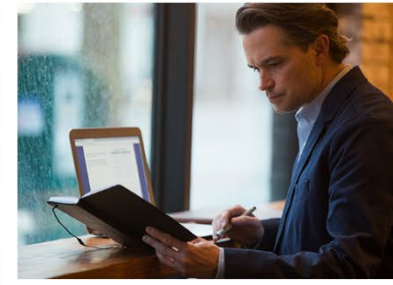


# PacifiCorp Integrated Resource Plan and Clean Energy Plan

June 27, 2023

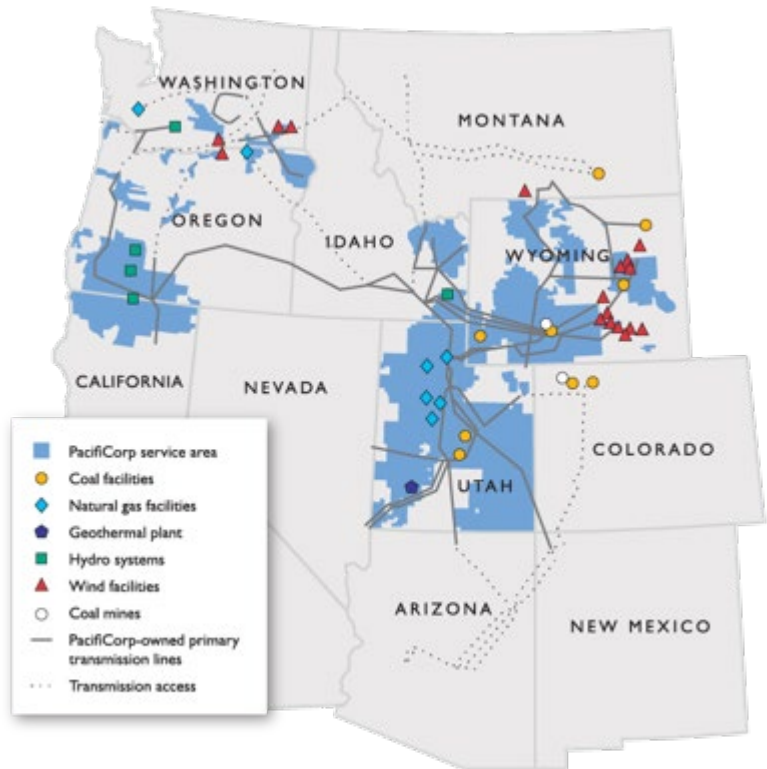


# Background



# PacifiCorp - Meeting the Energy Needs of All Our Customers

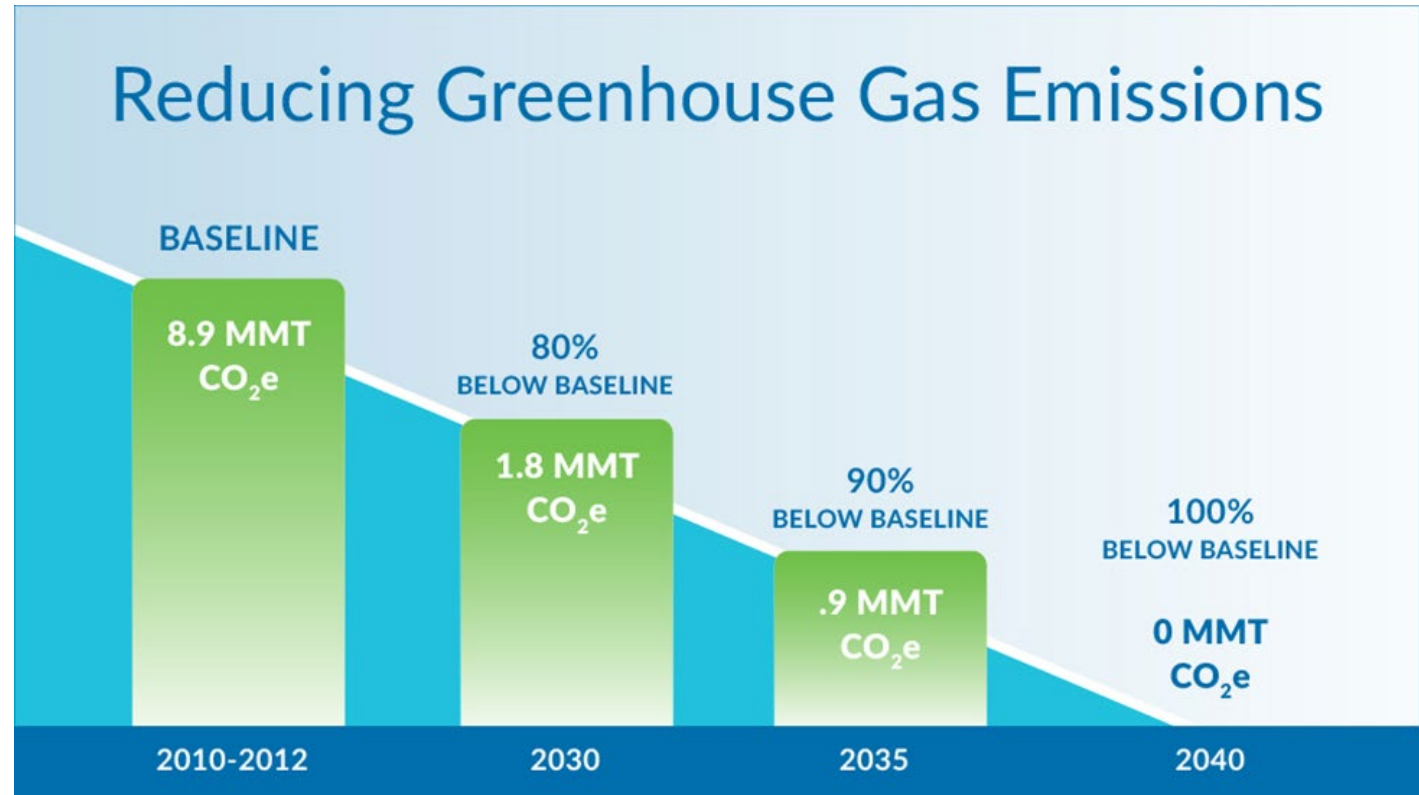
Our planning is designed to meet customers' energy needs across six states



