

AW-1. Manure Digesters/Other Waste Energy Utilization

Mitigation Option Description

[Insert text here]

Mitigation Option Design

[Insert text here]

- **Goals:**
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

[Insert text here]

Related Policies/Programs in Place

1. **Washington Department of Ecology Beyond Waste Plan:** Recommendation ORG 6, http://www.ecy.wa.gov/beyondwaste/p_org06.html.
2. **Energy Freedom Loan:**
 - **South Yakima Conservation District** – \$2 million.
 - **Port of Sunnyside, Dairy Anaerobic Digester** -- \$1,972,715
 - **Tulalip Tribes, Qualco Dairy Digester** -- \$1,500,266
3. **Ecology / WSU partnership:** Supplemental funding continues research on high solids anaerobic digester, and biomass inventory.
 - **Producing Energy and Fertilizer** (high solids anaerobic digester).
<http://www.ecy.wa.gov/biblio/0707024.html>
 - **Biomass Inventory Technology and Economics Assessment** <http://www.ecy.wa.gov/biblio/0707025.html>

Types(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

AW-2. In-State Production of Biofuels and Biofuels feedstocks

Mitigation Option Description

[Increase the production and use of biofuels from biomass feedstocks available in-state.] Current research has identified the largest potential for in-state biofuel feedstock production from the following: underutilized forest biomass, carbon-based municipal waste, and agricultural field waste. Producing bio-ethanol or other bio-fuels from various waste streams has huge potential for reducing waste while producing biofuels, as opposed to a dedicated energy crop, which typically requires the use of fossil fuels, fossil-fuel based fertilizers and agrichemicals, and possibly energy for pumping irrigation water.

Regional or community fuel production sites have some benefits over the creation of large scale facilities that require shipment of out of state feedstocks to in-state processing facilities. This decentralized approach would also consider regional crop diversities in the scale of processing facilities that support Washington-grown, Washington-owned biofuels.

Mitigation Option Design

- **Goals:** *[CCS inserted examples for consideration below, based on ideas in text provided by volunteers]*
 - Increase in-state production of biodiesel feedstocks by x% by 2020 (note: these could be “GHG superior” feedstocks rather than traditional soybean e.g., canola and waste oil).
 - Increase in-state production of ethanol feedstocks x% by 2020. (note: these could be “GHG superior” feedstocks rather than traditional corn feedstocks e.g., cellulosic feedstocks and feedstocks from waste sources).
- **Timing:**
- **Coverage of parties:**
- **Other:** Carbon dioxide emissions represent 85% of total greenhouse gas emissions in 2000. Energy-related activities were responsible for 85% of the total carbon dioxide emissions, with the transportation sector as the largest source at 48.8 million tons (56% of the energy-related emissions). Gasoline was the main source, responsible for 51% of emissions; jet fuel at 22% and diesel fuel at 16% comprise other major sources.

Pure biodiesel emits 78% less carbon dioxide, nearly 50% less particulates, and 80-90% fewer cancer-causing compounds than petro-based diesel. According to an EPA report¹, it emits slightly higher levels of nitrogen oxide, estimated to be about 2% for soybean-based B20, a blend of 20% biodiesel and 80% petro-based diesel.

¹ U.S. Environmental Protection Agency, A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions EPA-Draft Technical Report, EPA420-P-02-001, October 2002.

Ethanol has been proven to reduce carbon dioxide emissions in a full fuel cycle analysis conducted by numerous studies including those prepared by the Argonne National Laboratory and the National Renewable Energy Laboratory (NREL). NREL estimates that ethanol derived from cellulose decreases CO₂ emissions by 90 percent compared to gasoline.

Implementation Mechanisms

[Insert text here]

Related Policies/Programs in Place

Federal Incentives

The Energy Policy Act of 2005 provides federal incentives for consumers and businesses using biofuels. A summary of the Act's provisions and other federal incentives can be found at the Department of Energy's [Alternative Fuels Data Center](#). The major provisions affecting biodiesel and ethanol include:

