



Oregon

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AGENDA

Energy Strategy Advisory Group, Meeting #3

September 9, 2024 / 9:00 am – 12:00 pm

Individual Webex links sent to members

Objectives

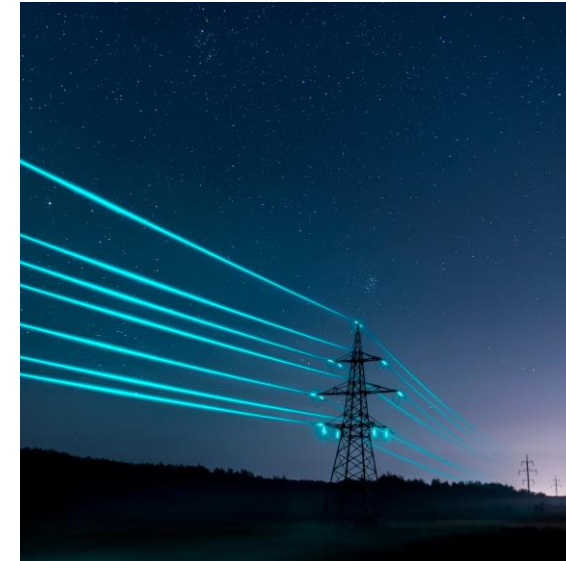
- Feedback and Review of Reference Case Scenario
- Presentation and feedback on emerging options for “What if” Scenarios
- Provide timeline and schedule for modeling process & define next steps

Time	Topic
9:00 - 9:10 am	Welcome and Agenda Review <ul style="list-style-type: none"> • Welcome and agenda review
9:10 – 9:25 am	Overview of process and model <ul style="list-style-type: none"> • Presentation of process to-date • Description of model – what it is and is not
9:25 – 10:25 am	Working Session: Draft Reference Scenario <ul style="list-style-type: none"> • Energy Efficiency & electrification: buildings, industry • Load flexibility • Direct Use Fuels • Transportation
10:25 -10:35 am	BREAK
10:35 – 11:35 am	Working Session: Draft Reference Scenario <ul style="list-style-type: none"> • Transmission & Distribution • Electricity Generation Technologies • Land Use and Natural Resources • Environmental Justice & Equity
11:35 - 11:55 am	What-if questions: Emerging Options for 5 Scenarios <ul style="list-style-type: none"> • Overview of emerging options • Discussion
11:55 - 12:00 pm	Preparing for Upcoming Meetings, Next Steps, and Summary <ul style="list-style-type: none"> • Advisory Group preparation for October and November • Confirm next steps
12:00 pm	Adjourn

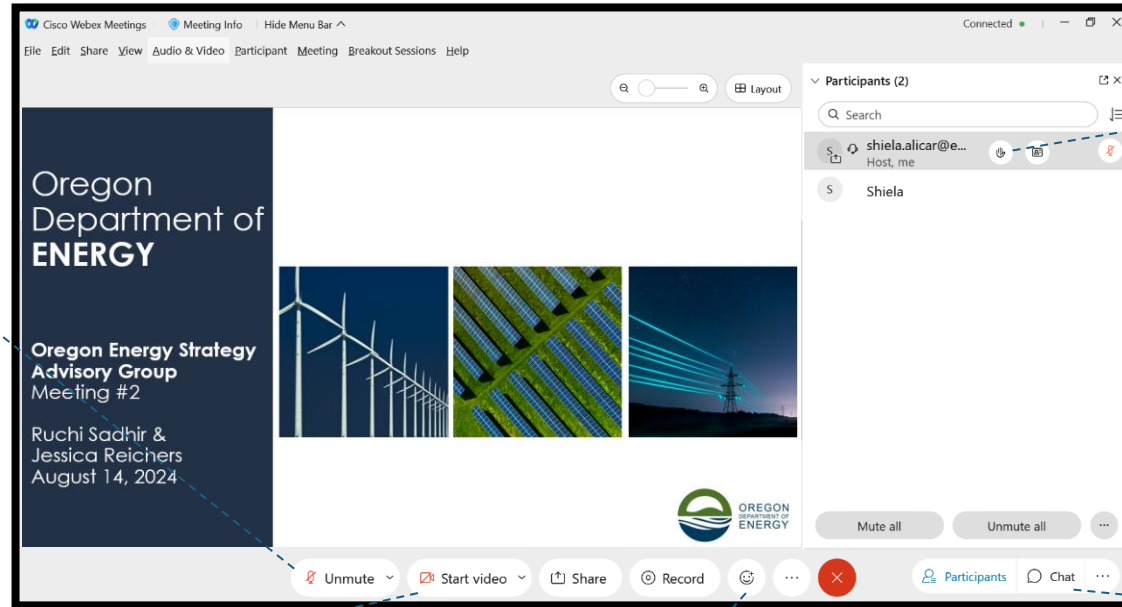
Oregon Department of **ENERGY**

**Oregon Energy Strategy
Advisory Group
Meeting #3**

Edith Bayer
September 9, 2024



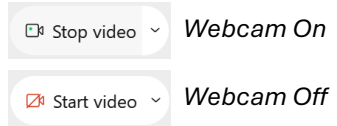
USING WEBEX



Audio Options



Video Options



Reactions



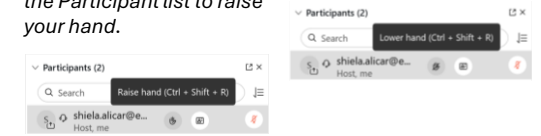
Click to Raise your hand.

