BUILT ENVIRONMENT

Major Sources of Emissions

The built environment sector accounts for 38% of regional greenhouse gas emissions. Emissions come from three primary types of activities: process heating, mostly for industry; space heating and cooling; and residential water heating.

Implementation Considerations

- Emphasize solutions that preserve affordable housing, reduce energy bills for low- and moderate-income residents and families, ensure upgrade costs are not passed on to tenants, and avoid placing disproportionate financial burden on frontline and overburdened communities
- Consider financial tools such as loan loss reserve programs or other financing mechanisms

Key Jobs for Workforce Planning

Electricians, insulation workers, plumbers, pipefitters and steamfitters, roofers, construction and related workers, power plant operators, wind turbine service technicians, power distributors and dispatchers, and electrical power-line installers and repairers

Existing Policies and Efforts to Reduce Greenhouse Gas Emissions

Several existing policies and efforts may reduce emissions from the built environment. Examples include:

State: Climate Commitment Act, Clean Energy Transformation Act, State Energy Code, Clean Buildings Act, Buy Clean Buy Fair Law

Local/regional: Jurisdiction and utility incentive programs (e.g., heat-pump rebate programs); regional and local building decarbonization programs (e.g., Energize, Local Government Building Decarbonization Grant, Seattle Building Emission Performance Standard); Northwest Ports Clean Air Strategy and associated 5-Year Clean Air Implementation Plan

Strategies and Actions

Strategy	Actions	Emission Reduction Potential 2030/2050 (MTCO2e)	Co-Benefits
Build Low-Carbon New Buildings	▪ Strengthen building codes ▪ Provide education and outreach for new commercial and residential construction	420,000/930,000	
Reduce Energy Use in Existing Buildings	▪ Weatherize existing buildings ▪ Upgrade appliances and lighting ▪ Provide training, coaching, audits and advisors ▪ Support utility demand response programs ▪ Develop residential point-of-sale energy disclosures and performance standards ▪ Develop building emissions performance standards	580,000/1,200,000	
Electrify or Decarbonize Existing Buildings	▪ Upgrade appliances ▪ Support market development and promotion for electric appliances ▪ Develop renewable electricity generation and storage systems ▪ Support battery storage systems and technologies ▪ Provide education, outreach, and ambassadors for appliances and coordination around natural gas options ▪ Develop building emissions performance standards ▪ Develop building decarbonization plans	1,900,000/4,900,000	
Increase Solar Adoption	▪ Promote solar for government buildings, public schools, covered surface parking, etc. ▪ Promote solar for brownfields, affordable housing buildings, warehouses or commercial buildings ▪ Reduce net metering barriers	24,000/94,000	
Reduce Industrial Emissions	▪ Support low-emission technology upgrades ▪ Establish greenhouse gas auditors/consultants ▪ Create low-emission ratings/awards for businesses ▪ Require governments to use low-carbon businesses when feasible ▪ Provide education, outreach, and ambassadors for appliances and coordination around renewable natural gas options	530,000/4,700,000	
Reduce Embodied Carbon From Building Materials	▪ Develop building codes ▪ Develop environmental product declarations	46,000/190,000	
Cross-Cutting Built Environment Actions	▪ Develop financing programs for decarbonization ▪ Streamline permitting for construction of electric generation, transmission and storage projects while maintaining adequate timelines for meaningful community engagement ▪ Develop air quality standards for appliances	Not quantified	

Co-Benefit Icon Legend

TRANSPORTATION

Major Sources of Emissions

The transportation sector accounts for 39% of regional greenhouse gas emissions. Emissions come primarily from the combustion of petroleum-based fuels from on-road (light-, medium-, and heavy-duty vehicles) and off-road (marine, rail and aviation vehicles and other mobile equipment) sources.

Implementation Considerations

- Prioritizing transit access that serves overburdened communities reduces vehicle emissions, improves mobility, lowers transportation costs, and expands access to housing—especially benefiting low-income households
- Emphasize solutions that avoid placing disproportionate financial burden on frontline, low-income, and overburdened communities

Key Jobs for Workforce Planning

Vehicle and engine mechanics and service technicians, electricians, power plant operators, wind turbine service technicians, power distributors and dispatchers, and electrical power-line installers and repairers

Existing Policies and Efforts to Reduce Greenhouse Gas Emissions

Several existing policies and efforts may reduce emissions from transportation. Examples include:

Federal/state: CAFE standards, Clean Fuel Standard, Clean Energy Transformation Act, Growth Management Act

Local/regional: VISION 2050 and Regional Transportation Plan; Northwest Ports Clean Air Strategy and associated 5-Year Clean Air Implementation Plan; city and county policies and programs to reduce transportation emissions, utility incentive programs (e.g. charging infrastructure rebates)

