Accelerating an Equitable Clean Energy Transition

Jeanne Currie & Ruby Moore-Bloom, Clean Energy Transition Institute

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Agenda

- Introduction
- Energy pathways modeling
- SCALE 2030
- Other projects
  - Community-scale solar
  - WestTEC
  - Northwest Clean Energy Atlas
- Q&A / Discussion

What is the Clean Energy Transition Institute?

- **What We Are:** Independent, nonpartisan Northwest research and analysis nonprofit organization
- **Our Mission:** Accelerate an equitable clean energy transition in the Northwest
- **Our Role**: Frame, translate, demystify decarbonization and the clean energy transition in the Northwest
  - Unbiased analysis to encourage fact-based conversations

CETI Program Areas and Projects

Energy

- Decarbonization Pathways Analyses
- WA, MT, OR

Buildings

- Operation 2030
- SCALE 2030

Industry

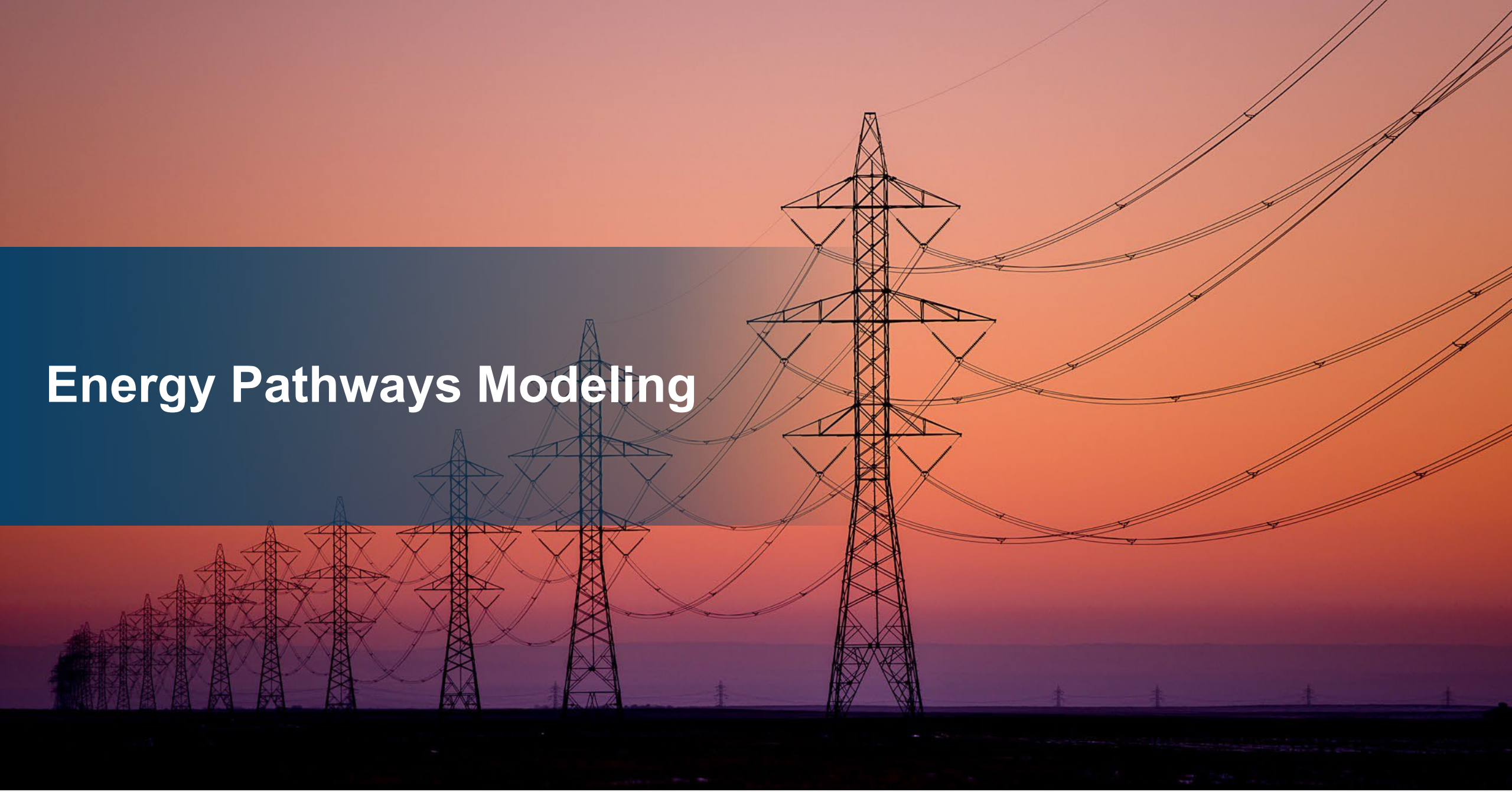
- WA Industrial Emissions Analysis
- Clean Materials Manufacturing

