



Integrated Resource Planning

ROUNDTABLE 23-1

JANUARY 2023

PGE

MEETING PARTICIPATION

Electronic version of presentation

https://www.portlandgeneral.com/our-company/energy-strategy/resource-planning/integrated-resource-planning/irp-public-meetings

Zoom Meeting

- Please click the meeting link sent to your email or here:
- Join Zoom Meeting https://us06web.zoom.us/j/84391255924?pwd=RDQ2VFpUZERVSEcraU5CZWw3VDhQZz09
- Meeting ID: 843 9125 5924
  Passcode: 108198

AGENDA

8:30 – 8:45	Welcome, Introductions, Operating Agreement, Meeting Logistics
8:45 – 9:30	Informational Community Benefit Indicators
9:30 – 12:30	Draft Portfolio Analysis Results & Scoring
12:30 – 1:00	*Break*
1:00 – 1:45	Draft Action Plan
1:45 – 2:00	Waiver/IRP filing update

Public Process Intent

IRP Guideline 2a - The public, which includes other utilities, should be allowed significant involvement in the preparation of the IRP. Involvement includes opportunities to contribute information and ideas, as well as to receive information. Parties must have an opportunity to make relevant inquiries of the utility formulating the plan.

MEETING LOGISTICS

Sharing space through facilitation

Focus on learning and understanding.

Team members will take clarifying questions during the presentation

Attendees will not have access to the chat feature during the meeting in order to streamline taking feedback

Attendees are encouraged to “raise” their hand to ask questions

Q&A

Time will be dedicated at the end of each presentation to address questions and comments

Follow Up

If we don’t have time to cover all questions, we will provide answers via the monthly published feedback form

PARTICIPATION

During the presentation

All attendees will be muted; to unmute yourself via computer, click on the microphone that appears on the screen when you move your mouse

To unmute yourself over the phone, **press *6**

Raise your hand icon to let us know you have a question

If you call in using your phone in addition to joining via the online link, please make sure to **mute your computer audio**

OPERATING AGREEMENTS

- Establishing norms with our partners is foundational to **building trust and ensuring a productive dialogue and engagement**
- Creating a **respectful and inclusive space**, starts with establishing **common agreements**

Share the Airtime

Expect and Accept Non-closure

Be Constructive

Listen to Seek Understanding, Not to Respond

Challenge Ideas and Not People

The courageous conversations framework

INFORMATIONAL COMMUNITY BENEFIT INDICATORS

ANDY EIDEN

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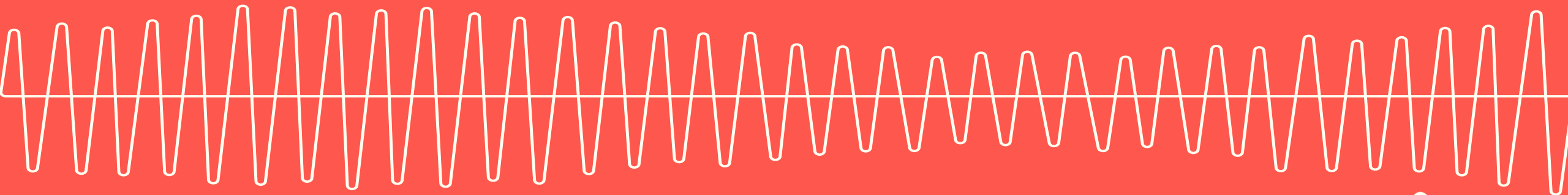

RECAP & PREVIOUS MEETINGS

This is our fifth presentation on Community Benefit Indicators (CBIs)

In previous meetings, we have discussed interim thinking around developing CBIs for inclusion in IRP portfolio analysis and scoring

The intent of this meeting is to

- Build on information we have presented on CBIs in the past
- Report out findings from community engagement efforts related to CBIs
- Share PGE's planned use of Informational CBIs (iCBIs) for setting goals and tracking progress in future CEPs

Community Benefit Indicators (CBI)

Definition:

- A Community Benefit Indicator (CBI) is an equity tool that can be applied to modeling, analysis, scoring metrics, procurement, programs, and reporting to inform decisions related to planning activities.

- The purpose of CBIs are to assist in pursuing equitable outcomes and beneficial long-term impacts to EJ communities.*

* PGE defines EJ communities in line with HB 2021

Community Benefit Indicators (CBI)

Must be quantifiable and measurable

Resiliency (Customer and System)

Economic

Environmental

Energy Equity

Health & Community Wellbeing

Community Benefit Indicators (CBIs)

Pathways

CBIs are the incorporation of community impacts and benefits into the CEP & **related planning activities, and it is a critical near-term priority for the implementation of HB 2021**

Staff expects utilities to prioritize the development & use of interim CBIs to inform **CBRE analysis, portfolio analysis, implementation actions, and tracking progress as the roadmap** is implemented

IRP Modeling

- Resource CBI - **rCBI**
- Information CBI - **iCBI**
- Portfolio CBI - **pCBI**

Procurement & Programs

- Potential CBRE RFP
- Non-wires Solutions
- Customer programs
- Cost-effectiveness
- HB 3141 (ETO)
- Capital planning

Analysis & Report

- Quantifiable & measurable
- Narrative in Clean Energy Plan
- Progress updates via IRP Update process
- Other reports and business processes (MYP, DSP)

CBI Development – PGE Approach

PGE engaged with community members, community representatives, and EJ advocates to provide education and solicit input and feedback to inform PGE's approach to CBIs in the first CEP

Presented on CBIs at one IRP roundtable and four community labs

Received valuable feedback and input from participants via surveys, Mural board exercises, meeting chat, email, interviews and meetings with EJ advocates and attendees

Worked with third-party consultants to review literature and best practices and benchmark what other peer utilities are doing in this space

Community-Prioritized CBIs

PGE evaluated CBIs with community members and through our Learning Labs and separately met with Energy Advocates

Purpose of these engagements:

- Vote on most important CBIs to communities
- Rank-order which CBIs PGE should prioritize in the near term

The highest ranked CBIs from our community outreach were:

- Reduction in number of customers suffering from high energy burden
- Low income and vulnerable communities have access to an increasing number of renewable or non-emitting distributed generation resources
- Meaningful bilateral engagement between utilities and tribes on siting
- Improve efficiency of housing stock, including lower-income housing

PGE took this feedback and combined with other CEP guidance to inform our Action Plan

Which additional indicators should be prioritized going forward. Help us prioritize the Community Benefits Indicators.

Each participant has 6 stars to vote the next indicators to prioritize.

UM 2225 Stakeholder CBI Proposal (without associated measures)	Add a star to the indicators you recommend prioritizing
Tribal Benefits and Priorities	
Ecosystem/Non-Energy Benefits	
1. Protect fish and reduce the region's pressure on the Columbia River ecosystem	★★★★★★★ 7
2. Meaningful bilateral engagement between utilities and tribes on siting	★★★★★★★★★★★★ 12
Energy Benefits	
1. Increased availability of electricity storage in Tribal and non-Tribal communities	★★★★ 4
2. Improve energy efficiency of housing stock in Tribal communities	★★ 2
3. Increased number of clean energy generation that powers Tribal communities	★★ ★ ★ 4
Larger Community Benefits and Priorities	
Energy Benefits	
1. Improve efficiency of housing stock in utility service territory, including low-income housing	★★★★★★★★★★★ 11
2. Low income and vulnerable communities have access to an increasing number of renewable or non-emitting distributed generation resources	★★★★★★★★★★★★ 12
Non-Energy Benefits	
1. Community Employment opportunities	★★★★★★★ 7
2. Health and Community well-being	★★★★★★ 6
3. Improved Public Health outcomes	★★★★ 4
4. Reduction in number of customers suffering from high energy burden	★★★★★★★★★★★★★★★ 15
5. Reduced barriers for program participation	★★ ★★★★★ ★ 9
Environment	
1. Reduction of GHG emissions	★★★★★★★★★★ 10
2. Reduced Pollution Burden and Pollution Exposure	★★★★ ★★★★ 8
3. Increase Neighborhood Safety	★ ★ 2
Energy Security	
1. Reduced Residential Disconnections	★★★★★★ 6
2. Improved access to reliable clean energy	★★★★★★★★ 8
Resilience	
1. Reduction in frequency and duration of blackouts or brownouts in target communities	★★★★★ 5
2. Reduction in energy and capacity need	★★ ★ 3
3. Reduction in recovery time and increase in survivability from outages	★★★★ ★ ★ 6

iCBIs for Metrics & Tracking

Improved Access to Reliable, Clean Energy

CBI 1: Improve participation in clean energy programs by EJ communities

Metric	Description
Metric 1A: Distributed energy resource (DER) program participation rates for EJ communities	Rate of improvement in customer participation in customer programs (DR, solar/storage, EE, CBRE) compared to baseline
Metric 1B: Allocation of budget and/or savings goal within DER programs for EJ communities	Increase in share of budget and/or savings goal in customer programs (DR, solar/storage, EE, CBRE) compared to baseline

