[2]			**39,460**			
Western Washington University	**23,120**	**28,593**	**29,525**	**27.7%**	**19,652**	**33.4%**
Central Washington University	**27,538**	*28,941*	*28,941*	*5.1%*	**23,407**	*19.1%*
Eastern Washington University	**27,280**	*27,014*	**23,376**	**-14.3%**	**23,188**	**0.8%**
Spokane Community College - District 17	**13,034**	**14,288**	**15,642**	**20.0%**	**11,079**	**29.2%**
Department of Fish and Wildlife	**21,136**	**16,564**	**15,223**	**-28.0%**	**17,966**	**0.0%**
Liquor Control Board	**7,323**	**11,983**	**15,103**	**106.2%**	**6,225**	**58.8%**
Seattle Community College - District 6	**15,003**	**14,355**	**14,843**	**-1.1%**	**12,753**	**14.1%**
Department of Health	**9,590**	*13,052*	*13,052*	*36.1%*	**8,152**	*37.5%*
The Evergreen State College	**12,977**	**10,666**	**11,855**	**-8.6%**	**11,030**	**7.0%**
State Parks and Recreation Commission	**13,573**	**12,744**	**11,782**	**13.2%**	**11,537**	**2.1%**
Department of Natural Resources	**11,790**	**10,256**	**9,931**	**-15.8%**	**10,022**	**0.0%**
Department of Veterans' Affairs	**6,452**	**6,427**	**7,150**	**10.8%**	**5,484**	**23.3%**
Bellevue Community College	**5,212**	**6,723**	**6,723**	**29.0%**	**4,430**	**34.1%**

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
Washington State Health Care Authority	**874**	**647**	**6,312**	**622.2%**	**743**	**88.2%**
Pierce College	**4,334**	**6,164**	**6,068**	**40.0%**	**3,684**	**39.3%**
Department of Ecology	**6,246**	**6,063**	**5,960**	**-4.6%**	**5,309**	**10.9%**
Columbia Basin Community College	**4,696**	*5,941*	**5,950**	**26.7%**	**3,991**	**32.9%**
Bates Technical College	**6,161**	*5,903*	*5,903*	*-4.2%*	**5,237**	*11.3%*
Department of Labor and Industries	**7,205**	**7,171**	**5,877**	**-18.4%**	**6,124**	**0.0%**
Highline Community College	**6,286**	**9,104**	**5,874**	**-6.6%**	**5,343**	**9.0%**
Shoreline Community College	**4,812**	*5,641*	*5,641*	*17.2%*	**4,090**	*27.5%*
Green River Community College	*5,543*	*5,543*	**5,543**	*0.0%*	*4,712*	*15.0%*
UW Tacoma	**4,428**	**5,703**	**5,402**	**22.0%**	**3,764**	**30.3%**
Big Bend Community College	**4,884**	**4,807**	**5,213**	**6.7%**	**4,151**	**20.4%**
Washington State University - Spokane[1]	*4,949*	**4,710**	**5,158**	*4.2%*	*4,207*	*18.4%*
Edmonds Community College	**5,877**	**5,485**	**5,080**	**-13.6%**	**4,996**	**1.7%**
Clover Park Technical College	**4,975**	*4,964*	*4,964*	*-0.2%*	**4,229**	*14.8%*
Skagit Valley College	**3,809**	**4,401**	*4,401*	*15.5%*	**3,238**	*26.4%*
Tacoma Community College	**3,944**	**4,174**	**4,201**	**6.5%**	**3,352**	**20.2%**
Washington State Univercity - Vancouver[1]	*3,899*	**3,792**	**4,158**	*6.6%*	*3,314*	*20.3%*
Wenatchee Valley College	**3,381**	*4,118*	*4,118*	*21.8%*	**2,874**	*30.2%*
Everett Community College	**3,924**	**3,890**	**4,005**	**2.1%**	**3,335**	**16.7%**
South Puget Sound Community College	**2,933**	*3,981*	*3,981*	*35.7%*	**2,493**	*37.4%*
Washington State Univercity - Tri Cities[1]	*3,749*	**3,575**	**3,918**	*4.5%*	*3,187*	*18.7%*
Walla Walla Community College	**3,715**	*3,726*	*3,726*	*0.3%*	**3,157**	*15.3%*
Department of Employment Security	**4,681**	**4,168**	**3,511**	**-25.0%**	**3,979**	**0.0%**