Strategies and Actions

Strategy	Actions	Emission Reduction Potential 2030/2050 (MTCO2e)	Co-Benefits
Reduce Vehicle Miles Traveled of On-Road Passenger Internal Combustion Engine Vehicles	▪ Implement transit-oriented, compact growth and development ▪ Develop income-sensitive vehicle use/congestion pricing programs ▪ Expand biking/walking networks and prioritize transit access that serves overburdened and underserved communities ▪ Reduce single occupant driving and increase public transit service and ridership ▪ Provide education and outreach to encourage mode-shift and car trip reduction ▪ Review parking minimums	320,000/790,000	
Increase Sales and Use of On-Road Passenger Electric Vehicles and Promote Low-Carbon Fuel Alternatives	▪ Build out charging infrastructure ▪ Develop a regional charging infrastructure plan ▪ Revise building codes to support charging infrastructure ▪ Electrify government fleets and promote the use of low-carbon fuels ▪ Provide outreach ambassadors for electric vehicles ▪ Support electric vehicle car sharing programs ▪ Support the electrification of high-emitting vehicles ▪ Provide electric vehicle purchase incentives ▪ Support Zero-Emission Vehicle standards	460,000/3,200,000	
Electrify or Reduce the Carbon Intensity of On-Road Medium- and Heavy-Duty Freight and Service Vehicles	▪ Support the electrification of medium-duty and heavy-duty vehicle fleets and installation of charging infrastructure ▪ Provide education and outreach to encourage privately-owned medium- and heavy-duty fleets to electrify ▪ Support Advance Clean Fleet Rules ▪ Support Washington's Alternative Fuel corridors and medium- and heavy-duty charging network ▪ Require low-carbon alternatives for government medium- and heavy-duty fleets	590,000/2,300,000	
Electrify or Reduce the Carbon Intensity of Heavy-Duty Transit Vehicles and Ferries	▪ Pursue bulk/collective vehicle purchasing ▪ Pilot alternative vehicles/fuels ▪ Prepare for/leverage, funding for low- and zero-emission vehicles and fueling infrastructure ▪ Deploy zero-emissions ferries and ferry terminal infrastructure	120,000/260,000	
Electrify or Reduce the Carbon Intensity of Off-Road Equipment	▪ Phase-out new sales of off-road gas- and diesel-powered equipment ▪ Support the decarbonization of off-road equipment ▪ Electrify off-road equipment for governments and schools ▪ Provide education and outreach to encourage the use of electric landscaping equipment ▪ Provide education, outreach, and ambassadors for off-road electric equipment	650,000/2,100,000	
Electrify or Reduce the Carbon Intensity of Aviation Vehicles and Equipment and Reduce Air Travel	▪ Require the use of low-carbon fuel for government-related travel ▪ Research low-carbon materials, fuels, and ground support equipment ▪ Support the electrification of non-road vehicles and equipment ▪ Develop stronger fuel efficiency and emissions standards for aircraft ▪ Support alternative options to air travel ▪ Increase virtual meetings	500,000/2,700,000	
Electrify or Reduce the Carbon Intensity of Off-Road Marine and Rail Vessels, Vehicles and Equipment	▪ Support low-carbon marine fuels ▪ Support low-carbon fuel handling systems ▪ Encourage the use of shore power ▪ Support shore power with grid upgrades ▪ Support low-carbon or electric port and rail equipment and vehicles ▪ Support shore power policy ▪ Support charging infrastructure zero-emissions vessels ▪ Research zero- and near zero-emission cruise ships	100,000/690,000	
Cross-Cutting Transportation Action	Streamline permitting for construction of electric generation, transmission and storage projects while maintaining adequate timelines for meaningful community engagement	Not quantified	

Co-Benefit Icon Legend

Improves air quality, reduces pollution

Reduces pollution levels for overburdened communities

Reduces or prevents health problems

Saves money, reduces costs, or produces value

Improves or protects the overall natural environment

Creates job opportunities or expands job sectors

Reduces consumption and promotes circular economy

MUNICIPAL SOLID WASTE

Major Sources of Emissions

The municipal solid waste and wastewater sector accounts for 3% of regional greenhouse gas emissions. Emissions come primarily from the decomposition of organic materials in landfills and water treatment facilities. Emissions also come from the production of new materials from raw resources that would otherwise have been diverted from landfills and reused.

Implementation Considerations

Emphasize solutions that avoid placing disproportionate financial burden on frontline, low-income, and overburdened communities

Existing Policies and Efforts to Reduce Greenhouse Gas Emissions

Several existing policies and efforts may reduce emissions from solid waste and wastewater. Examples include:

State: Clean Fuel Standard, Climate Commitment Act, Washington Building Code Appendix P (RCW 19.27), Organics Management Laws, Recycling Reform Act

Local/regional: Local policies and programs to increase compost and recycling rates

Strategies and Actions

Strategy	Actions	Emission Reduction Potential 2030/2050 (MTCO2e)	Co-Benefits
Divert Other Recyclable and Compostable Materials from Landfills	▪ Develop codes, permitting, or planning to maximize material reclamation ▪ Support new and existing markets for salvaged and recycled materials ▪ Train and provide auditors to maximize material diversion ▪ Provide or facilitate physical locations for processors, manufacturers, or resellers of diverted materials	80,000/160,000	
Reduce Energy Use in Existing Buildings	▪ Provide education and outreach to encourage landfill diversion ▪ Improve the processing and handling of compostable organic waste ▪ Reduce food waste ▪ Support new and existing markets for compost ▪ Increase methane capture in farming ▪ Research non-direct-combustion power	440,000/1,300,000	
Increase Methane Capture at Landfills	Increase methane capture from landfills	53,000/84,000	
Cross-Cutting Waste Actions	▪ Support markets and infrastructure for additional recycled materials ▪ Reduce emissions from other waste handling processes ▪ Reduce per capita waste disposed of in landfills	Not quantified	

CONSUMPTION

Major Sources of Emissions

This sector includes the full lifecycle of greenhouse gas emissions resulting from the consumption of goods, provision of services, and the activities undertaken by all residents, businesses, and organizations within the region, regardless of where those emissions occur. In the region, consumption emissions primarily come from food handling, storage, use and waste, and general good reuse, recycling, and repair.