- PacifiCorp serves approximately 2 million customers across six states
- PacifiCorp serves customers in Utah, Idaho and Wyoming as Rocky Mountain Power
- PacifiCorp serves customers in Washington, Oregon and California as Pacific Power
- Extensive generation, transmission and distribution infrastructure across the west
- PacifiCorp continues to decarbonize its entire system and expects to be emissions free by 2050
- Full decarbonization will require the development of new technologies to ensure reliability, and PacifiCorp has been actively exploring viable options

# Meeting Oregon's Clean Energy Requirements

- PacifiCorp's baseline emissions are 8.9 MMT CO<sub>2</sub>e, which will be reduced to:
  - 1.8 MMT CO<sub>2</sub>e by 2030;
  - 0.9 MMT CO<sub>2</sub>e by 2035; and
  - 0 MMT CO<sub>2</sub>e by 2040
- PacifiCorp's analysis shows that an 80 percent reduction in emissions by 2030 is possible under PacifiCorp's 2023 Integrated Resource Plan
  - PacifiCorp identified two pathways to meet this interim energy goal
  - The eventual goal of zero emissions will require new technology by 2040



A woman with dark curly hair, wearing a purple short-sleeved top and a black belt, is smiling as she adjusts a glass bell-shaped light fixture with a white globe. She is in a kitchen with wooden cabinets and a stainless steel refrigerator. In the foreground, a bouquet of yellow and pink flowers sits on a countertop. A dark grey banner with white text is overlaid on the left side of the image.

# Clean Energy Plan

## Seven Components to PacifiCorp's Oregon Clean Energy Plan (CEP)

- Community Engagement
- Community Benefit Indicators
- Resiliency
- Community-Based Renewable Energy
- Resource Planning
- Greenhouse Gas Emissions Analysis
- Action Plan



# Community Engagement

Community engagement will continue to foster a greater understanding of our communities and how we serve them. PacifiCorp's engagement opportunities include:

- Community Benefits and Impacts Advisory Group (CBIAG)
- Integrated Resource Plan (IRP) Public Input Meetings
- Distribution System Planning (DSP) Local Stakeholder Workshops
- Clean Energy Plan (CEP) Engagement Series
- Transportation Electrification (TE) Program engagement
- Tribal Nations Engagement Series

PacifiCorp has also developed consolidated information hubs where interested parties can access details on engagement opportunities, stakeholder comments and company responses, key issues, definitions, and other related materials



<https://www.pacificorp.com/energy/oregon-clean-energy-plan.html>  
<https://www.pacificorp.com/energy/integrated-resource-plan.html>  
<https://www.pacificorp.com/energy/tribal-relations.html>  
<https://www.pacificorp.com/energy/oregon-community-benefits-and-impacts.html>  
<https://www.pacificpower.net/savings-energy-choices/electric-vehicles/or-transportation-electrification-planning.html>

# Community Benefit Indicators

Community Benefit Indicators (CBI) are designed to demonstrate the impact of PacifiCorp's proposed programs, actions, and investments. To assess the progress of CBIs, PacifiCorp developed baseline metrics to understand the current state within its service regions

- Each CBI identifies a desired outcome, while metrics allow for PacifiCorp to monitor progress at achieving these outcomes

PacifiCorp has identified **six interim CBIs and 14 metrics** for the following five categories:

- Resilience (System and Community)
- Health and Community Well-being
- Environmental Impacts
- Energy Equity (Distributional and Intergenerational Equity)
- Economic Impacts



PacifiCorp considers its CBIs and metrics as interim, meaning they will adapt over time. The continued development and refinement of PacifiCorp's CBIs will leverage continued stakeholder engagement and input