- a. Small producer biodiesel and ethanol credit. This credit will benefit small agri-biodiesel producers by giving them a 10 cent per gallon tax credit for up to 15 million gallons of agri-biodiesel produced. In addition, the limit on production capacity for small ethanol producers increased from 30 million to 60 million gallons. This is effective until the end of 2008.
- b. Credit for installing alternative fuel refueling property. Fueling stations are eligible to claim a 30% credit for the cost of installing clean-fuel vehicle refueling equipment, (e.g. E85 ethanol pumping stations). Under the provision, a clean fuel is any fuel that consists of at least 85% ethanol, natural gas, compressed natural gas, liquefied natural gas, liquefied petroleum gas, or hydrogen and any mixture of diesel fuel and biodiesel containing at least 20% biodiesel. This is effective through December 31, 2010. In May 2006, the Internal Revenue Service (IRS) published Form 8911, which provides a mechanism to claim the infrastructure tax credit. Owners who install qualified refueling property on multiple sites can utilize the credit for each property. The instructions define what is considered qualified property and the value of the credit. See [IRS Form 8911](#).
- c. Biodiesel and ethanol tax credit. Extends the tax credit for biodiesel producers established in the American Jobs Creation Act of 2004 (Public Law 108-357) through 2008. The tax credit is \$.50 per gallon of waste-grease biodiesel and \$1.00 for agribiodiesel. If the fuel is used in a mixture, the credit is 1 cent per percentage point of agribiodiesel used or 1/2 cent per percentage point of waste-grease biodiesel. The American Jobs Act also established the Volumetric Ethanol Excise Tax Credit (VEETC), which provides ethanol blenders/retailers with \$.51 per pure gallon of ethanol blended or \$.0051 per percentage point of ethanol blended (i.e., E10 is eligible for \$.051/gal; E85 is eligible for \$.4335/gal). The incentive is available until 2010.

Washington State Incentives

Washington State also provides incentives to encourage the development of in-state production facilities, distribution services and retail sales facilities for biodiesel and ethanol fuels. In 2003, the Washington State legislature passed tax incentives for the manufacture and sale of biodiesel and ethanol. Detailed information on the 2003 state tax incentives for biofuels can be found at the Department of Revenue's Tax Incentive [website](#). Highlights include:

- a reduction in the B&O Tax for manufacturers of biodiesel and ethanol fuels from from 0.484% to 0.138%;`
- an exemption from state and local property and leasehold taxes for a period of 6 years for buildings, equipment and land used in the manufacturing of alcohol fuel, biodiesel fuel, or biodiesel feedstocks; and,
- an exemption from retail sales and use tax for the purchase of machinery and equipment and the construction of facilities used directly for the retail sale of alcohol fuel or biodiesel fuel.

In 2006, the Washington State Legislature passed additional biofuels legislation including the Energy Freedom Fund and the Renewable Fuel Standard.

- The Energy Freedom Program

The Energy Freedom fund includes the Energy Freedom Loan Account. This account is funded by \$100 million from the State General Fund and managed by a 13-member Energy Freedom Board. The Board is responsible for establishing a competitive process for awarding low-interest loan and grants in research and development of new and renewable energy sources, including infrastructure, facilities, technologies and research and development that will advance Washington's move towards energy independence. Financial assistance may be awarded by the Board for: research and development of new and renewable energy and biofuel sources, including biomass, solar, and wind power; renewable energy and biofuel development infrastructure and facilities; and research and development to develop markets for alternative fuel byproducts. The Energy Freedom Program expires June 30, 2016. The Energy Freedom Program expires June 30, 2016. Details of the Energy freedom Fund can be found in [RCW 15.110](#).

The 2006 supplemental capitol budget provided \$23 million to help fund biofuels projects, such as biodiesel and ethanol production facilities, oilseed crushers, and anaerobic digesters. The bulk of the funds will be provided as low-interest loans, with the potential for some grant funding. Of the \$23 million, \$6 million was earmarked for Grays Harbor Pulp and Paper Company to install a biomass turbine, \$10.25 million was earmarked for 5 biodiesel production or oilseed crushing projects selected by the Legislature. The remaining \$6.75 million is available for open competition. A summary of project funding and current activity can be viewed at the Washington State Department of Agriculture Bioenergy [website](#).

- Washington State Renewable Fuel Standard – ESSB 6508

In 2006, the Washington State legislature passed a renewable fuel standard –ESSB 6508. The standard requires that at least 2% of the diesel sold in Washington must be biodiesel beginning November 30, 2008, or earlier, if a determination is made by the Director of the State Department of Agriculture that feedstock grown in Washington State can satisfy a 2% fuel blend requirement. The biodiesel requirement would increase to 5% once in-state feedstocks and oil-seed crushing capacity can meet a 3% requirement. At current fuel consumption levels, a 2 percent biodiesel requirement is equivalent to approximately 20 million gallons per year. Details on Washington’s renewable fuel standard are contained in [RCWs 19.112.110 to 19.112.180](#). The 2006 renewable fuel standard also requires that beginning on December 1, 2008, at least 2% of the gasoline sold in Washington be ethanol. The ethanol requirement could be increased to 10% if the Director of Ecology determines that this would not jeopardize continued attainment of Clean Air Act standards. At current fuel consumption levels, a 2 percent requirement is equivalent to approximately 55 million gallons of ethanol per year.