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
Renton Technical College	**2,472**	**3,614**	**3,437**	**39.0%**	**2,101**	**38.9%**
Lower Columbia College	**2,577**	**3,385**	**3,298**	**28.0%**	**2,190**	**33.6%**
Military Department	**2,838**	**3,069**	**3,262**	**15.0%**	**2,412**	**26.1%**
Lake Washington Technical College	**5,217**	**3,137**	**3,062**	**-41.3%**	**4,434**	**0.0%**
Office of the Attorney General	**1,632**	**3,322**	**2,538**	**55.5%**	**1,387**	**45.4%**
Department of Revenue	**2,711**	**2,510**	**2,378**	**-12.3%**	**2,305**	**3.1%**
Centralia College	**1,865**	**2,370**	**2,299**	**23.3%**	**1,585**	**31.0%**
Department of Agriculture	**2,093**	*1,997*	**2,047**	**-2.2%**	**1,779**	**13.1%**
Bellingham Technical College	**2,192**	*2,061*	**1,930**	**-12.0%**	**1,863**	**3.5%**
Peninsula College	**1,265**	*1,884*	*1,884*	*48.9%*	**1,076**	*42.9%*
Whatcom Community College	**2,357**	**1,952**	**1,736**	**-26.3%**	**2,003**	**0.0%**
UW Bothel	**2,197**	**1,935**	**1,580**	**-28.1%**	**1,867**	**0.0%**
Cascadia Community College	**1,476**	**1,668**	**1,395**	**-5.5%**	**1,254**	**10.1%**
Department of Licensing	**2,896**	**2,399**	**1,324**	**-54.3%**	**2,462**	**0.0%**
Washington State Center for Childhood Deafness and Hearing Loss	**2,115**	**1,176**	**1,090**	**-48.5%**	**1,798**	**0.0%**
Grays Harbor College	*1,010*	**1,010**	**1,016**	*0.5%*	*859*	*15.5%*
State School for the Blind	**963**	**840**	**936**	**-2.8%**	**818**	**12.6%**
Washington State Criminal Justive Training Commission	**707**	*898*	**798**	**12.8%**	**601**	**24.6%**
State Board for Community and Technical Colleges	**659**	*769*	*769*	*16.6%*	**560**	*27.1%*
Washington State Gambling Commission	**981**	*754*	**686**	**-30.1%**	**834**	**0.0%**
Office of the State Auditor	**492**	*703*	**674**	**36.9%**	**418**	**37.9%**
Administrative Office of the Courts	**649**	**571**	**554**	**-14.7%**	**552**	**0.4%**
Department of Commerce	**788**	**743**	**550**	**-30.3%**	**670**	**0.0%**

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
Department of Retirement Systems	**462**	*524*	*524*	*13.4%*	**393**	*25.1%*
Board of Industrial Insurance Appeals	**550**	**333**	**518**	**-5.8%**	**467**	**9.8%**
State Lottery Commission	**630**	**486**	**516**	**-18.0%**	**536**	**0.0%**
Olympic College	**491**	**311**	**514**	**4.6%**	**417**	**18.7%**
Joint Legislative Systems Committee	**416**	**397**	*397*	*-4.5%*	**353**	*11.0%*
Utilities and Transportation Commission	**467**	*421*	**397**	**-15.1%**	**397**	**0.0%**
Office of Administrative Hearings	**384**	*384*	*384*	*0.1%*	**326**	*15.0%*
Department of Financial Institutions	**354**	**373**	**338**	**-4.5%**	**301**	**11.0%**
Legislative Service Center	*313*	*313*	**313**	*0.0%*	*266*	*15.0%*
Office of Financial Management[2]	**202**	**337**	**288**	**42.0%**	**172**	**40.2%**
State Investment Board	**177**	*224*	*224*	*26.4%*	**151**	*32.8%*
Transportation Improvement Board	**206**	*191*	**182**	**-11.6%**	**175**	**3.8%**
Office of Insurance Commissioner	**355**	**468**	**170**	**-52.2%**	**302**	**0.0%**
Higher Education Coordinating Board	**126**	*157*	*157*	*24.9%*	**107**	*31.9%*
Superintendent of Public Instruction	**221**	**152**	**145**	**-34.4%**	**188**	**0.0%**
Department for Early Learning		*232*	**134**		**286**	**0.0%**
Public Employment Relations Commission	**124**	*123*	*123*	*-1.1%*	**106**	*14.0%*
Work Force Training and Education Coordinating Board	**135**	*100*	*100*	*-25.8%*	**114**	*0.0%*
Puget Sound Partnership		*69*	**99**			
Human Rights Commission	**129**	**76**	**75**	**-41.5%**	**109**	**0.0%**
Public Disclosure Commission	**69**	*65*	**61**	**-12.8%**	**59**	**2.5%**
Indeterminate Sentence Review Board	**56**	**59**	*59*	*6.1%*	**47**	*19.9%*
Washington State Arts Commission	**62**	**59**	**55**	**-11.5%**	**53**	**3.9%**

