2021 Washington State Energy Strategy
We strengthen communities
2021 Washington State Energy Strategy

https://www.commerce.wa.gov/energystrategy
Aligning energy and climate policy

• Align strategy with clean electricity laws
  • Energy Independence Act (I-937, 2006)
  • Clean Energy Transformation Act (SB 5611, 2019)
    • After 2025, no coal in resource mix
    • By 2030, greenhouse neutral electricity supply
    • By 2045, 100% renewable or non-emitting sources

• Align strategy with greenhouse gas emissions limits (HB 2311, 2020)
  • By 2030, 45% below 1990 levels
  • By 2040, 75% below 1990 levels
  • By 2050, 95% below 1990 levels and achieve net-zero emissions.
Cross-Sector Considerations

• Maintaining reasonable and fair prices and sufficient supply of energy

• Promoting a competitive clean energy economy and workforce development

• Understanding and addressing the needs of low-income and vulnerable populations

• Reaching and responding to both urban and rural communities
Ensure Equitable Transition for Communities

- Apply explicit equity principles
- Ensure impacted communities design solutions
- Invest in equitable and inclusive transition
- Support workers in transition
- Universal broadband access as foundation for transition

Source: Washington State Department of Commerce
Five Decarbonization Strategies

**Energy Efficiency**
Energy Consumption (Gigajoules/person)

**Clean Electricity**
Electricity Carbon Intensity (Grams CO₂ per kWh)

**Electrification**
Electricity Share of Total Energy (% of Final Energy)

**Clean Fuels**
Fuels Carbon Intensity (kg/MMBtu)

**Carbon Sequestration**
(Million tonnes CO₂)

![Graphs showing trends in energy efficiency, clean electricity, electrification, clean fuels, and carbon sequestration.](image-url)
Final Energy Demand 2020-2050

COVID-19: 10% drop in demand in 2020 due to COVID impact

Electrification: 90% growth in electricity sector over 2020 levels, displacing fuels

Transport Fuels: Demand for fuels remains in 2050

Buildings: Higher demand for gas due to less electrification

Behavior: Fewer energy services drive demand lower

Cost Impacts and Economic Effects

Average Annual Energy Expenditure (%GDP/yr)

Change in Labor Income, Compared to Reference Case
Implications for Washington State

To meet the state’s 2030 GHG Targets

• Deep energy efficiency to reduce energy use
• Clean electricity grid by 2030
• Electrifying as many energy end uses as practical
• Accelerating clean fuels industry
• Regional approach required
WASHINGTON STATE 2050
Net-Zero Vision

A blueprint for how we can meet our state’s climate goals to nearly eliminate the use of climate-threatening fossil fuels by 2050, while growing a prosperous economy and maintaining affordable and reliable energy supplies.
100% Clean Electricity, Smart Grid Power Transition

- Enhance reliability and resource adequacy of the electricity grid
- Accelerate new renewables and transmission expansion
- Deploy flexible solutions and smart grid technology to manage load
- Develop market mechanisms for clean power
- Ensure effective implementation of the Clean Energy Transformation Act
Decarbonizing the Transportation Sector

- Transportation electrification key to cost-effectively decarbonizing Washington economy
  - Dramatically reduces use of diesel and gasoline

- Gasoline, diesel, jet fuel significantly decarbonized by 2030
  - Synthetic fuels and biofuels

- Peak in clean fuel demand in 2030 due to large number of ICEs still on the road

- Heavy-duty trucking drives demand for hydrogen fuel cells

<table>
<thead>
<tr>
<th>Percentage of LDVs and HDVs powered by clean fuels</th>
<th>GHG EMISSION REDUCTIONS</th>
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</thead>
<tbody>
<tr>
<td>LDV % electric: 24% in 2030 99% in 2050</td>
<td>34.2 MMT 2020</td>
</tr>
<tr>
<td>HDV % electric: 4% electric in 2030 67% electric in 2050</td>
<td>20.0 MMT 2030</td>
</tr>
<tr>
<td>HDV % hydrogen: 0% hydrogen in 2030 21% hydrogen in 2050</td>
<td>0 MMT 2050</td>
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Clean Buildings

ENERGY EFFICIENCY reduces building energy load by 26% in 2050

84% less pipeline gas used for residential heating in 2050

64% electric water heating in 2030

100% electric water heating in 2050

64% electric space heating in 2030

82% electric space heating in 2050
Decarbonizing the Electricity Sector

- Doubling of 2020 end use electricity load by 2050, plus additional flexible load from electrolysis and boilers
  - Growth in electricity sector displaces fuels by 2050

- Larger integrated electricity system in West
  - Regional coordination key to decarbonization

- All coal-fired electricity from state portfolios eliminated by 2025
  - Carbon-neutral electricity by 2030

- Gas capacity added for reliability
  - Used only for rate reliability events
Generation and Load in Washington

Increases in imports provide clean energy for expanding electricity sector

Growing reliance on clean imports to meet load growth, CETA, and emissions goals

Imports provide 43% of electricity in Electrification Case by 2050

Growth in clean electricity in Constrained Resources case due to offshore wind

Doubling of 2020 load by 2050, including new flexible loads (electrolysis, boilers)

Gas exports not prohibited under CETA but model assumes emissions count towards state inventory in decarbonization cases
Where do Imports Come from?

Clean electricity imports from Electrification Case

High quality wind resources from Wyoming and Montana account for 36% of WA clean electricity in 2050
Expanding Transmission Facilitates Imports

Increased transmission capacity required to import so much energy

- Expansion of up to 6 additional GWs of TX between states permitted in the model
  - MT->WA: Maximum 6 GW added by 2050
  - ID->WA: 5 GW added by 2050
- Western states become far more interconnected, taking advantage of least cost clean energy resources
- Additional solar and offshore wind built if unable to expand interties
Implications for siting work

- Substantial increase in supply of clean resources
- Transmission system upgrades are high priority
- Ability to substitute between generation and transmission
- Ability to substitute within generating resource options
Thank you!

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