Click on Lower hand when you are done.

Second Raise Hand Option

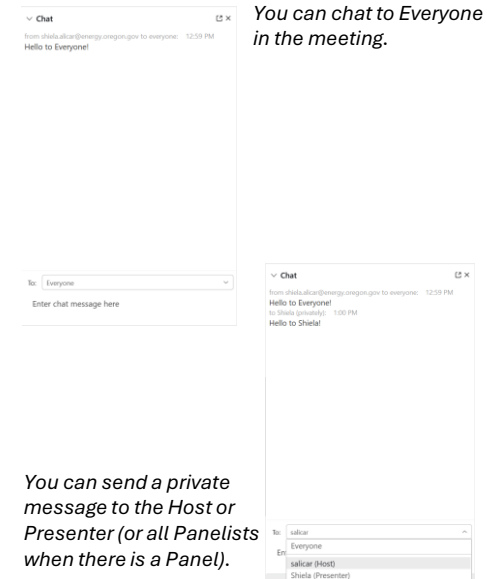
You can also click on the hand next to your name in the Participant list to raise your hand.

Click on Lower hand when you are done.



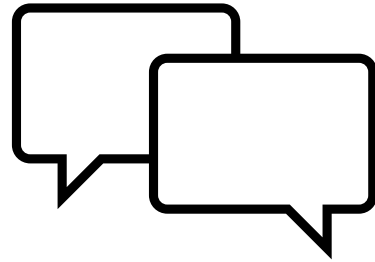
Chat

You can chat to Everyone in the meeting.



You can send a private message to the Host or Presenter (or all Panelists when there is a Panel).

OPPORTUNITIES FOR PUBLIC COMMENT



Provide written public comment

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

MEETING OBJECTIVES

- Summarize the modeling approach and objectives.
- Ensure clarity and hear Advisory Group members' reflections on the draft reference scenario.
- Present some specific questions for feedback.
- Present emerging options for “What-if” scenarios.

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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.



ADVISORY GROUP MEMBER INTRODUCTIONS

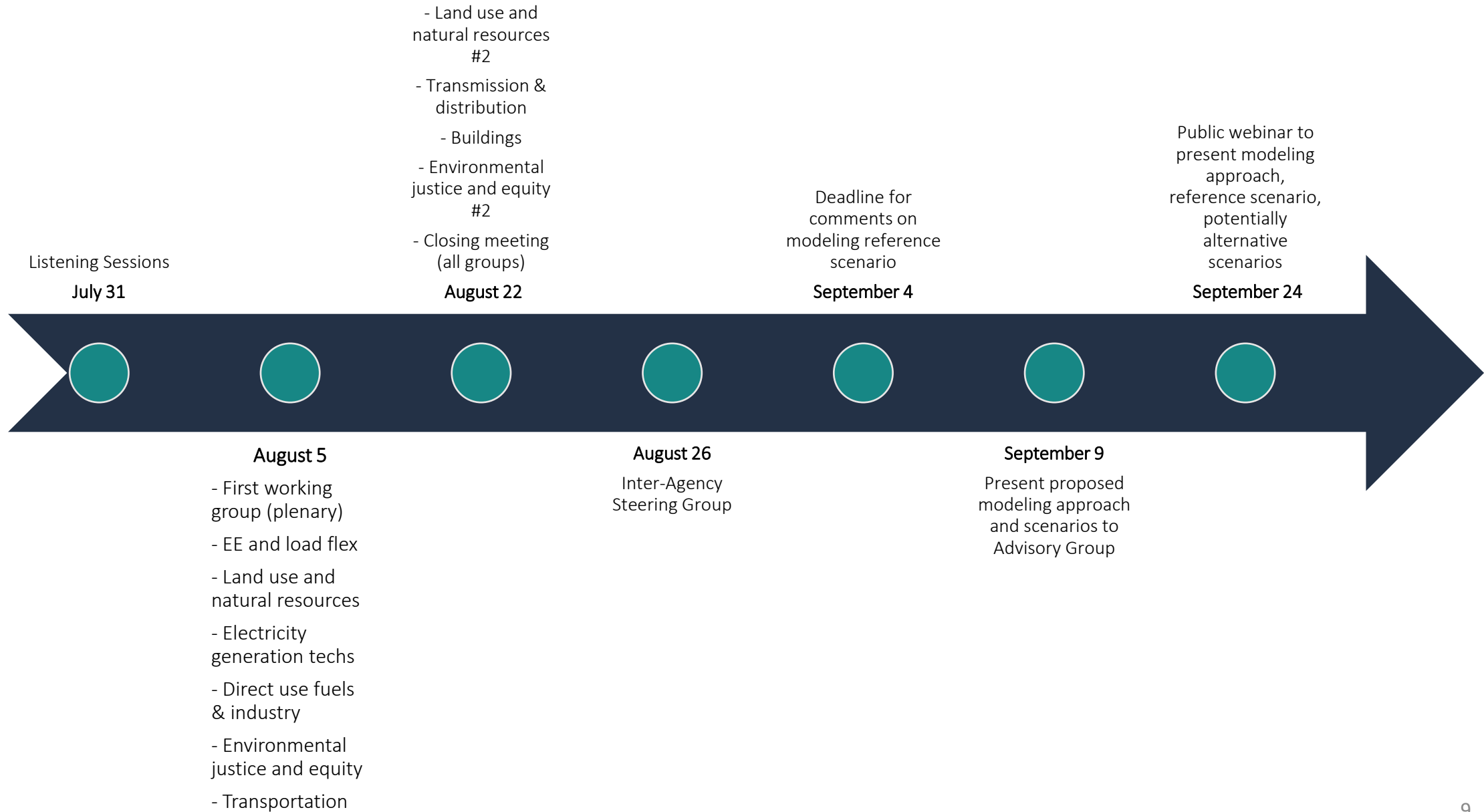


Please introduce yourself
(name, affiliation)

