Oregon Energy Strategy

Policy Working Group Plenary Meeting #1

February 12, 2025, 9:00am – 12:00pm.

Post-Meeting Notes

Meeting Summary

ODOE reviewed the role of the Policy Working Groups in the context of Phase 2 of the development of the Oregon Energy Strategy. During this Phase, the PWGs will engage in policy discussions to inform the drafting of recommendations. ODOE's technical expert, Evolved Energy Research, presented on the modeling findings with greater detail than was provided in the 1.31.24 OMSI presentation. The meeting then broke out into topic-focused Policy Working Groups to discuss the key findings relevant to their scope.

In-Meeting Notes

Participants

- *The participants list is included at the bottom of these notes and summary*

Introduction

- Edith Bayer (ODOE) kicked off the call, stated that the meeting is being recorded.
- Edith introduced ODOE, the directive in HB 3630, and ODOE's mission and activities as a central repository of energy data, information and analysis, and as a venue for problem solving Oregon's energy challenges. Edith also explained WebEx functionality
- Edith went over the meeting objectives, meeting agenda, and ground rules.
- Meeting objectives were to set expectations for the Policy Working Group (PWG) process, share key findings and methodology from the modeling, and to kickoff PWG meetings with breakout sessions.

Background on the Energy Strategy

- Edith described analysis from the 2022 Biennial Energy Report that accounted for ambitious, economy-wide energy goals and the benefits of having a statewide strategy to plan for and meet these goals. Edith highlighted that costs associated with failing to meet Oregon energy and climate goals would fall inequitably across Oregonians.
- HB 3630 then directed ODOE to produce this Energy Strategy
- There are three elements to the energy strategy
    - 1) Identifying pathways to achieve Oregon's policy objectives, supported through the pathways modeling analysis conducted earlier last year with CETI and stakeholder input;

    - 2) Recommendations based on the foundation laid by the pathways analysis;
    - 3) A final report due Nov 1 that must, among other things, describe the public engagement process and how the Energy Strategy incorporates diverse stakeholder perspectives
- Framework for Dialogue and WGs
    - Edith presented on different public engagement forums and where PWGs fit within this context.
    - PWGs are:
        - Focused on informing policy recommendations;
        - Subject matter experts able to engage in identification of gaps and needs; and will
        - Meet over ~ 3 months in early 2025
- The PWGs
    - Edith named the five PWGs. Edith described that the turn from modeling assumptions to policy has led to the restructuring of WGs from Phase 1.
    - Edith showed a slide on PWG scope and coverage[1]
    - Role of PWGs: Edith presented on what the responsibilities of PWG members are and are not, including expectations from PWGs summarized from a document shared earlier via email. Edith emphasized that there is a forward-looking goal that PWG activities focus on near-term policy ideas to consider for Oregon's Energy Strategy. PWG members' role is to substantively engage on the results of the modeling of the other complimentary analysis and to discuss how we meet our climate and energy goals and what recommendations we might need to get there
- Structuring meaningful engagement
    - ODOE has designed PWGs to provide a platform for dialogue; a space for all perspectives to be raised, for members to seek areas of alignment. Edith stated that ODOE's role will be to organize and facilitate PWG meetings, consider PWG input in drafting recommendations, and provide for transparency through the PWG process.
- Process for developing recommendations;
    - Edith described the process for informing and developing recommendations, with PWG meetings occurring from February through April, recommendation drafting to occur in May, publication and comment on draft recommendations to take place in June, and ODOE to finalize recommendations and draft the Energy Strategy Report later in the summer.
- What the modeling considered
    - Edith summarized the factors listed by HB 3630

[1] Refer to 2.12.25 PWG Plenary Meeting Presentation, at p.14

    - The modeling has not told us everything we need to know; policy discussions are designed to build from the modeling to produce recommendations
- Key considerations;
    - The model provides information on cost, feasibility, land use and natural resources impacts, but doesn't provide exhaustive information; the modeling does not provide for energy burden, affordability, and environmental justice. Complementary analyses will be undertaken to support these subjects. Additionally, resilience, community benefits, and economic and employment effects are factors addressed by the bill that Phase 2 policy discussions should help more fully address
- Integrating modeling and PWG work
    - Edith stated that modeling results inform "what" needs to be done, whereas phase 2 policy discussions should focus on "how" to accomplish the energy transition.
- Edith went through how the PWG process should lead to proposed policy actions, along with an example. The example tracked reviewing a key finding from the modeling, comparing that against where Oregon is today, reviewing policies affecting the relevant pathway, identifying gaps and barriers to realizing the pathway to meeting Oregon energy objectives, drafting an issue statement, proposing strategies to address the identified barriers and gaps, and finally proposing policy actions.
- Edith presented on the planned meeting schedule, providing that the current legislative calendar may impact scheduling[2]
    - March 13 is scheduled for the presentation of complementary analyses
    - Jobs study results are due towards July, which will involve a continuing workstream towards November
- Alan Zelenka, ODOE, spoke to recent NASEO conference. Said that agency personnel are concerned about uncertainty in the federal policy landscape, but that good, innovative work is still happening at the state level and focused on the clean energy transition.
    - Alan stated that this conference emphasized that state-level activity has become critically important; asked that PWG members help in producing recommendations that will further this clean energy transition