Draft indicators and metrics – subject to change

Reduction of Energy Burden

CBI 2: Increase energy affordability for target communities

Metric	Description
Metric 2A: Customers experiencing electricity bill burden	Reduction in electricity bill burden over time for low-income and EJ communities compared to baseline
Metric 2B: Customer arrearages for customers in EJ communities	Reduction in number of customers in arrearages in EJ communities compared to baseline
Metric 2C: Number of customer disconnections for non-payment in EJ communities	Reduction in number of customer disconnections for non-payment in EJ communities compared to baseline

Draft indicators and metrics – subject to change

Improved Grid Resiliency

CBI 3: Improved grid resiliency

Metric	Description
Metric 3A: Frequency and duration of outages, including long-duration outages	% of customers with access to emergency power in EJ communities
Metric 3B: % of customers with access to emergency power in EJ communities	Improve access to emergency backup power across customers; Increase number of customers in EJ communities with access to emergency backup power

Draft indicators and metrics – subject to change

Jobs and Economic Impact

CBI 4: Increased access to jobs/economic impact

Metric	Description
Metric 4A: # of clean energy jobs related to CBRE goals and % held by members of EJ communities	Increase number of clean energy jobs through future CBRE program and procurement activities
Metric 4B: Support workforce training opportunities for EJ communities	Participate in diverse workforce development initiatives

Draft indicators and metrics – subject to change

Environmental Outcomes

CBI 5: Environment

Metric	Description
Metric 5A: Reduced GHG emissions	Reductions in annual GHG emissions to serve retail load

Draft indicators and metrics – subject to change

Improved Efficiency of Housing Stock

CBI 6: Improve efficiency of housing stock in utility service territory, including low-income housing

Metric	Description
Metric 6A: Amount of residential energy efficiency achieved in target communities	Increase efficiency of housing stock in residential sector, including low-income housing, through increased coordination with Energy Trust and other local and state market actors
Metric 6B: Work w/ OHCS, CAAs, Energy Trust and other weatherization/EE implementors to encourage equitable distribution of benefits from EE programs in PGE service area	Participate in working groups to support effective and equitable distribution of weatherization and EE benefits

Draft indicators and metrics – subject to change

Next Steps

Work to develop quantitative tracking metrics based on the preferred portfolio and action plan

Continue to iterate with community partners to reflect CBIs in program and procurement scoring metrics

Engage with the CBIAG and continue sharing our approach in Community Learning labs to gather feedback

QUESTIONS/ DISCUSSION

DRAFT PORTFOLIO ANALYSIS RESULTS & SCORING

ROB CAMPBELL, TOMÁS MORRISSEY, NIHIT SHAH

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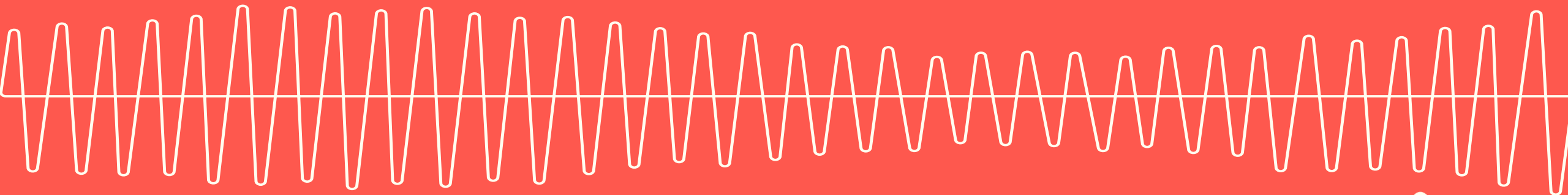


RECAP & PREVIOUS MEETINGS

We have presented on portfolio analysis in the last three meetings	December 2022 – Draft results – link
	November 2022 – Proposed portfolios for analysis - link
	October 2022 – Transmission constraint approach - link

Today's presentation will cover:	Capacity Need Update
	Analysis Approach
	Design Requirements
	Draft Results

Capacity Need Update

Sequoia

Sequoia is a stochastic adequacy model. It simulates load and resource combinations to answer two primary questions:

1. How much capacity do we need to keep the system adequate on a planning basis?
2. How much capacity do resources provide to the system?

The model was developed following the 2019 IRP and was used in the 2019 IRP Update and in the ongoing 2021 RFP. Sequoia is PGE's long term planning model (it is not an operations model).

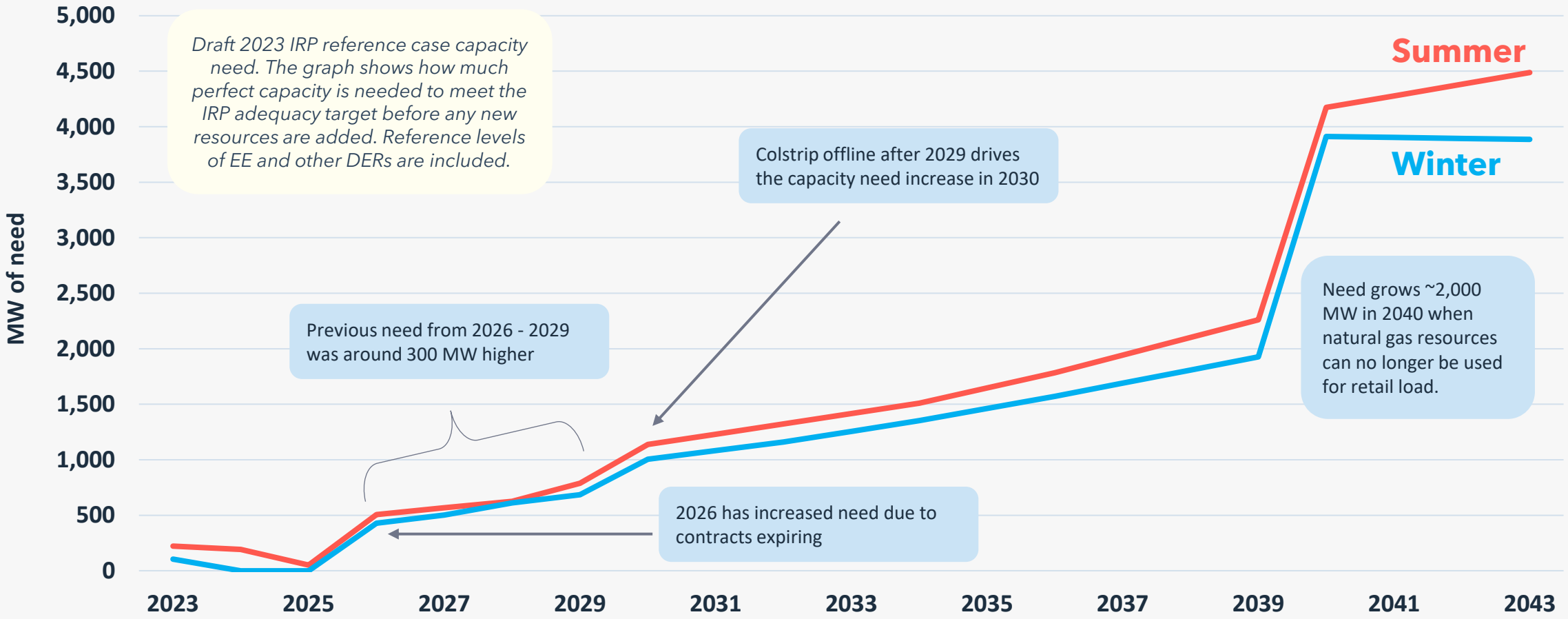
Sequoia targets a seasonal (winter/summer) adequacy level of 1-day-in-ten-years (2.4 LOLH)

Colstrip Uncertainty

Colstrip Units 3 & 4 are in Montana. PGE owns a 20% share of the output (296 MW nameplate).