# Community Benefit Indicators

CBI Category	Interim CBIs	Interim CBI Metrics
Resilience (System and Community)	<ul style="list-style-type: none"> <li>-Improve resilience of vulnerable communities during energy outages</li> <li>-Reduce frequency and duration of energy outages</li> </ul>	<ul style="list-style-type: none"> <li>-SAIDI, SAIFI and CAIDI at area level including major events</li> <li>-Energy Not Served (ENS) for IRP portfolios are included as an output from portfolio development</li> </ul>
Health and Community Well-being	Decrease number of residential disconnections	Number of residential customer disconnections
Environmental Impacts	Increase energy from non-emitting resources and reduce CO <sub>2</sub> emissions to meet House Bill 2021 targets	Oregon CO <sub>2</sub> emission from Oregon allocated resources
Energy Equity (Distributional and Intergenerational Equity)	Decrease proportion of households experiencing high energy burden	<ul style="list-style-type: none"> <li>-Energy burden by census tract</li> <li>-Energy burden for low-income customers, bill assistance participants and Tribal members</li> </ul>
Economic Impacts	Increase community-focused efforts and investments	<ul style="list-style-type: none"> <li>-Headcount of DSM program delivery staff &amp; grants</li> <li>-Public charging stations</li> <li>-Pre-apprenticeship / educational program participation</li> <li>-Resource development workforce and spend</li> </ul>

# Resiliency

- PacifiCorp's long-term resiliency objective is to include resilience risk scores in project and program prioritization
- PacifiCorp considers local community and resilience stakeholder input fundamental to the process of defining resiliency, establishing resiliency goals, and developing metrics for tracking electric system and community resilience
  - This is critical given the breadth and depth of what could be considered appropriate resiliency opportunities, and the lack of an industry consensus on resiliency analyses
- PacifiCorp intends to incorporate discussion of these topics into its next CEP Engagement series meeting (June 23) to solicit input and feedback. These sessions provide the appropriate forum to investigate and resiliency metrics and processes that are community-utility-specific



The OPUC requested a report from the U.S. Department of Energy's Grid Modernization Lab Consortium (GMLC) to research various resiliency-related issues and guidelines for consideration for Clean Energy Plans. The GMLC Report is a thoughtful and helpful survey of resiliency-related issues and will continue to be a clearinghouse of information for resiliency efforts.  
<https://edocs.puc.state.or.us/efdocs/HAH/um2225hah113046.pdf>

# Community-Based Renewable Energy

Community-Based Renewable Energy (CBRE) projects are defined as one or more energy systems, and may be combined with microgrids, storage systems, demand response measures, or energy-related infrastructure that promotes climate resiliency

CBRE projects must:

1. Directly benefit communities through community-benefit agreements or direct ownership by local government, nonprofit entities, or federally recognized Indian tribes; or
2. Increase resiliency or community stability, local jobs, economic development, or direct energy cost savings to families and small businesses

The Company has developed an Initial CBRE Potential Study and Initial CBRE Action Plan

- Following this collaborative process, the Company will provide updated versions of its CBRE Potential Study and CBRE Action Plan.

PacifiCorp's Initial CBRE Potential Study identified ~95 MW of future potential CBRE capacity over the period from 2024–2030



# Community-Based Renewable Energy

Action	Description
Resilience Partnership with the Energy Trust of Oregon	PacifiCorp also hopes to complement and support both existing program offers and the energy resilience program offerings under development by ETO
Federal Grant Opportunities	Continue to look for opportunities to leverage external funding for CBRE projects to decreased energy burden, access to low-cost capital, among other benefits
Future Request for Proposals	The company intends to issue a request for proposals for small-scale renewable projects, to which CBRE projects may qualify
CBRE Grant Pilot Straw Proposal	PacifiCorp plans to develop a straw proposal for potential expansion of the existing Community Resilience Battery Storage Grant Pilot
Updated CBRE Potential Study and Action Plan	PacifiCorp's actions above and a community survey will inform an updated CBRE Potential Study

# Integrated Resource Planning



# Resource Planning

- As a natural outgrowth of PacifiCorp's decarbonization trajectory over the past several IRP cycles, PacifiCorp's 2023 IRP positions the company to comply with HB 2021's decadal requirements
- Over the 20-year planning horizon, PacifiCorp expects to add:
  - 9,111 MW of new wind generation
  - 8,095 MW of storage resources
  - 7,855 MW of new solar generation
  - Over 1,000 miles of new transmission assets to access renewable generation
  - 4,953 MW of capacity saved through energy efficiency programs.
  - 929 MW of capacity saved through direct load control programs.
  - 1,500 MW of advanced nuclear generation
  - 1,240 MW of non-emitting peaking resources
    - Developing the last two technologies will be critical to manage the transition from our coal/gas resources and minimize impacts to our employees and communities*
- Small-Scale Renewable (20 MW or less) requirement is 10 percent of the company's generation portfolio for Oregon
  - Approximately 4.6 percent of this requirement may be met with existing small-scale renewable resources
  - PacifiCorp will need to procure an additional ~5.4 percent, or 490 MW in year 2030
    - This gap is anticipated to grow to 802 MW