Rural

- Community-Defined Decarbonization
- Claiming Power
- Community-Scale Solar

Clean Energy Atlas

- Interactive Energy Data



Energy Pathways Modeling

Energy Pathways Modeling

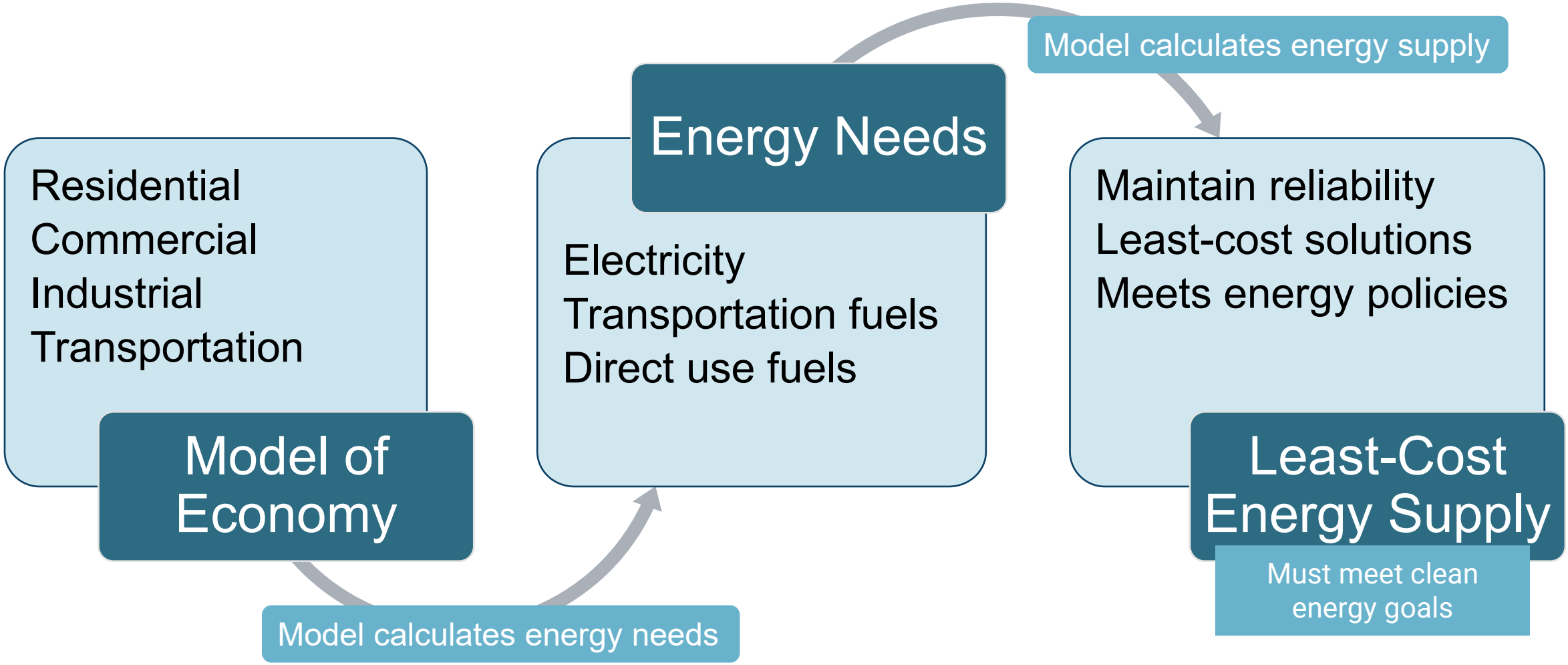
- Calculates energy needed to power an economy while meeting targets
- Provides least-cost ways to provide needed energy
- Includes detailed electricity sector modeling integrated with optimized fuels supply for an economy-wide perspective
- Provides direction and a framework to understand trade-offs

- Not focused on one state or a single utility service territory in isolation
- Complementary to and does not replace integrated resource planning models that utilities use
- Not a forecast

