

Pacific NW – Adaptation Strategies, Mitigation, and Local Efforts

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QUUF / L2020 Climate Class – Jan 10, 2017

Climate Preparedness Plan for NOP Focus Areas



Critical
Infrastructure











Ecosystems

Water
Supplies

[Link to plan](#)

TOP 10 Strategies for Critical Infrastructure



STRATEGY	SCORE	TYPE	LEAD GROUP(S)	CO-BENEFITS
Update Emergency management and response planning to include climate change where needed	20	PLANNING	Emergency Manager	
Reduce inflow and infiltration to wastewater systems	19.5	POLICY	Operations and Maintenance Dept.	
Update planning documents to incorporate sea level rise and flooding where needed	19	PLANNING	Multi-Stakeholder	
Do outreach and education on climate adaptation to build community support	19	AWARENESS	Multi-Stakeholder	 
Develop and utilize decision making tools related to climate change risks	18	PLANNING	Local Governments	 
Create critical area flood mapping beyond FEMA's historical flood data	17	PLANNING	Multi-Stakeholder	
Encourage soft defenses for shoreline infrastructure	16	POLICY	Local Government & Private Sector	
Improve on-site stormwater management practices	16	POLICY	Multi-Stakeholder	
Participate in FEMA's Community Rating System (CRS)	16	PLANNING	Multi-Stakeholder	 
Enhance stormwater retention in upstream areas	16	POLICY	Multi-Stakeholder	

Critical Infrastructure Adaptation Strategies -

CI-3: Update planning documents for sea level rise and flooding where needed					
Score	Type of Strategy	Timeframe for Implementation*	Lead Group(s)	Opportunities or Concerns	Focus Area Co-benefits
19	Planning	Near Term	Multi-Stakeholder	<i>Medium and long-term issue where planning now can help reduce future costs</i>	<i>Ecosystems</i>

*Near-term (0-3 years), Medium-term (3-10 years), Long-term (>10 years)

Key Action Steps:

- Create a sea level risk district for inclusion in Comprehensive Plan and promulgate new codes and code changes associated with managing for sea level risk.
- Incorporate climate change and coastal hazard considerations into building codes by increasing freeboard requirements to two feet (three feet for critical projects) above the current 100-yr flood plain as buildings are redeveloped, developed, or renovated.
- See **Supplementary Information C** for more details.










TOP 10 Strategies for Ecosystems



WATER
SUPPLIES



CRITICAL
INFRASTRUCTURE

STRATEGY	SCORE	TYPE	LEAD GROUP(S)	CO-BENEFITS
Enhance efforts to encourage breeding and planting of drought tolerant, resilient plant species	20	AWARENESS	Agriculture/Forestry & Edu. Orgs	
Incorporate climate change more explicitly into comprehensive plans and Shoreline Master Programs (SMP)	19	PLANNING	Local Governments	
Enhance promotion of agricultural best management practices to include future climate conditions	19	AWARENESS	Agriculture Sector and Edu. Orgs	
Update municipal codes to account for enhanced fire risk at forest/residential interface where needed	19	POLICY	Local Governments	
Increase regional capacity for water storage <i>(preferable with natural systems)</i>	18	PLANNING	Multi-Stakeholder	
Encourage FEMA to incorporate climate change in rate maps and guidance	18	PLANNING	State and County Government	
Develop graphic tool to illustrate climate impacts	17.5	PLANNING	Multi-Stakeholder	 
Update financing policies for development in high risk areas	17	POLICY	Multi-Stakeholder	
Enhance efforts to incentive use of native plants landscaping in residential, commercial, industrial settings	17	AWARENESS	Local Gov't and Private Sector	
Utilize low cost citizen science monitoring and analysis approaches and technologies	17	AWARENESS	Research Institutions and Citizens	

