

# Final Gas and Electric Portfolio Results

## 2023 Gas Utility IRP and Electric Progress Report

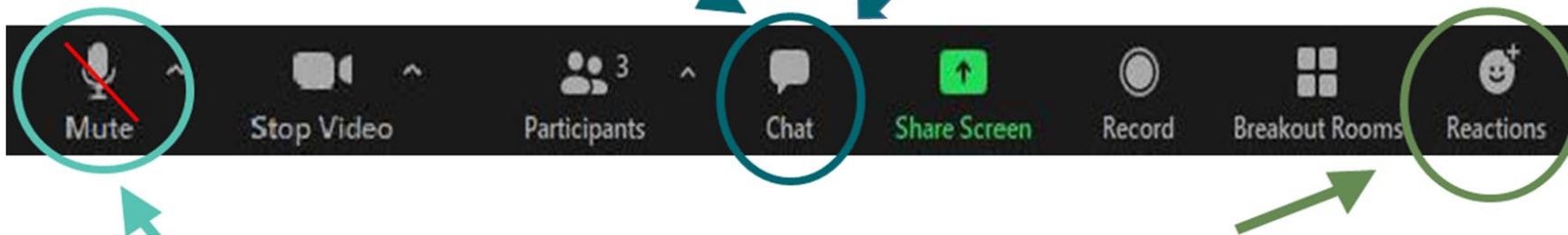
March 14, 2023



# Welcome to the Webinar!

If you want to type a question regarding the presentation, insert “Slide X followed by your question” in the chat box!

If you have a technical issue or a general question, please type it in the chat box.



Please keep yourself on mute unless you are speaking.

If you want to ask a question verbally, click the 'Reaction' button and click on the 'Raise Hand' option and we will call on you.

# Facilitator Requests

- Engage constructively and courteously towards all participants.
- Respect the role of the facilitator to guide the group process.
- Take space and make space.
- Avoid use of acronyms and explain technical questions.



# Safety Moment

March is Eye Wellness Month!

- Wear appropriate eyewear in a hazardous area
- Wear goggles or face shields when working with chemicals
- Keep your eye protection in good condition
- Prevent screen-related eye strain with the 20-20-20 rule:
  - Every 20 minutes look away from your screen and look at an object 20 feet away for 20 seconds

# Agenda

Time	Agenda Item	Presenter
1:00 p.m. - 1:10 p.m.	Introduction and agenda review	Sophie Glass, Triangle Associates
1:10 p.m. - 1:30 p.m.	Welcome and feedback update	PSE
1:30 p.m. - 2:35 p.m.	Gas Portfolio Results	Gurvinder Singh, PSE
2:35 p.m. - 2:50 p.m.	Break	All
2:50 p.m. - 3:55 p.m.	Electric Portfolio Results	Elizabeth Hossner, PSE
3:55 p.m. – 4:00 p.m.	Next Steps	Sophie Glass, Triangle Associates
4:00 p.m.	Adjourn	All

# Today's Speakers

## **Phillip Popoff**

Director, Resource Planning  
Analytics, PSE

## **Elizabeth Hossner**

Manager, Resource Planning  
and Analysis, PSE

## **Sophie Glass**

Facilitator, Triangle Associates

## **Gurvinder Singh**

Consulting Energy & Resource  
Planning Analyst, Resource  
Planning and Analysis, PSE

# Gas Utility IRP Feedback

## 2023 Gas Utility IRP

March 14, 2023



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# Feedback Themes: Prior to Draft

- ✓ Incorporated climate change data
- ✓ Considered alternative fuels
- ✓ Incorporated Inflation Reduction Act\*
- ✓ Conducted electrification analysis
- ✓ Examined no growth scenarios
- ✓ Examined State Energy Strategy (SES)

\*Included alternative fuels; appliance costs and policy implications are not included

# Feedback Themes: Draft Gas Utility IRP

- Climate Commitment Act and emissions reduction
- Zero-growth demand in preferred portfolio
- Electrification and decarbonization
- Alternative fuels

