

# NW Natural's 2025 IRP- Technical Working Group

TWG #10  
ICF Analysis and Action Plan  
June 26, 2025



# Today's Agenda

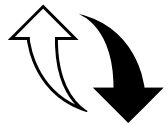


- Logistics
- Recap of previous TWG and today's objectives
- ICF Analysis
- Action Plan

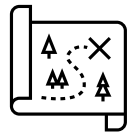
# Facilitator Requests



Engage constructively and courteously towards all participants



Take space and make space



Respect the role of the facilitator to guide the group process



Avoid use of acronyms and help each other understand

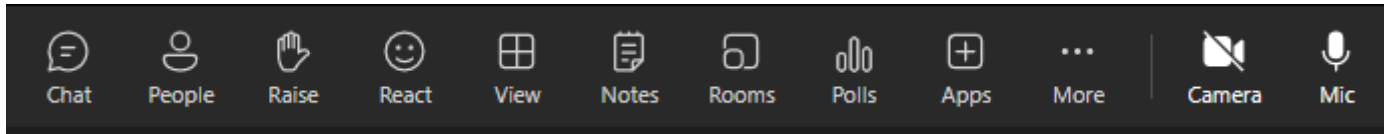


Aim to focus on the meeting topic

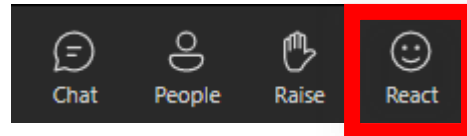
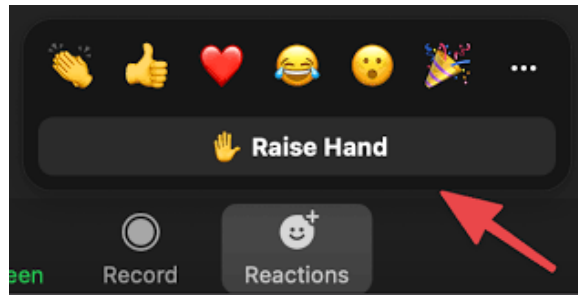
# How to Interact in a Teams Meeting



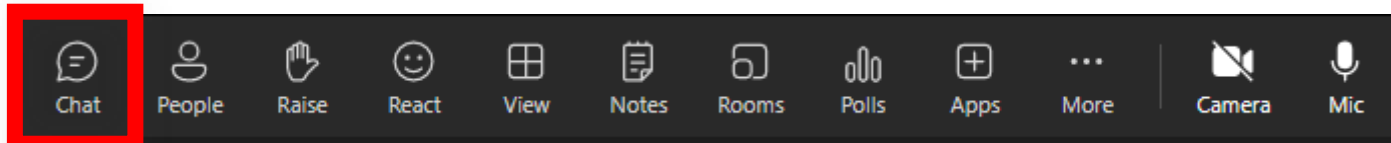
- Participant Controls are at the top or bottom of your screen



- Ask a question or comment at any time using the “raised hand”



- You may also use the chat box



A member of the IRP team will monitor the chat, and participant list for raised hands during the meeting.

# Meeting Best Practices – virtual spaces



To maintain an engaged and productive space, please:



Mute your mic unless asking a question and/or providing comment



Turn your camera on when speaking (if you are comfortable and your bandwidth allows)



Limit side conversations in the chat



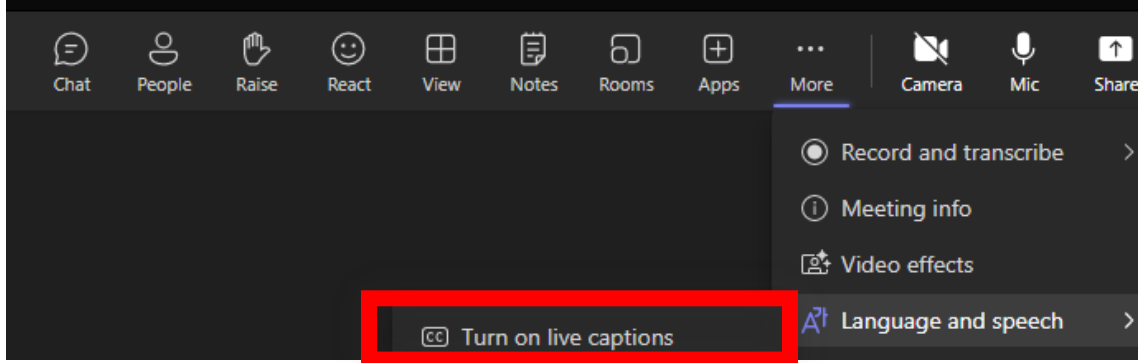
Make efforts to adhere to the meeting schedule



# Teams Meeting – Accessibility Functions



- [Live Captions](#) - real-time auto-generated text of what is said in a meeting. They appear a few lines at a time for a user who has turned them on, and aren't saved

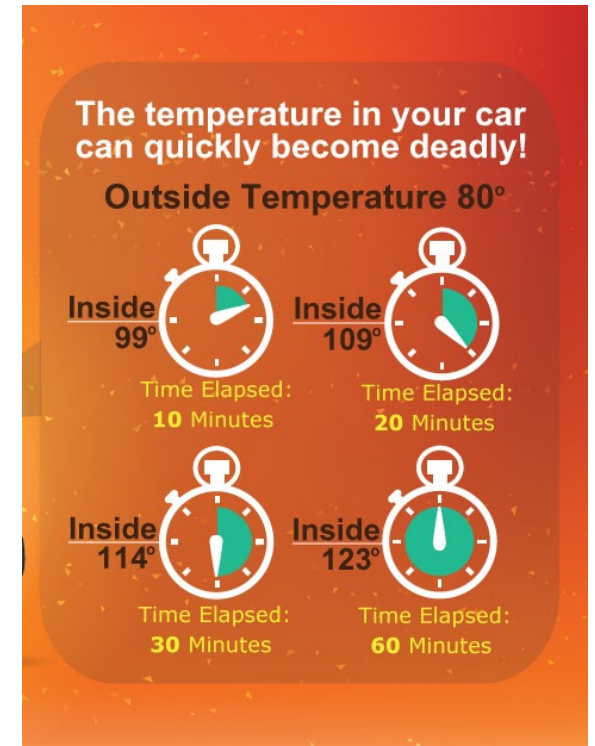


- Reducing Distractions and Customizing Views:
  - Microsoft Teams has a variety of features to support different learning styles, please find reference material for:
    - [Turn on live captions during meetings](#)
    - [Customize your meeting view](#)
    - [Change background effects in Teams meetings](#)
    - [Reduce background noise in Teams meetings](#)
    - [5 tips for using Teams when you're deaf or hard of hearing](#)
- Meeting Recordings:
  - NW Natural will record IRP virtual meetings and will post them to the NW Natural website on the [resource planning webpage](#)

# Two Minutes for Safety

Practice heat safety everywhere you go

- Job Sites: stay hydrated and take breaks in the shade as often as possible; consider shorter shifts if possible
- Indoors: check in on vulnerable populations including children, older adults, and those without AC (or similar cooling)
- Outdoors: limit physical exertion, find shade, stay hydrated, wear sunscreen/ light clothing
- Vehicles: Never leave children or animals unattended in a vehicle – LOOK before you LOCK – vehicle temperatures can rise quickly!



## Recap May 29 TWG

## ▶▶ Today's objectives

- Gained a shared understanding of resource optimization model
  - Reviewed Scenarios 1-3 and the PRS
- Reviewed potential pilots for inclusion in the 2025 IRP
- Answered clarifying questions about:
  - Alternative fuels and carbon capture prices and modeling
  - Scenario costs, risk considerations and compliance strategies
  - Pilot projects

- Share Electrification Study results
- Review Action Plan
- Answer clarifying questions
  - Draft chapters – if time allows, Q&A to be held at end of the TWG



# Current Technical Working Group Schedule



| TWG No.               | Date          | Type & Purpose of Engagement                |
|-----------------------|---------------|---------------------------------------------|
| TWG#1                 | Oct 22, 2024  | Planning Environment                        |
| TWG#2                 | Nov 1, 2024   | Scenarios                                   |
| TWG#3                 | Nov 21, 2024  | Scenarios Cont. and Climate                 |
| TWG#4                 | Dec 17, 2024  | Load Forecast                               |
| TWG#5                 | Jan 21, 2025  | Avoided Costs & Demand-Side Resource        |
| TWG#6                 | Jan 28, 2025  | Supply-Side & Compliance Resources          |
| TWG#7                 | Repurposed    | Repurposed for Office Hours                 |
| Office Hours          | April 1, 2025 | Electrification Study – follow up from TWGs |
| TWG#8                 | Apr 8, 2025   | Distribution System Planning                |
| TWG#9                 | May 29, 2025  | Resource Optimization Planning Model        |
| TWG#10                | June 26, 2025 | Portfolio Results and Action Plan           |
| File Draft – flight 1 | June 13, 2025 | Comments due by July 11 <sup>th</sup>       |
| File Draft – flight 2 | June 25, 2025 | Comments due by July 11 <sup>th</sup>       |
| File 2025 IRP         | Aug 1, 2025   | Beginning of formal process                 |

- All TWGs will be facilitated and virtual
- Dates and topics are tentative and subject to change
- Please refer to website for most up to date information: [IRP Website](#)
- The Draft IRP will be posted to the website upon release

# Other Public Engagement Opportunities



| Public Engagement Opportunity & Topic | Date              | Type & Purpose of Engagement                                                                                                                                                                             |
|---------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Energy Resource (IRP) Fair #1:        | November 16, 2024 | In-Person Only. Opportunity to learn and engage on IRPs and Energy Services & Programs. Event to be held in collaboration with community partners.<br><b>Parkrose High School from 11:00am to 2:00pm</b> |
| Public Engagement Webinar #1:         | March 5, 2025     | Opportunity to learn and engage on an IRP and key topics previously presented and related to resource planning and utility energy services.                                                              |
| Energy Planning-Events Engagement:    | June 7, 2025      | In-Person Only. Opportunity to learn about Energy Planning, Services & Programs. Events to be held in collaboration with community partners.<br><b>1303 NE 136th St Vancouver from 12:00 to 3:00pm</b>   |

- Please check our dedicated IRP website for the most current information:  
[IRP Website](#)
- Feedback form direct link: [Feedback Form](#)
- Email us at [IRP@nwnatural.com](mailto:IRP@nwnatural.com)

# ICF Study Results - Background

- Study was to help us understand costs and emissions associated with electrification from the electric perspective
- Study and key assumptions were discussed at previous TWGs
- Study includes four demand scenarios and one supply scenario
- Study results are still underway but wanted to present on what we have so far
- 2025 Draft IRP - Chapter 10 represents ICF Study and Chapter 11 represents the implications
- ICF's report will be included with the Final IRP



# ICF Presentation





# NW Natural Electrification Study



**TWG #10 Presentation**

06/26/2025



# Disclaimer

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# Agenda

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- Introduction
- Demand Side Analysis
- Load Impacts
- Power Sector Analysis
- Combined Results
- Key Take Aways



# Introduction

# Overview of NW Natural Electrification Study

## Specific key objectives of this study include:

- Provide input on gas demand impacts to NW Natural's IRP on potential electrification scenarios
- Consider the electric supply requirements for these electrification scenarios – to give context and characterize costs
- Assess the overall impacts and costs associated with electrifying NW Natural customer loads
- Assess how hybrid heating (ASHP with gas back-up) would change the impacts and costs of electrification
- While the focus is on building electrification the analysis and study also consider load growth in other sectors

### Demand-Side Analysis

- Assess electric load growth and gas demand impacts from different levels of electrification and types electric equipment
- Focus is on buildings but also considers other sources of load growth (EVs, data centers, industrial)
- Leverages NREL ResStock and ComStock datasets to characterize electrification impacts

### Electric Supply Analysis

- Capacity expansion modelling to assess the infrastructure requirements resulting from increased electric loads
- Includes generation, transmission, and distribution impacts
- Leverages ICF's Integrated Planning Model (IPM)

### Sector Integration & Results

- Combines demand and electric supply results to understand overall cost and GHG emissions impacts of different scenarios
- Including customer equipment conversion costs and incremental infrastructure costs for generation, transmission, and distribution



