# Oregon Department of ENERGY

Oregon Energy Strategy
Policy Working Group
Plenary Meeting

May 21, 2025











# OREGON DEPARTMENT OF ENERGY

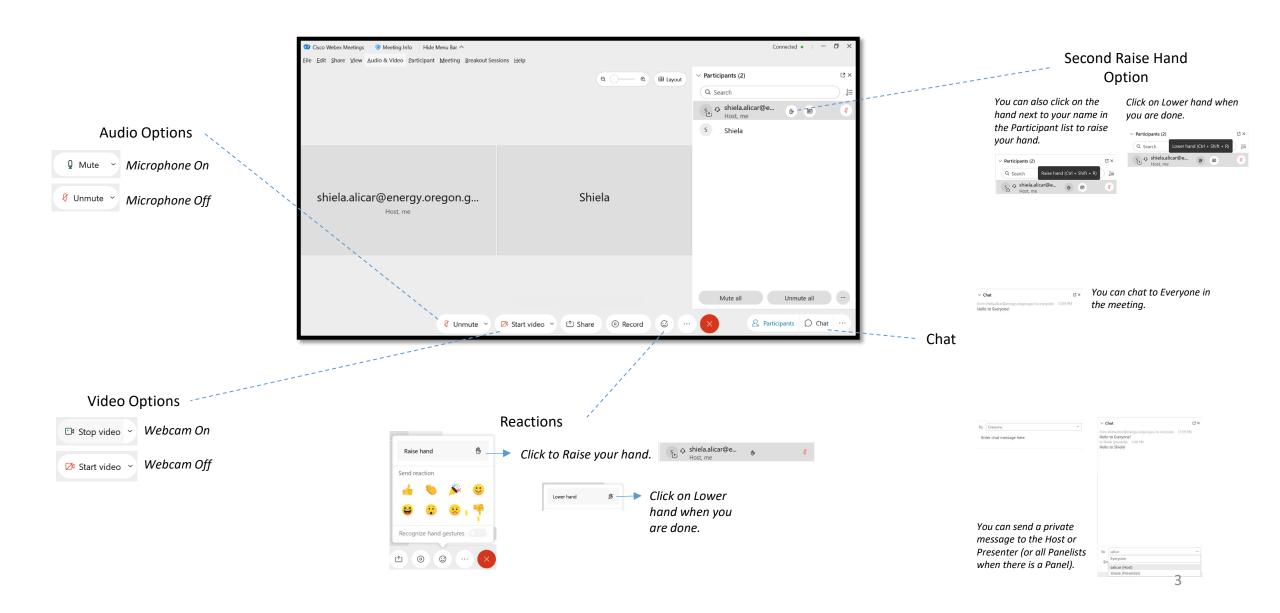
Leading Oregon to a safe, equitable, clean, and sustainable energy future.

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

# USING WEBEX



# **Meeting Objectives**

- Update on process for developing energy strategy recommendations
- Summarize discussions from across Policy Working Groups
- Present draft high-level policy recommendations across working group topics
- Answer clarifying questions
- Next steps





# AGENDA

Time	Topic
9:00 – 9:10	Welcome, Agenda, Introductions
9:10 – 9:25	Process Overview
9:25 – 9:40	Developing Equitable and Environmental Justice Processes
9:40 – 10:40	Summary of Working Group discussions and draft high-level Policy Recommendations
10:40 – 10:50	Next steps
10:50 – 11:00	Clarifying Questions



# **GROUP AGREEMENTS**

- Honor the agenda or modify by agreement.
- 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.
- Limit chat conversations.





# **UPDATE ON PROCESS**



# **TIMELINE**

May 2024 – January 2025

Modeling Pathways to understand options and tradeoffs February – May

Policy discussions building on insights from modeling

May – June

Drafting policy recommendations for public input

June – July
Public written

comments

July - August
Drafting

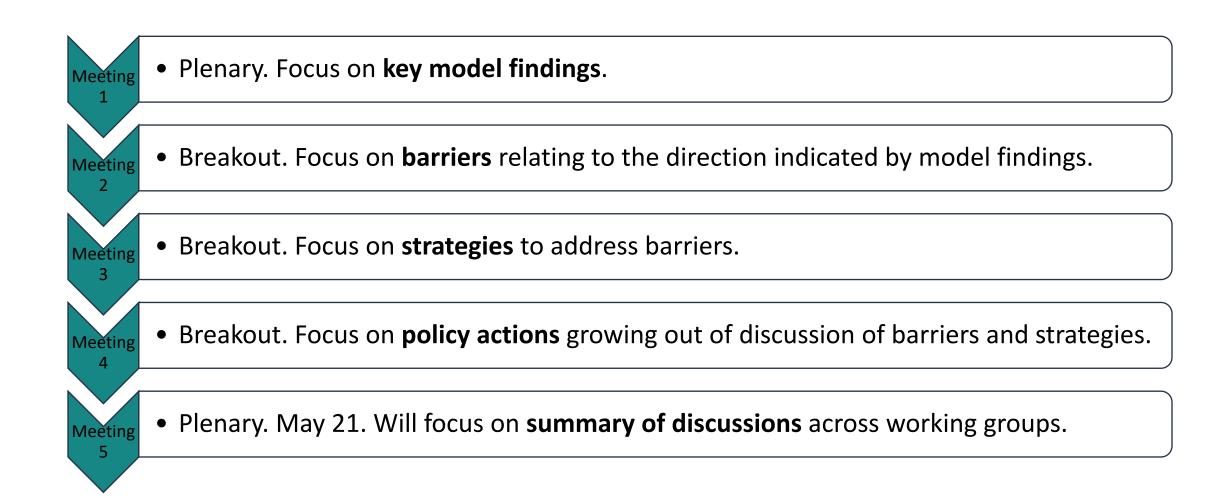
November 1
Final report

# FIVE POLICY WORKING GROUPS

- Environmental Justice and Equity
- Building Efficiency, Electrification, and DERs
- Transportation Electrification
- Developing Clean Electricity Generation and Transmission
- Low-Carbon Fuels



# WORKING GROUP DISCUSSIONS



# PATHWAYS MODELING PROVIDES DIRECTION

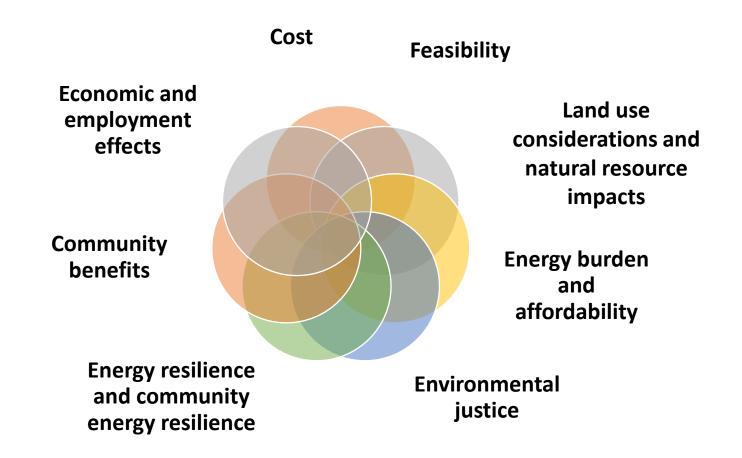
**Direction:** Liquid and gaseous fuels are critical to meet Oregon energy demand and its climate goals. There are different pathways for decarbonizing fuels, but it is clear that we must shift much of our fuel use to electricity and transition the hardest-to-electrify sectors — such as aviation, maritime, and high-heat industrial processes — to low-carbon alternatives.

With that direction on the "what," we must discuss the "how."