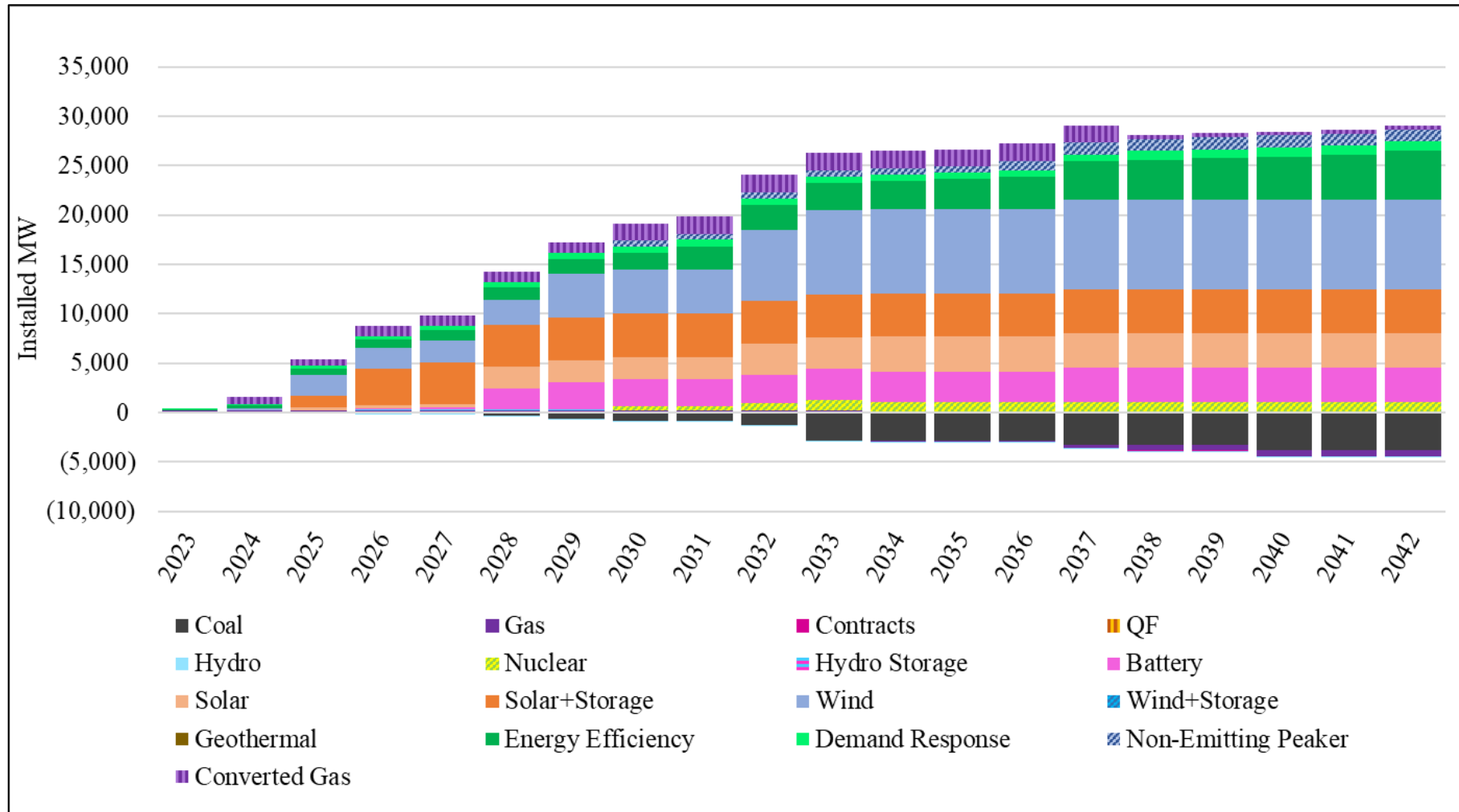
PacifiCorp's 2023 Integrated Resource Plan (IRP) provides the basis for analyzing HB 2021 requirements. This system-wide portfolio ensures that Oregon customers retain the benefits of multistate system planning and operations, that provides both access to West-wide resources and markets and mitigates risk through the delivery of reliable energy from a broad range of lower-cost resources

# 2023 IRP Progress

Responsive to Oregon Order 22-178, PacifiCorp has:

- Filed the Jim Bridger fuel plan
- Removed the minimum take requirement from coal resource modeling
- Modeled Sodium demonstration project in 2030 and created two alternative path analysis scenarios
- Expanded the foundation for transmission modeling through cluster study outcomes and best available information
- Modeled QF renewal rate based on historical data
- Assessed hydrogen electrolysis with support from sensitivities
- Conducted workshops on equity and justice, and offshore wind
- Reviewed pumped hydro proposals; new feasibility studies pursued
- Overhauled confidentiality treatment in reporting; huge expansion of public workpapers
- Held climate change discussions with stakeholders in three public meetings
- Established comparative resource metric for capacity expansion
- Provided an alternative fuels analysis
- Better distinguished variable costs from fixed O&M assumptions