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
Joint Legislative Audit And Review Committee	**2**	*51*	*51*	*2450.0%*	**2**	*96.7%*
Board of Tax Appeals	**47**	*46*	*46*	*-2.5%*	**40**	*12.8%*
Legislative Evaluation and Accountability Program Committee	**43**	**46**	*46*	*8.2%*	**36**	*21.5%*
Office of Minority and Women's Business Enterprises	**39**	*39*	*39*	*1.3%*	**33**	*16.1%*
Office of the State Actuary	**34**	*39*	*39*	*13.7%*	**29**	*25.2%*
Washington Hourse Racing Commission	**39**	*36*	*36*	*-6.7%*	**33**	*8.9%*
Caseload Forecast Council	**0**	**15**	**33**	**100.0%**	**0**	**100.0%**
Washington State Board of Accountancy	**20**	**32**	**30**	**55.1%**	**17**	**45.2%**
Washington State Commission on Hispanic Affairs	*27*	*27*	*27*	*0.0%*	*23*	*15.0%*
Environmental Hearing Office	**24**	*26*	*26*	*10.2%*	**20**	*22.8%*
Columbia River Gorge Commission	**20**	**24**	**24**	**18.7%**	**17**	**28.4%**
Senate	**11**	*17*	*17*	*54.5%*	**9**	*45.0%*
Washington State Transportation Commission	**7**	*15*	**17**	**147.8%**	**6**	**65.7%**
Recreation and Conservation Office	**28**	**16**	*16*	*-42.7%*	**24**	*0.0%*
Growth Management Hearings Board	*15*	**15**	*15*	*0.0%*	*13*	*15.0%*
House of Representatives	**15**	*15*	*15*	*1.4%*	**13**	*16.1%*
Office of Education Obudsman	**0**	*13*	*13*	*100.0%*	**0**	*100.0%*
Commission on Judicial Counduct	**0**	*11*	*11*	*100.0%*	**0**	*100.0%*
Department of Archaeology and Historic Preservation	**3**	**9**	**9**	**264.0%**	**2**	**76.6%**
Marine Employees Commissions	**8**	*8*	*8*	*1.3%*	**7**	*16.1%*
Office of the State Treasurer	**12**	**17**	**7**	**-45.1%**	**10**	**0.0%**
Pollution Liability Insurance Agency	**12**	**10**	**7**	**-45.9%**	**10**	**0.0%**
Statute Law Committee	**27**	*19*	**6**	**-77.2%**	**23**	**0.0%**

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
State Law Library	**5**	**2**	**2**	**-66.0%**	**4**	**0.0%**
Economic and Revenue Forecast Council	**0**	**1**	**2**	**100.0%**	**0**	**100.0%**
Office of the Lieutenant Governor	**1**	**1**	*1*	*0.0%*	**0**	*100.0%*
Freight Mobility Strategic Investment Board	**0**	*0*	*0*	*0.0%*	*0*	*0.0%*
Law Enforcement Officers' and Fire Fighters' Plan 2 Retirement Board	**0**	**0**	**0**	**0.0%**	**0**	**0.0%**
Office of Family & Children Obudsmen	**0**	*0*	*0*	*0.0%*	**0**	*0.0%*
Office of the Governor	**0**	*0*	*0*	*0.0%*	**0**	*0.0%*
Washington Citizens' Commission on Salaries for Elected Officials	*0*	**0**	**0**	**0.0%**	*0*	**0.0%**
Washington State Commission on Asian Pacific American Affairs	*0*	**6**	**0**	*0.0%*	*0*	*0.0%*
Clark College						
Consolidated Technology Services						
County Road Administration Board						

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target
Court of Appeals						
Department of Information Services[2]	**782**	**736**			**665**	
Department of Personnel[2]	**527**	*510*			**448**	
Department of Printing[2]	**72**	**9**			**61**	
Department of Services for the Blind						
Energy Facility Site Evaluation Council						
Department of General Administration[2]	**36,524**	**31,069**			**31,045**	
Office of Civil Legal Aid						
Office of Public Defense						
Office of Secretary of State						
State Conservation Commission						
State Convention and Trade Center						
Supreme Court						
Washington Economic Development Finance Authority						
Washington Health Care Facilities Authority						
Washington Materials Management and Financing Authority						
Washington State Commission on African-American Affairs						
Washington State Historical Society						
Washington State Housing Finance Commission						
Washington Traffic Safety Commission						
Yakima Valley College						
Total	**1,201,578**	**1,225,126**	**1,203,108**		**1,021,341**	

Total Annual Greenhouse Gas Emissions from Buildings (Owned and Leased) and State-Owned Vehicles	2005	2010	2011	% Change 2005-2011	2020 Target	% Reduction from 2011 Needed to Meet 2020 Target

Italic non-bold figures are Ecology estimates. Emissions are estimated for agencies that did not report for one or more years based on historical emissions
Emissions were also estimated for some agencies that underwent reorganization or consolidation or changes in reporting boundaries.
Emissions' estimates are not included for 19 agencies that have never submitted reports.

1 - WSU changed from entity-wide reporting to reporting by campus in 2011. 2005 reported entity emissions totals were used to estimate emissions by campus.