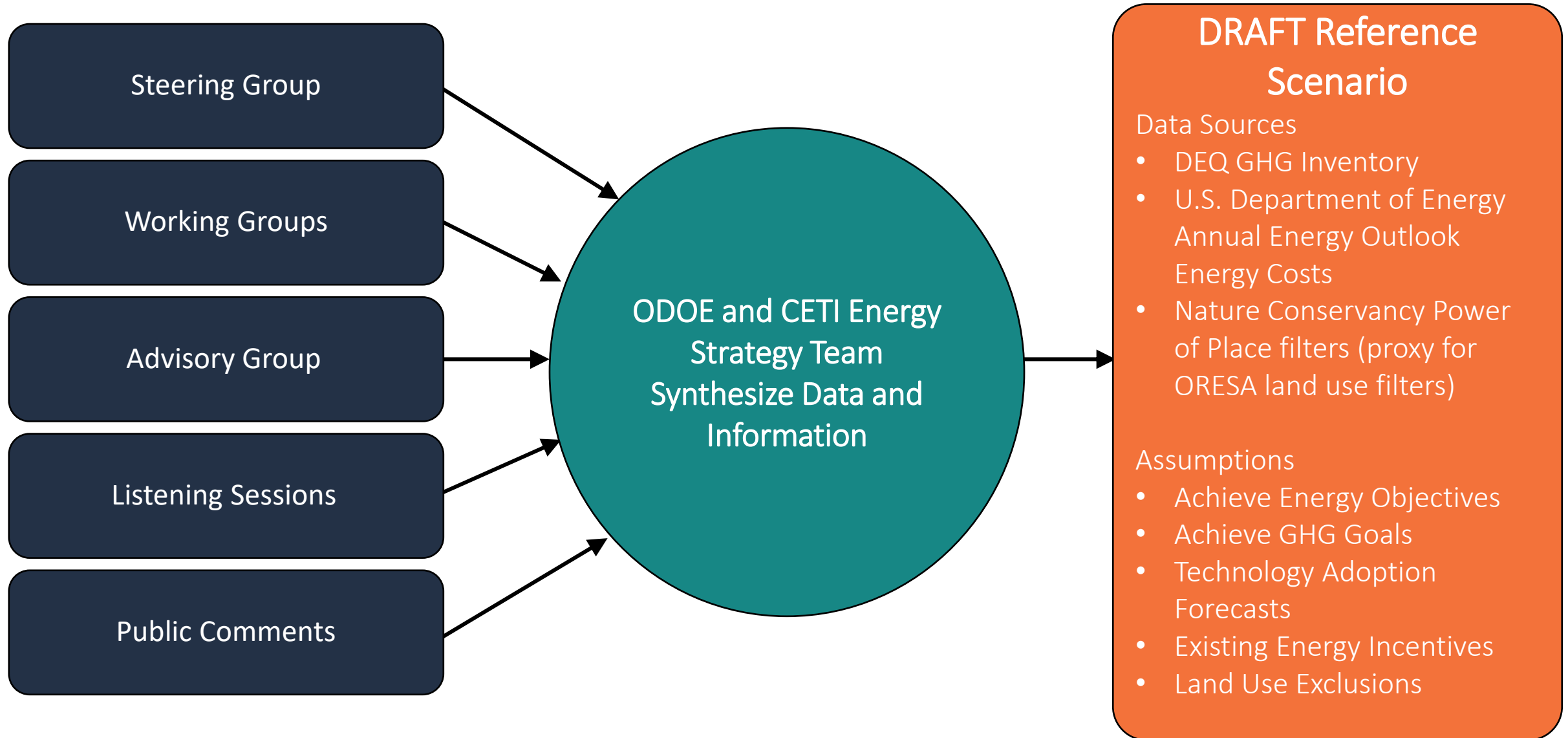


Overview of Process & Model

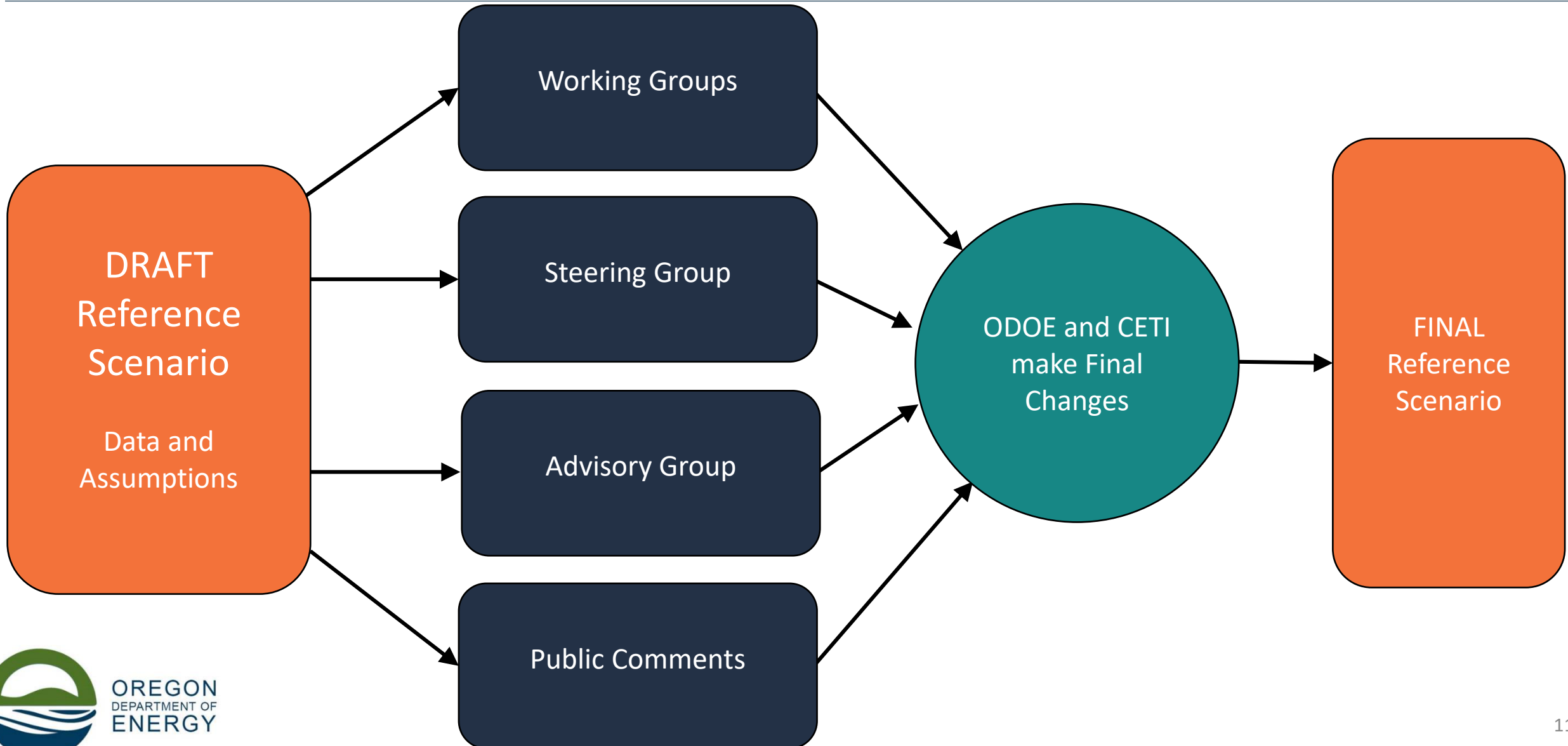
TIMELINE FOR MODELING INPUTS



INFORMING MODEL DEVELOPMENT



FINALIZING THE REFERENCE SCENARIO



DECISION-MAKING CRITERIA

Established modeling inputs, including:

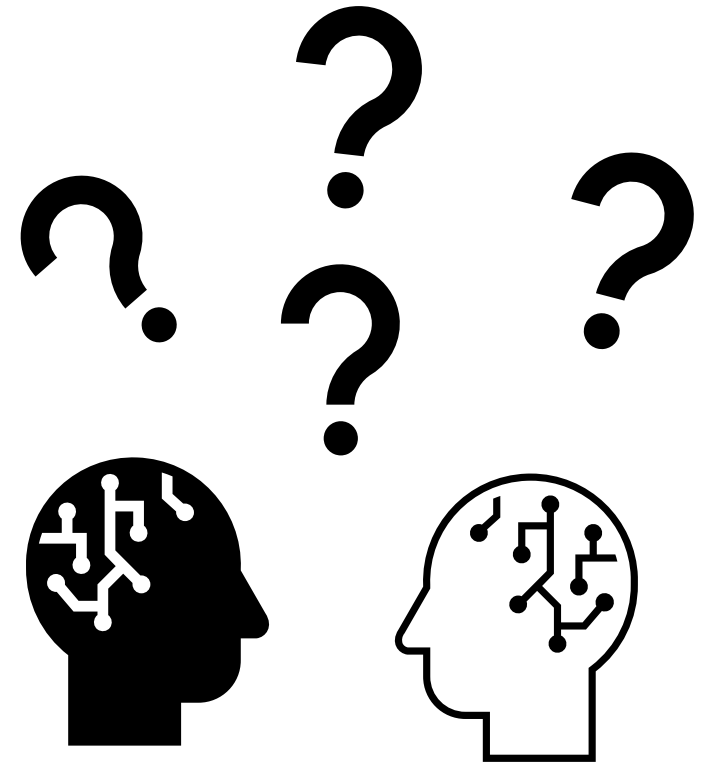
- Achieving state energy objectives, including greenhouse gas emissions goals
- Energy system reliability
- Existing laws and policies

Reference case focuses on “aggressive but achievable” levels of electrification, energy efficiency, and load flexibility

- Based on numerous other studies that identify these as part of a least-cost path to meeting energy and climate policy objectives
- Paired with scenarios that test alternative pathways with lower electrification and energy efficiency rates

Other considerations, including:

- Data availability and quality
- Focus on informing near-term decisions and recommendations



WHAT THE ANALYSIS DOES AND DOESN'T DO

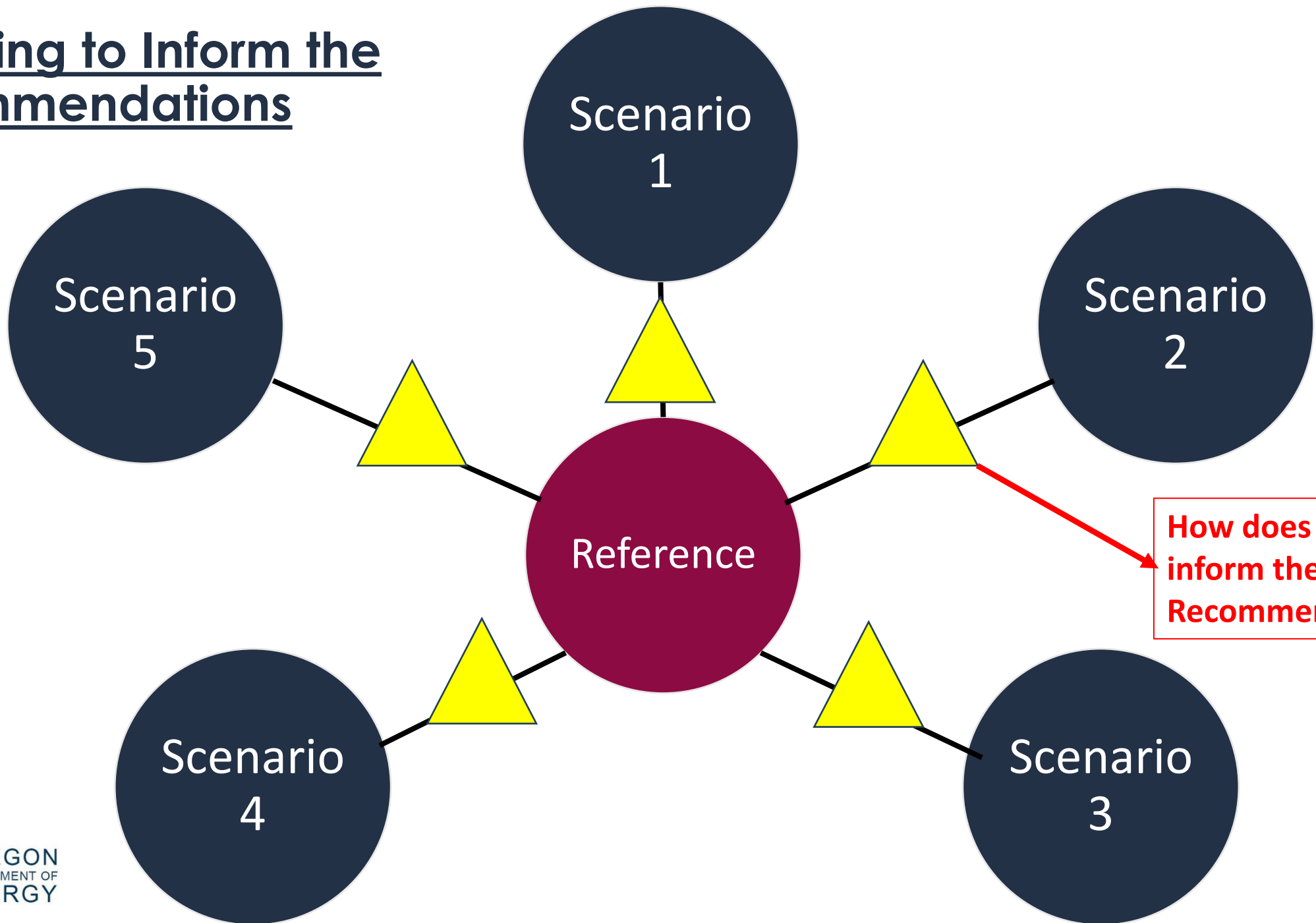
DOES

- Create an understanding of tradeoffs between different pathways, policies, and strategies to inform recommendations to meet Oregon's energy policy objectives
- Integrate detailed electricity sector modeling and fuels supply for an economy-wide perspective
- Create complementary analysis on co-benefits and costs: equity, environmental justice, land use, jobs, air quality, and public health