A sampling of other biofuel programs in the state include:

1. USDA-ARS/WSU bioenergy crops project, with field trials of various biofuel crops, including switchgrass (currently in its 4th year of production), soybeans, safflowers, camelina, mustard, canola, rapeseed, and others
2. Puget Sound Clean Cities Coalition, a public/private collaborative effort to promote alternative fuel vehicles and create a network of alternative fuel facilities
3. Brassica variety research trials initiated by the brassica breeding and research program at University of Idaho at numerous locations throughout the PNW

1. **Governor’s Executive Order, 07-02:** http://www.governor.wa.gov/execorders/eo_07-02.pdf.
 2. **Western Regional Climate Action Initiative:** http://www.ecy.wa.gov/climatechange/docs/07Mar_WesternRegionalClimateActionInitiative.pdf.
 3. **Governor’s Climate Change Challenge:** http://www.governor.wa.gov/priorities/environment/climate_brief.pdf.
 4. **Community Trade and Economic Development--Energy Freedom Loan:**
 - **Spokane County Conservation District**, Palouse-Bio, LLC Biodiesel Processing Facility –\$853,871
 - **Odessa Public Development Authority**, Inland Empire Oilseeds Biodiesel Facility – \$848,102
 - **Port of Whitman County**, Integrated Seed Processing and Biodiesel Production – \$778,869
 - **Port of Warden**, Integrated Seed Processing and Biodiesel Production – \$415,397
 - **Port of Warden**, Biodiesel/Glycerin Production Project – \$380,780
- Additional loans to:
- **Port of Warden** – \$2.5 million
 - **Odessa Public Development Authority** – \$2.5 million
 - **Port of Columbia County** – \$2.5 million
 - **Spokane Conservation District** – \$2 million
 - **Port of Sunnyside** – \$750,000
5. **WSDA 07-09 Budget:** Sugar Beet as Biofuel--\$125,000 to evaluate the use of sugar beets for producing biofuels.
 6. **Ecology / WSU partnership:** Supplemental funding continues research on biomass inventory.
 - **Biomass Inventory Technology and Economics Assessment** <http://www.ecy.wa.gov/biblio/0707025.html>

Types(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:** new jobs in the biofuel industry including the production, processing, storage, and distribution of these fuels and their feedstocks.
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

Canola production for biodiesel: While canola is well suited for production in Washington State, large-scale production of this crop could be unrealistic due to concerns with cross-pollination or contamination of the valuable seed crop industry in the state. Early research also shows that canola is a host to several nematodes that affect potato production, so widespread rotation with potatoes may be inadvisable. While canola is more sensitive to winter kill and heat stress than cereal grains, it is also quite drought tolerant. Long-term variety trials have been conducted around the region; this data will be invaluable for our production estimates.

One of the major challenges that exists at this time is the lack of technology to economically convert and ferment cellulosic feedstocks. Adoption of cellulosic ethanol has been limited by the high costs associated with converting vegetation into ethanol. The typical conversion process begins by grinding up the biomass, soaking it in water and adding an acidic pretreatment to separate it into its primary structural components: cellulose, hemicellulose and lignin. Enzymes are added to the mixture to break down the cellulose into its constituent sugars. The sugars are then fermented and finally distilled to create high-grade ethanol. Efforts to reduce the production costs are underway, including isolating and refining enzymes in an effort to speed up the conversion process.

Any biofuels consideration should take into account potential trade-offs of implementation. For instance, increasing landfill methane capture may not be viable if current and developing efforts to reduce carbon-based solid waste are successful; or, removal of field waste for biofuel generation may require additional soil amendments to be transported on to the fields, thereby potentially negating any carbon reduction gains.

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

AW-3. Significantly Expand Source Reduction, Reuse, Recycling and Composting

Mitigation Option Description

Expand source reduction, reuse, recycling and composting of household, business, industrial, agricultural, and construction-related waste streams to reduce greenhouse gas emissions. Based on data collected for calendar year 2005, existing recycling efforts reduced greenhouse gas emissions in Washington by almost 3.2 million metric ton CO₂ equivalents. This mitigation option, therefore, builds on existing programs and approaches and proposes to take advantage of newer market and business-based activities.

In addition to traditional recycling programs, a partial list of these approaches includes: source reduction (waste prevention) initiatives; expanding existing and encouraging more reuse, recycling, composting and processing businesses; establishing product stewardship programs; using environmentally preferable procurement practices; encouraging cradle-to-cradle design and manufacturing; facilitating safe byproduct “synergy” strategies; achieving a reduction of toxics in packaging and products to make them safer to manufacture, use and recycle while increasing their value and use in the market place; increasing closed-loop recycling and the percentage of recycled-content in products, and expansion of disposal bans

Mitigation Option Design

- **Goals:**
 - Reduce the total amount of household and business waste by 15% and recycle at least 50% of the waste remaining (see Table 1 for details);
 - Capture for composting² over 90 percent of compostable organics (see Table 1 for details).