TOP 10 Strategies for Water Supplies

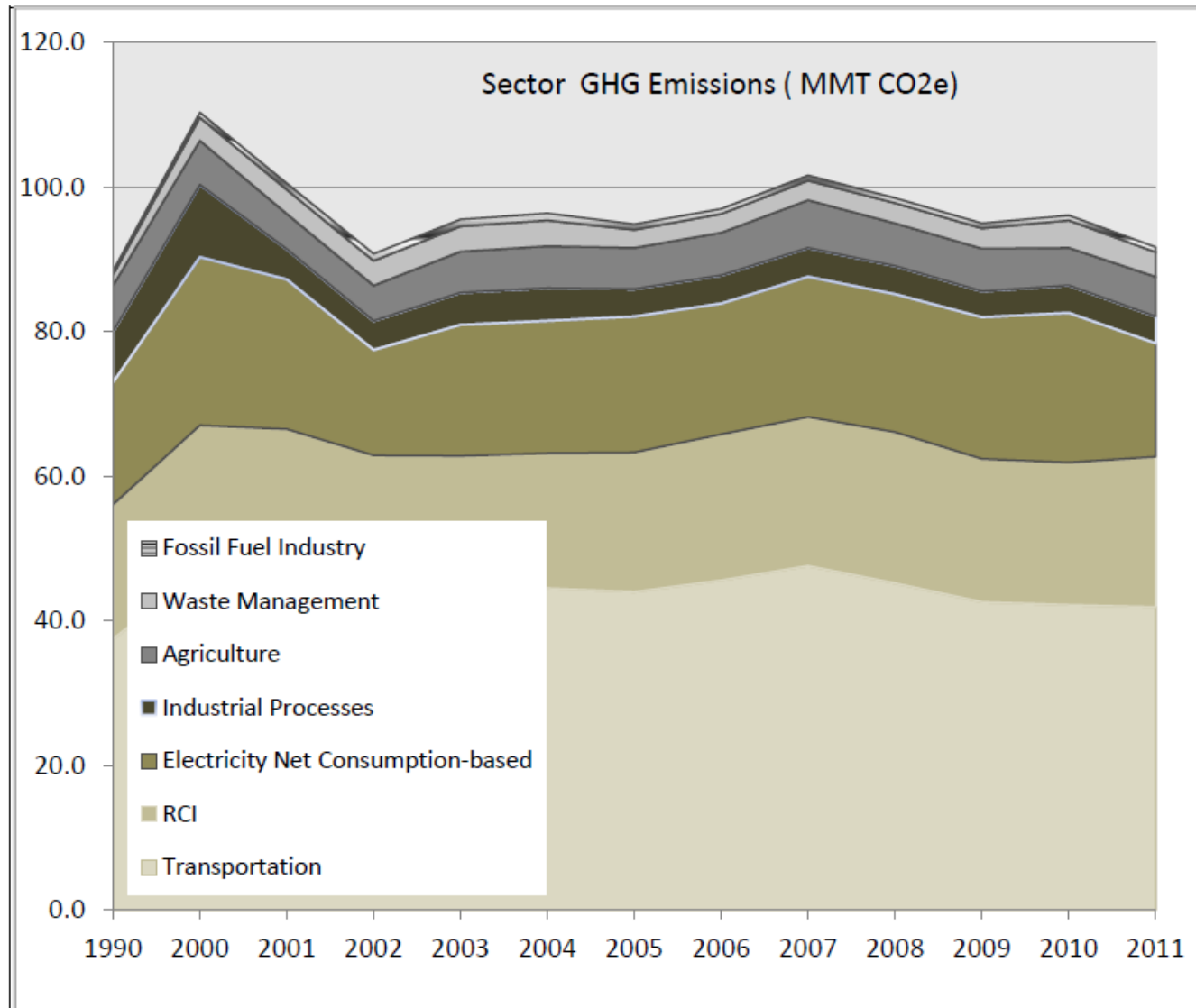


STRATEGY	SCORE	TYPE	LEAD GROUP(S)	CO-BENEFITS
Enhance education on drought & water supplies issues for the peninsula	20	AWARENESS	Multi-Stakeholder	
Adopt new regulations requiring water-efficient appliances	20	POLICY	State Government	
Promote and incentivize smart irrigation technologies for agriculture	20	AWARENESS	Agricultural Sector	
Identify monitoring needs and enhance water supply monitoring	19	AWARENESS	Multi-Stakeholder	
Enhance efforts to educate home and business owners on the value of on-site water conservation, retention, and catchment	18	AWARENESS	Multi-Stakeholder	
Continue to study ways to enhance water storage and groundwater recharge	18	PLANNING	Water Utility & Local Governments	
Encourage forestry practices promoting water retention within the watershed	18	AWARENESS	Forestry Sector	
Research or develop model to assess sea level rise and saltwater intrusion to groundwater	18	PLANNING	Local Governments	
Improve forecasting for future water supply and demand	18	PLANNING	Water Utility Managers	
Map water retention values for ecosystems	18	PLANNING	Multi-Stakeholder	

Mitigation - Greenhouse Gas Reductions in Pacific NW

Washington State GHG Emissions

Figure 1: Total annual GHG emissions (MMt CO₂e) by sector from 1990 – 2011



MMt: Million Metric Tons, RCI: Residential, Commercial, Industry use of fuels (propane, etc.)

Governor Inslee's Executive Order

Carbon Emissions Reduction Taskforce