DOES NOT

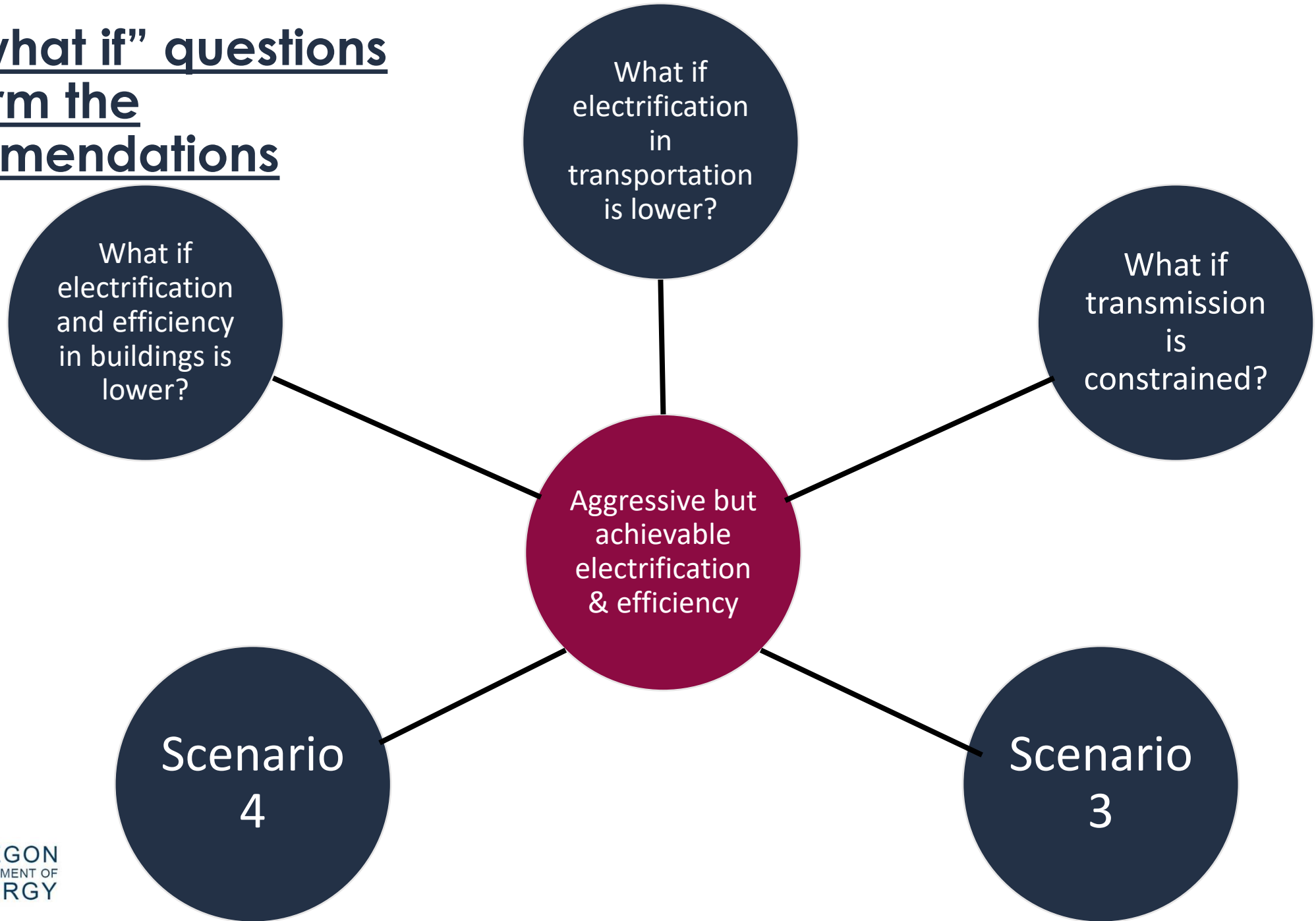
- Forecast the future; it informs near-term decision-making in the face of uncertainty about meeting our energy policy objectives
- Serve the same purpose as utility IRP models
- Focus on any single utility service territory; it is a statewide model
- Operate as a transmission planning model
- Provide location-specific outputs for resources or transmission lines

Modeling to Inform the Recommendations



How does the Delta inform the Recommendations?

Key “what if” questions to inform the recommendations



NOTES ON DEMAND & SUPPLY SIDE MODELS

Demand-side model:

- Model of Oregon's economy across 80 end-use sectors & all fuels
- Energy consuming technologies – stock rollover over time
- Model calculates energy needs
- Key assumptions, such as energy efficiency and electrification rates for appliances and transportation are inputs into the model
- These inputs were the focus of much of the engagement in the Working Groups

Supply-side model:

- Economy-wide
- Must meet climate targets
- Supply-side resource mix and transmission buildout are outputs of the model
- Most focus is on feedback on approach to modeling and feedback on key data
- Certain assumptions discussed to help reflect constraints of the model and risks/unknowns inherent in areas like transmission buildout, including:
 - Distribution costs
 - Transmission buildout

CLARIFYING QUESTIONS



Do you have any clarifying questions about how the model works or how the results will inform Phase 2 of the Energy Strategy Project?

Working Session: Draft Reference Scenario

PROPOSED REFERENCE SCENARIO CHANGES

Category	Updated Model Input	Original Model Input	Feedback from Engagement
Transportation - Vehicle Miles Traveled	20% reduction in VMT <u>per capita</u> by 2050	<ul style="list-style-type: none"> VMT per capita assumed flat through 2050 	<ul style="list-style-type: none"> VMT reduction targets are existing policy through Climate Friendly and Equitable Communities (CFEC); should not be treated differently from other transportation policies (e.g. ACC II, ACT)
Commercial Hot Water Heat Pumps	Weighted average of large and small commercial: <ul style="list-style-type: none"> Small commercial: follow residential (electric heat pump sales 95% of overall sales by 2045) Large commercial: Electric heat pump sales 25% of all new sales are electric by 2035 and 90% by 2045 	<ul style="list-style-type: none"> Large commercial: 25% of all new sales are electric by 2030 	<ul style="list-style-type: none"> Feedback: 2030 is too soon for 25% of sales for commercial buildings being electric hot water heat pumps.
Demand response participation	50% of households and commercial end-users participate in some form of firm DR commitment	<ul style="list-style-type: none"> Posed question of what % of eligible stock is participating 	<ul style="list-style-type: none"> Midwest ISO – 10% demand response savings at peak Demand response potential identified by PGE and PacifiCorp ODOE reviewed several studies (BPA, CPUC, Brattle) to understand current levels & projections
Buildings – dual fuel heat pumps	Dual fuel gas/electric heat pump systems compete with other electric technologies in line with sales shares set for residential and commercial	<ul style="list-style-type: none"> No change – clarification 	<ul style="list-style-type: none"> Questions about role of dual fuel heat pumps and their utility in the energy transition. We had not made clear that dual fuel heat pumps would be a competing technology with all-electric heat pumps in our presentation materials.

