

# Priority Climate Action Plan (PCAP)

March 1, 2024

## POLICY

Washington State Department of Commerce has partnered with the following individuals to produce this Priority Climate Action Plan (PCAP) to support investment in policies, practices, and technologies that reduce pollutant emissions, create high-quality jobs, spur economic growth, and enhance the quality of life for all Washingtonians. We thank you for your time, expertise, and commitment to climate action planning in Washington.

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## Coordination and outreach

In the development of this PCAP, Washington collaborated with various tribal governments, state and local governments, and representatives of the entities, groups, and individuals who may be impacted by implementation of this PCAP. These included, without limitation:

- Tribal governments
- Other state agencies
- Metropolitan planning organizations
- Economic development organizations
- Environmental advocates
- Industrial associations
- Automotive associations
- Utilities
- Agricultural associations
- Waste management organizations
- Industrial organizations
- Consumer advocates
- Local elected officials
- Community-based organizations
- Chambers of commerce
- Residents of Washington state
- Other interested organizations

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# Contents

<b>Key Terms, Abbreviations, Acronyms and Definitions .....</b>	<b>7</b>
<b>Executive Summary .....</b>	<b>9</b>
<b>1. Introduction .....</b>	<b>10</b>
1.1 Climate Pollution Reduction Program overview .....	10
1.2 PCAP Overview .....	10
1.3 Scope of the PCAP .....	11
1.4 Approach to developing the PCAP .....	11
1.5 State climate policies.....	11
<b>2. PCAP elements.....</b>	<b>14</b>
2.1 Greenhouse Gas (GHG) Inventory .....	14
2.2 GHG reduction measures .....	18
Buildings sector .....	20
2.2.1 Refrigerant reduction.....	20
2.2.2 Decarbonize campus energy systems.....	24
Waste, water and sustainable materials management sector.....	29
2.2.3 Organics management .....	29
Transportation sector .....	32
2.2.4 Scrap and replace fossil fuel powered commercial vehicles .....	32
2.2.5 Marine terminal electrification.....	35
2.2.6 Complete Streets .....	37
2.2.7 Reduce emissions of fleets for rural and special needs transit.....	40
2.2.8 Enable decarbonization of rail infrastructure .....	42
2.2.9 Electrify municipal and tribal fleets including expansion of electric vehicle charging.....	45
2.2.10 Mode shift from trucking to water transportation to reduce vehicles miles travelled .....	47
Electric power sector .....	49
2.2.11 Support tribal energy sovereignty through Tribal Clean Energy grants.....	49
Agriculture sector.....	52
2.2.12 Fund anaerobic digesters.....	52
2.3 Low income disadvantaged communities benefits analysis.....	54
2.3.1. Washington's environmental justice context.....	54
2.3.2. Identifying LIDACs and potential impacts.....	54
2.3.3. Mapping environmental justice communities in Washington.....	55
2.3.4. Potential benefits of GHG emission reduction measures to LIDACs.....	56
2.3.5 Community engagement.....	58
2.4 Workforce planning analysis .....	59

**3. Next Steps: Comprehensive Climate Action Plan ..... 62**

    3.1 CCAP development ..... 62

    3.2 Future outreach and engagement..... 62

    3.3 Measures identified for CCAP consideration..... 63

**Appendix A. CPRG PCAP Outreach and Coordination Log ..... 64**

**Appendix B. CPRG PCAP Recurring Workgroup Log..... 66**

**Appendix C. Potential CCAP GHG measures..... 68**

**Appendix D. LIDACs in Washington ..... 70**

## List of Figures

Figure 1. Washington GHG emissions in MMT CO <sub>2</sub> e by Sector.....	18
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## List of Tables

Table 1. Washington GHG emissions in MMT CO <sub>2</sub> e by Sector.....	15
Table 2. Washington Natural and Working Lands Net CO <sub>2</sub> Flux (Carbon Stock Change, MMT CO <sub>2</sub> e).....	16
Table 3. Washington Priority GHG Reduction Measures.....	19
Table 4. Average HFC Emissions for Common Commercial Refrigerant Systems.....	21
Table 5. Cumulative GHG Reductions for Refrigeration Reduction.....	21
Table 6. Cumulative GHG Reductions for SCC District Energy System Decarbonization.....	25
Table 7. Proposed Phasing for SCC Campus Energy Decarbonization.....	25
Table 8. Cumulative GHG Reductions for WWU Campus Energy System Decarbonization.....	27
Table 9. Cumulative GHG Reductions for Organics Management.....	29
Table 10. Implementation Approach to Organics Management.....	30
Table 11. Historic Investments in Organic Management and Food Waste Prevention.....	31
Table 12. Cumulative GHG Reductions for Scrap and Replace of Fossil Fuel Powered Commercial Vehicles....	33
Table 13. Funding for Fossil Fuel Powered Commercial Vehicles.....	35
Table 14. Cumulative GHG Reductions for Marine Terminal Electrification.....	36
Table 15. Cumulative GHG Reductions for Complete Streets .....	38
Table 16. Example of Typical Project Timeline for Complete Streets.....	38
Table 17. Cumulative GHG Reductions for Reducing Emissions of Fleets.....	40
Table 18. Cumulative GHG Reductions for Converting Locomotive Engines.....	43
Table 19. Cumulative GHG Reductions for Converting Fleets to Electric Vehicles.....	46
Table 20 Cumulative GHG Reductions for Mode Switch to Water Transportation to Reduce VMTs.....	48
Table 21. Cumulative GHG Reductions for Tribal Solar plus Storage Projects.....	50

Table 22. Cumulative GHG Reductions for Anaerobic Digesters.....52

Table 23. Washington Communities Affected by Priority Measures.....54

Table 24. Benefits to LIDACs from Priority Measures.....56

Table 1A. CPRG PCAP Outreach and Coordination Log 7/1/2023 - 2/29/2024.....64

Table 1B. CPRG PCAP Recurring Workgroup Log 7/1/2023 - 2/29/2024.....66

Table 1C. Measures that will be explored further in the CCAP but are not included in Washington’s PCAP and will not be considered for CPRG Phase 2 Implementation funding.....68

# Key Terms, Abbreviations, Acronyms and Definitions

**Climate:** the “average weather” generally over a period of three decades. Measures of climate include temperature, precipitation, and wind.

**Climate change:** any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period of time (decades or longer). Climate change may result from natural factors and processes and from human activities that change the atmosphere’s composition and land surface.

**Climate Pollution Reduction Grant (CRPG):** one of many federal funding opportunities created through the Inflation Reduction Act (IRA) and run through the U.S. Environmental Protection Agency (EPA). This program provides grants to states, local governments, tribes, and territories to develop and implement plans for reducing greenhouse gas (GHG) emissions and other harmful air pollution.

**Commerce:** The Washington State Department of Commerce.

**Comprehensive Climate Action Plan (CCAP):** a narrative report that provides an overview of the grantees’ significant GHG sources/sinks and sectors, establishes near-term and long-term GHG emission reduction goals, and provides strategies and identifies measures that address the highest priority sectors to help the grantees meet those goals.

**Environmental Justice (EJ):** according to [RCW 70A.02.010 \(8\)](#) means the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, rules, and policies. Environmental justice includes addressing disproportionate environmental and health impacts in all laws, rules, and policies with environmental impacts by prioritizing vulnerable populations and overburdened communities, the equitable distribution of resources and benefits, and eliminating harm.

**Ecology:** The Washington State Department of Ecology.

**Global warming:** average increase in the temperature of the atmosphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced.

**Greenhouse gas (GHG):** any gas that absorbs infrared radiation in the atmosphere; examples include carbon dioxide, methane, nitrous oxide, ozone, and water vapor.

**Low-Income/Disadvantaged Community (LIDAC):** communities with residents that have low incomes, limited access to resources, and disproportionate exposure to environmental or climate burdens. EPA strongly recommends CPRG grantees use the Climate and Economic Justice Screening Tool (CEJST) and the Environmental Justice Screening and Mapping Tool (EJScreen) to identify LIDACs in their communities. These tools identify LIDACs by assessing and combining indicators such as: pollution exposure, climate change risks, environmental hazards, health impacts, socioeconomic factors, and more. Terms from [Washington environmental justice laws](#) include vulnerable populations and overburdened communities.

**Metropolitan Statistical Area (MSA):** metropolitan statistical areas as defined by the U.S. Census 2020 MSA population.

**Overburdened Community:** according to [RCW 70A.02.010 \(11\)](#) means a geographic area where vulnerable populations face combined, multiple environmental harms and health impacts, and includes, but is not limited to, highly impacted communities as defined in [RCW 19.405.020](#).

**Priority Climate Action Plan (PCAP):** a narrative report that includes a focused list of near-term, high-priority, and implementation-ready measures to reduce GHG pollution and an analysis of GHG emissions reductions.

**Vulnerable Populations:** according to [RCW 70A.02.010\(14\)](#) means population groups that are more likely to be at higher risk for poor health outcomes in response to environmental harms, due to: adverse socioeconomic factors, such as unemployment, high housing and transportation costs relative to income, limited access to nutritious food and adequate health care, linguistic isolation, and other factors that negatively affect health outcomes and increase vulnerability to the effects of environmental harms; and sensitivity factors, such as low birth weight and higher rates of hospitalization. Vulnerable populations includes but is not limited to: racial or ethnic minorities; low-income populations; populations disproportionately impacted by environmental harms; and populations of workers experiencing environmental harms.

**WSDOT:** The Washington State Department of Transportation.



# Executive Summary

The State of Washington (Washington) received funding through the U.S. Environmental Protection Agency (EPA) Climate Pollution Reduction Grant (CPRG) to develop plans to reduce greenhouse gas (GHG) emissions and other harmful air pollution. The CPRG planning grant enables states, metropolitan statistical areas (MSAs), and tribal governments to develop a Priority Climate Action Plan (PCAP), followed by a Comprehensive Climate Action Plan (CCAP) and Status Report (state and MSAs only), over a four-year period through 2027. EPA requires that all PCAPs include a GHG Inventory, quantified GHG reduction measures, a Low Income and Disadvantaged Communities (LIDAC) Benefits Analysis, as well as a review of authority to implement each measure.

Washington also received funding for an MSA grant. The Puget Sound Clean Air Agency (Agency or PSCAA) is serving as the Lead Entity for the Phase 1 CPRG Planning Grant on behalf of the Seattle-Tacoma-Bellevue MSA, which covers all cities and counties in the four-county region of King, Kitsap, Pierce, and Snohomish counties. Skamania and Clark counties are included in the Portland, OR metro area MSA grant.

The Washington PCAP presents a focused list of measures to reduce GHG emissions and harmful air pollution and maximize the benefits of climate action in overburdened communities in Washington. Many of the quantified priority measures contained in this PCAP are based on existing state, local and tribal, climate and clean energy plans and programs.

The Department of Commerce (Commerce) was responsible for developing the PCAP, in partnership with the entities named in the Acknowledgements section. Commerce is aware that there are many additional priority actions for each sector that could be included in this PCAP and acknowledges that the list of priority measures included in Section 2.2 is not intended to be inclusive of all possible priority actions available to tribes, state agencies and local jurisdictions. Instead, these priority actions focus on measures for which an eligible entity is planning to seek Phase 2 CPRG funding, rather than an exhaustive list of all possible priority measures available to reduce emissions in the state. Commerce and the Washington State Department of Ecology (Ecology) will develop a comprehensive list of GHG measures in the CCAP, based on informal comments received on the PCAP, as well as existing state plans and other sources. A summary of measures that will be explored further in the CCAP can be found in Appendix C. Commerce also coordinated closely with the PSCAA, state agencies, and the Governor's Office, in the creation of the PCAP.

This PCAP was informed by, and is a continuation of, the many climate planning efforts already underway by state, regional, county, and local jurisdictions across Washington. This PCAP serves as a resource and guide for implementing near-term priority GHG reduction strategies and actions in furtherance of CPRG Phase 2 Implementation Grants for tribes, state agencies and local communities in Washington.

# 1. Introduction

Washington is widely recognized for its leadership in climate and environmental practices. The Climate Pollution Reduction Grant (CPRG) offers an opportunity to enhance the state's climate action goals by identifying policies, practices and technologies to reduce greenhouse gas (GHG) emissions, address environmental injustices through community-driven solutions, stimulate the economy by creating high-quality jobs, and improve air quality for all residents. The Priority Climate Action Plan (PCAP) presented here marks the initial steps toward a state Comprehensive Climate Action Plan (CCAP), scheduled to be completed by the summer of 2025. Collaboration with state and local agencies, tribes, subject matter experts, and the public has been integral to identifying priority measures that are ready for implementation in the PCAP.

This section offers an overview of the CPRG, outlines the PCAP elements, and discusses the scope and development of Washington's PCAP.

## 1.1 Climate Pollution Reduction Program overview

The CPRG program provides \$5 billion in grants to states, local governments, tribes, and territories to develop and implement ambitious plans for reducing GHG emissions and other harmful air pollution. Authorized under Section 60114 of the Inflation Reduction Act (IRA), this two-phase program provides \$250 million for noncompetitive planning grants, and approximately \$4.6 billion for competitive implementation grants.

Phase 1 of the CPRG program supports states, local governments, tribes, and territories regardless of where they are in their climate planning and implementation process. Planning grant recipients are using the funding to design climate action plans that incorporate a variety of measures to reduce GHG emissions from across their economies in six key sectors (electricity generation, industry, transportation, buildings, agriculture/natural and working lands, and waste management). The required deliverables include:

1. Priority Climate Action Plan (PCAP): due March 1, 2024
2. Comprehensive Climate Action Plan (CCAP): due Summer 2025
3. Status Report: due mid 2027

## 1.2 PCAP Overview

The Washington PCAP is focused on near-term, high-priority, implementation-ready measures to reduce GHG pollution and an analysis of GHG emissions reduction that could be achieved by 2030. The PCAP is not a comprehensive approach to Washington's GHG reduction strategy; that strategy will be addressed in the CCAP.

**This PCAP is organized into the following sections according to the [requirements from EPA](#):**

1. Introduction
2. PCAP Elements
  - a. Greenhouse Gas Inventory
  - b. Greenhouse Gas Reduction Measures
  - c. Low Income Disadvantaged Communities Benefits Analysis (including Community Engagement)
  - d. Workforce Planning Analysis
3. Next Steps: Comprehensive Climate Action Plan

## 1.3 Scope of the PCAP

Washington's PCAP includes a list of GHG reduction measures collected from existing state plans and programs, identified as priority measures for the purposes of pursuing funding through CPRG implementation grants. These measures are not exhaustive of Washington's priorities; instead, these listed measures meet specific criteria, including:

- The measure is implementation ready: the design work for the policy, program, or project is complete enough that a full scope of work and budget can be included in a CPRG implementation grant application.
- The measure can be completed in the near term: all funds will be expended, and the project completed, within the five-year performance period for the CPRG implementation grants.
- The measure advances state greenhouse gas (GHG) reduction mandates in RCW [70A.45.020](#).

Public feedback on these measures was gathered through a survey from December 19, 2023 through January 12, 2024. For further details on GHG measures that were provided through public feedback, but not used in this PCAP, refer to Appendix C.

**Details on Washington's authority for reducing GHG emissions related to these measures can be found in specific statewide laws, including:**

- [Statutory Emissions Limits](#)
- [Clean Energy Transformation Act](#)
- [Motor Vehicle Emission Standards](#)
- [Climate Commitment Act](#)
- [Healthy Environment for All \(HEAL\) Act](#)
- [Clean Fuel Standard](#)
- [Hydrofluorocarbons \(HFC\) Emission Reductions](#)
- [Move Ahead Washington](#)
- [Amending the Growth Management Act to address climate change and GHG emissions reductions](#)

## 1.4 Approach to developing the PCAP

Initial GHG reduction measures were identified by surveying existing plans, laws, resources, and projects. Collaboration with state agencies, local governments, subject matter experts, tribes, and the public narrowed down the list to priority implementation-ready measures. The draft priority measures received public input, input from the Governor's office and other key state stakeholders and deeper collaboration with contributors to ensure competitiveness for EPA's Phase 2 CPRG Implementation Grant General Competition requirements. [CPRG Implementation Grant General Competition](#) provides more information on requirements.

## 1.5 State climate policies

Washington has an extensive body of legislative support and statewide strategies to mitigate and respond to climate change:

In 2020, the Washington Legislature set [new GHG emission limits](#) (RCW 70A.45.020) in order to combat climate change. Under the law, the state is required to reduce emissions levels:

- 2030: 45% below 1990 levels
- 2040: 70% below 1990 levels
- 2050: 95% below 1990 levels and achieve net zero emissions

Meeting these limits will be achieved through the following laws and programs:

On May 7, 2019, Governor Jay Inslee signed into law the [Clean Energy Transformation Act \(CETA\)](#) (Chapter 299, laws of 2019), which requires Washington's electric utilities to eliminate carbon emissions from their energy resources. CETA requires that all electric utilities eliminate coal-fired generation serving Washington state customers by the end of 2025, be GHG neutral by 2030, and generate 100% of their power from renewable or zero-carbon resources by 2045. This law helped set Washington on the road to becoming a national leader in climate action policies.

In 2020, the Legislature passed the [Motor Vehicle Emission Standards](#) directing Washington to adopt California's vehicle emission standards. This includes new requirements to gradually increase the number of new zero-emission vehicles (ZEV) sold in Washington, until all new vehicles meet the ZEV standard starting in 2035. In 2021, the Legislature adopted new zero-emission and low-emission vehicle standards which will take effect in 2024, with the release of model year 2025 vehicles.

The [Climate Commitment Act \(CCA\)](#) (Chapter 310, Laws of 2021) caps and reduces GHG emissions from Washington's largest emitting sources and industries, allowing businesses to find the most efficient path to lower carbon emissions. This program works alongside other critical climate laws and policies to help Washington achieve its commitment to reducing GHG emissions by 95% by 2050. The CCA also puts environmental justice and equity at the center of climate policy, making sure communities that bear the greatest burdens from air pollution today breathe cleaner, healthier air as the state cuts GHGs. Finally, funds from the auction of emission allowances support new investments in climate-resiliency programs, fund clean transportation, and address health disparities across the state.

The passage of the [Healthy Environment for All \(HEAL\) Act](#) (Chapter 314, Laws of 2021) was a groundbreaking step toward eliminating environmental and health disparities among communities of color and low-income households. It is the first statewide law in Washington to create a coordinated state agency approach to environmental justice. The law requires Commerce and the state departments of Agriculture, Ecology, Health, Natural Resources, and Transportation, and the Puget Sound Partnership to identify and address environmental health disparities in overburdened communities and for vulnerable populations.

In 2021, the Legislature also adopted the [Clean Fuel Standard](#) (Chapter 317, Laws of 2021) a law requiring fuel suppliers to gradually reduce the carbon intensity of transportation fuels to 20% below 2017 levels by 2034. The Clean Fuel Standard is designed to decrease the carbon intensity of Washington's transportation fuels by providing an increasing range of low-carbon and renewable alternatives that reduce dependency on petroleum and improve air quality.

Also in 2021, the Legislature passed the Hydrofluorocarbons (HFC) Emissions Reduction Law ([Chapter 70A.60 RCW](#)), which bans the sale and purchase of certain HFC refrigerants with high-global-warming potential. [The law requires Ecology](#) to establish maximum global warming potential (GWP) thresholds for new stationary refrigeration and air conditioning equipment sold in Washington and to establish [a refrigerant management program](#) to reduce HFC leakage.