Convene a taskforce to make recommendations for a carbon emissions reduction program for consideration during 2015 legislative session.

Energy Efficiency
Focus on saving costs and reducing emissions from buildings by improving their efficiency and taking advantage of clean power.

Coal-Fired Electricity Transition
Work with private utilities and federal agencies to facilitate the transition from coal to cleaner electricity sources.

Clean Technology
Develop a new state program to support renewable energy and energy efficiency technology innovation in the public and private sectors.

Clean Transportation
Decide how to accelerate our use of clean cars and clean fuels, and reduce transportation emissions.

Governor Inslee's Climate Executive Order

"This is the right time to act. This is the right place. And we are the right people to make this happen."
— Gov. Inslee, April 29, 2014

Lightbulb icon via Chris Brunskill, the Naan Project
Power lines icon via Phil Laver, the Naan Project

#ActOnClimate
bit.ly/ClimateWA

WA Clean Air Rule

- In 2017 organizations that are responsible for 100,000 metric tons of carbon pollution annually are required to cap and gradually reduce their emissions.
- Every three years, the threshold is lowered by 5,000 metric tons and more emitters are brought into the program.
- By 2035 the threshold will reach 70,000 metric tons where it will remain.

Inslee Budget Proposal for 2017

- Would “Enact a carbon tax that would charge the state’s emitters \$25 per metric ton starting in 2018, raising \$2 billion. “

7th Power Plan Summaries (for Residential, Commercial, etc.)

