



# Offshore Wind for Washington State

November 2023

*Includes information from E3 Study commissioned by  
Trident Winds, Inc. (May 2023)*

# WA State Energy and Climate Goals



Clean Energy Transformation Act of 2019 (Senate Bill 5116)

Carbon neutral electric supply by 2030 and zero CO2 emissions by 2045



Climate Commitment Act (2021) plus Zero Emissions Vehicles Act (2020)

Creates increasing demand for clean electricity

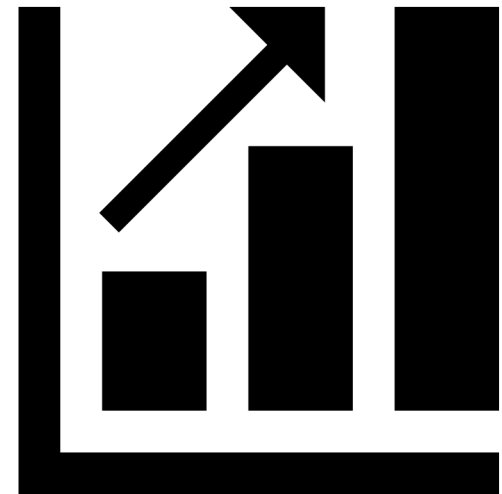


WA Policies

Require fundamental shift from fossil fuels to clean energy

# NW Power Council (NWPC) Projects Electricity Capacity Winter Shortfall

- ▶ The 2021 NWPC Reference Resource Strategy calls for **5.4 Gigawatt (GW)** of renewables between 2020 and 2027.  
(Power Council's Resource Adequacy Advisory Steering Committee, 12/5/22)
  - As of December 2022, only 0.59 GW of new renewables have been put into operation
- ▶ If the Reference Resource Strategy is not implemented the projected WA state winter **shortfall could reach of 5.2 GW by 2027**
- ▶ If higher energy demand prevails, **winter shortfall could grow to 6.3 GW by 2027**
  - An addition of approximately one Grand Coulee Dam



WA State needs to add GWs of clean energy to meet its energy demand and climate goals


# System Value of Offshore Wind in Washington

Prepared for Trident Winds Inc.

May 2023



Energy+Environmental Economics

A photograph of an offshore wind farm at sea, with several wind turbines visible against a cloudy sky. The image is partially obscured by a large, dark blue diagonal graphic element.

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# E3 Model Addresses Renewable Energy Needs at Lowest System Costs

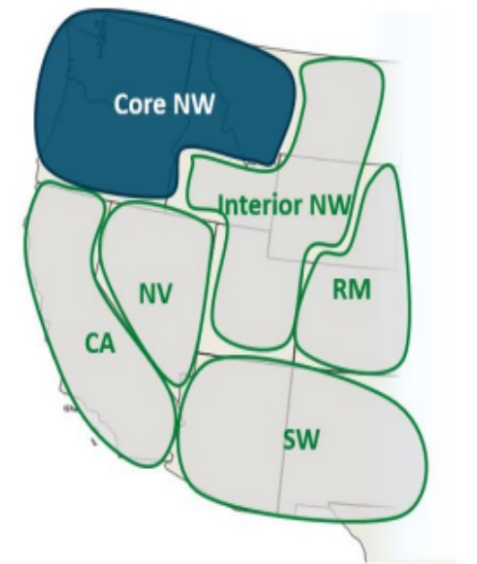
## Summary of Approach and Findings

- ▶ E3 Study modeled energy needs and economics with and without WA Offshore Wind (OSW)
- ▶ In winter months WA OSW is more valuable resource than OR OSW to WA state electrical system
- ▶ Leveraging NW Offshore Wind showed large system and WA state financial benefits to energy consumers/ratepayers