## Demand Side Analysis



# Scenario Definitions

## Electrification Scenarios

|                   |                |                                 |                                                                                                                                                                                 |
|-------------------|----------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demand Variations | Reference Case |                                 | Includes all known codes, policies and energy efficiency expectations and aligns with NW Natural’s reference case expectations of building electrification.                     |
|                   | S5             | Modest Customer Electrification | Aims to align with trends from NEEA-RBSA, projections from electric utilities of existing buildings electrifying, and limitations on natural gas in new construction buildings. |
|                   | S6             | Hybrid System Electrification   | Hybrid systems [electric heat pump with gas furnace as back up] are installed in existing buildings and new construction based on stock turn-over.                              |
|                   | S7             | All-Electric Buildings          | Significant levels of building electrification of existing buildings and new construction based on stock turn-over.                                                             |

# Assumed **Residential** Electrification Levels

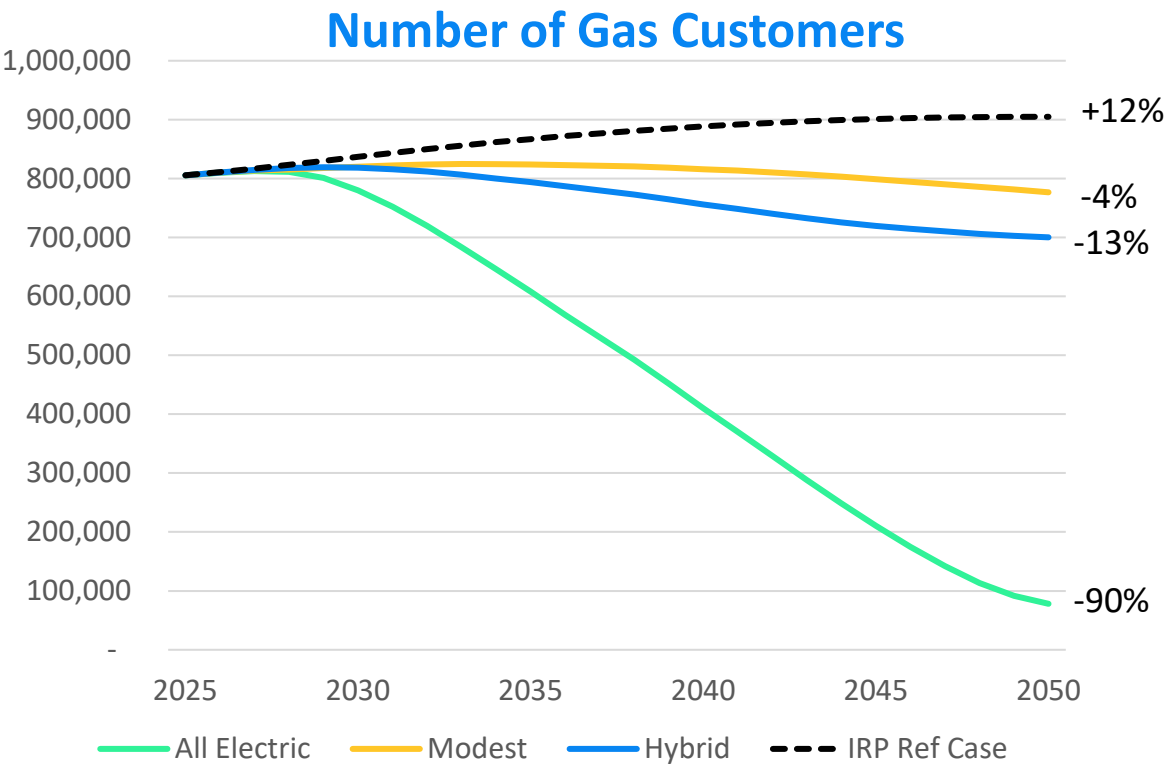
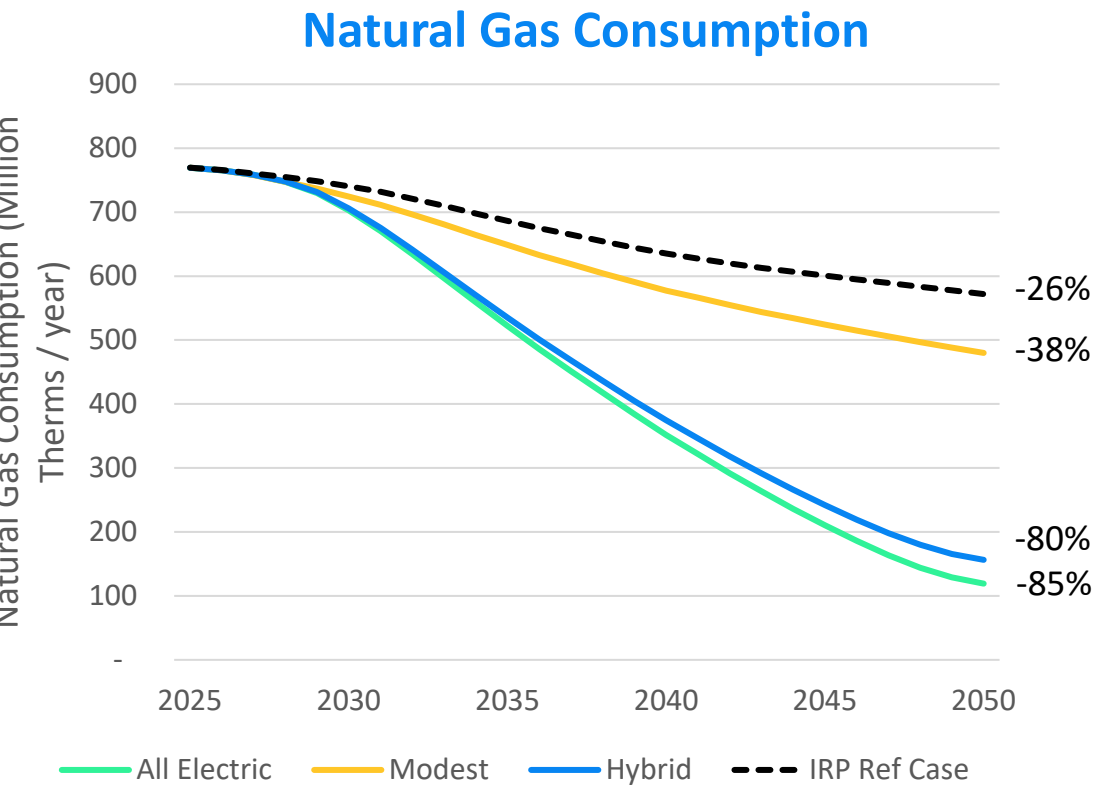
| Customer Type                                    | End Use       | Modest Customer Electrification                                                                                                                                   | Hybrid System Electrification                                                                                                                                                          | All-Electric Buildings                                                                                                                                                          |
|--------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential Sector<br><br>Existing Gas Customers | Space Heating | <ul style="list-style-type: none"> <li>•15% heat pump sales by 2030</li> <li>•Evenly split between heat pumps with electric backup and with gas backup</li> </ul> | <ul style="list-style-type: none"> <li>•Align with ODOE 65% heat pump sales by 2030 &amp; 90% by 2040</li> <li>•Energy Star AHSP with existing gas furnace system as backup</li> </ul> | <ul style="list-style-type: none"> <li>•65% heat pump sales by 2030 &amp; 90% by 2040</li> <li>•Mix of Energy Star and cold-climate heat pumps, with electric backup</li> </ul> |
|                                                  | Water Heating | 15% heat pump sales by 2030                                                                                                                                       | 50% heat pump sales by 2030 & 95% by 2045                                                                                                                                              | 50% heat pump sales by 2030 & 95% by 2045                                                                                                                                       |
|                                                  | Cooking       | 15% sales of new appliances are electric by 2030                                                                                                                  | 95% sales of new appliances are electric by 2035                                                                                                                                       | 95% sales of new appliances are electric by 2035                                                                                                                                |
| Residential Sector<br><br>New Construction       | Space Heating | 50% heat pumps by 2035 (half are hybrids)                                                                                                                         | 100% Hybrid Heating as of 2035                                                                                                                                                         | 100% ASHP as of 2035                                                                                                                                                            |
|                                                  | Water Heating | 50% Electric HPWH as of 2035                                                                                                                                      | 100% Electric HPWH as of 2035                                                                                                                                                          | 100% Electric HPWH as of 2035                                                                                                                                                   |
|                                                  | Cooking       | 50% All-electric as of 2035                                                                                                                                       | 100% All-electric as of 2035                                                                                                                                                           | 100% All-electric as of 2035                                                                                                                                                    |

# Assumed **Commercial** Electrification Levels

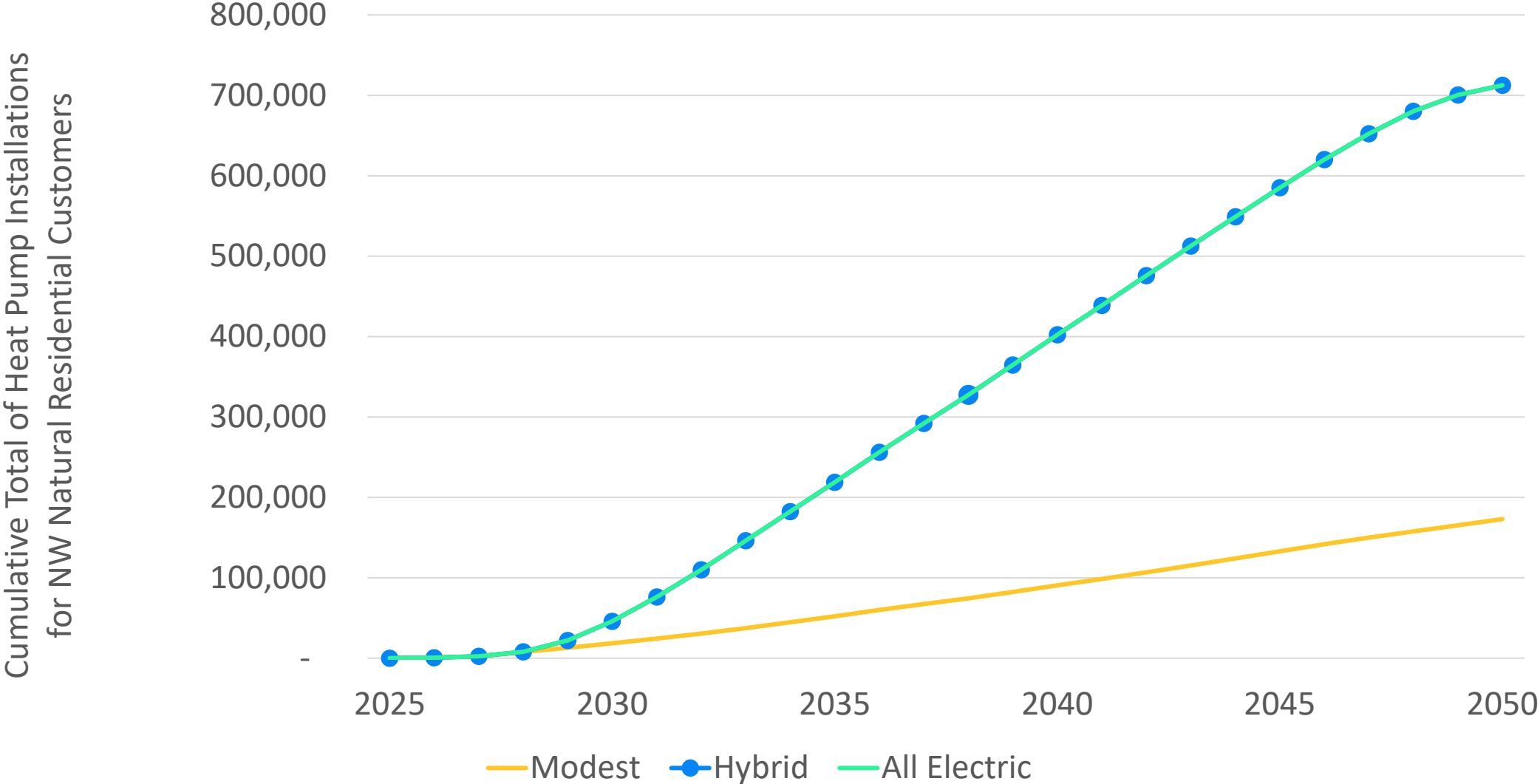
| Customer Type                                                 | End Use                  | Modest Customer Electrification                                                                                                                                  | Hybrid System Electrification                                                                                                                                                                       | All-Electric Buildings                                                                                                                                                                              |
|---------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Commercial Sector</b><br><br><b>Existing Gas Customers</b> | <b>Space Heating</b>     | <ul style="list-style-type: none"> <li>•5% heat pump sales by 2030</li> <li>•Evenly split between heat pumps with electric backup and with gas backup</li> </ul> | <ul style="list-style-type: none"> <li>•Small commercial: follows residential</li> <li>•Large commercial: 25% of all new sales are electric with gas backup by 2035 and 90% by 2045</li> </ul>      | <ul style="list-style-type: none"> <li>•Small commercial: follows residential</li> <li>•Large commercial: 25% of all new sales are all-electric (ASHP or boiler) by 2035 and 90% by 2045</li> </ul> |
|                                                               | <b>Water Heating</b>     | 5% incremental electric sales by 2030                                                                                                                            | <ul style="list-style-type: none"> <li>•Small commercial: follows residential</li> <li>•Large commercial: 25% of all new sales are electric (HPWH or resistance) by 2035 and 90% by 2045</li> </ul> | <ul style="list-style-type: none"> <li>•Small commercial: follows residential</li> <li>•Large commercial: 25% of all new sales are electric (HPWH or resistance) by 2035 and 90% by 2045</li> </ul> |
|                                                               | <b>Kitchen Equipment</b> | 5% sales of new appliances are electric by 2035                                                                                                                  | 95% sales of new appliances are electric by 2035                                                                                                                                                    | 95% sales of new appliances are electric by 2035                                                                                                                                                    |
| <b>Commercial Sector - New Construction</b>                   | <b>Space Heating</b>     | 25% heat pumps by 2035 (half are hybrids)                                                                                                                        | 100% Hybrid Heating as of 2035                                                                                                                                                                      | 100% electric as of 2035                                                                                                                                                                            |
|                                                               | <b>Water Heating</b>     | 25% electric as of 2035                                                                                                                                          | 100% electric as of 2035                                                                                                                                                                            | 100% electric as of 2035                                                                                                                                                                            |
|                                                               | <b>Kitchen Equipment</b> | 25% electric as of 2035                                                                                                                                          | 100% electric as of 2035                                                                                                                                                                            | 100% electric as of 2035                                                                                                                                                                            |