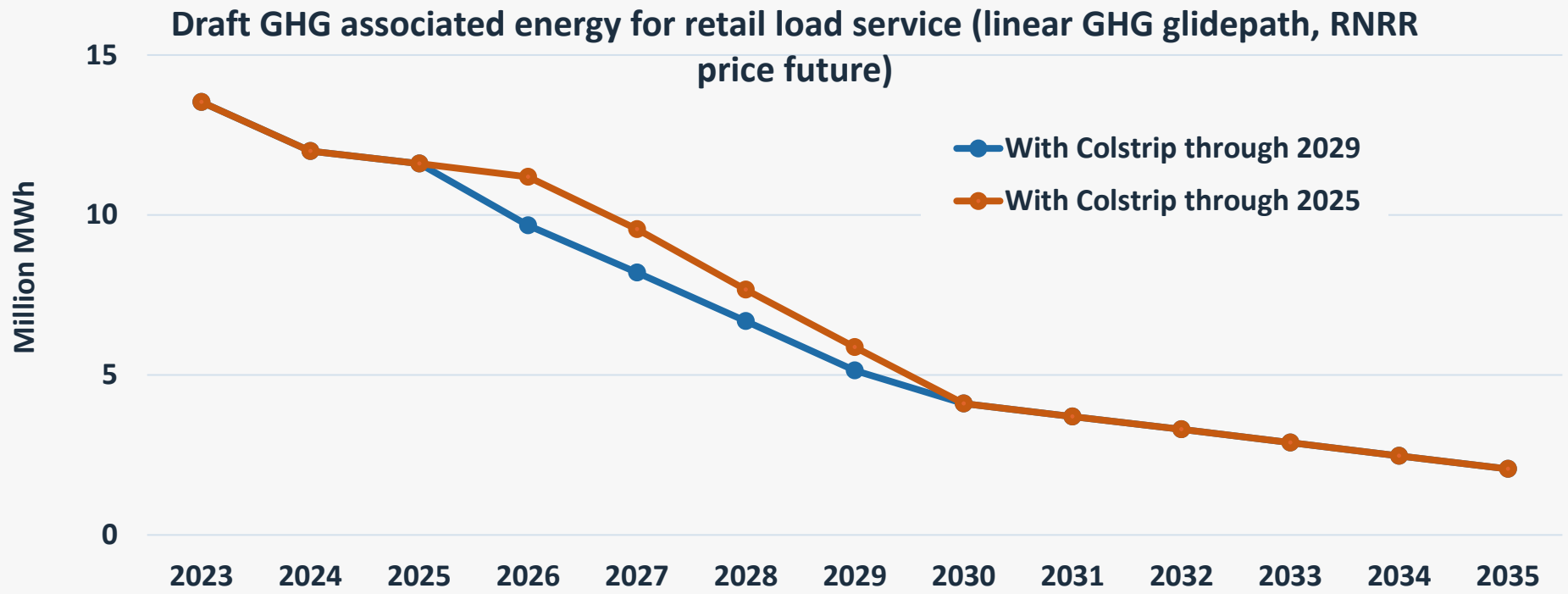
In past 2023 IRP modeling we assumed the plant exited the portfolio at the end of 2025. Due to uncertainty this has been revised to Colstrip exiting the portfolio at the end of 2029.

Draft Reference Case Capacity Need



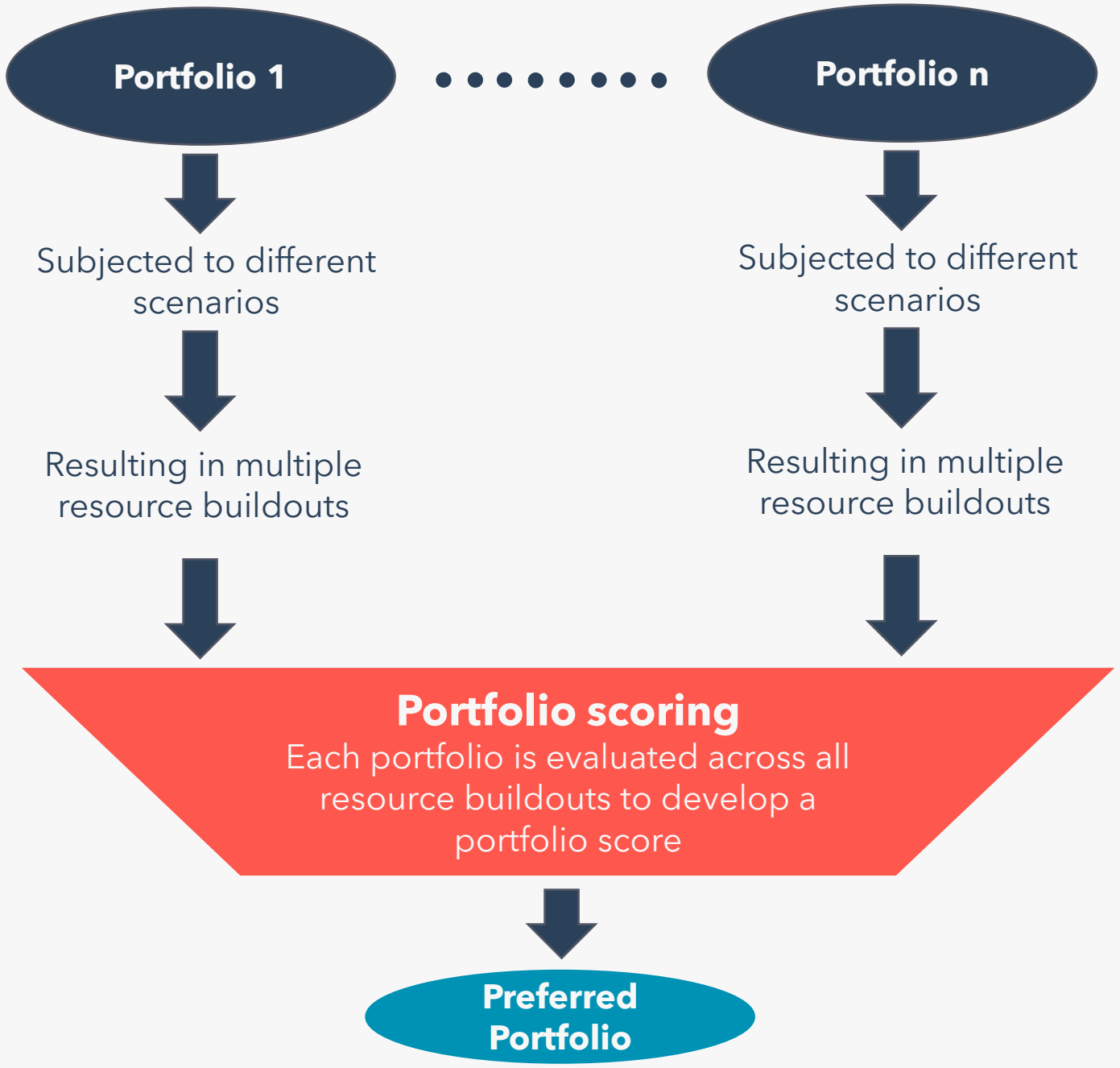
Colstrip & IRP energy need

Colstrip has a higher GHG intensity than other existing GHG emitting resources. Due to the higher intensity, including Colstrip in the portfolio through 2029 decreases the amount of GHG associated energy PGE can retain for retail load from 2026 - 2029.



Portfolio Analysis Approach

From a Portfolio to the Preferred Portfolio



Portfolio Analysis in this IRP

PGE has addressed key questions through portfolio analysis, such as:

- What should be the pace of emission reductions?
- Which resource actions maximize community benefit?
- Will community-based renewables (CBREs) lower system costs?
- Should PGE pursue additional EE and DR to what was previously planned?
- Is there sufficient transmission available to meet HB2021 2030 targets?
- Do transmission expansion options provide a way for PGE to meet system needs at the lowest cost?

Answering these questions provides key insights on how to balance cost, risk, rate of GHG reduction, and community benefits

PGE has developed the draft preferred portfolio based on these key insights

Portfolio Categories

PGE has evaluated 40 portfolios across 7 portfolio categories

Decarbonization Glidepath	• Explored the relationship between the rate of emissions reduction to serve retail load, cost, and risk
Transmission	• Studied the need for transmission, the timing of this need, and the corresponding magnitude needed over time to reliably decarbonize
CBRE	• Explored the relationship between costs, risk, and community benefits
Additional EE and DR	• Determined if and how the role of these resources could change with the changing planning environment
Optimized	• Effect of optimization assumptions. NOT YET COMPLETE
Targeted policy	• To inform stakeholder discussions on specific policy questions
Emerging Technology	• Understand the impact of emerging technologies