[In 2022, Washington enacted Move Ahead WA](#), a transformational 16-year package that creates a sustainable, achievable future for our transportation sector. The \$3 billion funding package adds support to existing programs and creates new programs to reduce climate pollution, create jobs and improve public health.

In 2023, the Legislature signed a law ([HB 1181](#)) that adds a climate goal to the Growth Management Act (GMA, [Chapter 36.70A RCW](#)) and requires local comprehensive plans to have a climate element with resilience and greenhouse gas emissions mitigation sub-elements.

- The resilience sub-element must include goals and policies to improve climate preparedness, response and recovery efforts. This is mandatory for all counties and cities fully planning under the GMA and encouraged for others.
- The greenhouse gas emissions sub-element must include goals and policies to reduce emissions and vehicle miles traveled. This sub-element is mandatory for the state's 11 largest counties and the cities within those counties.
- Climate elements must maximize economic, environmental, and social co-benefits and prioritize environmental justice in order to avoid worsening environmental health disparities.

In addition to legislation, Washington has been directed by the Legislature to develop extensive plans to implement these laws and emissions limits. The following plans were used to develop the PCAP, including:

- [Washington State Energy Strategy](#)
- [Transportation Electrification Strategy](#)
- [Washington State Transportation Carbon Reduction Strategy](#)
- [Use Food Well Washington Plan](#)
- [Refrigerant Management Program](#)
- [Washington Ferry Electrification Plan](#)
- [Green Transportation Capital grant program](#)
- [Washington State Active Transportation Plan](#)

The [2021 State Energy Strategy](#) is designed to provide a roadmap for meeting the state's GHG emission limits by using a "deep decarbonization pathway" analysis, which searches for the lowest cost path to reduce emissions based on known technologies, costs, and markets. The strategy is required to be updated every seven years and includes a [Biennial Energy Report](#) to track progress.

In 2022, the Legislature passed Move Ahead Washington, a 16-year transportation package that supports mode shift, electrification of major transportation modes, and reductions in vehicle miles traveled (VMT) along with associated emissions. It also established the [Interagency Electric Vehicle Coordinating Council \(EV Council\)](#) and a non-binding statewide target of reaching 100 percent new electric passenger vehicle sales by 2030. In 2023, the EV Council adopted the Washington [Transportation Electrification Strategy](#) (TES), which outlines policy recommendations and implementation timelines for meeting the state's clean transportation objectives.

In November 2023, WSDOT submitted the [Washington State Transportation Carbon Reduction Strategy](#) to the Federal Highway Administration. This strategy is required for the state to receive federal Carbon Reduction Program funds and builds on the SES by focusing on two ways to reduce transportation GHG emissions: move people and goods more efficiently and equitably and electrify vehicles and switch to low carbon fuels.

In February 2022, Ecology delivered the [Use Food Well Washington \(UFWW\) plan](#), which is a roadmap to reduce food waste by 50% by 2030 and includes a strong plan to measure and track progress on this legislative requirement. The UFWW plan also guides the work of the [Washington Center for Sustainable Food Management](#), which launched in January 2024.

In December 2023, Ecology initiated the [Refrigerant Management Program \(RMP\)](#), which requires facilities with refrigeration and air conditioning systems containing more than 50 pounds of refrigerant with a global warming potential GWP of 150 or more to conduct and report periodic leak inspections, promptly repair leaks, and keep service records on site.

The [Washington Ferry Electrification Plan](#) is a pathway for Washington State Ferries (WSF) to convert the state ferry system, the largest in the country, to hybrid-electric power by 2040 following mandates from the Washington legislature and Governor. The [Green Transportation Capital grants](#) provide funding to transit agencies for cost-effective capital projects that reduce the carbon intensity of the Washington transportation system. The larger WSDOT agency approach to active transportation on and across state highways is guided by the [Active Transportation Plan 2020 and Beyond](#).

## 2. PCAP elements

### 2.1 Greenhouse Gas (GHG) Inventory

By law, Washington publishes its GHG emissions inventory every two years ([RCW 70A.45.020\(2\)](#)). The current inventory, published in 2022, included data from 1990-2019. The data used in the inventory is derived primarily from EPA's [State Inventory Tool \(SIT\)](#) and incorporates the most current EPA data available at the time the report is due. For the December 2022 publication, the most current EPA data available was through 2019. The inventory will be published again in December 2024 and is expected to include EPA data through 2021.

Washington does not presently generate emissions projections or uncertainties in addition to what EPA provides; however, the state plans to expand the GHG inventory team and incorporate non-EPA, state-specific data in the future. In the coming years, the state GHG inventory should more accurately reflect the emissions impacts of state climate policies.

Standard emissions accounting guidelines use production-based emissions, which are emissions occurring within state boundaries. However, Washington's official inventory departs from the production-based approach utilized in the SIT in the state's electricity sector, which reports the electricity consumed in state, as well as emissions associated with electricity production. To make this substitution, in-state electric power generation emissions are replaced with [Fuel Mix Disclosure](#) program data provided by Commerce. Washington also utilized data from the [Washington State Department of Natural Resources](#) to supplement SIT data on emissions from wildfires.

## The Washington GHG inventory includes the following sectors and gases:

Sectors	Greenhouse Gases (across all sectors)
<ol style="list-style-type: none"> <li>Electricity generation and/or use</li> <li>Residential, Commercial and Industrial Energy Use</li> <li>Transportation</li> <li>Fossil Fuel Industry</li> <li>Industrial Process</li> <li>Waste and materials management</li> <li>Agriculture</li> <li>Natural and working lands</li> </ol>	<ul style="list-style-type: none"> <li>carbon dioxide (CO<sub>2</sub>),</li> <li>methane (CH<sub>4</sub>),</li> <li>nitrous oxide (N<sub>2</sub>O),</li> <li>fluorinated gases (F-gases) including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>)</li> </ul>

Below, Tables 1 and 2 detail GHG emissions in million metric tons (MMT) of carbon dioxide equivalents (CO<sub>2</sub>e) for all economic sectors. Figure 1 displays Washington's emissions data by sector across the three decades. Totals may not sum due to independent rounding.

**Table 1. Washington GHG emissions in MMT CO<sub>2</sub>e by Sector**

Sector	1990	2000	2010	2015	2016	2017	2018	2019
<b>Electricity, net consumption-based</b>	<b>16.9</b>	<b>23.3</b>	<b>20.9</b>	<b>19.2</b>	<b>17.1</b>	<b>16.9</b>	<b>16.5</b>	<b>21.9</b>
Coal	16.8	17.4	15.8	14.0	12.5	12.4	11.7	15.2
Natural gas	0.1	5.3	4.8	4.9	4.3	4.1	4.5	6.2
Petroleum	0.0	0.6	0.1	0.1	0.1	0.1	0.0	0.0
Biomass and waste (CH <sub>4</sub> and N <sub>2</sub> O)	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4
<b>Residential, Commercial, and Industrial (RCI)</b>	<b>25.3</b>	<b>28.9</b>	<b>23.5</b>	<b>23.8</b>	<b>24.3</b>	<b>25.0</b>	<b>24.8</b>	<b>25.3</b>
Coal	0.6	0.3	0.3	0.2	0.2	0.1	0.1	0.1
Natural gas	8.6	11.4	10.8	11.2	11.8	13.2	12.5	13.2
Oil	16.1	17.3	12.4	12.5	12.3	11.6	12.1	12.0
Wood (CH <sub>4</sub> and N <sub>2</sub> O)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Transportation</b>	<b>35.5</b>	<b>41.9</b>	<b>35.2</b>	<b>36.5</b>	<b>38.9</b>	<b>38.6</b>	<b>39.2</b>	<b>40.3</b>
Gasoline (Hwy)	15.6	19.8	16.1	15.5	15.3	16.1	17.0	16.9
Non-Highway	16.6	16.7	11.8	14.1	17.7	16.4	15.4	16.7
Diesel (Hwy)	3.4	5.4	7.3	6.9	5.9	6.2	6.9	6.6
Alternative Fuel Vehicles	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
<b>Fossil fuel industry</b>	<b>0.8</b>	<b>0.8</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>
Natural gas industry (CH <sub>4</sub> )	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Coal mining (CH <sub>4</sub> )	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Oil industry (CH <sub>4</sub> )	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>Industrial processes</b>	<b>4.9</b>	<b>6.5</b>	<b>4.7</b>	<b>5.0</b>	<b>5.0</b>	<b>5.0</b>	<b>5.1</b>	<b>5.3</b>
Carbon Dioxide Emissions	2.2	3.3	1.4	1.3	1.2	1.1	1.2	1.3



Sector	1990	2000	2010	2015	2016	2017	2018	2019
Cement Manufacture	0.0	0.4	0.3	0.3	0.4	0.4	0.4	0.4
Lime Manufacture	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1
Limestone and Dolomite Use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soda Ash	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Aluminum Production, CO <sub>2</sub>	2.0	1.7	0.5	0.4	0.2	0.2	0.2	0.3
Iron & Steel Production	0.0	0.8	0.3	0.3	0.3	0.3	0.3	0.3
Ammonia Production	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2
Urea Consumption	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrous Oxide Emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitric Acid Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adipic Acid Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HFC, PFC, NF <sub>3</sub> , and SF <sub>6</sub> Emissions	2.7	3.2	3.3	3.7	3.8	3.9	3.9	4.0
ODS Substitutes	0.0	1.1	2.3	2.9	2.9	3.0	3.0	3.2
Semiconductor Manufacturing	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Magnesium Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electric Power Transmission and Distribution Systems	0.8	0.4	0.1	0.1	0.1	0.1	0.1	0.1
HCFC-22 Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aluminum Production, PFCs	1.9	1.7	0.8	0.7	0.7	0.7	0.7	0.7
<b>Waste management</b>	<b>3.1</b>	<b>2.9</b>	<b>3.5</b>	<b>2.4</b>	<b>2.4</b>	<b>2.5</b>	<b>2.4</b>	<b>2.4</b>
Solid waste management	2.6	2.2	2.7	1.6	1.6	1.6	1.5	1.6
Wastewater management	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.9
<b>Agriculture</b>	<b>6.9</b>	<b>6.7</b>	<b>6.5</b>	<b>7.0</b>	<b>6.8</b>	<b>6.7</b>	<b>6.8</b>	<b>6.2</b>
Enteric fermentation	2.7	2.7	2.4	2.6	2.6	2.6	2.7	2.7
Manure management	0.9	1.2	1.3	1.5	1.5	1.5	1.5	1.5
Agriculture soils	3.3	2.8	2.9	2.9	2.6	2.6	2.7	2.1
<b>Total gross emissions</b>	<b>93.5</b>	<b>111.0</b>	<b>95.0</b>	<b>94.6</b>	<b>95.1</b>	<b>95.3</b>	<b>95.5</b>	<b>102.1</b>

**Table 2. Washington Natural and Working Lands Net CO<sub>2</sub> Flux (Carbon Stock Change, MMT CO<sub>2</sub>e)**

Land-Use Category	1990	2005	2015	2016	2017	2018	2019
Forest Land Remaining Forest Land	(10.3)	(15.2)	(19.1)	(18.7)	(18.2)	(17.8)	(17.3)



Land-Use Category	1990	2005	2015	2016	2017	2018	2019
Changes in Forest Carbon Stocks <sup>1</sup>	(10.3)	(15.2)	(19.1)	(18.7)	(18.2)	(17.8)	(17.3)
<b>Land Converted to Forest Land</b>	<b>(3.0)</b>	<b>(3.0)</b>	<b>(3.0)</b>	<b>(3.0)</b>	<b>(3.0)</b>	<b>(3.0)</b>	<b>(3.0)</b>
Changes in Forest Carbon Stocks <sup>2</sup>	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)	(3.0)
<b>Cropland Remaining Cropland</b>	<b>(0.5)</b>	<b>(0.3)</b>	<b>(0.4)</b>	<b>(0.7)</b>	<b>(0.7)</b>	<b>(0.6)</b>	<b>(0.6)</b>
Changes in Soil Carbon Stocks	(0.5)	(0.3)	(0.4)	(0.7)	(0.7)	(0.6)	(0.6)
<b>Land Converted to Cropland</b>	<b>0.5</b>	<b>0.6</b>	<b>0.7</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
Changes in Ecosystem Carbon Stocks <sup>3</sup>	0.5	0.6	0.7	0.6	0.6	0.6	0.6
<b>Grassland Remaining Grassland</b>	<b>(0.0)</b>	<b>0.1</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>
Changes in Ecosystem Carbon Stocks	(0.0)	0.1	0.3	0.2	0.2	0.2	0.2
<b>Land Converted to Grassland</b>	<b>0.2</b>	<b>(0.0)</b>	<b>0.3</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
Changes in Ecosystem Carbon Stocks <sup>4</sup>	0.2	(0.0)	0.3	0.1	0.1	0.1	0.1
<b>Wetlands Remaining Wetlands</b>	<b>(0.1)</b>	<b>(0.1)</b>	<b>(0.1)</b>	<b>(0.1)</b>	<b>(0.1)</b>	<b>(0.1)</b>	<b>(0.1)</b>
Changes in Organic Soil Carbon Stocks in Peatlands	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Changes in Ecosystem Carbon Stocks in Coastal Wetlands	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
<b>Land Converted to Wetlands</b>	<b>0.0</b>	<b>0.0</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>	<b>(0.0)</b>
Changes in Ecosystem Carbon Stocks <sup>5</sup>	0.00	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
<b>Settlements Remaining Settlements</b>	<b>(2.6)</b>	<b>(2.7)</b>	<b>(2.9)</b>	<b>(2.9)</b>	<b>(2.9)</b>	<b>(2.9)</b>	<b>(2.9)</b>
Changes in Organic Soil Carbon Stocks	0	0	0	0	0	0	0
Changes in Settlement Tree Biomass Carbon Stocks <sup>6</sup>	(2.2)	(2.6)	(2.9)	(2.8)	(2.8)	(2.8)	(2.8)
Changes in Yard Trimmings and Food Scrap Carbon Stocks in Landfills	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
<b>Land Converted to Settlements</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
Changes in Ecosystem Carbon Stocks	2	2	2	2	2	2	2
<b>Land Use, Land Use Change, Forestry (LULUCF) Net CO<sub>2</sub> Flux</b>	<b>(13.8)</b>	<b>(18.2)</b>	<b>(21.8)</b>	<b>(22.0)</b>	<b>(21.6)</b>	<b>(21.1)</b>	<b>(20.6)</b>

<sup>1</sup> Includes the net changes to carbon stocks stored in all forest ecosystem pools. Harvested wood products are not estimated in the SIT at this time. This includes the net CO<sub>2</sub> flux from drained organic soils in both Forest Land Remaining Forest Land and Land Converted to Forest Land.

<sup>2</sup> Includes the net changes to carbon stocks stored in all forest ecosystem pools, but emissions from drained organic soils are included in the flux from Forest Land Remaining Forest Land because it is not possible to separate the activity data at this time.

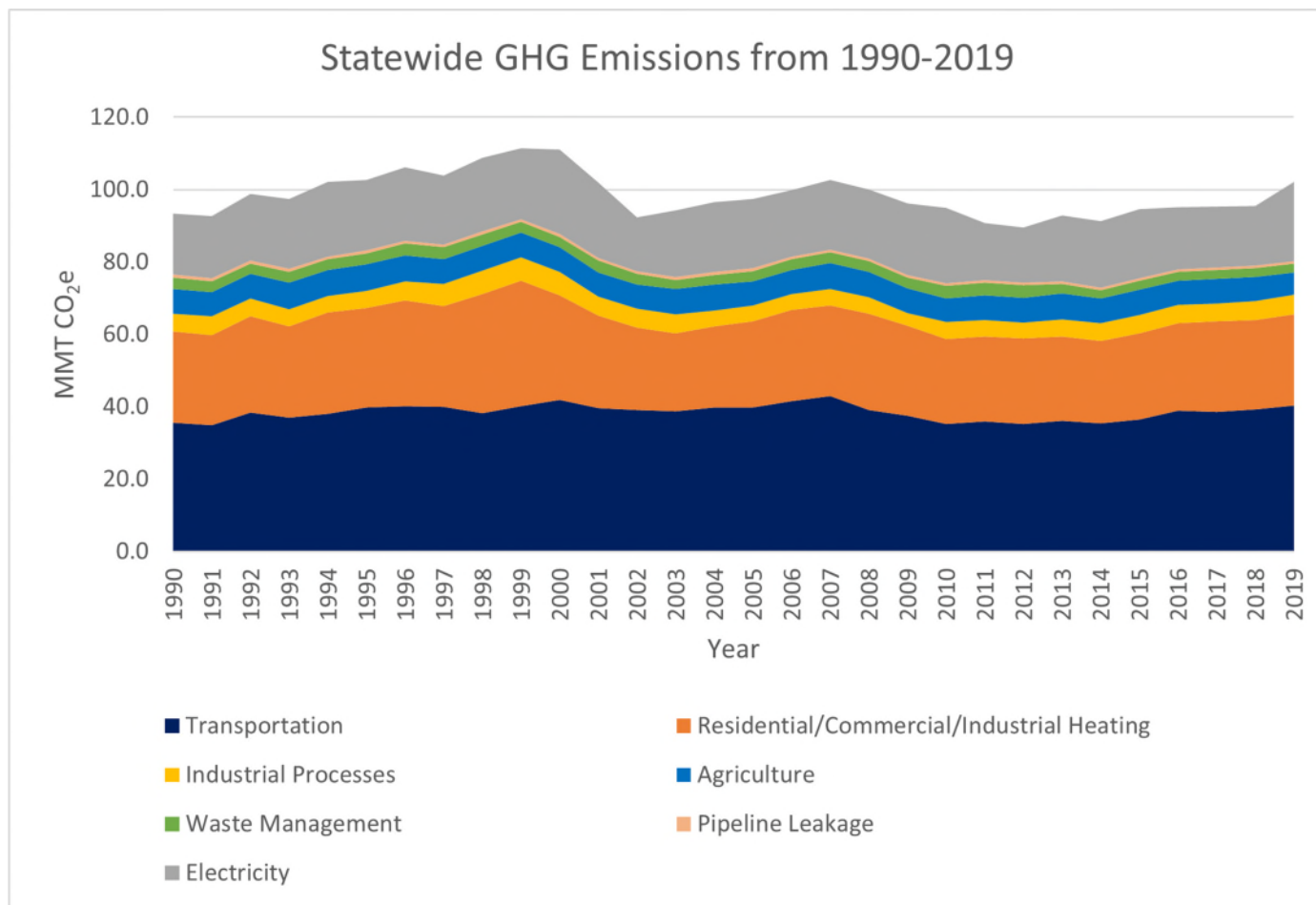
<sup>3</sup> Includes changes in mineral and organic soils from all lands converted to Croplands/Grasslands, and the above- and below-ground biomass, dead wood, and litter from Forest Lands Converted to Croplands/Grasslands.

<sup>4</sup> Includes changes in mineral and organic soils from all lands converted to Croplands/Grasslands, and the above- and below-ground biomass, dead wood, and litter from Forest Lands Converted to Croplands/Grasslands.