# Key Inputs to E3's Capacity Expansion Model

- Load Forecasts
  - Builds on the 2021 NW Power Council Plan, with adjusted boundaries for the “NW Core” study area
  - WA State Energy Strategy using [high electrification](#) scenario
- Projected build outs
  - WECC 2020 Anchor data set, 2021 NW Power Council Plan
- Achieving WA Energy Policy Goals
  - CETA, GHG, Climate Commitment Act, etc.
- Resource Cost
  - NREL Annual Technology Baseline (ATB) provides a consistent set of technology cost and performance data
- E3's Market Price Forecast

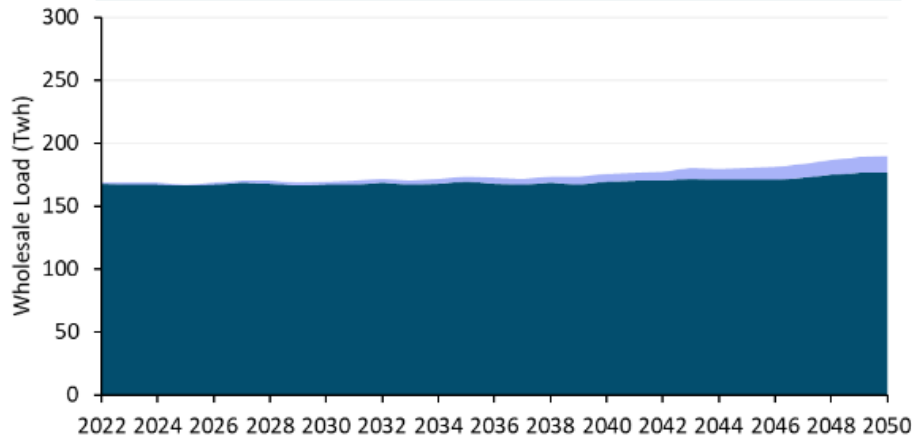




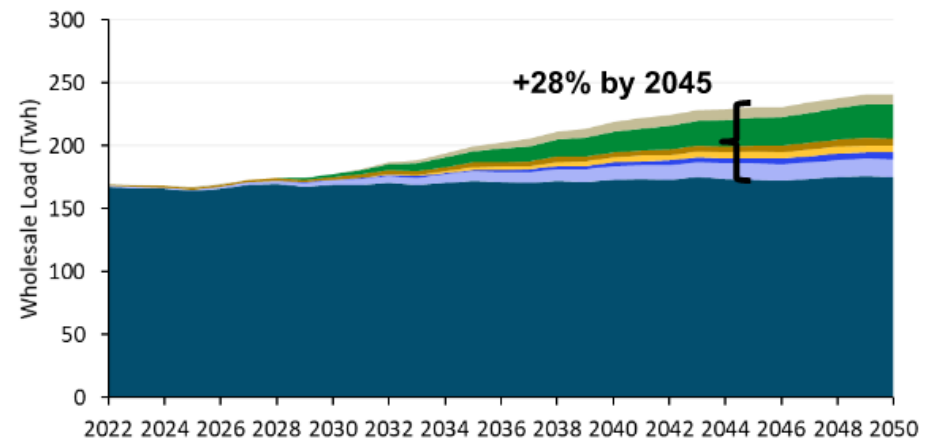
# Load Forecast

- + Base load forecast is from NWPCC 2021 Plan benchmarked to E3's boundary of Core NW
- + High Electrification scenario takes Washington's State Energy Strategy high electrification load and then scales up and benchmarked to the Core NW
  - Electrification grows across all sectors, most noticeably in commercial and transportation to meet state's net-zero emissions by 2050.
  - Commercial and residential SH electrification indicates a switch to high electric resistance & heat pump adoption which will significantly impact load profiles and ultimately peak load