Table 1. Goals by Household and Business Waste Sources

	Current Recycling Rate	Source Reduction Goal	Recycling Goal	Composting Goal
Aluminum Cans	33%	15%	60%	
Steel Cans	14%	15%	50%	
Glass	26%	15%	50%	
HDPE	20%	15%	50%	
LDPE	91%	15%	91%	
PET	32%	15%	50%	
Corrugated Cardboard	61%	15%	80%	
Newspaper	56%	15%	80%	
Office Paper	44%	15%	60%	

² or anaerobic digestion processes

Food Scraps	17%			80%
Yard Trimmings	56%			100%
Mixed Waste Paper (general)	28%	15%	60%	
Mixed Metals	83%	15%	90%	
Mixed Plastics	2%	15%	25%	
Mixed Organics	50%			90%

- **Timing:** Achieve full goal implementation by 2020.
- **Coverage of parties:** All sectors of society in Washington State will be engaged in attaining this mitigation action, as will many levels of state and local government. The private sector will play a critical role by facilitating the transportation of recyclable materials to processors and composters, by providing processing and composting capacity, and through product stewardship actions. The private sector will likely be invited to take the lead in creating new markets for materials, through expanding existing businesses and services, and establishing new enterprises.
- **Other:** The most important of these goals is to significantly “source reduce” to reduce the generation of discarded material. Currently, while recycling rates are increasing, the overall generation of material discarded has increased dramatically as well. The average amount of garbage (including recyclables) produced by each person in the state increased by 5.3 percent from 2004 to 2005 (from an average of 7.5 pounds of waste per person each day in 2004, to an average of 7.9 pounds a day in 2005). In 2005, residents and businesses in Washington generated almost 18 million tons of solid waste.

The overarching goal is to have continual improvement and progress toward an eventual “no waste” society, thereby dramatically reducing greenhouse gas emissions and attaining one of the cornerstone principles of sustainability. This can be enabled by taking steps toward product stewardship³ and the design of products with greenhouse gas emissions, waste prevention, reuse and recycling in mind. This encourages manufacturers to design and manufacture, and for consumers to purchase, products geared towards end-of-life handling methods that conserve, capture, or “recirculate” resources in the most effective and efficient way possible.

The current situation of increasing waste generation implies increasing consumption and production of goods. The greenhouse gas impacts of production are much larger than emissions from disposal facilities. Washington’s greenhouse gas inventory does not fully assign to Washington state the greenhouse gas impacts associated with producing goods that Washington residents and businesses consume. It is in changing the impacts

³ **Product stewardship** is a product-centered approach to environmental protection. It calls on those in the product lifecycle—manufacturers, retailers, users, and disposers—to share responsibility for reducing the environmental impacts of products. The greatest responsibility lies with whoever has the most ability to affect the lifecycle environmental impacts of the product. Please see the US EPA’s Product Stewardship site at <http://www.epa.gov/epr/> and the Northwest Product Stewardship Council site at <http://www.productstewardship.net>

associated with the manufacturing of these products that the greatest greenhouse gas reduction potentials are likely to be found.

Implementation Mechanisms

The effectiveness of a reduction/recycling/composting strategy is dependent on giving programs local flavor using local data. The first step in implementing this strategy should be a local waste disposal and recycling characterization audit in each of the state's 39 counties. The baseline data used to prepare this recommendation is nearly fifteen years old (1992 statewide waste audit). Local waste streams may differ significantly from the state average. Waste audits should be implemented using a common scenario with state funding in 2008 and 2009.

Additional crucial early steps:

- Full implementation of Washington's Beyond Waste Plan's current action items.
- Incorporate GHG reduction analysis and strategies in Beyond Waste Plan updates and next phase strategies.
- Fully implement and improve Washington State's Environmentally Preferable Procurement program and policies.

Legislative and budget proposals should be developed for the 2009 Legislature and a report and recommendations provided to the appropriate committees annually thereafter, until the goals are attained.

Specific details are provided below:

1. Local waste audits
 - development of statewide system model
 - development of statewide funding
 - implement audit
 - use results to influence local GHG reduction programs
2. Evaluate use of a model and index to measure and monitor GHG reductions
 - the EPA's WARM model was used for policy development
 - WARM model has some gaps, notably in failing to calculate source reduction potential for yardwaste and foodwaste and it doesn't consider all the materials that are being recycled.
 - Investigate applicability or tweaks necessary to account for the actual types and location of disposal facilities in Washington State.⁴
 - Implement and evaluate use of the Washington State Consumer Environmental Index (CEI). CEI tracks changes over time in the environmental emissions and their impacts caused by the production, use and disposal of items purchased each year by Washington's consumers.