Existing Policies and Efforts to Reduce Greenhouse Gas Emissions

Several existing policies and efforts may reduce consumption emissions. Examples include:

State: Recycling Reform Act, Extended Producer Responsibility Laws, NextCycle Washington program, Center for Sustainable Food Management, Use Food Well Washington Plan

Local/regional: Local policies and programs to reduce food waste and encourage reuse of goods (e.g., Seattle Tool Library)

Strategies and Actions

Strategy	Actions	Emission Reduction Potential 2030/2050 (MTCO2e)	Co-Benefits
Reduce Food Waste and Promote Low-Emission Dietary Choices	▪ Promote low-emission diets and dietary choice ▪ Reduce food waste from over-purchasing and improve storage/use of purchased food ▪ Improve food rescue and donation practices ▪ Increase repurposing of leftovers for other products	Not quantified	
Promote a Circular Economy for General Goods	▪ Extend producers' responsibilities to end-of-life and recycling ▪ Promote reuse and repair of general goods ▪ Support organizations that encourage reuse, repair, renting, and borrowing	Not quantified	

Co-Benefit Icon Legend

- Improves air quality, reduces pollution
- Reduces pollution levels for overburdened communities
- Reduces or prevents health problems
- Saves money, reduces costs, or produces value
- Improves or protects the overall natural environment
- Creates job opportunities or expands job sectors
- Reduces consumption and promotes circular economy

NATURAL AND WORKING LANDS

Major Sources of Emissions

The natural and working lands sector accounts for 14% of regional greenhouse gas emissions. Trees, especially mature, second-growth and old-growth trees, can store significant amounts of carbon throughout their lifecycle. Emissions primary come from removing trees and biomass through timber harvesting or land development.

Implementation Considerations

- Increasing urban tree canopy, especially in overburdened communities, can support additional public health co-benefits such as reducing heat island effects and heat stress
- Solutions should ensure newly planted trees are appropriately-located and monitored to maintain longevity

Existing Policies and Efforts to Reduce Greenhouse Gas Emissions

Several existing policies and efforts may reduce emissions and enhance sequestration of natural and working lands. Examples include:

State: Growth Management Act (Comprehension Plan Mandatory Elements), Use of Biochar in Public Works Projects

Local/regional: VISION 2050, city and county tree protection and land conservation ordinances and strategies

Strategies and Actions

Strategy	Actions	Emission Reduction Potential 2030/2050 (MTCO2e)	Co-Benefits
Steward Natural Lands to Reduce Tree Loss	▪ Increase tree planting, stewardship, and monitoring ▪ Strengthen zoning and permitting to protect trees ▪ Promote tree retention and planting ▪ Increase green stormwater infrastructure	500,000/1,500,000	
Steward Natural Lands to Increase Carbon Sequestration and Reduce Emissions	▪ Increase soil carbon sequestration on farms ▪ Steward forests, farmland, and open spaces ▪ Promote de-paving to restore natural vegetation	2,500,000/5,000,000* *Note: This represents sequestration of carbon, not direct emission reductions	

REFRIGERANTS

Major Sources of Emissions

The refrigerants sector accounts for 6% of regional greenhouse gas emissions. Emissions primarily occur when equipment releases HFCs (hydrofluorocarbons) or HCFCs in(hydrochlorofluorocarbons) to the atmosphere. These releases can occur through small, continuous leaks during normal operation, sudden equipment failures, or when owners or scrappers dispose of equipment without recovering the refrigerants, either due to lack of awareness or willful neglect.

Existing Policies and Efforts to Reduce Greenhouse Gas Emissions

Washington State passed two laws to address refrigerant emissions:

- HB 1112 (2019) banned new equipment using HFCs, directed Ecology to explore phase-out strategies for high-GWP refrigerants, and required the state to prioritize low-GWP equipment in its purchasing decisions.
- HB 1050 (2021–2022) expanded on HB 1112 by setting maximum GWP thresholds for refrigerants, adding residential air conditioners and heat pumps to the list of regulated equipment, and establishing programs to reduce leaks and promote refrigerant recovery from large systems.

Strategies and Actions

Strategy	Actions	Emission Reduction Potential 2030/2050 (MTCO2e)	Co-Benefits
Reduce Use of High-GWP Devices and Increase Recovery of High-GWP Refrigerants	▪ Replace existing high-GWP refrigerant devices ▪ Support governments' and schools' transition to low-GWP refrigerant devices ▪ Increase good device disposal practices ▪ Increase the purchase of low-GWP devices ▪ Subsidize proper disposal of high-GWP devices	120,000/240,000	
Reduce Refrigerant Leaks from Commercial and Industrial Systems	Support commercial and industrial leak detection and repair	90,000/140,000	