# KEY CONSIDERATIONS





# STRUCTURE OF BREAKOUT MEETINGS

	Meeting 2	Meeting 3	Meeting 4
Pathway / key findings	Challenges and Barriers	Proposed strategies to address barriers	Proposed policy actions
Low Carbon Fuel Development			
Need for Fuel Resources to Support the Electric Grid			
Electrification with Strategic Consumption			
Fuel Demand Declines			

### WORKING GROUPS INFORMED POLICY FRAMING



### WHAT IS A STRATEGY?

Strategy 1

Strategy 2

Strategy 3

Strategy 4

Strategy 5

Strategy 6

Each strategy represents the **direction** that Oregon needs to pursue to meet our energy policy objectives. These objectives include reliability, affordability, resilience, and climate.

Strategies are framed as *directional*, drawing on results from the energy strategy *modeling*, as well as from *engaging with our partners*. They are organized around key elements/pillars of Oregon's energy system, such as electricity generation and energy efficiency, and account for the interactions between each pillar.

Strategies do not set a concrete goal, such as achieving a certain pace or scale of electrification or resource build-out. Rather, the strategies are meant to guide our state over time.



# SIX STRATEGIES

To meet its energy policy objectives, Oregon must build on and advance policies that support the following six strategies:

Strategy 1 Improve energy efficiency of buildings and industry and electrify end uses Electrify transportation and reduce vehicle miles traveled Strategy 2 Expand distributed energy resources and enable demand-side flexibility Strategy 3 Strategy 4 Promote a reliable and clean electricity system Advance the use of low-carbon fuels to maintain a reliable grid and fuel the hardest-to-Strategy 5 electrify end uses Strengthen resilience across the energy system, including at utility-scale, community, and Strategy 6 customer levels.

Implementation of each strategy must consider burdens and benefits to environmental justice communities and apply an equity lens to prevent further disproportionate impacts to historically and currently marginalized communities.

# HIGH-LEVEL POLICY RECOMMENDATIONS

- Each strategy has 2-3 high-level policy recommendations
- Policy recommendations provide more detailed direction
- Intended to provide specific focus areas for guiding policy development, but are in and of themselves not sufficiently specific enough to be directly actionable
- Do not define pace or scale
- Mid-way point between strategy and policy actions



# **POLICY ACTIONS**

- Policy actions are meant to be specific, measurable, and achievable
- They serve to overcome specific barriers that have been identified with help from engagement process

There are four "flavors" of policy actions

- Build on existing programs/authority
- Create a new policy or program
- Broader state direction/support
- Further study to help inform decisions





# **EXAMPLE**

#### **STRATEGY**

 Advance the use of low-carbon fuels to maintain a reliable grid and fuel the hardest-to-electrify end uses

#### POLICY RECOMMENDATIONS

- Foster development of low-carbon fuels in Oregon as a strategic resource, while mitigating environmental and community impact.
- Support a deliberate transition to a low-carbon energy future that results in a system that utilizes increasingly cleaner fuels, supports grid reliability, and encourages technological innovation to facilitate a least-cost pathway to decarbonization.

#### **POLICY ACTIONS**

Focused on actionable recommendations with 5-10 year outlook.

# HOW THIS FITS TOGETHER





# **DEVELOPING THE ENERGY STRATEGY**

#### **INPUTS**

#### **Analysis**

- Energy Strategy Modeling
- Energy Wallet
- Air Quality Modeling
- Geospatial Maps
- Jobs Study

#### **Expertise**

- Tribes
- Interagency Steering Group
- Advisory Group
- Working Groups
- Public Comments

Draft policy recommendations for public comment

#### FINAL REPORT

- State-wide strategy and pathways to achieving energy policy objectives
- Policy Recommendations
- Description of engagement process and how different perspectives informed state energy strategy

# **WORKING GROUP SCOPE**

Environmental Justice and Equity

- Role in providing EJ and equity perspectives in the other working groups
- Evaluate analysis and develop recommendations related to EJ and equity





Environmental justice and equity concepts and best practices as an umbrella to use as a tool for lawmakers while developing energy policy.



Embed specific and explicit environmental justice concepts and best practices in policies.



# **ENVIRONMENTAL JUSTICE AND EQUITY**

Big Headings	Issue statement	Proposed strategies
EQUITABLE ACCESS TO DECISION- MAKING PROCESSES	Environmental justice communities, particularly Tribes, rural, and coastal communities are not included in decision-making processes in a way that centers equity and justice practices.	Any policy or program to expand necessary energy infrastructure should be designed to ensure environmental justice and energy burdened communities have equitable access. Participation of EJ organizations and community members should be appropriately compensated for sharing their personal experiences and professional expertise  • Participation of EJ groups in any decision-making bodies, including committees, commissions, task forces, etc.  • Develop a statewide policy to develop an equitable payment system to reduce barriers to participants and agencies
EQUITABLE ACCESS TO INFRASTRUCTURE DEVELOPMENT	There is limited infrastructure in Tribal, coastal, and rural communities that contributes to the slower rate of technology adoption and the lack of energy reliability.	Any policy or program to expand infrastructure to support technology adoption and energy reliability should be designed to ensure environmental justice and energy burdened communities have equitable access to:  • EV charging • Reliability • Resilience

# **ENVIRONMENTAL JUSTICE AND EQUITY**

Big Headings	Issue statement	Proposed strategies
INVEST IN LONG TERM INCENTIVE PROGRAMS FOR EJ COMMUNITIES	While incentives and tax credits may offer assistance to moderate-income households, they do not provide enough financial assistance to relieve the burden to lowincome and energy-burdened households.	Develop statewide prioritization criteria for energy funding/assistance that provides equitable solutions ensuring that people who need the most assistance are able to get it with the least barriers possible.  • Provide increased and stable funding and assistance for those in low-income and energy burdened households  • Establish revolving loans for low or no interest loans to medium-income households
PROMOTE HOLISTIC WORKFORCE DEVELOPMENT IN UNDERSERVED COMMUNITIES	There is a need for holistic workforce training that incorporates culturally responsive and technology-specific training and continuing education so that implementers and contractors are confident and knowledgeable when serving the community to be able to speak to benefits including health and affordability.	Develop and expand training and continuing education programs in underserved communities for sales, contractors, tradespeople, and landlords. Ensure trainings include:  • Incentive programs  • Culturally responsive  • Technology specific  • Health  • Air quality  • Cost  • Etc.

# **ENVIRONMENTAL JUSTICE AND EQUITY**

Big Headings	Issue statement	Proposed strategies	
DEVELOP PARTNERSHIPS AND RESOURCES IN EJ COMMUNITIES	End-users and those in the workforce need better resources to understand energy technologies, programs, and how they are beneficial or burdensome so they can participate in the process of program development, rulemaking, and consumer education.	<ul> <li>Provide community outreach and informational opportunities that include in-person engagement</li> <li>Offer other resources/tools that are in plain language and multiple languages</li> <li>Partner with community organizations who are trained and compensated appropriately to be trusted partners and community navigators in the field</li> </ul>	
CONSIDER THE INTERSECTION OF ECOSYSTEMS	The way that we currently evaluate benefits and burdens in our energy systems does not include enough consideration of how ecosystems interact and intersect between land, animals, nature, and environmental justice communities.	I halancing energy needs — like access to attordable energy and	

### **WORKING GROUP SCOPE**

Building
Efficiency,
Electrification,
and DERs

- Residential and commercial
- Customer-side of the meter

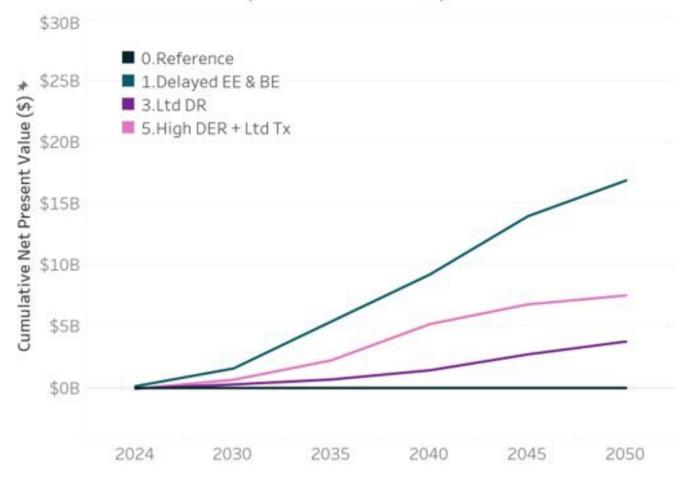


# MODEL RESULTS: BUILDING EFFICIENCY AND ELECTRIFICATION

Delayed energy efficiency and building electrification represents the highest cost of all the scenarios that were modeled.