<sup>5</sup> Includes carbon stock changes for land converted to vegetated coastal wetlands.

<sup>6</sup> Includes Lands Converted to Settlements.

**Figure 1. Washington GHG emissions in MMT CO<sub>2</sub>e by Sector**



As the above [inventory](#) data demonstrates, total statewide emissions have held relatively steady in recent decades, despite significant economic and population growth. Washington has made notable progress in reducing its carbon intensity as measured in terms of emissions per capita or per economic output (Gross Domestic Product or GDP). Relative to 2005, the metric tons of CO<sub>2</sub>e per million dollars of GDP declined 51 percent and the CO<sub>2</sub>e per capita has declined 15 percent. The transportation sector, however, remains the largest source of emissions in the state at 40.3 MMT CO<sub>2</sub>e in 2019. This is 4.8 MMT CO<sub>2</sub>e increase over the 1990 baseline and a 2.8% increase over 2018 emissions for this sector.

These measurements clearly articulate the need to continue reducing GHG emissions in Washington, particularly in the transportation sector. Funding from federal programs such as the CPRG will be a critical factor in the ability to deploy effective GHG reduction measures and work toward the state's goal of net zero emissions.

## 2.2 GHG reduction measures

Table 3 is a list of Washington's PCAP priority measures. These measures were collected from existing state and local plans and programs and identified as priority measures for the purposes of pursuing funding through CPRG implementation grants. Each measure is explained in detail following Table 3.

This is not an exhaustive list of Washington’s priorities. Instead, the selected priority measures included in this PCAP meet the following criteria:

- They are implementation ready; the design work for the policy, program, or project is complete enough that a full scope of work and budget can be included in a CPRG implementation grant application.
- They can be completed in the near term; all funds could be expended, and the project completed, within the five-year performance period for the CPRG implementation grants.
- They advance state GHG reduction mandates in [RCW 70A.45.020](#).<sup>7</sup>

Feedback on these measures was provided through a public survey that was open December 19, 2023 through January 12, 2024. The CCAP will provide a holistic pathway analysis of the full suite of cost-effective measures to achieve the state’s 2050 GHG emission limits. For further details on GHG measures that were provided through public feedback and will be used as a starting point of the CCAP, refer to Appendix C.

Additional details of Washington plans for reducing GHG emissions related to these measures can be found in the state laws and plans listed in Section 1.

**Table 3. Washington Priority GHG Reduction Measures**

Index	Sector	Priority Measure	Implementing Agency or Agencies
2.2.1.	Buildings	Refrigerant reduction	Washington State Department of Ecology
2.2.2.	Buildings	Decarbonizing campus energy systems	Higher education Local agencies School districts Tribes Utilities
2.2.3.	Waste, water, and sustainable materials management	Organics management	Washington State Department of Ecology
2.2.4.	Transportation	Scrap and replace fossil fuel powered commercial vehicles	Washington State Department of Ecology
2.2.5.	Transportation	Marine terminal electrification	Washington State Department of Transportation
2.2.6.	Transportation	Complete streets	Washington State Department of Transportation
2.2.7.	Transportation	Reduce emissions of fleets for rural and special needs transit	Washington State Department of Transportation
2.2.8.	Transportation	Enable decarbonization of rail infrastructure	Local agencies Tribes Ports
2.2.9.	Transportation	Electrify municipal and tribal fleets including expansion of electric vehicle charging	Local agencies Tribes

<sup>7</sup> Of note, the GHG emissions reductions stated in each of the following measures are estimates based on available data, which may be subject to revisions or updates as needed

Index	Sector	Priority Measure	Implementing Agency or Agencies
2.2.10.	Transportation	Mode shift from trucking to water transportation to reduce vehicles miles travelled	Local agencies Tribes Ports
2.2.11.	Electric power	Support tribal energy sovereignty through Tribal Clean Energy grants	Washington State Department of Commerce
2.2.12.	Agriculture	Fund anaerobic digesters	Washington State Conservation Commission Washington State Department of Commerce Tribes Local agencies School districts

## Buildings sector

### 2.2.1 Refrigerant reduction

#### Implementing entity

Washington State Department of Ecology

#### Description of measure

Hydrofluorocarbons (HFCs) are a type of fluorinated gas commonly used in refrigeration and air conditioning. Over recent decades, these chemical compounds gained popularity as a replacement for ozone depleting substances (ODSs) that are being phased out under the terms of the [Montreal Protocol](#). These refrigerants are short lived climate super pollutants that can be thousands of times more potent than carbon dioxide in the atmosphere. Due to increased global demand for cooling and refrigeration, HFCs are now the fastest growing category of GHG emissions in the world and are having a disproportionate impact on the climate crisis.

Nationwide, the average grocery store refrigeration system leaks approximately 25% of its refrigerant each year; these systems can have an operational life span longer than 20 years. This measure would support the conversion of medium and small grocery stores away from high-global warming potential (GWP)<sup>8</sup> refrigerants and would be targeted to small businesses and stores serving low-income communities with limited access to groceries and which may face high compliance costs. This program could serve as a catalyst to transform market adoption to these low GWP technologies in WA and would provide higher market value for these technologies allowing for a scalable transformation from the old to new, cleaner, technologies. Success of this program could encourage acceleration through program growth and future funding from Ecology's Refrigerant Management Program (RMP) and the Climate Commitment Act (CCA).

#### Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates

Table 4 estimates of average HFC emissions for common commercial refrigerant systems of differing sizes, displaying the significant effects refrigerant emissions reduction could have on GHG emissions.

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<sup>8</sup> Global warming potential compares a climate pollutant relative to a similar mass of carbon dioxide (e.g. one pound of an emitted HFC with a GWP = 150 would have the same climate warming as 150 pounds of carbon dioxide emissions.)

To calculate estimated statewide emissions of refrigerant from equipment in Washington, Ecology used the [IPCC](#)'s emission factor approach, following the California Air Resources Board (CARB) example. Emissions were calculated by multiplying the estimated number of units, the average charge of refrigerant in each type of unit, and the leak rate, which is the rate of refrigerant loss over a year of operation. This is the same approach used by both CARB for its GHG inventory and Ecology's RMP.

In addition to using the IPCC approach, Ecology is using a leak rate for retail food refrigeration equipment, based on CARB emission inventories of this equipment, EPA Greenchill estimates, and anecdotal evidence from stakeholders, to be 25%, and end of life refrigerant loss to be approximately 20%.

**Table 4. Average HFC Emissions for Common Commercial Refrigerant Systems**

System Size	Large (3,635 lb. refrigerant)		Medium (704 lb.)		Small (125 lb.)	
Equipment Age (year)	Cumulative refrigerant lost (lb.)*	CO <sub>2</sub> e (lb.)	Cumulative refrigerant lost (lb.)*	CO <sub>2</sub> e (lb.)	Cumulative refrigerant lost (lb.)*	CO <sub>2</sub> e (lb.)
5	4,209	16,508,482	819	3,213,687	145	568,690
10	7,844	30,764,952	1,523	5,974,775	270	1,058,940
15	11,479	45,021,422	2,227	8,735,863	395	1,549,190
20	15,114	59,277,892	2,931	11,496,951	520	2,039,440
* based on an average annual leak rate of 20% for a system using R-404a refrigerant (GWP = 3,922)						

Addressing these systems can be transformational. California's "[F-gas Reduction Incentive Program](#)" began with \$1 million in funding in 2019 that converted and helped build 15 grocery store refrigeration projects to lower GWP systems, reducing emissions of systems by 75-90%. In Washington, Ecology has estimated emissions from retail food refrigeration systems to amount to 1 million MMTCO<sub>2</sub>e/year. There are an estimated 1,700 average sized grocery stores and another approximately 1,300 small grocery stores in Washington that use high-GWP refrigerants. The cost to fully convert an average sized grocery store amounts to around \$1 million. A \$25 million incentive program similar to that in California, providing grants from \$250,000 to \$500,000, would allow Washington to help owners convert and build low GWP refrigeration systems into approximately 70 stores. Table 5 shows the approximate reductions that this approach to the measure could achieve and represent 7% of the GHG emissions from these types of equipment in Washington.

**Table 5. Cumulative GHG Reductions for Refrigeration Reduction**

Measure or Project	Cumulative GHGs Avoided, 2025-2030 (MT CO <sub>2</sub> e)	Cumulative GHGs Avoided, 2025-2050 (MT CO <sub>2</sub> e)
Refrigerant Reduction	57,000	255,000

For a state program for this measure funded at \$25 million, the cost effectiveness of the GHG reductions for this priority measure is approximately \$440/MTCO<sub>2</sub>e<sup>9</sup>. The impact of these investments would be immediate upon the decommissioning of the old high GWP equipment and would eliminate the future emissions entirely when replaced with ultra-low GWP technologies.

### **Implementation schedule, milestones, and metrics for tracking progress**

This measure would be implemented through grant awards to applicants, in order to carry out refrigerant conversions to low-GWP refrigerants at grocery stores and food retailers, prioritizing stores in overburdened communities.

The implementation schedule may proceed as follows:

- Request for information (RFI): Ecology would conduct an RFI to better understand the current state of Washington grocers and retail food refrigeration, the incentives needed to transition to low-GWP refrigeration technologies, and a manageable timeframe for facilities to participate in such a program. Ecology's RMP reporting data would inform this work as well.
- Application format: The application would be developed using Ecology's Administration of Grants and Loans system. It would be simple and streamlined to improve access and reduce barriers to applicants.
- Scoring and evaluation: Scoring and evaluation criteria would prioritize the installation of refrigeration systems that contain ultra-low GWP refrigerants, i.e., with a GWP <10, as well as small businesses and grocery stores in both EPA defined low-income and disadvantaged communities (LIDACs) and state defined overburdened communities in Washington.
- Funding levels: Ecology would rely on the RFI to inform the funding amount offered per system and the technology of the potentially proposed replacement system options.
- Timing: The program would be an ongoing grant program, anticipating one application period each year for four years. Ecology anticipates opening the first round of the grant program in 2025. If CPRG funds are made available, approximately \$6 million would be available in each round for the HFC reduction incentive.

The program may proceed according to the following timeline:

- Year 1 – request for information (RFI) from stakeholders in WA and program designs, which will determine outreach and community engagement strategies
- Years 2-4 – grant award cycles for the replacement of approximately 70 system replacement projects in WA (~\$6 million per year, final awards in Year 4):
  - Request for proposals/grant applications
  - Determination of eligibility
  - Distribution of annual incentive grants to applicants to carry out work at recipient stores; milestone tracking begins for each project
  - Milestones of projects will be tracked including the completion of each activity: design, installation, completion; as well as semi-annual schedule updates to ensure milestones are on track with project timelines
  - Project verification

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<sup>9</sup> For the purposes of the Climate Pollution Reduction Grant program, EPA defines cost effectiveness as the total cost of the priority measure divided by the cumulative GHG reductions from 2025-2023: [cprg-general-competition-correction.pdf \(epa.gov\)](https://www.epa.gov/cprg-general-competition-correction.pdf). These are estimates based on proposed CPRG funding levels.

- Program outreach for next application cycles
- Year 5 – follow up and completion of projects, review program performance and outcomes, and final reporting

### **Milestones**

- Ecology would track design, installation, and completion of projects toward the goal of over 70 systems.
- Target the reduction of HFCs by 10,200 MTCO<sub>2</sub>e per year
- Increase awareness of refrigeration technologies that use refrigerants with GWP <10 and further market demand of ultra-low GWP technologies already available

### **Metrics for measuring performance**

- Number of new/replacement systems completed and total number of systems permanently removed from service
- Number of systems with GWP <10 in Washington
- Pounds of high-GWP refrigerant capacity permanently removed from service
- Outreach and community engagement (metric to be determined)

### **Geographic location**

This measure would affect eligible refrigeration units and systems in new and existing retail food facilities across the state that currently use or would otherwise use HFCs and other fluorinated refrigerants with a GWP greater than 150. The measure would focus on EPA defined LIDACs and state defined overburdened communities.

### **Intersection with other funding**

There is no known funding to supplement this work directly. However, EPA's [HFC Reclaim and Innovative Destruction Grants](#) could be utilized to complement the removal of high GWP refrigerants. However, Ecology would not have a role in applying for this grant due to the scope of work.

### **Authority to implement**

In May 2021, the Governor signed HB 1050 ([codified as Chapter 70A.60 RCW](#)). The 2021 law directs Ecology to:

- Set a maximum GWP threshold for hydrofluorocarbons used in:
  - ice rinks
  - new stationary air conditioning equipment.
  - new stationary refrigeration equipment.
- Establish a refrigerant management program to address refrigerant emissions from large air conditioning and refrigeration equipment.
- Recommend to the Legislature how to manage end-of-life and disposal of refrigerants.

Starting July 25, 2021, the new law banned the sale and purchase of certain HFC refrigerants with high-GWP, as well as non-essential consumer products (e.g., air horns and noisemakers) which contain high GWP refrigerants.



## 2.2.2 Decarbonize campus energy systems

### Implementing entity

Higher education; State and Local agencies; School districts; Tribes; Utilities

### Description of measure

Universities, colleges, state and local agencies, and school districts must dramatically lower their GHG footprint to meet state goals as well as the state's building energy performance standard. For many, legacy systems, which include steam heating and natural gas boilers, are at the end of life, having become unreliable, and posing a significant life-safety risk to maintenance personnel. Buildings are often decades old and predate modern energy efficiency standards. Deferred maintenance costs impact budgets, air quality, and the ability of a campus to function efficiently.

This measure targets campus energy system decarbonization through conversion from legacy district energy systems that are heated by fossil fuel combustion to electric and renewable thermal central plant space conditioning using a variety of technologies, which may include air or ground source heat pumps, thermal storage and renewable energy resources among other clean solutions. This measure can also cover a variety of energy efficiency upgrades for buildings to reduce heating demand and lower emissions, including exhaust air heat recovery systems. Examples include heating, ventilation and air conditioning (HVAC) controls recommissioning, and upgrades that support energy efficiency through the inclusion of state-of-the-art electronic controls that can monitor building occupancy and indoor air quality and provide fresh air ventilation only when occupied. Further investments could include an all-electric approach that ties in solar panels and battery energy storage for greater resiliency and self-reliance. Modular approaches that roll out in multiple phases can accommodate expansion to new college buildings and tying in neighboring properties as they are redeveloped.

### Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates

In 2022, the [State Efficiency and Environmental Performance Office](#) published a [legislative report](#) recommending public agencies and institutions develop plans for replacing these systems and called for an inventory of such systems in public agencies across the state. At this time, this inventory has not been conducted; however, the following list of public entities are known to have fossil-fuel campus boiler systems:

- Seattle Central College
- Washington State Department of Health
- Central Washington University
- University of Washington
- Washington State University
- Western Washington University

Every system will have vastly different assumptions for GHG reductions based on the specific upgrades being made and the legacy system being replaced.

To illustrate the impact and assumptions of this measure, figures have been provided from two use cases: (1) Seattle Central College (SCC) plans to construct an EcoDistrict as part of the college's decarbonization plans and (2) Western Washington University (WWU) plans to expand exhaust air heat recovery and HVAC controls.

## Seattle Central College



Seattle Central College (SCC) is taking an all-electric solution, which uses the [Washington Department of Enterprise Service's \(DES\) Energy Savings Performance Contracting program model](#). SCC contracted through DES with a DES-approved energy services company (ESCO), McKinstry, to analyze all the available technologies and come back with a design, modeled performance and estimated GHG reduction based on published emission data from SCC's utility providers and CenTrio Energy, the college's current steam provider.

SCC's approach to this measure includes two buildings, which if CPRG funds are made available, could be updated three years earlier than planned. This updated timing increases the total GHG savings and is responsive to [new City of Seattle Building Performance Standard regulations](#), which have accelerated the need to expand the EcoDistrict scope.

SCC would replace its use of fossil-fueled steam heating with an all-electric, heat pump based, low carbon impact heating and cooling system to serve its Broadway campus buildings. This conversion would dramatically lower GHG emissions by more than 3 million lbs (1,387 MTCO<sub>2</sub>e) per year as well as adding redundancy and resiliency and lowering maintenance, operating, and utility costs. The EcoDistrict is an example of a shovel-ready project to implement this measure and would provide up to a 90% reduction in the college's carbon footprint.

**Table 6. Cumulative GHG Reductions for SCC District Energy System Decarbonization**

Measure or Project	Cumulative GHGs Avoided 2025-2030 (MTCO <sub>2</sub> e)	Cumulative GHGs Avoided 2025-2050 (MTCO <sub>2</sub> e)
Seattle Central College EcoDistrict	7,000	35,000

The financial impact of addressing these systems is substantial. For SCC, the upgrades would mean avoidance of \$10 million in deferred maintenance costs for failing steam pipes and supply. The college would realize a savings of \$550,000 per year on steam costs and an overall operations and maintenance savings of more than \$750,000 annually. The total cost of the project is around \$7,300,000 and the cost effectiveness of this measure is approximately \$1000/MTCO<sub>2</sub>e.

**Implementation schedule, milestones, and metrics for tracking progress**

Like many large-scale campus projects, the SCC EcoDistrict would need to be implemented in phases and work around the reality of campus life. Phase 1 is sized to serve the 404,000 square feet (sf) Broadway/Edison building, the 83,000 sf Science and Math Building, and the 41,000 sf Broadway Performance Hall. Future phases would expand the work to other buildings on campus. Piping to distribute the hot and chilled water is sized for future expansion to include the Mitchell Athletic Center, a remodeled Student Union Building, planned student housing, and a planned North Plaza instructional building. When fully realized, the EcoDistrict will serve approximately one million square feet of buildings. Table 7 shows the phasing timeline for this work:

**Table 7. Proposed Phasing for SCC Campus Energy Decarbonization**

Building Name	Phase	Building Type	Square Footage
BPH	1	College	41,174
Broadway-Edison Total	1	College	405,085
Broadway Phase 1	1	College	

Building Name	Phase	Building Type	Square Footage
Broadway Phase 2	1	College	
Edison	1	College	
Bookstore	2	Student Union	14,765
MAC	2	Student Union	85,000
Science and Math (SAM)	2	College	83,446
Student Housing	3	Housing	179,000
New North Plaza Academic Building	4	College	145,000
TOTAL			953,470

### Timeline

- SCC estimates an eighteen-month construction to commissioning timeline. The start date for this work is contingent on funding and other statewide rulemaking related to contracting with an ESCO.

### Milestones

- Milestones include retirement of legacy systems and commissioning of newly renovated buildings.

### Metrics for tracking progress

- Natural gas (therms) reduced
- Electricity (kWh) consumed

## Western Washington University

At Western Washington University (WWU), the majority of buildings are more the 30 years old and predate modern energy efficiency code requirements. The campus is heated by a Steam District Energy System that uses natural gas combustion as the energy source, creating 95% of scope 1 GHG emissions for the campus. WWU was funded by the legislature with CCA funds in 2021 to conduct a Feasibility Study for a reduced carbon District Energy System. That study identified energy conservation efforts as an immediate first step to reduce GHG emissions. Specifically, the study showed that concentrating on the nine highest demand buildings had the potential to reduce heating demand up to 22%. Additional federal funding would mean the accelerated deployment of these projects, reducing the capacity demands and construction cost of the new system.

