Oregon
Tina Kotek, Governor

OREGON DEPARTMENT OF ENERGY

550 Capitol St. NE
Salem, OR 97301
Phone: 503-378-4040
Toll Free: 1-800-221-8035
FAX: 503-373-7806
www.oregon.gov/energy

AGENDA

Oregon Energy Strategy Working Group Kickoff Meeting

July 30, 2024 / 9:00 am – 11:00am
Zoom Link for virtual participants: Zoom Meeting Link

Objectives

- Bring all working groups together to develop a shared understanding of the project and role of the working groups.
- Prepare working groups for meetings in the topical break-out groups by presenting the modeling approach and providing an opportunity for Q&A.
- Ensure working group members understand what to expect in the break-out meetings.

Time	Topic
9:00 - 9:20 am	Welcome, Introductions, and Overview of Oregon Energy Strategy
9:20 – 9:30 am	Working Group Agreements
9:30 – 10:15 am	Presentation: Energy Strategy Modeling
10:15 – 10:45 am	Working Group Member Q&A and Discussion
10:45 - 11:00 am	Next Steps and Summary
11:00 am	Adjourn

Oregon Department of **ENERGY**

Oregon Energy Strategy Working Group
Meeting #1

Edith Bayer
7/30/2024

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OREGON DEPARTMENT OF ENERGY

Leading Oregon to a safe, equitable, clean, and sustainable energy future.

Our Mission

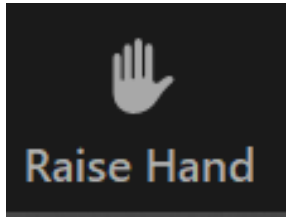
The Oregon Department of Energy helps Oregonians make informed decisions and maintain a resilient and affordable energy system. We advance solutions to shape an equitable clean energy transition, protect the environment and public health, and responsibly balance energy needs and impacts for current and future generations.

What We Do

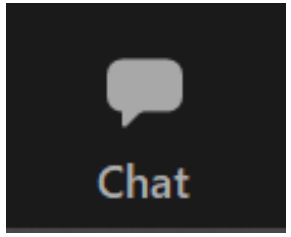
On behalf of Oregonians across the state, the Oregon Department of Energy achieves its mission by providing:

- A Central Repository of Energy Data, Information, and Analysis
- A Venue for Problem-Solving Oregon's Energy Challenges
- Energy Education and Technical Assistance
- Regulation and Oversight
- Energy Programs and Activities

ZOOM MEETING TIPS FOR WORKING GROUP MEMBERS



If you have a question for the presenter or would like to add to the discussion, please use the raise hand function or the chat function (*9 if you are joining by phone).



If you need any technical help, please use the chat function and the meeting host will assist you.

AGENDA

Time	Topic
9:00 - 9:10 am	Welcome, Introductions, and Working Group Agreements
9:10 – 9:30 am	Overview of Oregon Energy Strategy
9:30 – 10:15 am	Presentation: Energy Strategy Modeling
10:15 – 10:45 am	Working Group Member Q&A and Discussion
10:45 - 11:00 am	Next Steps and Summary
11:00 am	Adjourn

Working Group Agreement

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GROUP AGREEMENTS

- Listen carefully; seek to learn and understand each other's perspective.
- Encourage respectful, candid, and constructive conversation.
- Keep an open mind.
- Ask questions to clarify and understand why.
- Be open, transparent, inclusive, and accountable.
- Respect differing opinions.
- Seek to resolve differences and find common ground.
- Be conscious of speaking time; step back to allow space for others to contribute.

ODOE PROJECT TEAM & WORKING GROUPS

Alan Zelenka - Assistant Director for Planning and Innovation

Jessica Reichers - Manager, Policy & Innovation

Edith Bayer - Team Lead

Working Groups	
Direct Use Fuels & Industry	Michael Freels & Tom Elliott
Electricity Generating Technologies	Joni Sliger & Edith Bayer
Transportation	Jillian DiMedio & Evan Elias
Transmission & Distribution	Jason Sierman & Rob Delmar
Buildings	Blake Shelide, Stephanie Kruse & Mary Kopriva
Energy Efficiency & Load Flexibility	Andy Cameron & Edith Bayer
Equity and Environmental Justice	Lauren Rosenstein & Edith Bayer
Land Use & Natural Resources	Michael Freels & Amy Schlusser

CLEAN ENERGY TRANSITIONS INSTITUTE TEAM

Project Management

- Overall Project Manager: Eileen V. Quigley, CETI
- Technical Project Manager: Ruby Moore-Bloom, CETI

Technical Modeling

- Technical Project Lead: Jeremy Hargreaves, Evolved
- Technical Advisors: Elaine Hart, Moment Energy Insights; Amy Wagner, Evolved
- Technical Project Support: Ryan Jones and Gabe Kwok, Evolved
- Health Impacts Lead: Jamil Farbes, Evolved

Equity Support

- Equity Advisor: Angela Long, Rockcress Consulting
- Equity Advisory & Data Analyst: Mariah Caballero, CETI

KEARNS & WEST FACILITATION TEAM

Neutral process support to ODOE as it develops the Oregon Energy Strategy.

Ben Duncan

Facilitation Lead

Gillian Garber-Yonts

Process Support

HB 3630: COMPREHENSIVE STATE ENERGY STRATEGY

Directs ODOE to develop a state energy strategy identifying pathways to achieve Oregon's energy policy objectives

- Must be informed by stakeholder perspectives
- Must draw from existing resource plans, energy-related studies, and analyses

State energy strategy must account for a variety of factors, such as:

- Costs, efficiencies, feasibility, and availability of energy resources and technologies
- Economic and employment impacts
- Energy burden, affordability, environmental justice, and community impacts and benefits
- Land use and natural resource impacts and considerations
- Energy resilience, security, and markets

ENERGY POLICY OBJECTIVES

Economy-wide	Electricity (IOUs)	Natural gas, liquid fuels, propane
• 80% GHG reduction, 2050 • EO 20-04	• 100% clean by 2040 • HB 2021	• 90% GHG reduction, 2050 • Climate Protection Program

Policies driving and shaping compliance pathways:
Clean Fuels Program, Advanced Clean Cars II, Building Codes, Appliance Standards, Renewable Portfolio Standard, and many more….

