Accelerating Equitable Decarbonization in the Northwest

K & L Gates Environmental Law Practice Group

Eileen V. Quigley—June 15, 2022
Agenda

- Clean Energy Transition Institute
- Decarbonization Pathways Studies
- Questions and Answers
Clean Energy Transition Institute

- **What We Are:** Independent, nonpartisan Northwest research and analysis nonprofit organization

- **Our Vision:** Accelerate the transition to a clean energy economy in the Northwest

- **Our Role:**
  - Provide unbiased research and analytics
  - Offer an information clearinghouse for policymakers
  - Convene diverse stakeholders
Northwest Deep Decarbonization Pathways Study—June 2019
Why a Northwest Deep Decarbonization Study?

**Common set of assumptions** to inform decisions about how the clean energy transition could unfold over the coming decades

- Unbiased, analytical baseline for the region
- Variety of pathways to lower carbon emissions
- Surface trade-offs, challenges, and practical implications of achieving mid-century targets
- Broaden conversations about actions needed
Comparison to Prior Decarbonization Studies

<table>
<thead>
<tr>
<th>Year</th>
<th>Organization</th>
<th>Scope</th>
<th>WA</th>
<th>OR</th>
<th>ID</th>
<th>MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>State of Washington Office of the Governor</td>
<td>All sectors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>Public Generating Pool</td>
<td>Electricity sector only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>Portland General Electric</td>
<td>All sectors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Climate Solutions</td>
<td>Electricity sector only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northwest Natural Gas Company</td>
<td>All sectors; optimized decisions limited to electricity sector only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Public Generating Pool</td>
<td>Electricity sector only; reliability study</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean Energy Transition Institute</td>
<td>All sectors; optimized decisions across entire energy supply side</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Northwest Deep Decarbonization Target

86% reduction in energy-related CO₂ emissions is required to achieve overall NW target.

2015 EIA CO₂ (Energy)
- WA: 76 MMT
- OR: 38 MMT
- MT: 32 MMT
- ID: 18 MMT

2050 Target: 20.8 MMT 86% below 1990 Levels
Northwest in the Context of a Western Grid

- Holistic Approach
  - Integrated across geographies and economic sectors
- Regional Representation
  - Other state’s actions impact the availability and cost of solutions
  - 11 Western states
- Remainder of the U.S. also modeled
What Did We Want to Know?

- How do we get to a 100% Clean Grid quickly?
- How do we avoid outages with intermittent supply and changing demand?
- How much and how fast can we electrify?
- How do we manage the cost impacts, overall and for different customers?
- What business and regulatory models and markets are needed?
What Did We Learn?

- ~96% clean Electricity
- Clean electricity + highly efficient buildings
- Clean electric vehicles where possible
- Some, but not much, fossil fuel (natural gas) important for reliability and transition
- Improved regional transmission and integration
- Biomass should be used to replace jet & diesel fuel
- Fuels made from electricity will play important role
Pillars of Deep Decarbonization

1. **Energy Efficiency**
   - Reducing energy consumed to provide energy services
   - Energy Consumption Per Person (MMBtu)

2. **Clean Electricity**
   - Reducing the emissions intensity of electricity generation
   - Electricity Carbon Intensity (tonnes CO₂ per MWh)

3. **Electrification**
   - Switching end uses from fuel to electricity
   - Electricity Share of Total Energy (percentage)

4. **Low-Carbon Fuels**
   - Reducing the emissions intensity of liquid and gaseous fuels
   - Fuels Carbon Intensity (kg CO₂ per MMBtu)

5. **Carbon Capture**
   - Capturing CO₂ from a facility or removing CO₂ from the atmosphere
   - Carbon Capture (Megatones CO₂)

---

cleanenergytransition.org  @CETransition

Clean Energy Transition Institute
Key Issues and Challenges the NWDDP Highlighted

- **100% Clean Grid**: How to deploy required renewables, transmission, storage, gas?

- **Reliability, Capacity & Resource Adequacy**: How to avoid outages with intermittent supply and variable demand?

- **Electrification**: How much, how fast? What happens to demand and how to manage it?

- **Affordability**: How to manage the cost impacts, overall and for different customer groups?

- **Business/Regulatory Models/Markets**: What is needed for the transition?
Equity and Workforce Implications

- Regional equity (rural vs. urban)
- Addressing existing environmental/racial justice inequities
- Who makes the decisions about cost distribution and who benefits?
- What jobs are gained, and which are lost?
- How are people compensated for loss?
Transforming Washington’s Energy System

Washington State’s 2030 Challenge:

- 53% Reduction in Emissions in less than a decade

Washington’s Very Clean Electric Grid

**Washington State**
- 54.5 percent Transportation
- 17.2 percent Industrial
- 16.0 percent Electric Power
- 7.3 percent Residential
- 5.2 percent

**United States**
- 38.3 percent Electric Power
- 18.2 percent Industrial
- 33.0 percent Transportation
- 6.3 percent Residential
- 4.2 percent
What Did We Want to Know?

- What is the impact of rapid and aggressive electrification of energy systems?
- What if we don’t electrify transportation as quickly as required?
- What happens if we retain gas instead of electrifying buildings?
- What if transmission expansion is limited due to siting or permitting?
- What if policies or behavior change (i.e., more telecommuting after Covid) lower demand?
What Did We Learn?