PROPOSED REFERENCE SCENARIO CHANGES

Category	Updated Model Input	Original Model Input	Feedback from Engagement
Timing of transmission development	No new transmission until 2035, except for a few advanced projects: <ul style="list-style-type: none"> - Boardman to Hemingway (2030) - PAC's Gateway project (2035) - BPA's Big Eddy to Chemawa (2035) - PGE's Round Butte to Bethel (2035) 	<ul style="list-style-type: none"> • No new transmission until 2035 • Had a date of 2025 for Boardman to Hemingway • Were looking for feedback on other lines 	<ul style="list-style-type: none"> • Boardman to Hemingway – 2025 is too soon • Questions & comments about other projects in advanced planning stages
Generation - Data Center Load Growth		<ul style="list-style-type: none"> • Northwest Power and Conservation Council Pacific Northwest Power Supply Adequacy Assessment for 2029 base case, with load differentiated across modeling zones 	<ul style="list-style-type: none"> • Concern with significant uncertainty • Interest in study's higher forecast
Direct Use Fuels- Hydrogen	Confirmed renewable hydrogen can be used in the model to replace direct use fuels	<ul style="list-style-type: none"> • 50% of heat in bulk chemicals (not a large industry in OR) • 20% of construction energy demand • 20% of industrial vehicles by 2050 	<ul style="list-style-type: none"> • Concern with the role of hydrogen

DISCUSSION



Do you have any questions or comments about the proposed changes to the modeling inputs and assumptions?

ENVIRONMENTAL JUSTICE & EQUITY

- Topic intersects across all working groups
- Dedicated work group focused on:
 - Discussing feedback coming from other working groups
 - Understanding how complementary analysis can help understand the Environmental Justice and Equity impacts and opportunities arising from the modeling
- Complementary analysis will build on the modeling and include:
 - Definition of representative **household “energy wallets”** to investigate impacts of different scenarios on costs
 - Applying GIS mapping tool to analyze potential **geospatial impacts and opportunities** of modeling results
 - Analyzing air quality effects of different pathways on **public health**

ENERGY EFFICIENCY AND LOAD FLEXIBILITY

- Demand Response participation – 50% of residential and commercial buildings participate in Demand Response programs.
- Based on:
 - Review of existing projects in Oregon and planned distributed energy resources participation levels in utility integrated resource plans
 - Review of demand response participation rates around the U.Ss
 - Review of analyses looking at the role of demand response and electrification
- Question: Do you have any additional perspectives to help inform the level of DR participation we anticipate out to 2050?

BUILDINGS

- Hot water heating
 - Residential and small commercial, considering:
 - Electric heat pump sales rising to 95% of overall sales by 2045 (includes hybrid heat pumps)
 - DEQ MOU with several other states: 65% of overall sales are heat pumps by 2030; 90% by 2040
 - Larger commercial:
 - 25% of all new sales are electric heat pumps by 2035 and 90% by 2045
- Cooking and other appliances
 - Starting point: 100% sales of new appliances are electric by 2035
 - Considering lowering this to 90% of sales of new appliances to account for barriers brought up in comments
- Question: Do you have any comments or additional inputs to share on these assumptions?

DIRECT USE FUELS AND INDUSTRY

- Aggressive but achievable rate of electrification of buildings and industry
 - 100% of machine drives by 2035
 - 100% of industrial low heat demand by 2050
 - 100% of refrigeration by 2040
 - 90% of industrial HVAC loads by 2050
 - 80% of industrial/agricultural vehicles by 2050
- Based on:
 - Contractor recommendations from previous energy strategy development
 - Review of electrification and energy transition studies
 - Consultation with working group
- Question: Do you have comments on these assumed rates of electrification?

7 MINUTE BREAK

TRANSPORTATION

- MHD vehicle electrification rate:
 - School and transit buses: 100% new sales are zero emission vehicles by 2036
 - All other MHD vehicles: 100% new sales are zero emission vehicles by 2040
- Based on:
 - Aggressive but achievable electrification
 - Review of existing policy and recent studies while also recognizing the barriers to electrification that still exist in this sector
 - Consultation with working group members and data holders
- Question: Do you have comments or questions on this approach?

TRANSMISSION AND DISTRIBUTION

- Electricity Transmission Development
 - Existing planned or in development projects
 - New lines
 - Idaho Power- Boardman to Hemingway
 - Pacific Power- Gateway
 - Reconductoring/Rebuilding Existing Lines
 - BPA- Big Eddy to Chemawa
 - PGE- Round Butte to Bethel project
 - No new transmission until 2035
- Pipeline Infrastructure
 - No new development
- Electricity distribution development costs
 - Proxy value based on historic costs from EIA
- Question: Do you have questions or comments on these transmission and distribution assumptions?