CETI Partnership with Evolved Energy Research

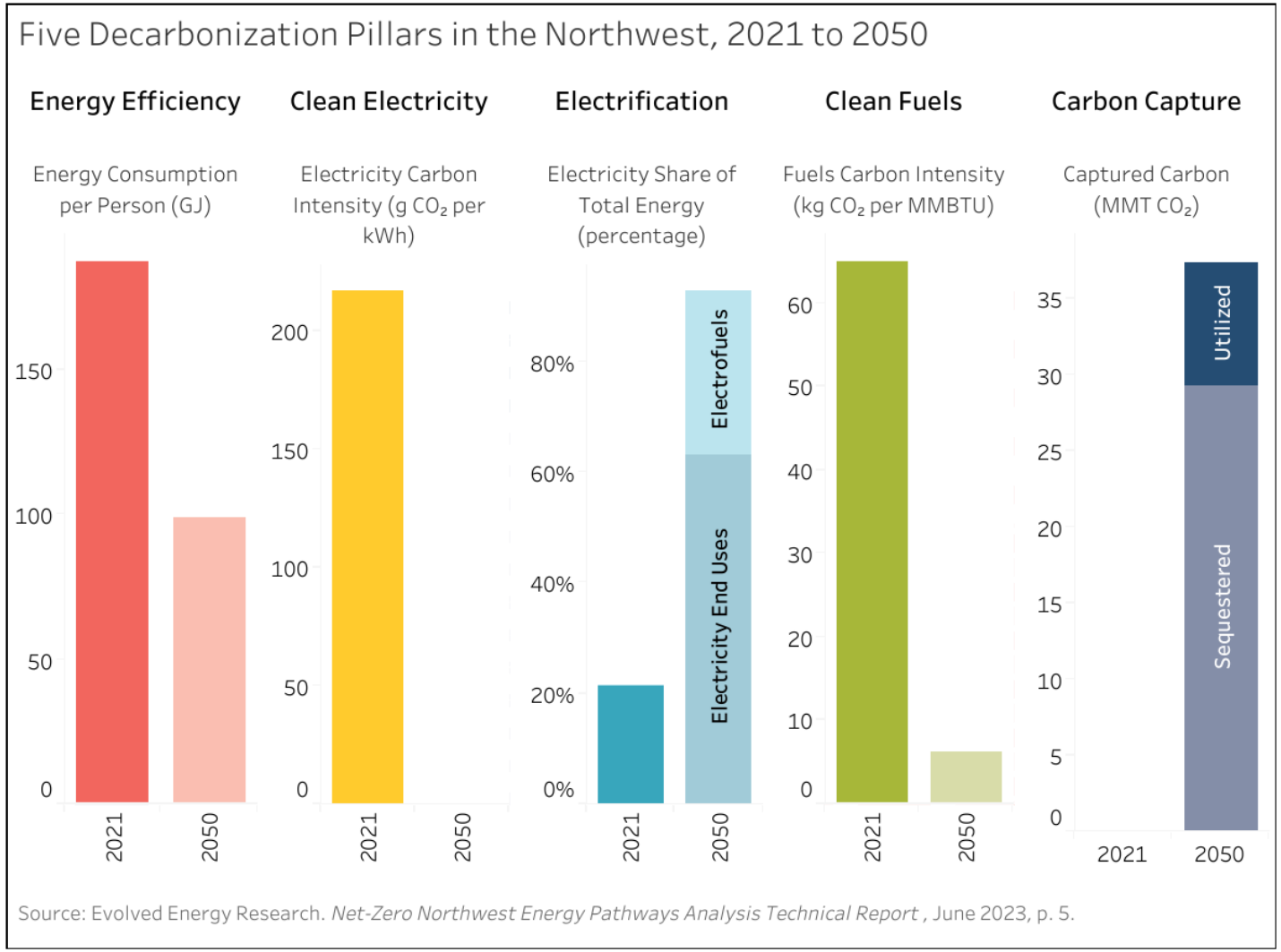
- National energy modeling firm
  - Partners include NGOs, state and local energy offices, utilities, academic institutions, and more
  - Worked on Net-Zero America; produces Annual Decarbonization Pathways (ADP)
- CETI and Evolved have partnered on:
  - NW Deep Decarbonization Pathways (2019)
  - MT Climate Solutions (2020)
  - WA 2021 State Energy Strategy (2021)
  - OR Clean Energy Pathways (2021)
  - Net-Zero Northwest (2023)
  - WA Green Electrolytic Hydrogen (2024)
  - OR Energy Strategy (2024-25)
  - WA Pathways Modeling for Comprehensive Climate Action Plan (2024-25)

Overview of Evolved's Modeling Approach



Five Pillars of Deep Decarbonization

- Decarbonization in the region hinges on five intertwined pillars:
  - Energy Efficiency
  - Clean Electricity
  - Electrification
  - Clean Fuels
  - Carbon Capture