### Base Forecast for Core NW



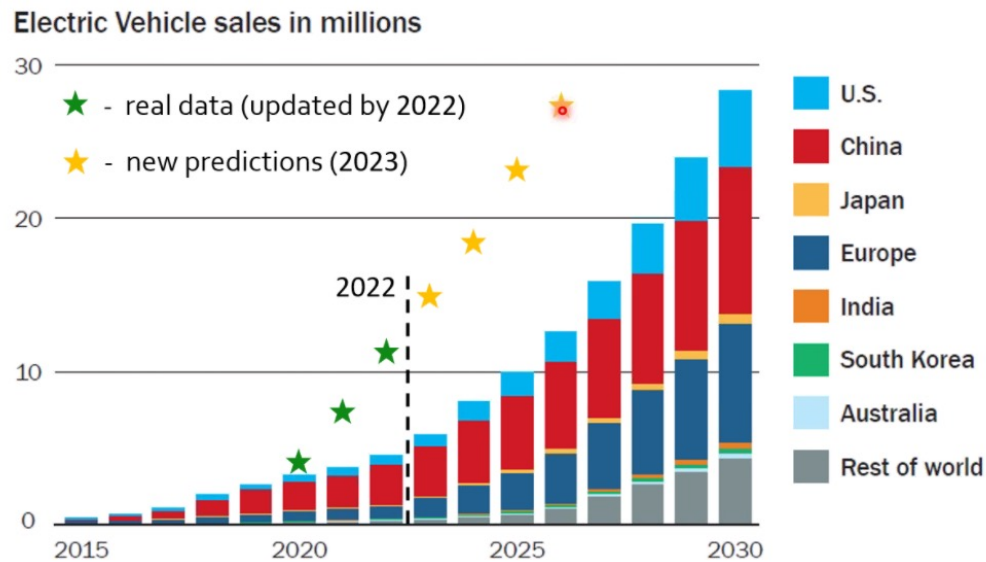
### High Electrification Load Forecast for Core NW



■ Core NW Baseline ■ LDV ■ HDV ■ Residential SH ■ Residential non-SH ■ Commercial ■ Industrial

# EV Sales Exceed 2019 Projections

- ❖ In 2022, EVs accounted for 18.6% of total vehicle sales
- ❖ Will the predictions hold?  
Will it underestimate?
- ❖ **Demand is exceeding the expectations, so we must ensure we will meet it**



Annual Sales of Passenger EVs (Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs))