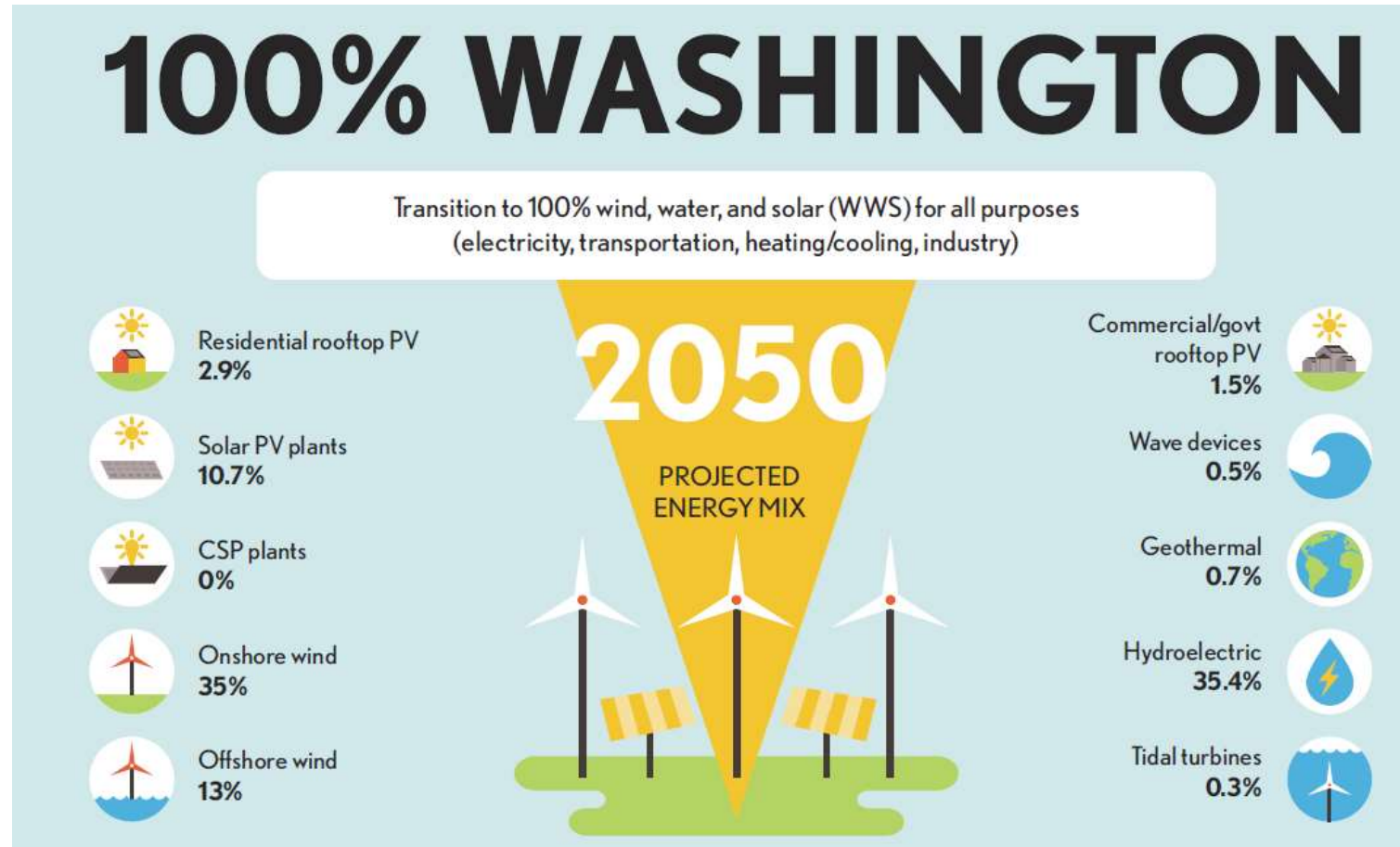
Energy Efficiency is the cheapest and least risky way to meet future load growth, AND the cheapest way to reduce GHG.

Table 12 - 2: Summary of Potential and Cost for Residential Measure Bundles

Measure Bundle	Maximum Achievable Technical Potential (aMW)			TRC Net Levelized Cost (\$/MWh)		
	2021	2026	2035	Weighted Average	Min	Max
HVAC	248	460	793	136		
Weatherization	166	233	248	104	(16)	843
Air Source Heat Pumps	12	45	130	363	22	1,075
Heat Pump Controls Commissioning and Sizing	4	16	46	54	29	285
DHP for zonal heated homes	12	45	132	134	94	153
DHP for forced air furnace homes	28	76	158	45	41	57
Duct Sealing	21	30	32	60	12	133
Ground source heat pumps	0	3	19	169	157	181
WIFI Enabled Thermostats	4	10	12	40	40	43
Heat Recovery Ventilation	0	3	16	124	76	140
Lighting	177	380	484	1		
Lighting	136	334	425	(9)	(120)	353
Lighting (pre-2020 general service lamps)	38	38	38	(59)	(74)	0
Linear fluorescent lighting	3	9	20	301	154	617