Oregon Energy Strategy Technical Report; Evolved Energy Research Presentation

- Jeremy Hargreaves, Evolved Energy Research, stated that he will go over modeling results today in more detail than way provided on 1.31.25 at OMSI

[2] Refer to 2.12.25 PWG Plenary Meeting Presentation, at pp. 33-34.

- Jeremy reviewed the key study questions and Alternative Scenarios examined by the pathways modeling[3]
    - Jeremy added that the analysis also included sensitivity questions, including investigations on the impact of vehicle miles traveled (VMT) reductions, tech load growth, and the Advanced Clean Trucks(ACT) regulation
- Modeling methodology
    - Jeremy presented on the modeling methodology as including policy constraints, analysis of economy-wide energy needs, modeling supply-side least cost optimization to meet those needs consistent with reliability and State energy policy and emissions goals.
- Jeremy presented on Oregon emissions projections and policy, explaining that, because other sectors such as agriculture are the hardest to decarbonize, most emissions reductions will need to come from the energy sector to provide a least-cost pathway to decarbonization.
- Jeremy presented on the energy pathways modeling's use of backcasting, rather than forecasting, to identify means and policies to meeting Oregon energy goals. Stated that a backcasting approach puts all options on the table to identify efficient solutions to meeting policy goals.
    - Jeremy explained that variables such as infrastructure and equipment replacement timelines are important to prioritizing some policies sooner than others
- Jeremy explained that the purpose of economy-wide modeling is to examine the tradeoffs of decarbonization strategies applied or focused in different sectors and where it is most cost-effective to focus decarbonization efforts.
    - Jeremy explained that the modeling can help untangle chicken-and-the-egg problems where technology needs to be prioritized or developed prior to adoption but where adoption is slow because technologies have not yet been sufficiently developed; looking at investment decisions in light of the state-wide emissions targets can help inform where investments should be made.
- Reference Scenario: Jeremy described how engagement with the public helped Evolved identify Oregon-specific data sources for the modeling.
- Model Geography: Jeremy explained that the modeling included competition for resources geographically and temporarily on a West-wide and national- basis. The modeling also examined the role of the Cascades to capture transmission barriers.

Sector Insights

Electricity Sector

- Jeremy explained that the modeling showed a need for more electricity infrastructure in Oregon, especially accounting for transportation and building electrification and in order

[3] Refer to 2.12.25 Evolved Energy Research Presentation, at p.3.

to meet projected near-term load growth resulting from data centers. Jeremy explained that clean electricity is vital towards meeting HB 2021 and EO 20-04 targets

- Electricity balance in the Reference Scenario; Jeremy presented on projected electricity supply and demand sources, with electricity demand increasing overall through 2050. Onshore wind, solar, and geothermal electricity are project to supply demand increases in later years. Overall, a diverse electricity portfolio, with in-state and out-of-state generation, is projected.
- Alternative Scenario 4, which limited in-Oregon grid-scale renewable development, predicted greater costs, transmission needs, and imported energy. Conversely, Alternative Scenario 5, increased DERs and limited transmission, resulted in greater rooftop solar buildout and reduced energy imports.
- Land-use constraints. Jeremy described that the modeling relies on the strictest restraints from the Nature Conservancy's PoP-West. The modeling found that, in the Reference Case, 620 sq miles of Oregon East and 200 sq miles in Oregon West would be used for electricity generation. Jeremy stated that there are variances in estimates of land-use for wind and solar per gigawatt, but that Evolved relied on NREL data for this assumption.
- Modeling results indicated a need for increased transmission capacity in Oregon and especially into Oregon West. Limiting the ability to build clean-fuel, <MW25 electricity plants to provide system reliability calls for increased transmission and clean generation needs.

Clean Fuels

- Overall fuel demand is predicted to decrease overall, but the clean fuel demand will increase, especially in transportation.
- Predicted clean fuels include biogas, bio liquids, e-fuels, which are fuels that are produced from electrolytic hydrogen, and ammonia, with varying price ranges[4]
- Model built for minor reductions in agricultural and industrial fuel use, with industrial fuel use being replaced by geothermal steam in places by 2040
- Gas electricity generators use very little fuel; Jeremy explained that the Reference Scenario built for <25MW generators that would only burn relatively expensive fuel in high-need times.
- Jeremy provided an example of hourly operations in 2050 for Oregon West, indicating that, when wind and solar energy production is lower, new clean gas generation may be turned on.
- Jeremy explained that the Reference Scenario found reduced volumes in gas delivery to electricity generators and other end-uses.