The model demonstrates that a delay of 10 years in energy efficiency and building electrification results in more than \$17B in additional costs through 2050.

#### Difference to Reference (Cumulative NPV \$B)

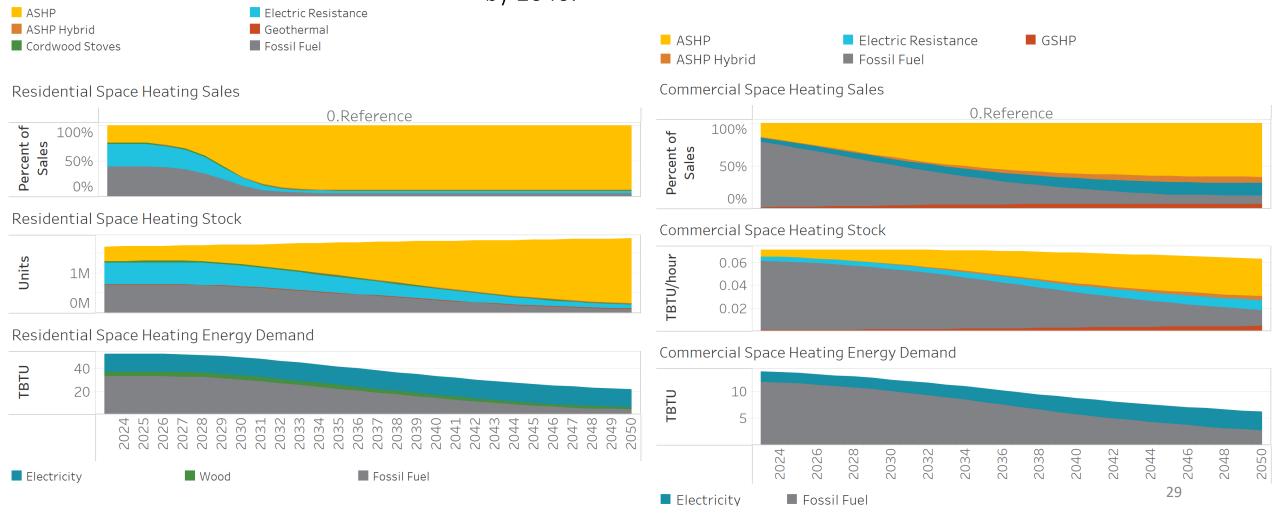




# MODEL RESULTS: BUILDING EFFICIENCY AND ELECTRIFICATION

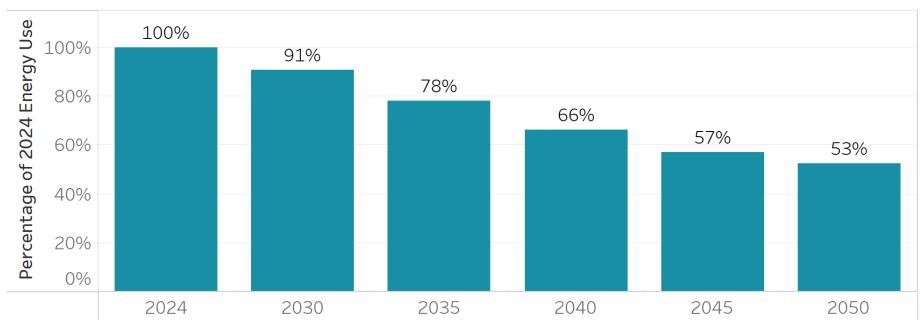
Building electrification results in system-wide reductions in energy demand.

Model assumes existing policies play out for all space heating technologies 65 percent electric heat pump sales by 2030; 90 percent by 2040.



# MODEL RESULTS: BUILDING EFFICIENCY AND ELECTRIFICATION

#### Per Capita Residential Energy Use as Percent of 2024





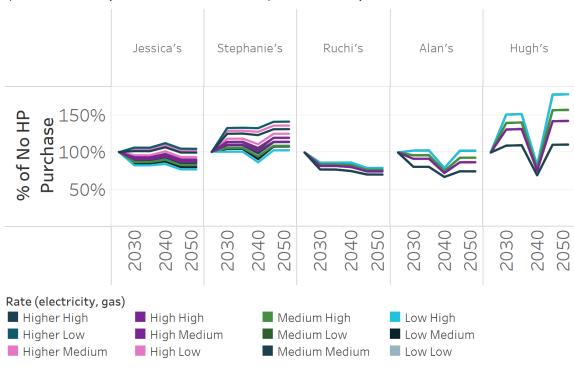
# **ENERGY WALLET**

Household Characteristic	Jessica's	Stephanie's	Ruchi's	Alan's	Hugh's
Building Category	Single Family Detached	Single Family Detached	Single Family Detached	Single Family Manufactured	Multi-family
Region	Urban	Rural Cold Climate	High Priority Area	Rural	Urban
Ownership	Own	Own	Own	Rent	Rent, Below county AMI
Primary Heating Fuel Type	Natural gas	Natural gas	Electricity	Electricity	Electricity
Primary Heating System	Furnace	Furnace	Furnace	Furnace	Baseboard
Primary Cooling System	Central AC	None	Portable AC	Window AC	None
Water Heater Technology	Fossil Fuel Non-Condensing	Fossil Fuel Non-Condensing	Electric Resistance	Electric Resistance	Electric Resistance
Water Heater Fuel	Natural gas	Natural gas	Electricity	Electricity	Electricity
Area (sq ft)	3100	1855	1400	1520	· **
Year	2012	2006	2007	1986	1977
Stove/Oven	Natural gas	Natural gas	Electric	Electric	Electric
Occupants	6	4	2	2	2
Vehicles	2 SUVs	2 SUVs	2 SUVs	2 Cars	1 Car

# HEATING COST UNCERTAINTY: SAVINGS OF HEAT PUMPS ARE RATE AND TECHNOLOGY DEPENDENT

- Whether a heat pump saves a household money or not depends on rate, technology, and service demand
- Customers with electric resistance heat and window AC units save under all rates, the greatest savings under the highest electric rates
- Households with gas heating save the most under the lowest electric rates
  - Jessica's household saves in all but the "higher" electric rate
  - Stephanie's household does not have AC so doesn't receive the benefits of avoiding an AC purchase with a heat pump
- Hugh's rental unit has high costs for installation (\$14,900/unit) and struggles to save even at the highest electric rates

2030 HP purchase estimated bills as % of no HP purchase (assumes no EV purchase)



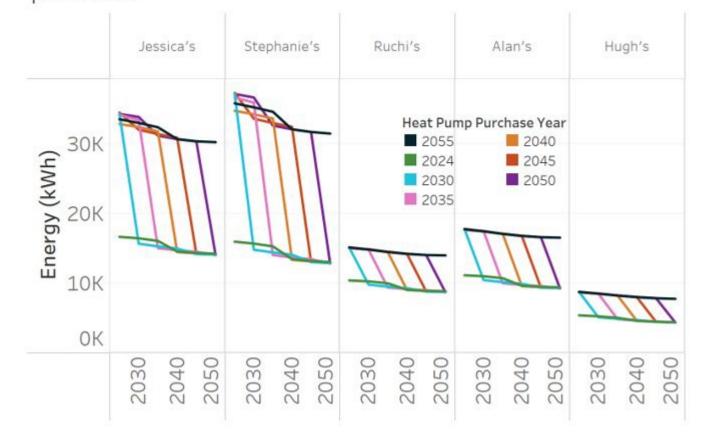
Note: Spike downwards is in years when customers do not have a loan payment to make on heat pump equipment



# SIGNIFICANT ENERGY SAVINGS FROM INSTALLING AN ELECTRIC HEAT PUMP

- Energy use for heating and cooling declines significantly regardless of the starting technology.
- When a customer can install a heat pump depends on when their current equipment reaches end of life.
- There will still be cost barriers for some households to install a heat pump.