Portfolio Design Requirements

Key Assumptions in Portfolio Analysis

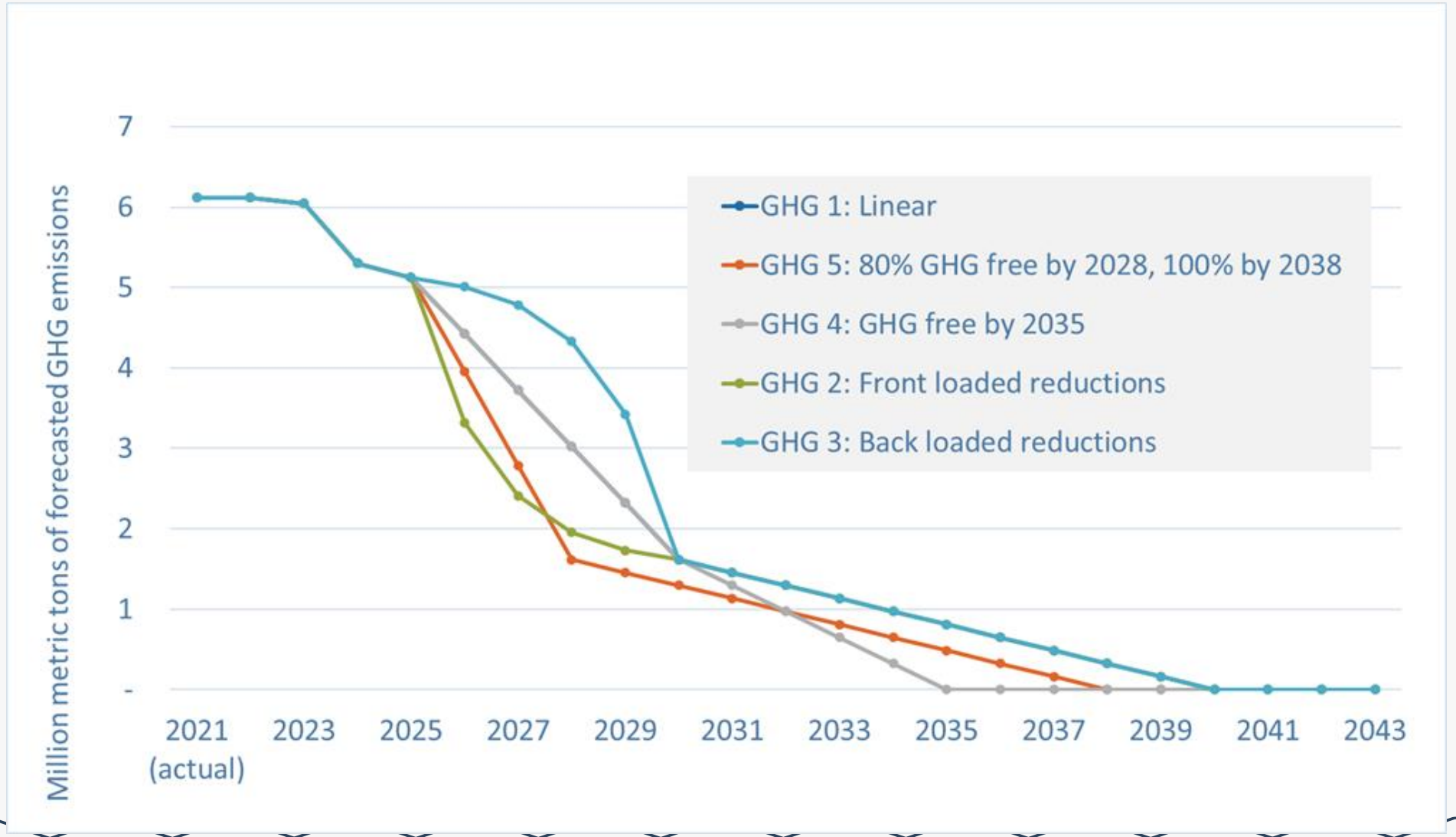
Parameter	Base Assumption (unless modified by portfolio design)
Emissions	Must comply with HB 2021 GHG emissions reduction targets
Resource procurement	Opportunities for incremental resource actions are available starting in 2026
Energy position	Starting in 2026, portfolio can't be long more than 100 MWa
Contract expiration	200 MW of contract extension through 2030
Generic resource	Non-emitting resource with 100% ELCC, 50% capacity factor, High fixed costs
RPS	Portfolios comply with RPS obligations
Transmission	Portfolios subject to Tx constraint based on BPA contractual landscape

Draft Portfolio Results

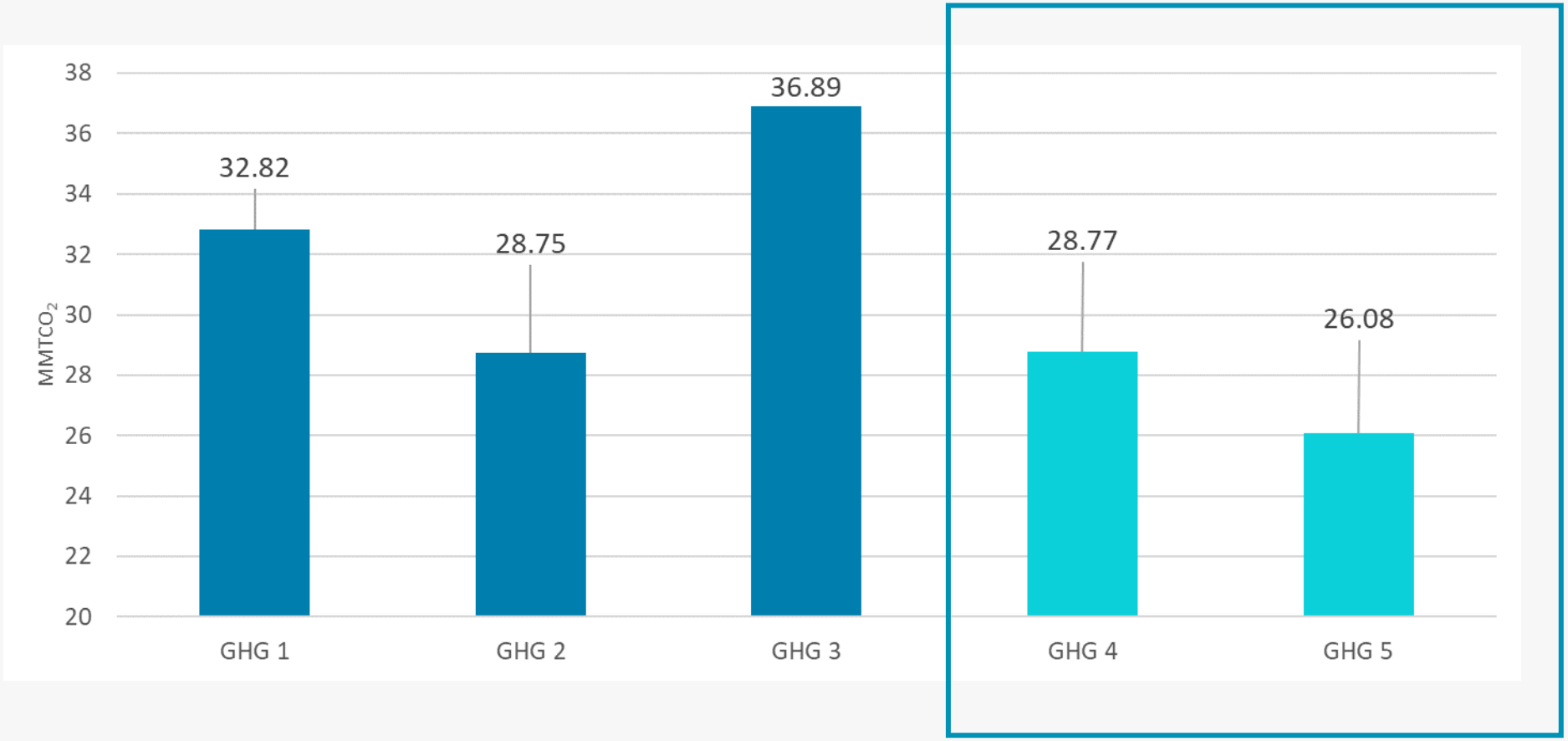
Decarbonization Glidepath Portfolios

Portfolios	Portfolio Condition
GHG 1	Meeting 2030 targets by adopting a linear path in emissions reduction
GHG 2	Meeting 2030 targets by front loading emission reduction
GHG 3	Meeting 2030 targets by rear loading emission reduction
Accelerated Decarbonization Portfolios (achieving targets ahead of HB 2021)	
GHG 4	Achieving 100% carbon reduction by 2035
GHG 5	Achieving each carbon target 2 years ahead of schedule - 80% by 2028, 90% by 2033 and 100% by 2038