[4] Refer to 2.12.25 Evolved Energy Research Presentation, at p.25 for projected clean fuel price ranges

- The modeling showed that e-fuels and ammonia would likely be imported in later years but that Oregon may produce clean hydrogen to serve as a transportation fuel

Transportation

- Transportation electrification (TE) plays a very significant role in reducing overall system-wide energy demand, even in the face of tech load growth
- Early adoption of EVs significantly reduces decarbonization costs and EVs serve a helpful role in providing managed grid flexibility
- Jeremy explained that the modeling did not show costs associated with possible VMT reductions, such as infrastructure or work-from-home costs
- Jeremy presented on TE's impacts on economy-wide energy demand in the Reference, No ACT, and Delayed TE changes
    - No ACT and delayed TE cases call for much more diesel consumption
- Jeremy explained findings that TE remains cost-effective with changes in vehicle pricing, even with a margin of error of plus or minus ten percent.
- Flexible loads from EVs provide system benefits; the limited flexible load scenario showed cost increases of $4 billion

Buildings

- Delaying energy efficiency (EE) and building electrification (BE) would call for more fossil fuel use and overall energy consumption in residential and commercial buildings; the delated EE and BE scenario showed overall increased costs of $17 billion.
- Installing more heat pump and efficient appliances shrinks the overall size of energy consumption. In the residential sector, the Reference Scenario calls for a 53% overall decrease in energy consumption by 2050. Delaying EE and BE increases energy consumption by 6% versus the Reference Scenario and increases fossil fuel consumption.
- Examining the higher DER scenario, increased installation of rooftop solar in Oregon West mitigates siting and permitting grid-scale resources, including generation and transmission.
- The higher DER alternative scenario also provided flexible load benefits if paired with adoption of electric heat pumps and other BE measures

Key takeaways

- Electrification and energy efficiency are key to reducing the size of the overall energy "pie" and to cost containment
- Fuels play a strategic role in the transition, with a shift toward clean fuel alternatives toward 2050
- All scenarios indicate a need to build infrastructure in Oregon
- Tech loads are the biggest driver of electricity demand growth but are also uncertain in when and where they could emerge

Break: 10:38-10:50

Q&A

- Jessica Reichers (ODOE) introduced the Q&A, explained she's organized the questions asked by sector
- Electricity generation:
    - Rebecca Smith (RHA) question on wind turbines. Repowering projects in NW, were those projects assumed for land use purposes?
        - Jeremy: yes, retired projects are replaced with latest vintage technology in the same year
    - Kelly Hoell (EWEB)
        - Clean energy imports; is there info on where these are expected to come from, specifically?
        - Jeremy: modeling didn't account from West-wide RECS, with resources coming from different plants from the west on an hour-by-hour basis. However, resources invested in were Montana-Wyoming wind, Washington geothermal, and solar from the Southwest; all energy is clean and sourced from a place, but investments aren't attributed to Oregon
    - Nuclear (from several questioners)
        - Jessica explains that nuclear was included as a resource but not available to be sited in Oregon. Stated that policy discussions may speak to siting restrictions in Oregon.
        - How much nuclear did the modeling call for outside of Oregon?
        - Jeremy: modeling allowed for SMRs, but none was built outside of Oregon. Other past studies have built nuclear, but this current modeling allowed enhanced geothermal with dispatchable, firm capacity that displaces nuclear. Jeremy says the competition between EGS and SMRs is cost-based; these are somewhat substitutes, and the cost projections are uncertain for these technologies.
    - Dam removal or curtailment
        - Jessica stated that the modeling considered existing policy and so didn't consider dam curtailment

- Jeremy says Evolved modeled hydro by using NWPCC climate-sensitive forecast data, running low, medium, and high-hydro years, with 1-hour and 6-hour ramps based on NWPCC data.
- Jeremy says the reduced renewable development scenario would have a similar effect to curtailing hydro, but that removing hydro energy would also hurt system flexibility because hydro provides better resource flexibility than other renewables.