ELEMENTS OF THE OREGON ENERGY STRATEGY

1. Summary of the Energy Strategy and pathways to achieve Oregon's policy objectives

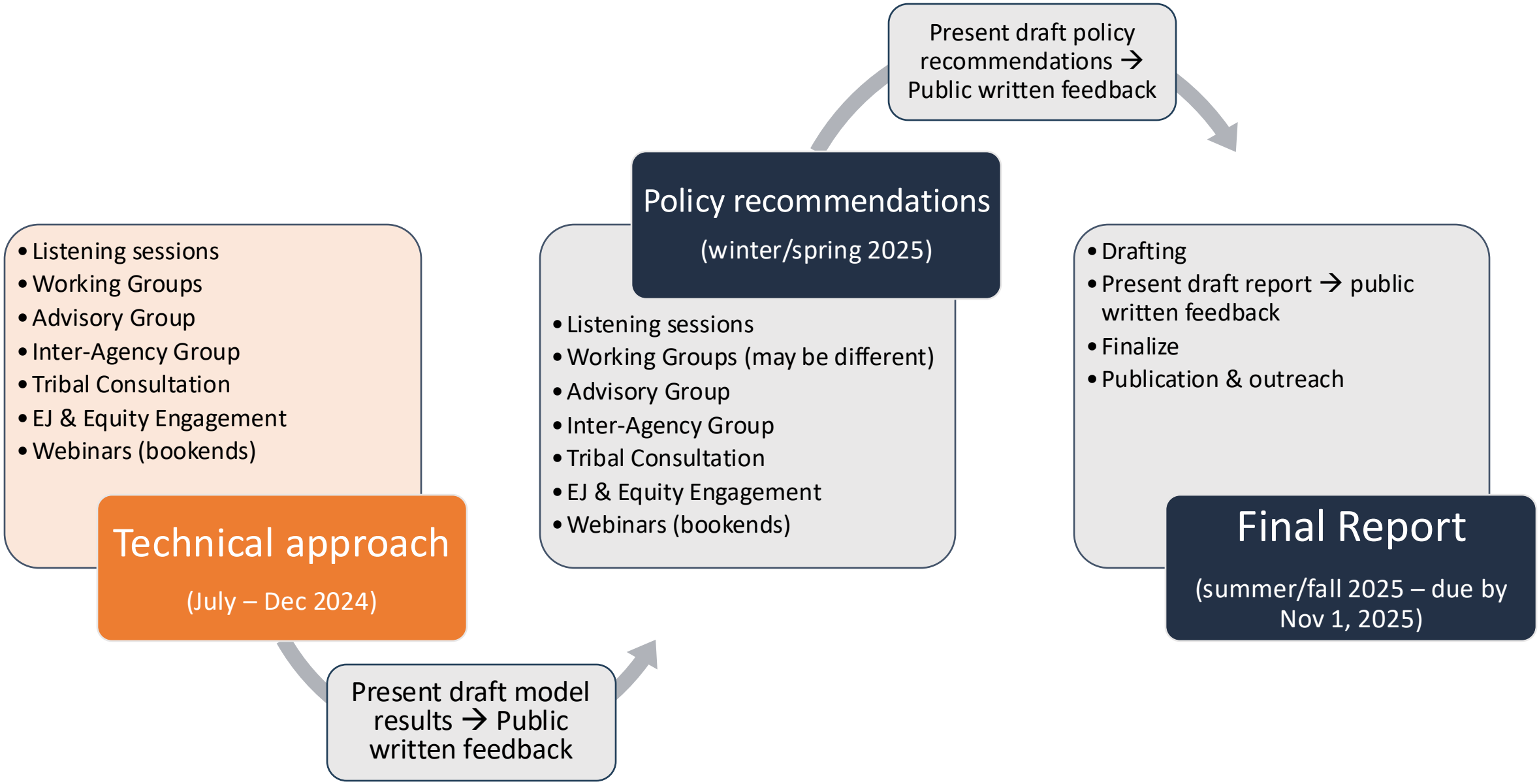
2. Recommendations of policy options

3. Description of stakeholder engagement and how stakeholder perspectives informed the strategy

CONSULTATIVE STRUCTURES

Interagency Steering Group	• State Agency Coordination • ODOE, DLCD, ODOT, PUC, DEQ, Business OR, Governor's office; other agencies • Meets 1x a month
Advisory Group	• Advise ODOE throughout the process and help inform decisions • Representatives of diverse perspectives and lived experience across OR • Meets 1x a month
Working Groups	• Focused on details of modeling • Subject matter experts able to inform modeling and technical analysis • Meet in July/Aug 2024
Tribal Consultation	• Government-to-Government, ensuring tribal perspectives inform Energy Strategy • Members of the 9 Federally Recognized Indian Tribes in Oregon • Ongoing
Listening Sessions	• Collecting broad views from across the state • Anyone can and is encourage to join • July 31, 10am – 12pm and 5pm – 7pm

PROCESS


Present draft policy recommendations → Public written feedback
Policy recommendations
(winter/spring 2025)
• Listening sessions
• Working Groups (may be different)
• Advisory Group
• Inter-Agency Group
• Tribal Consultation
• EJ & Equity Engagement
• Webinars (bookends)
• Drafting
• Present draft report → public written feedback
• Finalize
• Publication & outreach
Final Report
(summer/fall 2025 – due by Nov 1, 2025)
• Listening sessions
• Working Groups
• Advisory Group
• Inter-Agency Group
• Tribal Consultation
• EJ & Equity Engagement
• Webinars (bookends)
Technical approach
(July – Dec 2024)
Present draft model results → Public written feedback

Energy Strategy Modeling Approach

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Q&A

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WORKING GROUP CALENDAR

Breakout Meetings		
Topic Area	**Breakout meeting 1**	**Breakout meeting 2**
Land Use and Natural Resources	August 5, 10am-12pm	August 12, 1pm-3pm
Electricity Generation Technologies	August 5, 1pm-3pm	
Direct Use Fuels & Industry	August 6, 9am-11am	
Transmission & Distribution (wires and pipes)	August 14, 1pm-3pm	
Buildings	August 16, 9am-11am	
Transportation	August 8, 9am-11am	
Environmental Justice & Equity	August 6, 2pm-4pm	August 16, 1pm-3pm
Energy Efficiency and Load Flexibility	August 2, 1pm-3pm	
Closing Meeting		
Final review of results from all Working Groups		
****All Working Groups Together****	August 22, 1pm-3pm	

OPPORTUNITIES FOR FURTHER ENGAGEMENT

Provide Written Public Comment

- Written public comment can be submitted at: https://odoe.powerappsportals.us/en-US/energy-strategy/
- Written public comment is open until August 31

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Thank you

Project page: https://www.oregon.gov/energy/Data-and-Reports/Pages/Energy-Strategy.aspx

ODOE's website: www.oregon.gov/energy

Contact us: energy.strategy@energy.Oregon.gov

Edith Bayer: edith.bayer@energy.Oregon.gov

Oregon Energy Strategy Technical Consulting Approach

Working Group Meeting, July 30, 2024











Oregon Energy Strategy Technical Approach

- Introduction to CETI Energy Strategy Team
- Technical Approach
  - What Energy Pathways modeling is and isn't
  - Energy Pathways Modeling Methodology
  - Approach to Cross-Cutting Equity Issues

Introduction-CETI-OES Team

- **Project Management**
  - Overall Project Manager: Eileen V. Quigley, CETI
  - Technical Project Manager: Ruby Moore-Bloom, CETI
- **Technical Modeling**
  - Technical Project Lead: Jeremy Hargreaves, Evolved
  - Technical Advisors: Elaine Hart, Moment Energy Insights and Amy Wagner, Evolved
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  - Equity Advisor: Angela Long, Rockcress Consulting
  - Equity Advisor & Data Analyst: Mariah Caballero, CETI