For WWU, the biggest GHG reduction opportunity is expanding the exhaust air heat recovery systems at the two main science buildings, which were constructed in the 1990s. These buildings require 100% outside air delivered at six air changes per hour to maintain a healthy lab environment. From an energy perspective, this means a fresh air molecule only spends about 15 minutes in the building before it is exhausted back out of the roof. The Chemistry building has no heat recovery system, and the Biology building has a partial heat recovery system that is 30-40% effective depending on the outside temperature. The proposed upgrades install a complete heat recovery fluid loop at both buildings, which will permit more efficient operations during low occupancy and low demand periods.

The second **largest** GHG reduction opportunity is HVAC controls recommissioning and upgrades which take advantage of state-of-the-art electronic controls that monitor occupancy and indoor air quality and provide fresh air ventilation only to the extent necessary. During the recent COVID pandemic, most buildings ended up over-ventilated out of an abundance of caution to provide fresh air. WWU learned to use a home-grown

solution to ensure proper ventilation, marrying CO<sub>2</sub> and occupancy sensors with dynamic monitoring that enabled the university to match ventilation to the actual occupancy need. Further federal funding would expand those learnings with more devices and smarter controls programming to conserve even more energy and thereby reduce heating demand and fan run time. These upgrades would result in the following GHG reductions:

**Table 8. Cumulative GHG Reductions for WWU Campus Energy System Decarbonization**

Measure or Project	Cumulative GHGs Avoided 2025-2030 (MTCO <sub>2</sub> e)	Cumulative GHGs Avoided 2025-2050 (MTCO <sub>2</sub> e)
Western Washington Exhaust Heat Recovery and HVAC control upgrade	4,000	36,000

The cost effectiveness of this measure is approximately \$1,200/MTCO<sub>2</sub>e and the estimated cost of the project is around \$4,700,000.

#### Implementation schedule, milestones, and metrics for tracking progress

The proposed projects were identified by an ASHRAE Level II Energy Audit that WWU commissioned in 2022 for its highest energy use buildings. Conceptual designs were completed as proofs of concept thus enabling the team to move right into detailed construction design and permitting.

#### Implementation activities

- Complete detailed design and submit construction permits
- Engage with the building users to set expectations for timing and mitigate disruptions
- Commence construction
- Complete digital controls programming and commission the upgrades
- Compile closeout and Maintenance and Operations manuals
- Begin measurement and verification process

#### Milestones

- 1,291 Metric Tons of CO<sub>2</sub> reduced per year
- Electrical grid benefit of 680,000 kWh avoided and available for other uses
- Co-pollutant reduction from less natural gas combustion

#### Metrics for tracking progress

- Natural gas (therms) reduced
- Electricity (kWh) reduced

The SCC EcoDistrict and WWU project represent two of dozens of conversion opportunities for district heating and cooling systems across the state. The emission reductions, cost, implementation timeline, and co-benefits of each project would vary by location and design. For most of these facilities, the legacy boilers are the largest source of GHG emissions.

#### Geographic location

Statewide; higher education campuses, state and municipal buildings, tribal centers.

## Intersections of other funding

Several federal grants address building decarbonization, but finding the funding to upgrade legacy campus energy systems can be challenging given the scale of work. The Washington Legislature may potentially provide direct support to universities and colleges through the CCA funds. Project proponents can also leverage IRA clean energy tax credits in some cases where the technology aligns with available programs. Washington offers a state energy performance standard [Early Adopter Incentive program](#), which began July 1, 2021 and applies to non-residential, hotel, motel, and dormitory buildings greater than 50,000 sq. ft. An eligible building owner that demonstrates early compliance with [the Clean Buildings Standard](#) may receive a one-time base incentive payment of \$0.85 per gross sf of floor area, excluding parking, unconditioned, or semi-conditioned spaces. Incentive funds are limited to \$75 million at this time.

## Authority to implement

The State's Building Energy Performance Standard, also called the Clean Buildings Performance Standard, established through legislation enacted in 2019 and codified in [RCW 19.27A.210](#), requires Commerce to establish rules for energy performance standards for covered buildings, to collect data on compliance, and to report on outcomes. Covered buildings include any nonresidential buildings greater than 50,000 square feet, excluding those used for industrial or manufacturing purposes, those that are agricultural structures, or those meeting certain standards for financial hardship. The performance standards seek to maximize reductions in GHG emissions from the building sector. The performance standard includes energy use intensity targets by building type, as well as requirements for an energy management plan, operations and maintenance program, energy efficiency audits, and investments in energy efficiency measures. In 2022, parts of the Clean Building Performance Standard was expanded to add a second tier of covered buildings: multifamily residential buildings over 20,000 sf and smaller commercial buildings (between 20,000-50,000 sf). These buildings will need to meet benchmarking requirements, energy management planning, and operations and maintenance planning, and may be subject to future energy use intensity targets.

Campuses with district energy systems have specific requirements under this law. In Washington, a campus district energy system is defined as a district energy system that provides heating, cooling, or heating and cooling to three or more buildings with more than 100,000 sf of combined conditioned space, where the system and all connected buildings are owned by:

- a single entity;
- a public-private partnership where a private entity owns the energy system and a public entity owns the buildings; or
- two private entities where one owns the connected buildings and the other owns the energy system.

A state campus district energy system is a campus district energy system owned by either the State of Washington or by a public-private partnership. Under state law ([RCW 19.27A.260](#)), the owner of a state campus district energy system must develop a decarbonization plan. The plan must provide a strategy for up to 15 years, or longer, if approved by Commerce. The plan must be under development by June 30, 2024, and a final plan must be submitted to Commerce by June 30, 2025. Commerce must provide a summary report on decarbonization plans to the Governor and Legislature by December 1, 2025.

Additional authority to implement comes from [Executive Order 20-01](#), which authorizes the [State Efficiency and Environmental Performance Office](#) to support state agencies in emission reduction planning and implementation.

## Waste, water and sustainable materials management sector

### 2.2.3 Organics management

#### Implementing entity

Washington State Department of Ecology

#### Description of measure

This measure reduces GHG emissions by upgrading organics management facilities and supporting organics management efforts by local governments and local health jurisdictions, in line with the goals of Washington's 2022 Organics Management Law (OML) ([RCW 70A.205.070](#)). The measure also includes a pilot for King County and the City of Seattle for institutional, local food procurement, compost market creation, and next generation organics management, to address GHG emissions in the state's most populous region that uses a whole supply chain approach to pilot new methods that reduce emissions throughout regional food systems.

The OML requires that by 2025, 20% of previously disposed edible food must be rescued for consumption, and by 2030, 75% of previously disposed organic materials must be diverted from landfills. Currently, organics represent nearly 60% of total landfilled waste in Washington. According to EPA, landfilled organics are the third largest generator of methane emissions in the US. A significant strategy utilized by the OML is to require statewide management of organics at both the commercial and residential levels. Thus, local governments, who are also tasked with creating and managing solid waste plans in their jurisdictions, are now responsible for creating and developing programs to support organics management. The law also gives local health jurisdictions (LHJs) enforcement authority to ensure compliance of organics management.

#### Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates

A 2019 law ([RCW 70A.205.715](#)) mandated the creation of a cross agency plan that "develops and adopts a state wasted food reduction and food waste diversion plan" to achieve the aforementioned food waste reduction goals. This plan is called [Use Food Well Washington](#) (UFWW), and it was developed and published in 2022. The plan includes 30 recommendations and quantifies the GHG, economic, and cost impact of each organic and food waste reduction recommendation.

This measure focuses on three recommendations of the UFWW. Table 9 below lists the estimated GHG reduction potential of each program over 5-year and 25-year time frames. This table also includes estimates based on an expected pilot through King County and Seattle for food procurement, compost market creation, and next generation organics management.

**Table 9. Cumulative GHG Reductions for Organics Management**

Measure or Project	Cumulative GHGs Avoided, 2025-2030 (MT CO <sub>2</sub> e)	Cumulative GHGs Avoided 2025-2050 (MT CO <sub>2</sub> e)
Organics Management Processing Facilities	28,000	158,000
Organics Management Working Capital to Local County and City Governments	301,000	1,986,000
Organics Management Working Capital to Local Health Jurisdictions	135,000	443,000
<b>Total</b>	<b>464,000</b>	<b>2,587,000</b>

The overall cost effectiveness for all measures is approximately \$140/MTCO<sub>2e</sub> for an estimated cost of around \$67 million.

### Implementation schedule, milestones, and metrics for tracking progress

Table 10 below lists the context and potential implementation approach for each recommendation in this measure, including timeline, milestones, and metrics for tracking progress.

**Table 10. Implementation Approach to Organics Management**

	Organics Management Support for Local Governments	Investment in Local Health Jurisdictions (LHJs)	Investment in Organics Processing Facilities
<b>Rationale</b>	County and City governments are tasked with developing organics management services and capabilities to meet the State's organics diversion goals. This also includes the proposed pilot through King County and Seattle for low carbon food procurement, compost market creation, and next generation organics management.	LHJs are provided with enforcement authority for the commercial organics management requirements. LHJs provide all solid waste permits for organics processing facilities.	Due to the 2022 Organics Management Law, significant growth in organics feedstock will occur. Organics processing facilities will be impacted.
<b>Fund Deployment</b>	Cities and Counties will receive funds on a noncompetitive basis. An organics management plan must first be developed as a stipulation of receiving funding.	LHJs will receive funds on a noncompetitive basis. An organics management plan must first be developed as a stipulation of receiving funding.	Two tranches of funding will be available: one that funds research and development for improving pre & post-consumer food waste at facilities, the second tranche for capital improvements. This will be a competitive process.
<b>Implementation Schedule</b>	Year 1: Counties and participating cities submit organics management plans, including their use of funds plan. Year 2: Funding deployed. Years 2-5: Implementation, tracking and evaluating.	Year 1: LHJs submit organics management enforcement plans, including their use of funds plan. Year 2: Funding deployed. Years 2-5: Implementation, tracking and evaluating.	Year 1: Facilities indicate interest in R&D fund. Year 2: Awarded Facilities receive funding and spend the year piloting new processes. Year 3: Facilities apply through a competitive process to access funding capital improvement projects. Years 3-5: Funding for Capital projects deployed. Tracking and evaluation of investment follows.
<b>Milestones</b>	Years 1-3: Local Jurisdictions support impacted businesses comply with the Organics Management Law. Year 4: All impact jurisdictions ensure there is organics curbside service available, a result of the OML.	Year 1: LHJs submit organics management plan Year 2-5: LHJs receive CPRG funds and generate an organics management plan; a process of tracking and evaluation is developed.	Year 1: Facilities statewide express interest R&D funds to process more food waste. Year 2: Food waste processing is dialed in. Years 3-5: Capital improvements made to facilities statewide Tracking and evaluation is established.

	Organics Management Support for Local Governments	Investment in Local Health Jurisdictions (LHJs)	Investment in Organics Processing Facilities
	Year 5: Record significant diversion of organics from landfill.		
Metrics for Tracking Progress	Number of organics management plans developed that addresses commercial and/or residential needs.	Number of enforcement actions taking for non-compliance with organics management.	Total pounds of organic waste processed
	Total pounds diverted from landfill on annual basis.	Number of campaigns developed to provide education and technical assistance  Total pounds diverted from landfill on annual basis	Total pounds of compost generated

### Geographic location

#### Processing Facilities

- Currently, six facilities in Washington regularly accept post-consumer food waste. Federal funding from CPRG could be used to support compost facilities, evolve processes to accept food waste, pilot new processes, and fund upgrades to provide infrastructure to handle increased volumes of organic waste, including pre and post-consumer food waste.

#### Funding to Local and City Governments

- Support each of Washington's 39 counties and a per capita allocation to one city per county

#### Funding to Local Health Jurisdictions

- 35 Local Health Jurisdictions distributed regionally in Washington

### Intersections of other funding

Historic investments made in organics management and food waste prevention are listed in Table 11 below. These investments have funneled support to county and city governments and non-profits throughout Washington. Funds have been used to implement the OML in addition to prioritizing food rescue and recovery. The Washington State Data Hub is a priority of the recently launched Washington State for Sustainable Food Management. The Data Hub will serve as the incoming conduit to track edible food waste diverted.

**Table 11. Historic Investments in Organic Management and Food Waste Prevention**

Funding Source	Time Frame	Total Investment
Public Participation Grants (State Budget)	2023-2025	\$1,526,816
Local solid waste financial assistance program grants (State Budget)	2023-2025	\$2,094,000
Food Waste Reduction Campaigns (State Budget)	2021-2023	\$2,000,000
Washington State Data Hub (State Budget)	2023-2025	\$280,000



In addition to the funding sources listing in Table 11, LHJs receive funding from the Legislature and municipal governments that support organics management work when able.

The estimated need to meet Washington's organic management goals by 2030 as [legislatively mandated](#) by OML is \$2 billion in total.

#### **Authority to implement**

To address food waste and wasted food in Washington, the 2019 Washington Legislature passed the Food Waste Reduction Act, now codified as [RCW 70A.205.715](#).

In 2022, the Washington State Legislature passed the [Organics Management Law](#). This law requires diversion of organic materials away from landfill disposal and toward food rescue programs and organics management facilities. This legislation amended and/or created over 20 laws, such as [RCW 70A.205.540](#) and [RCW 70A.205.545](#), which will drive the largest recovery of organics by phasing in business and residential organics collection requirements.

[Seattle Municipal Code sections 21.36.082 and 21.36.083](#) require that residents and businesses do not put food scraps, compostable paper, yard waste, and recyclables in their garbage.

[King County Code \(KCC\) 10.14.020](#) requires zero waste of material resources through prevention, reuse and reduction of solid wastes to landfill. Pursuant to [KCC 18.25.010](#) to meet climate goals a goal of zero food waste in landfill by 2030 has been set.

## **Transportation sector**

### **2.2.4 Scrap and replace fossil fuel powered commercial vehicles**

#### **Implementing entity**

Washington State Department of Ecology

#### **Description of measure**

This priority measure addresses transportation sector emissions by implementing strategies identified in the newly approved state [Transportation Electrification Strategy](#) (TES). Transportation emissions account for [39% of emissions in Washington](#) and medium- and heavy-duty (MHD) vehicles are responsible for [27% of on-road GHG emissions](#).

The goal of this measure is to establish a MHD vehicle scrap and replace program, offering point-of-sale vehicle incentives to scrap diesel vehicles and replace with zero-emission models and charging infrastructure incentives. This measure would catalyze Washington's MHD EV market while simultaneously ensuring polluting vehicles are removed from the road. Incentivizing the uptake of MHD vehicles will have an out-sized emission reduction impact relative to their proportion of the on-road vehicle population. Many MHD zero-emission vehicles are primed for wide-scale zero-emission adoption and only face the barrier of high upfront costs. This approach, with built-in reassessment milestones to adapt to market needs, will target vehicles that are ready for wide-scale application, bring down up-front costs, establish supportive fueling infrastructure, and encourage wide-spread adoption.



This program aligns with federal and state efforts to reduce transportation GHG emissions, future-proofing this infrastructure investment. The sooner zero-emission MHD vehicles are adopted, the sooner GHG emission reductions will be realized and associated public health co-benefits will be felt by LIDAC and overburdened communities. Additionally, the scrapping component of this program ensures older polluting vehicles will not be sold and operated elsewhere, such as overburdened communities. Decarbonizing high-mileage MHD vehicles will result in immediate and cost-effective GHG emission reductions and the scrapping component of this program will improve the air quality of communities overburdened by air pollution.

**Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates**

This program will result in immediate and permanent GHG reductions by taking internal combustion engine (ICE) vehicles off the road and replacing them with zero-emission vehicles. Vehicles included in the GHG reduction model include zero-emission delivery vans, class-8 tractors, and refuse trucks, all of which have a useful life expectancy of 10-15 years. Per-vehicle emissions profiles are estimated using [Alternative Fuel Data Center data](#) on annual vehicle miles traveled (VMT) and fuel economy by vehicle type, as well as [CO<sub>2</sub> emissions per gallon of gasoline from EPA](#).

The program design will take into account various scenarios, market demands, and potential GHG reductions when determining the classes of vehicles incentivized and the incentive amounts. Table 12 displays scenarios that model illustrated emissions reduced if all program funds were used for a single vehicle class.

**Table 12. Cumulative GHG Reductions for Scrap and Replace of Fossil Fuel Powered Commercial Vehicles**

Measure or Project	Cumulative GHGs Avoided 2025-2030 (MTCO <sub>2</sub> e)	Cumulative GHGs Avoided 2025-2050 (MTCO <sub>2</sub> e)
Scenario 1: Cumulative Emissions Reductions from Delivery Vans	117,000	313,000
Scenario 2: Cumulative Emissions Reductions from HD C8 Tractors	179,000	637,000
Scenario 3: Cumulative Emissions Reductions from Refuse Trucks	74,000	117,000

The above estimates are based on an estimated program cost of \$100 million, which results in the following cost effectiveness for each scenario:

- Scenario 1 (Cumulative Emissions Reductions from Delivery Vans): \$850/MTCO<sub>2</sub>e
- Scenario 2 (Cumulative Emissions Reductions from HD C8 Tractors): \$560/ MTCO<sub>2</sub>e
- Scenario 3 (Cumulative Emissions Reductions from Refuse Trucks): \$1400/ MTCO<sub>2</sub>e

**Implementation schedule, milestones, and metrics for tracking progress**

The implementation of this proposed program could follow the following schedule:

- October 2024: Program Research: RFI & existing research review phase
- November 2025: Procurement: Request for Proposal (RFP) for third party administrator (TPA) released
- February 2025: TPA selected, contracting
- April-June 2025: Program design, approval, Environmental Justice Review

- July 2025: Round 1 funding launch (~\$25 million)
- April 2026: Year 1 review program performance measures & modify
- July 2026: Round 2 funding launch (~\$25 million)
- April 2027: Review program performance measures & modify
- July 2027: Round 3 funding launch (~\$25 million)
- April 2028: Review program performance & modify
- July 2028: Round 4 (final) funding launch (~\$25 million or remaining funds)
- June 2030: Review program performance and outcomes, Program closes, Final reporting

### **Milestones**

- 400-1500 MHD zero emission vehicles purchased
- 400-1500 MHD ICE vehicles scrapped
- Reduction in cumulative metric tons of GHG emissions (120,000 – 180,000 MTCO<sub>2</sub>e by 2030, 300,000 – 600,000 MTCO<sub>2</sub>e by 2050)
- Reduction of criteria air pollutants (NO<sub>x</sub>: range 50 – 580 short tons, CO: range 86 – 394 short tons, PM<sub>2.5</sub>: range 0.3 - 1.1 short tons)
- Expansion of charging infrastructure (low-end range; 392 to high-end: 1524, assuming 1 charging station per vehicle replaced)<sup>10</sup>

### **Metrics for tracking progress**

- Incentives distributed (\$)
- Number of vehicles scrapped and replaced
- Vehicle purchase data (Price, make, model, year, intended use)
- Locations of vehicle replacements, % of funds in LIDAC
- GHG emissions reduced
- CAP pollutants reduced (NO<sub>x</sub>, PM<sub>2.5</sub>, CO)

### **Geographic location**

The focus will be on MHD vehicles operating in EPA defined LIDACS and state defined overburdened communities in Washington. [The Seattle-Tacoma-Bellevue MSA PCAP](#) includes measures relating to regional transportation electrification and would be designed to ensure no duplication or overlap with the State's scrap and replace measure.