# Changes to Residential and Commercial Gas Consumption & Customers for NW Natural in Oregon & Washington

- The NW Natural IRP Reference case sees customer numbers grow, but includes very significant reductions in use per customer (based on Energy Trust of Oregon energy efficiency expectations & warming temperatures)
- The All-Electric and Hybrid scenarios have the same levels of electric equipment adoption (in line with Oregon DOE study) – but in the Hybrid scenario electric heat pumps are installed with gas furnaces remaining as back-up (keeps gas customers, but have much lower levels of gas use per customer)



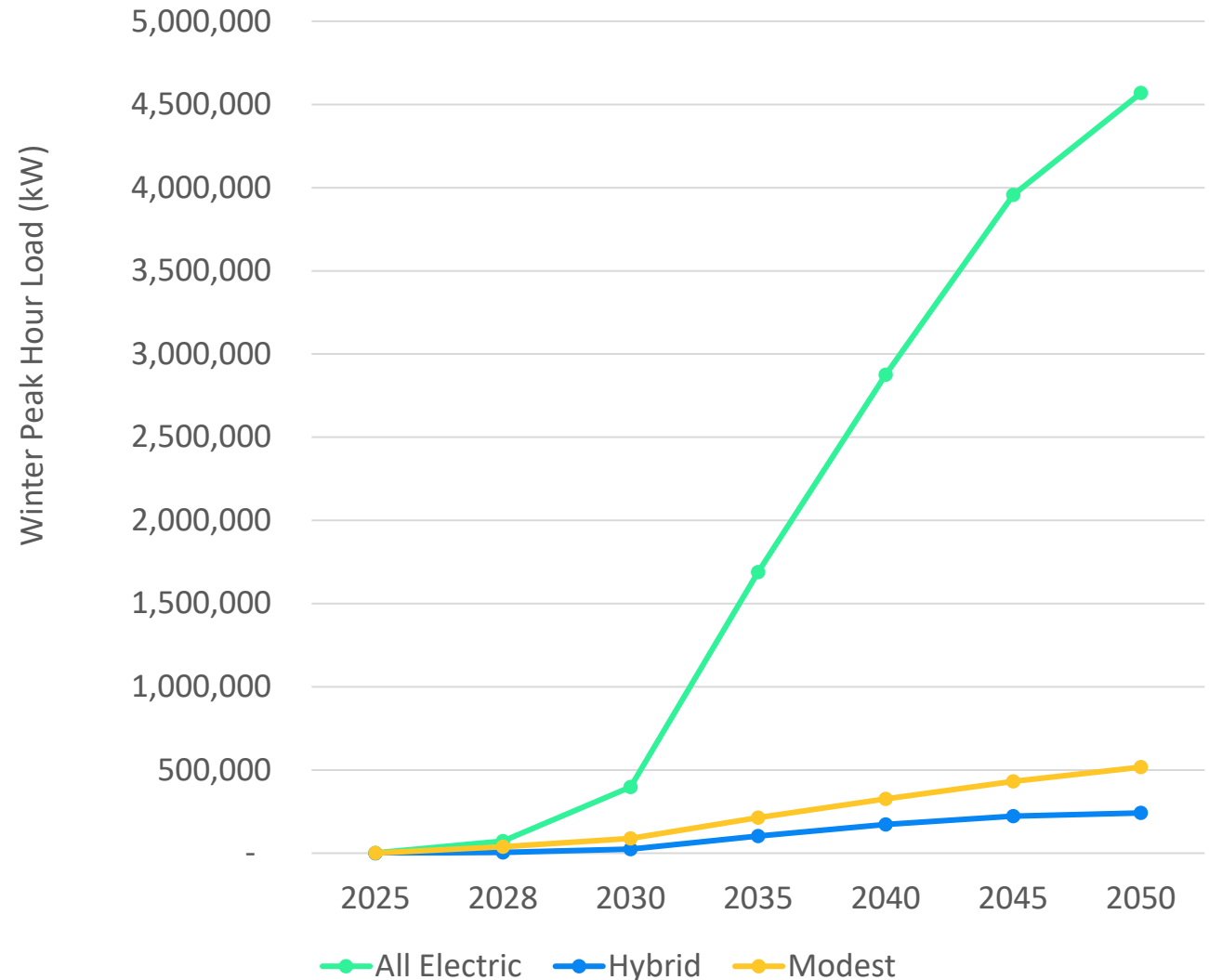
# Cumulative Heat Pump Adoption by NW Natural Residential Customers in Oregon and Washington





# Oregon Peak Electric Winter Load Impact from Building Electrification

- Peak electric demand impacts are derived from NREL ResStock and ComStock modelling of the 8760 load shapes from electrification technologies for gas customers in counties that overlap with NW Natural's service area
- NREL electric load shapes are scaled down to reflect the ~30% reduction in gas use per customer from Reference Case
- ASHP peak winter day load shapes are scaled up to represent a winter day matching January 13<sup>th</sup> 2024 temperatures, which got down to 15°F in parts of Portland, based on custom model runs in ResStock
- Electric demand is also scaled up to account for electric line losses



Peak end use load impact shown here are just from building electrification – so these values may not be co-incident with system overall peak load.