# Preferred Portfolio Resources

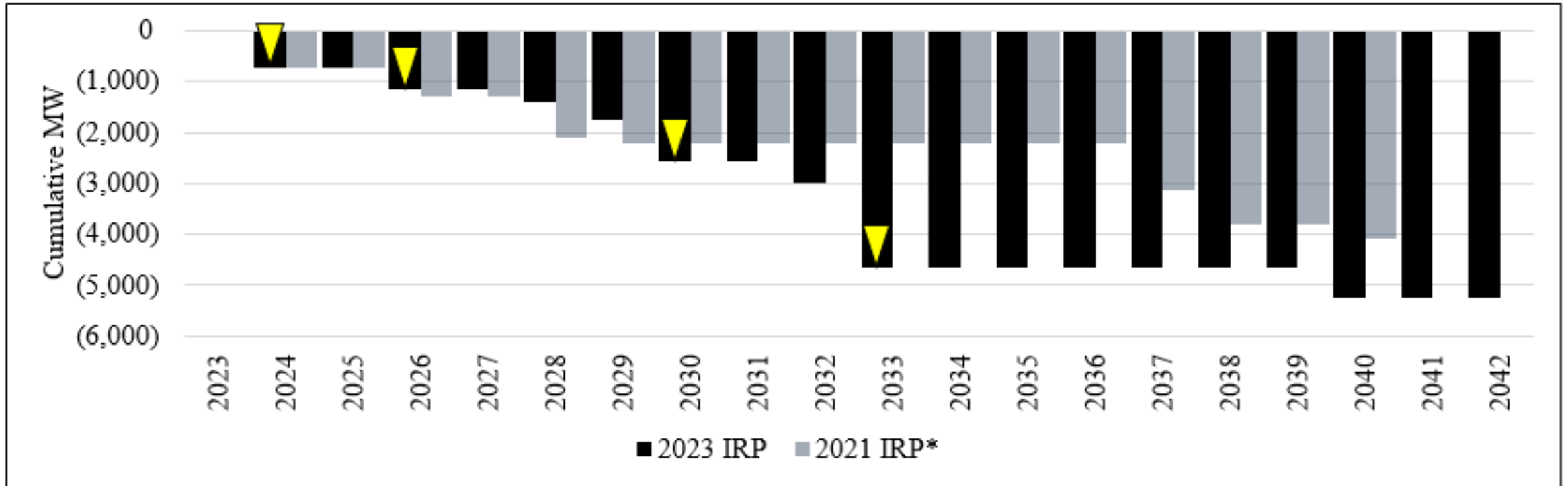




# Coal Exits, Retirements and Gas Conversions

- 2023 = Jim Bridger Units 1-2, converted to natural gas in 2024 (same as in the 2021 IRP)
- 2025 = Craig Unit 1 retirement (same as in the 2021 IRP)
- 2025 = Colstrip Unit 3 exit (same as in the 2021 IRP)
- 2026 = Naughton Units 1-2, converted to natural gas in 2026, operates through 2036  
(retired 2025 in the 2021 IRP)
- 2027 = Dave Johnston Units 3 retirement (same as in the 2021 IRP)
- 2027 = Hayden Unit 2 retirement (same as in the 2021 IRP)
- 2028 = Dave Johnston Units 1-2 retirement (retired 2027 in the 2021 IRP)
- 2028 = Craig Unit 2 retirement (same as in the 2021 IRP)
- 2028 = Hayden Unit 1 retirement (same as in the 2021 IRP)
- 2029 = Colstrip Unit 4 exit, Colstrip Unit 3 share is consolidated into Colstrip Unit 4 in 2025  
(retired 2025 in the 2021 IRP)
- 2030 = Jim Bridger Units 3-4, converted to natural gas in 2030, operates through 2037  
(retired 2037 without conversion in 2021 IRP)
- 2031 = Hunter Unit 1 retirement, SNCR installed 2026 (outside of 2021 IRP planning horizon, retiring 2042)
- 2032 = Hunter Units 2-3 retirement, SNCR installed 2026 (outside of 2021 IRP planning horizon, retiring 2042)
- 2032 = Huntington Units 1-2 retirement, SNCR installed 2026 (retired 2036 in 2021 IRP)
- 2039 = Dave Johnston Unit 4 retirement (retired 2027 in 2021 IRP)
- 2039 = Wyodak retirement, SNCR installed 2026 (retired 2039 without SNCR in 2021 IRP)

# Coal Exits, Retirements and Gas Conversions



<sup>1</sup> Coal exits and retirements are assumed to occur by the end of the year before the year shown in the graph. The graph shows the year in which the capacity will not be available for meeting summer peak load. All figures represent PacifiCorp's ownership share of jointly owned facilities.

<sup>2</sup> Yellow triangles in this figure highlight points of significant change in nuclear resources.

# New Transmission

## 2023-2026

Year	From	To	Export (MW) <sup>1</sup>	Import (MW) <sup>1</sup>	Inter-connect (MW)	Description	
2024	Multistate Path C Improvement		0	0	100	Path C enables Utah, Idaho, Wyoming interconnection, additional transmission options	
	Within Yakima WA Transmission Area		0	0	80	Union Gap-Midway 230 kV Line and substation - Yakima, enables additional transmission options	
2025	Within Willamette Valley WA Transmission Area		0	0	9	Cluster 2 Area 22 - Willamette Valley, enables 9 MW of solar	
	Walla Walla WA	Yakima WA	400	400	200	Walla Walla - Wine Country 230 kV line and integration, enables 200 MW of wind in 2032	
	GWS	Wyoming East	Clover UT	1,200	1,700	2,030	Energy Gateway South, enables 1,716 MW wind, 315 MW solar and storage, and future transmission
2026	Within Borah-Populus ID Transmission Area		0	0	1,100	Cluster 2 Area 5 - Borah, enabling 1,100 MW solar and 1,100 MW storage	
	Within BPA NITS (OR) Transmission Area		0	0	160	Cluster 2 Area 21 - BPA NITS, enables 160 MW storage	
	Within Central Oregon Transmission Area		0	0	240	Transition Cluster Area 8 - Central Oregon, enables 200 MW solar and 200 MW storage	
	Within Clover UT Transmission Area		0	0	331	TCA4: Q820 contingent facilities - Utah South, enables 300 MW solar and 300 MW storage	
	Within Willamette Valley OR Transmission Area		0	0	719	Cluster 2 Area 23 - Willamette Valley, enables 474 MW solar and 474 MW storage	
	Within Yakima WA Transmission Area		0	0	450	Cluster 1 Area 10 - Yakima, enables 450 MW solar and 707 MW storage	
	B2H	Borah-Populus ID	Hemingway ID	600	300	600	B2H - Idaho Power Asset Transfer, enabling 300 MW wind, 400 MW solar, 600 MW storage
		Hemingway ID	Longhorn OR	818	0	0	B2H component
		Longhorn OR	McNary OR	300	0	0	B2H - Longhorn Load component
		Walla Walla WA	Borah ID	300	0	0	B2H - IPC PTP Eastbound component