2 - In 2010, General Administration, Dept. of Personnel, Dept. of Printing, Dept. of Information Services, and Office of Financial Management were consolidated into 3 agencies: Department of Enterprise Services, Consolidated Technology Services, and Office of Financial Management

Appendix 2:
Summary of Actions Taken to Reduce GHG Emissions

WA Agency GHG Actions Taken 2010-12

1. Please provide your contact information below.

		Response Percent	Response Count
Name:		**100.0%**	**54**
Department/Agency:		**100.0%**	**54**
Email Address:		**100.0%**	**54**
Phone Number:		**100.0%**	**54**
	answered question		**54**
	skipped question		**3**

2. Please select your agency category:

		Response Percent	Response Count
State Agency		**55.4%**	**31**
Board or Commission		14.3%	8
University or College		17.9%	10
Community and Technical College		12.5%	7
	answered question		**56**
	skipped question		**1**

3. In general, in the past few years have your GHG emissions:

	Response Percent	Response Count
Increased	29.1%	16
Decreased	**50.9%**	**28**
Stayed the same	20.0%	11
	answered question	**55**
	skipped question	**2**

4. In general, are emissions increasing, decreasing or staying the same in the following sectors:

	Increase	Decrease	Stay the same	Not Applicable	Response Count
Energy use in buildings	16.4% (9)	**45.5% (25)**	30.9% (17)	7.3% (4)	55
Travel in agency-owned vehicles or the motor pool	18.2% (10)	**52.7% (29)**	25.5% (14)	3.6% (2)	55
Travel in employee-owned vehicles or air travel	27.8% (15)	**42.6% (23)**	27.8% (15)	1.9% (1)	54
Commuting	21.8% (12)	30.9% (17)	**38.2% (21)**	9.1% (5)	55
				answered question	**55**
				skipped question	**2**

5. What factors have contributed to your agency's change in GHG emissions?

	Response Percent	Response Count
Increase/ decrease in employees	48.1%	25
Increase/ decrease in agency services	25.0%	13
Increase/ decrease in population served	26.9%	14
Increase/ decrease in agency building space	46.2%	24
Implementation of strategies to reduce energy use and GHG emissions	**53.8%**	**28**
Agency reorganization	9.6%	5
Unsure	13.5%	7
	Other (please specify)	18
	answered question	**52**
	skipped question	**5**

6. Do you anticipate that your agency will meet the 2020 target to reduce emissions 15% below 2005 levels?

	Response Percent	Response Count
Yes	**43.6%**	**24**
No	14.5%	8
Don't Know	41.8%	23
	answered question	**55**
	skipped question	**2**

7. What is needed to help meet the GHG targets? (E.g., funding mechanisms, agency management support, better understanding of emission reduction actions)

	Response Count
	41
answered question	**41**
skipped question	**16**

8. Do you have recommendations on bugetary and other incentives to reduce emissions?

	Response Count
	27
answered question	**27**
skipped question	**30**

9. Has your agency taken action (since 2010) to cut costs and reduce energy consumption and GHG emissions from through changes in building infrastructure and operations and/or from appliances and outdoor lighting?

		Response Percent	Response Count
Yes		**73.2%**	**41**
No		12.5%	7
Not applicable		14.3%	8
answered question			**56**
skipped question			**1**

10. Please describe your agency's experience with the following energy use reduction actions (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Constructed new or renovated buildings meeting green building standards (LEED or others)	**43.6% (17)**	35.9% (14)	5.1% (2)	38.5% (15)	30.8% (12)	39
Incorporated performance contracting for energy conservation	22.5% (9)	**42.5% (17)**	10.0% (4)	35.0% (14)	20.0% (8)	40
Installed meters to track energy use	37.5% (15)	30.0% (12)	15.0% (6)	**40.0% (16)**	15.0% (6)	40
Switched from electric to gas heating	23.1% (9)	17.9% (7)	15.4% (6)	20.5% (8)	**53.8% (21)**	39
Weatherized buildings	**38.5% (15)**	33.3% (13)	7.7% (3)	35.9% (14)	23.1% (9)	39
Required energy upgrade as condition of a building lease	17.9% (7)	12.8% (5)	12.8% (5)	7.7% (3)	**53.8% (21)**	39
Retrofitted HVAC of existing buildings	46.2% (18)	**53.8% (21)**	0.0% (0)	35.9% (14)	20.5% (8)	39
Installed more efficient indoor (building) lighting	**60.0% (24)**	55.0% (22)	0.0% (0)	35.0% (14)	10.0% (4)	40
Installed more efficient outdoor (building) lighting	47.5% (19)	**52.5% (21)**	7.5% (3)	40.0% (16)	12.5% (5)	40
Installed occupancy sensors	**50.0% (20)**	42.5% (17)	12.5% (5)	35.0% (14)	10.0% (4)	40
Installed more efficient street or traffic lights	23.1% (9)	30.8% (12)	2.6% (1)	28.2% (11)	**53.8% (21)**	39
Installed light sensors for street lights	32.4% (12)	18.9% (7)	8.1% (3)	16.2% (6)	**48.6% (18)**	37
Switched to energy efficient appliances	**52.5% (21)**	45.0% (18)	5.0% (2)	27.5% (11)	20.0% (8)	40
Using/purchased EnergyStar refrigerators	**51.3% (20)**	**51.3% (20)**	5.1% (2)	25.6% (10)	10.3% (4)	39