Load Impacts

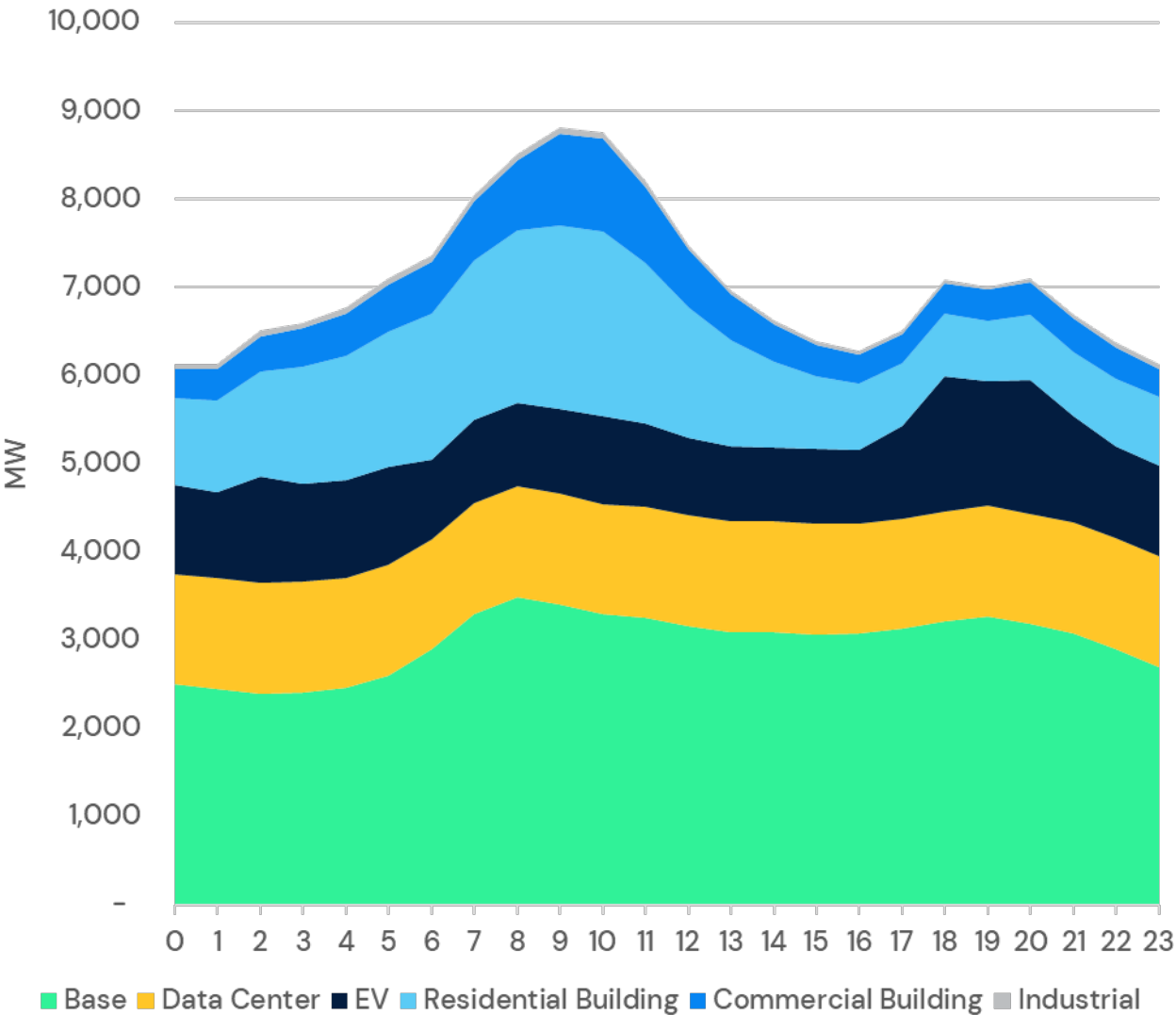
## Note on Washington Results

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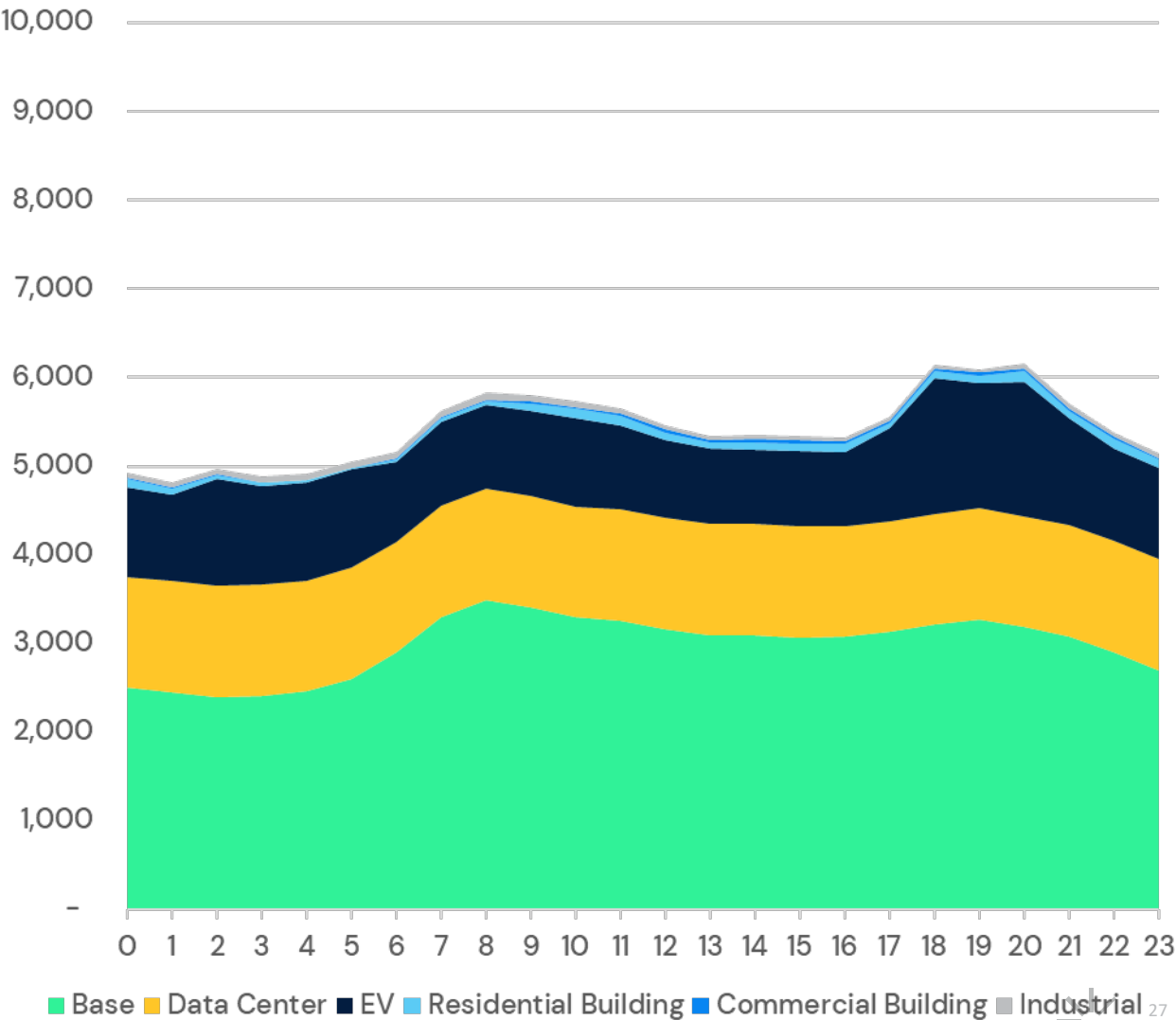
- Some of the demand-side results for Washington were included above.
- Final IRP filing will have more Washington power sector details included.
- The impact of NWN electrification on state-wide results are more limited given the lower share of NWN customers relative to statewide totals (NWN customers represent ~7% of total residential and commercial gas utility customers in the WA)
- For this and a few other reasons, the power modelling had a few additional considerations that needed a bit more time to be properly represented before sharing results.
- Within Oregon, results often focus on PGE specifically, where NW Natural has the largest overlap (all PGE electric customers who are also gas utility customers are served by NW Natural).

# Hybrid scenario mitigates almost 3 GW of PGE winter peaks vs. All Electric scenario in 2050 and maintains a summer peak

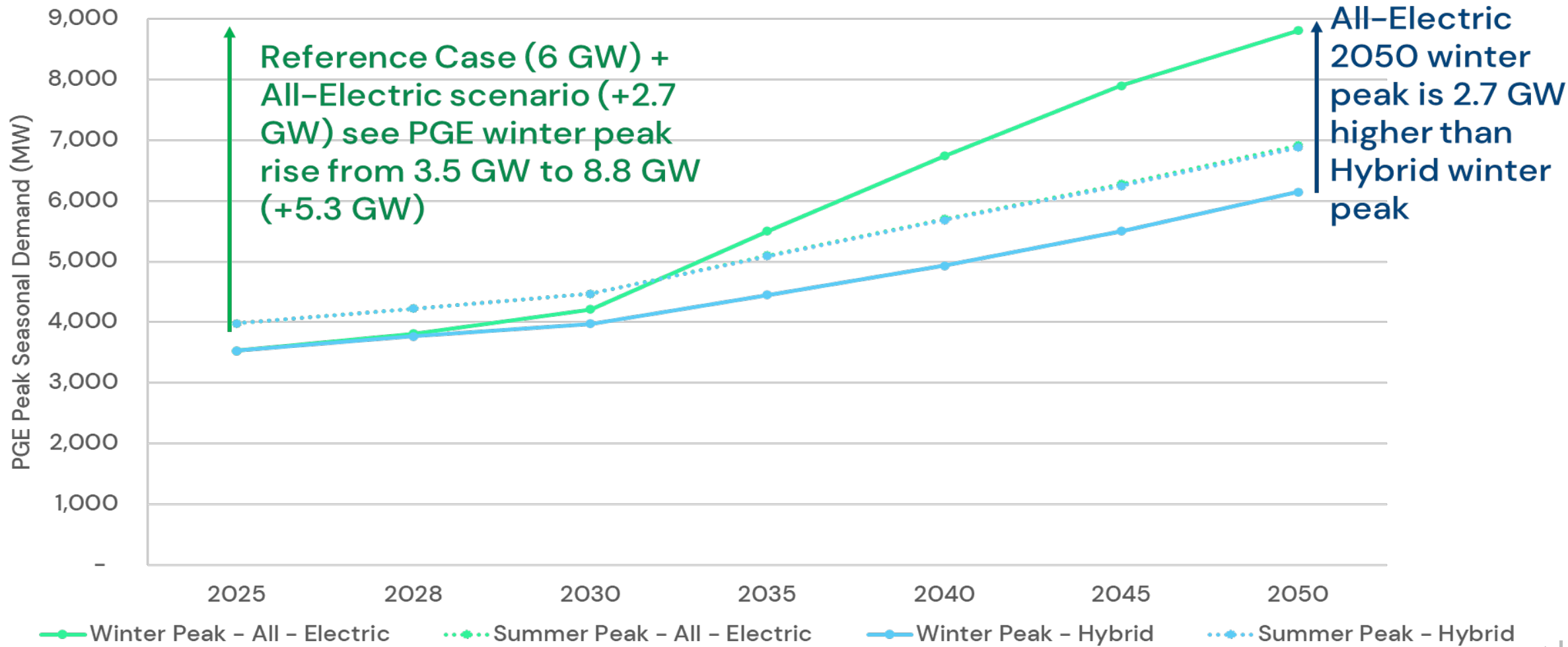
All Electric 2050 Winter Peak Day (PGE)



Hybrid 2050 Winter Peak Day (PGE)



For PGE the All-Electric scenario sees a large jump in peak demand from building electrification and shifts electric systems to winter peaking. Gas back-up heating in the Hybrid scenario keeps winter electric peak under summer peak.



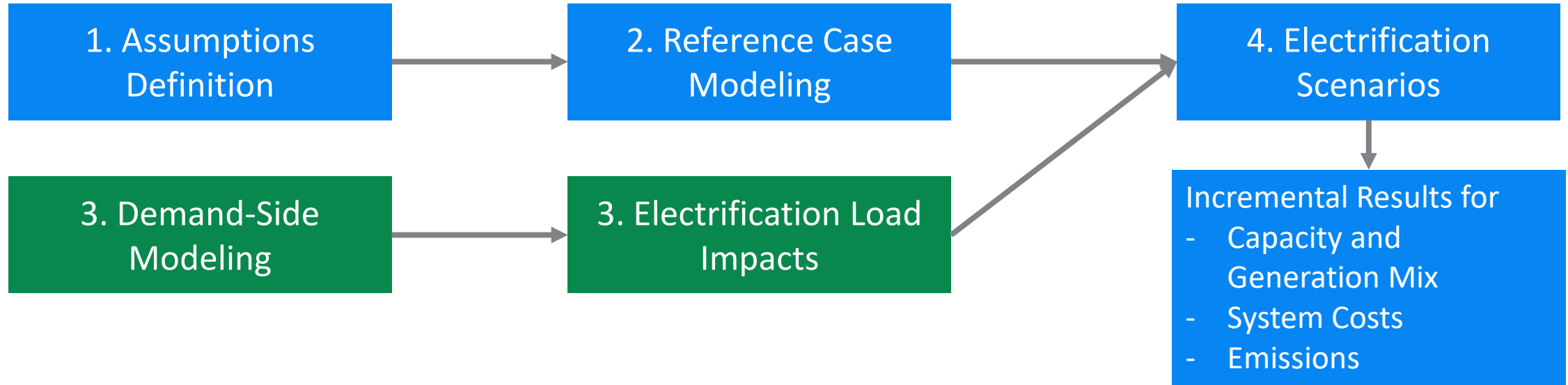
The Reference Case load growth represents roughly a 2.5 – 3 GW contribution to 2050 peaks.



# Power Sector Analysis



# Overview of the Power Modelling Steps



## Resource Adequacy Approach:

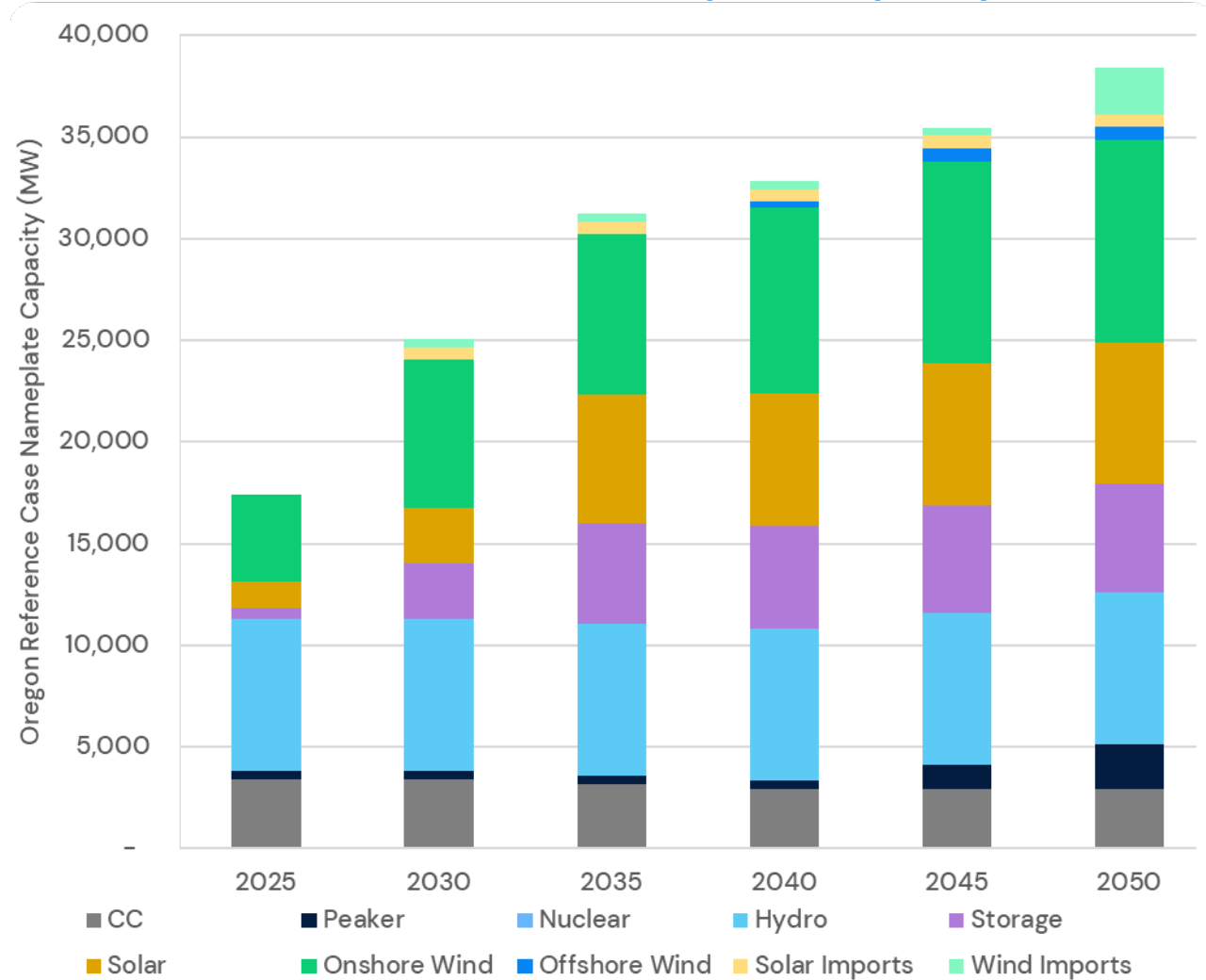
- Resource contributions to peak demand vary seasonally based on Western Resource Adequacy Program data
- Hourly peak demand modeling defines seasonal peaks, planning reserve margins are added to seasonal peak demand requirements
- Resource adequacy of selected portfolio not tested beyond PRM based approach to test for weather extremes and long-duration peak events.
- Additional capacity may be required based on more detailed resource adequacy model and/or variations of winter peak demand contributions of resources – battery storage in particular