# Gas Final Preferred Portfolio

## 2023 Gas Utility IRP

March 14, 2023

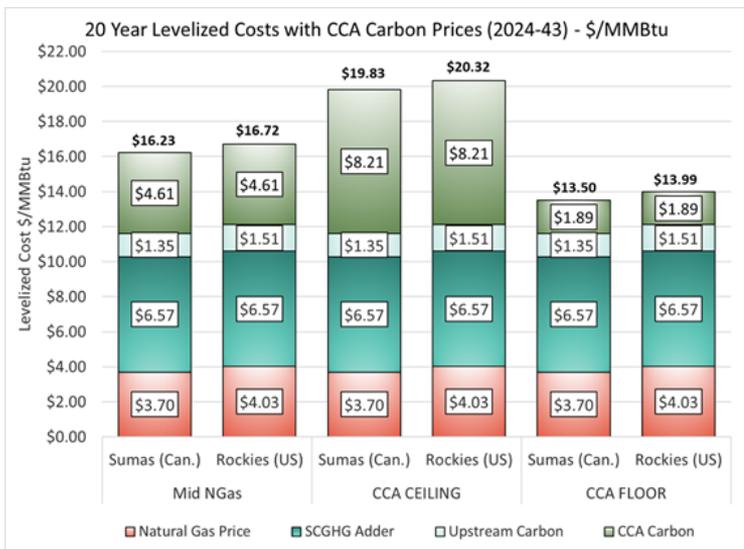


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# Ceiling & Floor Price Assumptions Update – Draft vs. Final

## Draft Gas IRP (Jan. 2023):

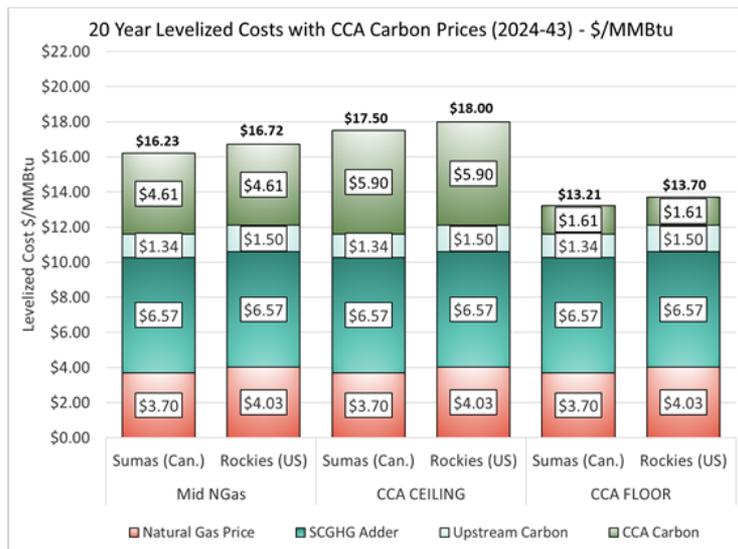
- Sensitivity A and Preferred Portfolio: Ceiling Price for CCA Allowances used CA CEC forecast
- Sensitivity B: Floor price was CA CEC forecast



Sept 22 Meeting Slide 50

## Final Gas IRP (after internal review)

Sensitivity A, B and Preferred Portfolio: Ceiling and Floor Prices updated to align with Dept. of Ecology's final Rule in October 2022.



Now - Updated Ceiling and Floor prices

# Preferred Portfolio – Draft vs. Final

## Draft Preferred Portfolio (Jan. 2023):

- Sensitivity A: Ceiling Price for CCA allowances, and substitute the zero-growth conservation

Resource (MDth/d)	2024	2030	2040	2050
Energy Efficiency	7	61	127	172
Swarr Propane Plant	0	30	30	30
Plymouth LNG	15	15	15	15
Pipeline Renewals	(59)	(120)	(122)	(122)
RNG PNW Regional	3	9	11	10
RNG On-system	0	1	2	2
Green H2 - Gas Blending	0	9	14	14
<b>Net Supply Resources</b>	<b>(44)</b>	<b>(65)</b>	<b>(61)</b>	<b>(60)</b>