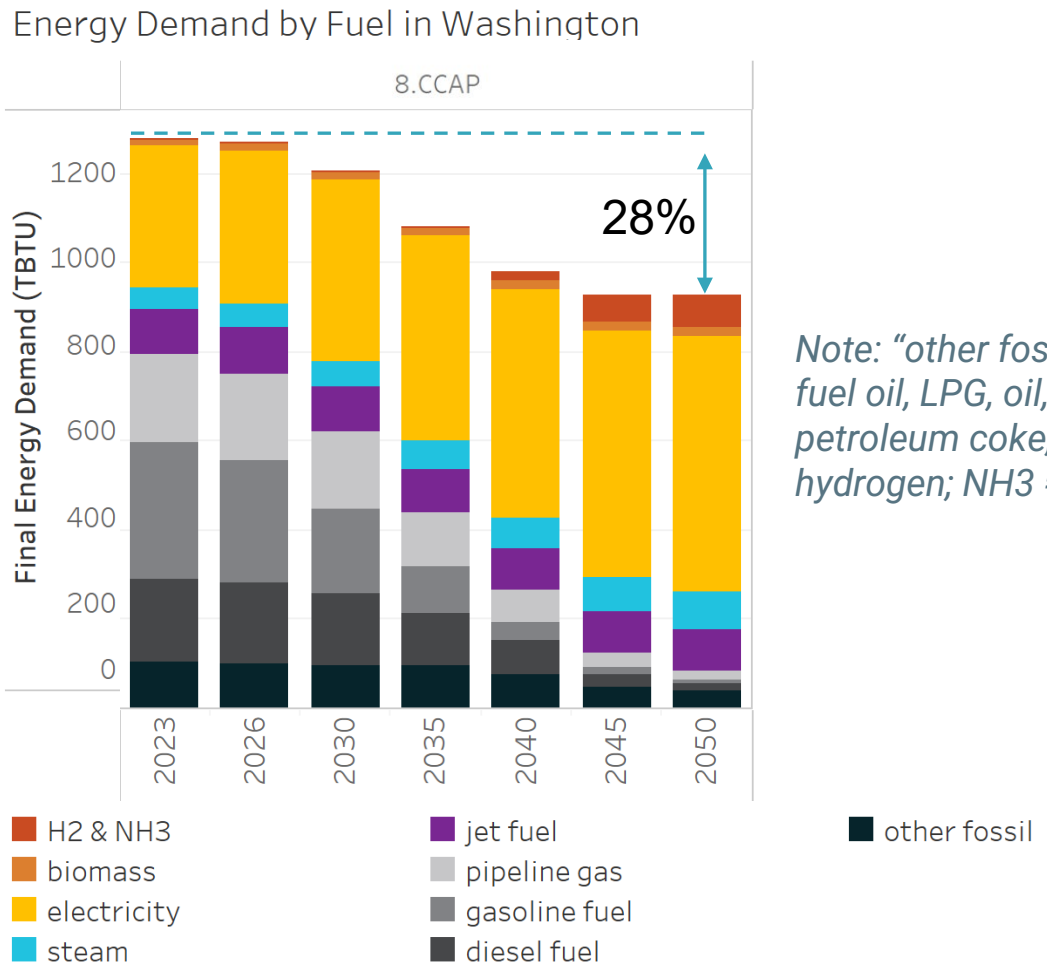
Source: Evolved Energy Research. *Net-Zero Northwest Energy Pathways Analysis Technical Report* , June 2023, p. 5.

Modeling for Washington Comprehensive Climate Action Plan (CCAP)

- Funded by the Climate Pollution Reduction Grant in the Inflation Reduction Act (IRA)
- The CCAP serves as a roadmap, guiding policies and actions to reduce emissions and build a sustainable future
  - Evaluates existing climate policies
  - Recommends new strategies and actions
- Highly collaborative effort with significant public engagement
- Modeling led by Evolved Energy Research with CETI support

CCAP Analysis: Energy Demand (Draft CCAP Scenario)

- Overall energy demand decrease is driven by efficiency gains, mostly from fuel switching to electricity
- Economy-wide energy demand drops by 28% in the CCAP Scenario
  - Despite increase of electricity final energy demand by 80%