Decarbonization Glidepath Portfolios

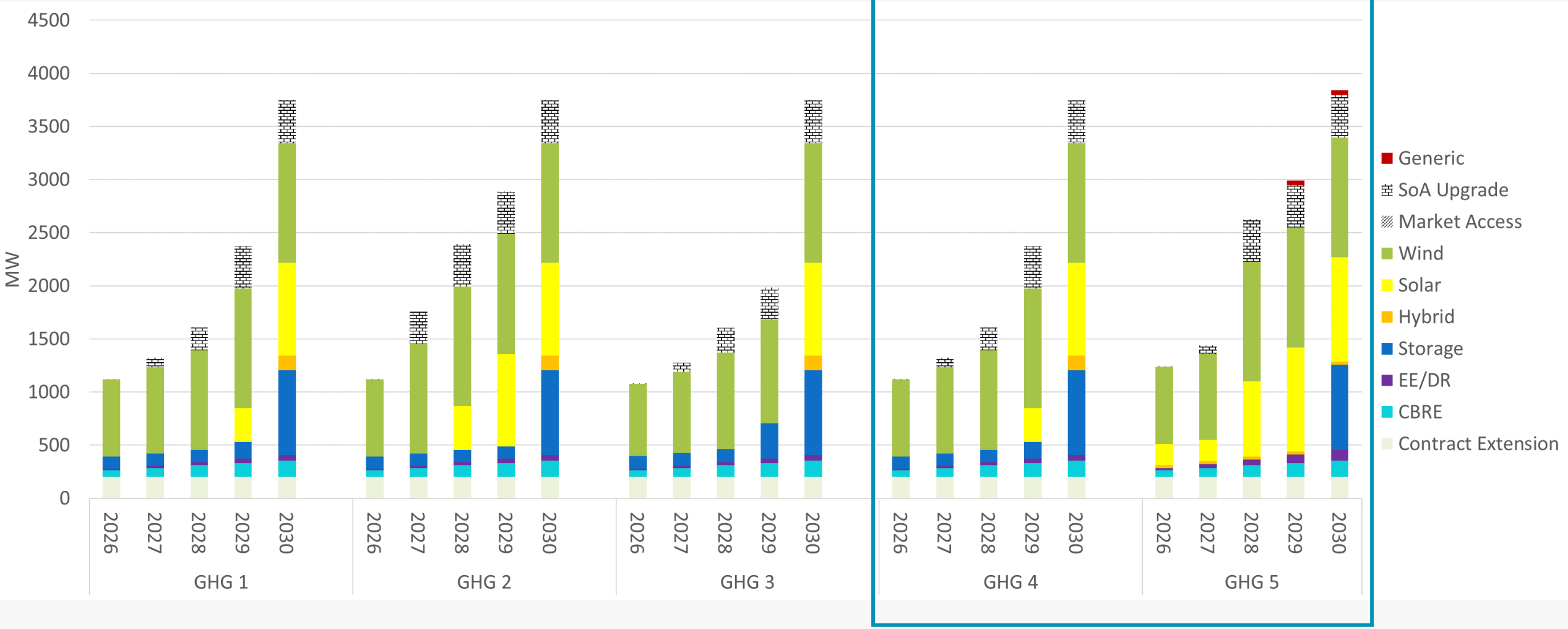


Decarbonization Glidepath Portfolios: Cumulative Emissions



Accelerated decarbonization portfolios

Decarbonization Glidepath Portfolios: Resource Buildouts



Accelerated decarbonization portfolios

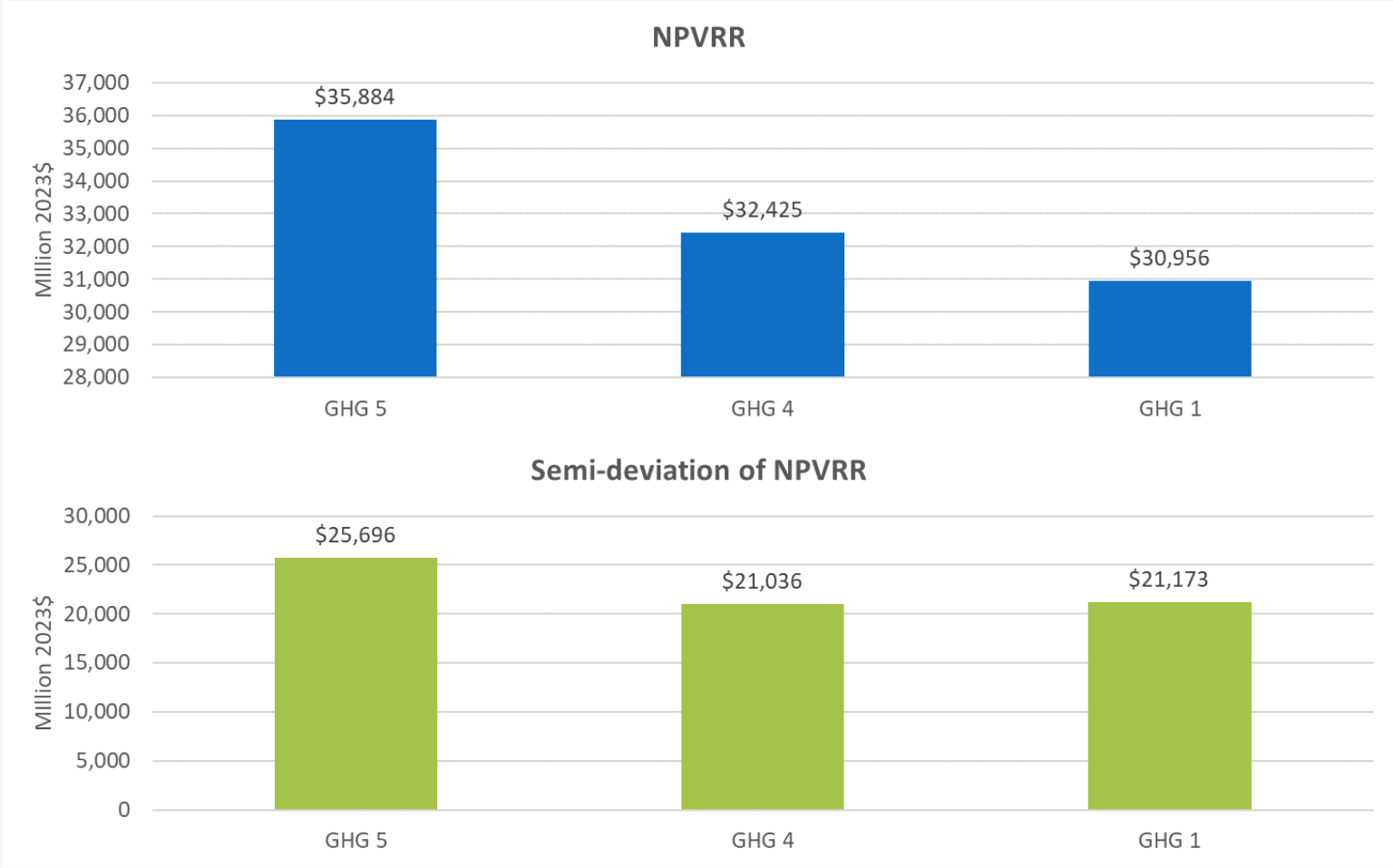
Decarbonization Glidepath Portfolios: Insights (1/2)

Achieving HB 2021 targets earlier than currently mandated (GHG 4 and GHG 5) increases system costs

- Meeting HB2021's 2030 target in 2028 instead increases cost pressure the most

GHG 5 produces the lowest emissions but increases dependence on new transmission options or emerging technologies

Meeting HB2021 targets as currently mandated best balance GHG reductions, risk, and cost



Note: While resource buildouts are shown through 2030, cost and risk metrics throughout presentation are based on full 2024-2043 time-horizon.