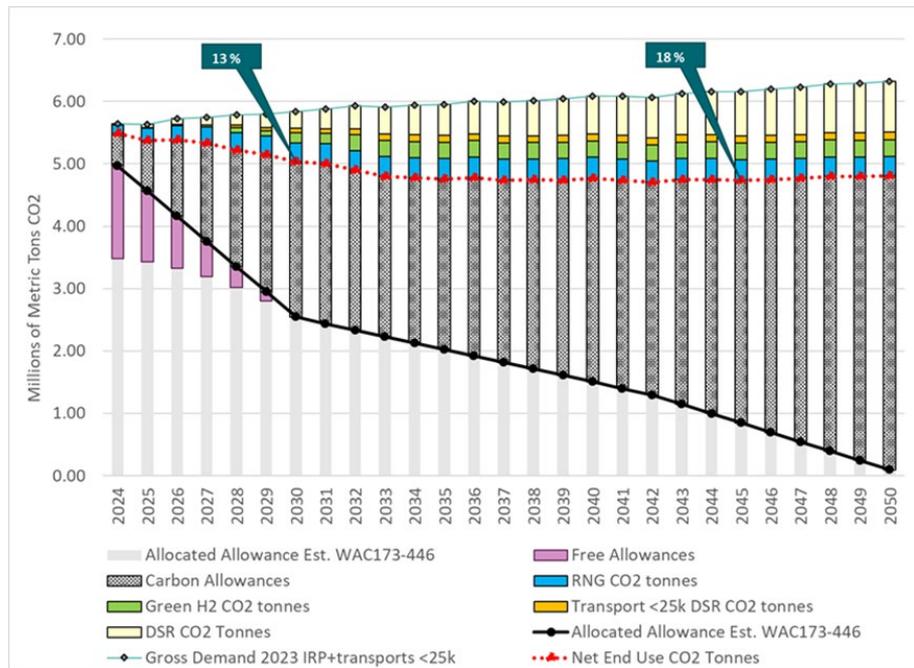
## Final Preferred Portfolio (after feedback):

- Changed to Sensitivity F: Zero Gas Growth portfolio
- No gas growth and mid-CCA price

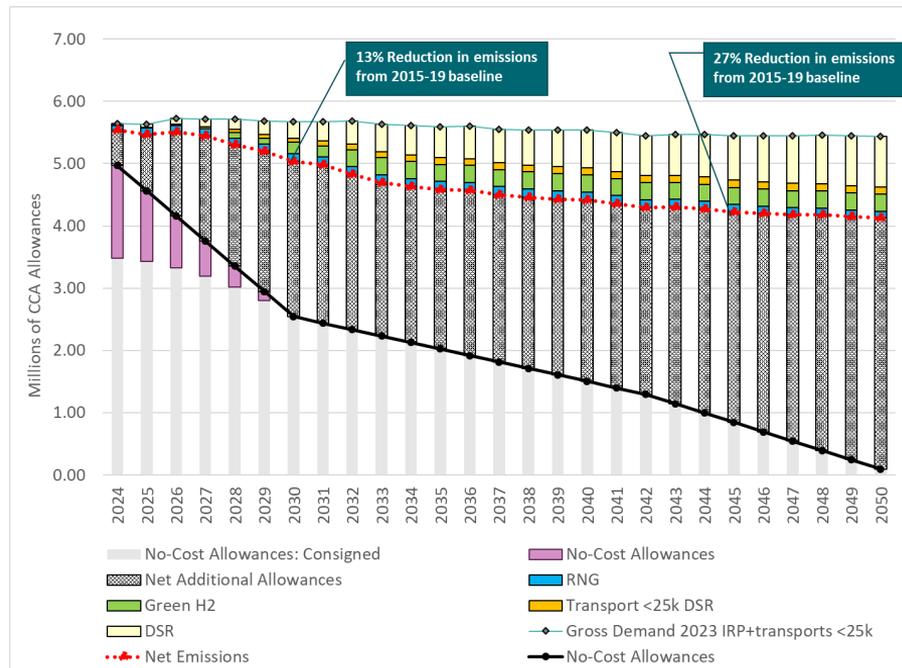
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Plymouth LNG	15	15	15	15
Pipeline Renewals	(59)	(142)	(195)	(195)
RNG PNW Regional	0	0	0	0
RNG On-system	0	1	2	2
Green H2 - Gas Blending	0	9	14	14
<b>Net Supply Resources</b>	<b>(44)</b>	<b>(87)</b>	<b>(134)</b>	<b>(134)</b>

# Preferred Portfolio – CCA Allowances

Draft Preferred Portfolio



Final Preferred Portfolio



\*CCA terminology revised based on Commission staff feedback.