## 2027-2042

Year	From	To	Export (MW) <sup>1</sup>	Import (MW) <sup>1</sup>	Inter-connect (MW)	Description	
2027	Within Walla Walla WA Transmission Area		0	0	733	Cluster 2 Area 15 - Walla Walla, enabling 100 MW wind, 483 MW solar, 628 MW storage	
2028	Within Yakima WA Transmission Area		0	0	180	230 kV Union Gap-Pomona Heights, prerequisite of Union Gap-Wine Country part b	
	Jim Bridger WY	Borah-Populus ID	1,621	1,621	357	Segment D3, Transition Cluster Area 1, enables 357 MW wind	
2029	Within Goshen ID Transmission Area		0	0	662	Transition Cluster 5/Cluster 1 Area 3 - Goshen, enables 200 MW wind and 549 MW storage	
	Wyoming East	Jim Bridger WY	950	950	1,209	D2.2/D1.2, Cluster 1 Area 1, enables 1815 MW of wind	
	D3	Utah North	Borah-Populus ID	1,000	600	0	D3 supporting projects (west), enabled by D3
		Wyoming East	Jim Bridger WY	728	728	298	D3 supporting projects (east), enables 298 MW wind
2030	Within Utah North Transmission Area		0	0	558	Path C improvements: mostly 138 kV, enables 300 MW wind and 606 MW non-emitting peaker	
2032	Within Portland North Coast Transmission Area		0	0	130	Birdsdale 230-115 kV and Portland 115 kV reinforcement, enables 130 MW wind	
	Within Yakima WA Transmission Area		0	0	100	230 kV Union Gap-Wine Country part b, enables 500 MW wind	
2033	Southern Oregon	Central Oregon	389	389	935	Del Norte-Central Oregon 500kV <sup>2</sup> , enables 1,382 MW wind and 303 MW non-emitting peaker	
2037	Walla Walla WA	Willamette Valley WA	30	30	12	500 kV Walla Walla-S.Lebanon and Reinforcement <sup>2</sup> , facilitates regional transmission	

- The scope and cost of transmission upgrades are planning estimates. Actual scope and costs will vary depending upon the interconnection queue, the transmission service queue, interconnected resource attributes and other factors.
- Transmission builds from 2033 and beyond could be selected on a partial basis, so as to provide an indication of possible future outcomes.

# Long-term Resource Study Plan



**20-year planning horizon**  
PLEXOS optimization  
software to plan resource  
growth

- Optimization ensures least-cost, least-risk planning to meet all requirements
- Study method is consistent with the 2023 Integrated Resource Plan

## Clean Energy Plan (CEP) Portfolio Development Stages

1

2023 IRP preferred  
portfolio

2

Create CEP  
portfolio by adding  
small-scale  
resources to meet  
2030 and beyond  
10% Oregon  
requirement

3

Finalize CEP with  
additional  
emissions  
reduction pathways  
to achieve 2030  
and beyond Oregon  
emissions targets

# Greenhouse Gas Emissions



# Greenhouse Gas Emissions Analysis

PacifiCorp forecasts that it will meet the goals set by HB 2021

*However*, meeting these goals presents challenges and will require new non-emitting resource technology

There were three important components of the planning landscape

1. PacifiCorp expects substantial load growth for Oregon (60% by 2030 and 80% by 2040)  
While emissions per megawatt-hour are expected to decrease, load growth results in higher emissions on an absolute basis and creates a proportional need for more small-scale renewables
2. Conversion of coal-fired units to natural gas is economic for customers, but are emitting resources  
Benefits are avoiding additional resource costs and hedging against reliability risk if new technology is delayed, but PacifiCorp will have to manage emissions by minimizing use to serve Oregon customers
3. The IRP and CEP are both informed by assumptions around cost allocations  
Maintaining the benefits associated with being part of a multi-state system also poses specific issues regarding discrepancies between forecast and actual compliance