- Fuels
  - Sustainable aviation fuel (SAF), Q from David Vant Hof (Climate Solutions): how much did the modeling assume that SAF would go into aviation from now through 2040, versus, say, 2050; how does it ramp up?
    - Jeremy: clean fuel costs for aviation versus other liquid fuels, such as diesel, are similar. The ramp up in SAF use could also be more gradual than is indicated by modeling results
    - David; a question for a policy discussions may be to explore how to ramp up SAF in aviation sooner rather than later
  - Q, Vanthof; does modeling only include 0 emissions SAF, or 70% reductions fuel; David thinks its important to consider low-emissions fuels in addition to zero-emission fuels
    - Jeremy; model can blend SAF. However, modeling consideration for SAF fuels assumes zero emissions; so fuels produces from cellulosic fuels assumes zero emissions. New fuel sources are considered as carbon-free. Existing fuels have emissions factors and new fuels don't, in the modeling, but this in reality will depend on future supply chains
  - Rebecca Smith (RHA) on natural gas turbines: 100% H2 turbines will still need natural gas on start-up; was this accounted for in the modeling in any way?
    - Jeremy; no, this start-up isn't considered in modeling. Modeling may also build synthetic natural gas from h2, which it didn't do; but that is a possible future if technological constraint applies.
- Electrification
  - Jana Jarvis (Oregon Trucking Association): Delay of ACT will have costs, is the assumption. BEV trucks would require more trucks for same work because of range and payload constraints; how were these differences factored in?
    - Jeremy: electric trucks were assumed to replace fuel trucks on a 1-to-1 basis; where end uses
    - Jana states that difference in BEV efficiency needs should be taken into account and assumed to reflect a 25% payload

efficiency cost. Even the 7 percent truck electrification required today of ACT imposes efficiency costs.

- DERs
  - David Heslam (Earth Advantage); asked if the modeling considered electric vehicle charging and discharging as a DER resource. From a policy context, would want to examine building codes for buildings to handle loads.
    - Jeremy: a large portion of flexible resources come from vehicle energy flexibility. Behind-the-meter storage is also included and provides flexibility in DER scenario. Jeremy will work to break out flexible load resources into DR appliances versus vehicle charging to better inform policy discussions.
  - Charlie Tracy (OTEC); how does model look at upgrades needed for light duty electrification and especially distribution system needs
    - Jeremy; costs differ significantly in different systems, so model retained high-level analysis. Jeremy took EIA regional multipliers, as presented on a $/mw basis, and took historical investments on distribution infrastructure, broken down from peak and other loads. Impacts on peak loads and energy transfers are used to estimate cost impacts.
    - Charlie says that ability to adjust charging time is valuable and appreciates the modeling accounting for peak loads

- Jessica concluded the QnA; Edith Bayer instructed PWG members to join breakout rooms

Participants

ODOE	CETI-OES Team	WG Members
Alan Zelenka	Jeremy Hargreaves, Evolved Energy Research	Alma Pinto
Edith Bayer	Eileen V. Quigley she/hers Clean Energy Transition Institute	Alyn Spector
Hugh Arceneaux	Ruby Moore-Bloom | she/hers | Clean Energy Transition Institute	Alyssa Bonini, DLCD
Michael Freels		Amanda Welch ODOE
Joni Sliger		Amber Faist
Jillian DiMideo		Anahí Segovia Rodriguez | Verde
Mary Kopriva		Anne Thrall-Nash
Jason Sierman		Antonio Machado - WSPA
Evan Elias		Bilal G Jones
Jessica Reichers		Billy Curtiss
Lauren Rosenstein		Bob Kaplan

Rob Del Mar		BPS, Pam Neild she/her
Joshua Price		Bret Stevens
Stacey Heuberger		Brett Morgan He/Him
		Brian Hurley
		Brittany Park
		Bryan Adams - PPGA
		Call-in User_13 (971213****)
		Carra Sahler
		Cassandra Jackson
		Charity Fain
		Charles Knutson
		Charlie Tracy - OTEC
		Chris Golightly, she/her, CRITFC
		Christina Zamora
		Claire Prihoda
		Crystal Grinnell
		Dan Dorran, Umatilla County
		Dave Vanthof
		David Heslam
		Devin McGreal
		Diane Brandt, RNW
		Edison Elizeh
		Elijah Cetas
		Eric Main he/him
		Fred Heutte NWEC
		Gabriela Goldfarb she/her
		Greer Klepacki CEP
		Hannah Dondy-Kaplan BPA
		Ingrid Fish, City of Portland, BPS
		Jacob Goodspeed - PGE
		jake wise
		James Metoyer
		Jamie Johnson, Green Energy Inst. at Lewis & Clark Law School
		Jana Jarvis
		Jared Hansen, Idaho Power
		Jason Altamirano - TITAN Freight Systems
		Jennifer Joly, OMEU
		Jeremy Thompson- ODFW
		Jess, Rogue Climate she/they
		John Garrett, CUB
		John Maddalena he/him SEI-Energy Program Manager
		John Plaza
		John Tokarczyk ODF