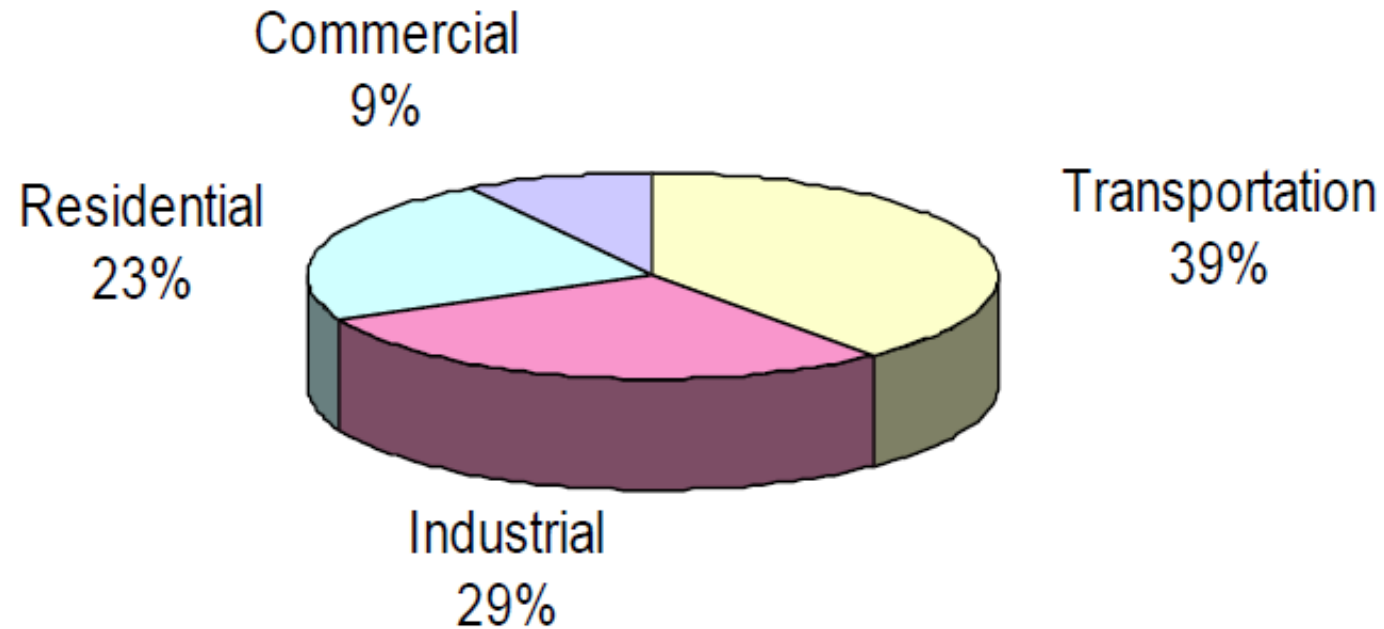
TRC: Total Resource Cost, aMW: annual average Megawatts

100% Renewable for WA - Jacobson Plan



One caveat – storage costs not estimated

Jefferson County GHG Emissions - 2005



[Jefferson County and Port Townsend Climate Action Plan](#)

Note: since then, PTPC and electricity GHG ↓

Ideas for County-wide GHG Reductions



Climate Action Plan

Port Townsend/Jefferson County, Washington



Jefferson County Opportunities

- From CAP:

Section 2 - Community-wide Transportation: Moving People and Goods More Efficiently