# Greenhouse Gas Emissions Analysis

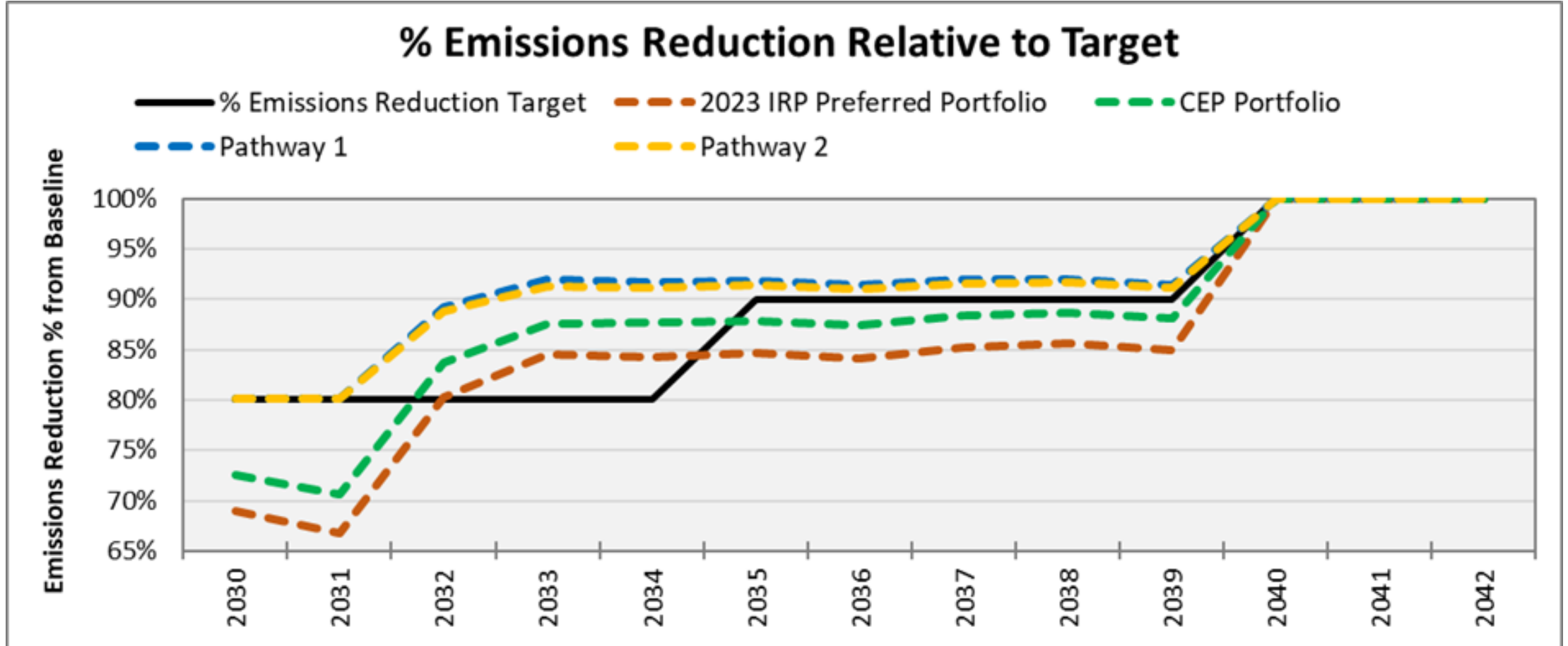
Due to these complexities of significant additional load, increased natural gas generation, and the dynamic nature of the multi-state utility, PacifiCorp's CEP identified two compliance pathways to meet the emissions targets set forth in HB 2021

- Managing dispatch from natural gas fueled resources until they are replaced with new non-emitting peaking generation technology
- Through the ongoing multi-state negotiations on the allocation of costs and benefits from PacifiCorp resource portfolio among the six states the Company serves

## RESULTS

This approach achieves targets and reaches 90 percent emissions reduction by 2033. Requires some adjustment of thermal resource allocation factors in years 2030 and 2031.