⁴ Given varying distances to transport waste and recyclables, using average distances and population "centroids" (as was used for the estimates in the current run of the WARM model) may not be the most accurate for program implementation

3. Build on existing source reduction and recycling programs, targeting commodities with the largest GHG reduction potential.
4. Fully implement and update Washington's Beyond Waste Plan. The current 5 year milestones and action items include key initiatives to increase recycling of industrial waste and organic materials, expand green building, reduce toxics and increase the recyclability of products, and more. The next update and related funding priorities should further incorporate GHG emissions analysis and GHG reduction actions.
5. Fully implement and expand Environmentally Preferable Procurement policies and programs by the State and local governments.
6. Encourage manufacturers to provide – and consumers to use – end of life management and upstream design solutions that reduce the green house gas and other environmental impacts of product waste. Develop a framework policy for establishing product stewardship programs.
7. Establish a research and educational institute to address sustainable product design and manufacturing.
8. Ecology, CTED, Health and other appropriate agencies should coordinate reporting to the appropriate committees of the legislature, on an annual basis, progress made in reaching the goals and recommendations for legislation or other actions by the state.
9. Form an on-going technical work group of experts on reduction, reuse, recycling, composting, product stewardship and green business development to advise Ecology, CTED, Health and other appropriate agencies on actions needed to implement this action item and attain the policy goals. This could be accomplished by restructuring the Washington Solid Waste Advisory Committee (SWAC), creating a sub-committee of SWAC, or by creating an entirely new group. The technical work group's recommendations will be considered when reporting progress, next steps and recommendations to the legislature.

Related Policies/Programs in Place

This section identifies (and provides links to) some of the “foundational” policies and programs that are already in place supportive of our proposal.

1. **Washington RCW 70.95** establishes solid waste hierarchy of reduce/reuse/recycle and requires all local governments to have a solid waste management plan.
<http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95>
2. **Washington Department of Ecology Beyond Waste Plan:**
<http://www.ecy.wa.gov/beyondwaste/>
 - Solid Waste Initiative, <http://www.ecy.wa.gov/beyondwaste/SWIssues.html>.
 - Hazardous Waste Initiative, <http://www.ecy.wa.gov/beyondwaste/HazWasteIssues.html>
 - Small Volume Toxics Initiative, <http://www.ecy.wa.gov/beyondwaste/reduceToxics.html>

- Organics Initiative, <http://www.ecy.wa.gov/beyondwaste/increaseOrganics.html>.
 - Industrial Waste Initiative, <http://www.ecy.wa.gov/beyondwaste/reduceWaste.html>.
 - Green Building Initiative, <http://www.ecy.wa.gov/beyondwaste/increaseGB.html>.
 - Measure Progress, <http://www.ecy.wa.gov/beyondwaste/measureProgress.html>
3. **Electronic Product Recycling Program:** Manufacturers required to provide recycling for covered electronics. <http://www.ecy.wa.gov/pubs/wac173900.pdf>.
 4. **Ecology Coordinated Prevention Grants:** Available to local governments to develop and implement their hazardous and solid waste management plans. <http://www.ecy.wa.gov/programs/swfa/grants/cpg.html>.
 5. **Ecology Public Participation Grants:** Public Participation Grants provide funding to citizen groups and not-for-profit public interest organizations to provide public involvement in monitoring the cleanup of contaminated sites and prevent pollution by reducing or eliminating waste at the source. <http://www.ecy.wa.gov/programs/swfa/grants/ppg.html>.
 6. **Washington State Environmentally Preferable Purchasing Policies:** The State of Washington has a broad legislative and policy mandate for environmentally preferable purchasing activities by state agencies. This mandate is articulated in state executive orders, laws and rules. Executive Orders (EOs) are issued by the Governor to direct state agencies and officials in their execution of established laws or policies. The Revised Code of Washington (RCW) is the compilation of all permanent laws now in force in the State of Washington. The Washington Administrative Code (WAC) is the compilation of all rules promulgated by state agencies.

A brief summary of environmentally preferable purchasing executive orders, laws and rules for state agencies is listed below. For more information on specific activities or directives contained within each order, law or rule, follow the link provided.

[Executive Order 02-03 SUSTAINABLE PRACTICES BY STATE AGENCIES](#)

This Executive Order calls for each state agency to establish sustainability objectives and modify their purchasing practices in order to:

- minimize energy and water use
- shift to clean energy for both facilities and vehicles
- shift to non-toxic, recycled and remanufactured materials in purchasing and construction
- expand markets for environmentally preferable products and services
- reduce and eliminate waste

Each agency is required to prepare a biennial Sustainability Plan guided by the above objectives and an annual report on its progress in implementing its Sustainability Plan.