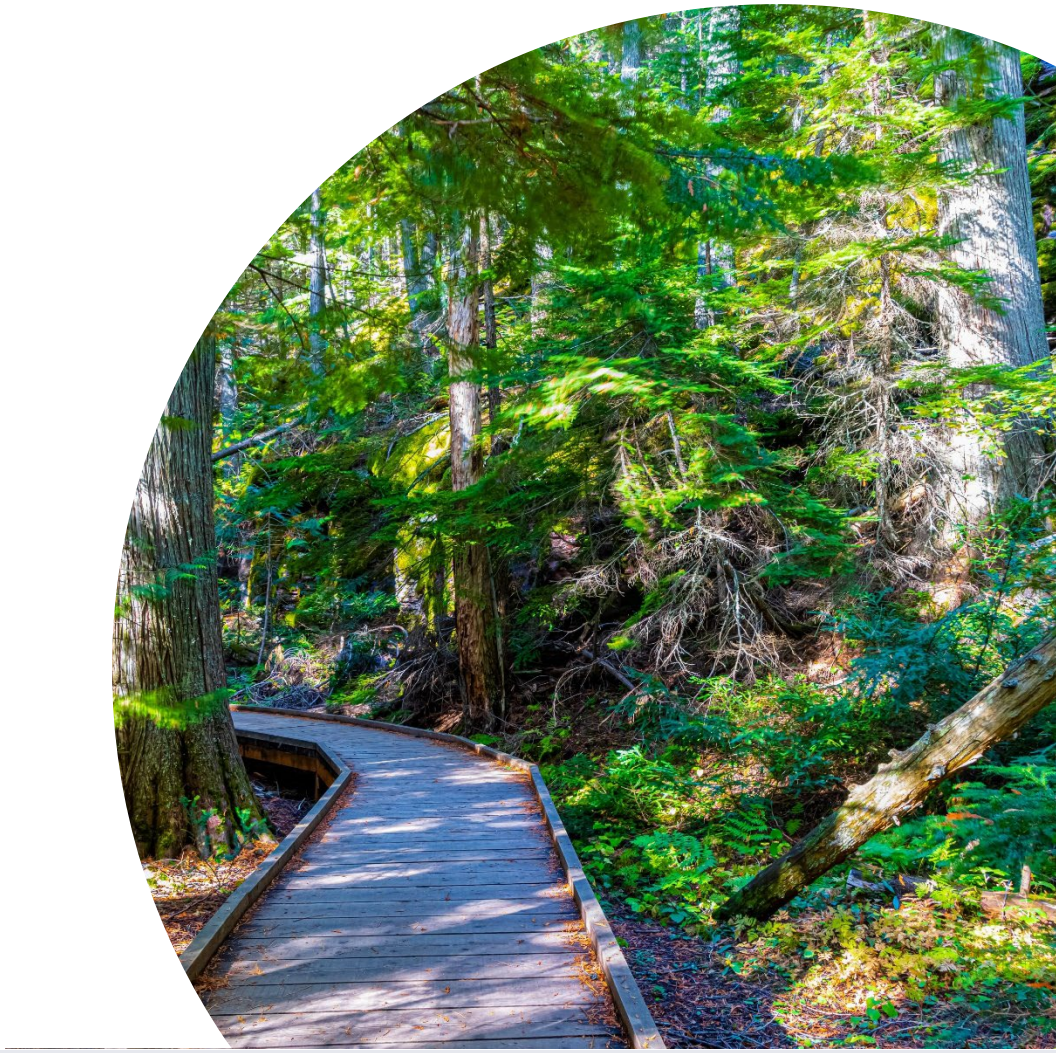
Technical Approach

What Energy Pathways Modeling Is and Isn't

What is the Purpose of Energy Pathways Modeling?

Serves to inform decision-making

- Can illuminate the pros and cons of going one direction versus another
- Will uncover strategies that can help manage or mitigate uncertainty
- Not a prediction of the future but an investigation of choices
- Looking to 2050 can inform near-term actions needed, as well as policy gaps/opportunities



What Energy Pathways Modeling Does

- Calculates energy needed to power an economy while meeting policy targets
- Finds least-cost ways to provide needed energy with efficiency, clean electricity, electrification, clean fuels, and carbon sequestration
- Includes detailed electricity sector modeling integrated with optimized fuels supply for an economy-wide perspective
- Does not answer all questions, but provides direction and a framework to understand trade-offs between different pathways, policies, and strategies

What Energy Pathways Modeling Doesn't Do

- Not focused on one state or a single utility service territory in isolation
- Does not model liquid or gaseous fuels and electrification separately
- Complementary to and does not replace integrated resource planning models that utilities use
  - Not a loss-of-load probability model
  - Not a nodal production simulation
- Not a forecast
  - Helps inform near-term decision-making in the face of uncertainty
  - Determine the best way forward across multiple potential futures
  - Examines different scenarios to inform near-term decisions in the context of future goals

What are Energy Pathways Modeling Characteristics?

Least-cost, energy system optimization that matches Oregon-specific energy supply and demand from now until 2050 in the context of the 11 Western states:

- Considers the whole energy sector and economy and all forms of energy
- Structured to meet Oregon's energy policy objectives
- All emissions counted and modeled together to be reduced over time to achieve GHG emissions targets
- Integrated and holistic, indicates future energy supply across a specific geographic area
- Includes supply and demand of all forms of energy, not just electricity sector
- Grounded in ensuring reliability and looking for least-cost solutions

Evolved's Analysis Drives Decision-Making

Past partners

NGOs

NRDC, TNC, SDSN, GridLab, Sierra Club, CETI, OCT, UCS, EDF, CATF, BPC, Audubon Society, Breakthrough Energy Foundation, Third Way, RMI, and others