Source: BloombergNEF Long-Term Electric Vehicle Outlook 2019

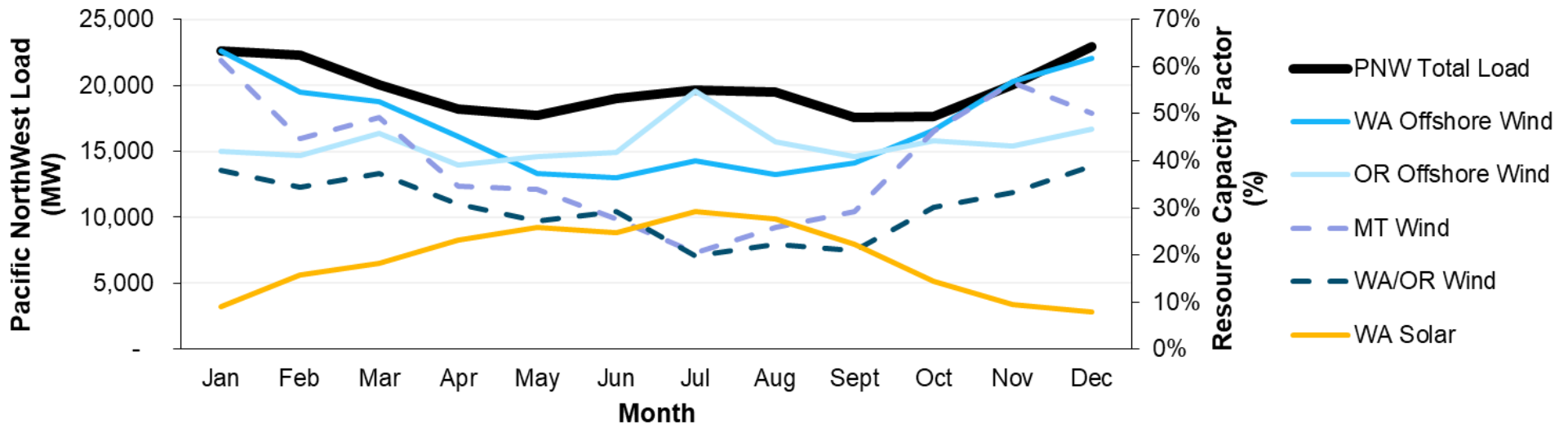


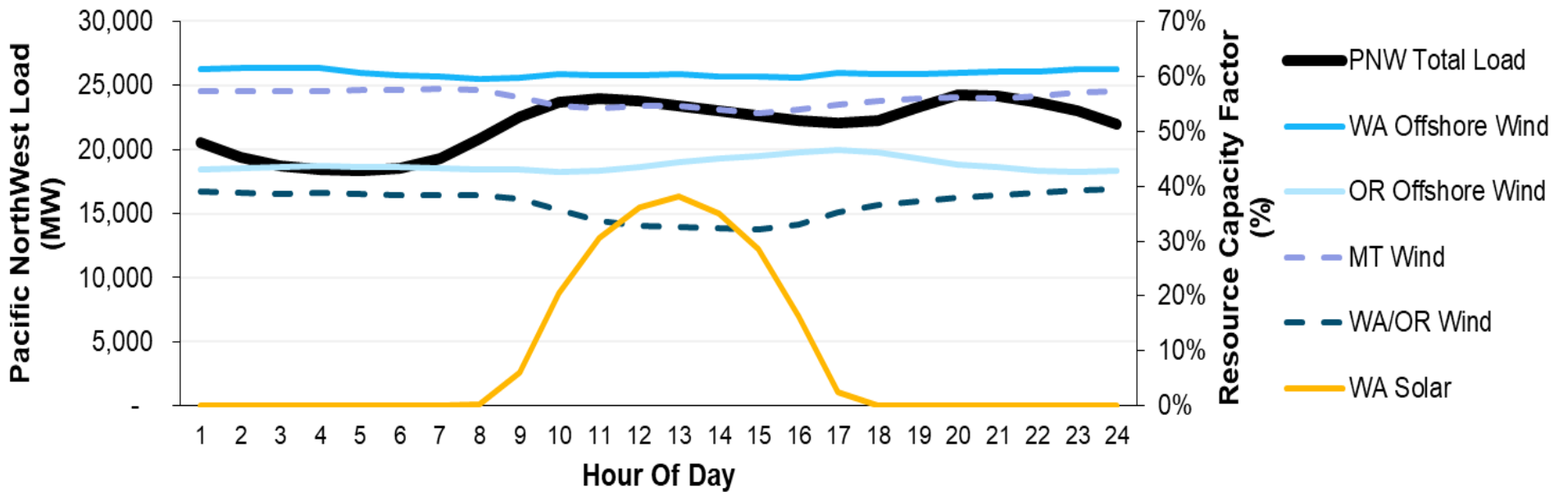


## WA OSW Production is Highest in Winter Months

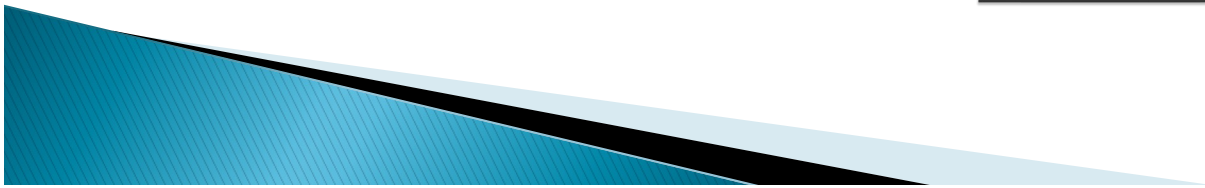
- ▶ WA OSW is best to serve WA load in Winter months to satisfy the coincident peak demand
- ▶ Solar seasonal production is inversely related to Northwest seasonal load patterns
- ▶ OR OSW has a flatter seasonal production pattern w/summer spike
- ▶ Onshore wind resources exhibit a similar pattern to WA offshore wind but at lower average Winter capacity factors