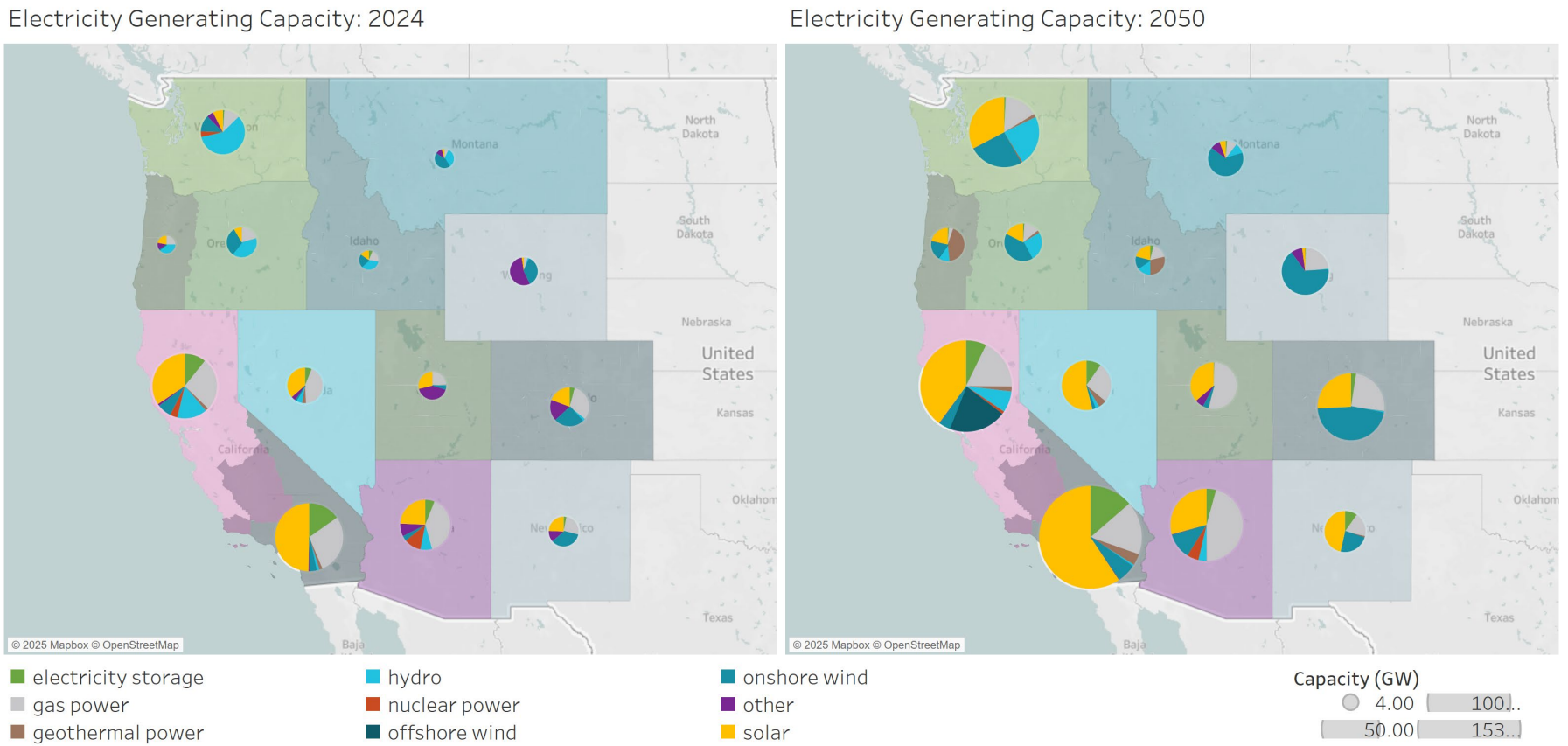


Note: "other fossil" includes fuel oil, LPG, oil, coal, and petroleum coke; H2 = hydrogen; NH3 = ammonia

Source: Washington Draft Comprehensive Climate Action Plan, June 2025 draft for public comment, Appendix C. Modeling Technical Report, pg. 22. https://deptofcommerce.app.box.com/s/f9bh3dq9oe3mrz0qto4up3ijvjfgl1ym

CCAP Analysis: Generation Capacity (Draft CCAP Scenario)

- Washington is part of a dynamic energy system of 11 Western states
- From 2024 to 2050, total generation capacity grows dramatically in the West, with renewables dominating



Source: Washington Draft Comprehensive Climate Action Plan, June 2025 draft for public comment, Appendix C. Modeling Technical Report, pg. 42. https://deptofcommerce.app.box.com/s/f9bh3dq9oe3mrz0qto4up3ijvjfgl1ym

Key Takeaways from OBBBA Modeling

- Changes to electricity resource mix
  - Demand for firm resources with high growth in data center load
  - Greater builds of enhanced geothermal, nuclear, and gas
  - Slower and lower build-out of wind and solar
- Changes to economics of hydrogen production
- Electrification driven by policy, but electric vehicles and heat pumps are more expensive without the IRA
- Value of flexible loads emerges in near-term supply crunch
  - Modeling has assumed that new data center loads are firm, but we are in a new paradigm
- Important to contextualize the OBBBA in the global picture