The Office of Financial Management must designate a Sustainability Coordinator to help state agencies meet the goals of the Executive Order.

[Executive Order 05-01 ESTABLISHING SUSTAINABILITY AND EFFICIENCY GOALS FOR STATE OPERATIONS](#)

The Executive Order directs state agencies to achieve specific sustainability goals and required actions:

- incorporate green building practices based on Leadership in Energy and Environmental Design (LEED) standards into new building construction and major remodeling projects
- achieve a target of 20% reduction in petroleum use in the operation of state vehicles by 2009
- employ professional vehicle fleet management practices to achieve more fuel efficient and low emission agency fleets
- significantly reduce office paper purchases by 30%, increase the purchase of environmentally preferable paper to at least 50%, recycle all used office paper, and increase the purchase of post-consumer recycled janitorial products
- reduce energy purchases by 10% from FY 2003 to 2009

[Executive Order 04-01 PERSISTENT TOXIC CHEMICALS](#)

The Executive Order directs state agencies to take steps to reduce persistent toxic chemicals in Washington State's environment. Specifically, it directs:

- General Administration (GA) to make available for purchase products that do not contain persistent toxic chemicals. If such products are not available, products with the least amount of persistent toxic chemicals shall be made available.
- Each state agency to adopt measures to reduce purchase of goods that contain persistent toxic chemicals. Agencies are directed to report annually on progress in meeting these measures.
- Department of Ecology to establish through rule specific criteria for use in identifying persistent toxic chemicals.

[Executive Order 07-02 Washington Climate Change Challenge](#)

The Executive Order establishes the goal of reducing greenhouse gas emission in the state of Washington to:

- 1990 levels by 2020 and to 25% below 1990 levels by 2035.

[Chapter 43.19 RCW Department of General Administration](#)

This statute, which is GA's enabling legislation, provides a broad legislative basis for state purchases of recycled content and energy saving products. It also provides the flexibility to allow GA to award state contracts based on environmental considerations. It establishes that factors beyond price, including past performance and life cycle costing, are to be used in determining the "lowest responsible bidder."

[Chapter 43.19A RCW Recycled product procurement](#)

This statute was established to substantially increase the purchase of recycled content products by local and state government agencies. This statute

- established numeric goals for statewide purchase of recycled content paper and compost
- directs GA to develop a strategy for state agencies and GA to increase purchases of plastic products, retread and remanufactured tires, motor vehicles, lubricants, latex paint and lead acid batteries having recycled content.

[Chapter 43.19.539 RCW Purchase of Electronic Products Meeting Environmental Criteria](#)

This statute requires the Department of General Administration to

- establish purchasing and procurement policies that establish a preference for electronic products that meet environmental performance standards relating to the reduction or elimination of hazardous materials.
- ensure that their surplus electronic products, other than those sold individually to private citizens, are managed only by registered transporters and by processors meeting the requirements of RCW [70.95N.250](#).
- ensure that their surplus electronic products are directed to legal secondary materials markets by requiring a chain of custody record that documents to whom the products were initially delivered through to the end use manufacturer.

Chapter 39.35D RCW High-performance public buildings

[Green Buildings](#)

State-owned buildings and schools shall adopt recognized standards for high-performance public buildings and allowing flexible methods and choices in how to achieve those standards. Public agencies and school districts shall document costs and savings to monitor this program and ensure that economic, community, and environmental goals are achieved each year.

Chapter 70.95M RCW Mercury Education Reduction Act

[Mercury Education Reduction Act](#)

The Mercury Education Reduction Act (MERA) mandates General Administration to give priority and preference to the purchase of equipment, supplies, and other products that contain no mercury-added compounds or components.

[WAC 236-48-096 Bid Award Preference](#)

Washington Administrative Code 236-48-096 establishes a bid award preference for recycled products. When determining the lowest responsive bid, bids for goods certified as recycled are to be given a preference of 10% of the amount of the bid.

7. **Local governments:** Local governments have instituted plans and a wide range of programs and policies to establish reduction, reuse, recycling, and composting activities, to increase procurement of environmentally preferable products, and to ban specific

materials from disposal. Program information is shared through a variety of means including Recycling Coordinator meetings, Solid Waste Policy Forum, and the State Solid Waste Advisory Committee. Product stewardship efforts are coordinated through the Northwest Product Stewardship Council. <http://www.productstewardship.net/>

8. **Businesses:** Many businesses have instituted internal policies to address waste and recycling and some have begun to implement product stewardship programs. Washington has many businesses engaged in the business of reuse, recycling, composting, and processing, including reuse organizations such as Goodwill, and businesses that refurbish electronic equipment and resell building materials. Other businesses incorporate recycled content into their products. Green building activities are coordinated by a variety of business interests including the Built Green program of Master Builders and the Cascadia Green Building Coalition, and others.
9. **Non-Governmental Organizations:** A variety of NGOS have internal policies and work on implementation and coordination of policies and programs. These include Washington Citizens for Resource Conservation, Washington State Recycling Association, Washington Organic Recycling Council, Washington Toxics Coalition, Pollution Prevention Resource Center, and others.