### **Intersections of other funding**

This measure seeks to provide the entire state's MHD fleet access to zero-emission vehicles. Existing funding for converting vehicles is listed in Table 13 and has historically been focused on publicly-owned fleets.

The \$120 million appropriated by Washington for MHD vehicle incentives will, at maximum only impact 1-2% of the total registered MHD fleet in the state<sup>11</sup>. Further funds from CPRG could double funds dedicated to the state's MHD fleet. In the zero-emission MHD commercial vehicle incentive study conducted for the WA Legislature's Joint Transportation Committee, stakeholder feedback highlighted the necessity of point-of-sale

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<sup>10</sup> Ranges provided for the Scrap and Replace program quantify the possible program impact based on modeled scenarios using different vehicle types (class 8 tractors, refuse trucks, and delivery vans). Vehicles incentivized with the program will be determined based on the research/RFI phase of the project.

<sup>11</sup> Based on fleet data used in Transportation Electrification Strategy modeling

rebates to drive adoption of MHD EVs<sup>12</sup>. Existing tax credits are often inaccessible to many small, owner-operator businesses since they require the purchaser to provide the full cost up front and then be reimbursed.

**Table 13. Funding for Fossil Fuel Powered Commercial Vehicles**

Funding Source	State/Federal	Total Investment
Carbon Emissions Reduction Account (CERA), funded through Climate Commitment Act revenues (cap and invest program)	State	\$120M appropriated for zero emission MHD vehicle incentives. At maximum, these funds will impact 1-2% of the total registered MHD fleet in WA. Additional funding is necessary to further accelerate transportation sector emission reductions. This funding does not include a vehicle scrapping incentive.
Commercial Clean Vehicle Credit	Federal	Up to \$40k per vehicle tax credit. This tax credit has limited usefulness to many small, owner-operator or disadvantaged businesses since it does not reduce the capital needed at the time of purchase. The high initial investment associated with transitioning to zero-emission vehicles has been identified as a primary barrier to wide-spread adoption <sup>13</sup> .
EPA Diesel Emissions Reduction Act (DERA) grants	Federal	Approximately \$1M/biennium to scrap and replace old diesel-fueled equipment with cleaner equipment.
Volkswagen mitigation fund	Federal Settlement, State Penalty	\$141M in funds from the Volkswagen federal settlement and State penalty invested in projects that accelerate widespread adoption of zero-emission technology. Initial funding opportunities were focused on publicly owned vehicles and charging infrastructure.
Ecology Air Quality Clean School Bus Grant Program	State	\$14M appropriated in 23-25 biennium to scrap and replace diesel school buses with electric school buses.

#### Authority to implement

Authority for this measure is established in Washington's Clean Air Act (Chapters [70A.15 RCW](#), and [173-476 WAC](#)).

State policies that will support this program include:

- Washington's Clean Fuel Standard, which will align with and support funding granted to the scrap and replace program by providing credits to owners of zero-emission infrastructure.
- Washington's Clean Truck program, which will align Washington with California's Advanced Clean Truck programs and will also positively impact MHD vehicle adoption.

## 2.2.5 Marine terminal electrification

#### Implementing entity

Washington State Department of Transportation

<sup>12</sup> Study in draft form, final study will be published on the JTC website: <https://leg.wa.gov/JTC>

<sup>13</sup> MHD study in draft form, final study will be published on the JTC website: <https://leg.wa.gov/JTC>

### Description of measure

This measure will reduce GHG emissions through adding electrification improvements to key ferry routes operated by Washington State Ferries (WSF) in the Greater Seattle Metropolitan Area, which is home to more than half of Washington’s population and is one of the largest metropolitan areas in the U.S. This measure will be implemented through the electrification of ferry terminals that will enable full electrification of four ferry routes. The measure will support the design and construction of rapid charging systems (RCS) for routes in the Central Puget Sound Region: Seattle-Bainbridge, Seattle-Bremerton, Edmonds-Kingston, and Mukilteo-Clinton. The RCS will allow for full battery-electric propulsion of the ferry system’s Jumbo MKII and Hybrid Electric Olympic (HEO) class vessels. The design and installation of medium voltage power delivery and offshore charging structures — by providing RCS at both terminals on each route — will allow these hybrid-electric vessels to operate their electric engines fully on batteries without having to run their diesel-electric generators, thereby facilitating GHG emissions reductions.

### Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates

Table 14 lists the estimated GHG reductions for all routes in this measure. Projects will result in a permanent reduction of GHG emissions because diesel-powered vessels will no longer operate on these routes. GHG emission reductions are based on engineering estimates capturing vessel emissions generated by the engine/generator as well as the power utilities upstream emissions. Vessel emissions are calculated based on historical Fuel Consumption (FC).

**Table 14. Cumulative GHG Reductions for Marine Terminal Electrification**

Measure or Project	Cumulative GHGs Avoided 2025-2030 (MTCO <sub>2e</sub> )	Cumulative GHGs Avoided 2025-2050 (MTCO <sub>2e</sub> )
All terminal upgrades (Seattle, Bainbridge, Bremerton, Edmonds, Kingston, Clinton, Mukilteo)	102,000	1,318,000

An approximate cost of \$99 million would fund terminal electrification upgrades on four major ferry routes and enable implementation of the entire electrification project along with other state and federal funding already identified. The measure will have a cost effectiveness of approximately \$900/MTCO<sub>2e</sub>.

### Implementation schedule, milestones, and metrics for tracking progress

[The WSF System Electrification Plan \(SEP\)](#) outlines the agency’s implementation schedule for the full system electrification initiative. Work has already begun to accomplish the project. Beginning in 2025, final design and right-of-way acquisition will be completed. Construction will be underway in 2026 and last less than five years. Progress toward achieving the expected outputs and outcomes will be tracked as part of WSDOT’s annual requirement to report emissions of GHG and criteria pollutants to Ecology.

#### Milestones

- Upgrades to four routes allowing use of battery-electric propulsion of ferry system
- Reduction of ~1.3 million MTCO<sub>2e</sub> by 2050

#### Metrics for tracking progress

- Gallons of diesel used throughout the ferry system (change in gallons used by route)
- Number of ferry terminals converted to RCS
- Total GHGs reduced

### Geographic location

The measure will support the design and construction of rapid charging systems for routes in the Central Puget Sound Region: Seattle-Bainbridge, Seattle-Bremerton, Edmonds-Kingston, and Mukilteo-Clinton.

### Intersections of other funding

The Washington Legislature has approved approximately \$435 million toward this measure from the CCA, but that amount is not sufficient to complete the project. In 2022, WSF applied for and received federal funds through the [Federal Transit Administration's Low Emitting Passenger Ferry Program](#) with \$4.9 million in funds awarded for the electrification of the Clinton Terminal in Island County. The entire electrification program is estimated to cost approximately \$4 billion for all 16 terminals with the potential of supporting hybrid electric propulsion.

### Authority to implement

WSF is a publicly owned provider of mass transportation, administered by WSDOT under [RCW 47.60](#). The authority to take all necessary action and responsibility on behalf of Washington is properly delegated and executed, and there are no outstanding legal, technical, or financial issues that would make this a high-risk project to implement quickly. Annually, WSDOT provides all certifications and assurances expected to apply to any active grant of the applicant in the fiscal year and will record these in the Federal Transit Administration's (FTA) Transit Award Management System (TrAMs) with the appropriate electronic signatures. WSF ensures compliance with all applicable Federal statutes, regulations, executive orders, FTA circulars, and other Federal requirements in carrying out any project supported by an FTA grant or cooperative agreement.

## 2.2.6 Complete Streets

### Implementing entity

Washington State Department of Transportation

### Description of measure

Complete streets create the foundation for a virtuous cycle of GHG reduction that sustains and accelerates over time. The public benefit and desirability of complete streets stimulates development of housing and destinations within convenient proximity of each other, reducing travel distances for all modes. Making places walkable and bikeable is an essential and foundational element of achieving [Smart Growth](#) as outlined by the EPA, and a [strategic priority of the USDOT](#). As demonstrated by [Washington's long-standing leadership](#) in multimodal transportation and [growth management](#), when people have access to transportation options, they use them. State highways are often the weakest link and most inhospitable part of the transportation network for walking and biking. By providing high quality walking and biking facilities on and across state highways, growing networks can be connected and catalyzed and infill development in already developed places can be supported.

Electrification of the transportation system is essential, [but not sufficient](#) to meet climate goals, and does not address the need to improve access for the Washingtonians who do not drive. Studies have found trips under 3 miles to be [more than 50% of all daily trips](#), which is the [active transportation standard](#) for an easily bikeable distance. Complete streets that enable people of all ages and abilities to walk, cycle, roll, and access transit can transform our transportation system to one where people can freely access their destinations with little to no GHG emissions or co-pollutants, enjoy healthy exercise and connection to their communities, and benefit from improved equity, safety, and quality of life.

Developing complete streets is a requirement for state transportation projects. When project funds are available, WSDOT collaborates with local communities and redesigns streets which were built decades ago without infrastructure to support walking, biking, and other forms of active transportation. WSDOT has a long list of unfunded projects which this measure seeks to address and through which the agency is prioritizing communities with the most environmental health disparities.

**Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates**

To be consistent with current best practices, the emissions reduction calculations in Table 15 are derived using [the CARB Clean Mobility model](#), which includes assumptions about change in travel behavior. WSDOT currently has proposals to improve both the CARB Clean Mobility and the [California Air Pollution Control Officers Association \(CAPCOA\) model](#) for needed state reporting, and WSDOT will continue to test and refine these models for complete streets projects in Washington. As is expected of infrastructure projects, many of the reductions will occur in later years of project implementation and will continue to accrue reductions beyond the 2050 timeframe.

**Table 15. Cumulative GHG Reductions for Complete Streets**

Measure or Project	Cumulative GHGs Avoided 2025-2030 (MTCO <sub>2</sub> e)	Cumulative GHGs Avoided 2025-2050 (MTCO <sub>2</sub> e)
Complete Streets	450	6,500

This measure assumes a cost of \$100 million for WSDOT to deliver complete streets improvements across Washington, with a cost effectiveness of approximately \$222,000/MTCO<sub>2</sub>e. With further funding, WSDOT will accelerate the successful delivery of programmed complete streets projects in over a dozen communities across the state, the majority of which would be in EPA EJScreen disadvantaged block groups. The median size of population expected to benefit from an individual project is around 10,000 people. These transformative projects will build demand and support for more improvements, catalyzing future success with other funding opportunities.

**Implementation schedule, milestones, and metrics for tracking progress**

Performance of the project delivery and construction is tracked and documented by the Capital Program Development and Management Division, as part of the standard statewide oversight of project delivery. Regional WSDOT teams oversee implementation of projects.

**Project timelines**

Each project will have specific needs depending on the location. A typical project timeline may look like the schedule presented in Table 16.

**Table 16. Example of Typical Project Timeline for Complete Streets**

Milestone	Date
Pre-design begins	11/2024
Project summary approval	8/2025

Milestone	Date
Preliminary engineering begins	9/2025
Environmental approval	7/2026
Right of way certification	12/2027
Advertisement	1/2028
Operational completeness	10/2029

### Milestones

- Completing at least 17 projects
- Benefitting 13,000 people on average for projects
- More than 6,000 MTCO<sub>2</sub>e avoided by 2050
- 350,000 people within three miles of projects

### Metrics for tracking progress

- Reduction in transportation related criteria and hazardous air pollutants measured in lbs.
- Reduction in GHG emissions (MTCO<sub>2</sub>e)
- Number of projects and project mileage each report that finish Pre-Design
- Number of projects and project mileage each report that reach Construction start
- Number of projects and project mileage each report that open to the public
- Number of community engagement activities and # of participants

### Geographic location

WSDOT currently has approximately over 100 projects located across the state that are targeted for completion by 2030 and need improvements to make them complete streets. Of that set, more than 75% serve communities in Washington that are low-income and disadvantaged. Providing benefits to these communities would be prioritized as part of this measure.

### Intersections of other funding

The Complete Streets requirement at WSDOT does not have a dedicated funding source within the state transportation budget. As of September 2023, total preservation funding from the state legislature for the state highway system met 40% of total need, and without additional funds, projects will struggle to be completed<sup>14</sup>.

The WSDOT projects with Complete Streets requirements have an estimated \$890 million funding gap for the walking and bicycling elements programmed to be constructed by 2030.

Federal programs such as the [Federal Highway Administration's identified Complete Streets funding opportunities](#) and [Department of Transportation programs for pedestrian opportunities](#) tend to favor large individual projects. Currently, there is no dedicated funding that focuses on retrofitting complete streets for state highways or takes a programmatic approach. This measure would rely on CPRG funds to fill in the gaps

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<sup>14</sup> The supplemental budget for the 23-25 biennium had not been finalized at time of publication and may have an impact on total state funding



in other funding sources to maximize the number of projects that are open for use by the public within the grant period.

**Authority to implement**

Authority for this work is under [RCW 47.01.260](#) and Complete Streets directive is [RCW 47.04.035](#). WSDOT also maintains long-standing agreements and protocols to address overlapping jurisdictional issues, including utilities relocation and ongoing maintenance.

2.2.7 Reduce emissions of fleets for rural and special needs transit

**Implementing entity**

Washington State Department of Transportation

**Description of measure**

State funding to transition public transit fleets has been effective in the procurement, delivery, and operation of zero-emission vehicles and equipment providing millions of trips per year in the largest population centers and avoiding the need for single occupancy vehicle trips. Proof of this program design has been established through the state [Green Transportation Capital Grant](#) program authorized by the Legislature in 2018. Since 2018, \$78.3 million has been awarded to 23 agencies, supporting 44 zero-emissions projects.

The goal of this measure is to eliminate financial and technical barriers that prevent rural, private non-profit, and tribal transit providers of critical services from transitioning to a zero-emission transit fleet. To implement this measure, WSDOT would establish a competitive grant program to provide funding to these entities for cost-effective capital projects that reduce the carbon intensity of the Washington transportation system, expanding on the Green Transportation Capital Grant program. The proposed program expands the eligible pool of applicants to tribal transit agencies and private non-profit providers of critical services currently excluded from the Green Transit Capital and State Bus and Bus Facilities grant programs. It also expands the types of projects eligible to meet needs not currently addressed through other state or federal grant programs.

**Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates**

Table 17 lists the estimated emissions reduction for this measure, which were calculated using the California Air Resources Board’s [Clean Mobility calculator tool](#). Funding would provide vehicle replacements and operating support to transition existing rural fixed route services in Washington to renewable vehicles. As an input to the calculator, an average annual VMT on each vehicle of 45,610 was assumed, which is an average calculated from rural Washington transit data in the [National Transit Database’s 2021 dataset](#). The results of this analysis greatly depend on the fuel source and quantity of vehicles purchased through this project. By increasing the number of battery electric vehicles purchased, GHG reductions could be increased further.

**Table 17. Cumulative GHG Reductions for Reducing Emissions of Fleets**

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2e</sub> )	Cumulative Reductions 2025-2050 (MTCO <sub>2e</sub> )
Purchase Electric Bus (29)	16,000	38,000
Purchase Hybrid Cutaway/Shuttle (19)	1,500	1,500
Purchase Electric Van (51)	1,600	1,600



Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
All Vehicle Replacements	19,000	41,000

Assuming additional funding for this measure of \$50,000,000, the cost effectiveness is approximately \$2,600/MTCO<sub>2</sub>e.

### Implementation schedule, milestones, and metrics for tracking progress

The implementation schedule for this measure may proceed as follows:

- Fall 2024 - May 2025: WSDOT develops supplemental Green Transportation NOFO
  - Develop grant parameters: Create funding opportunity using the state’s Green Transportation Capital Grant program as a model for application and scoring criteria development. Engage internal and external stakeholders in grant development. Prepare program materials such as website, informational documents, online application, and communications to partners.
  - Application cycle: call for projects, applications submitted, awards finalized WSDOT posts notice of funding opportunity, provides technical assistance to applicants, oversees application through evaluation and final awards, notifies grantees of awards, develops grant agreements, assigns project managers to funded projects
- May - June 2025: WSDOT awards all funds and executes grant agreements, and procurement initiated.
- July 2025 - June 2026: Subrecipients place orders for vehicles and equipment
- July 2026 - December 2027: Awarded projects are completed (all vehicles and equipment are delivered, accepted, and reimbursed)
- January 2027-2030: Completed projects are monitored for performance annually

### Milestones

- Deployment of:
  - 29 Electric Buses
  - 18 Hybrid Cutaway/Shuttle
  - 50 Electric Vans
- 19,000 MTCO<sub>2</sub>e reduced from 2025-2030
- 41,000 MTCO<sub>2</sub>e reduced from 2025-2050
- 15,000 tons of NOx reduced from 2025-2030
- 105 lbs. of diesel PM and 446 lbs. of PM2.5 reductions from 2025-2030

### Metric for tracking outcomes

- Short term outcomes:
  - Decreased diesel emissions
  - Increased mobility for rural areas
  - Increased awareness of green technology
  - Increased availability of alternative fueling infrastructure

- Long term outcomes:
  - Improved air quality leading to improved health outcomes
  - Reduced fire danger from climate change causing emissions

#### **Metrics for tracking progress**

- Number of vehicles converted to zero-emissions
- Amount of GHGs reduced

#### **Geographic location**

This measure plans to support rural transit agencies, tribal transits, and community transit providers (private non-profits) throughout Washington.

#### **Intersections of other funding**

While state and federal funding opportunities exist to support green fleet transitions, none are designed specifically for this applicant pool. This priority measure helps fill a critical funding gap while leveraging overall progress toward green fleet transitions. Tribal transit agencies and non-profits currently are not eligible for the state [Green Transportation Capital grant program](#). Rural agencies can struggle to be competitive for this funding with big projects proposed by large urban transit organizations. Further, non-profit agencies are not eligible to apply for the [Federal Transit Administrations Bus and Bus Facilities Program \(5339\(b\)\)](#). And finally, the federal [Low or No Emission Grant Program \(5339\(c\)\)](#) and the [Bus and Bus Facilities Program \(5339\(b\)\)](#) require applicant match which can be a barrier for smaller agencies with limited financial resources.

#### **Authority to implement**

Authority for this work is under RCW [47.66.120](#). WSDOT maintains long-standing agreements and protocols to address overlapping jurisdictional issues, including utilities relocation and ongoing maintenance.

## **2.2.8 Enable decarbonization of rail infrastructure**

#### **Implementing agency or agencies:**

Local Agencies, Ports

#### **Description of measure**

The [Transportation Carbon Reduction Strategy](#) cite green hydrogen and low-carbon fuels for rail as strategies to reduce the carbon intensity of transportation. The [State Energy Strategy](#) cites ongoing work to include new technologies and improvements that help make the changes needed to meet statewide GHG reduction limits and encourages the state to fund pilots and demonstration projects. This work is especially important for medium- and heavy-duty vehicles, rail, marine, and aviation.

It is estimated that rail moves around 40% of freight measured in ton-miles and is responsible for about 8% of the freight transportation carbon [emissions](#). The rail industry in Washington is seeking ways to continue to lower its environmental footprint and there is growing interest in powering trains with hybrid solutions featuring hydrogen fuel cells. For example, Coradia iLint, launched in France, is one of the first passenger trains powered solely by hydrogen fuel cells and it produces zero emissions at the point of use.