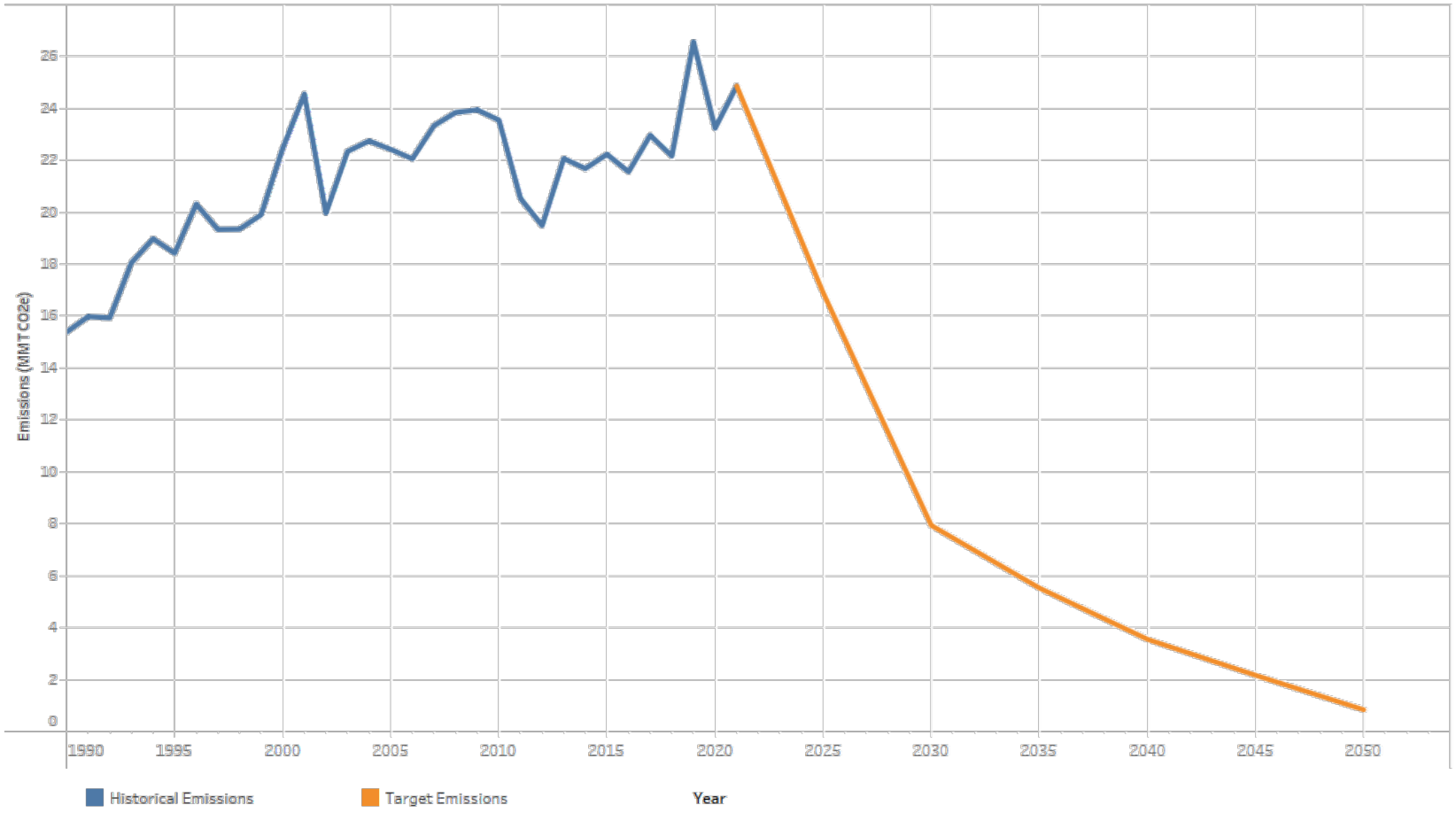
Learn More

- Net-Zero Northwest (June 2023)
- Oregon Energy Strategy (November 2025)
- Washington Comprehensive Climate Action Plan (Draft: June 2025)
- How OBBBA Rewrites America's Energy Transition (November 2025)

Scaling Building Decarbonization in Washington: SCALE 2030

Building sector emissions need to shift quickly

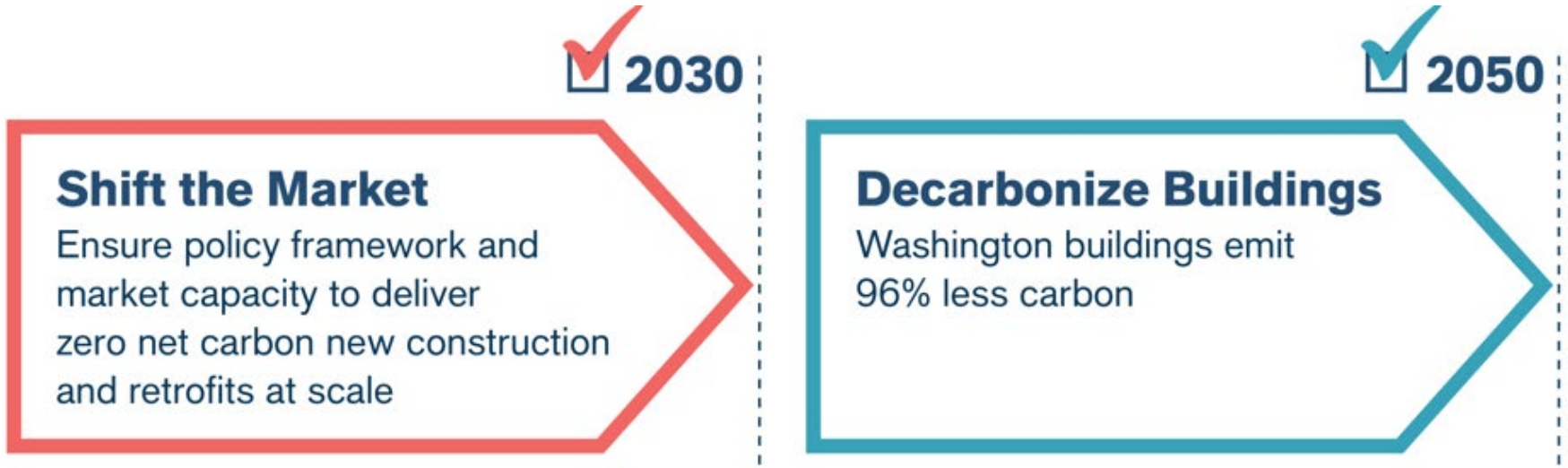
Washington State Residential and Commercial Buildings Emissions Over Time



Source: 2050 Institute and Clean Energy Transition Institute analysis using Washington Greenhouse Gas Emissions Inventory data; and projected energy use from deep decarbonization modeling performed for the Washington 2021 State Energy Strategy by Evolved Energy Research. Target emissions for 2021-2024 are adjusted to reflect updated emissions published after the State Energy Strategy.