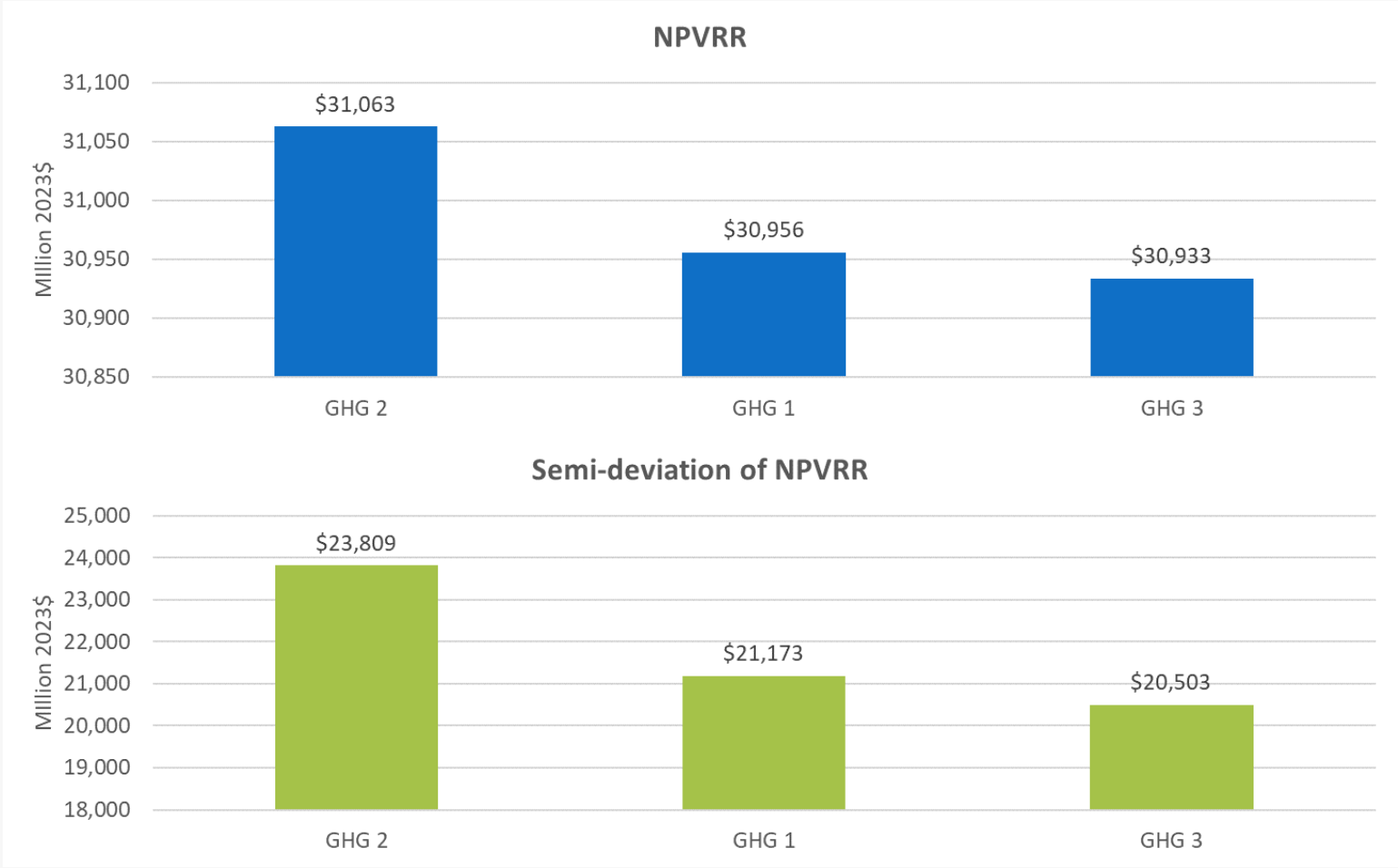
Decarbonization Glidepath Portfolios: Insights (2/2)

Cumulative emissions of GHG 1 are close to the average of GHG 2 and GHG 3 but costs are closer to GHG 3

GHG 3 is lowest cost but increases risks such as:

- Increased uncertainties in available transmission inventory
- Procurement delays and other supply chain constraints
- Operational risks associated with adding large quantities of resources in a small amount of time
- Regulatory delays of approval processes

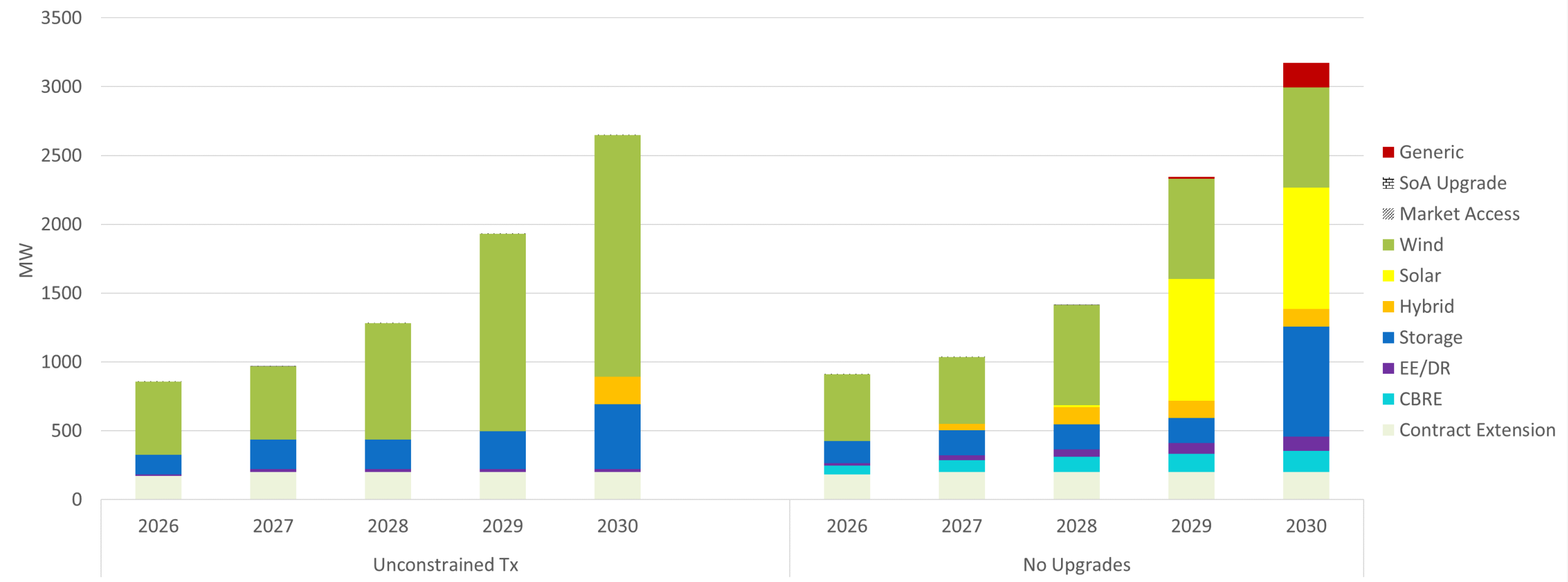
Key takeaway – PGE should use a linear reduction path through 2030 in the preferred portfolio



Transmission Portfolios

Portfolios	Subcategory	Portfolio Condition
No Tx constraints	Informational	No transmission constraints
No upgrades		No transmission upgrades or built options are available.
Unconstrained SoA	Transmission diversity	Unlimited South of Allston transmission access beginning in 2027
Unconstrained SoA plus other options		Unlimited South of Allston transmission access beginning in 2027 New transmission options to WY and NV are available in 2026
SoA in 2027 plus	Transmission timing	South of Allston upgrade unlocks 400MW of IRP proxy resources in the PNW in 2027 New transmission options 400 MW each to WY and NV are available in 2026
SoA in 2027		South of Allston upgrade unlocks 400MW of IRP proxy resources in the PNW in 2027
SoA in 2029		South of Allston upgrade unlocks 400MW of IRP proxy resources in the PNW in 2029
WY in 2026		New transmission option 400 MW to Wyoming in 2026
NV in 2026		New transmission option 400 MW to Desert Southwest in 2026
WY in 2028		New transmission option 400 MW to Wyoming in 2028
NV in 2028		New transmission option 400 MW to Desert Southwest in 2028

Informational Transmission Portfolios



Informational Transmission Portfolios: Insights

Transmission is the single largest factor impacting the economics and timing of resource additions in this IRP

Transmission need is significant and required for PGE to reliably decarbonize and meet the 2030 targets of HB 2021

Transmission needs arise by 2030 at the latest assuming no constraints on distribution connected resources

Year	Transmission based on Generic resource buildout (100% ELCC, 50% capacity factor)
2026	-
2028	-
2030	210
2035	1,527
2040	3,316
2043	3,725