# Summary of Electric Supply Options

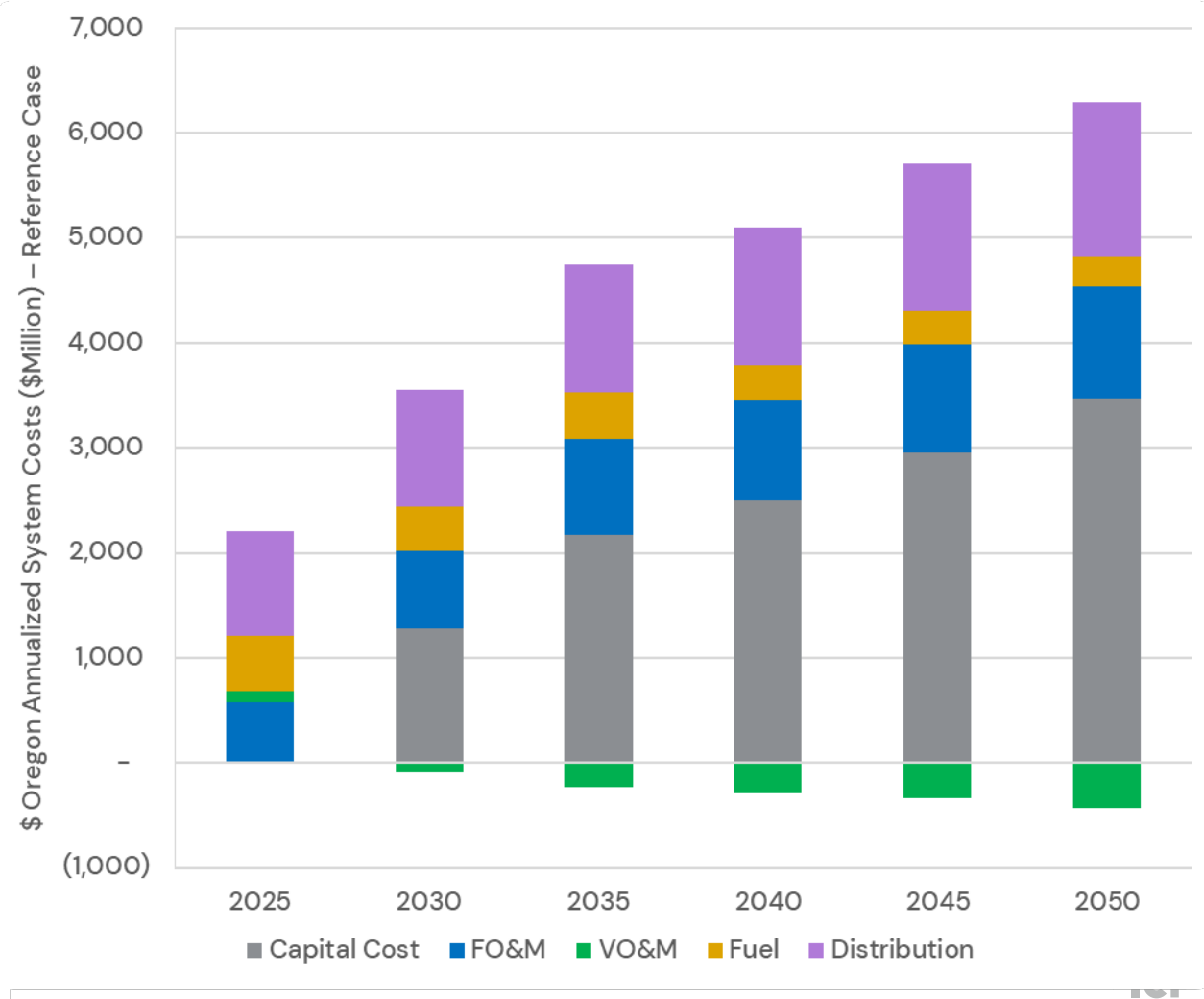
| Supply Option                                              | Assumption             | Current Trends                                                                                            |
|------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------|
| Known and Planned Transmission Projects in Advanced Stages |                        | As published, relaxed to ensure sufficient capacity to comply with HB2021                                 |
| Unplanned/Early-Stage Projects                             | Timeline of Deployment | Current timelines                                                                                         |
| Alternative Fuels (RNG, H <sub>2</sub> , SNG)              | Cost                   | Consistent with assumptions modeled in NW Natural IRP for cost and availability                           |
|                                                            | Availability           |                                                                                                           |
| Technology Costs (Wind, Solar, Battery Storage)            |                        | Costs consistent with trend in recent years through 2030, NREL ATB 2035 onwards                           |
| Offshore Wind                                              | Cost                   | Costs consistent with NREL ATB 2024                                                                       |
|                                                            | Availability           | Current Procurements/TX Limitation – 2035+                                                                |
| Demand Response/EE                                         | Assumed Deployment     | Consistent with electric utility IRPs for EE, DER and DR                                                  |
| Tax Credits                                                | PTC/ITC availability   | PTC assumed for solar/wind; ITC assumed for offshore wind/battery storage. No rollback of credits modeled |

Reference Case power sector load growth (no incremental building electrification considered yet) doubles capacity needs and with HB2021 requiring clean power will be an expensive challenge for utilities to meet.

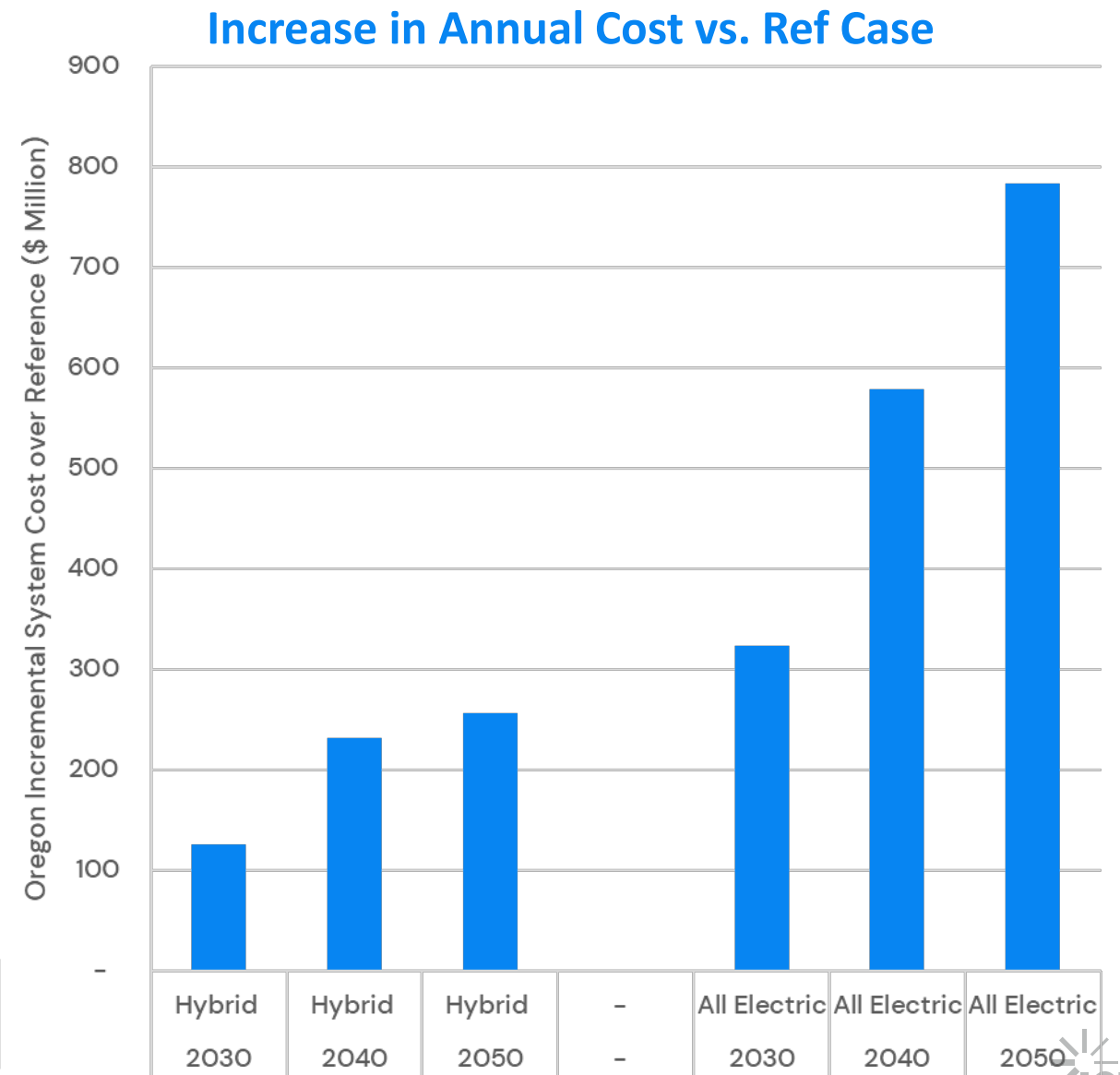
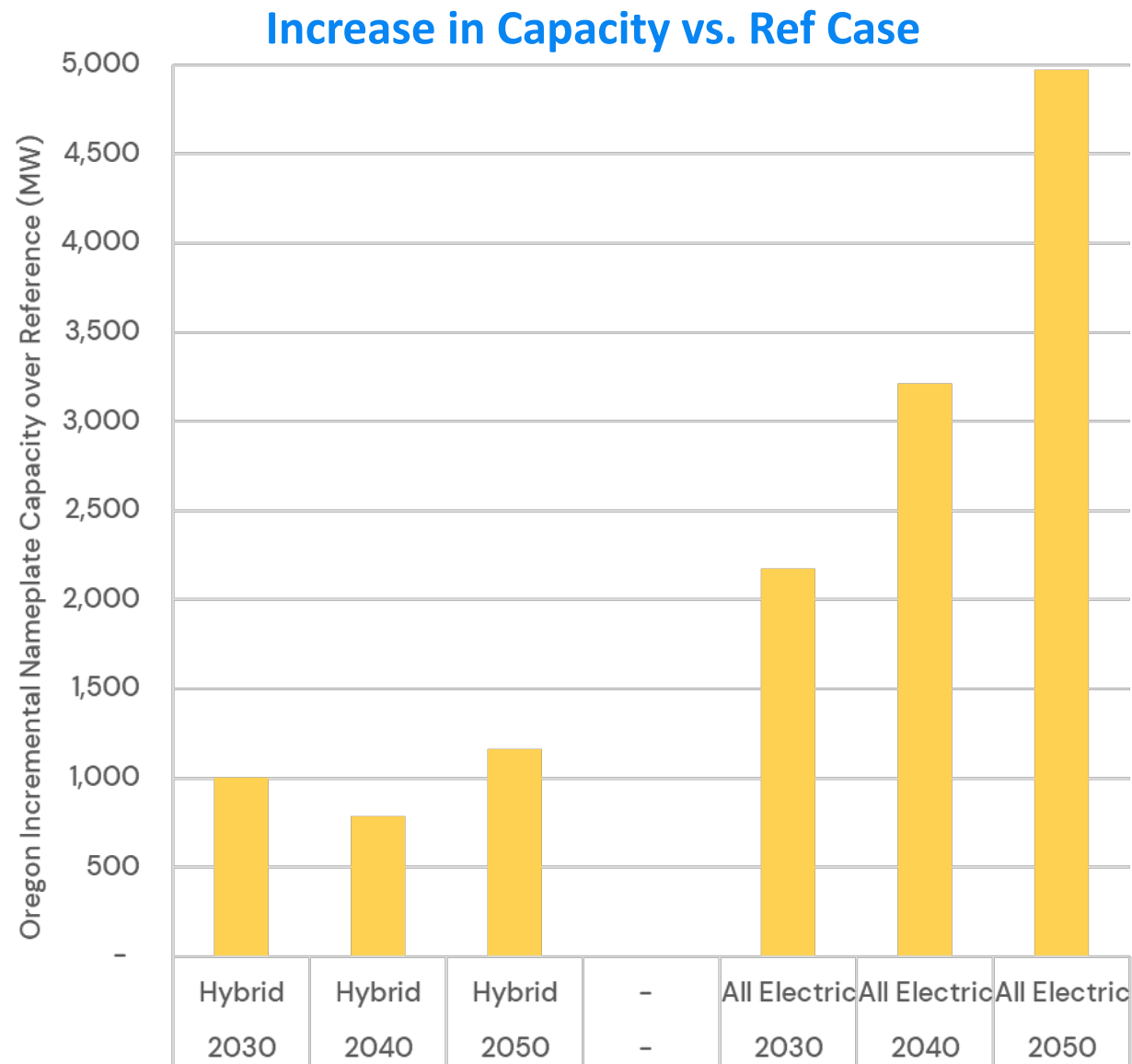
Reference Case Nameplate Capacity