The SCALE 2030 Vision…

- In 2030, all new/replacement equipment going into buildings is zero emissions and highly efficient because that is the preferred, easiest, and most affordable option



Clean Buildings Transition Roadmap

- Goal #1: Create a pathway for scaling clean buildings in the next five years
- Goal #2: Deliver a call to action to building sector actors
- Input: Advisory group, workshops, 1:1 interviews
- Deliverable: Online-first roadmap with a set of actions, roles, timelines
- Timeline: Expected March 2026

SCALE 2030 Impact

Optimism

- New technologies
  - Super efficient windows: LuxWall
  - Radiator covers: Kelvin
  - Tech for contractors: Conduit
- New business models
  - Vertically integrated heat pumps: Jetson
  - Leasing equipment
  - Inclusive Utility Investment
  - Valuing flexibility: Piclo
- Policies are in place: implementation time!

Research and Analysis Driving Implementation Change

Community-Scale Solar

- Collaboration between CETI and University of Washington researchers exploring community-scale solar in Washington
- No standard definition
  - Purpose is to benefit local community members and provide equitable access to solar energy
  - Projects mostly between 12kW – 1 MW
- Project scope
  - Five staff interviews
  - Focused literature review
  - Development of data visualizations and accompanying narrative text (StoryMap)

Community-Scale Solar: Role in Washington's Clean Energy Future

- Seen as key part of a resilient, equitable energy transition
- Enables community participation in clean energy goals
- Current policy may be barrier; upcoming conversations about how to value solar
- Specific considerations for rural communities
  - Underserved communities are often at the ends of distribution lines and experience more frequent outages

Community-Scale Solar: Learn More

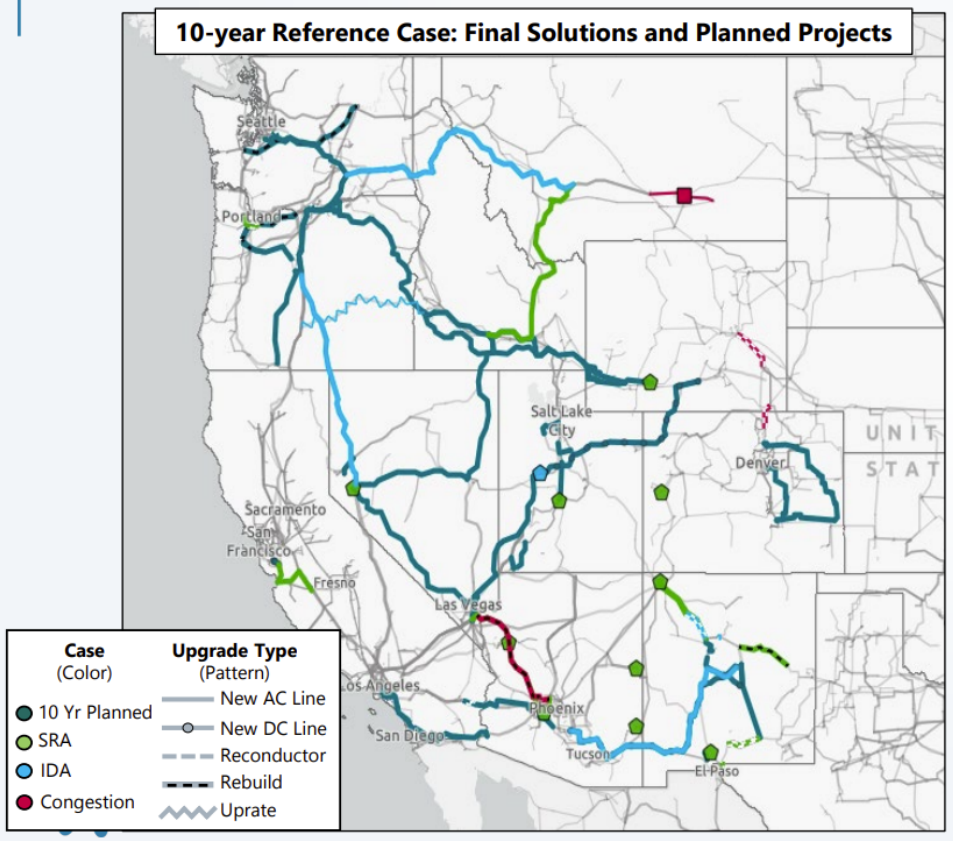
- Upcoming publication of CETI project: *The Sun Also Rises in Washington*
- Oregon microgrid legislation (2025)
  - Creates comprehensive regulatory framework for microgrids
- Washington State Academy of Sciences study on value of distributed solar and storage

WestTEC: Successful Planning is a Group Project!