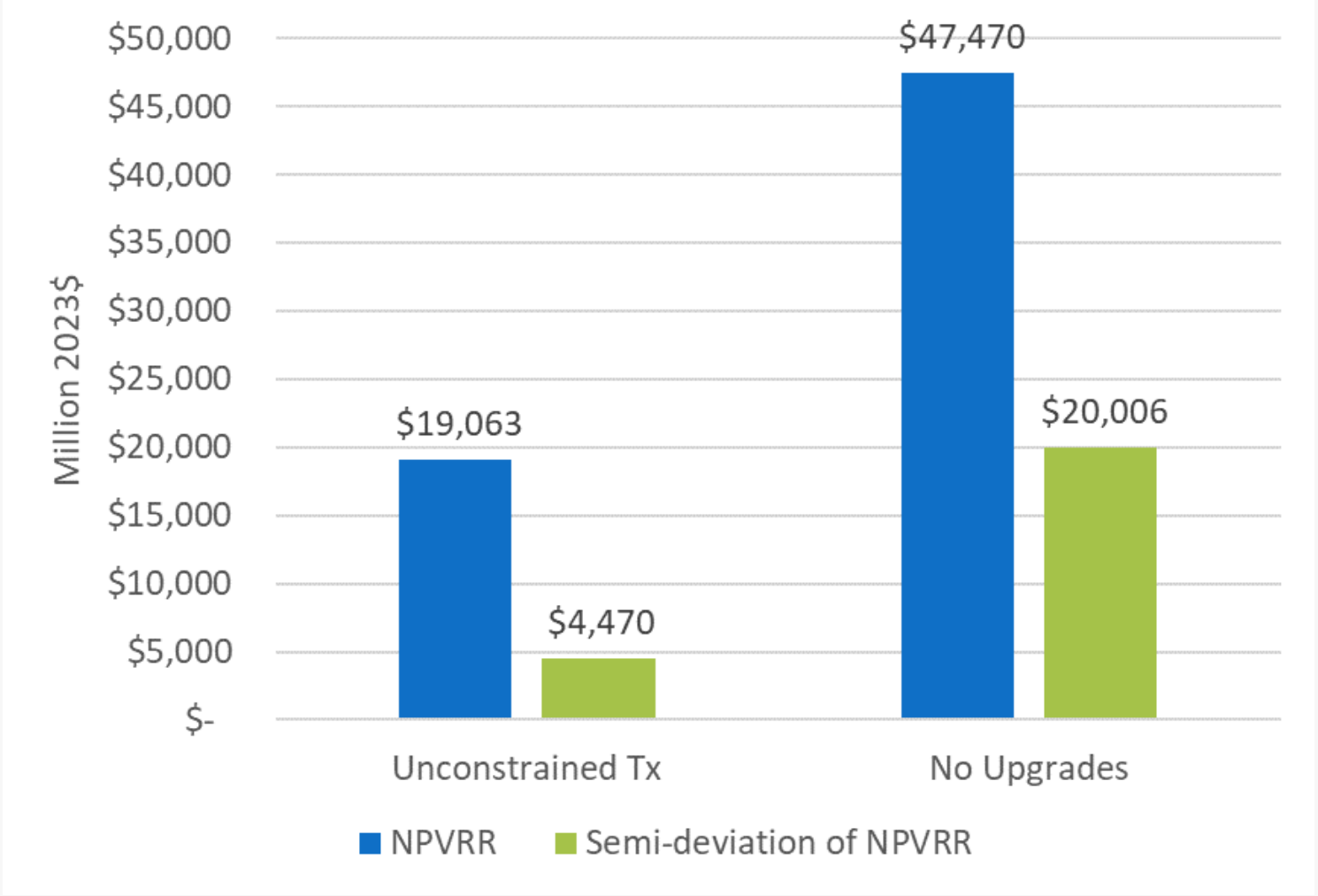
Informational Transmission Portfolios: Insights

Without transmission constraints, CBREs are not selected, only minimal additional EE is added

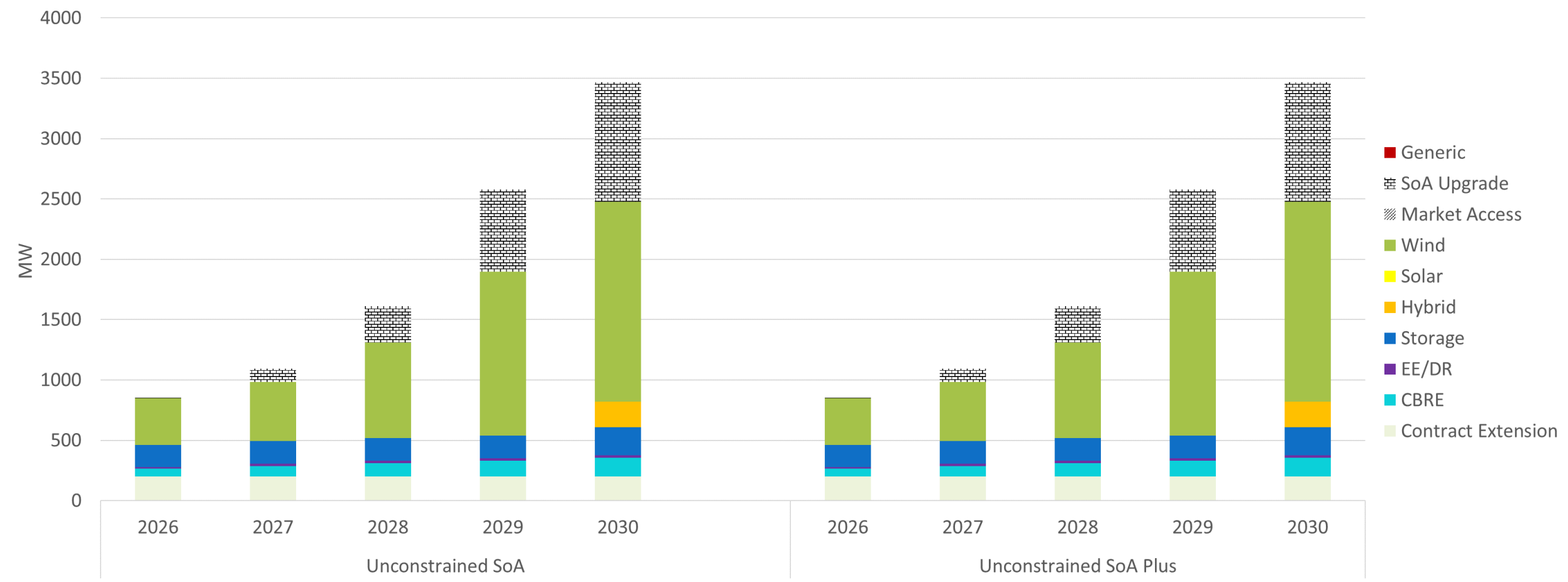
Introducing transmission constraints makes additional EE and CBREs more competitive

Not investing in transmission significantly increase portfolio costs

Even after including additional EE and DR, we see the transmission needs equivalent to 210MW of perfect capacity by 2030 growing rapidly to 1,527 MW by 2035