Energy use excluding vehicles by year of heat pump purchase





# **BARRIERS**

- Cost
- Consumer Education
- Weatherization Maintenance
- Incentive Structure
- System Performance



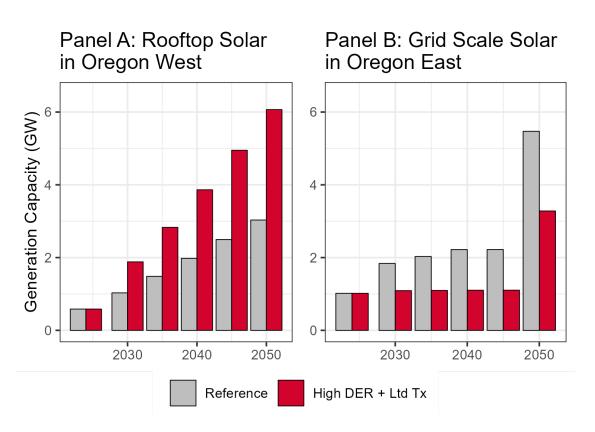
# EXPAND DISTRIBUTED ENERGY RESOURCES AND ENABLE DEMAND-SIDE FLEXIBILITY

#### **Policy Recommendations**

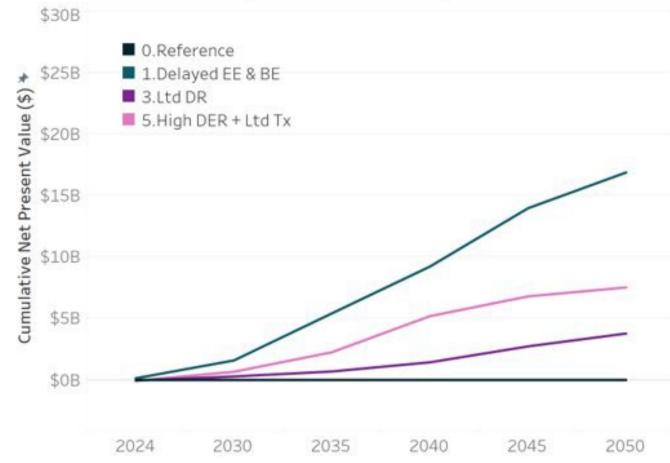
- 1. Reduce the carbon intensity of residential and commercial buildings while maintaining affordability and energy system resilience.
- 2. Prioritize the management of flexible loads, including EVs, building systems, and distributed batteries to mitigate peak demand, defer the need for grid investments, support resilience, and facilitate integration of variable renewable resources Improve.



# DISTRIBUTED ENERGY RESOURCES

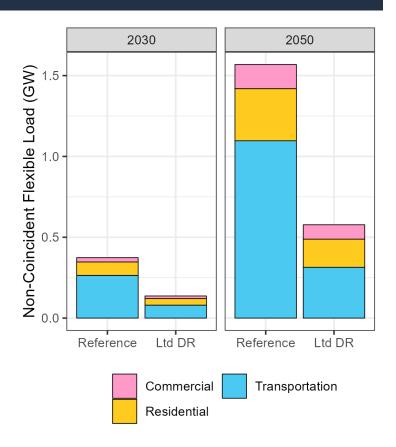


#### Difference to Reference (Cumulative NPV \$B)

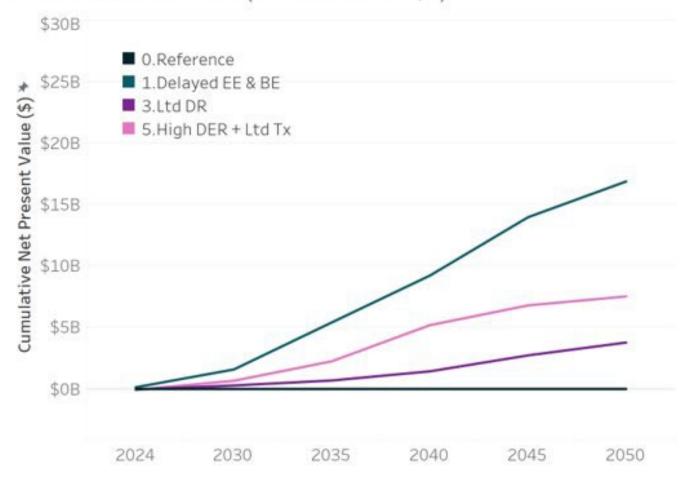




#### **DEMAND RESPONSE**



#### Difference to Reference (Cumulative NPV \$B)





#### **BARRIERS**

Cost

Consumer Education

Utility Interconnection

Technology Limitations



## EXPAND DISTRIBUTED ENERGY RESOURCES AND ENABLE DEMAND-SIDE FLEXIBILITY

#### **Policy Recommendations**

- Support adoption of distributed energy resources, including solar PV and batteries, to advance energy resilience at household, utility, and community-level, including local microgrids for communities at high risk for power outages.
- 2. Prioritize the management of flexible loads, including EVs, building systems, and distributed batteries to mitigate peak demand, defer the need for grid investments, provide grid services, and facilitate integration of variable renewable resources.



#### WORKING GROUP SCOPE

## Transportation Electrification

- Light, medium, and heavy-duty zero emission vehicles (battery electric and hydrogen fuel cell)
- Charging and fueling infrastructure
- Grid integration
- Vehicle miles traveled reduction

#### STEP BY STEP PROCESS

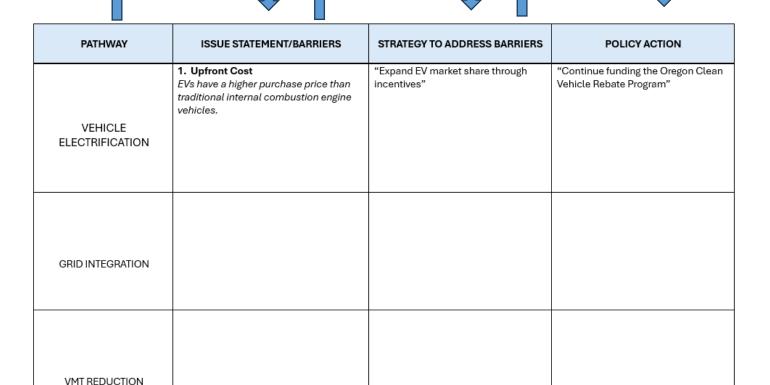
Meeting 1: Model Findings

Meeting 2: Barriers to Progress

Meeting 3: Strategies to

Overcome Barriers

Meeting 4: Draft Policy Actions





#### **RECAP: MODELING QUESTIONS**

0. Reference: What are the key elements of a least-cost pathway to meeting Oregon's energy policy objectives?

0a. Sensitivity: No Change in VMT (vs. Reference) – what if VMT per capita remains flat to 2050?

0b. 50 percent Lower Tech Load Growth (vs. Reference) – what if electricity demand for data center growth were 50 percent lower through 2035?

- 1. What if energy efficiency and building electrification is delayed by 10 years?
- 2. Delayed TE What if full transportation electrification of medium- and heavy-duty vehicles is delayed 10 years, from 2040 to 2050?

2a. Sensitivity: No Advanced Clean Trucks regulation (vs. Delayed TE Alt. Scenario) – what if there were no near-term electrification targets for MHD vehicles?

- 3. Limited Demand Response What if there is limited participation in demand response programs?
- 4. What if there is limited utility-scale electricity generation in Oregon?
- 5. What if there are higher levels of rooftop solar and behind-the-meter storage and transmission is limited to reconductoring only (no new build)?
- 6. What might an alternative portfolio of flexible resources for electricity reliability look like?