Co-Benefit Icon Legend


Improves air quality, reduces pollution


Reduces pollution levels for overburdened communities


Reduces or prevents health problems


Saves money, reduces costs, or produces value


Improves or protects the overall natural environment


Creates job opportunities or expands job sectors

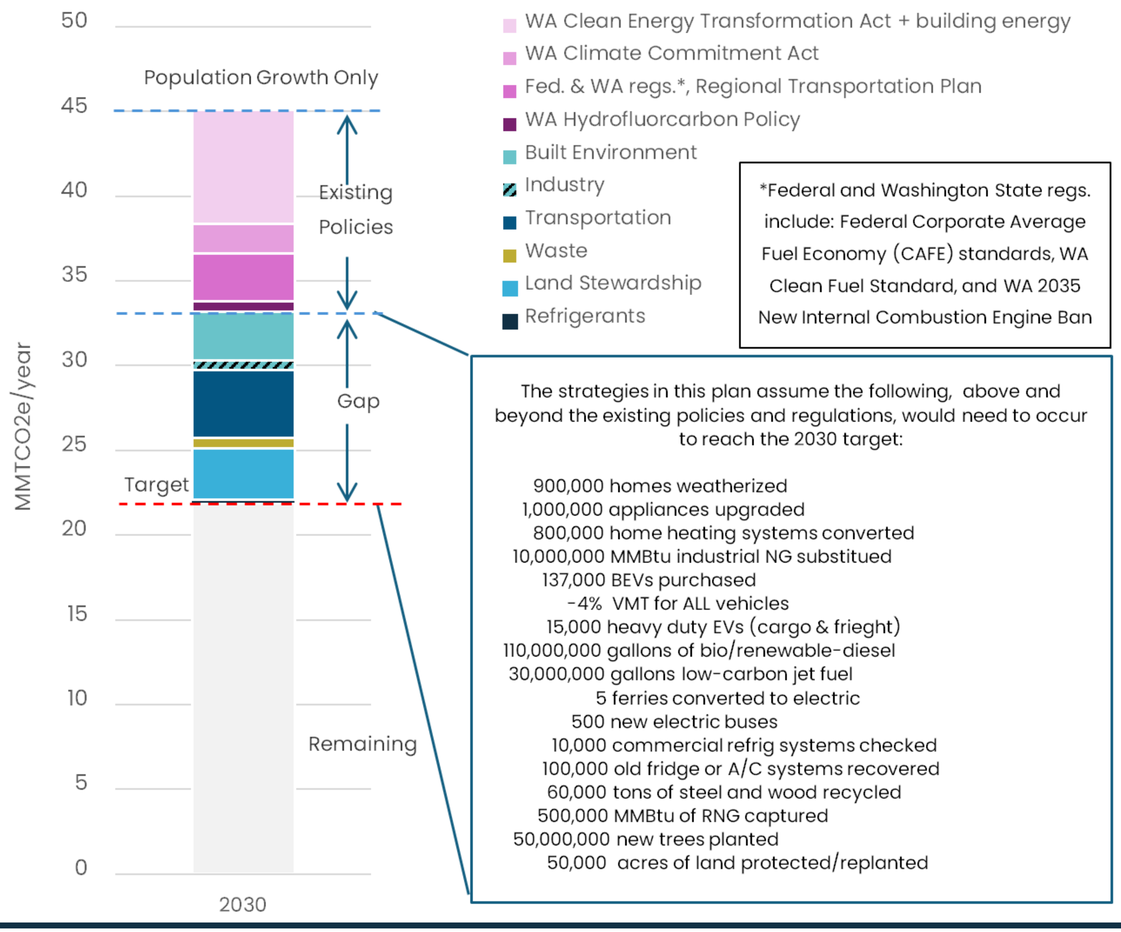

Reduces consumption and promotes circular economy

Potential Strategies and Assumptions to Meet the 2030 and 2050 Emission Reduction Targets

The Puget Sound Region CCAP provides “Emission Reduction Potential” (Gap) for each climate strategy, which is the difference between current greenhouse gas emissions and the 2030 or 2050 targets for a sector. The CCAP estimates the maximum potential impact of each strategy by assuming the largest realistic scale of action. These estimates can help decision-makers see which strategies could contribute most to meeting climate goals. The implementation of actions to support the CCAP’s strategies will need to be designed to achieve this level of ambition.

Our region is progressing on an achievable and bold course to 2050, and our estimates for 2030 lay the foundation for moving forward now to reach the 2050 target. Through collaboration, focus, and innovation, we can create a cleaner future.