State & Local Energy Offices

Massachusetts, Maine, Washington, California, New Jersey

Utilities

PGE, DTE, Hydro Quebec, and others

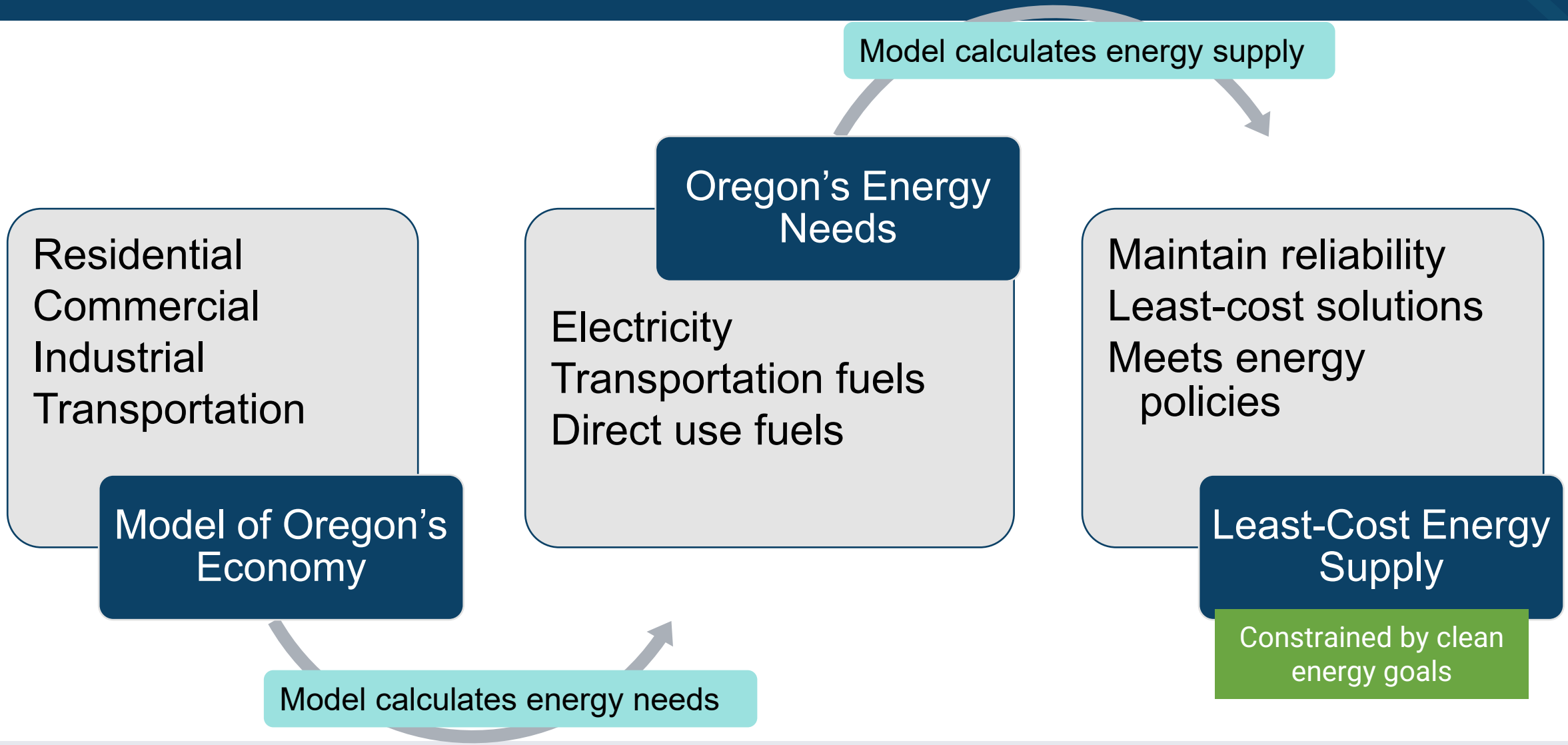
Others

Princeton University, University of Queensland, Breakthrough Energy Ventures, Inter-American Development Bank, DOE, NREL, UVA

Technical Approach

Energy Pathways Modeling Methodology

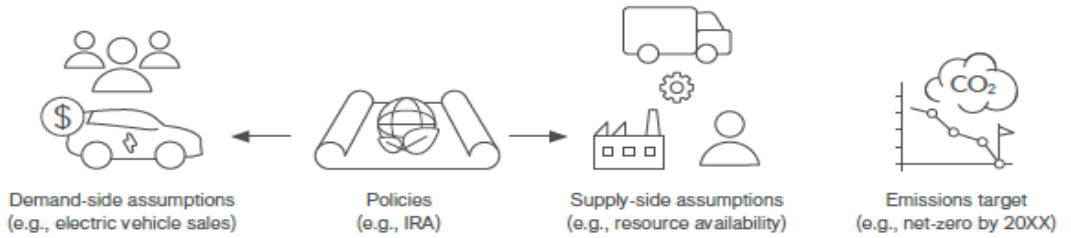
High-Level Overview of Modeling Approach



Economy-Wide Energy Modeling

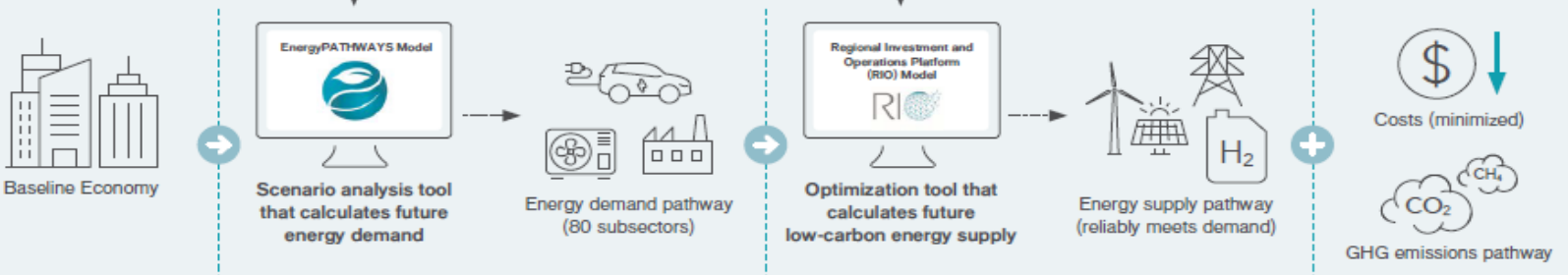
Scenario Assumptions

Model incorporates assumptions about demand-side uses, clean energy policies and incentives, and supply-side resources.



Energy Modeling

Evolved Energy Research uses two models to calculate the least-cost way to provide energy under an emission target: Energy Pathways for demand and RIO for supply.



Best Available Data

Model incorporates relevant and up-to-date energy data from reputable sources, substituted with local data where possible.

Underlying demand data

- Economic subsectors
- Demand technology characteristics
- Capital, operating, and installation costs
- Hourly demand shapes
- Current technology stocks
- Energy service demands
- Fuels efficiencies (electricity, pipeline gas, diesel, etc.)
- Demand drivers (e.g., population)
- Geographies

Underlying supply data

- Existing energy infrastructure
- Existing infratructure scheduled retirement
- Scheduled resource additions already committed
- Energy production and conversion infrastructure characteristics
- Energy transport, storage, and delivery options
- Capital, operating and maintenance, and installation costs
- Resource potentials
- Renewable resource production shapes
- Commodity costs and delivery costs
- Gas global warming potentials
- Land use
- Geographies

EVOLVED ENERGY RESEARCH

Clean Energy Transition Institute

End-Use Sectors Modeled

- Approximately 80 demand sub-sectors represented
- The major energy consuming sub-sectors are listed below:

Key energy-consuming subsectors:

Residential Sector
- Air-conditioning
- Space heating
- Water heating
- Lighting
- Cooking
- Dishwashing
- Freezing
- Refrigeration
- Clothes washing
- Clothes drying

Commercial Sector
- Air-conditioning
- Space heating
- Water heating
- Ventilation
- Lighting
- Cooking
- Refrigeration

Industrial Sector
- Boilers
- Process heat
- Space heating
- Curing
- Drying
- Machine drives
- Additional subsectors (e.g., machinery, cement)