Reference Case Costs



Also needing to serve all the peaky building electrification loads will make the already challenging electric utility situation from Reference Case more costly.



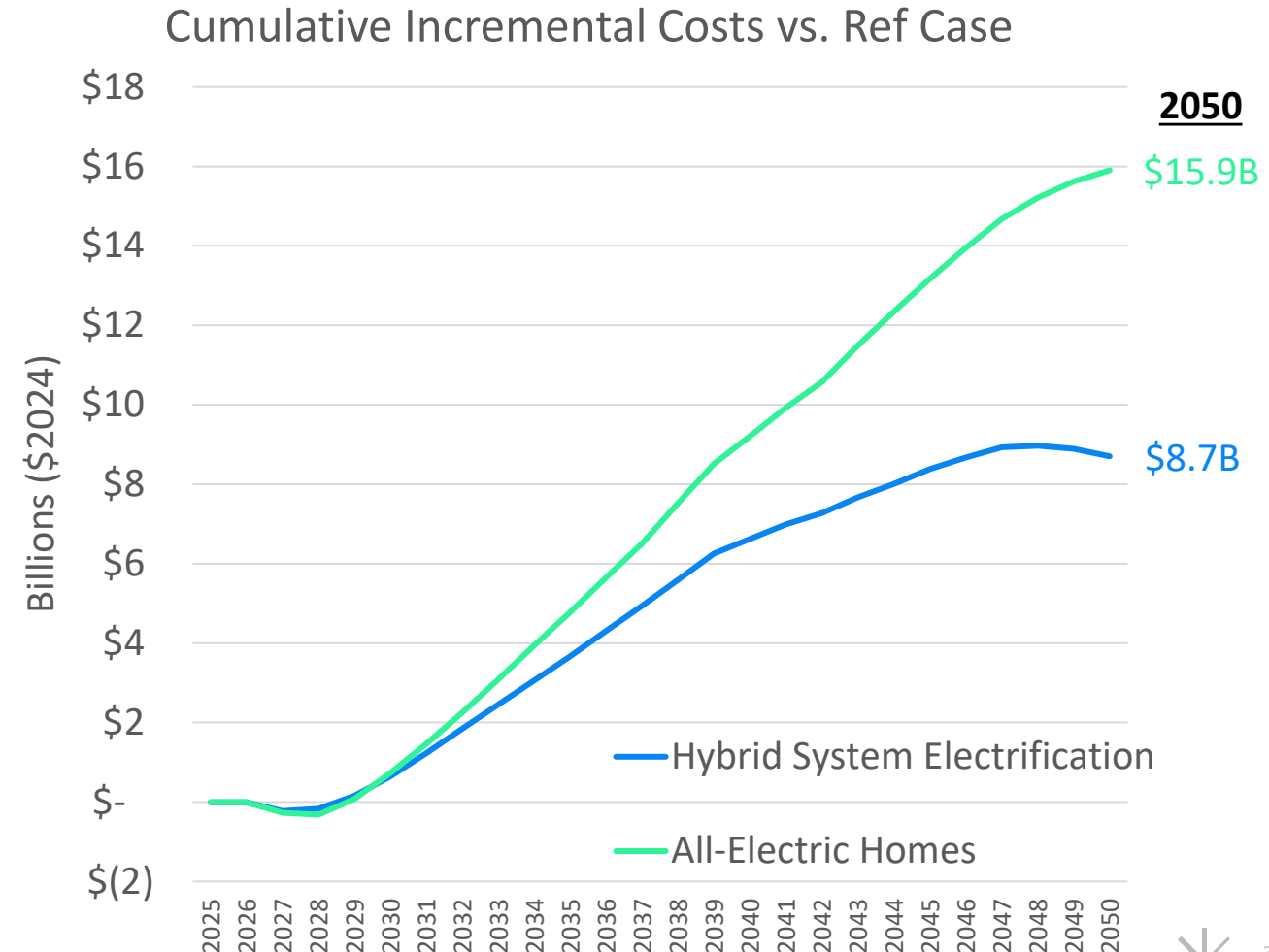


Combined Results

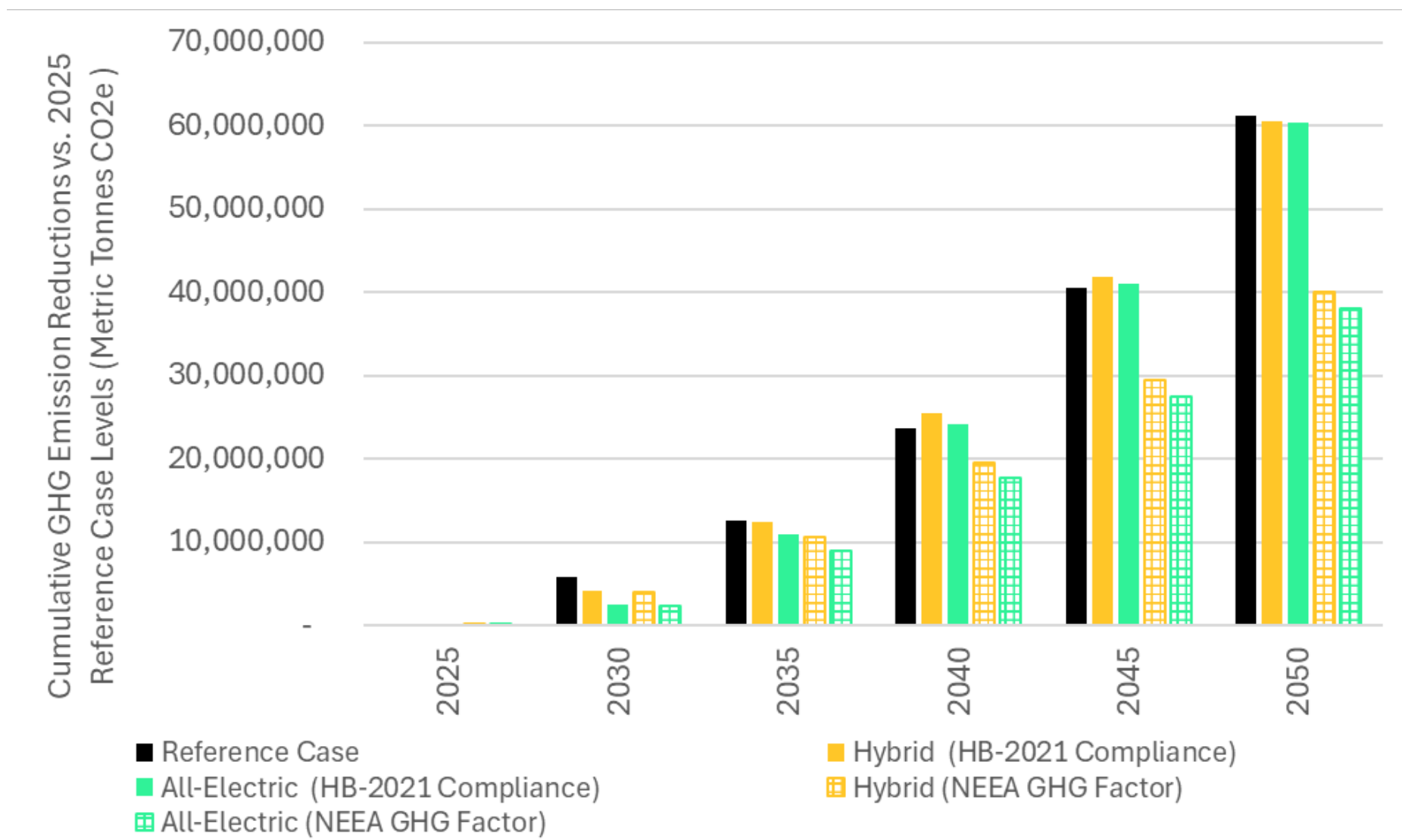
**The electrification scenarios (All-Electric and Hybrid) are both more expensive than the Reference Case (which focuses on Energy Efficiency and decarbonized gases), but the Hybrid Electrification approach (maintaining gas back-up) is the lower cost electrification option.**

This adds up the following annual costs out to 2050 (all showing the delta vs. Ref Case):

- Increased electric costs from generation, transmission, and distribution investments
- Customer equipment conversions costs to electrify (less IRA incentives)
- NW Natural commodity & capacity cost savings
- NW Natural reduced emissions compliance costs



By 2050 there is little difference between the cumulative net GHG emissions reductions achieved in the Reference Case and the Electrification Scenarios – because both gas and electricity supplies are being required to decarbonize.







## Key Take Aways

# Key take away messages from NW Natural IRP (part 1)

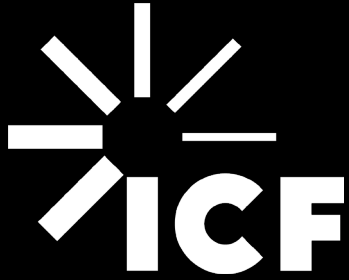
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1. The energy transition will be expensive and challenging for both the gas and electric systems. A successful energy transition must consider and balance three fundamental needs and objectives: (1) carbon reduction, (2) cost and affordability, and (3) risk, reliability and public health/safety.
2. Energy Efficiency is (and remains) a key pillar and essential for both the gas and electric systems and thus all cost-effective measures should be pursued.
3. All-Electric Buildings is the most expensive scenario and potentially the highest risk scenario in terms of risk, reliability, and public health/safety.
4. Hybrid space heating can give you almost all the emissions reductions of All Electric heating with significantly lower infrastructure costs and risks to reliability and public health/safety.

## Key take away messages from NW Natural IRP (part 2)

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5. Hybrid heating allows you to retain diversity and optionality of both the gas and electric systems and requires a much smaller amount of gas to be decarbonized.
6. The hybrid pathway, in addition to being a lower cost electrification approach, with the lowest risk to reliability, also provides the greatest flexibility to adjust to new future circumstances. An All-Electric pathway is the most expensive and highest risk, and locks customer into an inflexible future with no option beyond a single type of energy infrastructure.
7. Joint system planning of the gas and electric systems and regulatory model reforms should be pursued under the hybrid pathway if the gas system will be used as demand response (aka back-up in-home capacity) for the electric system.