2030 Emission Reduction Target

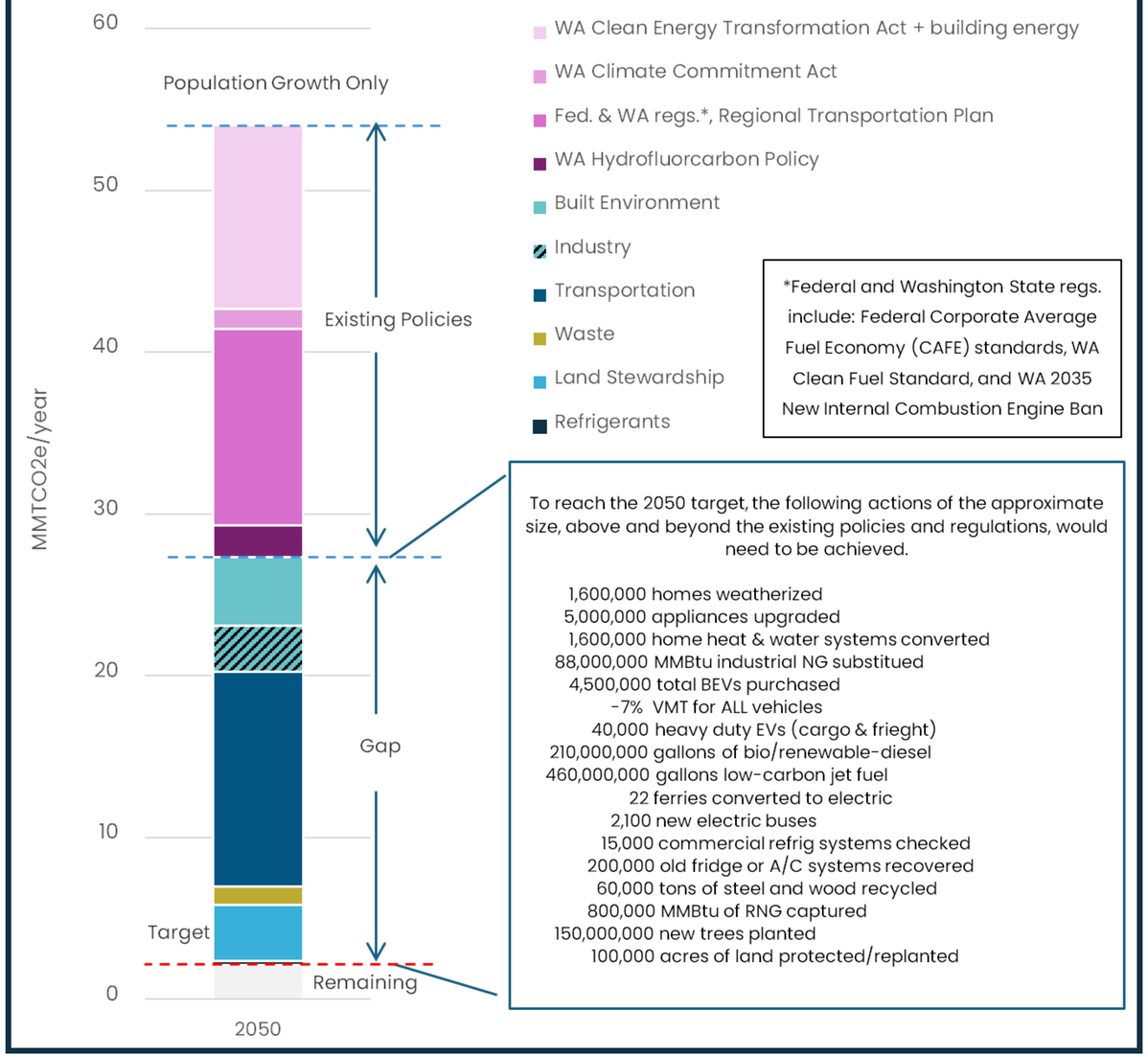


*Federal and Washington State regs. include: Federal Corporate Average Fuel Economy (CAFE) standards, WA Clean Fuel Standard, and WA 2035 New Internal Combustion Engine Ban

The strategies in this plan assume the following, above and beyond the existing policies and regulations, would need to occur to reach the 2030 target:

900,000 homes weatherized
1,000,000 appliances upgraded
800,000 home heating systems converted
10,000,000 MMBtu industrial NG substitued
137,000 BEVs purchased
-4% VMT for ALL vehicles
15,000 heavy duty EVs (cargo & frieght)
110,000,000 gallons of bio/renewable-diesel
30,000,000 gallons low-carbon jet fuel
5 ferries converted to electric
500 new electric buses
10,000 commercial refrig systems checked
100,000 old fridge or A/C systems recovered
60,000 tons of steel and wood recycled
500,000 MMBtu of RNG captured
50,000,000 new trees planted
50,000 acres of land protected/replanted

2050 Emission Reduction Target



*Federal and Washington State regs. include: Federal Corporate Average Fuel Economy (CAFE) standards, WA Clean Fuel Standard, and WA 2035 New Internal Combustion Engine Ban

To reach the 2050 target, the following actions of the approximate size, above and beyond the existing policies and regulations, would need to be achieved.

1,600,000 homes weatherized
5,000,000 appliances upgraded
1,600,000 home heat & water systems converted
88,000,000 MMBtu industrial NG substitued
4,500,000 total BEVs purchased
-7% VMT for ALL vehicles
40,000 heavy duty EVs (cargo & frieght)
210,000,000 gallons of bio/renewable-diesel
460,000,000 gallons low-carbon jet fuel
22 ferries converted to electric
2,100 new electric buses
15,000 commercial refrig systems checked
200,000 old fridge or A/C systems recovered
60,000 tons of steel and wood recycled
800,000 MMBtu of RNG captured
150,000,000 new trees planted
100,000 acres of land protected/replanted

Top 10 Strategies Ranked in Order of their Greenhouse Gas Emission Reduction Potential by 2030*

These 10 strategies show the highest greenhouse gas emission reduction potential by 2030 in addition to existing strategies and actions. It's important to note that several actions already in place will not realize their full potential until 2050, well after the 2030 emissions reduction potential calculations used for this report. For example, large state programs like the Climate Commitment Act, Clean Fuel Standard, and Vehicle Emission Standards won't realize their full emission reductions until well after 2030, and regional transit is actively being built out under the Regional Transportation Plan.

Sector	Strategy	Summary of Actions
Built Environment	**1.3 Electrify or Decarbonize Existing Buildings**	Electrify appliances; Develop renewable electricity generation and battery storage systems; Develop building emissions performance standards and building decarbonization plans; Promote low-carbon fuels
Transportation	**2.3 Electrify or Reduce the Carbon Intensity of On-Road Medium- and Heavy-Duty Freight and Service Vehicles**	Support the electrification of government and privately medium- and heavy-duty fleets; Support Advanced Clean Trucks and Advanced Clean Fleet Rules; Support medium- and heavy-duty charging infrastructure build-out; Require low-carbon alternatives for medium- and heavy-duty government fleets
Built Environment	**1.2 Reduce Energy Use in Existing Buildings**	Weatherize existing buildings; Upgrade appliances for efficiency, and upgrade lighting; Support utility demand response programs; Develop efficiency standards
Transportation	**2.2 Increase Sales and Use of On-Road Passenger Electric Vehicles and Promote Low-Carbon Fuel Alternatives**	Support charging infrastructure build-out and develop a regional charging infrastructure plan; Electrify government fleets and high-emitting vehicles; Support electric vehicle car sharing programs; Provide electric vehicle purchase incentives and support the State's Zero-Emission Vehicle Standard
Natural and Working Lands**	**4.1 Steward Natural Lands to Reduce Tree Loss**	Increase offset tree planting and stewardship; strengthen zoning requirements to protect trees; promote tree retention and planting and increase green stormwater infrastructure
Built Environment	**1.5 Reduce Industrial Emissions (especially process heating)**	Support low-emission technology upgrades; Establish greenhouse gas auditors/consultants; Create low-emission ratings/awards to identify low emitters; Promote low-carbon fuels
Transportation	**2.5 Electrify or Reduce the Carbon Intensity of Off-Road Equipment**	Phase-out new sales of gas- and diesel-powered off-road equipment; Promote low-carbon fuels for off-road equipment
Transportation	**2.6 Electrify or Reduce the Carbon Intensity of Aviation Vehicles and Equipment and Reduce Air Travel**	Promote low-carbon fuels for government-related travel; Electrify equipment and non-road vehicles; Establish stronger fuel efficiency and emissions standards for aircraft and engines; Promote alternative options to air travel and increase use of virtual meetings
Built Environment	**1.1 Build Low-Carbon New Buildings**	Strengthen building codes to require structurally sound low- or zero-emission building materials and appliances in new construction; Provide education and outreach for developers and builders of new commercial and residential construction
Municipal Solid Waste	**3.2 Divert Other Recyclable and Compostable Materials from Landfills**	Provide education and outreach to encourage landfill diversion; Improve the handling and processing of organics waste and reduce food waste; Support new and existing markets for compost; Increase methane capture in farming