- Voluntary process with utilities, state agencies, advocates, independent transmission companies
- Creating an “actionable” transmission plan looking 10 and 20 years out at the needs of the Western U.S. grid
- CETI is one of four public interest organizations on the Regional Engagement Committee
- Optimism: First time Western U.S. has cooperated like this on transmission

WestTEC: 10 Year (Draft) Results

10-year Horizon Final Transmission Portfolio

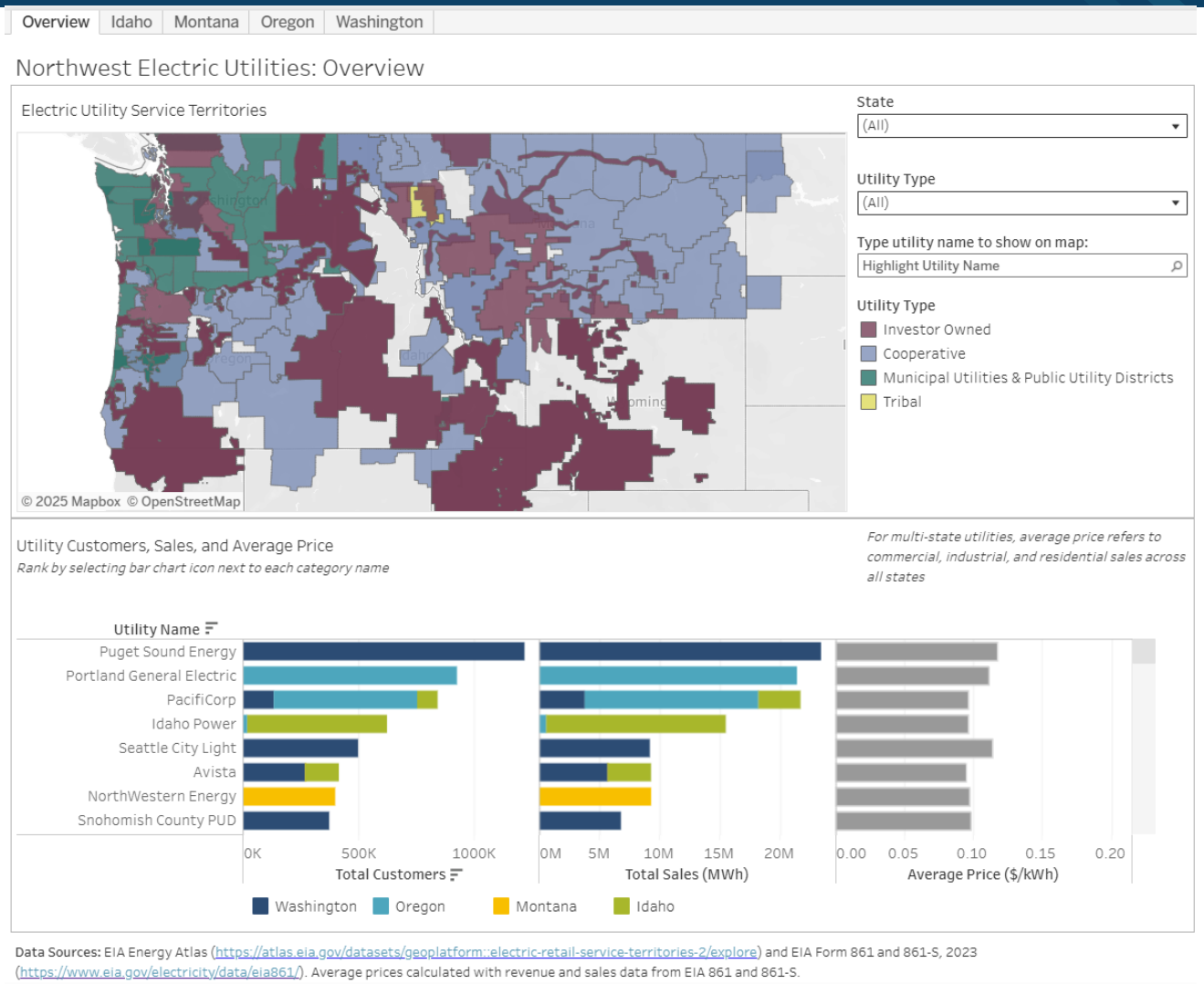


- **10-Year Portfolio includes over 12,200 miles of regionally-significant upgrades or additions. Total estimated cost around $56B.**
  - **About two-thirds of these projects meet the criteria of Planned projects according to the WestTEC study plan**
  - **The remaining one-third of lines represent upgrades conceptualized as part of WestTEC transmission solutioning efforts (SRA, IDA, or Congestion)**

Drivers and Upgrade Type	Count	Total Line Miles	Total Estimated Cost ($M)
Planned	71	8,910	$41,872
SRA	22	1,214	$6,266
IDA	8	1,742	$7,239
Congestion	3	394	$391
Total	104	12,259	$55,768

Northwest Clean Energy Atlas

- www.nwceatlas.org
- CETI website platform launched in 2022
- Hosts interactive data visualizations relevant to deep decarbonization in the Northwest
- We update visualizations annually (as possible) with most recent available data
  - Possible with support from CETI Research Fellows and interns
- Five categories: Energy, Emissions, Utilities, Equity, Jobs



Data Sources: EIA Energy Atlas (https://atlas.eia.gov/datasets/geoplatform::electric-retail-service-territories-2/explore) and EIA Form 861 and 861-S, 2023 (https://www.eia.gov/electricity/data/eia861/). Average prices calculated with revenue and sales data from EIA 861 and 861-S.

Thank you very much

Jeanne Currie jeanne@cleanenergytransition.org
Ruby Moore-Bloom ruby@cleanenergytransition.org

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