		Joshua Basofin
		Juan J Serpa Muñoz - EWEB
		Justin DeMello
		Kaleb Lay, ORA
		Kelly
		Kelly Campbell
		Kelly Hoell "hail", EWEB she/her
		Kelly Thomas - BCD
		kellye Dundon
		Ken Morgan
		Kyle Whatley
		Laney Ralph she/her
		Laura Tabor
		Lewis
		Logan Telles, City of Eugene
		Maddy Salzman
		Mark Healy
		Mark Heizer
		Marshall McGrady
		Mary Moerlins She, Her NW Natural
		Masha Cole OPHI
		Michael Graham, Clean Cities
		Michael Mitton
		Nancy Bennett
		Natalia Ojeda
		Nataliya Stranadko
		Nick Cheke - CEP
		nikita
		Nikita Daryanani
		Pam Barrow
		Pat DeLaquil
		Patrick Sterns
		Paul Hawkins, he/him
		Petra Schuetz
		Ranfis GV, BlueGreen Alliance
		Rebecca Smith for RHA
		Robert Waldher - Umatilla County
		Robert Wallace, WyEast
		Rory Isbell
		Ryan Perry
		Sam Henstell she/her
		Sam Wade
		Scott Beyer
		Shannon Souza
		Sharla Moffett
		Sidney Villanueva - Blue Skies Law

		Silvia Tanner, MultCo Sustainability, she/her
		Spencer Moersfelder
		Stefenie Griggs - ODOT
		Stephanie Kruse
		Stu Green - Forth [he,his]
		Tim Lynch | he/him | MultCo Sustainability
		Tim Miller - he/him - Oregon Business for Climate
		Zach Mulholland

Virtual Meeting Chat

12-Feb-25	9:04 AM	from Jessica Reichers to everyone:	Welcome, all! I am Jessica Reichers, the Technology & Policy Manager at the Oregon Department of Energy. I will be monitoring the chat, helping to answer questions there, or raise them up for the speakers as needed.
12-Feb-25	9:05 AM	from Jessica Reichers to everyone:	Price.
12-Feb-25	9:06 AM	from Jessica Reichers to everyone:	If you have any technical issues with WebEx, you can send a message directly to Josh Price.
12-Feb-25	9:08 AM	from Jessica Reichers to everyone:	As questions occur to you, feel free to add them here. I can add them to the queue, and give you the opportunity to ask them during the Q&A.
12-Feb-25	9:10 AM	from Jessica Reichers to everyone:	Also, if there are any clarifying questions to what is being presented, please add them here as well. I will raise them up in a timely manner if needed.
12-Feb-25	9:13 AM	from Lauren Rosenstein to everyone:	Hi Gabriela, that's correct. We are asking the EJ & Equity Working Group members to choose one of the other breakout groups to join.
12-Feb-25	9:13 AM	from Jennifer Joly, OMEU to everyone:	How do the recommendations come about?

12-Feb-25	9:13 AM	from Lauren Rosenstein to everyone:	You can message Josh Price with the group you would like to join.
12-Feb-25	9:14 AM	from Jessica Reichers to everyone:	If you are a member of the Environmental Justice & Equity Working Group, please let Josh Price know which breakout group you would like to join during the breakout session. Your choices are: Low-Carbon Fuels, Transportation Electrification, Developing Clean Electricity Generation and Transmission, and Building Efficiency, Electrification, and DERs (distributed energy resources, like rooftop solar and residential storage)..
12-Feb-25	9:16 AM	from Nataliya Stranadko to everyone:	Can you share a presentation with group members later on?
12-Feb-25	9:16 AM	from Jessica Reichers to everyone:	Hi, Jennifer! We are seeking input from multiple groups, including the Working Groups, the Advisory Group, peer agencies, Tribes, and the public at large. We will collect the feedback from these groups and use them to develop draft recommendations which we will provide for comment. This is anticipated to happen in May.
12-Feb-25	9:17 AM	from Jessica Reichers to everyone:	Hi, SIdney! We will publish the slides from this meeting on our Policy Working Group webpage, most likely up later today. https://www.oregon.gov/energy/Data-and-Reports/Pages/Energy-Strategy-Working-Groups.aspx
12-Feb-25	9:20 AM	from Jessica Reichers to everyone:	Hi, Nataliya - the different working group leads will be sending a post-meeting email with a link to the slides that we are publishing.
12-Feb-25	9:25 AM	from Nataliya Stranadko to everyone:	Hi Jessica, thank you! It would be great to refresh our minds and remind ourselves about goals and model results before the WG meeting.
12-Feb-25	9:26 AM	from David Heslam to everyone:	What's the breakdown of those 46,000 heat pumps installed in 2022. Do we know how many were residential HVAC, residential hot water, commercial HVAC, commercial hot water?
12-Feb-25	9:27 AM	from Bob Kaplan to everyone:	How should the working groups take into account the changing federal policy environment?