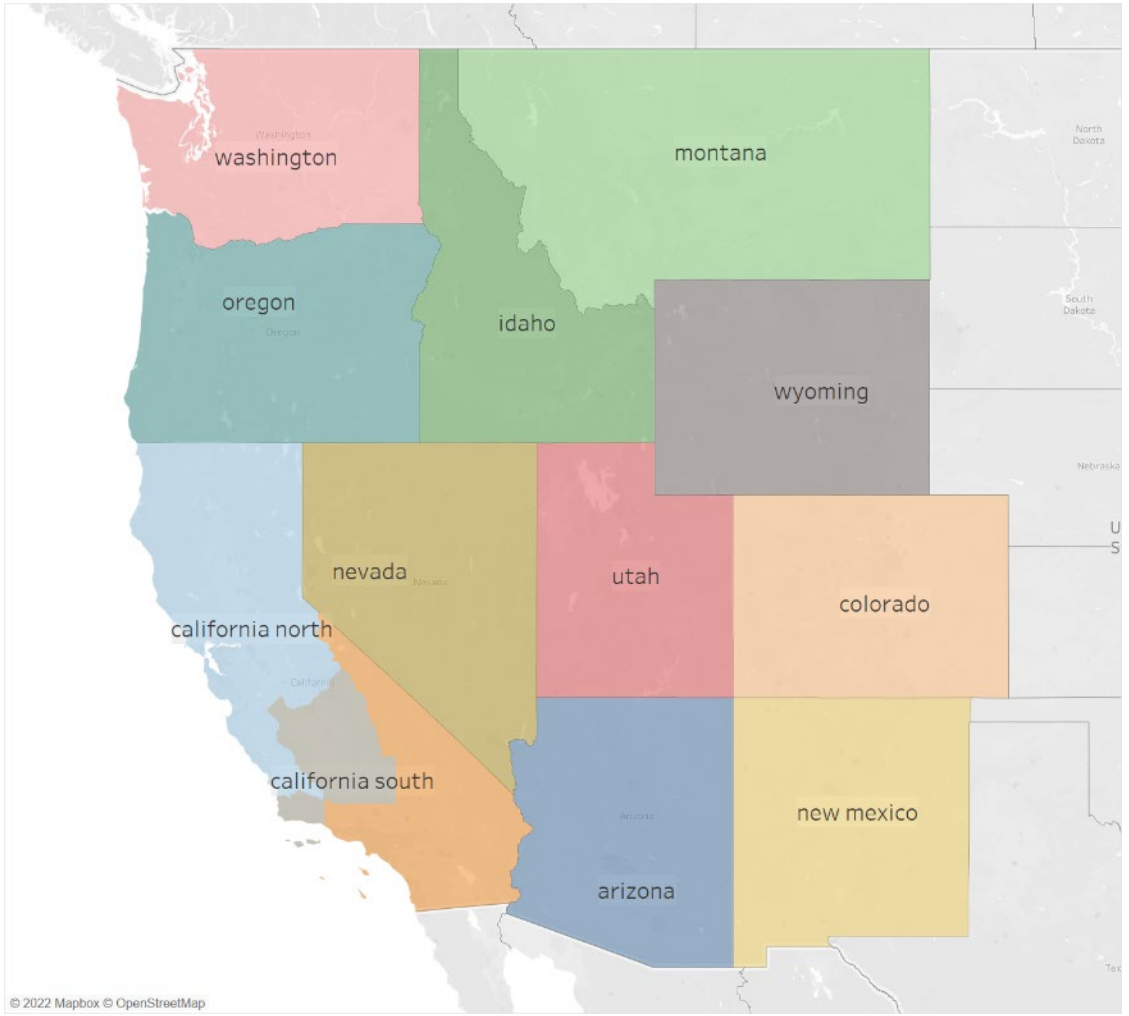
Transportation Sector
- Light-duty autos
- Light-duty trucks
- Medium-duty vehicles
- Heavy-duty vehicles
- Transit buses
- Aviation
- Marine vessels

Source: CETI, NWDDP, 2019

Model Geography

Oregon operates as part of a larger energy system

- Competition for fuels including biomass, renewables, and hydrogen derived from renewables
- Balances the electricity system over a large and diverse region – assumes single balancing authority
- Captures transmission line and pipeline flow and build constraints
- Resource, load, and temporal diversity contribute to economy and region-wide least cost strategy to reach net zero

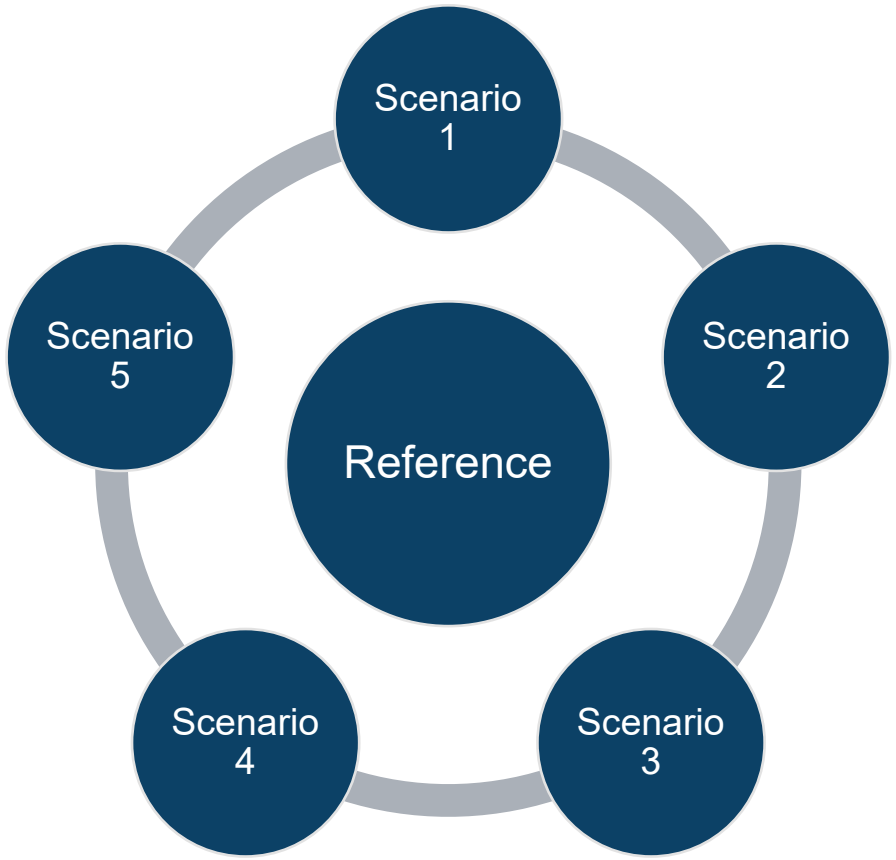


Review of Existing Information and Plans

- Ground analysis in recent utility IRPs, CEPs, and CPP Compliance Plans
- Review Oregon energy policies and document how modeling accounts for them:
  - HB 3630; HB 2021; SB 1547 (2016); relevant rulemakings; the Department of Environmental Quality's (DEQ) CFP rules; Executive Order 20-04; DEQ's CPP rulemaking; the "Climate Package" from the 2023 Legislative Session; and any other policy documents identified by ODOE and stakeholders
- Review recent relevant work to identify potential data for incorporation:
  - ODOE: 2022 Biennial Energy Report; 2023 Biennial Zero Emission Vehicle Report; 2023 Cooling Needs Study; 2022 Small-Scale Renewable Energy Projects Study; 2021 Regional Transmission Organization Study; 2022 Floating Offshore Wind Study; and the forthcoming 2024 Oregon Energy Security Plan
  - Recent reports from the Oregon Climate Action Commission, including the Oregon Climate Action Roadmap to 2030
- Review for regional perspective:
  - Northwest Power and Conservation Council's 2021 Northwest Power Plan, while following key developments as the Council develops the next plan; the Pacific Northwest Utilities Conference Committee's 2023 Northwest Regional Forecast; The Nature Conservancy's Power of Place-West; and the Columbia River Inter-Tribal Fish Commission Energy Vision for the Columbia River Basin
- Review program design elements:
  - Western Resource Adequacy Program (WRAP), CAISO's Extended Day-Ahead Market (EDAM) and Western Energy Imbalance Market (WEIM), and SPP's Markets+ and Western Energy Imbalance Service (WEIS)
  - Regional transmission planning efforts, including the Western Transmission Expansion Coalition (WestTEC).