Average Monthly Northwest Load and Capacity Factor by Resource Type





**WA OSW has the highest average generation (capacity factor %) compared to solar, WA/OR, MT onshore wind and OR offshore wind across all winter hours**



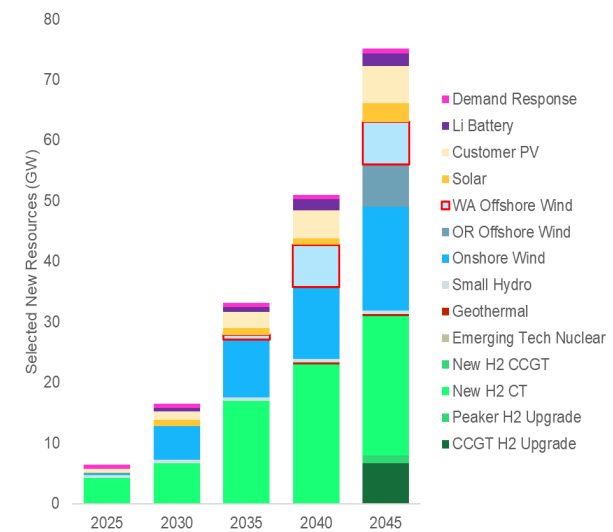
# Large WA Energy System Benefits (7 GW WA OSW)

- ▶ Offshore wind has the potential to reduce system costs to Washington ratepayers over **\$5 billion on a Net Present Value (NPV)** basis in the Base Scenario when WA is limited to **7 GW of OSW**

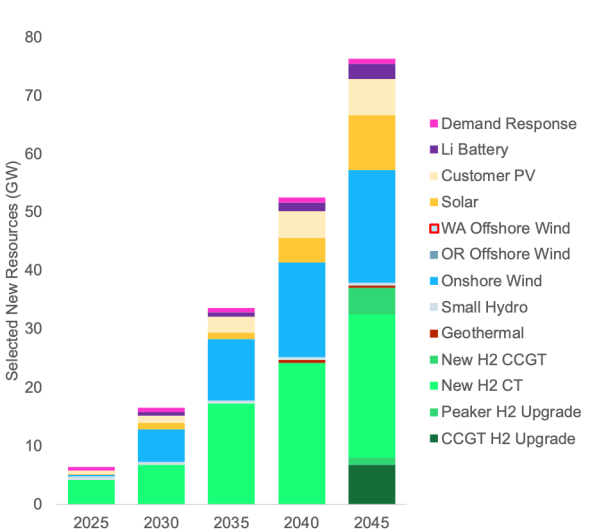
$$\text{System Cost Savings} = \text{Costs without OSW in WA/OR} - \text{Costs with OSW Allowed}$$

- ▶ Most system benefits of offshore wind concentrated in 2045 due to large additions to reach policy goals