ELECTRICITY GENERATION TECHNOLOGIES

- Significant uncertainty of data center load growth
- Discussed potential alternative scenario with higher growth
- Proposed for Reference scenario: Base case in the Northwest Power & Conservation Council's Pacific Northwest Power Supply Adequacy Assessment for 2029
- **Question:** Would the “Base” or “Mid-Higher” forecast be more appropriate for the Reference?

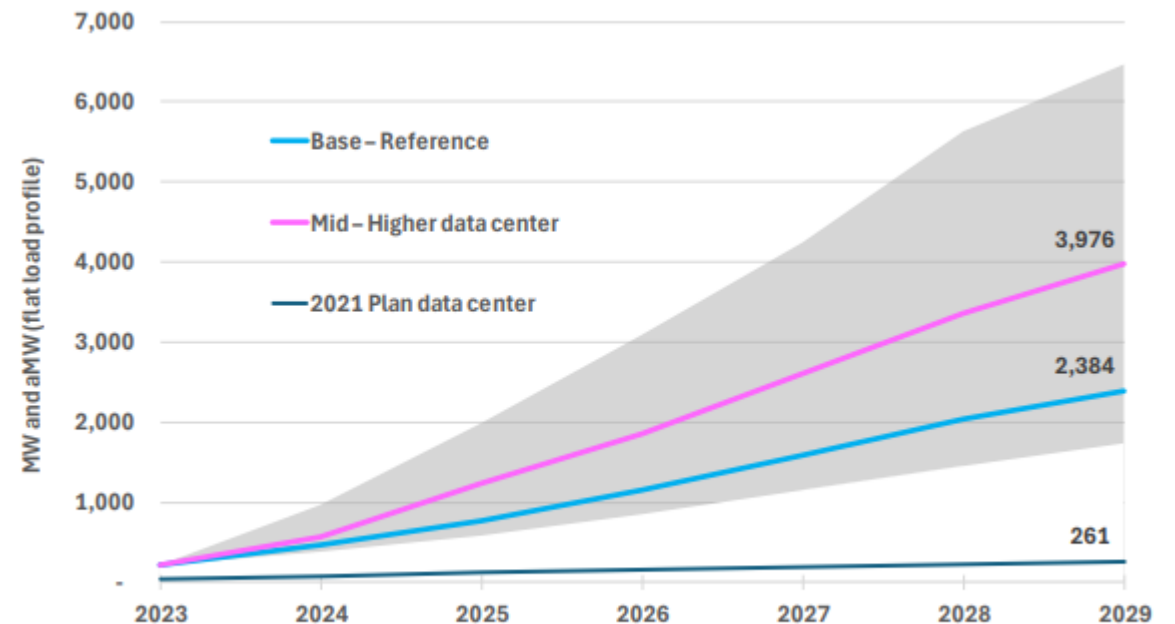


Figure 2. Incremental data center and fab growth forecast, 2023 to 2029

Chart from Northwest Power & Conservation Council's Pacific Northwest Power Supply Adequacy Assessment for 2029 at page 15, report at <https://www.nwcouncil.org/fs/18853/2024-4.pdf#page=15>

LAND USE AND NATURAL RESOURCES

- Legally and administratively protected lands where state or federal law requires consultation or review, and lands owned by non-governmental organizations (NGOs) on which there are conservation restrictions.
- Based on:
 - The Nature Conservancy's Power of Place- West Study
- Question:
 - Do you have comments or questions on this approach?

“What If” Questions: Emerging Options for the Five Alternative Scenarios

“WHAT IF” QUESTIONS – EMERGING TOPICS

- What if we max out energy efficiency? What do we get?
- What if we achieve less energy efficiency?
- What if we have more aggressive electrification?
- What if we rely more on alternative fuels?

More/less energy efficiency and electrification in buildings



- What if we can't electrify transportation as quickly?
- What if barriers prevent heavy-duty vehicles from electrifying?

Constrained transportation electrification



- What if we build more non-EV transportation alternatives?
- What if we test urban planning and behavior on transportation and buildings energy demand?

What if we constrain vehicle miles traveled?



- What if transmission doesn't get built or takes longer than expected?
- What if we rely on more local resources? What would this mean for jobs?

Constrained transmission



- Concern over limiting natural gas in homes
- How much/quickly can industry electrify?
- What if we electrify more slowly?

Enhanced alternative fuels



- Concern over data centers, electrification, growing cooling loads.

What if load growth is much faster or greater than expected?



- Do we want to understand the implications of a more ambitious decarbonization trajectory?

More ambitious decarbonization scenario



- What if more or less offshore wind is built?
- What if we model more grid-enhancing technologies?

Others



Preparing for Upcoming Meetings, Next Steps, and Summary

ENERGY STRATEGY RESOURCES

- Oregon Energy Strategy [Main Webpage](#)
- [Advisory Group Webpage](#) – agendas, meeting recordings, members
- [Working Group Webpage](#) – agendas, meeting recordings, members
- [Draft Reference Scenario](#)
- [Comment Portal](#)
- [Email sign Up for Updates](#)

NEXT STEPS

Focus of October 17 meeting - 9am-12pm

- Discuss alternative scenarios
- Collect feedback

Focus of November meeting

- Planning for engagement early next year
- Building on reflections of engagement so far
- Get feedback & recommendations for engagement process



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Thank You!