Using/purchased EnergyStar washing machines/dryers	23.1% (9)	28.2% (11)	0.0% (0)	17.9% (7)	**51.3% (20)**	39
Installed energy efficient air conditioners	28.9% (11)	**36.8% (14)**	7.9% (3)	26.3% (10)	**36.8% (14)**	38
Installed green roof	13.5% (5)	8.1% (3)	24.3% (9)	18.9% (7)	**43.2% (16)**	37
Retrofitted water pump stations for increased efficiency	15.4% (6)	15.4% (6)	10.3% (4)	10.3% (4)	**69.2% (27)**	39
Installed energy efficient equipment for wastewater treatment	5.3% (2)	5.3% (2)	5.3% (2)	0.0% (0)	**86.8% (33)**	38
Establish or expand employee engagement initiatives	25.6% (10)	25.6% (10)	20.5% (8)	**41.0% (16)**	15.4% (6)	39
					answered question	**40**
					skipped question	**17**

11. If there are any other actions your agency has taken (since 2010) to cut costs and reduce energy consumption and GHG emissions from building energy use please describe them below.

	Response Count
	23
answered question	**23**
skipped question	**34**

12. Has your agency taken action (since 2010) to cut costs and reduce energy consumption and GHG emissions through changes in office equipment and IT best practices?

	Response Percent	Response Count
Yes	**90.9%**	**50**
No	9.1%	5
Not applicable	0.0%	0
	answered question	**55**
	skipped question	**2**

13. Please describe your agency's experience with the following office equipment and IT energy use reduction actions (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Using/purchasing ENERGY STAR Computers and/or Monitors	**74.0% (37)**	40.0% (20)	2.0% (1)	22.0% (11)	4.0% (2)	50
Using/purchasing ENERGY STAR Printers and/or Copiers	**62.0% (31)**	44.0% (22)	4.0% (2)	24.0% (12)	4.0% (2)	50
Setting computer to hibernate when idle	**63.3% (31)**	40.8% (20)	14.3% (7)	20.4% (10)	0.0% (0)	49
Setting printer to hibernate when idle	**64.0% (32)**	50.0% (25)	6.0% (3)	18.0% (9)	0.0% (0)	50
Using technology to replace printing materials	**70.0% (35)**	52.0% (26)	2.0% (1)	22.0% (11)	2.0% (1)	50
Reducing number of printers and copiers	**54.0% (27)**	46.0% (23)	12.0% (6)	18.0% (9)	6.0% (3)	50
Deploying software on cost of printing and reducing printing	**38.0% (19)**	28.0% (14)	16.0% (8)	22.0% (11)	16.0% (8)	50
Reducing use of dual monitors	8.0% (4)	10.0% (5)	**72.0% (36)**	10.0% (5)	12.0% (6)	50
Installing video conferencing systems	**67.3% (33)**	40.8% (20)	10.2% (5)	20.4% (10)	4.1% (2)	49
Consolidate and virtualize servers	44.0% (22)	**52.0% (26)**	4.0% (2)	20.0% (10)	14.0% (7)	50
Move servers to the State Data Center	8.5% (4)	19.1% (9)	27.7% (13)	10.6% (5)	**38.3% (18)**	47
					answered question	**50**
					skipped question	**7**

14. If there are any other actions your agency has taken (since 2010) to cut costs and reduce energy consumption and GHG emissions from office equipment and IT energy use please describe them below.

	Response Count
	19
answered question	**19**
skipped question	**38**

15. Has your agency taken action (since 2010) to use, support, or generate renewable energy?

	Response Percent	Response Count
Yes	**43.6%**	**24**
No	32.7%	18
Not applicable	23.6%	13
answered question		**55**
skipped question		**2**

16. Please describe your agency's experience with the following renewable energy actions (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Installed solar hot water	13.0% (3)	8.7% (2)	**34.8% (8)**	30.4% (7)	21.7% (5)	23
Installed solar photovoltaics (PV)	21.7% (5)	26.1% (6)	17.4% (4)	**56.5% (13)**	13.0% (3)	23
Installed capacity to use geothermal energy	4.3% (1)	4.3% (1)	26.1% (6)	**39.1% (9)**	30.4% (7)	23
Displaced/replaced diesel, heating oil, gasoline and other fossil fuels with other low carbon fuel	8.7% (2)	**39.1% (9)**	13.0% (3)	13.0% (3)	**39.1% (9)**	23
Installed wood-waste co-generation units	0.0% (0)	0.0% (0)	22.7% (5)	9.1% (2)	**68.2% (15)**	22
Purchased renewable energy credits through utility	**33.3% (8)**	**33.3% (8)**	25.0% (6)	20.8% (5)	12.5% (3)	24
Purchased renewable energy credits or carbon offsets through third party vendor	0.0% (0)	9.1% (2)	**50.0% (11)**	13.6% (3)	31.8% (7)	22
					answered question	**24**
					skipped question	**33**

17. If there are any other actions your agency has taken (since 2010) to use, create, or support renewable energy please describe them below.