Selected Resources with Limited OSW



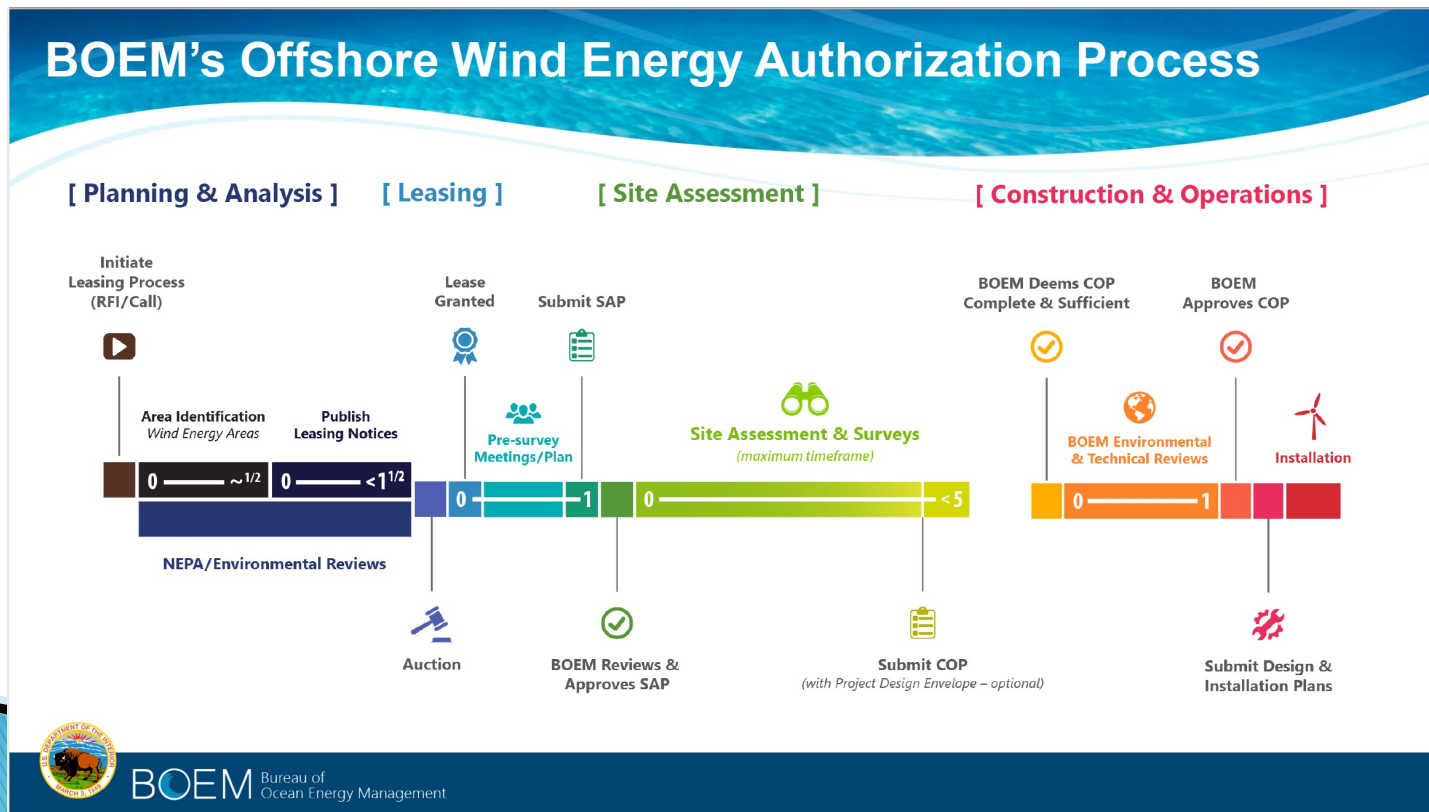
Selected Resources without OSW



# BOEM's OSW Leasing Process (30 CFR 585)

The OSW leasing process is triggered by either:

- a) Submittal of an Unsolicited Lease Request to BOEM, or
- b) a Governor's request to BOEM to designate and lease offshore wind energy areas



State-led Interagency Task Force	Governor should form a <b>WA state OSW Interagency</b> Task Force inclusive of all stakeholder groups and tribal entities
BOEM	<b>WA state OSW Interagency</b> Task Force invites BOEM to participate in the interagency coordination BOEM should engage with NW Treaty tribes via direct <b>Government-to-Government</b> coordination
State Studies	WA State to conduct studies to assess value of OSW: <ul style="list-style-type: none"><li>• Meeting Energy and Climate goals,</li><li>• Economic benefits, and</li><li>• Employment benefits</li></ul>
Engage	Engage with ongoing West Coast OSW key regional initiatives such as Transmission, Infrastructure and Workforce Development funded by BOEM, DOE, etc. Coordinate with OR, CA, BPA, NW Power Council on the OSW initiatives, policies and plans

# What's Next?

# THANK YOU!

## Questions???

### ▶ Contacts

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