# Greenhouse Gas Emissions Analysis



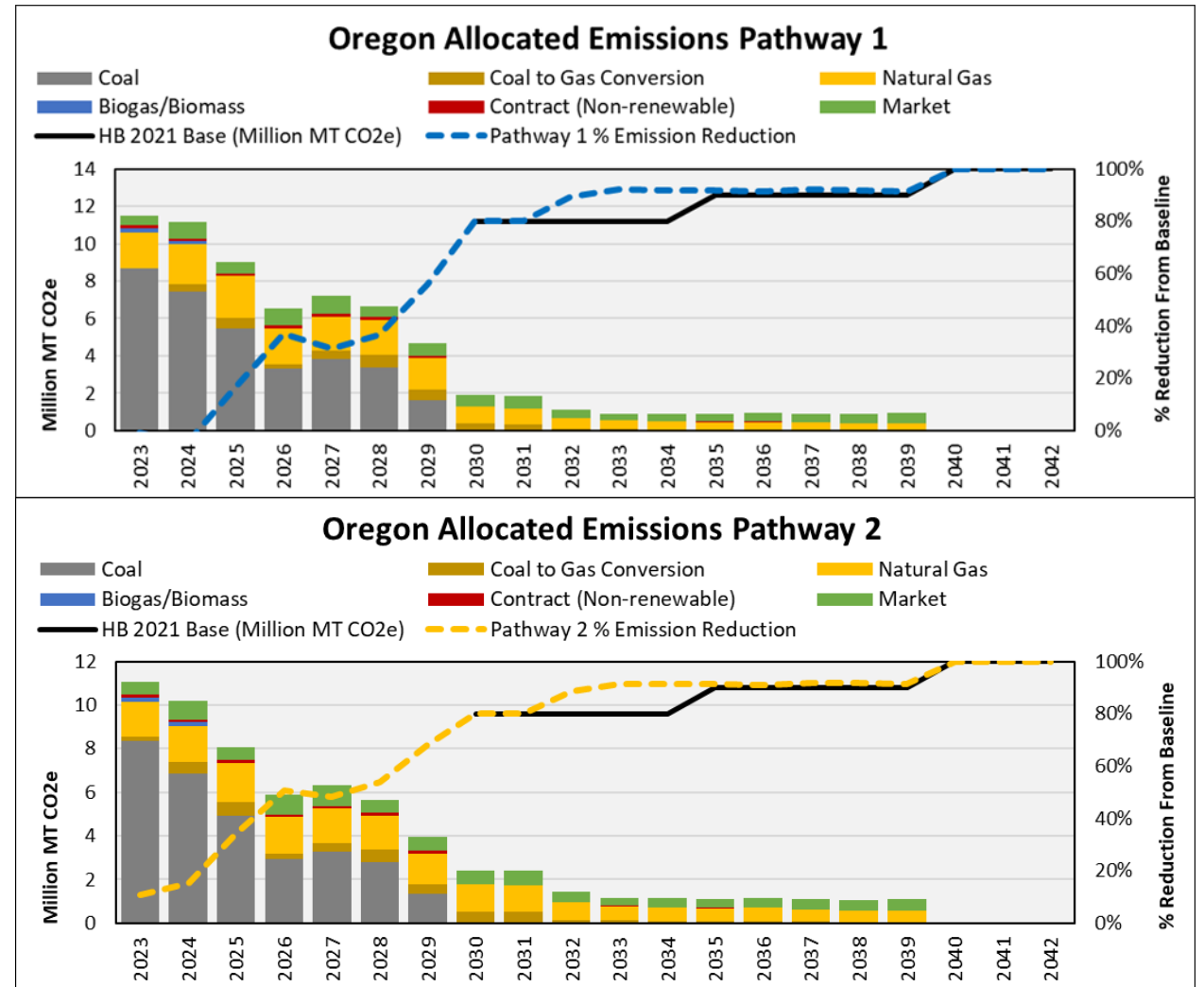


# Greenhouse Gas Emissions Analysis

## Year-over-year emissions reduction

- With the exception of 2027, PacifiCorp's CEP demonstrates a drastic reduction in emissions over time, as well as year-over-year for both emissions reduction pathways.
- The increase in emissions observed in 2027 relative to 2026 is driven by two factors:
  1. Increased load, and
  2. Change in the forward price curve that may be favoring thermal dispatch in the forecast model

While this relative uptick in emissions is observed in the data projections, actual operations will be monitored closely during these years to minimize the risk of increased emissions



# Action Plan



# Action Plan

- Continued **community engagement** on key Clean Energy Plan topics and other program and planning processes
- Monitor and evaluate **Community Benefit Indicators**, with continued refinement
- Develop a working definition of resiliency, resiliency goals, and metrics for **system and community resilience**
- Update the **Community Based Renewable Energy Potential Study and Community-Based Renewable Energy Action Plan** following stakeholder engagement
- Develop a straw proposal for a **Community Based Renewable Energy Project Pilot** focused on a renewable energy source paired with battery energy storage to develop community resilience hubs
- Conduct a **survey to better gauge future interest** in different types of Community-Based Renewable Energy projects
- Look for ways to leverage other **public funding sources**



# Action Plan

- Complete the **2022 all-source request for proposals** process
- Conduct a new **2023-2024 all source request for proposals**, expected to solicit, acquire, and evaluate specific energy supply resources through the end of 2028
- Evaluate appropriate criteria for assessing bids in **specific small-scale renewable resource request for proposals**
- **Expand transmission capacity** to interconnect renewable resources from across the West
- Develop **operational procedures to dispatch natural gas resources** to serve PacifiCorp's Oregon customers to meet emissions requirements until 2040, while pursuing new non-emitting technologies
- Continue to work on the development of an allocation methodology that provides options to **meet each state's energy policy as new resources are developed**



## Utility Scale

- 2023-2024 All-Source Request for Proposals
  - Aligns with needs identified in 2023 IRP
  - Designed to acquire and evaluate specific energy supply resources through the end of 2028

## Small-Scale Renewables

- 490 MW need by 2030
- Anticipate issuing a Small-Scale Request for Proposals with bids due late 2024 or early 2025

**NOTE: Resources that participate in the next generation interconnection cluster study could be contracted in the year 2025 with a COD by December 31, 2028. The participation window will be open from April 1 to May 15, 2024. PacifiCorp recommends that developers determine interconnection requirements as soon as possible so that projects can interconnect and reach commercial operation by 2030**



All new resources are required to have an interconnection study that outlines an interconnection schedule consistent with the proposed commercial operation date of the resource. PacifiCorp's small generator (20 MW or less) interconnection process is identified in its OATT. <https://www.oasis.oati.com/ppw/index.html>

Questions?