This measure would have the objective of increasing energy efficiency of locomotive engines in the region. The measure would further reduce emissions associated with current locomotive technology and move toward

lower and zero-emission technologies that are still in research, development, and demonstration phases. Funding to support this measure could be used for the design and build of a repair and maintenance shop run by the Port of Pend Oreille (dba Pend Oreille Valley Railroad, POVA) for locomotives, large industrial vehicles, and smaller commercial vehicles. The facility would increase the number of locomotive engine conversions to Tier 3 and 4 locomotive emission standards (the highest efficiency and performance standards). POVA also plans to pilot a hydrogen fueling station and engine conversions which will look to replace diesel powered emissions entirely for a certain percentage of locomotives. This additional work in the measure would have further impacts to GHG reductions in the region. Costs will vary depending on the development of technology and supply chain. Additional funding from CPRG would allow the facility to expand from its current rate of 1-2 engine conversions per year to an additional 4-6 engine conversions per year and add hydrogen refueling capacity.

The new locomotive repair and maintenance shop would also incorporate, wherever possible, all sustainable development and design practices. These also include strategies that promote minimal environmental impact, advanced energy efficiencies, reduced water consumption, practical landscaping, and other green technologies that would be of particular interest and focus. Maintenance ease and the economical operation of the facility would also be essential to the project build. The new facility could also meet nationally recognized standards for energy efficiency and pursue LEED Certification.

**Estimate of the quantifiable GHG emissions reductions quantitative cost estimates**

Table 18 shows the estimated cumulative GHG reductions for Tier 3 and Tier 4 locomotive engines. With funding from CPRG, the number of converted locomotives to either Tier 3 or Tier 4 could be more than 35 by 2030. Additional shop space, staff, and apprentices could cut the timeline of this work in half and allow for an additional 4-6 conversions a year (instead of the average 1 to 2).

By 2050, POVA staff could complete an estimated 150-200 locomotive conversions, thus directly impacting at least 1% of the total North American Fleet, which as of 2020 was estimated to have around 38,450 locomotives in total with over 26,000 of them being diesel powered. Emissions and fuel consumption information is based on data and calculations done by Cummins and Western Rail.

**Table 18. Cumulative GHG Reductions for Converting Locomotive Engines**

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
Conversions to Tier 3 engines	2,800	11,000
Conversion to Tier 4 engines	7,900	30,000
Total	10,700	41,000

The estimated cost of this project is \$12 million and the cost effectiveness is approximately \$1,100/MTCO<sub>2</sub>e for both tiers of locomotive engines.

**Implementation schedule, milestones, and metrics for tracking progress**

Initial performance measures would revolve around the timely completion of the maintenance shop expansion project. Following that project, increased locomotive conversions could begin to be measured compared to previous conversion capacity.

### Implementation timeline

The timeline for this planning and construction project is estimated to take a least six to eight months to complete the building design process with an additional six to eight months for the selected consultants to draft and finalize a shovel-ready, turn-key building specification plan for the construction of POVA's new locomotive maintenance and repair shop. POVA anticipates that the total planning process for this feasibility study will take an estimated 12 to 16 months to complete. The actual infrastructure construction of this new facility could take up to 12 to 16 months, pending any possible issues there might be with assembly, installation, equipment testing, supply chain gaps or disruptions, and/or any potential delivery delays. Therefore, the overall estimated timeline to complete the entire project including planning, building construction, and installation of the new dry blast booth and hydrogen fueling station with storage capabilities is estimated to range between 24 to 32 months within a three-year (or 36 month) timespan. Following that time engine conversions can begin at a rate of an additional 4-6 per year.

### Milestones

- 30 locomotives upgraded by 2030
- 150 locomotives upgraded by 2050
- 1 hydrogen fueling station added
- 1 blast booth conversion from a wet-to-dry process
- 6-8 new jobs created
- 100 annual apprenticeships created

### Metrics for tracking progress

- Increase in locomotives upgraded to Tier 3/4
- Reduction of GHG emissions from new hydrogen fuel locomotives
- Improvements in air quality
- Increase in technology that conserves fuel, reduces idling and arm crews with information to operate trains more efficiently
- Number of direct/indirect jobs created through workforce development program that aims to train, place, support, and retain a diverse rail industry workforce

### Geographic location (if applicable)

Port of Pend Oreille/ Pend Oreille Valley Railroad; Other ports in Washington

### Intersections of other funding

This planning and construction project will not be a feasible option for POVA to pursue without the assistance of significant state and/or federal grant funding. To support the costs of construction and consultation for the new shop, POVA is seeking funding through federal programs including: [EDA Public Works and Economic Adjustment Assistance Program](#); [US DOT Rebuilding American Infrastructure with Sustainability and Equity \(RAISE\) grants](#); [US DOT Maritime Administration Port Infrastructure Development Program](#); and the [Consolidated Rail Infrastructure and Safety Improvements \(CRISI\) Program](#) as well as investigating IRA clean energy tax credits related to hydrogen fueling. POVA will also seek state funding through the [Commerce Community Economic Revitalization Board Planning Grant](#).

### Authority to implement

[Ecology regulates transportation emissions](#) in Washington and follows [EPA regulations](#) for Tier 3 and 4 nonroad diesel engine standards. POVA has authority for this work under the [Port of Pend Oreille Comprehensive Plan](#) "Comprehensive Scheme of Harbor Improvement" per [RCW 53.20.010](#) and economic

development activities are also authorized as part of the Port's public purpose by [RCW 53.08.245](#). Similar authorities would be available under individual port comprehensive plans.

## 2.2.9 Electrify municipal and tribal fleets including expansion of electric vehicle charging

### Implementing entity

Local agencies; tribes

### Description of measure

Washington recently developed the [Transportation Electrification Strategy](#) (TES) to help the transportation sector reduce its GHG emissions in accordance with the state's GHG reduction goals. Electrifying on-road transportation, which represents 24% of the state's emissions, and for which electric vehicle (EV) technology is most advanced, is a critical opportunity for the state to reduce GHG emissions. As a national leader on climate action, Washington is already taking critical steps toward achieving these goals.

For example, the Washington Legislature adopted, and Ecology is implementing, California's motor vehicle emissions standards rather than the federal government's standards for new light-duty (i.e., passenger) vehicles (LDVs), the Advanced Clean Cars I and II (ACC I and ACC II) regulations, which require a progressively stringent zero-emissions vehicle (ZEV) sales share, culminating in a 100% sales requirement by 2035.

In addition to state legislation, tribes, cities, towns, ports, and transit agencies are also committed to reducing GHGs in Washington. This measure would directly fund the decarbonization of both municipal and tribal fleets to zero-emission vehicles, as well as the expansion and strategic deployment of EV charging infrastructure to support the increased use of EVs.

Additional GHG emissions reductions and resilience benefits could be realized by leveraging this measure in two different ways:

- Deploying renewable energy plus storage to fuel charging stations. By encouraging adoption of EVs, grant investments can address the transportation sector's outsized contributions to climate change in Washington.
- Using electrified fleets in a vehicle-to-grid set up. By leveraging smart charging technology to communicate with the local utilities and help mitigate load during peak times, especially extreme heat events, this measure can further reduce emissions associated with peak loads on the grid.

### Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates

Calculating the emissions and costs impacts from EV and charging infrastructure will vary depending on many factors including vehicle model and number, cost and emissions content of electricity and the emissions associated with existing fleets.

Table 19 lists estimated reductions from conversion to EVs. For the EV emission reduction estimations, the historic annual gasoline and diesel emissions can be compared to the projected electricity emissions after the project using the following methodology: Annual gallons of fuel consumed can be multiplied by the [EPA's CO<sub>2</sub>e equivalency factors](#) to obtain the historic emissions from the vehicles to be replaced. For the projected emissions, the mileage for those same vehicles can be multiplied by their [kWh per mile figures for the electric replacements](#). The total amount of electricity required to replace that fuel use can then be converted to CO<sub>2</sub>e by multiplying by [utility specific grid emission figures reported by Ecology](#). Using this methodology it is

expected that approximately 80% of emissions from fossil vehicles will be demonstrably avoided through the use of zero emission fleet EVs. Based on typical passenger vehicle estimates and a projected 80 vehicle list for municipality or tribe, annual estimated GHG reductions would be 300 MTCO<sub>2</sub>e reduced annually.

**Table 19. Cumulative GHG Reductions for Converting Fleets to Electric Vehicles**

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
Convert fleets to electric vehicles	1,500	7,500

The average cost of electric light duty vehicles (which could include trucks and other larger LDV) can be estimated at \$60,000. Therefore, the cost effectiveness of this measure using these assumptions is \$3,200/MTCO<sub>2</sub>e.

#### Implementation schedule

This measure could expect to be implemented over several years including purchasing, installation of charging stations and data collection for potential grid-related benefits and other renewable energy opportunities. Vehicle purchases are likely to happen over a staggered timeline, with approximately a dozen purchases per year during a five-year period, assuming supply chain issues do not hinder progress.

#### Milestones

- Complete conversion of fleets to EVs
- Deployment of charging infrastructure for EVs

#### Metrics for tracking progress

- Number of vehicles converted
- Number of emissions reduced
- Amount of storage capacity deployed

#### Geographic location

Statewide. [The Seattle-Tacoma-Bellevue MSA PCAP](#) includes measures relating to regional transportation electrification and would be designed to ensure no duplication or overlap with this measure.

#### Intersection with other funding

Washington has been awarded several federal funding opportunities related to EVs. WSDOT will receive [\\$71 million total over five years](#) from the [National Electric Vehicle Infrastructure Formula Program](#), including 10.5 million in the first year. Washington received over \$40 million from the [FHWA Charging and Fueling Infrastructure Discretionary Grant program](#), with programs that support charging stations along the Olympic Peninsula, City of Mount Vernon, Ports of Seattle and Tacoma, and as part of a Pacific Northwest Rural Community Charging program. Commerce also [awarded \\$85 million](#) in grants to fund nearly 5,000 new EV charging stations in communities throughout the state, using state funds.

#### Authority to implement

Authority for this measure is established in Washington's Clean Air Act (RCW [70A.15 RCW](#), and [173-476 WAC](#)) and Washington's Vehicle Emissions Standards ([Chapter 70A.30 RCW](#)).

[E2SHB 1181, 2023](#) adds a climate change and resiliency goal to the Growth Management Act (GMA) and a required climate change and resiliency element to a GMA comprehensive plan.

## 2.2.10 Mode shift from trucking to water transportation to reduce vehicles miles travelled

### Implementing entity

Local agencies; tribes; ports

### Description of measure

[The State Energy Strategy](#) identifies reducing vehicle miles traveled (VMT) as a key strategy to reducing transportation emissions and the [Washington State Transportation Carbon Reduction Strategy](#) cites mode shift to maritime freight transport as an efficient and equitable way to move goods and people, one of the two overall strategies for emissions reductions.

This measure leverages mode shifting to water transportation as an effective VMT reduction strategy. To reduce GHG emissions in the transportation sector, local agencies and ports can purchase equipment and provide incentives to encourage the adoption of water transportation in lieu of long-haul freight trucking. Barging is a form of water transportation used to move freight between coastal ports. Barges are non-motorized, cargo-carrying vessels that are pushed or pulled between ports by towing vessels (such as electric tugboats). Barging freight is a less carbon-intensive modality that will lead to a measurable reduction in VMT and GHG reductions compared to long-haul trucking by:

- Allowing freight to be moved in bulk which reduces emissions; one barge can transport approximately 50 truckloads of freight
- Not consuming fuel and instead pushing or pulling freight by a towing vessel, which can be electric or electric-hybrid, further reducing the emissions compared to long-haul diesel trucking
- Reducing VMT by taking long-haul freight trucks off the highways.
- Lowering wear and tear on truck tires due to reduced VMTs<sup>15</sup>.

### Estimate of the quantifiable GHG emissions reductions quantitative cost estimates

Projects under this measure may increase the amount of goods moved by barging, increasing the efficiency of transportation and reducing VMT. This strategy has been explored by the Port of Port Angeles. Currently, the Port participates in two barge routes running between Port Angeles and Everett, WA and Port Angeles and Coos Bay, OR. In 2023, freight movement along these water routes produced 41% fewer GHG emissions compared to long-haul trucking. GHG reduction estimates for the proposed measure are modeled on actual VMT, fuel consumption, and freight volume numbers from 2023. These datasets were compiled on a weekly basis by the Port of Port Angeles and its logistics partners who received freight from Port Angeles.

For an estimate of GHG emissions, the Port considered the impact of creating new barging routes between Port Angeles and Everett, WA. Table 20 shows the potential impact that reducing VMTs through barging could have along that route.

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<sup>15</sup> [EPA identifies](#) four major sources of emissions related to tire manufacturing: rubber processing, the use of cement, tire cord production, and puncture seal application. Tire manufacturing facilities are known to produce hazardous air pollutants (HAPs) that contribute to chronic and acute health disorders including formaldehyde, methanol, and hexane. In addition, tires are the primary source of 6PPD-quinone, a chemical found in runoff that is highly toxic to endangered salmon species.



**Table 20. Cumulative GHG Reductions for Mode Switch to Water Transportation to Reduce VMTs**

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
Mode switch, reduction in VMT	3,600	18,000

These estimated emissions reductions are based on a grant award of around \$10 million, with a cost effectiveness of approximately \$2,800/ MTCO<sub>2</sub>e.

These calculations do not include hybrid or electric towing vessels; however, with the adoption of such vessels, which are increasingly available and feasible for barging operations, [GHG reductions could increase](#) by an additional 27% (CO<sub>2</sub>) and for criteria pollutants up to 73% (particulates) and 51% (NO<sub>x</sub>).

#### Implementation schedule, milestones, and metrics for tracking progress

Using the Port of Port Angeles as a pilot, the implementation of this measure may proceed via this proposed timeline:

- Year 1:
  - Purchase and installation of spud barge for use in shipping routes
  - Purchase of an inland barge; signed documents leasing the inland barge to a qualified operator
  - Develop management program for scheduling barging route
- Year 2:
  - 1-2 qualified participants selected and enrolled into management program
  - New inland barge begins operating

#### Milestones

- GHG emission reductions at double the current rate (725-ton reduction per year based on 2023 barging rates)
- Doubling barge freight traffic
- Reduced long-haul trucking vehicle miles traveled (VMT)
- Hazardous Air Pollutant (HAP) and Criteria Air Pollutant (CAP) reductions driven by fewer VMT and fewer gallons of fuel being consumed for freight truck traffic.

#### Performance Measure and Metrics for Tracking Progress

- Amount of GHG emissions reductions
- Amount of increase in barge traffic route
- Amount of reduction in long-haul trucking VMT.
- Amount of reduction in Hazardous Air Pollutants (HAP) and Criteria Air Pollutants (CAP)

#### Geographic location

Ports throughout Washington waterways could take advantage of this measure through multiple barging routes.



### Intersections of other funding

A number of programs exist to support the work of ports, including the upcoming [EPA Clean Ports Program](#) and [MARAD Port Infrastructure Development Program](#). However, these federal programs do not provide support for barging. Currently, funding through the CPRG is the best option for funding barging operations.

### Authority to implement

Local governments have been directed to include VMT reductions in long term planning. In 2023, Washington Legislature passed [legislation](#) that adds a climate goal to the Growth Management Act (GMA) and requires local comprehensive plans to have a climate element with resilience and greenhouse gas emissions mitigation sub-elements. The GHG emissions sub-element must include goals and policies to reduce emissions and vehicle miles traveled. This sub-element is mandatory for the state's 11 largest counties and the cities within those counties. Climate elements must maximize economic, environmental, and social co-benefits and prioritize environmental justice in order to avoid worsening environmental health disparities.

## Electric power sector

### 2.2.11 Support tribal energy sovereignty through Tribal Clean Energy grants

#### Implementing entity

Washington State Department of Commerce

#### Description of measure

This measure supports continued funding for federally recognized tribal governments and tribes' contracted service providers to promote sovereignty, advance resiliency, and contribute to Washington's climate, energy and environmental justice goals. The measure may include projects that modernize the electric grid, promote innovation and solar energy deployment, enhance community resilience, support low-income communities, target industrial decarbonization and siting and permitting of clean energy projects<sup>16</sup>, and address any other climate pollution reduction projects important to tribes.

The 2021 State Energy Strategy includes tribal energy sovereignty as a priority for achieving the clean energy transition. This goal is best achieved through direct funding to tribes for tribally led projects. To achieve this goal through the state, the Washington Legislature has historically provided support for the state [Clean Energy Fund \(CEF\)](#) at Commerce for projects that provide a public benefit to communities in Washington through deployment of clean energy technologies that save energy and reduce energy costs, reduce harmful air emissions, or otherwise increase energy independence for the state.

To enhance support for tribal projects, the [Tribal Clean Energy Grant program](#) is a newly designed, state funded, program at Commerce that makes at least \$16 million of grant funds available, with the funds tailored exclusively to federally recognized tribal governments and tribes' contracted service providers. Projects funded through this program align with [state requirements](#) to use funding for efforts to mitigate and adapt to the effects of climate change affecting Indian tribes, including capital investments in support of the relocation of Indian tribes located in areas at heightened risk due to anticipated sea level rise, flooding, or other disturbances caused by climate change and should not be used for activities that would violate tribal treaty rights or result in significant long-term damage to critical habitat or ecological functions. Investments from

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<sup>16</sup> Clean energy projects funded under this measure should meet the state's definitions of clean energy ([Chapter 19.405 RCW](#)).

this account must result in long-term environmental benefits and increased resilience to the impacts of climate change.

This measure would seek additional federal funding to support an additional round of grants as part of this new program, which could begin as early as 2025. Commerce also supports direct funding of tribally led projects and this measure includes projects not funded by Washington state, but instead developed by and funded directly to tribes.

**Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates**

Commerce has previously funded over 30 clean energy projects with federally recognized tribal governments and tribes’ contracted service providers, focusing on the following projects:

- Solar projects
- Solar + storage (including planning, pre-design and pre-development)
- Grid modernization
- EV charger installation (including planning, pre-design and pre-development)

Tribal microgrids are a good example of a project that both deploys renewable energy and provides resilience benefits, which has been understood by Commerce to be a priority for many tribes in the Pacific Northwest region. Many tribes are “first off and last on” when extreme weather, wildfire, and other emergencies take down the power grid. The most recent round of funds for the [Commerce Solar plus Storage for Resilient Communities grants](#) supported four tribal microgrid projects. To estimate the GHG impacts over time, Commerce used the 895 kW of solar paired with 4053 kWh of storage from these tribal projects to estimate reductions.

Table 21 lists estimated GHG reduction assumptions for the solar deployed as part of these projects. Impacts to GHG emissions would be even greater with further data on the impacts of offsetting diesel backup and other grid benefits realized through deployment of solar plus storage microgrids.

**Table 21 Cumulative GHG Reductions for Tribal Solar plus Storage Projects**

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
Tribal solar from microgrids	1900	9900

The total funds supporting these tribal solar plus storage projects was \$4.63 million, making the cost effectiveness of this program approximately \$2,300/MTCO<sub>2</sub>e. Cost effectiveness thresholds may be expanded at the discretion of Commerce evaluators for projects that support tribal energy sovereignty in a manner that support tribal priorities.