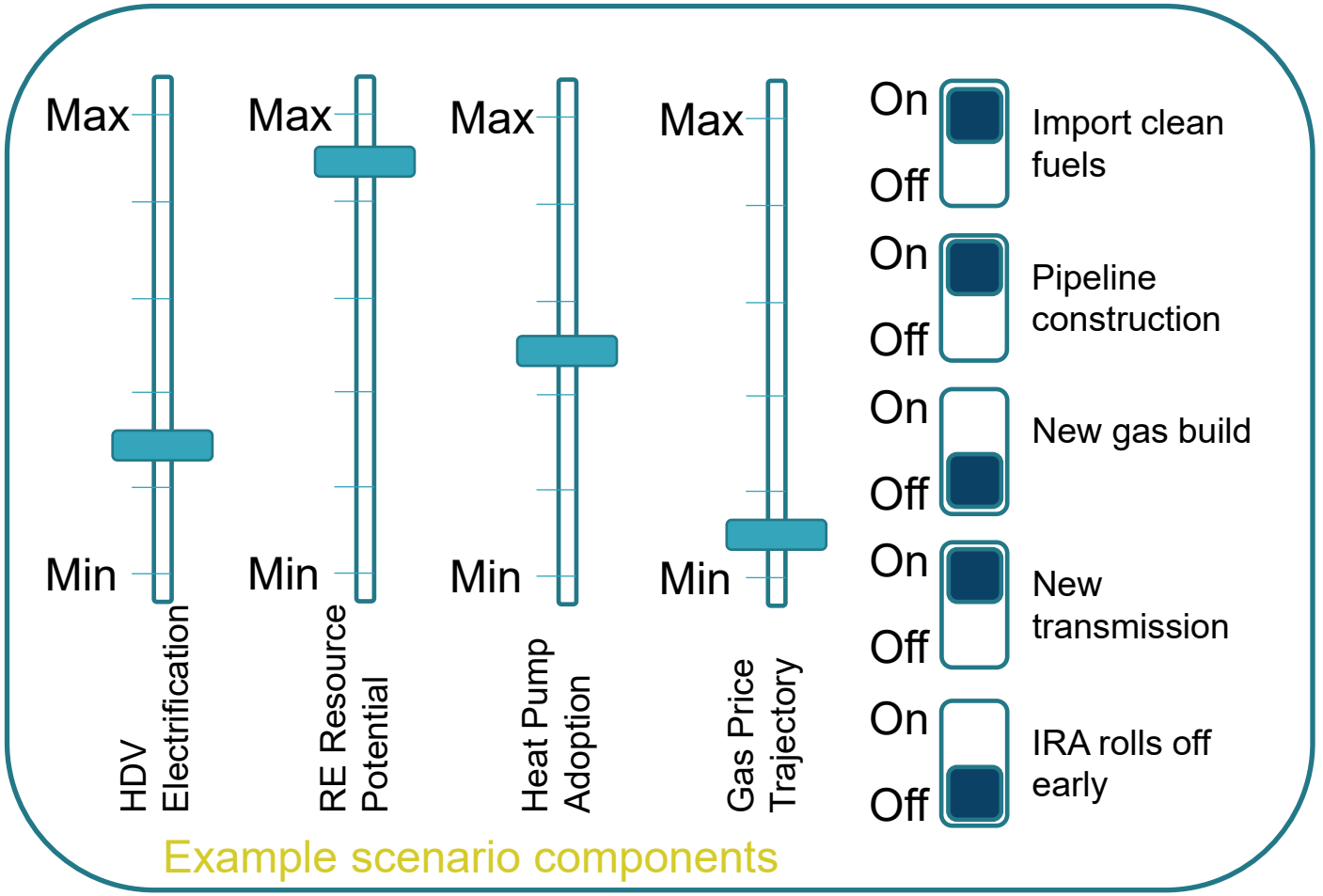
Scenario Development

- Reference Scenario
  - Develop Oregon specific database using best available resources
  - Define Reference Scenario assumptions
    - Starting point set of assumptions for stakeholders to react to and suggest changes
- Scenario Development
  - Develop set of interesting questions in collaboration with ODOE and stakeholders
    - What are the most pressing questions, uncertainties, and state priorities that will provide the most valuable information to policymakers?
  - Develop starting point study questions from stakeholder listening sessions for refinement to final five scenarios to be modeled



Components of a Scenario

- Many assumptions go into projecting an energy pathway
- Different levers can be set to test:
  - More or less
  - Yes/no
- The model optimizes decisions, informed by those levers
  - Test uncertainties
  - See impacts of policies/actions/ customer behavior on energy needs and how energy is supplied



Reference Scenario Database Development with Oregon-Specific Data

- Oregon-specific data collected from up-to-date Oregon datasets, past studies, and consultations
  - Transportation Data (ODOT, EPA MOVES)
  - Building Data (NEEA RBSA & CBSA, EIA RECS & CBECS)
  - EIA State Energy Data System (SEDS)
  - Oregon DEQ GHG Emissions Inventory
  - Planned resource investments
  - Data center and crypto forecast data
  - PSU Population Research Center
- Review of Oregon resources and input from ODOE and data holders in identifying available datasets

Defining Key Questions

Questions drive the shape of the Energy Strategy. What do we want to learn? And what can we learn with the tools that we have?

What are the most pressing questions, uncertainties, and state priorities that will provide the most valuable information to policymakers?

- Feedback requested from you
- "What if" format represents different policy choices or uncertainties

Examples:

- *What if developing new clean energy resources is delayed?*
- *What if consumer adoption of technologies like heat pumps and EVs occurs more slowly than expected?*
- *What if transmission expansion to access resources outside of Oregon is harder than expected?*
- *What if hydrogen pipelines and other clean fuel delivery systems cannot be constructed between Oregon and other states?*

Translating "What If" Questions to Scenario Matrix

- e.g., What if consumer adoption of heat pumps occurs more slowly than expected?
  - Reference Scenario: 100% sales of heat pumps by 2035
  - Scenario X: 50% sales of heat pumps by 2035 and through 2050
- e.g., What if transmission expansion to access resources outside of Oregon is harder than expected?
  - Reference Scenario: Relatively unconstrained transmission build
  - Scenario Y: No transmission expansion outside of Oregon