Idea	Benefit	Feasibility	Total
1. Develop a Smart Trips program to promote public transportation, ride-sharing, walking and biking.	4.11 (22%)	4.00 (21%)	8.11
2. Increase funding for public transportation.	4.56 (14%)	3.44 (17%)	8.00
3. Develop a commuter-friendly transit plan and increase service where appropriate.	3.89 (18%)	3.78 (8%)	7.67
4. Promote use of fuel efficient, alternative-fuel and hybrid vehicles, including low-pollution scooters.	4.00 (23%)	3.56 (17%)	7.56
5. Provide electric vehicle recharging stations at government offices, in residential areas, and in commercial crossroads.	4.44 (14%)	3.00 (23%)	7.44

Local Opportunities to Get Involved

From Community Read Climate Panel - March 2016

Local Organizations

- [Green Sanctuary Committee – QUUF](#)
- [Jefferson Land Trust](#)
- Jefferson County Food Council
- [North Olympic Peninsula Resource Conservation and Development Organization](#)
- [Port Townsend Marine Science Center](#)
- [The Recyclery](#)
- Peace and Social Concerns Working Group - Port Townsend Friends Meeting (PTFM)
- [See handout](#) for more information, or see the video here ([parts I and II](#)) and here ([part III.](#))

Jefferson County Marine Resource Committee and WSU Extension Water Programs

- MRC – an advisory committee to the county commissioners, focused on protecting and restoring marine resources and habitat
 - Education and restoration programs
 - Helps build resiliency to climate impacts
- WSU Extension / Water programs
 - Educating community about water issues:
 - Digging for Dinner
 - Olympia oyster restoration
 - Beach Naturalist program
 - Rain gardens
- Note: not on handout, contact Cheryl Lowe, cheryl.lowe@wsu.edu for more details



- Climate Action Committee -

Created to implement the Climate Action Plan adopted by Port Townsend and Jefferson County.

Members of the Committee represent:

- County Council
- City Council
- Non-motorized transportation
- Student groups
- PTPC
- Jefferson Transit
- Jefferson County Public Health
- PUD
- Port of Port Townsend
- Local 20/20

Port Townsend High School Students for Sustainability



”Climate change is the issue of our generation.
We urge our leaders to act NOW
because our future matters!”

LOCAL 20/20

ACTION GROUP EFFORTS TO MITIGATE THE IMPACT OF CLIMATE CHANGE



And now, Art for Earth, Heart Circles, and Health and Wellness

www.l2020.org



Why Climate Action Now?

Energy use is costly to your pocketbook and your environment. Burning fossil fuels for energy generates greenhouse gases, such as carbon dioxide, which lead to [global warming and climate change](#).

The governments of [Jefferson County and Port Townsend](#), Washington, set a goal of reducing countywide greenhouse gas emissions to levels 80% lower than 1990 levels by 2050. Making this a reality requires individual commitment. We believe that the citizens of Jefferson County [CAN](#) rise to this challenge!

Why This Website?

This website provides the tools you need to save energy, save money, and reduce your carbon footprint — at home, at work, and on the road — with tools specific for Jefferson County, Washington. Try one or two, and you may be surprised to learn that saving energy doesn't mean sacrificing quality of life!

If you're new to the site, we recommend clicking on the [Get Started Guide](#). We also invite you to subscribe to our blog and "like" us on Facebook to keep up with the latest news.

Another way to start is to try one of the Carbon Calculators on the web. Here are a few we found helpful, check them out and see where your greenhouse gas "contributions" are the highest! Then you can visit the various topic areas on the top of this page to get ideas for how to reduce in those areas.