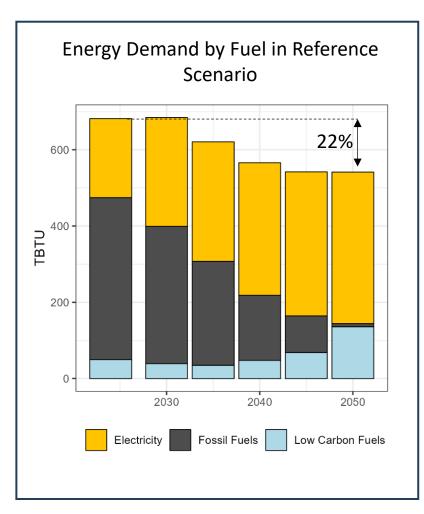
## VEHICLE ELECTRIFICATION

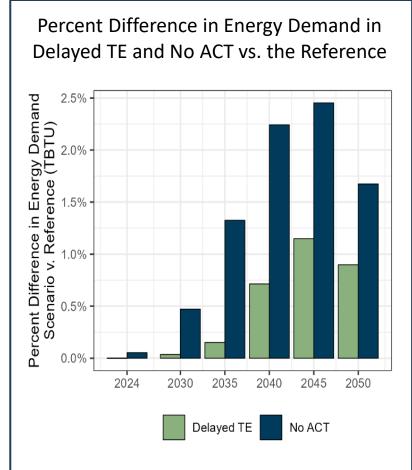
TE Policy WG - Meeting 1

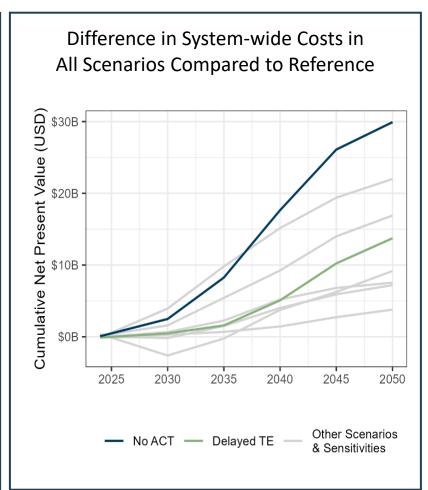
Transportation electrification reduces system-wide energy demand and the cost of decarbonization, and the pace matters.

#### **KEY FINDING #1**

#### EARLY EV ADOPTION KEY TO COST CONTAINMENT









## VEHICLE ELECTRIFICATION BARRIERS

#### TE Policy WG – Meeting 2

Barrier Category	Summary
High Costs / Lack of Funding	High upfront costs coupled with lack of sufficient incentives
Consumer / Dealer Awareness	EV myths persist and many are unaware of benefits
Charger Reliability / Maintenance	Charging stations are unreliable and difficult to repair and maintain
Interoperability & Standards	Lack of interoperability and standards leads to charger downtime and consumer confusion
Technical Assistance	Large learning curve for fleets and no statewide technical assistance
Charging & Fueling Access	Availability and accessibility of charging and fueling infrastructure in Oregon is limited, particularly for certain populations
MHD ZEV Technology	Limited commercially available ZEVs for some MHD sectors and use cases



# VEHICLE ELECTRIFICATION: POLICY RECOMMENDATION

#### TE Policy WG – Meeting 3

- Discussed strategies to overcome barriers:
  - Increased funding
  - More technical assistance
  - More information on infrastructure needs and commercial availability of ZEV technologies
  - Consumer awareness
  - Minimum standards for charging equipment

High-Level Policy Recommendation: Advance and expand efforts to electrify the transportation system, with a targeted focus on removing barriers to ensure the state meets its zero-emission vehicle goals.



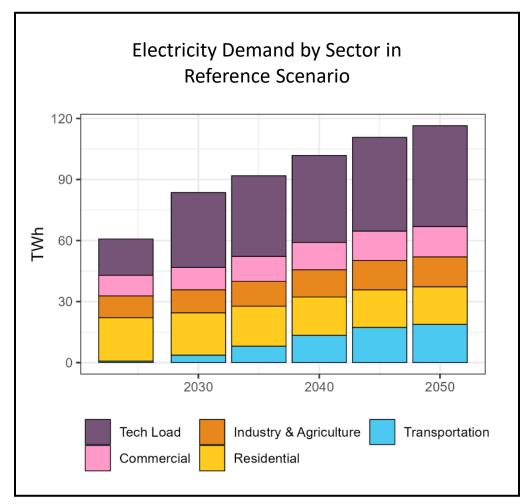
## **GRID INTEGRATION**

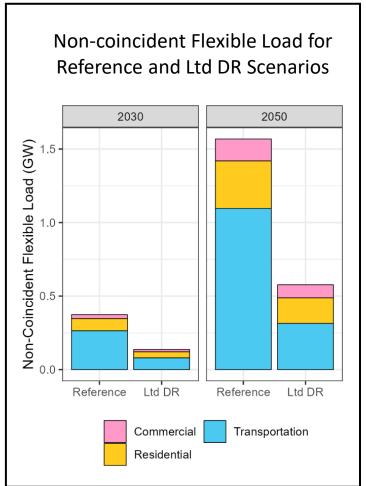
Transportation electrification will significantly increase electricity demand but EVs can provide a net benefit to the grid if managed flexibly.

TE Policy WG – Meeting 1

#### **KEY FINDING #2**

#### EVS CAN SERVE AS A FLEXIBLE RESOURCE







## GRID INTEGRATION BARRIERS

#### TE Policy WG – Meeting 2

Barrier Category	Summary
Load Management / DER / BESS	Load management strategies and technologies are not well understood or developed
Utility Capacity / Upgrades / Interconnection	Large power demand and limited grid capacity means high costs and timelines for interconnection
Lack of Utility Resources and Incentives	Some public utilities have limited TE resources and expertise, and limited incentive for managed charging
Historic Planning / Investment Patterns	Utilities hesitant to invest proactively without certainty of cost recovery
Utility Rates	Utility rates not reflective of EV benefits and cost prohibitive for some consumers
Consumer Awareness – Load Management	Consumers wary of managed charging due to insufficient incentives and misconceptions



#### **GRID INTEGRATION: POLICY RECOMMENDATION**

#### TE Policy WG – Meeting 3

- Discussed strategies to overcome barriers:
  - More information on grid capacity
  - Electricity rates that align with grid benefits
  - Technical assistance for public utilities
  - More proactive investment by utilities
  - Study on load management technologies
  - Incentives for Battery Energy Storage
     Systems
  - More consumer awareness of grid benefits

High-level Policy Recommendation: Establish streamlined processes for distribution system upgrades and infrastructure interconnection, while prioritizing the integration of EVs as flexible loads, to minimize delays, mitigate the impacts of growing EV adoption, and improve overall grid efficiency.