# Expanding Electrification/Decarbonization Analysis (2025 IRP)

- Understand how federal and state subsidies will affect electrification
- Incorporate additional information as more is known about no cost allowance revenue uses (CCA)
- Understand how changes in gas and electric heating bills affect customer behavior – in addition to the above

# Gas Utility Action Plan

## 2023 Gas Utility IRP

March 14, 2023



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# The Action Plan

## Intermediate Term (2024 – 2029)

- Continue to acquire cost-effective conservation
- Explore which expiring pipeline contracts would be feasible to let expire rather than renew
- Determine technical feasibility and any other issues of upgrading the Swarr propane-air injection facility
- Purchase CCA allowances to meet CCA compliance requirements
- Reduce emission profile by exploring Renewable Natural Gas (RNG) within the Pacific Northwest and outside the region
- Participate in green hydrogen activities in the PNW
- Continue to assess non pipe alternatives on the gas distribution system
- Continue to assess electrification as a decarbonization option for the gas utility
- Continue engagement to develop and deliver on a plan to meaningfully incorporate equity considerations into the 2025 IRP

## Long Term (2030 – 2045)

- Explore clean technology and fuels such as direct air capture, green hydrogen, and RNG
- Turn back transport pipeline capacity to the pipeline company when the portfolio becomes surplus due to decreasing loads

# Break

Please return in 15 minutes



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# Electric Progress Report Feedback

## 2023 Electric Progress Report

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# Feedback themes: Prior to draft

- ✓ Reduce market reliance
- ✓ Incorporate climate change data
- ✓ Consider range of resource alternatives and emerging technologies
- ✓ Model battery cycling at various frequencies, capacities, and types
- ✓ Model hybrid renewables and diverse energy storage resources
- ✓ Incorporate Inflation Reduction Act
- ✓ Embed equity

# Feedback themes: Draft Electric Progress Report

- Green hydrogen availability
- Biodiesel availability
- Advanced nuclear (SMR) exclusion
- CETA compliance

# Hydrogen Fuel Risk

## Preferred Portfolio:

- New blend hydrogen peakers start in 2039

## Participant Concern:

- What if PSE built peakers that will blend to full hydrogen but hydrogen is not available as planned?

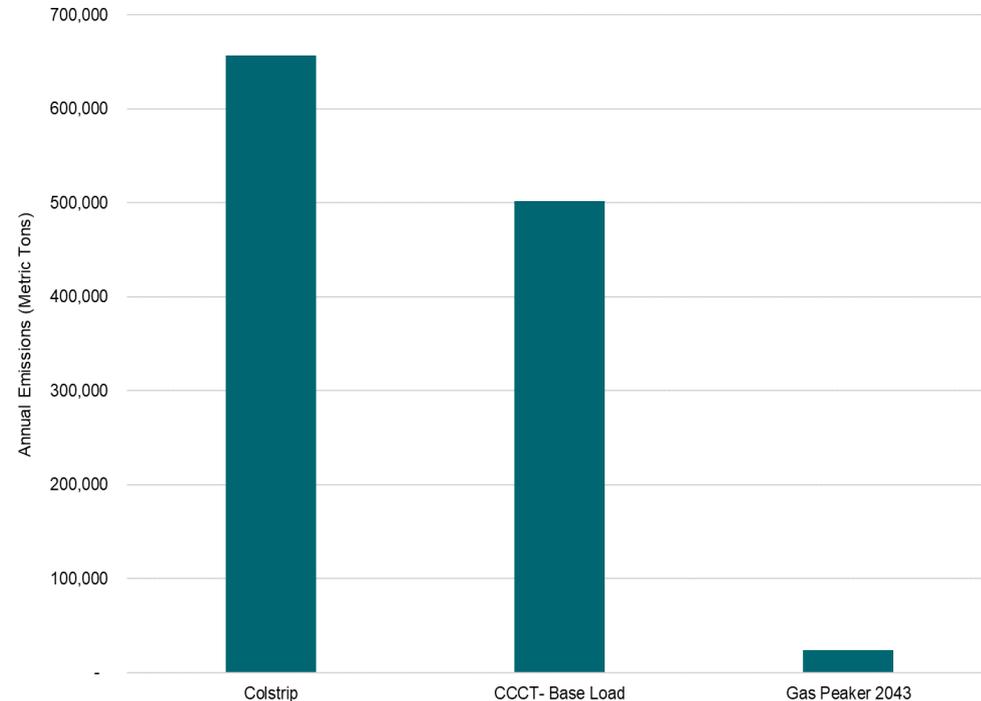
## Response:

- PSE would not start building a hydrogen peaker in 2035 if hydrogen supply is unavailable
- Benefits of a dual-fuel unit: biodiesel provides back-up (reliability), the unit could run on biodiesel if hydrogen unavailable

## Further Analysis:

- Comparison of the emissions profile of a gas peaker in 2043, if it had to run on gas only, as compared to Colstrip and a CCCT of equal capacity.