* Strategies appear in order of their estimated maximum emission reduction potential by 2030. The maximum potential impact of each strategy assumes the largest realistic scale of action; estimates are not plans or predictions and don't guarantee results.

** While some Land Use sector strategies can prevent direct carbon emissions from soils (e.g., reducing tree loss) most Land Use sector strategies (e.g., stewarding natural lands, planting trees, etc.) primarily increase carbon sequestration rather than directly reduce emissions. Land Use strategies to increase carbon sequestration are critical to meeting our 2050 climate targets but cannot compensate for direct emission reductions in other sectors of the economy.

Top 7 Climate Strategies with the Greatest Air Quality and Public Health Co-Benefits with a Focus on Overburdened Communities

These 7 strategies are likely to result in air quality and public health co-benefits, especially in overburdened communities. The strategies are ranked approximately highest to lowest according to their likely benefit for air quality and public health including impacts on ambient air quality and exposure, indoor air quality, urban livability, and home heating and cooling. Diesel particle pollution from diesel engines is the top air quality toxics risk in the region (driving 85% of the potential cancer risk from air pollution) and remains a top priority for public health, especially for overburdened communities. Some built environment strategies can lead to improvements in indoor environments, where people spend a majority of their time. Some natural and working lands strategies can increase urban green areas; while these do not directly reduce pollutant exposures, they can reduce urban heat island effects that can cause heat-related illnesses and death.

Sector	Strategy	Summary of Actions
Transportation	**2.3 Electrify or Reduce the Carbon Intensity of On-Road Medium- and Heavy-Duty Freight and Service Vehicles**	Support the electrification of government and privately medium- and heavy-duty fleets; Support Advanced Clean Trucks and Advanced Clean Fleet Rules; Support medium- and heavy-duty charging infrastructure build-out; Require low-carbon alternatives for medium- and heavy-duty government fleets
Transportation	**2.5 Electrify or Reduce the Carbon Intensity of Off-Road Equipment**	Phase-out new sales of gas- and diesel-powered off-road equipment; Promote low-carbon fuels for off-road equipment until electrification is possible
Transportation	**2.2 Increase Sales and Use of On-Road Passenger Electric Vehicles and Promote Low-Carbon Fuel Alternatives**	Support charging infrastructure build-out and develop a regional charging infrastructure plan; Electrify government fleets and high-emitting vehicles; Support electric vehicle car sharing programs; Provide electric vehicle purchase incentives and support the State's Zero-Emission Vehicle Standard
Built Environment	**1.3 Electrify or Decarbonize Existing Buildings**	Electrify appliances; Develop renewable electricity generation and battery storage systems; Develop building emissions performance standards and building decarbonization plans; Promote low-carbon fuels until electrification is possible
Built Environment	**1.5 Reduce Industrial Emissions (especially process heating)**	Support low-emission technology upgrades; Establish greenhouse gas auditors/consultants; Create low-emission ratings/awards to identify low emitters; Promote low-carbon fuels until electrification is possible
Transportation	**2.1 Reduce Vehicle Miles Traveled of On-Road Passenger Internal Combustion Engine Vehicles**	Implement transit-oriented, compact growth and development; Develop income-sensitive vehicle use/congestion pricing programs; Expand biking and walking networks and prioritize transit access; Provide education and outreach to encourage mode-shift and car trip reduction
Natural and Working Lands	**4.1 Steward Natural Lands to Reduce Tree Loss**	Increase offset tree planting and stewardship; strengthen zoning requirements to protect trees; promote tree retention and planting and increase green stormwater infrastructure

Top 5 Climate Strategies Well-Positioned for Implementation at the Regional or Local Level

While many strategies and actions detailed in the Puget Sound Region CCAP can be implemented effectively at different scales and levels of government, based on preliminary analysis, these 5 strategies are well-positioned for collaboration and implementation at the local or regional level or have the potential to scale across the four-county Puget Sound region.