Scenario Matrix Development: Washington Example

Scenario Assumptions	Reference (R)	Electrification (E)	Transport Fuels (TF)	Gas in Buildings (GB)	Constrained Resources (CR)	Behavior Change (BC)
Clean Electricity Policy	CETA: Coal retirements 2025; 100% carbon neutral 2030 (with alternative compliance); 100% RE 2045					
Economy-Wide GHG Policy	None	Reduction below 1990: 45% by 2030; 70% by 2040; 95% and net zero by 2050				
Buildings: Electrification	AEO	Fully electrified appliance sales in most sub-sectors by 2050		**Gas appliances replaced with new gas sales**	Fully electrified appliance sales in most sub-sectors by 2050	
Buildings: Energy Efficiency	AEO	Sales of high efficiency tech: 100% in 2035				
Transportation: Light-Duty Vehicles	AEO	100% electric sales by 2035	**75% electric sales by 2045**	100% electric sales by 2035		
Transportation: Freight Trucks	AEO	Same as GB, CR, and BC Cases	**Half the electric sales/no hydrogen adoption**	HDV long-haul: 25% electric, 75% hydrogen sales by 2045 HDV short-haul: 100% electric sales by 2045 MDV: 70% electric sales by 2045		
Industry	AEO	Generic efficiency improvements over Reference of 1% a year; fuel switching measures; 75% decrease in refining and mining to reflect reduced demand				
Service Demand Reductions	Baseline service demand informed by AEO					**VMT by 2050: 29% LDV, 15% MDV/HDV 15% Com, 10% Res**
Resource Availability	NREL resource potential; 6 GW of additional transmission potential per path; SMRs permitted				**Washington: No new TX**	Same as R, E, TF, and GB Cases

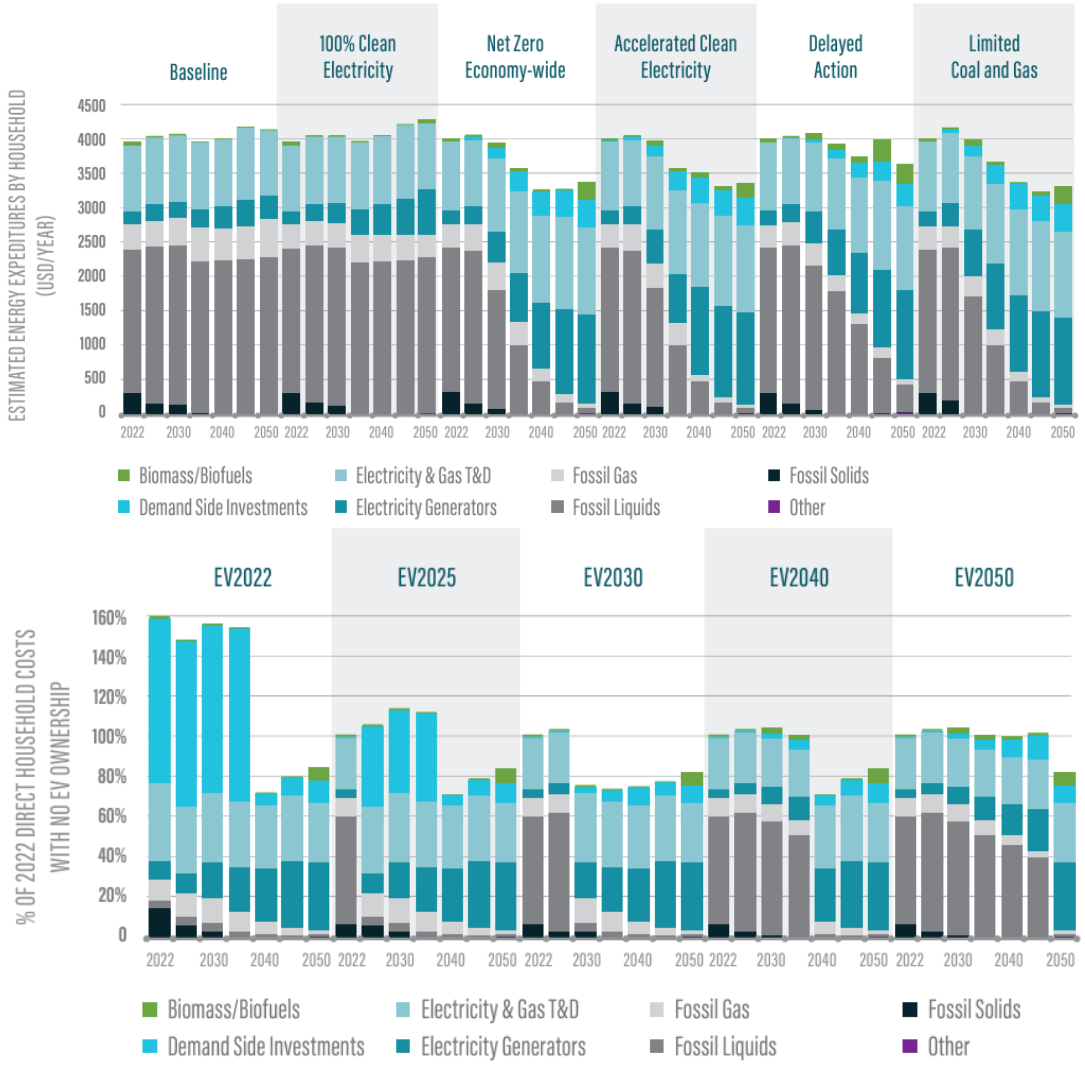
Example for Washington 2021 State Energy Strategy