Emissions Comparison Based on Equivalent 237 MW Unit



# Electric Final Preferred Portfolio

## 2023 Electric Progress Report

March 14, 2023



# 2023 Electric Preferred Portfolio

- 2025:**
- ✓ Eliminate coal-fired resources from its allocation of electricity to Washington retail electric customers, **740 MW total capacity removed**
  - ✓ Consistent with CEIP
  - ✓ Acquire conservation
  - ✓ Pursue demand response

- 2030:**
- ✓ Over **6,700 MW new nameplate** capacity needed to meet CETA and resource adequacy
  - ✓ Reduced market reliance at peak
  - ✓ Add diverse commercially available resources
  - ✓ Expand transmission capacity

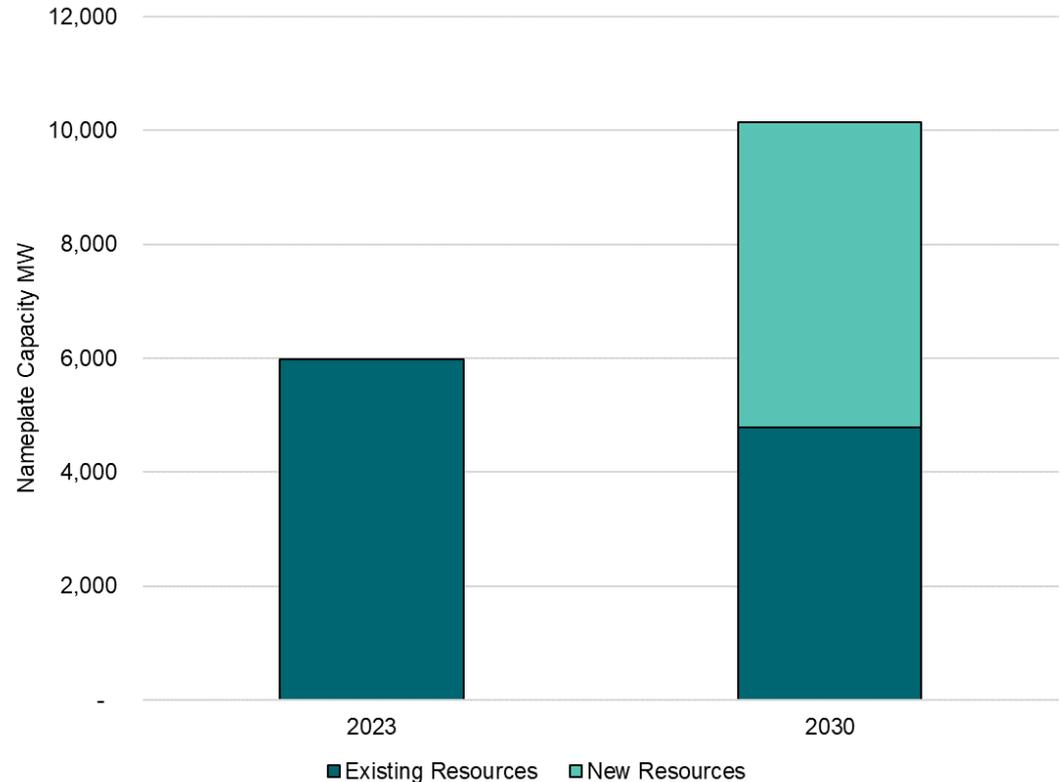
- 2045:**
- ✓ Explore new and emerging options to drive diversity in our energy supply and achieve 100 percent renewable and non-emitting resources

1. Conservation in winter peak capacity includes energy efficiency, codes and standards, and distribution efficiency.
2. Distributed Energy Resources (DER) solar includes customer solar photovoltaic (PV), Clean Energy Implementation Plan (CEIP) solar additions, non-wires alternatives, and ground and rooftop solar additions.
3. Distributed Energy Resources (DER) storage includes CEIP storage additions, non-wires alternatives, and distributed storage additions.
4. CETA compliant peaking capacity is functionally similar to natural gas peaking capacity, but operates using non-emitting hydrogen or biodiesel fuel.