	Response Count
	12
answered question	**12**
skipped question	**45**

18. Has your agency taken action (since 2010) to cut costs and reduce fuel use and GHG emissions from your fleet of passenger vehicles?

	Response Percent	Response Count
Yes	**72.7%**	**40**
No	14.5%	8
Not applicable	12.7%	7
	answered question	**55**
	skipped question	**2**

19. Please describe your agency's experience with the following passenger vehicle fleet efficiency actions:

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Disposed of old vehicles	56.4% (22)	**59.0% (23)**	2.6% (1)	28.2% (11)	10.3% (4)	39
Purchased most fuel efficient vehicles	**50.0% (20)**	**50.0% (20)**	2.5% (1)	30.0% (12)	12.5% (5)	40
Purchased hybrid vehicles	**51.3% (20)**	43.6% (17)	5.1% (2)	28.2% (11)	15.4% (6)	39
Purchased plug-in hybrid electric vehicles	5.3% (2)	5.3% (2)	21.1% (8)	34.2% (13)	**36.8% (14)**	38
Constructed electric vehicle charging stations in parking facilities	5.1% (2)	12.8% (5)	12.8% (5)	**51.3% (20)**	25.6% (10)	39
Procured small vehicles	**45.0% (18)**	32.5% (13)	12.5% (5)	22.5% (9)	30.0% (12)	40
Discouraged purchase of SUVs and full size sedan	**33.3% (13)**	**33.3% (13)**	15.4% (6)	17.9% (7)	28.2% (11)	39
Instituted preventative maintenance schedule and employed fleet management practices	53.8% (21)	**56.4% (22)**	2.6% (1)	28.2% (11)	12.8% (5)	39
Instituted policies to utilize fuel-efficient vehicles for high mileage activities (e.g., enforcement, field work)	**31.6% (12)**	28.9% (11)	18.4% (7)	13.2% (5)	**31.6% (12)**	38
Limited idling of on-road vehicles	24.3% (9)	24.3% (9)	18.9% (7)	18.9% (7)	**37.8% (14)**	37
Purchase flex-fuel vehicles	**33.3% (13)**	30.8% (12)	23.1% (9)	25.6% (10)	25.6% (10)	39
					answered question	**40**
					skipped question	**17**

20. If there are any other actions your agency has taken (since 2010) to cut costs and reduce energy consumption and GHG emissions from passenger vehicle fleet please describe them below.

	Response Count
	16
answered question	**16**
skipped question	**41**

21. Has your agency taken action (since 2010) to cut costs and reduce fuel use and GHG emissions from your fleet of heavy duty or off-road vehicles, ferries, boats, or aircraft?

	Response Percent	Response Count
Yes	21.8%	12
No	12.7%	7
Not Applicable	**65.5%**	**36**
answered question		**55**
skipped question		**2**

22. Please describe your agency's experience with the following fleet efficiency actions related to: heavy duty on-road vehicles (buses, heavy duty trucks, dump trucks, snow plows, fire engines); off-road vehicles (yellow iron, tractors, forklifts, ATVs, etc); and ferries, aircraft and boats. Select all that apply

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Retrofitted vehicles	8.3% (1)	0.0% (0)	**33.3% (4)**	25.0% (3)	**33.3% (4)**	12
Expand biodiesel use	**50.0% (6)**	**50.0% (6)**	16.7% (2)	25.0% (3)	16.7% (2)	12
Converted vehicles to use natural gas (CNG)	0.0% (0)	0.0% (0)	38.5% (5)	0.0% (0)	**61.5% (8)**	13
Purchase hybrid or electric vehicles or mobile equipment	15.4% (2)	**46.2% (6)**	15.4% (2)	**46.2% (6)**	7.7% (1)	13
Installed idle time limits or limited idling	15.4% (2)	15.4% (2)	**38.5% (5)**	23.1% (3)	23.1% (3)	13
Instituted preventive maintenance and fleet management practices	**75.0% (9)**	50.0% (6)	0.0% (0)	50.0% (6)	0.0% (0)	12
Implement shorepower for ferries	0.0% (0)	7.7% (1)	0.0% (0)	7.7% (1)	**92.3% (12)**	13
Expand biodiesel use in ferries	7.7% (1)	7.7% (1)	0.0% (0)	7.7% (1)	**92.3% (12)**	13
Purchased high efficient ferries	0.0% (0)	0.0% (0)	0.0% (0)	8.3% (1)	**91.7% (11)**	12
Planned boat and aircraft trips to multiple locations in most efficient order	33.3% (4)	25.0% (3)	8.3% (1)	33.3% (4)	**58.3% (7)**	12
					answered question	**13**
					skipped question	**44**

23. If there are any other actions your agency has taken (since 2010) to cut costs and reduce fuel use and GHG emissions from heavy duty on-road or off-road fleet, ferries, boats, or aircraft please describe them below.