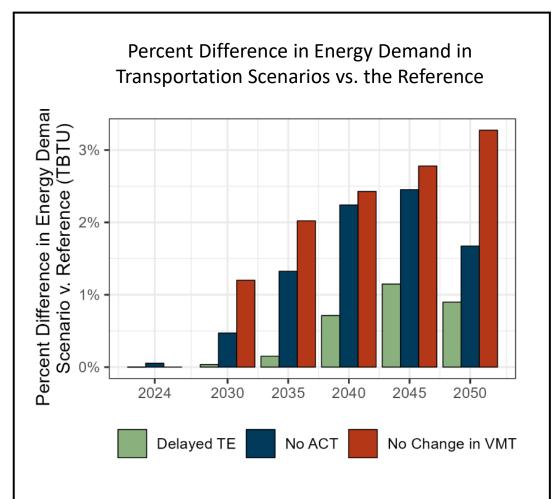


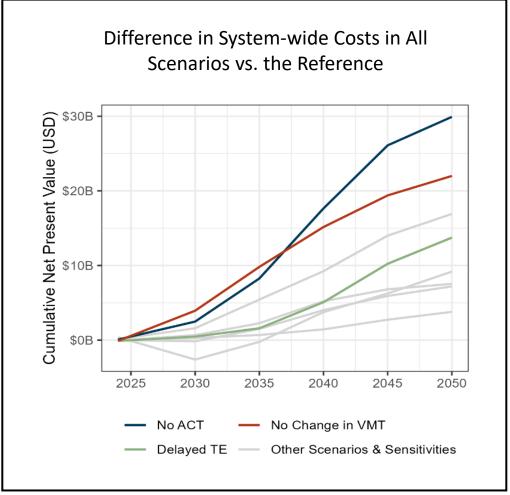
## **VMT REDUCTION**

Reducing vehicle miles traveled has a large impact on overall energy demand and therefore costs for maintaining and upgrading the electric grid. TE Policy WG - Meeting 1

#### **KEY FINDING #3**

#### VMT REDUCTION IS A WORTHY INVESTMENT







## VMT REDUCTION BARRIERS

#### TE Policy WG – Meeting 2

Barrier Category	Summary
Transit Investment	Lack of sufficient and sustainable transit funding
Transportation Funding	Lack of sustainable funding for road maintenance and transportation options
Transportation Options for Rural and Low- income Residents	Lack of viable alternatives to cars for rural and low-income residents
Land Use / Development Patterns	Development that favors cars
Cultural Perceptions	Cultural preference for personal vehicle ownership and use and negative impressions around alternative transportation modes
Safety	Safety concerns around alternative transportation modes
Intermodal System Completeness	Gaps in the multi-modal system



#### VMT REDUCTION: POLICY RECOMMENDATION

#### TE Policy WG – Meeting 3

- Discussed strategies to overcome barriers:
  - More funding for transit and active transportation programs
  - Climate alignment in how we fund transportation
  - Incentivize mixed-use development
  - Increase safety of low carbon transportation modes, esp. transit
  - Incentivize electric bikes / e-micromobility

High-level Policy Recommendation: Prioritize policies and allocate funding to programs that expand access to multimodal transportation options — including public transit, biking, and walking infrastructure — and promote development patterns that make it easier and more appealing for people to live, work, and access services without relying on a personal vehicle.



#### **WORKING GROUP SCOPE**

Developing Clean Electricity Generation and Transmission

- Electricity generation and storage in front of the meter
- Transmission
- Development needs and barriers/competing priorities



## PATHWAYS MODELING KEY FINDINGS

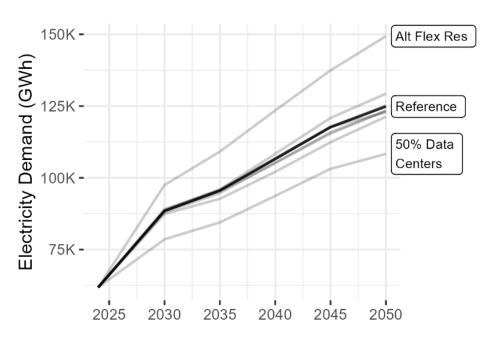
- The Model Shows Significant Near-Term Load Growth
- Both In-State and Out-of-State Resources Contribute to a Least-Cost Supply Portfolio
- Oregon Does Not Have Sufficient Physical Transmission
   Capacity to Meet the Modeled Electricity Flows
- The Model Consistently Builds More Generating Capacity
- Decarbonizing Oregon's Electricity May Require More Policy Action



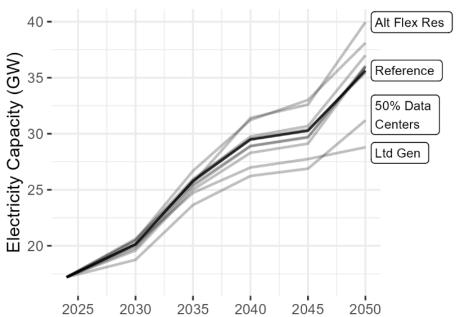


#### PATHWAYS MODELING: DEMAND & CAPACITY

## **Electricity Demand in Oregon Across All 10 Scenarios and Sensitivities (2024-2050)**



## Electricity Capacity in Oregon Across All 10 Scenarios and Sensitivities (2024-2050)



Charts from <u>Key Model Findings for Clean Electricity</u> <u>Generation and Transmission</u>

Notes: Reference Scenario is shown in bold. All 10 scenarios and sensitivities are shown but may not be distinguishable due to overlap. Scenarios/sensitivities with the highest and lowest growth are labeled.

Additional capacity is built in Oregon to meet rising demand, even with significant increases in clean imports.

Restricting in-state development ("Ltd Gen") increases imports and transmission needs, and it increases modeled costs.

#### PATHWAYS MODELING PROVIDES DIRECTION

**Direction:** Electricity is a key fuel for Oregon to meet its climate goals. There are different pathways for expanding our system, but in all scenarios the electricity sector must expand significantly.

With that direction on the "what," we discussed the "how."



## CHALLENGES/BARRIERS: THEMES WE HEARD

#### Barriers to resource development

- Cost; risk; lack of "perfect" information; concerns planning too siloed
- Competing land use and natural resource priorities; NIMBYism
- Regulatory restrictions and regulatory uncertainty
- Need for coordination and collaboration with utility, BPA, others
- Constraints in interconnection and transmission
- Supply chain delays
- Workforce limitations
- Differing perspectives on challenge/opportunity of new large loads

## CHALLENGES/BARRIERS: THEMES WE HEARD

#### Barriers to enhancing resilience

- Cost; struggle to monetize non-energy/non-capacity values
- Lack of education and awareness; lack of local resources/internal planning capacity
- Regulatory uncertainty, e.g., role of utility vs other entities for microgrids; need for cooperation and coordination
- Differing perspectives on role of natural gas to support grid resilience

## CHALLENGES/BARRIERS: THEMES WE HEARD

#### Barriers to regional coordination

- Lack of RTO; no organized market with centralized investments in generation, storage and transmission
- Market uncertainties; differing perspectives on challenge/opportunity of large loads
- Challenge of relying on/needing to coordinate with BPA, federal government, neighboring states

#### PROMOTE A RELIABLE AND CLEAN ELECTRICITY SYSTEM

#### **Policy Recommendations**

- 1. Collaborate with Tribes, neighboring states, regional entities, and federal partners to address Oregon's needs as part of a regional grid.
- 2. Reduce barriers to development and expansion of non-emitting generation, storage, and transmission infrastructure to meet the state's climate objectives and maintain a reliable and affordable system while minimizing impacts on natural and working lands.



#### **WORKING GROUP SCOPE**

## Low-carbon Fuels

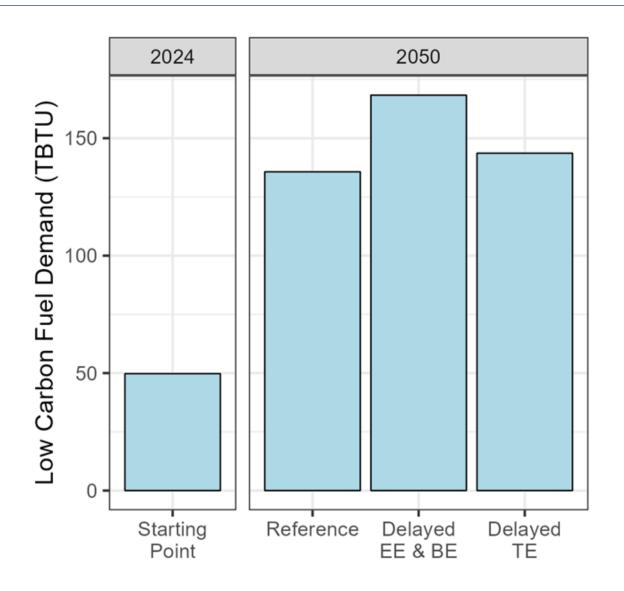
- Best application of low carbon fuels used in buildings, industry, and transportation
- Identification of barriers and potential solutions to production and distribution of fuels



Low-carbon fuels are an increasing proportion of Oregon's energy supply across all scenarios.