**Implementation schedule, milestones, and metrics for tracking progress**

The state-funded Tribal Clean Energy grant program timeline runs from February 15, 2024 into the fall of 2024. To address the varying levels of tribal staff capacity and readiness, applications are accepted on an ongoing basis until funds are exhausted. In support of this measure, additional federal funding for another round of the program would leverage existing program design Commerce has executed to develop the state-funded program, including listening and informational sessions and Commerce attendance at tribal conventions. Program development and design has also included working with Commerce’s Office of Tribal Relations,

leveraging previous feedback from listening sessions and meetings with individual tribes on Commerce programs to develop the request for applications (RFA).

Implementation timelines and schedules would likely [mirror those of the state-funded program](#), and could follow this timeline for a winter 2025 rollout:

- Request for Applications posted: February 15
- Question & answer period: February 15 – March 15
- Pre-Application Conferences (2): between March and February
- 1st Application review deadline: March 29
- Evaluate applications: April
- Announce awards: April 26
- Negotiate contract May – June
- Other rounds of application review could be run on a rolling basis in summer and winter depending on availability of funds

### **Milestones**

- Increased tribal energy sovereignty
- Increased renewable energy on tribal lands
- Workforce development
- Deploying projects to tribes not having received funding in previous Commerce grants
- Emissions reductions on tribal lands
- Increased resilience
- Continued coordination with tribes

### **Metrics for tracking progress could include**

- Number of tribal projects funded
- Amount of renewable energy capacity constructed
- Amount of storage capacity constructed
- Amount of GHG emissions reduced
- Health disparities impact on tribal lands

### **Geographic location**

All federally recognized tribal governments, [defined by Commerce as](#) “[t]he government of any federally recognized Indian tribe whose traditional lands and territories included parts of Washington, designated subdivisions and agencies (such as a Tribal Housing Authority), or any other entities or authorities of a federally recognized tribal government in corporate form or otherwise in Washington[,]” are included as part of this measure.

### **Intersections of other funding**

The Department of Energy (DOE) Office of Indian Energy keeps an [updated list](#) of funding opportunities available to tribes. One program under the Infrastructure Investment and Jobs Act is the [Grid Resilience State and Tribal Formula Grants](#), which provide allocations to states and tribes. [Allocations available for tribes](#) are listed on the federal funding website. DOE also plans to release a funding opportunity in spring 2024 for \$25 million to support [Clean Energy Technology Deployment on Tribal Lands](#).

### **Authority to implement**

Governor Inslee created the Clean Energy Fund (CEF) in 2013 to fund projects that provide a public benefit to communities in Washington through deployment of clean energy technologies that save energy and reduce

energy costs, reduce harmful air emissions, or otherwise increase energy independence for the state. The authority for the newly released Tribal Clean Energy Grant program comes from ten provisos in both the 2023-25 Biennium [Capital](#) and [Operating](#) Budget.

The [HEAL Act](#) requires Commerce to conduct consultation with federally recognized Indian tribes and guides tribal coordination and program development and design.

## Agriculture sector

### 2.2.12 Fund anaerobic digesters

**Implementing entity**

Local agencies; tribes, farms, third party implementers

**Description of measure**

Organic waste, which includes food waste and other biodegradable materials, accounts for approximately 1.2 million tons (2015 baseline for food waste, source: Use Food Well Washington Plan) of all municipal solid waste generated in Washington per year. Food waste left to rot in landfills produces methane, a potent GHG. Anaerobic digesters (AD) divert organic waste from landfills, thereby reducing the impact of rotting food on the environment. AD can also be used to transform waste to energy at its source, reducing the need for hauling waste, and the renewable energy generated by the system could displace energy that would have otherwise come from fossil fuels. The anaerobic digestion process produces organic digestate that adds nutrients and carbon to the soil for improved plant growth and long-term carbon storage.

ADs can be implemented at a small scale to handle food waste at public facilities, medium scale when servicing agricultural livestock operations, and regional scale when accounting for multiple inputs which can include all the above. Deployment of community scale AD systems, which locate project as close to the food waste source as possible, preempts methane from being released in the atmosphere and captures it for beneficial use. These decentralized systems benefit the communities in which they are located. This measure aligns with recommendations from [state plans](#) to increase the use of small-scale ADs to reduce methane emissions from food waste.

**Estimate of the quantifiable GHG emissions reductions and quantitative cost estimates**

Local governments can implement this measure at a variety of scales. A small AD system can process 25 tons per year and reduce emissions by about 0.67 MTCO<sub>2</sub>e per ton of food waste, meaning that one project could avoid 17 MTCO<sub>2</sub>e per year. A larger system can process 500 tons per year and reduce emissions by about 0.67 MTCO<sub>2</sub>e per ton of food waste, meaning that one larger scale project could avoid 335 MTCO<sub>2</sub>e per year. These emissions reductions estimates are based on calculations done using EPA emissions factors and the [EPA Waste Reduction \(WARM\) model](#).

**Table 22. Cumulative GHG Reductions for Anaerobic Digesters**

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
Small scale anaerobic digester AD25	85	425
Large scale anaerobic digester AD500	1700	8000

Measure or Project	Cumulative Reductions 2025-2030 (MTCO <sub>2</sub> e)	Cumulative Reductions 2025-2050 (MTCO <sub>2</sub> e)
Total	1760	8800

Small ADs are approximately \$209,000, and the large ADs are approximately \$1,000,000, making the approximate cost effectiveness of the AD systems alone \$2,500/MTCO<sub>2</sub>e and \$590/MTCO<sub>2</sub>e, respectively. The total cost effectiveness of a full project would depend on project specific costs of freight, permitting, installation and training, as well the size of digester.

### Implementation schedule, milestones, and metrics for tracking progress

This measure could start with deployment to three projects in communities across Washington. The implementation schedule would include site work/installation, digester construction, and beginning of digestion. The transformative potential of projects could scale with more ADs coming online in the next five to ten years.

Other anticipated milestones and outputs:

- Over 8000 MTCO<sub>2</sub>e avoided by 2050
- 14200 tons of food waste diverted from landfills 2030-2050
- 3 installations by 2025
- Between 3-30 local jobs created

### Metrics for tracking progress

- Number of digester projects completed
- Tons of waste diverted from landfill
- MTCO<sub>2</sub>e avoided
- Communities engaged
- Local jobs created

### Geographic location

Small scale digester deployments as demonstration projects could be deployed at community facilities and farms across Washington.

### Intersections of other funding

Federal funding for ADs is available through the [USDA Rural Energy for America Program](#), which provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements. Agricultural producers may also apply for new energy efficient equipment and new system loans for agricultural production and processing.

The [Washington State Conservation Commission](#) has one-time funding of \$30 million from the CCA that was appropriated as part of the 2023-25 biennium to the Sustainable Farms and Fields program for organic agricultural waste and greenhouse gas emissions reduction through climate-smart livestock management. This one-time funding resulted in three new funding opportunities: Alternative Manure Management, Research and Demonstration, and Dairy Anaerobic Digesters.

### Authority to implement

Washington's [Solid Waste Handling Standards](#) includes permitting requirements for solid waste anaerobic digesters. Other specific regulations are included in [Chapter 70A.205.290 RCW](#).

## 2.3 Low income disadvantaged communities benefits analysis

The implementation of the measures included in this PCAP are anticipated to prioritize benefits to low-income and disadvantaged communities (LIDACs). This section identifies LIDACs covered by this PCAP, discusses meaningful engagement in the development of this PCAP, and lays out how Washington will continue engagement into the future (i.e. during CCAP development).

### 2.3.1. Washington's environmental justice context

Washington's environmental justice (EJ) law, known as the Healthy Environment for All (HEAL) Act ([Chapter 70A.02 RCW](#)), was enacted in 2021 and provides a roadmap for integrating EJ into state agency actions. The seven agencies covered by the HEAL Act include the state departments of Agriculture, Commerce, Ecology, Health, Natural Resources, and Transportation; it also includes the Puget Sound Partnership. The HEAL Act directs agencies to:

- Adopt a community engagement plan that centers on EJ
- Incorporate EJ into strategic plans
- Develop a tribal consultation framework
- Prioritize EJ in budget and funding decisions
- Conduct EJ assessments for [Significant Agency Actions](#) – any new program and projects over \$12 million will count as Significant Agency Actions

The HEAL Act ensures that any significant new funding directed at climate pollution reduction will be required to center EJ principles and community engagement in both design and implementation.

### 2.3.2. Identifying LIDACs and potential impacts

Appendix D provides all LIDAC census block groups in Washington from the CEJST tool and EPA's EJScreen mapping tool. [The criteria for determining LIDACs](#) are set by EPA. For programs being delivered by state agencies, this list represents census block groups that will be prioritized in receiving the benefits of priority measures. Local agencies will also be required to work with LIDACs as they distribute implementation grant funds.

Table 23 lists the communities anticipated to be affected by implementation of specific priority measures included in this PCAP. Projects with "statewide" census LIDAC block groups are those that will be implemented through competitive programs or where project sites are not yet determined.

**Table 23. Washington Communities Affected by Priority Measures**

Measure	Affected LIDAC Census Block Groups
Refrigerant reduction	Statewide
Decarbonizing campus energy systems	Statewide  Campuses with known fossil-fuel campus boiler systems: <ul style="list-style-type: none"><li>○ Seattle Central College</li><li>○ Department of Health</li><li>○ Central Washington University</li><li>○ University of Washington</li><li>○ Washington State University</li><li>○ Western Washington University</li></ul>

Measure	Affected LIDAC Census Block Groups
Organics management	Statewide
Scrap and replace fossil fuel powered commercial vehicles	Statewide Especially along interstate highway routes, ports and other heavy-duty vehicle hubs.
Marine terminal electrification	Washington State Ferry service areas, including Island, King, Kitsap, and Snohomish counties
Complete Streets	Statewide
Reduce emissions of fleets for rural and special needs transit	Statewide
Enable decarbonization of rail infrastructure	Statewide
Electrify municipal and tribal fleets including expansion of electric vehicle charging	Statewide
Mode shift from trucking to water transportation to reduce vehicles miles travelled	Communities along coastal shipping routes, especially along Hwy. 101, the only truck route that connects the North Olympic Peninsula to the I-5 corridor and runs directly through downtown corridors and residential zones
Support tribal energy sovereignty through Tribal Clean Energy grants	Federally recognized tribes
Fund anaerobic digesters	Statewide

### 2.3.3. Mapping environmental justice communities in Washington

To assist with implementing the state’s EJ requirements, Washington has developed a mapping tool, the [Washington Environmental Health Disparities \(EHD\) Map](#), which provides nuanced information on different environmental health indicators across the state and identifies which communities are most impacted by environmental health disparities. State agencies are strongly encouraged to use the EHD map as a resource when implementing the HEAL Act, including making funding decisions and prioritizing outreach. The EHD map weighs environmental exposures such as diesel emissions and ozone with environmental effects like proximity to hazardous waste sites and measures such as education levels, race, employment, poverty rates, birth weights, and cardiovascular disease deaths to develop an overall environmental health disparities score between 1 and 10 for each census tract in the state. Higher scores correspond to higher rates of environmental health disparities; a score of 9 or 10 indicates that a census tract is “highly impacted” under Washington’s Clean Energy Transformation Act ([RCW 19.405.020](#)).

There are also several federal tools for EJ mapping. Since each tool takes a different approach to mapping environmental, health, and economic disparities, multiple tools can be used together to determine disadvantaged communities. For CPRG, EPA includes any of the following as LIDACs:

- Any census tract included as disadvantaged in CEJST



- Any census block group at or above the 90th percentile for any of EJScreen’s Supplemental Indexes when compared to the nation or state
- Tribal lands including Reservations or Off-reservation Trust Lands

While there is significant overlap between census tracts with high environmental health disparities scores and LIDACs, there is not complete agreement. For example, [the CEJST tool](#) marks all federally recognized tribal lands as disadvantaged, while the EHD tool does not score census tracts containing tribal lands highly unless these lands also have other significant environmental health disparities. However, other Washington laws require that tribal lands be a focus of clean energy transition, greenhouse gas reductions, and environment justice. A University of Washington researcher has [compared these maps](#) and found that another example is that more census tracts in southern parts of Puget Sound are considered highly impacted by the EHD map but not disadvantaged by CEJST; the difference may be because of weighting for various environmental factors between the two tools, different datasets or weighting of datasets, or different metrics that go into one tool versus another (e.g., the [EHD map](#) weighs race as a factor because “[a]n individual’s race/ethnicity is a primary social determinant of health and is strongly associated with exposure to environmental pollutants”<sup>17</sup>).

[EPA’s EJScreen](#) is another commonly used EJ mapping tool. Unlike the EHD Map, EJScreen does not combine all indicators into one score and unlike CEJST, EJScreen does not identify census block groups as “disadvantaged.” Rather, it combines socioeconomic indicators with individual environmental indicators to create thirteen EJ indexes for pollution sources and hazards like superfund proximity or air toxics cancer risk.

### 2.3.4. Potential benefits of GHG emission reduction measures to LIDACs

Table 24 lists the potential co-benefits that LIDACs would receive from each measure in this PCAP. Potential risks for each measure would be identified as part of EJ assessments and could include environmental assessments for construction for projects and grid related infrastructure improvements. Other potential disbenefits would also be identified directly by impacted LIDACs through outreach and engagement activities.

**Table 24. Benefits to LIDACs from Priority Measures**

Measure	Direct/Indirect Benefits
<b>Refrigerant reduction</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ economic development through transition to climate friendly refrigeration systems for small businesses</li> <li>○ promote healthy food options in areas that may otherwise have few accessible stores</li> <li>○ accelerated development of the workforce needed to support the installation and maintenance of climate friendly technologies</li> </ul>
<b>Decarbonizing campus energy systems</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhance resilience of campus infrastructure and reduce the risk of educational disruptions from the imminent failure of the existing infrastructure</li> <li>○ workforce development</li> <li>○ reducing operating costs</li> <li>○ increasing health and safety for maintenance workers</li> </ul>
<b>Organics management</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ improve the air quality in communities near landfills</li> </ul>

<sup>17</sup> Washington State Department of Health. Washington Environmental Health Disparities Map, Technical Report. Updated July 2022. <https://deohs.washington.edu/sites/default/files/2022-08/311-011-EHD-Map-Tech-Report.pdf>



Measure	Direct/Indirect Benefits
	<ul style="list-style-type: none"> <li>○ reduce methane emissions</li> <li>○ Potential to increase food recovery</li> </ul>
<b>Scrap and replace fossil fuel powered commercial vehicles</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhance resilience</li> <li>○ improve air quality</li> <li>○ promote economic development</li> <li>○ improve salmon recovery</li> <li>○ build community knowledge</li> <li>○ provide cost savings</li> <li>○ benefit wildlife and habitat</li> <li>○ reduce emissions (mitigation)</li> <li>○ relieve local road congestion</li> </ul>
<b>Marine terminal electrification</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhance resilience</li> <li>○ improve air quality</li> <li>○ reduce HAPs and CAPs by eliminating the need to burn diesel</li> <li>○ reduce risk of fuel spills and damage to the marine environment</li> <li>○ provide cost savings</li> <li>○ benefit wildlife and habitat</li> </ul>
<b>Complete Streets</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ improved safety, mobility, and accessibility</li> <li>○ climate resilience</li> <li>○ mitigate heat islands</li> <li>○ housing</li> <li>○ physical and mental health</li> <li>○ connectivity plus social capital</li> <li>○ community centered economic development</li> <li>○ environment and open space</li> <li>○ co-governance</li> <li>○ reduce individual transportation costs</li> </ul>
<b>Reduce emissions of fleets for rural and special needs transit</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhance resilience</li> <li>○ improve air quality</li> <li>○ promote economic development</li> <li>○ improve salmon recovery</li> <li>○ build community knowledge</li> <li>○ provide cost savings</li> <li>○ benefit wildlife and habitat</li> <li>○ relieve local road congestion</li> </ul>
<b>Enable decarbonization of rail infrastructure</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhance resilience</li> <li>○ improve air quality</li> <li>○ promote economic development</li> <li>○ workforce development</li> </ul>
<b>Electrify municipal and tribal fleets including expansion of electric vehicle charging</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhances resilience</li> <li>○ enable further transportation electrification</li> <li>○ reduce noise pollution</li> <li>○ improve air quality</li> <li>○ promote economic development</li> <li>○ workforce development</li> </ul>

Measure	Direct/Indirect Benefits
<b>Mode shift from trucking to water transportation to reduce vehicles miles travelled</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ reduce VMT through communities</li> <li>○ reduce noise pollution</li> <li>○ enhance resilience</li> <li>○ improve air quality</li> <li>○ promote economic development</li> <li>○ workforce development</li> </ul>
<b>Support tribal energy sovereignty through Tribal Clean Energy grants</b>	<ul style="list-style-type: none"> <li>○ support tribal sovereignty</li> <li>○ reduce GHG emissions</li> <li>○ enhance resilience</li> <li>○ promote economic development</li> <li>○ workforce development</li> </ul>
<b>Fund anaerobic digesters</b>	<ul style="list-style-type: none"> <li>○ reduce GHG emissions</li> <li>○ enhance resilience</li> <li>○ reduce waste volume</li> <li>○ reduce water pollution</li> </ul>

### 2.3.5 Community engagement

Washington conducted intergovernmental coordination and public outreach in the development of this PCAP. This section outlines the approach to facilitating meaningful engagement strategies, aiming to ensure broad representation from across the state in the identification of priority measures.

#### Collaborating partners in PCAP development

This PCAP is designed to address and identify the priority measures that are implementation ready, can be completed in the near term (defined as the five-year performance period of the implementation grant), and follows state [GHG reduction mandates](#). The priority measures in this PCAP include actions that will be competitive for Phase 2 CPRG funding implementation grant awards.

Washington actively engaged with all CPRG Phase 1 awardees in the state, encouraging them to coordinate and collaborate on CPRG deliverables and potential Phase 2 implementation grant applications. Puget Sound Clean Air Agency (PSCAA), lead for the Seattle-Tacoma-Bellevue Metro Statistical Area (MSA), and Washington began collaboration prior to the submission of the CPRG Phase 1 application. Despite the tight timeline for developing the PCAP, due by March 1, 2024, Washington made significant efforts to ensure the inclusion of voices from a diverse range of interested partners.

To identify collaborating partners for the PCAP, Washington reached out to tribes, state and local agencies, organizations with an interest in clean energy infrastructure and practices, as well as the general public. These collaborating partners encompass various entities, groups, and individuals who may be affected by the PCAP's implementation, including but not limited to:

- State agencies
- Metropolitan planning organizations
- Economic development organizations
- Environmental advocates
- Industrial associations
- Automotive associations
- Utilities
- Agricultural associations
- Waste management organizations
- Industrial organizations
- Consumer advocates
- Local elected officials

- Community-based organizations
- Chambers of commerce
- General public

### Outreach and Coordination Plan

Commerce established the [Washington Climate Pollution Reduction Grant Program](#) website upon receiving the grant, serving as a central hub for information, meeting announcements, and collaboration opportunities related to the Washington Climate Pollution Reduction Grant Program. Engagement strategies encompassed various channels, including email lists, social media, public surveys, online meetings, public comment periods, and a [dedicated portal](#) for submitting ideas and input.