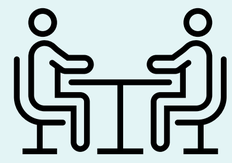
Sector	Strategy	Summary of Actions
Built Environment	**1.2 Reduce Energy Use in Existing Buildings**	Weatherize existing buildings; Upgrade appliances for efficiency, and upgrade lighting; Support utility demand response programs; Develop efficiency standards
Built Environment	**1.3 Electrify or Decarbonize Existing Buildings**	Electrify appliances; Develop renewable electricity generation and battery storage systems; Develop building emissions performance standards and building decarbonization plans; Promote low-carbon fuels until electrification is possible
Transportation	**2.1 Reduce Vehicle Miles Traveled of On-Road Passenger Internal Combustion Engine Vehicles**	Implement transit-oriented, compact growth and development; Develop income-sensitive vehicle use/congestion pricing programs; Expand biking and walking networks and prioritize transit access; Provide education and outreach to encourage mode-shift and car trip reduction
Transportation	**2.2 Increase Sales and Use of On-Road Passenger Electric Vehicles and Promote Low-Carbon Fuel Alternatives**	Support charging infrastructure build-out and develop a regional charging infrastructure plan; Electrify government fleets and high-emitting vehicles; Support electric vehicle car sharing programs; Provide electric vehicle purchase incentives and support the State's Zero-Emission Vehicle Standard
Natural and Working Lands	**4.1 Steward Natural Lands to Reduce Tree Loss**	Increase offset tree planting and stewardship; strengthen zoning requirements to protect trees; promote tree retention and planting and increase green stormwater infrastructure

CONSIDERATIONS FOR SUCCESSFUL IMPLEMENTATION

Turning climate strategies and actions into effective programs and policies requires thoughtful, context-sensitive and community centered approaches. The following high-level considerations can help support successful implementation:

Environmental Justice

The State's Healthy Environment for All (HEAL) Act requires state agencies to set a goal of directing 40% of all grants and expenditures that create environmental benefits to vulnerable populations and overburdened communities. Jurisdictions in the region can demonstrate our commitment to the state's environmental justice goals by striving to meet this goal when implementing climate strategies. Likewise, partners should prioritize strategies that both reduce emissions and result in direct community benefits, thereby stacking benefits for the region's most vulnerable communities.



Community Engagement

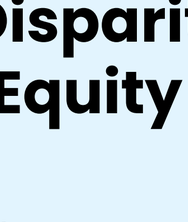
Implementing the strategies in this climate plan will require ongoing, deep collaboration with communities to inform equitable program and policy design, build trust, and avoid unintended consequences, particularly at the local level. Program design should center equitable community engagement.

Geographic Disparities in Health Equity

The impacts of climate change can have long-term, amplifying effects on social inequalities that already exist in communities. Data like the Washington Environmental Health Disparities Map and the Agency's Overburdened Communities Map show how benefits and burdens are distributed unevenly across communities in the Puget Sound. Implementers should leverage this data and develop new modeling and geospatial analyses to quantify the public health impacts of climate strategies and maximize benefits for overburdened communities.

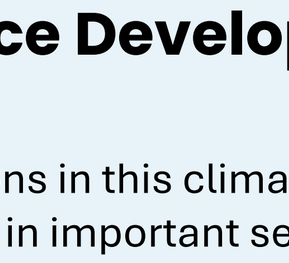
Workforce Development

Implementing the actions in this climate plan will require accelerated job growth in important sectors like building electrification; electric vehicle production, infrastructure and maintenance; renewable fuel production; energy transmission, storage, and distribution; and others. Jurisdictions must prioritize green jobs and youth development and address known workforce challenges, including a just transition for fossil fuel workers, to support this job growth in our region.



Utility Collaboration

Many of the challenges associated with the state's clean energy transition largely fall upon electric and natural gas utilities to address. Our region's utilities must remain involved in strategy implementation, electrification, and grid modernization planning at all levels of government to meet the region's near- and long-term climate goals. Implementers should collaborate with utilities early and often during policy and program development.



Ongoing Regional Coordination

The climate strategies in this plan must scale across jurisdictional borders to maximize their impact. The Puget Sound Clean Air Agency can serve as a backbone organization, bringing transparency to implementation activities and highlighting opportunities for necessary collective action.

WORKFORCE DEVELOPMENT

Building an Inclusive and Prosperous Climate Workforce

As the region's investment in clean technology grows, so will the need for a future clean technology workforce. Workforce development challenges and gaps, recommendations, and models for success are summarized here.

Challenges and Gaps	Recommendations
Racial and Gender Diversity in Clean Energy Occupations • Advancements in zero-emission technology are bringing sustainable, living-wage career opportunities to the region, and it is essential that all communities have access to those benefits. • While opportunities in the region's clean energy sector have great potential, this sector often lacks racial and gender diversity compared to other sectors.	**Support Equitable Pathways to Finding and Retaining Talent** • Industry, government and educational institutions all have a role to play in building community capacity to support a diverse and equitable workforce in the region. • Regional partners can work together through the Coalition for Climate Careers (C3) collaborative to explore new ways to increase awareness and perception of green jobs and skillsets with a focus on youth, and connect frontline communities to economic opportunity in the regional green economy
Worker and Trainee Support • For many vulnerable populations, including low-income and minority communities, finding and keeping a high-quality job, training course, or apprenticeship can be difficult without adequate logistical support. • Wraparound services can provide comprehensive and coordinated support to help individuals become job-ready and stay employed.	**Enhance Employee and Trainee Support Services** • Local employers, education and training providers, schools, community colleges, labor partners, and national and community-based organizations all have opportunities to provide support for employees and trainees. • These entities can connect with programs like C3 to identify and support consistent, regional guidelines and programs for wraparound services that eliminate employment barriers and promote long-term career aspirations.
Work-Based Learning • Accessible and practical solutions are essential to create opportunities for emerging workers to gain experience on projects central to decarbonization and clean energy deployment. • Historically, pre-apprenticeship programs have struggled to support graduates in securing competitive apprenticeship placements.	**Scale Work-Based Learning Opportunities** • Leveraging coalitions like C3 and successful models like Jumpstart, regional partners across trades can work together to establish more paid work-based learning opportunities for graduates of registered pre-apprenticeship programs. • Regional partners should work with the Washington State's Department of Labor and Industries to establish clear guidance around contractor participation and ratio requirements to ensure paid work-based learning is effectively implemented and scaled across the region.
Public-Private Partnerships • Public-private partnerships play a pivotal role in shaping a workforce development landscape that responds to the evolving needs and gaps across our region. • Work must be done to expand access to public-private partnerships to prepare the region for the demands of climate action.	**Leverage Public-Private Partnership to Support Innovation** • Local and regional governments and employers can connect with coalitions like C3 and the BUILT Cluster to expand access to public-private partnerships and catalyze private investment to scale successful workforce development models across the region.
Federal and State Funding • Recent reductions in federal and state funding for workforce development initiatives mean less funding for programs that provide training, upskilling, and employment support. • Regional partners must find new ways to establish long-term funding streams and resource networks to advance skills training and workforce development in climate- and energy-related capital projects.	**Fill Gaps in Federal and State Workforce Development Funding** • Leveraging coalitions like C3 and potential models like the "1% for Workforce" program, industry, government and educational partners can work together to identify and establish durable public-private funding streams to support the region's climate workforce development needs. • These same partners can support legislation to scale-up innovative workforce development programs and explore developing regional applications to state funding opportunities to enhance competitiveness (e.g., Green Jobs Grant Program).