<http://www.carbonfootprint.com/calculator.aspx>

<http://coolclimate.berkeley.edu/calculator>

Search JeffersonCAN.org



RSS SUBSCRIBE

Recent Posts

- Reduce Your Carbon Footprint, Win Prizes, Save Money, Have Fun!
- Summer Drought: A Window to our Future?
- Wanted: Citizen Scientists to Monitor Olympic Precipitation!
- Great Recycling News in Jefferson County!
- Feb 7th Event – Climate Change and Reasons for Hope

Our Mission

JeffersonCAN.org provides information to citizens of East Jefferson County, Washington, to reduce their carbon footprint and live a

<http://jeffersoncan.org/>

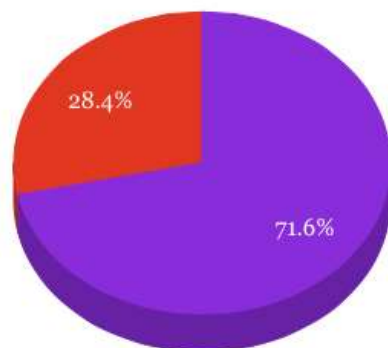
NOP Climate Preparedness Plan
Climate Dashboard

Climate Adaptation Dashboard

The collaborative process undertaken during the [Planning for Climate Change on the North Olympic Peninsula Project](#) brought together over 175 stakeholders from across the North Olympic Peninsula of Washington State. The recommended climate change adaptation strategies are centered on **three focus areas: Ecosystems, Water Supplies, and Critical Infrastructure.**

In order to track progress towards and achievement of these prioritized adaptation strategies, project stakeholders have been reporting on the status of their implementation of these strategies. Below is a summary of the responses received before May 31, 2016.

Summary of All Project Responses



- Strategies with Status of In Planning, In Process, or Complete
- Strategies Not Yet Started

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Type to search, then press enter...

More About Climate Action

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- [Climate Change Resources](#)
- [Planning for Climate Change on the North Olympic Peninsula Project](#)
- [Drought 2015](#)

Climate Action RSS Feed

Jefferson CAN

[JeffersonCAN.org](#)

Climate Action Now

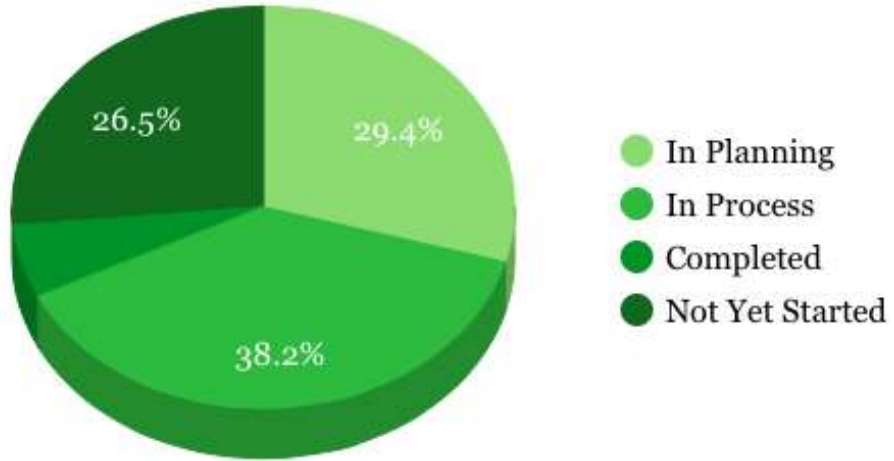
Learn what you can do to save energy, save money, and reduce your carbon footprint