Resource Additions (Nameplate MW)	Total by 2030	Total by 2045
<b>Demand Side Resources</b>	<b>618</b>	<b>1,265</b>
Conservation <sup>1</sup>	281	818
Demand Response	337	446
<b>Distributed Energy Resources</b>	<b>739</b>	<b>2,392</b>
DER Solar <sup>2</sup>	552	2,124
Net Metered Solar	284	1,393
CEIP Solar	79	79
New DER Solar	189	652
DER Storage <sup>3</sup>	187	267
<b>Supply Side Resources</b>	<b>5,360</b>	<b>11,174</b>
CETA Compliant Peaking Capacity <sup>4</sup>	711	1,588
Wind	1,400	3,650
Solar	700	2,290
Green Direct	100	100
Hybrid (Total Nameplate)	1,450	1,748
Hybrid Wind	600	800
Hybrid Solar	400	398
Hybrid Storage	450	550
Biomass	-	-
Nuclear	-	-
Standalone Storage	1,000	1,800
<b>Total</b>	<b>6,717</b>	<b>14,830</b>

# PSE's Current Nameplate Electric Generating Resources

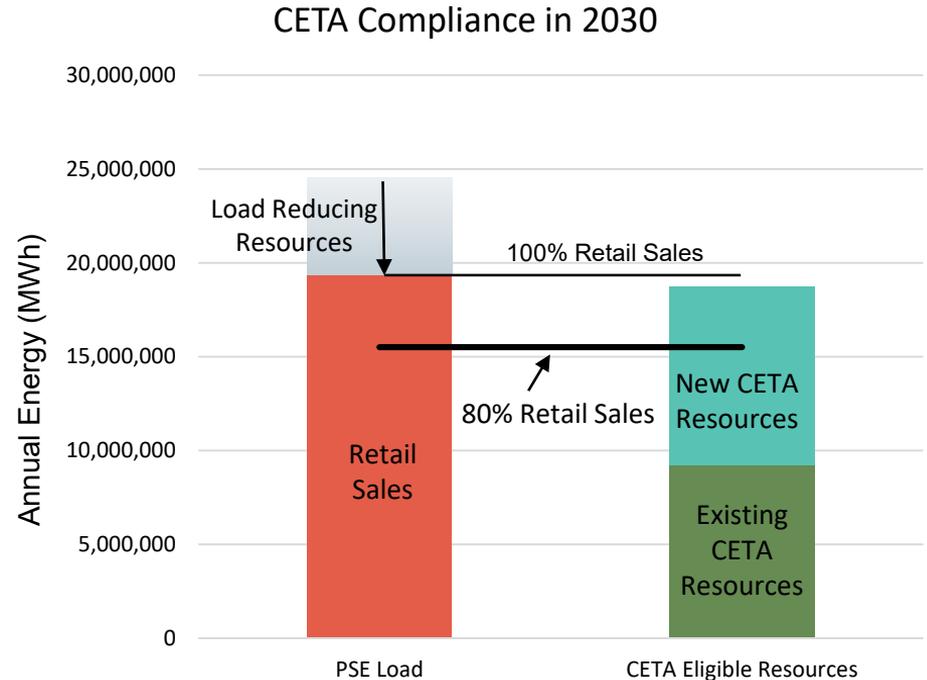
- 6,000 MW of existing resources in 2023
- Reduction in existing resources by 2030 due to expiration of contracts and removal of Colstrip 3 & 4 from the portfolio
- Portfolio is estimated to almost double by 2030 with the addition of new resources