Types(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO₂e

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD

AW-4. Agricultural Carbon Management

Mitigation Option Description

Agriculture carbon sequestration uses agricultural crops and acreage to store carbon in biomass and soils. [CCS suggests adding a few sentences describing how the actions in the goals will increase sequestration, e.g., *Changes in soil management practices such as...., can prevent soil carbon losses and increase the amount of carbon sequestered in soils...*]

Mitigation Option Design

- **Goals:**
 - Increase soil carbon storage statewide in agricultural soils by xx MMtCO₂e per year by 2020 by implementation of proven and novel technologies, such as reduced tillage, cover cropping, increased perennial cropping, use of biochar and other soil amendments, and alternatives to agricultural burning.
 - Increase diversion of organic residuals and wastes from all sources (including municipal wastes) for land application on agricultural soils by x% per year. (*CCS suggested slight modification*)
 - Expand use of agricultural crops and residuals for bioproducts that sequester carbon (e.g. fiberboard from straw) by x% by 2020. (*CCS suggested slight modification*)
 - Increase vegetative standing biomass in agriculture [by x% or x acres per year] through use of woody crops, perennial grasslands, and improved rangeland management, thereby storing xx MMtCO₂e. (*CCS suggested slight modification*)
- **Timing:**
- **Coverage of parties:**
- **Other:** There is additional potential to increase carbon sequestration through agriculture practices beyond what is explicitly stated in the goals above. However, there is not enough information currently available to fully develop policies in these areas: replace CO₂ emitting practices with CO₂ neutral practices in agriculture (e.g. generation of CO₂ in greenhouses; crop drying); optimize carbon-cropping for the state's diverse bioregional specifications that reduction GHG emissions, sequester carbon, and allows a cash crop for farmer (e.g. food, fuel, or carbon crop); increase conversion of dryland acreage to irrigated acreage (this will increase carbon sequestration but will rely upon more water that may not be available due to existing water rights and potential reduction in hydro power, snowpack, and rainfall); organic cropping systems (additional research is needed to compare organic and conventional cropping systems for carbon sequestration using life cycle assessment techniques that include, but are not limited to, tractor/farm vehicle hours, fuel usage, source of any nutrient and pesticides, hauling of nutrients and pesticides and respective application rates, and energy use from processing/conversion of crops for next stage use).

Implementation Mechanisms

- Engage in certification standards to maximize access to carbon markets from in-state agriculture (e.g. Chicago Climate Exchange eligibility). *[originally listed as goals]*
- Stable land resource programs that encourage long-term carbon sequestration on appropriate acreage. *[originally listed as goals]*
- Encourage regionally specific rotational/perennial crops that increase carbon sequestration and hold potential for economic gains. *[originally listed as goals]*
- Support existing USDA programs such as CRP, CSP, and EQUIP to expand successful adoption by producers. Expand programs that reduce risk and transition barriers (e.g. no-till drill rentals through conservation districts). Support research to develop novel techniques such as perennial wheat, biochar, and agriculturally-derived bioproducts.
- Explore policies to expand grass-based livestock production in the state, particularly through marketing Washington grown grass fed meat products.
- Work with agricultural producers to test alternatives to burning of agricultural residuals (e.g. bioenergy or bioproduct utilization). Partner with Ecology program.
- Develop conversion processes for bioproducts that can utilize crops and residuals from the state. Work with businesses to start new enterprises using these materials. Incorporate bioproduct specifications into state contracts (e.g. straw board for construction, compost and mulch for highway projects). Test adaptability of new crops such as switchgrass, kenaf, and hybrid willow for expanding production of agricultural biomass for bioproducts.
- Develop validated tools for calculating carbon credits from agriculture.

Related Policies/Programs in Place

USDA farm programs – EQIP, CRP, CSP

WA Ag Pilots Project

WSU Center for Bioproducts and Bioenergy (operations not funded)

USDA STEEP program for direct seeding; PNDSA grower organization

WSU perennial wheat breeding program

USDA-ARS agroecosystems project

USDA-ARS/WSU bioenergy crops project

WSDA alternatives to agricultural burning program

Conservation District programs – rental of direct seed drills

King County and other land application of biosolids programs

WDOE Beyond Waste program, Agricultural Burning Alternatives program

1. **Northwest Natural Resource Group (WA), \$200,000.00:** Promoting Small Landowner Access to Emerging Carbon Sequestration Markets through Forest Certification, Aggregation, and Market Development. <http://www.nnrg.org/>.
2. **Washington Department of Natural Resources (DNR):** DNR and WESTCARB produced an inventory of terrestrial carbon sequestration opportunities in Washington State.