Climate Action Committee

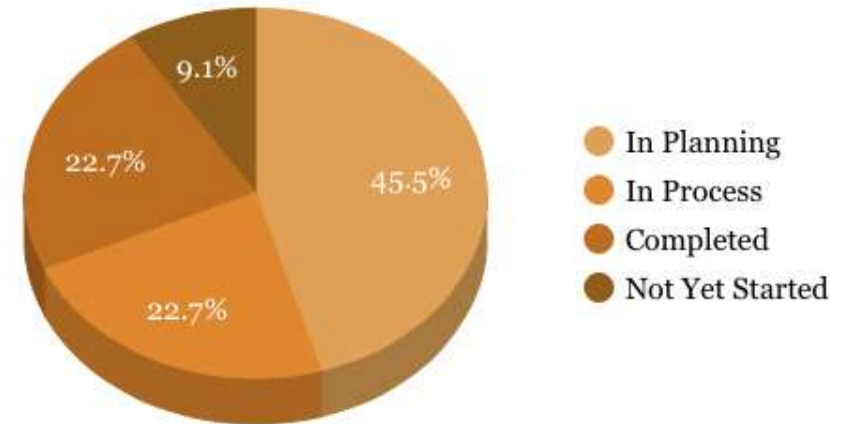


Learn about the joint city/county Climate Action Committee and the joint Climate Action Plan

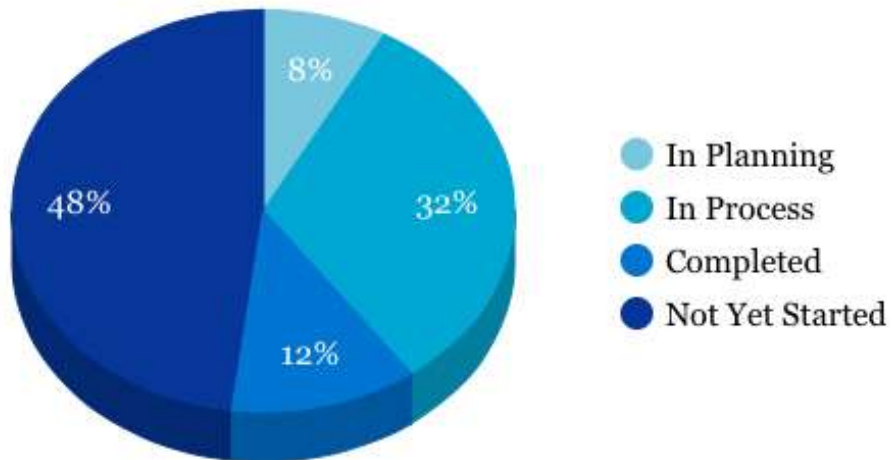
Summary of Ecosystem Responses



Summary of Critical Infrastructure Responses



Summary of Water Supply Responses



Active Strategies by Organization

Show entries

Search:

Organization	↕ Ecosystem ↕	Water Supplies	↕ Critical Infrastructure ↕
City of Sequim	9	7	3
Clallam Conservation District	2	0	0
NOPRCD	1	2	1
Local2020	3	2	1
Makah Tribe	19	5	2
City of Port Townsend	4	5	8
Northwest Straits Commission	5	0	1
Washington Water Trust	1	2	1
Neah Bay	1	0	0
Streamkeepers of Clallam County	6	0	0

Showing 1 to 10 of 16 entries

[← Previous](#) [Next →](#)

Click the name of an organization to see descriptions of all their projects by strategy and status.

Organization Activity by Strategy Number

Show entries

Search:

Project Number and Description	In Planning	In Process	Completed
E-1: Enhance efforts to encourage breeding and planting of drought tolerant, resilient plant species.	<ul style="list-style-type: none">•City of Sequim•Clallam Conservation District		
E-2: Incorporate climate change more explicitly into comprehensive plans and Shoreline Master Programs (SMP)	<ul style="list-style-type: none">•NOPRCD•Local 2020•Makah Tribe	<ul style="list-style-type: none">•City of Sequim•Clallam Conservation District•City of Port Townsend	
E-3: Enhance promotion of agricultural best management practices to include future climate conditions	<ul style="list-style-type: none">•Northwest Straits Commission•Makah Tribe		
E-4: Update municipal codes to account for enhanced fire risk at forest/residential interface where needed	<ul style="list-style-type: none">•Local 2020		
E-5: Increase regional capacity for water storage (preferably with natural systems)	<ul style="list-style-type: none">•City of Sequim•Clallam Conservation District•Washington Water Trust•Neah Bay		

Local Organizations/ Opportunities

- Other opportunities that you know of?