12-Feb-25	9:27 AM	from Jennifer Joly, OMEU to everyone:	Are we assuming any fiscal constraints? Or just pure policy recommendations?
12-Feb-25	9:27 AM	from Jessica Reichers to everyone:	@Nataliya - absolutely! Your Working Group leads will be giving you a few items to help you get ready for the second working group meetings. Including links to this recording, the slides here, slides and recording from the Working Group breakouts you will be joining at the end of this meeting, and a 4-pager providing high level key takeaways from the modeling specific to your working group.
12-Feb-25	9:27 AM	from Ingrid Fish, City of Portland, BPS to everyone:	It looks like the policies category includes policies and programs, correct?
12-Feb-25	9:29 AM	from Jessica Reichers to everyone:	@David Heslam - working on an answer for you.
12-Feb-25	9:30 AM	from Jessica Reichers to everyone:	Welcome, Ingrid! Yes, policies are inclusive of existing programs.
12-Feb-25	9:31 AM	from Jessica Reichers to everyone:	@Jennifer Joly - are you asking if the Working Group members will be considering fiscal constraints?
12-Feb-25	9:33 AM	from Jessica Reichers to everyone:	@Bob Kaplan - in the Working Groups you will want to bring that up as a consideration. We anticipate this is a question most groups will want to raise, and consider options to reduce that risk.
12-Feb-25	9:34 AM	from Stephanie Kruse to everyone:	@David Heslam The ~46,000 heat pumps comes from BPA's 2022 NW HVAC Market Snapshot. I estimated Oregon's share of the market heat pump sales in that report. The report focuses on residential heat pumps, though it likely includes some small commercial since the markets overlap.
12-Feb-25	9:34 AM	from Ingrid Fish, City of Portland, BPS to everyone:	Great point, Alan, about the importance of this state based and local work during these times.

12-Feb-25	9:35 AM	from Jennifer Joly, OMEU to everyone:	Yes. And the overall policy recommendations that will be coming out of the Strategy.
12-Feb-25	9:37 AM	from Jessica Reichers to everyone:	@Jennifer Joly - Working Groups will be identifying barriers to achieving policy options needed to meet our goals. Fiscal barriers are absolutely on the table, and the Recommendations could include options to address fiscal barriers and risks.
12-Feb-25	9:40 AM	from Mary Moerlins She, Her NW Natural to everyone:	Is the order of the questions based on prioritization of modeling? Generation resources seem to be a pretty significant consideration prior to the other questions.
12-Feb-25	9:44 AM	from Eileen V. Quigley she/hers Clean Energy Transition Institute to everyone:	No the order of the "what if" questions is not based on prioritization.
12-Feb-25	9:44 AM	from Jessica Reichers to everyone:	Welcome, Mary! There is no priority order to the questions, but prioritization of potential policy actions could be a topic of discussion in the different Working Groups.
12-Feb-25	9:47 AM	from ctracy to everyone:	Is there a case evaluating what happens if we remove the columbia river dam system?
12-Feb-25	9:49 AM	from Jessica Reichers to everyone:	Hi, Ctracy! No, there is no scenario modeling removal of any dams on the Columbia River system.
12-Feb-25	9:56 AM	from Joni Sliger, ODOE to everyone:	ESS = Electricity service supplier.
12-Feb-25	9:59 AM	from Jess, Rogue Climate she/they to everyone:	Will any working groups be exploring policy approaches for reducing tech load growth?
12-Feb-25	10:00 AM	from Alyn Spector to everyone:	Is geothermal the only non-combustion piped thermal energy being explored? Will be good to understand the full spread of thermal energy network options.

12-Feb-25	10:01 AM	from Charlie Tracy - OTEC to everyone:	I don't see any nuclear. Does this assume that is still off limits?
12-Feb-25	10:02 AM	from Jessica Reichers to everyone:	Welcome, Jess! That is certainly something you could bring up in your Working Group discussions.
12-Feb-25	10:03 AM	from Dave Vanthof to everyone:	Is there an alternate scenario that is not limited to the Nature Conservancy map?
12-Feb-25	10:03 AM	from Rebecca Smith for RHA to everyone:	Are turbine upgrades assumed for some existing wind projects in OR and in neighboring states?
12-Feb-25	10:03 AM	from Jessica Reichers to everyone:	Welcome, Alyn! There are other potential piped energy resources, like renewable natural gas and hydrogen.
12-Feb-25	10:04 AM	from Jessica Reichers to everyone:	@Charlie Tracy - Nuclear was included in the modeling, but the model did not permit development of nuclear in Oregon consistent with existing state law.
12-Feb-25	10:06 AM	from Alyn Spector to everyone:	Thanks, Jessica. I was talking more about ground source HP connected solutions that captured the ambient temperature of the ground or water (but not necessarily geothermal). That could include sewer heat capture, other waste heat capture, etc. that could be used as part of a thermal energy network. Geothermal is sometimes used as a "catch all" phrase that does include these other technologies, but I wasn't sure.
12-Feb-25	10:07 AM	from Jessica Reichers to everyone:	Welcome, Dave! The use of the Nature Conservancy's Power of Place maps were discussed in the modeling working groups last summer. So, these were the foundational basis of any modeling inputs on energy developments based on constrained land use options.
12-Feb-25	10:07 AM	from Jessica Reichers to everyone:	@Alyn Specter - thanks for the clarification. Working on getting you a response.
12-Feb-25	10:08 AM	from Dave Vanthof to everyone:	SAF is a good existing way to significantly lower GHG in aviation -just not zero emissoin