For detailed insights into outreach and coordination efforts, covering interagency and intergovernmental coordination, partnering agencies, and public engagement associated with the PCAP's development, refer to Appendix A, Table 1A. Additionally, Appendix B, Table 1B provides specifics on recurring workgroup meetings dedicated to offering guidance, subject matter expertise, collaboration, and outreach coordination regarding CPRG progress. Meeting and outreach materials and resources are available at [WA CPRG Meeting Materials](#).

## 2.4 Workforce planning analysis

The priority measures included in this PCAP will result in the creation of high-quality jobs for Washington. This section details Washington's strategies and commitments to ensure job quality, strong labor standards, and a diverse, highly skilled workforce to implement priority measures. In 2023, Governor Inslee and the Legislature passed the [Climate and Clean Energy Service and Workforce Programs](#) bill, House Bill 1176.

The goals of this legislation include:

- Enacting the Washington Climate Corps Network to support and grow climate-related service opportunities for young adults and veterans.
- Establishing the Clean Energy Technology Workforce Advisory Committee (CETWAC) to advise policymakers on efforts to support the expansion of clean energy technology sectors and jobs by prioritizing transition of the existing skilled workforce to new industry sectors and providing training opportunities where needed to address gaps.

CETWAC is tasked with recommending strategies to prevent workforce displacement, to support job creation in clean energy technology sectors, and to provide support for workforce-related changes to businesses and for adversely impacted workers. CETWAC membership is open to all interested parties including, but not limited to, business and worker representatives from sectors of the economy affected by the transition to clean energy.

In addition to the Commerce, participating CETWAC entities include:

- International Brotherhood of Electrical Workers
- Employment Security Department
- Northwest Laborers' Employers Cooperation and Education Team
- Governor's Office
- Washington and Northern Idaho District Council of Laborers
- State Board of Community & Technical Colleges
- Global Operational Due Diligence

- Washington Labor Advisory Committee
- Amalgamated Transit Union
- Washington Building Trades
- City of Seattle
- Workforce Training and Education Coordinating Board
- WSU Energy,
- BlueGreen Alliance
- CleanTech Alliance
- United Steel Workers
- PNW Center of Excellence for Clean Energy
- Puget Sound Partnership
- Washington State Association of Plumbers & Pipefitters
- Washington Roundtable
- Office of Financial Management
- MacDonald Miller
- Association of Washington Business
- Department of Labor and Industries
- Puget Sound Energy
- Sheet Metal Workers Union

CETWAC is serving as a policy development hub supporting public and private partnerships and facilitating regional and industry specific workforce needs. Over the next two years, aligning with the HEAL Act and President Biden’s Executive Order 14008 Justice40 Initiative, emphasis will be placed on diversity and inclusion in recruitment and training, especially for workers in overburdened, marginalized, and vulnerable communities. The committee will work with education and training sources to encourage opportunities in clean energy and technology for workers, both those entering the workforce for the first time, and for workers interested in a career shift. Recommendations will be made to create a crosswalk of transferable skills between industries and supporting alterations in curriculum for career training and educational programs as well as registered apprenticeships. Supporting creation of family wage jobs, while meeting employer needs for skilled workers will address Washington’s future job needs and bring a financial boost to families and the state’s economy.

Over the next few years, the Advisory Committee plans to prioritize a comprehensive analysis of Washington’s clean energy policies’ impact on the current workforce. This includes assessing the capacity of existing education and training programs to meet clean energy sector workforce needs, while also evaluating the demographics of the workforce and efforts to bring equity to the Washington workforce. Recommendations to policymakers will involve input from a balance of business, labor interests, education and training programs, as well as state agencies.

The first [CETWAC report](#) includes preliminary policy issues identified by the advisory group to assist with clean energy technology workforce development. The recommendations include:

1. Policymakers fund grant development and management capacity for state and local agencies, tribal governments, postsecondary education and technical programs, as well as registered apprenticeship programs, to best leverage available federal funding opportunities focused on clean energy technology workforce needs. This will enable local partnerships between government, labor, business, and others to plan, solicit, and implement clean energy workforce activities.

2. Policymakers at the state, local and federal level address delays, and work to improve the predictability of the permitting process to help business, labor, and communities plan for their workforce needs.

## 3. Next Steps: Comprehensive Climate Action Plan

The next step for the CPRG planning grant is to develop Washington’s Comprehensive Climate Action Plan (CCAP). This section details the EPA requirements and current plans for that work.

### 3.1 CCAP development

The CCAP is a crucial tool in determining the full scope of actions required to reach the state-mandated limit of net-zero emissions by 2050. It will be a pathways analysis, identifying and prioritizing cost-effective opportunities to achieve Washington’s emission limits. The development of the CCAP will align with the state’s EJ and equity objectives, as stipulated in the HEAL Act and state agency-specific community engagement plans. The elements that [are required by EPA](#) in the CCAP include:

- Element 2.1, GHG Inventory
- Element 2.2, GHG Emissions Projections
- Element 2.3, GHG Reduction Targets
- Element 2.4, Quantified Comprehensive GHG Reduction Measures
- Element 2.5, Benefits Analysis
- Element 2.6, Low-Income and Disadvantaged Communities Benefits Analysis
- Element 2.7, Review of Authority to Implement
- Element 2.8, Leverage and Intersection with other Funding
- Element 2.9, Workforce Planning Analysis
- Element 2.10, Stakeholder engagement activities

### 3.2 Future outreach and engagement

Washington, in collaboration with the Puget Sound Clean Air Agency (PSCAA),<sup>18</sup> will host the CPRG CCAP Public Kick-Off meeting on April 29th, 2024. The partners will adopt a comprehensive and equitable approach to GHG reduction strategies that includes lived experience. Building on relationships established during the PCAP, Washington aims to deepen existing connections and expand avenues for engagement during CCAP community outreach. Cascadia Consulting Group, Inc. has been contracted by Commerce to strategize on how to identify and engage low-income and disadvantaged communities, creating meaningful opportunities for resident input regarding concerns and priorities. Cascadia (Cascadia) will also assist in establishing specialized workgroups tailored to specific sectors, measures, regions, and shared areas of interest.

Washington plans to overcome participation barriers by utilizing available funds from the CPRG planning grant. These funds will be allocated for needed services, such as translation services, stipends for participation in listening sessions, space rental, and tabling/participation in community events. A combination of hybrid in-person and virtual events will address geographic representation concerns, allowing individuals to attend regardless of their ability to physically reach a location. Meeting locations will be selected with consideration for community trust, accessibility, and flexibility.

Multiple communication channels, such as press releases, social media, online meetings, focus groups, public meetings, and both virtual and in-person community dialogues, will be leveraged to inform and invite interested parties and the public to participate in CCAP development. Regular updates on progress, upcoming

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<sup>18</sup> the lead for the Seattle/Tacoma/Bellevue municipal statistical area (MSA)

engagement opportunities, and solicitation of feedback will be provided through these channels. By employing these engagement methods, Washington aims to incorporate the priorities and concerns of low-income and disadvantaged communities into the CCAP while ensuring alignment with federal government guidance.

### 3.3 Measures identified for CCAP consideration

Commerce received public feedback on draft PCAP priority measures, which were made publicly available for review from December 19, 2023 through January 12, 2024. Measures that were not aligned with the goals of the PCAP, but were aligned with overall Washington GHG reduction strategies, are presented in Appendix C, Table 1C and will be considered in development of the CCAP. These measures will not be used for CPRG Phase 2 Implementation funding.

Beyond the measures outlined in Appendix C, conducting a thorough analysis of measures across all sectors is essential to meet the state's net-zero emissions requirement by 2050. Through extensive outreach, Washington intends to engage state agencies, local governments, subject matter experts, tribes, and the public in shaping the CCAP. This collaborative approach ensures that relevant measures in various communities are considered, emphasizing EJ and equity goals. As the CPRG team transitions to the next phase, these measures will not only steer CCAP development but also play a vital role in achieving overall success in GHG emissions reduction, fostering an inclusive and sustainable approach to tackling climate pollution challenges.

# Appendix A. CPRG PCAP Outreach and Coordination Log

**Table 1A. CPRG PCAP Outreach and Coordination Log 7/1/2023 - 2/29/2024**

Date/ Schedule	Topic	Organizations Involved	Outreach Method	Outcome/Links
6/27-29/ 2023	Conveners Network in Chicago	Commerce & Ecology	In Person - Chicago	Coordinate and connect with other states on the CPRG
8/28/2023	Public Engagement	Commerce and other state agencies	Lunch and Learn zoom	Public utility focused
9/19/2023	Presentation with Energy Division	Affiliated Tribes of Northwest Indians (ATNI) Convention	In Person	Information sharing
9/20/2023	Refineries Emissions Workgroup	RMI, Ecology, Commerce	Online	Review reduction strategies
9/21/2023	Seattle/Bellevue/Tacoma MSA CPRG Kick Off Meeting	PSCAA (Lead), Commerce and Ecology present	In Person	Collaboration with MSA
10/30/2023	CPRG Phase 1 Quarterly Meeting	Commerce and Ecology present with General Public in attendance	Online	Introduction to CPRG and first quarter progress. 80 attendees
11/14/2023	Phase 2 Public Stakeholder Meeting	Department of Commerce & PSCAA	Online	180 virtual attendees, collaboration, partnership building, survey for GHG priority identification
11/15/2023	Phase 2 Working Session	Governor's Office, Commerce, Ecology, PSCAA, Cascadia Consulting	Online	Identified Governor office priorities for GHG reduction measures
11/20/2023	CPRG and UCUT Collaboration	Commerce and UCUT	Online	Collaboration and Partnership with Tribal CRPG recipient. 8 attendees
11/21/2023	CPRG Phase 1 Tribal Collaboration Gathering	Commerce and 10 tribes who received CPRG Phase 1 grants were invited	Online	Coordination and Partnership with Tribal CPRG recipients. 19 attendees from 5 tribes.
11/28/2023	CPRG/Cascadia Ideation meeting for CPRG Message and Tools for Effective Outreach	Commerce, Cascadia, PSCAA, Ecology	Online	Brainstorming session to identify CPRG Communications, Messaging, and Outreach needs. 10 attendees
12/15/2023	Phase 2 Working Session	Governor's Office, Commerce, Ecology, PSCAA, Cascadia Consulting	Online	Strategy development for State and MSA Phase 2 applications. 10 attendees
12/20/2023	CPRG Phase 1 Tribal Collaboration Gathering follow up	Commerce and 10 tribes and 2 tribal consortium who received CPRG Phase 1 grants were invited	Online	Coordination and Partnership with Tribal CPRG recipients. 19 attendees from 5 tribes and 1 tribal consortium
12/21/2023	Phase 2 Strategy Session	Governor's Office, Commerce, Ecology, and PSCAA	Online	Discussion and identification of PCAP draft measures for potential Phase 2 Implementation Grant. 24 attendees



Date/ Schedule	Topic	Organizations Involved	Outreach Method	Outcome/Links
1/10/2024	CPRG/Cascadia Ideation meeting for Engagement and Outreach	Commerce, Cascadia, PSCAA, Ecology, and DH Consulting	Online	Identify Outreach and Engagement goals, objectives, impacts, methods, and barriers to engagement. 8 attendees
1/11/2024	CPRG Monthly Tribal Workgroup Preparation	Commerce and Office of Tribal Relations	Online	Assist with preparation and review for up-coming CPRG Monthly Tribal Workgroup. 2 attendees
1/18/2024	Peninsula Regional Transportation Planning Organization (PRTPO) Advisory Committee	PRTPO, Commerce, and interested public members	Online	Presented information on CPRG to Advisory group. 30 attendees
1/29/2024	CPRG Phase 1 Quarterly Meeting	Commerce and Ecology present with General Public in attendance	Online	CPRG Planning Grant progress. 188 virtual attendees.
Throughout PCAP	Numerous one on one meetings	Various state and local agencies, tribes, communities, subject matter experts, businesses, and public	Online, In Person, Phone	Collaboration on PCAP measures and identification of potential Phase 2 Implementation grant projects. Outreach to 95+

## Appendix B. CPRG PCAP Recurring Workgroup Log

**Table 1B. CPRG PCAP Recurring Workgroup Log 7/1/2023 - 2/29/2024**

Date/ Schedule	Topic	Organizations Involved	Outreach Method	Outcome/Links
<b>Weekly</b>	CPRG State/MSA Coordination meetings	Department of Commerce & PSCAA	Online	CPRG Outreach, engagement, and coordination.
<b>Weekly</b>	Commerce/ Ecology CPRG Progress Meeting	Commerce & Ecology	Online	Updating progress toward CPRG deliverables.
<b>Weekly 9/28/2023-11/1/2023 then moved to Monthly</b>	Weekly Clean Energy Workforce Technical Advisory Committee	Clean Energy Technology Board, Commerce, Union Worker Representatives, Employment Security Department, Labor organizations, Governor's Offices, State Boards and Councils, College and Training Institutions, Trade Organizations, Various State and Local Organizations, Business Organizations, Council of Laborers, and various Industry Representatives	Online	Workforce Planning Analysis Collaboration.
<b>Bimonthly 7/1/2023-10/31/2023</b>	Office of Financial Management Coordination	OFM and Commerce	Online	Coordination of CPRG operations.
<b>Bi- Monthly as of Nov 2023- Feb 2024</b>	CPRG and Cascadia Communication/ Engagement Meetings	Commerce and Cascadia Communications	Online	Coordination of marketing, communications, and engagement strategy for CPRG program.
<b>Bimonthly as of Jan 2024</b>	CPRG and EPIC coordination	Commerce CPRG and Energy Division EPIC teams	Online	Coordination of climate related programing.
<b>Bi-monthly as of Feb 2024</b>	CPRG, MSA (PSCAA), and Cascadia Communication/ Engagement Meetings	Commerce, PSCAA, and Cascadia Communications	Online	Coordination of marketing, communications, and engagement strategy for CPRG program.
<b>Monthly</b>	CPRG update to State offices	Commerce, Governor's Office, Ecology, Office of Financial Management, Department of Health	Online	Provide updates and guidance on CPRG progress on deliverables.
<b>Monthly</b>	Tribal Climate Roundtable	Tribal governance members, Governor's Office of Indian Affairs, ATNI, Ecology, Commerce, Governor's Office, and Climate related agencies	Online	Provide updates and coordination among different climate related policies, planning, and grants.
<b>Monthly</b>	PSCAA/UW TCTAC Coordination	PSCAA, UW TCTAC, Commerce, Ecology	Online	Program updates, sharing of resources, and coordination.
<b>Monthly</b>	USCA CPRG Monthly Meetings	USCA and CPRG awardees throughout the nation	Online	Coordination and collaboration among CPRG recipients.

Date/ Schedule	Topic	Organizations Involved	Outreach Method	Outcome/Links
Monthly	CPRG and Office of Tribal Relations Coordination	Commerce CRPG and Office of Tribal Relations	Online	Coordination and technical assistance to prepare for tribal engagement.
Monthly	Energy Tribal Relations Committee	Commerce Energy Division programs	Online	Coordinate tribal relations and outreach among Energy Division at Commerce.
Monthly	Righting our Relations: Tribal Resource Group	Commerce staff & Office of Tribal Relations	Online	Provide information, conversations, tools, tips, techniques, and coordination of tribal engagement.
Monthly	Energy Resilience Workgroup	Commerce Energy Department Staff	Online	Coordination of Commerce Energy Programs
Monthly	Washington, Oregon, ATNI, MSA, and EPA Coordination calls	Affiliated Tribes of NW Indians (ATNI), Oregon State- DEQ & ODOE, Washington State - Commerce & Ecology, Portland-Vancouver Metro MSA, Seattle-Tacoma-Bellevue MSA (PSCAA), EPA	Region 10 listserv	CPRG Updates, Collaboration, and Coordination.
Monthly	Environmental Justice Council Meeting	EJ appointed council members and interested public attendees	Online	Provide information about EJ within the state of Washington.

## Appendix C. Potential CCAP GHG measures

**Table1C. Measures that will be explored further in the CCAP but are not included in Washington’s PCAP and will not be considered for CPRG Phase 2 Implementation funding.**

Sector	Greenhouse gas reduction measure
Solid waste management	Use renewable energy plus storage for backup power at wastewater treatment plant
Solid waste management	Fund food donation and transportation related cold chain infrastructure
Solid waste management	Retrofit anaerobic digesters, including more energy efficient pumps, lights, and other support systems that will reduce the electrical and fossil fuel load
Electric power sector	Create a virtual power plant incentive program
Built Environment	Energy efficiency upgrades for public libraries
Agriculture	Decarbonize agriculture and forestry using electrification, on-farm charging, and energy efficiency measures-especially in heating, cooling, pumps, and other equipment
Agriculture	Provide grants and incentives for in-state alternative nitrogen fertilizer production
Building	Fund neighborhood energy districts
	Deploy natural refrigerant heat pumps and chillers with stratified thermal storage to enable thermal demand to be decoupled from power supply
	Fund residential, commercial and municipal waste heat recovery
Building	Fund EV chargers in multifamily homes
	Fund EV chargers at commercial buildings (ex. building-supply centers) and places of employment
Building	Replace electric resistance water heaters and electric resistance space heating in "mobile homes" with heat pump systems
Building	Incentive programs for electric heat pump water heaters for residential gas customers
Building	Fund residential, campus, commercial and municipal waste heat recovery
Building	Fund digital building controls that enable deep energy savings, such as conservation of electrical energy for fans and motors, in older commercial and campus buildings
	Support sub-metering capabilities at campuses as a tool for conservation
Building	Holistic library retrofits to create resilience hubs, including solar and storage, high-quality air filtration, and all-electric heating and cooling alongside energy efficiency upgrades
Building	Expand Funding for High Efficiency Electrification Programs through existing residential energy efficiency program to achieve 3,000 installations of ductless heat pumps in moderate income homes, replacing oil, gas, propane, or wood heat
Building	Fund K-12 community resilience hub and distributed energy/storage demonstration projects with solar panels, geothermal heating/cooling, and bi-directional EV buses
General	I want cleaner energy, and air land and water

Sector	Greenhouse gas reduction measure
Carbon Removal Measures	Include carbon capture as a viable means to reduce GHG emissions. For large buildings and campus settings
Electric Power Sector	Fund existing or expired renewable energy incentive programs
Electric Power Sector	Encourage the use of solar modules with a low carbon footprint
Transportation	In addition to Complete Streets, fund complementary land use patterns that generate walk, bike, and transit trips
Carbon Removal Measures	Carbon sequestration on natural and working lands, including restoration treatments on acquired properties, expanded invasive species management, and land acquisition for conservation practices.
Transportation	Low-interest loan/financing for low-income individuals for electric vehicle purchases
Transportation	Incentives for income-qualified residents to purchase e-bikes
Transportation	Programs to increase the share of electric vehicles and to expand electric vehicle charging infrastructure powered by renewable energy
Transportation	Improve public transit service and infrastructure
Transportation	Truck and vehicle replacements for small businesses to upgrade their gasoline & diesel vehicles to electric or hybrid electric.

## Appendix D. LIDACs in Washington

Please see Attachment 1 for a full list of Washington LIDACs, which includes data from both the Climate and Economic Justice Screening Tool and the Environmental Justice Screening and Mapping Tool.

The underlying data from both tools and technical documentation can be found on the EPA website: [Inflation Reduction Act Disadvantaged Communities Map](#)