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 critical
- Regional approach required
Washington Deep Decarbonization Pathways

**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 and data visualizations related to energy efficiency, clean electricity, electrification, clean fuels, and carbon sequestration are shown.]
Common Findings
Common Findings across Decarbonization Scenarios

- Greater regional coordination required to facilitate clean energy transfers across the West
- Strengthened/expanded Western grid needed to take advantage of resource and geographic diversity
- Large build of solar in the Southwest and wind in the inland states (MT, WY)
- A large clean fuels industry developed based on biofuels and hydrogen from electrolysis
- Electrification of buildings and transportation
Many Issues to Explore—All with Equity Lens

- Distributed energy resources (equity; transmission & renewables siting issues)
- Barriers to electrifying transport
- Removing pipeline gas (grid & buildings)
- Liquid fuels (use of biomass/biofuels)
- Electricity load (resource adequacy & reliability)
- Economic impacts (jobs & cost distribution)
- Clean energy industrial policy
CETI 2022 Programs
Current Institute Programs

- **Operation 2030**
  - Scaling building decarbonization in Washington state

- **Northwest Clean Energy Atlas**
  - Interactive dashboard of decarbonization visualizations in the Northwest

- **Clean Materials Manufacturing**
  - Analysis (May); Summit (June)

- **Clean Energy and Northwest Rural Communities**
  - Rural community-defined decarbonization
  - Claiming Power: video stories of rural clean energy

- **Net-Zero Northwest**
  - Decarbonization pathways to 2030 + jobs analysis

@CETransition
Clean Energy Transition Impact 2018-2021

Download our Case Statement

Download our Impact Report

Accelerating an Equitable Clean Energy Transition in the Northwest
2022 Case Statement

Now is the time to act swiftly to decarbonize the Northwest. This climate imperative to clean and just future for all necessitates action, not just for a few decades, but all the time. As we prepare for the Biden-Harris administration, we should be able to reframe our priorities and move forward. We should look to a clean energy future and build relationships with local communities, particularly in the Northwest, to ensure that we are not just making decisions, but are being made decisions. We should be able to think globally and act locally.

Our Vision
- Accelerate the transition to a clean energy economy in the Northwest

Our Approach
- Use an independent, systemic, economy-wide lens to assess technical, economic, and equitable decision-making strategies

Our Role
- Provide unbiased research and analytics on the challenges to a clean energy economy
- Offer an information clearinghouse for best practices and solutions
- Encourage central collaborations to address the opportunities, risks, and tradeoffs of carbon emissions reduction approaches

Our Impact
- Developed an analytic tool to guide decision-making in the programs, policies, and market transformation that will reduce new emissions buildings by 2050 with Operation 2050
- Analyze the industrial emissions to pulp and paper, ironwork, wood products, food production (animal, dairy), and oil and gas, and develop their impact on the overall emissions
- Closes the Northwest Clean Energy Atlas to enable citizens and policymakers to understand decarbonization in the context of the Northeast energy landscape

www.cleanenergytransition.org
Thank you very much
Eileen V. Quigley eileen@cleanenergytransition.org
Questions & Answers
Research and Analytics to Support Policymakers

2019
- First economy-wide deep decarbonization study mapped to the Northwest’s economic & institutional realities
- First regional decarbonization study in nation

2020
- Provided technical analysis for a chapter in the Montana Climate Solutions Council Plan
- Presented to Montana stakeholders in 2019, 2020, & 2021

2021
- Provided technical and economic analysis for the 2021 Washington State Energy Strategy
- Roadmap to get WA on the path to net zero over next decade

2021
- Examined technical and economic implications of accelerating decarbonization in OR
- Results informed 2021 OR clean energy standard bill

2022
- Charts the targets and requirements for how Washington can scale building decarbonization by 2030
- Released January 5, 2022
Operation 2030 Project

- Independent analysis of data from the Washington 2021 State Energy Strategy deep decarbonization modeling
- Focuses on multi-level ramp up required to take building decarbonization to scale by 2030
- White paper
- Forums
Clean Materials Manufacturing

- Analysis of six key manufacturing sectors in Washington state
  - Emissions profiles
  - Decarbonization pathways
  - Workforce

- In advance of June 23 & June 28 Summit
The Northwest Clean Energy Atlas provides regional stakeholders interactive tools to explore energy data relevant to deep decarbonization in Idaho, Montana, Oregon, and Washington.
Clean Energy Transition Institute References

- Meeting the Challenge of Our Time: Pathways to a Low-Carbon Future for the Northwest (NWDDP Analysis)—June 2019
- Montana Governor’s Climate Solutions Council—September 2020
- Washington 2021 State Energy Strategy; Chapter B from the WA SES; Deep Decarbonization Modeling Final Report—January 2021
- Oregon Clean Energy Pathways Analysis—July 2021
- Washington State Industrial Emissions Analysis—July 2021
- Operation 2030: Scaling Building Decarbonization in Washington State—January 2022
- Northwest Clean Energy Atlas—May 2022
- Washington State Clean Industrial Economy Summit—June 2022
- Rural Community-Defined Decarbonization—Launching summer of 2022
- Claiming Power: Stories of Rural Communities and Clean Energy—Launching summer of 2022