# Meeting the CETA requirement in 2030

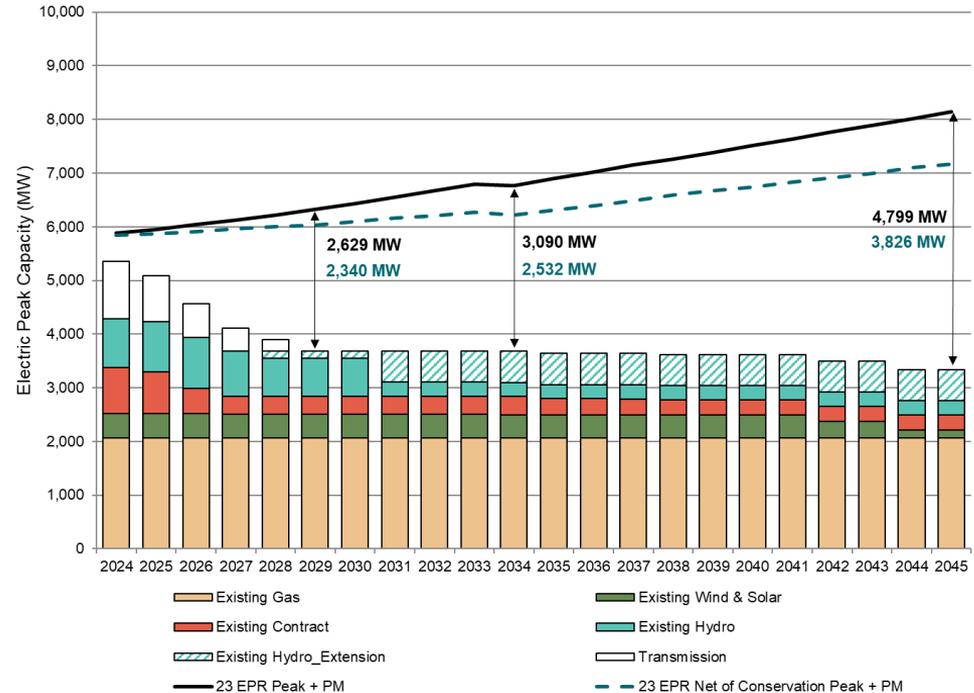
- Preferred portfolios exceeds 80 percent of retail sales supplied with renewable and non-emitting energy
- Load reducing resources include
  - Conservation
  - Demand response
  - Voluntary renewable programs
    - Net-metering
    - Community solar
    - Green Direct
  - PURPA\* contracts

\*Public Utility Regulatory Policy Act (PURPA) qualifying facilities (QFs) are smaller generating units that use renewable resources, such as solar and wind energy, or alternative technologies, such as cogeneration

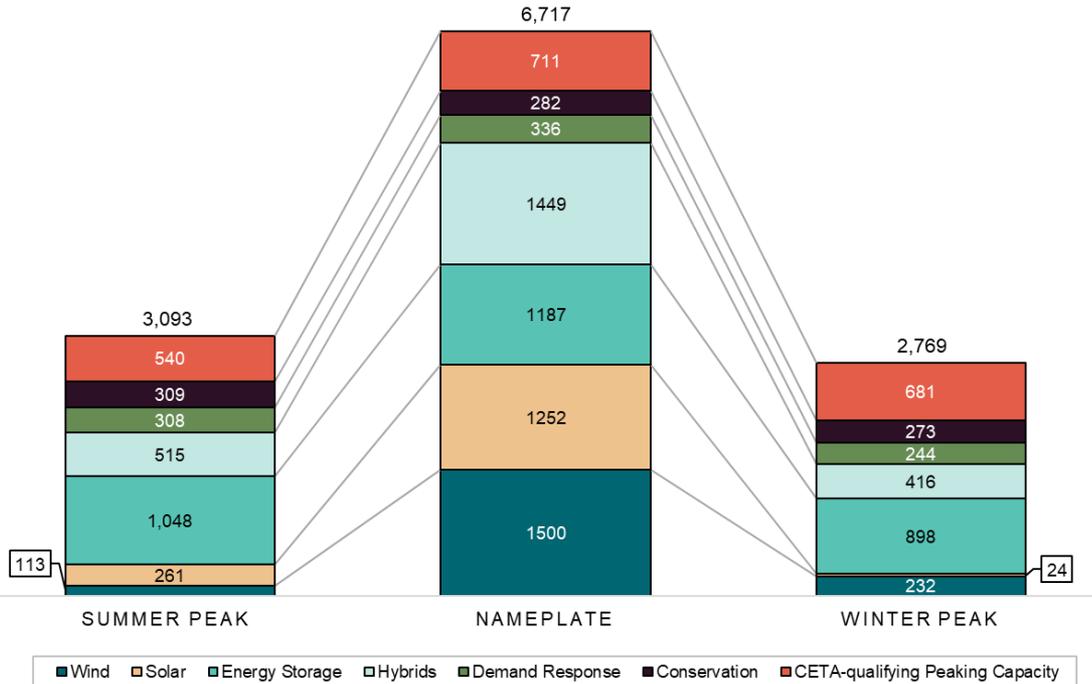


# Winter Peak Driving Effective Capacity Additions

- Winter peak > summer peak through 2045
  - 2,629 MW by 2029 is needed to achieve 5% loss of load probability.
    - Reduced to 2,340 MW after conservation
- Renewable and energy storage peak capacity contribution is larger in the summer
- New renewable and non-emitting resources will meet summer but not winter peaks
- New peaking capacity resources are needed