12-Feb-25	10:10 AM	from Jessica Reichers to everyone:	Welcome, Rebecca! Working on a response to your question.
12-Feb-25	10:13 AM	from Rebecca Smith for RHA to everyone:	Does this gas supply for new generators assume that natural gas will be needed for start up even for turbines that can run 100% H2?
12-Feb-25	10:14 AM	from Jessica Reichers to everyone:	@Dave Vanthof - SAF is included in the model, and is the primary low-carbon fuel supporting aviation in 2050.
12-Feb-25	10:15 AM	from Charlie Tracy - OTEC to everyone:	-14 Deg F in north east oregon this morning :-)
12-Feb-25	10:15 AM	from Dave Vanthof to everyone:	Thanks Jessica. It is available today and was not clear how much it was assumed to be used say by 2030
12-Feb-25	10:16 AM	from Stephanie Kruse to everyone:	@Alyn Thanks for your question. On the generation side we only modeled advanced geothermal electricity production. The model did end up including some ground source heat pumps, used mainly in the commercial sector for larger heating loads. Since many distributed energy resources and demand side load flexibility technology is not fully developed, the exact stack of options to produce the resultant reductions in energy demand could include distributed thermal storage options instead of primariliy battery storage and waste heat recovery efficiency gains - this is a great topic for further discussion in the working groups.
12-Feb-25	10:17 AM	from Jessica Reichers to everyone:	@Dave Vanthof - I will add a question for Jeremy during the Q&A to dive a little more into what is powering aviation and when in the model.
12-Feb-25	10:18 AM	from Ingrid Fish, City of Portland, BPS to everyone:	Does this forecasting have federal policy (pre and/or post Trump administration) assumptions built in?
12-Feb-25	10:18 AM	from Jessica Reichers to everyone:	@Rebecca Smith - we will address your question in the Q&A portion of the meeting.

12-Feb-25	10:22 AM	from Jessica Reichers to everyone:	@Ingrid Fish - the modeling includes existing policy before the election. The modeling was finalized before the Executive Orders were issues, so does not include any assumption around those. However, the federal guidance, and associated influence, is likely to be discussed in the individual working groups.
12-Feb-25	10:23 AM	from Jessica Reichers to everyone:	@Rebecca Smith - to clarify, both of your questions will be added to the Q&A queue at the end of the presentation.
12-Feb-25	10:25 AM	from Sharla Moffett to everyone:	ACT does not require 100% sales of ZEVs.
12-Feb-25	10:26 AM	from Jillian DiMedio, ODOE, she/her to everyone:	Hi Sharla, yes, you are correct. The reference scenario makes assumptions beyond ACT, such that MHD vehicles reach 100% by 2040.
12-Feb-25	10:28 AM	from Sharla Moffett to everyone:	Thank you. I don't think you can refer to 100% ZEV sales as ACT. That is an assumption for this exercise.
12-Feb-25	10:28 AM	from Jana Jarvis to everyone:	How did you calculate the cost of delay in adoption of the ACT? Did you consider the inefficiency of battery-electric trucks versus diesel trucks? Significantly less range and less payload per truck. Is this part of your calculation?
12-Feb-25	10:30 AM	from Jessica Reichers to everyone:	Welcome, Jana! I will include your question for the Q&A at the end of the presentation.
12-Feb-25	10:34 AM	from Kelly Hoell, EWEB she/her to everyone:	Do the estimates for clean energy imports show where we expect these resources to come from in the region?
12-Feb-25	10:35 AM	from Jess, Rogue Climate she/they to everyone:	Did you model for the viability of solar production in different areas of the space due to weather and other factors?