Technical Approach

Cross-Cutting Equity Considerations

Energy Burden and Affordability

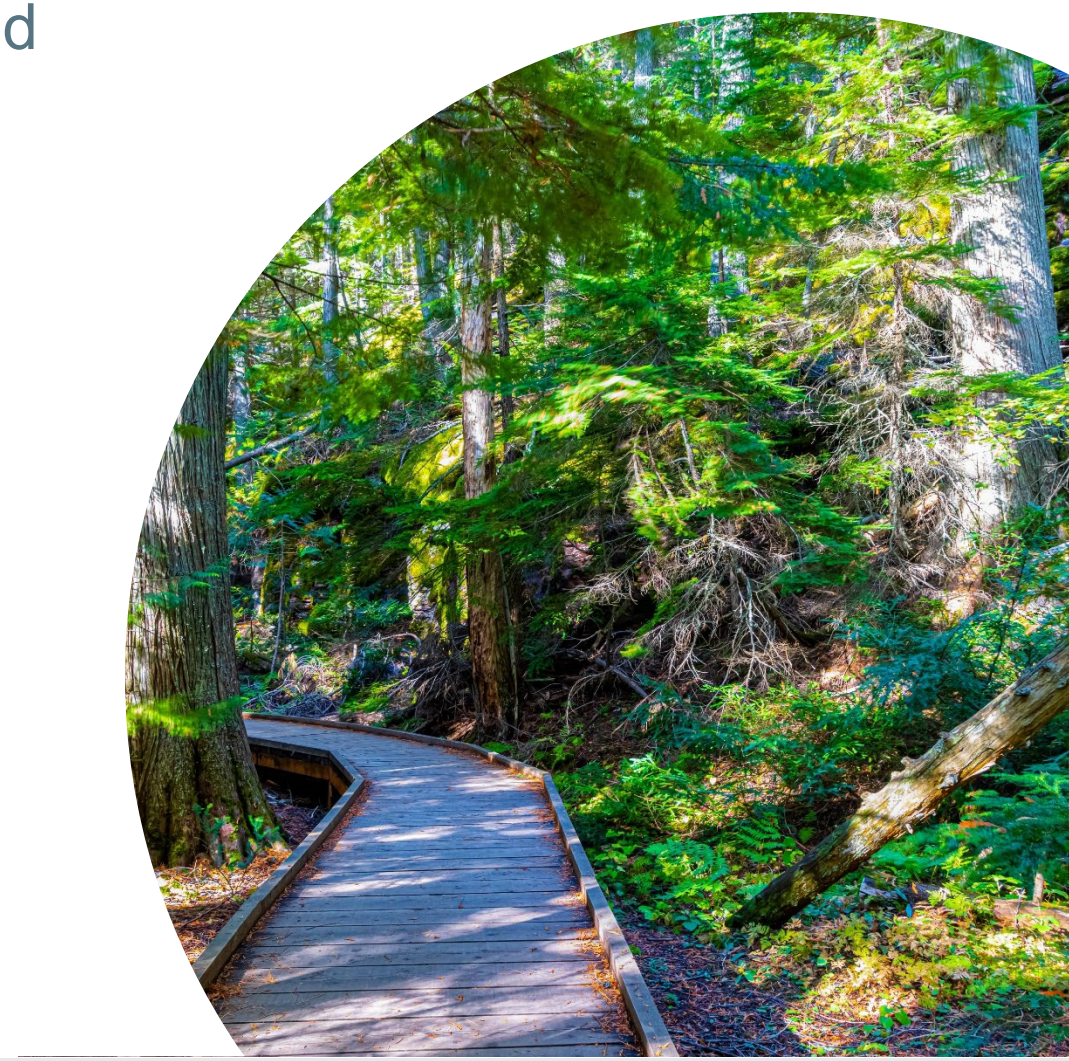
- Energy Wallet: Electricity bills increase with electrification, but bills for other fuels decrease at the same time
- How is total energy spending for different customer types including LIDAC impacted?
  - What is the impact on customers investing in electrification earlier or later?
- How is energy burden impacted?



Air Quality Modeling

Geospatial Mapping

- Use publicly available datasets to understand community-level energy inequities and relationship to socioeconomic disparities
- Pair with energy wallet to show where archetypal customer groups are located throughout Oregon
- Consider energy metrics identified and prioritized through engagement, e.g.,:
  - Energy burden
  - Poverty level
  - Access to internet
  - Rural classification
  - Etc.



Economic and Employment Effects

- Literature Review of past studies in Oregon and other states
  - Recent CETI study *Net-Zero Northwest Workforce State Analysis*
  - Other studies, as recommended by ODOE and stakeholders

Oregon Energy Employment by Subsector in 2021 and 2030

Net-Zero Northwest Workforce Analysis

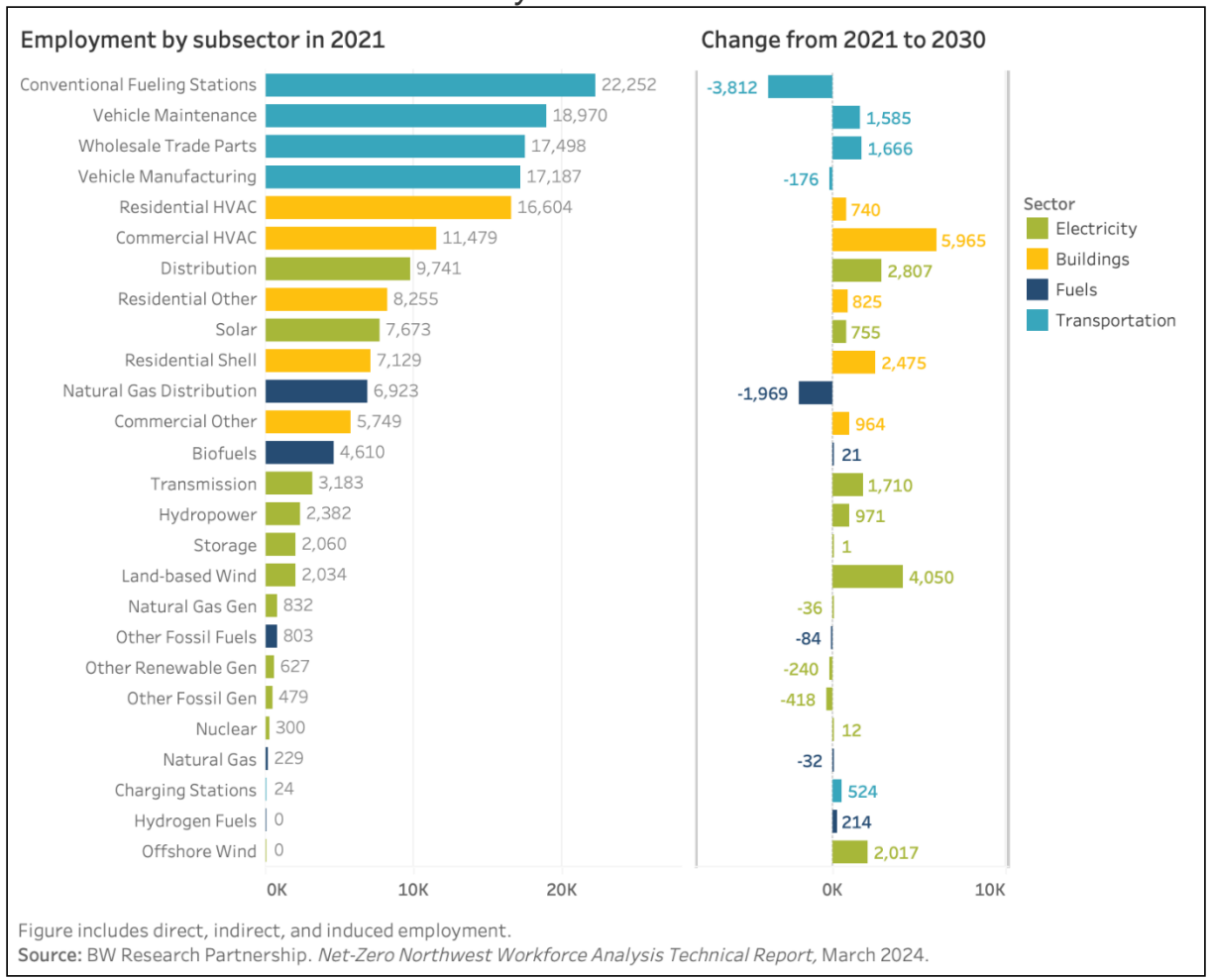


Figure includes direct, indirect, and induced employment.

Source: BW Research Partnership. *Net-Zero Northwest Workforce Analysis Technical Report,* March 2024.

Thank you very much

Jeremy Hargreaves jeremy.hargreaves@evolved.energy
Mariah Caballero mariah.d.caballero@vanderbilt.edu
Elaine Hart elaine@momentenergyinsights.com
Angela Long angela.long@rockcressconsulting.com
Ruby Moore-Bloom ruby@cleanenergytransition.org
Eileen V. Quigley eileen@cleanenergytransition.org