Regional Models for Success

King County's JumpStart Program	CleanTech Alliance BUILT Cluster	1% for Workforce Program
King County's JumpStart program partners with local pre-apprenticeship initiatives to connect graduates directly with contractors across various fields. JumpStart's growing network of over 20 local employers, eight education and training providers, and community partners connects youth ages 18-24 with paid, work-based learning and employment opportunities in the clean energy sector.	The Buildings, Utilities, and Infrastructure Living Together– or the BUILT Cluster – leverages the State's social and intellectual capital to decarbonize the built environment by supporting cradle-to-career education and training opportunities for related industries and the trades including K-12 STEM pipeline, continuous education for the trades, internships and apprenticeships, and recruitment and talent acquisition.	Inspired by existing "1% for Arts" programs in the region, King County is exploring a "1% for Workforce" program to create a funding stream to weave skills training, workforce development, minority- and women-owned business engagement, and living-wage career on-ramps into applicable County capital projects, creating a much-needed long-term funding source for workforce development and training activities.

UTILITY CONSIDERATIONS

Many Climate Plan strategies and actions involve electrification, especially in the transportation and built environment sectors. The region's clean energy transition will require thoughtful planning and implementation, taking into account energy challenges in production and transmission that largely fall to electric utilities to address. Decision-makers should keep in mind the following considerations:

Utility Involvement in Electrification Planning Efforts

- To meet the region's energy goals, utilities must find new and improved ways to generate, supply, store, and transmit electricity loads across and beyond their service territories, while simultaneously managing ratepayer costs and significant lead times for infrastructure build-out. The process of planning, permitting, and constructing new storage, transmission, and distribution infrastructure can take over a decade.
- Whether implementing jurisdiction-wide electrification policies or identifying project-specific needs, local and regional governments must involve utilities in their electrification planning conversations early and often to identify constraints and ensure projects stay on track.

Partnering to Meet Growing Energy Needs and Decarbonization Goals

Investments in generation, transmission, and storage to meet electrification goals will help enhance our energy resilience and enable a robust clean energy pathway for the future, Local governments can:

- Encourage development of clean energy sources, including small modular reactors, bioenergy, long-duration battery storage, and hydrogen, to create a resilient electric grid that can support decarbonization strategies at the local level.
- Advocate for new policies to reduce permitting delays for the construction of clean energy generation and transmission capacity while maintaining adequate timelines for meaningful community engagement.
- Advocate with state policy makers to explore new mechanisms and governance structures for increasing transmission capacity.

Awareness Around Utility Incentive Programs

- Utilities in the region have developed various incentive programs with the intent of creating an inclusive and equitable energy transition for communities.
- Local and regional governments should ensure they understand the rules and eligibility requirements associated with utility.
- Utilities and local government should work together to raise awareness and communicate the benefits of these programs to communities, and identify how these programs can complement and bolster existing climate action.

Building on Regional Conservation Successes

The region's utilities have a strong history of energy conservation. Building on successes and lessons learned can help to mitigate demand from increased electrification. Opportunities include:

- Increased emphasis on energy efficiency and conservation, particularly as consumers purchase and install electrified equipment in homes and businesses.
- Transportation electrification planning that results in managed and bi-directional electric vehicle charging strategies.
- Expanded implementation of demand-response programs, including rate design, that encourages energy consumption at times of low demand.
- Expansion of local distributed energy resources, including solar installations paired with battery energy storage

Opportunities for Local Government to Incentivize Electrification

- Local governments can work with their utilities to develop solutions to ensure all residents, especially low-income residents, can benefit from electrification incentives programs.
- Local government should also work with utilities to ensure incentive programs are implemented in the correct order to ensure maximum effectiveness (e.g., weatherization incentive programs should always be implemented before appliance replacement incentive programs).

Cost Effective Decision Making

- Utilities must balance the need for more cost-effective efficiency investments with the up-front costs of new generation sources in their long-term planning decisions, and ensure replacement sources are established before eliminating greenhouse gas-emitting energy sources (e.g., natural gas).
- Promoting energy efficiency measures through incentive programs and energy code changes continues to be a low-cost way for our region to reduce electricity demand. However, as the market transforms and code changes are implemented, the energy savings from many common low-cost measures, such as energy-efficient lighting, are not as readily available as they once were.