	Response Count
	7
answered question	**7**
skipped question	**50**

24. Has your agency taken action (since 2010) to cut costs and reduce fuel use and GHG emissions from business travel?

		Response Percent	Response Count
Yes		**90.9%**	**50**
No		7.3%	4
Not applicable		1.8%	1
	answered question		**55**
	skipped question		**2**

25. Please describe your agency's experience with the following business travel reduction actions (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Implemented business trip reduction policies	**62.0% (31)**	38.0% (19)	6.0% (3)	24.0% (12)	2.0% (1)	50
Invested in video conferencing equipment	**68.1% (32)**	44.7% (21)	10.6% (5)	21.3% (10)	2.1% (1)	47
Encourage/require carpooling to business meetings or conferences	**82.0% (41)**	56.0% (28)	2.0% (1)	20.0% (10)	0.0% (0)	50
Attend meetings or conferences via web	**72.9% (35)**	58.3% (28)	0.0% (0)	22.9% (11)	2.1% (1)	48
Expand use of video and web conferencing	**63.8% (30)**	57.4% (27)	2.1% (1)	23.4% (11)	2.1% (1)	47
				answered question		**50**
				skipped question		**7**

26. If there are any other actions your agency has taken (since 2010) to cut costs and reduce fuel use and GHG emissions from business travel please describe them below.

	Response Count
	13
answered question	**13**
skipped question	**44**

27. Has your agency taken action (since 2010) to cut costs and reduce fuel use and GHG emissions from employee commuting?

		Response Percent	Response Count
Yes		**89.1%**	**49**
No		10.9%	6
		answered question	**55**
		skipped question	**2**

28. Please describe your agency's experience with the following commuting reduction actions (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Increased ride-sharing,van-pooling, and/or bus ridership	**64.6% (31)**	43.8% (21)	4.2% (2)	22.9% (11)	6.3% (3)	48
Provide incentives for carpooling, bicycling, and telework access	**62.5% (30)**	31.3% (15)	12.5% (6)	14.6% (7)	10.4% (5)	48
Enacted parking fees at worksites and/or shared parking incentives	**30.6% (15)**	18.4% (9)	28.6% (14)	14.3% (7)	24.5% (12)	49
Increased employee permissions to telecommute and telework	**50.0% (24)**	33.3% (16)	12.5% (6)	20.8% (10)	8.3% (4)	48
Implemented flexible work hours policies	**75.0% (36)**	33.3% (16)	10.4% (5)	18.8% (9)	2.1% (1)	48
Implemented policies and actions to reduce employee drive-alone commute trips	**50.0% (24)**	29.2% (14)	29.2% (14)	16.7% (8)	4.2% (2)	48
Located worksites to encourage walking, ridesharing, and bicycling	18.8% (9)	14.6% (7)	22.9% (11)	10.4% (5)	**43.8% (21)**	48
Provided emergency ride home programs	**58.3% (28)**	35.4% (17)	16.7% (8)	22.9% (11)	6.3% (3)	48
Establish a commute trip reduction program at a new worksite	25.5% (12)	17.0% (8)	8.5% (4)	8.5% (4)	**46.8% (22)**	47
Engage and communicate with employees about commute options	**68.8% (33)**	52.1% (25)	8.3% (4)	18.8% (9)	4.2% (2)	48
Present the agency's CTR program to agency management	**60.4% (29)**	45.8% (22)	4.2% (2)	18.8% (9)	14.6% (7)	48
					answered question	**49**
					skipped question	**8**

29. If there are any other actions your agency has taken (since 2010) to cut costs and reduce fuel use and GHG emissions from commuting please describe them below.

	Response Count
	15
answered question	**15**
skipped question	**42**

30. Has your agency taken action (since 2010) to reduce waste generation or increase environmentally preferable procurement?

	Response Percent	Response Count
Yes	**81.8%**	**45**
No	10.9%	6
Not applicable	7.3%	4
answered question		**55**
skipped question		**2**

31. Please describe your agency's experience with the following waste prevention, recycling and procurement actions:

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Developed and implemented a paper conservation plan to reduce use of printing and copy paper by at least 30 percent of current use (RCW 70.95.725)	**46.7% (21)**	31.1% (14)	4.4% (2)	13.3% (6)	4.4% (2)	45
Purchased only 100 percent recycled-content white cut sheet bond paper (RCW 43.19A.22)	**51.1% (23)**	40.0% (18)	2.2% (1)	6.7% (3)	0.0% (0)	45
Set printers to default to duplex printing	40.0% (18)	**44.4% (20)**	8.9% (4)	4.4% (2)	2.2% (1)	45
Switched to electronic records/invoicing	20.0% (9)	**37.8% (17)**	8.9% (4)	24.4% (11)	8.9% (4)	45
Developing and implementing a paper recycling program with the goal of recycling 100 percent of all copy and printing paper in all buildings with 25 employees or more (RCW 70.95.725)	**51.1% (23)**	28.9% (13)	11.1% (5)	2.2% (1)	6.7% (3)	45
Collected and composted organic materials on-site	20.0% (9)	17.8% (8)	**28.9% (13)**	13.3% (6)	20.0% (9)	45
Collected and composted organic materials off-site	15.9% (7)	25.0% (11)	18.2% (8)	9.1% (4)	**31.8% (14)**	44
Developed an Environmentally Preferrable Purchasing Policy	**34.1% (15)**	9.1% (4)	22.7% (10)	29.5% (13)	4.5% (2)	44
Procured environmentally preferred products	**62.2% (28)**	22.2% (10)	6.7% (3)	2.2% (1)	6.7% (3)	45
Recycled spent flourescent lamps (RCW 70.275.080)	**63.6% (28)**	15.9% (7)	4.5% (2)	0.0% (0)	15.9% (7)	44
Tracked the number and type of lamps recycled	22.0% (9)	2.4% (1)	**41.5% (17)**	9.8% (4)	24.4% (10)	41
					answered question	**45**