Types(s) of GHG Reductions

Reduce emissions of CO₂ from agricultural soils and increase C sequestration in soil.

Sequester agricultural carbon in bioproducts that would otherwise return to the atmosphere through normal decomposition of residues.

Sequester agricultural carbon in soil through biochar amendments, a product of gasification technology, and diversion of other suitable organic residuals.

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:** Bioproducts can offset use of fossil fuel feedstocks. Gasification to make biochar is a source of bioenergy. Direct seeding reduces on-farm energy use by decreasing tractor fuel consumption.

Key Uncertainties

- Washington State lags the nation, and the US lags many other nations, in adoption of direct seed systems. Some of this is due to production risks where continued research may help resolve current problems. Another issue is investment risk in purchasing the new equipment needed.
- Biochar is untested in the diversity of soils in the state, so it is unknown whether benefits described elsewhere will occur here. Production of biochar is dependent on availability and deployment of gasification technology, for which there is no clear standard or leader at this time.
- The price of transport fuel will dictate the economic feasibility of moving large volumes of agricultural residuals to the place of beneficial use.
- How will increasing temperatures counteract our efforts to store soil C?
- There are still many uncertainties about the impact of specific farming practices on GHG. For example, the recent article by Hamilton et al. (2007) illustrates the uncertainty as to whether agricultural liming is a net source or sink for CO₂, with significant implications for the GHG impact of various farming systems.

Additional Benefits and Costs

- Direct seed can lead to increased water infiltration and reduced sandblasting of crops, increasing profits. It can also protect water quality from sediment and agrichemicals, and air quality from dust. Initially direct seed may cost more due to increased fertilizer and pesticide use, and higher potential for crop loss.
- Use of organic amendments for fertilizer and soil quality helps position a farm for certified organic production where there are currently substantial price premiums for many crops grown in the state. There is currently a shortage of organic hay, and growing this crop would provide a financial boost to growers and support the use of perennial crops that can sequester carbon.
- A new strawboard process from WSU could open the market for this product. Excess straw, some of which is currently burned, could go to this product and be sequestered for 20-50 yr (whatever one uses for the life of a building).

Feasibility Issues

- The uniqueness of the state’s agricultural diversity and variability must be considered in any agriculture carbon policy. Any such policy must be based off of sound research of our state's agricultural land and crops, and consider bio-regional differences in any recommendations.
- Overall sustainability is an important criterion for considering trade offs in benefits. For example, irrigating previous dryland acres for the purpose of sequestering carbon will require using more water
- More investment is needed to develop carbon storage validation tools for both policy and carbon market use. Without such tools, viable agriculture mitigation efforts will be difficult.

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD



AW-5. Agricultural Nutrient Management

Mitigation Option Description

[Insert text here]

Mitigation Option Design

[Insert text here]

- **Goals:**
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

[Insert text here]

Related Policies/Programs in Place

[Insert text here]

Types(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD



AW-6. Reductions In On-Farm Energy Use and Improvements in Energy Efficiency

Mitigation Option Description

[Insert text here]

Mitigation Option Design

[Insert text here]

- **Goals:**
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

[Insert text here]

Related Policies/Programs in Place

House Bill 1303: <http://www.leg.wa.gov/pub/billinfo/2007-08/Pdf/Bill%20Reports/House%20Final/1303-S2.FBR.pdf>.

Types(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD



AW-7. Preserve Open Space/Agricultural Land

Mitigation Option Description

[Insert text here]

Mitigation Option Design

[Insert text here]

- **Goals:**
- **Timing:**
- **Coverage of parties:**
- **Other:**

Implementation Mechanisms

[Insert text here]

Related Policies/Programs in Place

[Insert text here]

Types(s) of GHG Reductions

[Insert text here]

Estimated GHG Savings (in 2020) and Costs per MtCO_{2e}

- **Data Sources:**
- **Quantification Methods:**
- **Key Assumptions:**

Contribution to Other Goals

- **Contribution to Long-term GHG Emission Goals (2035/2050):**
- **Job Creation:**
- **Reduced Fuel Import Expenditures:**

Key Uncertainties

[Insert text here]

Additional Benefits and Costs

[Insert text here]

Feasibility Issues

[Insert text here]

Status of Group Approval

TBD

Level of Group Support

TBD

Barriers to Consensus

TBD