#### **KEY FINDING**

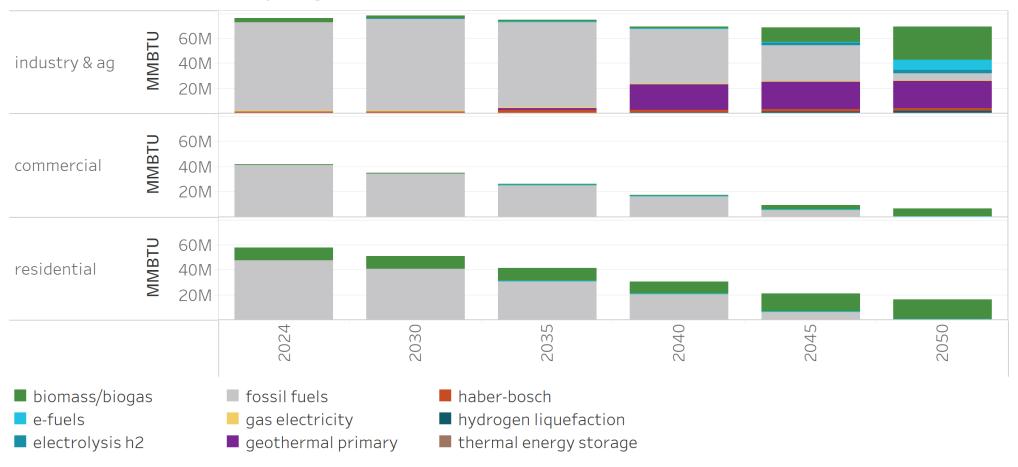
# CHANGES IN LOW-CARBON FUEL CONSUMPTION ACROSS ALL SCENARIOS





#### DIRECT USE FUEL CONSUMPTION

Direct Use Fuels in Industry & Ag, Commercial, and Residential Sectors



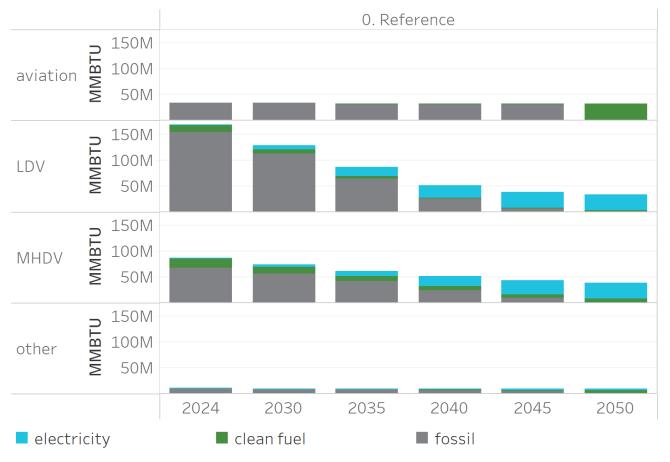


#### TRANSPORTATION FUEL USE

- Electrification of light duty and medium duty vehicles
- Improving fuel efficiency
- Dependent on clean fuels:
  - Aviation
  - Medium- and Heavy-Duty Vehicles
  - Freight rail
  - Maritime

# 5 OREGON DEPARTMENT OF ENERGY

#### Source of Energy in Transportation



#### LOW-CARBON FUEL BARRIERS

#### Low Carbon Fuel Development

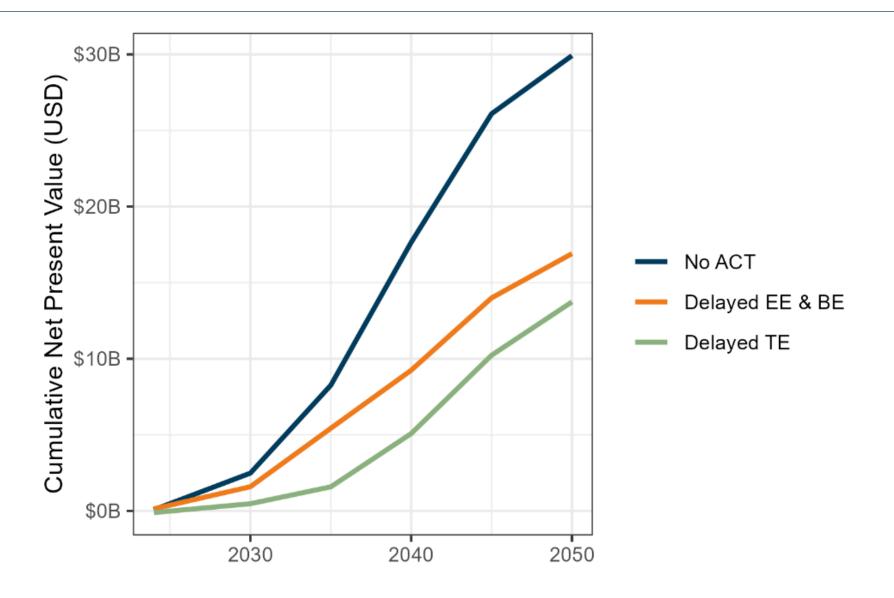
- Supply: Limited fuel infrastructure and supply leads to competition with other states and end-uses
- Demand: Market is not driving demand for low-carbon fuels
- Feedstock: Many feedstocks in Oregon are not economical to develop due to long distances to existing infrastructure
- Cost/Affordability: Upfront costs of vehicles, equipment, new technologies, and infrastructure



Electrification is more cost effective than adopting low-carbon fuels in many applications.

#### **KEY FINDING**

# COSTS OF DELAYED ENERGY EFFICIENCY AND ELECTRIFICATION COMPARED TO REFERENCE SCENARIO





### LOW-CARBON FUEL BARRIERS

#### Electrification

- Transportation: Consumer awareness and understanding
- Industry and Agriculture: Existing infrastructure is not well placed to serve the most strategic uses
- Residential and Commercial
  - Upfront cost of retrofitting existing end uses
  - Lack of support for those who cannot afford to transition





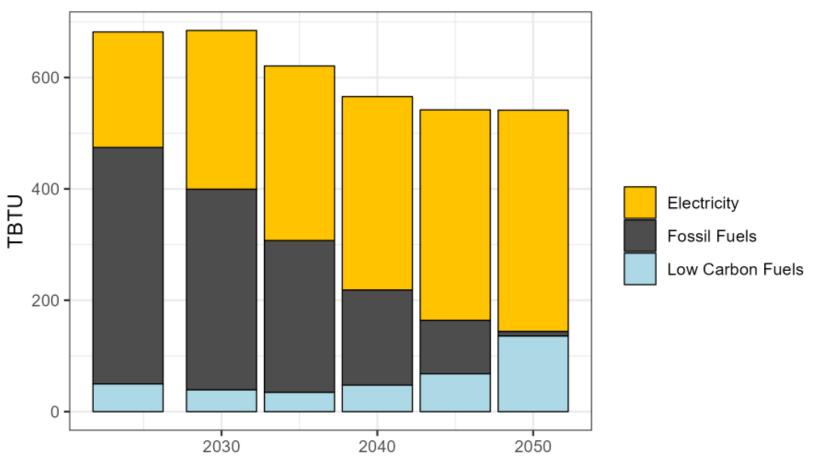
Demand declines but fuels remain a significant component of Oregon's Energy System across all scenarios.