12-Feb-25	10:36 AM	from Jessica Reichers to everyone:	Hi, Sharla - the objective of the Energy Strategy is to identify different pathways to meet the state's energy and climate goals. Existing policies get us quite far, but are not enough to get us to the 2050 goals. So, the Reference Scenario assumed existing policies, and then the model assesses the least-cost resource choices to achieve the 2050 goals. Modeling constraints for each scenarios create the different policy options, and we included an alternative where medium- and heavy-duty electrification occurs more slowly. Jillian will be presenting more on that in the Transportation Electrification Working Group.
12-Feb-25	10:39 AM	from Jessica Reichers to everyone:	Welcome, Kelly! I will add yout question to the Q&A coming up after the break.
12-Feb-25	10:42 AM	from Tim Miller to everyone:	Jeremy - can you outline some of the increased costs of the delayed ACT scenario?
12-Feb-25	10:43 AM	from Tim Miller to everyone:	Does land 'use' for wind assume no other uses of the land beneath / between the turbines?
12-Feb-25	10:45 AM	from Jessica Reichers to everyone:	@Jess Rogue Climate - The model isn't that specific on land use, but rather used several guiding factors to determine the totatl amount of land available, including National Renewable Energy Laboratory's solar potential data and The Nature Conservancy' Power of Place Level 3 land use constraints. Does that fully answer your questions, or is there anything else we can add.
12-Feb-25	10:50 AM	from Jessica Reichers to everyone:	Joni is going to send you to a specific point on this in the chat.
12-Feb-25	10:52 AM	from Charlie Tracy - OTEC to everyone:	It would be helpful to explore nuclear in oregon in case we want to advicate for policy changes.
12-Feb-25	10:53 AM	from Charlie Tracy - OTEC to everyone:	I have concerns about Dam removal or curtailment of output and how that could impact assumtions.

12-Feb-25	10:55 AM	from Fred Heutte NWEC to everyone:	Just to note we are getting a lot of solar from southern Cal and the Southwest at this hour on this very cold morning!
12-Feb-25	10:56 AM	from Dave Vanthof to everyone:	What portion of imported clean electricity is assumed to be nuclear?
12-Feb-25	10:58 AM	from David Heslam to everyone:	Flexible load behind the meter participation was identified as water heating, space heating and cooling. Did you also model batteries and EVs located behind the meter at homes and businesses as these would greatly increase that resource? (FYI- my home battery was dispatched this morning to help PGE meet peak load)
12-Feb-25	10:58 AM	from Joni Sliger, ODOE to everyone:	Hello Tim, yes, the land use numbers include indirect land use between wind turbines. The model allocates land for resources at a high level and does not do site specifically. It does just assume that the land will be allocated for energy and not a dual use. The Policy Working Groups will be a good venue to talk about dual use potential of sites.
12-Feb-25	11:00 AM	from Joni Sliger, ODOE to everyone:	Hi Charlie, to reiterate Jessica's point, nuclear was not modeled as a option to be sited in Oregon. But this may be a topic the policy working group explores.
12-Feb-25	11:00 AM	from Robert Waldher - Umatilla County to everyone:	Can you clarify how the land use footprint was calculated? For example, with a wind project, does it include the entire project area?
12-Feb-25	11:01 AM	from Joni Sliger, ODOE to everyone:	Hi Robert, yes, the land use numbers used from NREL include the entire project area, including land between wind turbines.
12-Feb-25	11:01 AM	from Pat DeLaquil to everyone:	Were there any growth rate constraints in thr modelling?
12-Feb-25	11:02 AM	from Jessica Reichers to everyone:	@David Heslam - ading your question to the Q&A queue,

12-Feb-25	11:03 AM	from Jessica Reichers to everyone:	@Pat DeLaQuill - can you specifiy the type of growth contraints? Load growth? Population? OTher
12-Feb-25	11:04 AM	from Pat DeLaquil to everyone:	maximum growth rate constraint
12-Feb-25	11:05 AM	from Pat DeLaquil to everyone:	so a resource can't grow too fast -- to allow for industrial development
12-Feb-25	11:06 AM	from Joni Sliger, ODOE to everyone:	Hi Pat, I'm sorry. Are you asking about electricity generation or something else? Jeremy noted earlier resources have to come online when selected, so there is time beforehand where they're assumed to being developed. Some resources were not options in early years for that reason. Does that help?
12-Feb-25	11:07 AM	from Charlie Tracy - OTEC to everyone:	Does the model look at electric distribution system upgrades for electrification?
12-Feb-25	11:08 AM	from Bret Stevens to everyone:	What was you assumption on vehicle efficiency for MHDV's
12-Feb-25	11:10 AM	from Pat DeLaquil to everyone:	Not to worry. Its perhaps too technical.
12-Feb-25	11:16 AM	from Mark Healy to everyone:	Is the model refined enough to look at coastal loads?There is a west and east regions but does it also look at coastal west loads that have substation and transmission chokepoints? The coast would have difficulty in accessing alternate fuels as well.
12-Feb-25	11:17 AM	from Joni Sliger, ODOE to everyone:	Hi Mark, the model only included two zones, eastern and western. As Jeremy noted, transmission needs within those zones were not directly modeled except with a cost adder based on historical EIA costs. This is not a transmission model, but recognize transmission within zones is also an important topic for discussion.