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# 5 Minute Break

# Action Plan Review

# Action Plan in the 2025 Draft IRP



## OPUC AR 669 IRP Modernization

- Long Term Resource Strategy which must:
  - i. Consider the potential impacts of future technological development and changes to consumer behavior, state and federal energy policies, and regional developments.
  - ii. Describe the utility's strategy for addressing major risks, key dependencies, barriers to implementation, and critical junctures for the plan.
  - iii. Describe any enabling strategies that the utility is evaluating to support the long-term resource strategy, including changes to system operational practices.
- Near Term Action Plan
  - Short Term Action Plan was 2 to 4 years and now would cover 1 to 5 years



# Structure of 2025 Draft IRP Action Plan



Action Plan is included in detail in Chapter 13 as follows:

## 13.1 Long Term Resource Strategy

- 13.1.1 System Capacity and Energy Long Term Resource Strategies

- 13.1.2 Oregon Compliance Long Term Resource Strategies

- 13.1.3 Washington Compliance Long Term Resource Strategies

- 13.1.4 System Enabling Long Term Compliance Strategies

## 13.2 Near Term Action Plan

- 13.2.1 System Capacity Resource Action Items

- 13.2.2 Oregon Compliance Resource Action Items

- 13.2.3 Washington Compliance Resource Action Items

- 13.2.4 Multi-state Compliance Resource Action Items

- 13.2.5 Oregon Distribution System Resource Action Items

# Long Term Resource Strategy

# Long Term Resource Strategy



## Key Takeaways

- 1. Energy Efficiency:** Leverage cost-effective energy efficiency to reduce peak, energy, and compliance resource requirements.
- 2. Demand Response and Resource Utilization:** Expand and explore cost-effective demand response programs to meet peak demand. Rely on Mist Recall as the incremental capacity resource, while evaluating other potential opportunities to meet peak day system requirements.
- 3. Emissions Planning and Compliance:** Continue to use IRP modeling to evaluate compliance resources to meet emissions obligations and voluntary RNG goals.
- 4. Hybrid Heating Systems:** Develop programs promoting hybrid heating systems to reduce natural gas emissions while maintaining reliability and affordability.
- 5. Joint System Planning:** Support gas and electric joint system planning to achieve decarbonization goals affordably and reliably.
- 6. Energy Burden Assessment:** Perform regular assessments to inform programs aimed at reducing energy burden for low-income customers

# Long Term Resource Strategy

## System Capacity and Energy Strategies



A-1: Continue to leverage cost-effective **energy efficiency** to reduce energy and peak demand requirements.

A-2: Continue to expand existing cost-effective **demand response** programs and explore the cost effectiveness of demand response offerings to meet peak demand requirements.

A-3: Continue to rely on existing resources and incremental amounts of **Mist Recall** to be able to meet peak demand requirements while evaluating other potential incremental options, such as city gate deals or increasing Newport Takeaway, to reliably serve design peak day demand.

A-4: Regularly **update peak day forecasts** and design winter load forecasts to ensure an appropriate mix of pipeline and storage resources required to reliably serve customers throughout the winter.

A-5: Use NW Natural resource optimization tool to **evaluate pipeline contract extensions or capacity release deals** under all demand- scenarios conducted in this IRP and maintain interstate pipeline options for customers whenever possible.

### System Capacity and Energy Strategies:

- Resource selection is informed by avoided costs, and supply-side portfolio optimization
- Meet both current and future customer peak day capacity and design winter annual energy requirements
- Update load forecasts and adapt resource strategies as demand requirements grow or decline

# Long Term Resource Strategy

## Oregon Compliance



- A-6: Continue to leverage cost-effective **energy efficiency** to reduce compliance resources requirements.
- A-7: Plan and purchase compliance resources to prepare to meet a **95th percentile** emissions obligation profile for the upcoming CPP compliance period
- A-8: **Bank** any DEQ distributed allowances that result from this planning and apply them to a future compliance period.
- A-9: Rely on incremental **CCI purchases, RTCs, and RNG** as other alternatives develop for CPP compliance.
- A-10: Monitor and evaluate any opportunities for purchasing **compliance instruments** from other covered entities.

### Oregon Compliance Strategies:

- Cost-effective energy efficiency is a no regrets strategic pillar to meeting decarbonization targets
- Use stochastic demand based on weather simulations to develop strategies that mitigates non-compliance due to weather risk
- Use IRP modeling that balances incurring near-term low cost options vs future high cost alternatives to inform compliance resource procurement and banking qualified compliance instruments.

# Long Term Resource Strategy



## Washington Compliance

- A-11: Continue to leverage cost-effective **energy efficiency** to reduce compliance resources requirements.
- A-12: Plan and purchase compliance resources as needed to meet a **95<sup>th</sup> percentile** emissions obligation profile for the upcoming CCA compliance period.
- A-13: Engage in quarterly and Allowance Price Containment Reserve (APCR) **allowance auctions** to acquire CCA allowances, as needed.
- A-14: Monitor the availability of qualified **offsets** and purchase any offsets that are cost-competitive with allowance prices.
- A-15: **Bank** any unused allowances that results from this planning and apply those to the next compliance period to decrease our emissions obligation for the next compliance period.
- A-16: Monitor the **secondary allowance market** and evaluate opportunities for participation.
- A-17: Rely on the availability of **ceiling price allowances** up to the point where the allowance ceiling price exceeds the cost of other alternatives for CCA compliance.

### Washington Compliance Strategies:

- Cost-effective energy efficiency is a no regrets strategic pillar to meeting decarbonization targets
- Use stochastic demand based on weather simulations to develop strategies that mitigates non-compliance due to weather risk
- Engage in all opportunities to procure allowances and cost-effective offsets

# Long Term Resource Strategy



## Enabling Long Term Compliance

- A-18: **Hybrid heating** (dual-fuel space heating systems) presents a promising approach to reducing emissions on the gas system, while still maintaining reliability, affordability, and optionality for both energy systems. Accordingly, NW Natural will develop programs that promote the use of hybrid space heating systems and joint system planning.
- A-19: Continue to evaluate and pursue **RNG** development projects and RTC purchases that qualify for voluntary SB 98 in Oregon and HB 1257 in Washington to continue to take steps forward with reducing the emissions associated with customers' use of the gas system.
- A-20: Given the forecasted future reliance on **alternative fuels and CCUS** in all scenarios, continue to monitor market dynamics and update information as these resources develop.
- A-21: Continue to find opportunities for gas and electric **joint system planning** to achieve emission reduction goals as affordably and reliably as possible.

### Enabling Long Term Compliance Strategies:

- Informed by PRS, scenario analysis, and electrification study
- Focuses on pathways to provide optionality for decarbonization
- Recognition that regardless of approach GHG compliance will be expensive

# Long Term Resource Strategy



## Enabling Long Term Equity

A-22: Perform an **Energy Burden Assessment** at least every four years (pending current events at the time) to build upon our knowledge and analysis of low-income customers to inform energy affordability focused programs with the intent to continue to reduce energy burden for the most burdened customers.

- Energy Equity and Energy Affordability work is iterative, collaborative, and ongoing
- EBAs are a snapshot in time and a static analysis by their nature.
  - Effectiveness of EBAs relies on the problem statement being addressed, which is informed by the current environment, making it difficult with availability of federal aid uncertainties
  - EBAs can be refreshed for data only, still providing valuable analysis without tackling a new problem statement



# Near Term Action Plan

# Near Term Action Plan (Next 5 Years)



## Key Takeaways

- 1. Capacity Resources:** Mist Recall, energy efficiency, and demand response
- 2. Oregon Compliance Resources:** Energy efficiency; CCI purchase; voluntary RNG to meet goal of 5% of sales volumes; acquire RNG from a local on-system water resource recovery facility and retire associated RTCs
- 3. Washington Compliance Resources:** Energy efficiency, allowance purchases, voluntary RNG to meet goal of 5% of sales volumes, off-sets if available and cost-effective
- 4. Enabling Pilots and Studies:** Commercial gas-fired heat pump; CCUS pilot; Hybrid-HVAC pilot, CCUS geological screening study, synthetic methane from biomass study
- 5. Distribution System Planning:** Pursuing non-pipeline solutions in all three areas identified in the forward-looking plan (Creswell, Dallas, and McMinnville) to delay pipeline reinforcement investments
  1. Note: GeoTEE will be pursued in Dallas and McMinnville but is not viable option for Energy Trust to implement in Creswell. Other demand-response alternatives in the Creswell area will be pursued.

# Primary Scenarios – Cheat Sheet

|                   |     |                                 |                                                                                                                                                                                                                                                                           |
|-------------------|-----|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policy Variations | S1  | CPP/CCA Compliance              | Eligible resources are acquired to meet CPP and CCA compliance. No SB 98 or HB 1257 targets are considered.                                                                                                                                                               |
|                   | S2  | Voluntary RNG Targets           | SB 98 eligible resources are acquired to meet voluntary SB 98 targets. Required by Oregon Administrative Rule 860-150-0100 to be studied in an IRP; Applies to WA for voluntary RNG under HB 1257. This scenario examines meeting SB 98 targets absent CPP or CCA policy. |
|                   | S3  | No GHG Compliance Policies      | Consider current building codes but is absent CPP/CCA or RNG procurement policies; customers are served with the lowest cost resources.                                                                                                                                   |
| Demand Variations | PRS | Reference Case                  | Baseline of <u>reference case load</u> forecast and preferred resource strategy constraints.                                                                                                                                                                              |
|                   | S4  | Growth Recovery                 | Population and housing trends experience higher growth patterns than the reference case.                                                                                                                                                                                  |
|                   | S5  | Modest Customer Electrification | Aims to align with trends from NEEA-RBSA, projections from electric utilities of existing buildings electrifying, and limitations on natural gas in new construction buildings.                                                                                           |
|                   | S6  | Hybrid System Electrification   | Hybrid systems [electric heat pump with gas furnace as back up] are installed in existing buildings and new construction based on stock turn-over.                                                                                                                        |
|                   | S7  | All-Electric Buildings          | Significant levels of building electrification of existing buildings and new construction based on stock turn-over.                                                                                                                                                       |

# System Capacity Resource Action Items

# Near Term Action Plan



## System Capacity Resource Action Items

B-1: Meet customer peak day deliverability requirements by acquiring peak day **energy efficiency and recalling Mist** over the next 5-years, subject to updated load forecasts, information about Woodfibre LNG, other updates to our existing resources, or updated information on alternative options

| Gas Year  | Peak Day Energy Efficiency | Mist Recall    |
|-----------|----------------------------|----------------|
| 2026-2027 | 7,500 Dth/day              | 5,000 Dth/day  |
| 2027-2028 | 8,500 Dth/day              | 65,000 Dth/day |
| 2028-2029 | 9,000 Dth/day              | 5,000 Dth/day  |
| 2029-2030 | 9,000 Dth/day              | -              |
| 2030-2031 | 10,000 Dth/day             | 5,000 Dth/day  |

### Informed By:

- Peak day forecast
- Current resource stack
- Conservation Potential Assessments (CPA) in both states
- Analysis from the resource optimization model as compared to alternative capacity resources

# Oregon Compliance Resource Action Items

# Near Term Action Plan



## Oregon Compliance Resource Action Items

B-2: Working with Energy Trust of Oregon, acquire cost-effective first year **energy efficiency therm savings** IRP targets outlined below, or the revised amounts identified by the Energy Trust Board over the next 5 years through existing programs for residential, commercial and industrial sales customers.

| Calendar Year | Oregon Sales First Year Therm Savings Targets |
|---------------|-----------------------------------------------|
| 2026          | 5.518 - 6.56 million                          |
| 2027          | 6.209 - 7.17 million                          |
| 2028          | 6.494 - 7.90 million                          |
| 2029          | 6.609 - 8.00 million                          |
| 2030          | 7.147 - 8.68 million                          |

B-3: Continue to expand the energy efficiency programs for Oregon **transportation customers**.

Informed by:

- Avoided costs filed in UM 1893 and Energy Trust's Oregon conservation potential assessment (CPA) and latest 5-year plan

Additional Details:

- Updated avoided costs that are an output from this IRP will be filed in the next UM 1893 filing.