#### **KEY FINDING**

# OREGON ENERGY DEMAND BY FUEL IN REFERENCE SCENARIO

#### Energy Demand by Fuel

Reference Scenario, 2024-2050

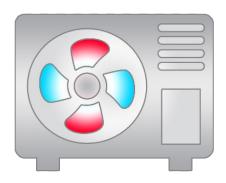




### LOW-CARBON FUEL BARRIERS

#### **Demand Declines**

- Consumer Behavior: Awareness and confidence in electric vehicles, heat pumps, or new electric technology
- Cost/Affordability: Electric utility consumer rate increases
- Infrastructure: Regulatory framework and business model of fossil fuel suppliers
- Supply: Price volatility of low-carbon fuel programs and markets





## ADVANCE THE USE OF LOW-CARBON FUELS TO SUPPORT THE HARDEST-TO-ELECTRIFY END USES

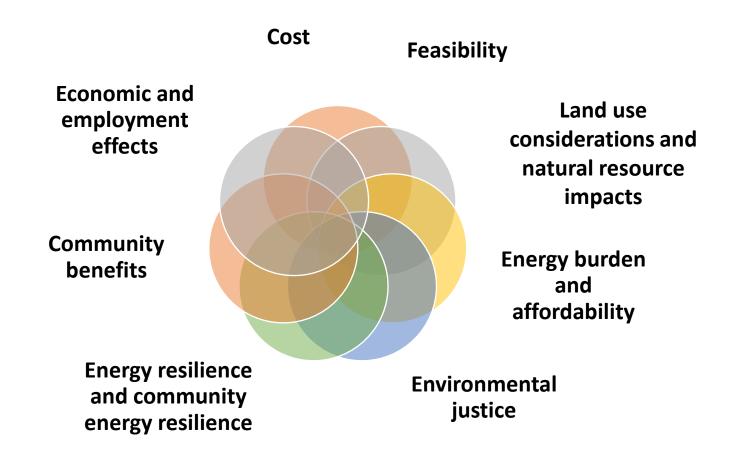
#### **Policy Recommendations**

- 1. Foster development of low-carbon fuels in Oregon as a strategic resource, while mitigating environmental and community impact.
- 2. Support a deliberate transition to a low-carbon energy future that results in a system that utilizes increasingly cleaner fuels, supports grid reliability, and encourages technological innovation to facilitate a least-cost pathway to decarbonization.



## **RESILIENCE**

## KEY CONSIDERATIONS

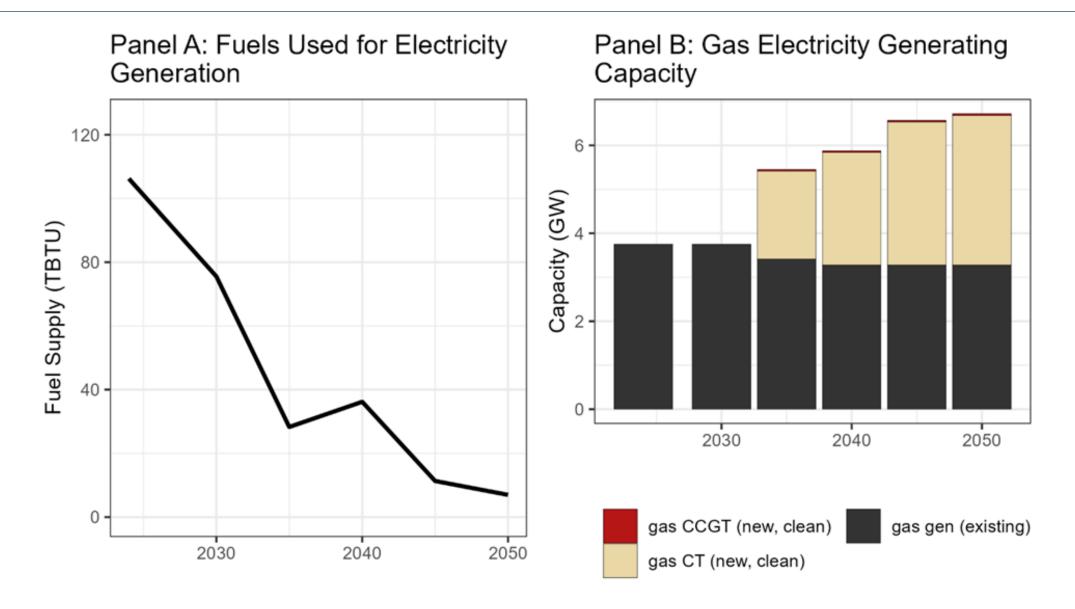




Firm dispatchable resources are needed to support the growing electric grid.

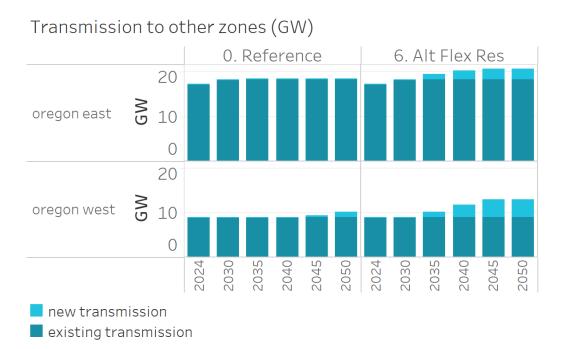
#### **KEY FINDING**

## ELECTRICITY GENERATION FROM FOSSIL AND LOW-CARBON FUELS IN THE REFERENCE SCENARIO

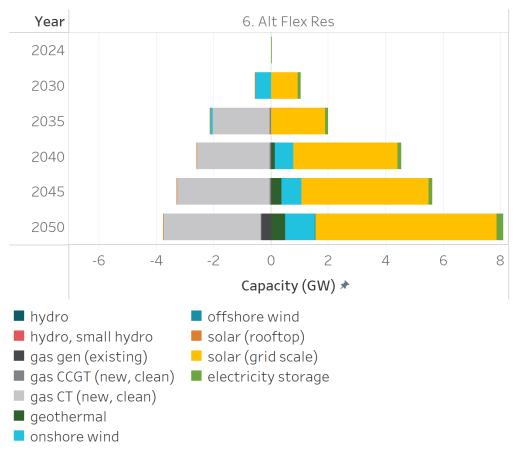


# WHAT IF WE COULDN'T RELY ON CLEAN GAS PLANTS FOR RELIABILITY?

Increased loads from electrolysis supported by increased renewables and transmission



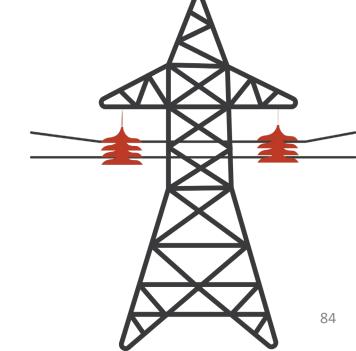
Electricity Generating Capacity in 6.Alt Flex Res relative to Reference (GW)



### LOW-CARBON FUEL BARRIERS

#### Dispatchable Resources to Support the Electric Grid

- Siting Facilities: State and local siting and permitting process
- Investments and Cost Recovery: Consistent access to renewable electricity
- Community and Environmental Impacts: Health and safety concerns of siting new gas generation and storage near communities





# STRENGTHEN RESILIENCE ACROSS THE ENERGY SYSTEM, INCLUDING AT UTILITY-SCALE, COMMUNITY, AND CUSTOMER LEVELS

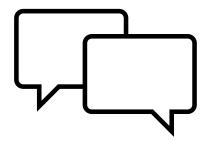
#### **Policy Recommendations**

- 1. Evaluate cross-fuel interdependencies and build on existing processes to better align planning to optimize cross-fuel operations.
- 2. Support community-led efforts to enhance local resilience.
- Promote adoption of small-scale rooftop solar and battery storage systems to support energy resilience for households and small businesses, especially in rural communities.

#### **NEXT STEPS**

- Late June: Info Session-webinar and final draft recommendations to be released.
- Late July: ODOE will work to incorporate feedback from written comments into Energy Strategy.
- November 1: Final report due to the Governor and Legislature

## **OPPORTUNITIES FOR PUBLIC COMMENT**



Provide written public comment

https://odoe.powerappsportals.us/en-US/energy-strategy/





# Thank You!

www.oregon.gov/energy/Data-and-Reports/Pages/Energy-Strategy.aspx