skipped question	**12**

32. If there are any other actions your agency has taken (since 2010) to reduce waste generation or increase environmentally preferable procurement please describe them below.

	Response Count
	14
answered question	**14**
skipped question	**43**

33. Has your agency taken action (since 2010) to conserve water indoors and outdoors?

		Response Percent	Response Count
Yes		**58.2%**	**32**
No		18.2%	10
Not applicable		23.6%	13
	answered question		**55**
	skipped question		**2**

34. Please describe your agency's experience with the following water efficiency actions (Select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Installed low-flow fixtures (faucets, shower heads, toilets, etc.)	**62.5% (20)**	53.1% (17)	0.0% (0)	34.4% (11)	3.1% (1)	32
Installed other water efficient or water saving equipment and appliances	**53.1% (17)**	43.8% (14)	9.4% (3)	40.6% (13)	0.0% (0)	32
Used low-maintenance landscaping (e.g., native plants)	**71.9% (23)**	37.5% (12)	0.0% (0)	28.1% (9)	12.5% (4)	32
Reused non-potable water (reclaimed) for irrigation	3.1% (1)	9.4% (3)	28.1% (9)	**40.6% (13)**	25.0% (8)	32
Installed irrigation control sensors	25.0% (8)	25.0% (8)	25.0% (8)	**31.3% (10)**	12.5% (4)	32
Installed water meters	**48.4% (15)**	25.8% (8)	9.7% (3)	35.5% (11)	16.1% (5)	31
Implemented other irrigation efficiency practices	**48.4% (15)**	29.0% (9)	6.5% (2)	29.0% (9)	16.1% (5)	31
				answered question		**32**
				skipped question		**25**

35. If there are any other actions your agency has taken (since 2010) to conserve water please describe them below.

	Response Count
	13
answered question	**13**
skipped question	**44**

36. Has your agency taken action (since 2010) to implement stormwater best management practices?

	Response Percent	Response Count
Yes	38.2%	21
No	9.1%	5
Not applicable	**52.7%**	**29**
	answered question	**55**
	skipped question	**2**

37. Please describe your agency's experience with the following stormwater management practices (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Storing all liquids, chemicals, and materials under cover and with secondary containment	**81.0% (17)**	33.3% (7)	4.8% (1)	19.0% (4)	4.8% (1)	21
Maintaining spill kits, posted spill plans, and regular spill trainings for employees	**81.0% (17)**	38.1% (8)	0.0% (0)	23.8% (5)	4.8% (1)	21
Checking all vehicles and outdoor equipment for leaks regularly and fixing them quickly	**81.0% (17)**	42.9% (9)	0.0% (0)	28.6% (6)	4.8% (1)	21
Applying best management practices for cleaning equipment, vehicles, and other potential sources of pollution	**76.2% (16)**	38.1% (8)	0.0% (0)	33.3% (7)	4.8% (1)	21
					answered question	**21**
					skipped question	**36**

38. If there are any other actions your agency has taken (since 2010) to implement stormwater best management practices please describe them below.

	Response Count
	10
answered question	**10**
skipped question	**47**

39. Has your agency taken action (since 2010) to reduce emissions from wastewater treatment?

	Response Percent	Response Count
Yes	3.6%	2
No	7.3%	4
Not applicable	**89.1%**	**49**
answered question		**55**
skipped question		**2**

40. Please describe your agency's experience with the following wastewater treatment actions (select all that apply):

	Took this action prior to 2010	Have taken this action since 2010	Have not considered taking this action	Plan to take this action in the future	Not applicable	Response Count
Install high energy efficiency equipment	50.0% (1)	**100.0% (2)**	0.0% (0)	0.0% (0)	0.0% (0)	2
Converted waste to energy system (anaerobic digester)	0.0% (0)	**50.0% (1)**	**50.0% (1)**	**50.0% (1)**	0.0% (0)	2
answered question						**2**
skipped question						**55**

41. If there are any other actions your agency has taken (since 2010) to reduce emissions from wastewater treatment please describe them below.

	Response Count
	2
answered question	2
skipped question	55

42. If there are any other actions your agency has taken since 2010 to cut costs and reduce energy use and emissions please describe them below. Wherever possible please specify the number of sites or employees affected.

	Response Count
	13
answered question	13
skipped question	44