# 2030 Nameplate vs. Peak Capacity



After adjusting for peak capacity contribution

6,717 MW installed nameplate capacity of new resources  
 =  
 3,093 MW summer peak capacity  
 =  
 2,769 MW winter peak capacity

# Electric Action Plan

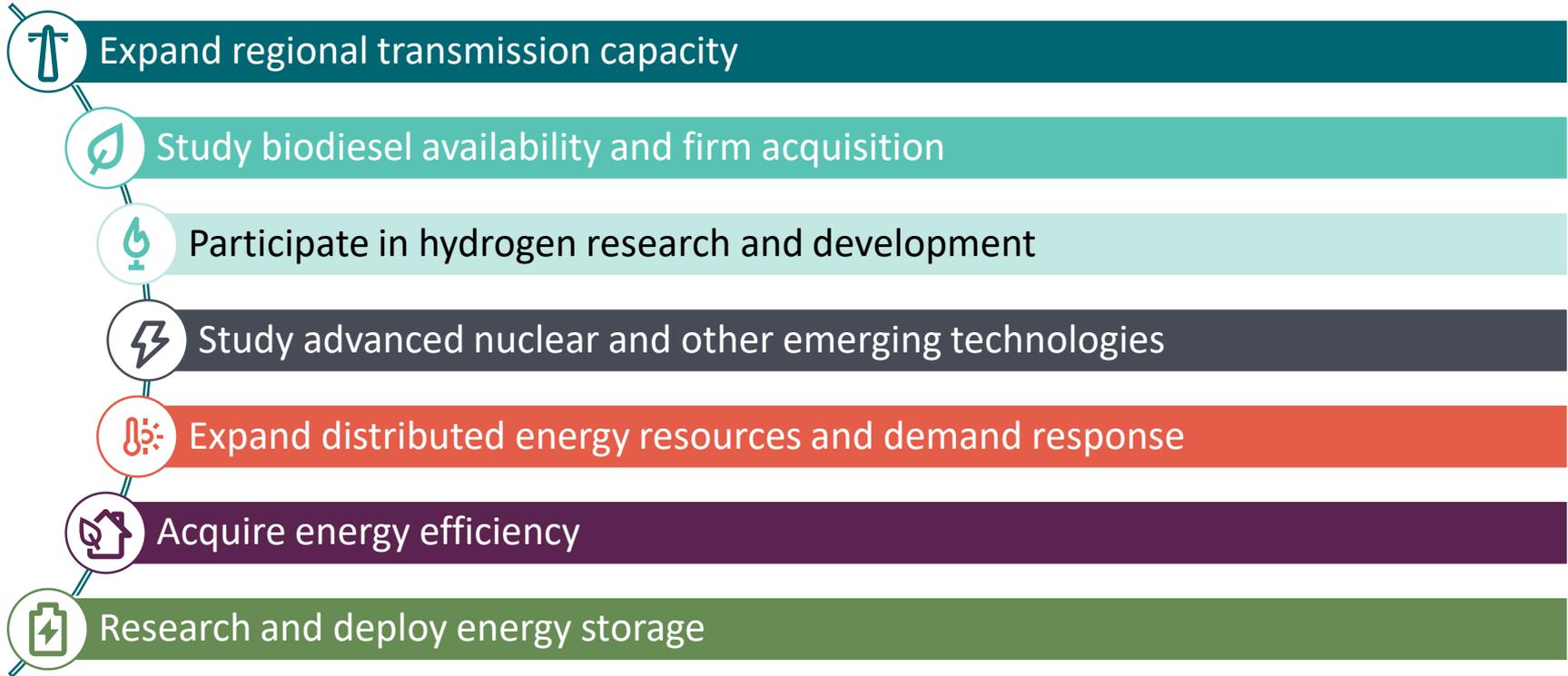
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# Action Plan



# Next Steps

March 14, 2023



# Gas Utility IRP and Electric Progress Report

- **March 31, 2023** – Final documents submitted to Washington Utilities and Transportation Commission and posted on [pse.com/irp](https://pse.com/irp).

 [irp@pse.com](mailto:irp@pse.com)

 [pse.com/irp](https://pse.com/irp)

**Thank you for joining us!**



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