# Near Term Action Plan



## Oregon Compliance Resource Action Items

B-4: Maximize **CCI** purchases of 15 percent of NW Natural's emissions obligation in the first CPP compliance period, 2025-2027 calendar years, and 20 percent of NW Natural's emissions obligation in the second and third compliance periods, 2028-2029 and 2030-2031 calendar years.

| Calendar Year                  | Expected # CCI Purchases* |
|--------------------------------|---------------------------|
| Compliance Period 1: 2025-2027 | 2,014,000                 |
| Compliance Period 2: 2028-2029 | 1,712,000                 |
| Compliance Period 3: 2030-2031 | 1,677,000                 |

**\*Actual CCI amounts will be weather dependent.**

B-5: **Bank** any DEQ distributed instruments from the first CPP compliance period that are in excess of NW Natural's emissions obligation

Informed by:

- Results from all scenarios, expect S2 and S3.



# Near Term Action Plan



## Oregon Compliance Resource Action Items

B-6: As identified in the Preferred Resource Portfolio, acquire RNG from a **local on-system water resource recovery facility** as set forth in the table below and retire the RTCs on behalf of customers consistent with CPP compliance.

| Calendar Year | Expected RNG Volumes from Project (Dth/year) |
|---------------|----------------------------------------------|
| 2027          | 5,000                                        |
| 2028          | 35,000                                       |
| 2029          | 35,000                                       |
| 2030          | 35,000                                       |

Informed by:

- PRS.a, S1, S2, S4, S5, S6 and S7 results.

# Near Term Action Plan



## Oregon Compliance Resource Action Items

B-7: As identified in the Preferred Resource Portfolio (PRS.a results), synthetic gas as a potential cost-effective emission reduction pathway. Developing synthetic methane derived from woody biomass could have significant additional benefits such as a wildfire mitigation program.

Accordingly, NW Natural will develop a Biomass Derived **Synthetic Methane Feasibility Study**. Conduct a detailed 12-month study assessing woody biomass feedstocks in Oregon for synthetic methane production via gasification + syngas methanation and CO<sub>2</sub> + green hydrogen methanation.

### Informed by:

- Results from PRS, S1, S2, S4, S5, all select synthetic methane as a least cost compliance resource at some point in the planning horizon beyond 2035
- Some models would select synthetic methane from biomass earlier if unconstrained

# Washington Compliance Resource Action Items

# Near Term Action Plan



## Washington Compliance Resource Action Items

B-8: Acquire cost-effective first year **energy efficiency** therm savings as outlined for residential and commercial sales customers below.

| Calendar Year | Washington Sales First Year Therm Savings Targets |
|---------------|---------------------------------------------------|
| 2026          | 225,000 - 381,000                                 |
| 2027          | 267,000 – 405,000                                 |
| 2028          | 337,000 – 456,000                                 |
| 2029          | 427,000 – 501,000                                 |
| 2030          | 533,000 - 542,000                                 |

B-9: Continue to develop energy efficiency programs for Washington **transportation** and **industrial sales** customers.

Informed by:

- Avoided costs and consultant's 2023 conservation potential assessment (CPA) for Washington

Additional Detail

- Work for the 2025 CPA as required by Washington law is currently near completion and required previous GHG compliance costs (i.e., SCC) to complete the work in time.
- In anticipation of higher GHG compliance costs as an output from this IRP, NW Natural requested the consultant to conduct a sensitivity using the allowance ceiling price as the GHG compliance avoided costs.

# Near Term Action Plan



## Washington Compliance Resource Action Items

B-10: Purchase compliance **offsets** as they become available and are forecasted to be lower cost than auction allowances.

B-11: Rely on auction **allowance purchases** to meet remaining CCA compliance after accounting for offset purchases and any RNG procurement for the next 5-years.

Informed by:

- Results from PRS, S1, S4, S5, S6, S7.

# Multi-state Compliance Resource Action Items

# Near Term Action Plan



## Multi-state Compliance Resource Action Items

B-12: Continue to acquire **RNG** to achieve goals as set forth below to enable NW Natural to continue to reduce emissions associated with customers' use of the gas system, achieve compliance under CPP {while maximizing CCI purchases (see B-4 above)} and compliance under the CCA, while remaining in cost containment parameters established in SB 98 and HB 1257.

| Calendar Year | Expected RNG Purchases as Percentage of Total Sales Load |
|---------------|----------------------------------------------------------|
| 2026          | 4%                                                       |
| 2027          | 5%                                                       |
| 2028          | 5%                                                       |
| 2029          | 5%                                                       |
| 2030          | 5%                                                       |

Informed by:

- Results from S2, showing that cost containment limits will likely constrain voluntary RNG procurement.
- Modest step to mitigate the risks of:
  - 1) a changing policy landscape,
  - 2) compliance risks associated with colder weather, and
  - 3) the lack of a liquid RNG market.
- By 2028 NW Natural would not solely rely on CCIs.
- Given the high reliance on allowance purchases for the CCA, HB 1257 allows NW Natural to make progress towards directly reducing emissions.

# Near Term Action Plan



## Multi-state Compliance Resource Action Items

B-13: Energy Efficiency remains a key demand side resource and compliance resource for the Company. Accordingly, NW Natural will develop a **Commercial Gas Heat Pump pilot** beginning in 2026.

### Informed by:

- Energy efficiency being a key pillar to decarbonization in all scenarios, this pilot to target increased energy efficiency amongst large commercial customers

B-14: As identified in the Preferred Resource Portfolio (PRS.a results), Carbon Capture and Sequestration is a near-term compliance resource for the CPP. Accordingly, NW Natural will develop a **Geological Screening Study for CO<sub>2</sub> Sequestration** in Northwest Oregon.

### Informed by:

- Results from PRS, S1, S2, S4, S5, S6, and S7 all select CCUS as a least cost compliance resource. This pilot along with proposed study (Action Item B-11) will enable decarbonization efforts using CCUS which appears to be a future low-cost resource



# Near Term Action Plan



## Multi-state Compliance Resource Action Items

B-15: As identified in the Preferred Resource Portfolio (PRS.a results), Carbon Capture and Sequestration is a compliance resource for the CPP and CCA.

Accordingly, NW Natural will develop a commercial CCUS pilot beginning in 2026.

### Informed by:

- Results from PRS, S1, S2, S4, S5, S6, and S7 all select CCUS as a least cost compliance resource. This study along with proposed pilot (Action Item B-9) will enable decarbonization efforts using CCUS which appears to be a future low-cost resource

# Near Term Action Plan

## Multi-state Compliance Resource Action Items



B-16: Develop a **hybrid heating pilot** that explores joint system planning with an electric utility partner, including demand response/capacity payments. File this pilot (or provide status update) on or before the first IRP Update.

B-17: Develop a **hybrid heating program** providing cost effective emissions reduction incentives.

### Informed by:

- Electrification Study, showing the benefits of hybrid systems to total energy system costs relative to an all-electric building approach

### Additional Details:

- This pilot would focus on decarbonization incentives, joint system planning, and demand response payments/capacity payments from partnering electric utility
- Pilot needs to be scoped

# Near Term Distribution System Action Items

# Near Term Action Plan



## Oregon Distribution System Action Items – Creswell

B-18: Raise incentives for customers in the Creswell area for the **BYOT program** for the next 3- years (2026-2028) aimed at achieving 3.1 peak therm hour savings at a cost not to exceed an incremental \$2,000 to baseline.

B-19: Pursue a 3-year Geo Behavioral **DR program with large commercial customers** and industrial customers in the Creswell area to achieve 13.4 peak hour therms at a cost not to exceed \$24,400.

B-20: **Continue scoping the Creswell Uprate** of approximately 1.9 miles of 3” and 2” wrapped steel main from an MAOP of 150 psig to 300 psig, between Creswell Gate Station to the end of High Pressure main, with an anticipated in-service date of 2030.

B-21: **Update analysis** for Creswell area on an annual basis and report updated analysis through IRP Updates or subsequent IRPs until the Uprate is put into service or the analysis shows the Uprate is no longer needed. The Company anticipates continuing action items B-18 – B-20 beyond the 3-year action plan window and updating this analysis will inform the decision to continue or discontinue these NPA projects.

# Near Term Action Plan



## Oregon Distribution System Action Items – Dallas

B-22: In partnership with Energy Trust of Oregon, plan and develop a 3-year GeoTEE project starting in 2027 in the Dallas area with the goal of achieving 20 peak hour localized therm savings incremental to baseline energy efficiency efforts.

B-23: Raise incentives for customers in the Dallas area for the BYOT program for the next three years (2026-2028) aimed at achieving 7.6 peak therm hour savings at a cost not to exceed an incremental \$6,800 to baseline.

B-24: Pursue a 3-year Geo Behavioral DR program with large commercial customers and industrial customers in the Dallas area to achieve 39.0 peak hour therms at a cost not to exceed \$98,900.

# Near Term Action Plan



## Oregon Distribution System Action Items – Dallas continued

B-25: **Continue scoping** the Dallas System Reinforcement, which includes: a) replacing approximately 1,100 ft of 4" wrapped steel main with 6" wrapped steel main and b) uprating the Dallas Feeder from an MAOP of 175 psig to 300 psig, with an anticipated in-service date of 2036.

B-26: **Update analysis** for Dallas area on an annual basis and report updated analysis through IRP Updates or subsequent IRPs until the system reinforcement is put into service or the analysis shows the system reinforcement is no longer needed. The Company anticipates continuing action items B-22 – B-25 beyond the 3-year action plan window and updating this analysis will inform the decision to continue or discontinue these NPA project.

# Near Term Action Plan



## Oregon Distribution System Action Items – McMinnville

B-27: In partnership with Energy Trust of Oregon, plan and develop a 3-year GeoTEE project starting in 2027 in the McMinnville area with the goal of achieving 35 peak hour localized therm savings incremental to baseline energy efficiency efforts.

B-28: Raise incentives for customer in the McMinnville area for the BYOT program for the next three years (2026-2028) aimed at achieving 15.2 peak therm hour savings at a cost not to exceed an incremental \$18,400 to the baseline.

B-29: Pursue a 3-year Geo Behavioral DR programs with large commercial customers and industrial customers in the McMinnville area to achieve 104.8 peak hour therms at a cost not to exceed \$331,500.

# Near Term Action Plan



## Oregon Distribution System Action Items – McMinnville continued

B-30: **Continue scoping** the two options for the McMinnville Feeder System Reinforcement which includes: a) installing compression between the Christensen Regional Station and Amity to raise the line pressure along the McMinnville feeder, increasing pipeline capacity to the McMinnville load center; or b) loop the existing 6-inch McMinnville Feeder with 5.2 miles of 400 MAOP 8" wrapped steel main to increase pipeline capacity to the McMinnville load center, with an anticipated in-service date of 2049. The costs of the two options will be examined annually and the lower cost option will be eventually selected when the pipeline solution is needed to implement.

B-31: **Update analysis** for McMinnville area on an annual basis and report updated analysis through IRP Updates or subsequent IRPs until the system reinforcement is put into service or the analysis shows the system reinforcement is no longer needed. The Company anticipates continuing action items B-27 – B-30 beyond the 3-year action plan window and updating this analysis will inform the decision to continue or discontinue these NPA projects.



# System-wide Near Term Equity Action Items

# Near Term Action Plan



## Continued Focus on Energy Equity and Affordability

B-32: Increase **community awareness** of/involvement in energy planning and utility programs by partnering with trusted community partners and service providers (including peer/local utilities) to bring forward an annual resource fair centered on energy planning topics and resources.

# Q&A

# Feedback Form

*Feedback requested by July 11, 2025*

<https://www.surveymonkey.com/r/NWNaturalIRP>

# Forward Looking Statement



This presentation contains forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as "anticipates," "assumes," "continues," "could," "intends," "plans," "seeks," "believes," "estimates," "expects," "will" and similar references to future periods. See "Risk Factors" in our most recent Annual Report on Form 10-K and our subsequent quarterly reports for examples of forward-looking statements and for important factors that could cause actual results to differ materially from those in the forward-looking statements, including legal, regulatory and legislative risks, financial, macroeconomic and geopolitical risks, and business, environmental and technology risks.

You are cautioned against relying on any forward-looking statements. Any forward-looking statement speaks only as of the date on which such statement is made, and we undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law. New factors emerge from time to time and it is not possible to predict all such factors, nor can we assess the impact of each such factor or the extent to which any factor, or combination of factors, may cause results to differ materially from those contained in any forward-looking statements.



Thank you!  
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