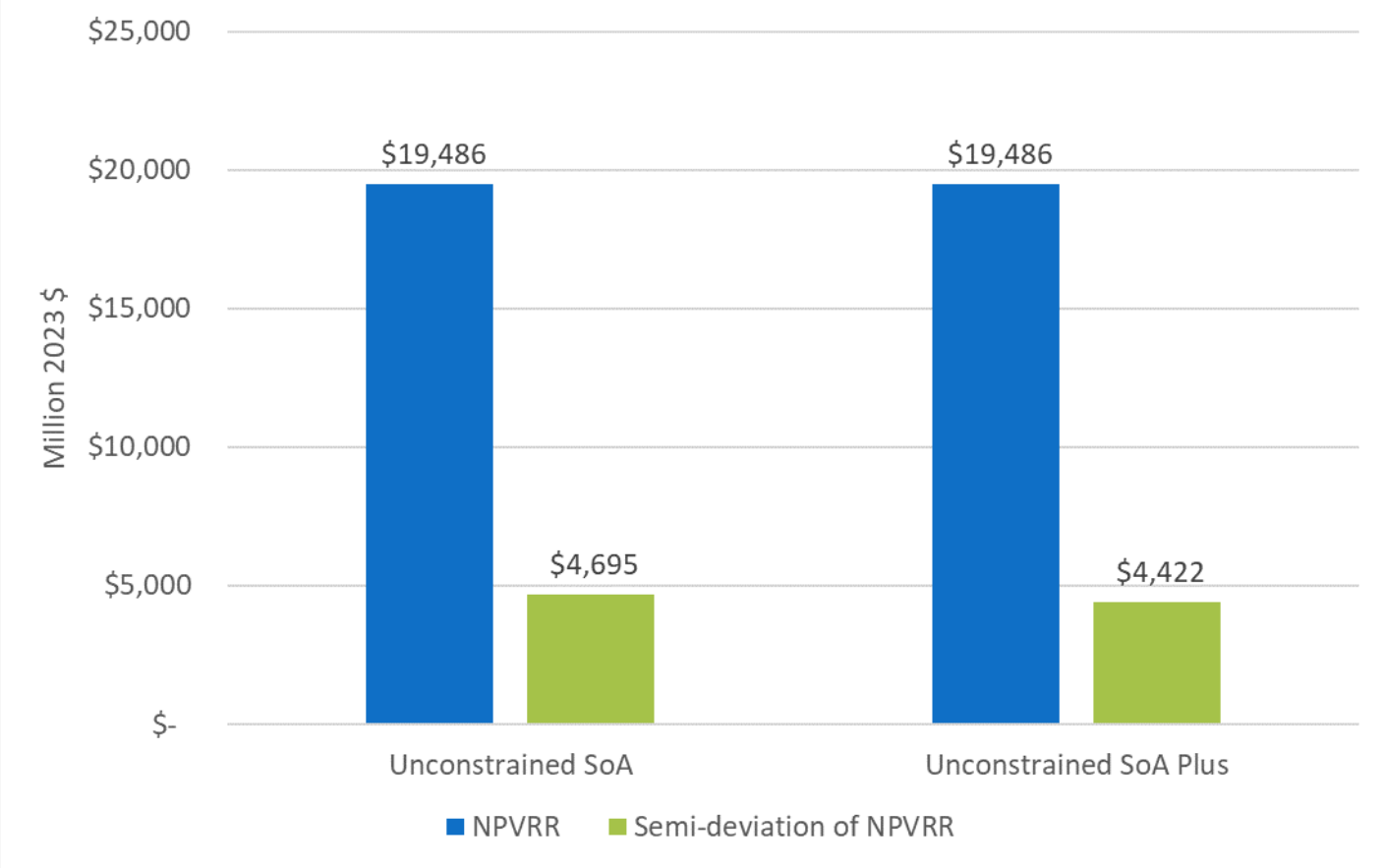
Transmission Diversity Portfolios



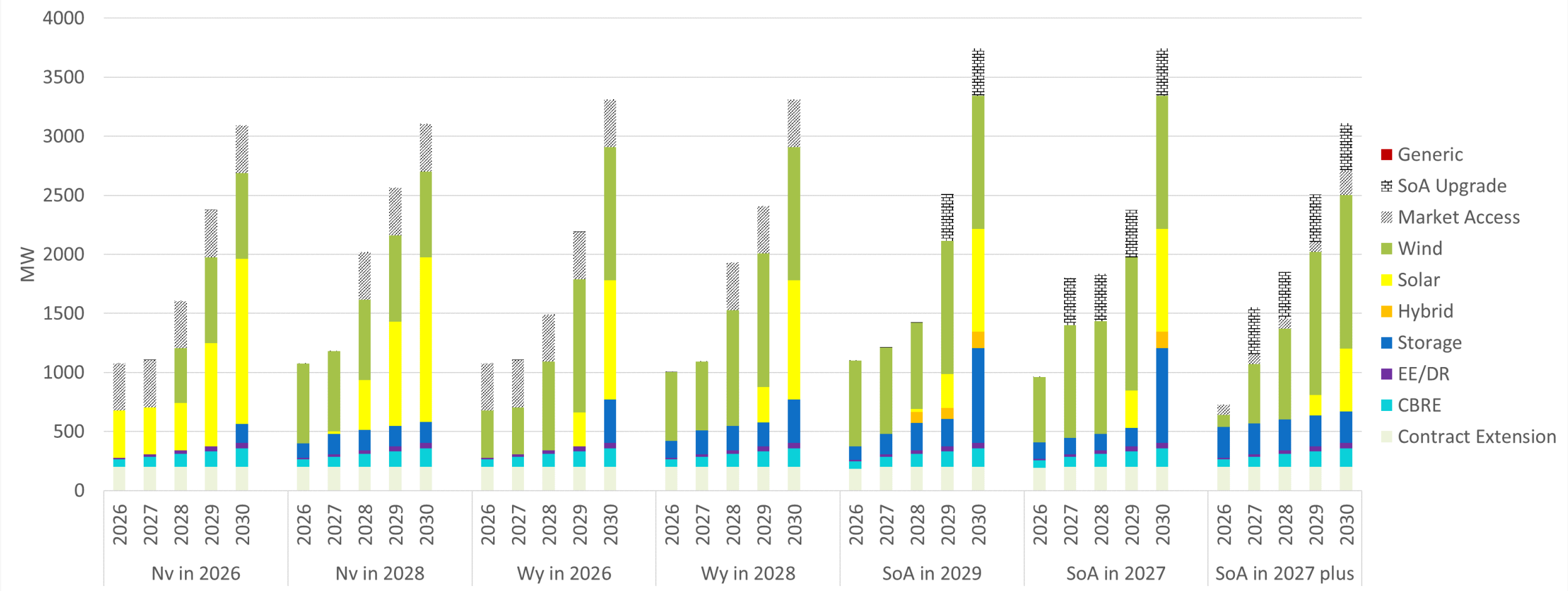
Transmission Diversity Portfolios: Insights

Increasing access to current PNW proxy resources through BPA is a sufficient condition to decarbonize reliably

Investing in additional transmission options beyond the BPA choices can reduce risk in higher need futures



Transmission Timing Portfolios: Resource Build

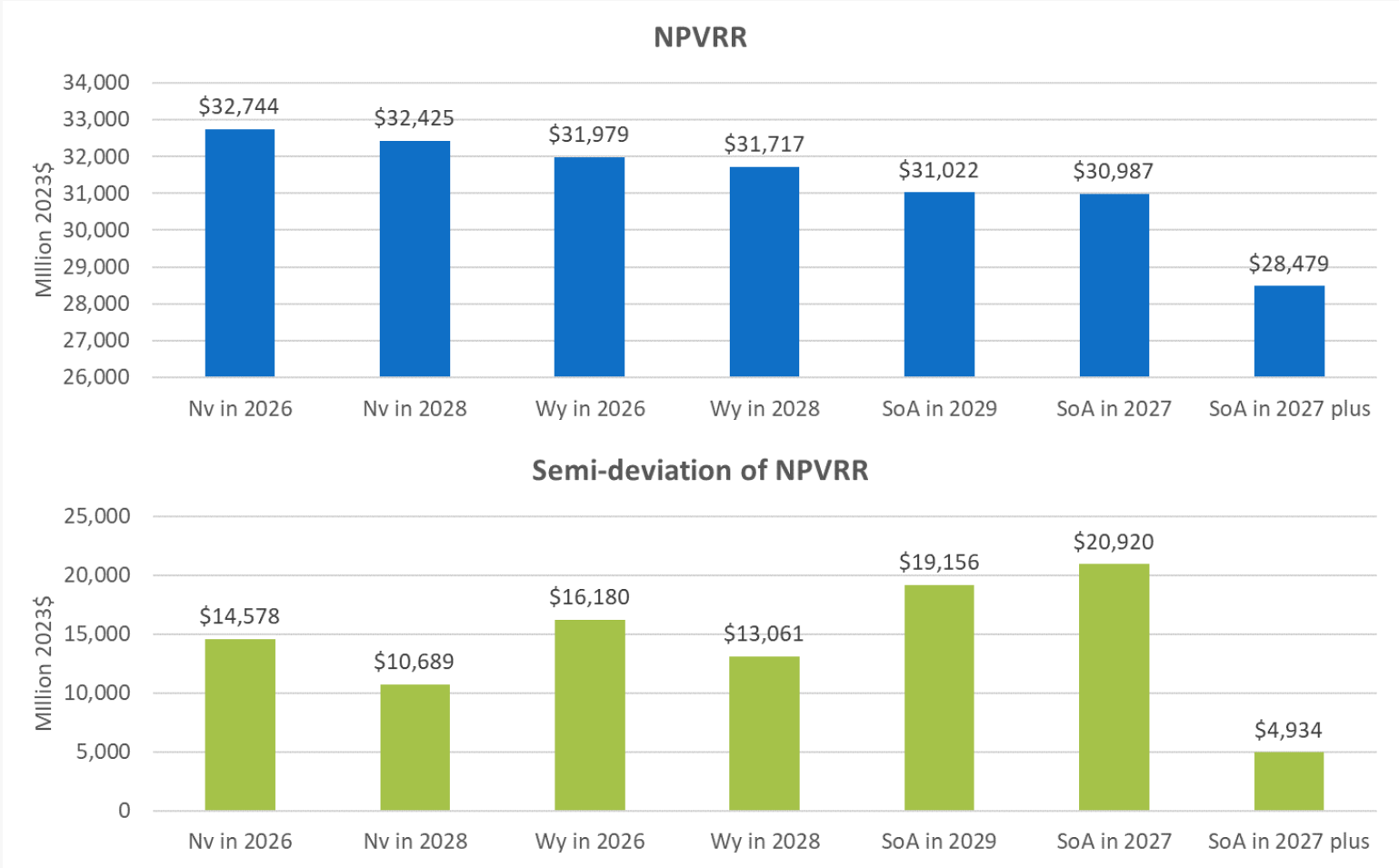


Transmission Timing Portfolios: Insights

After implementing all transmission constraints:

- Investing only in new transmission options or only increasing access to existing IRP proxy resources is sufficient to reliably decarbonize through 2030
- Actions to increase access IRP proxy resources and explore new transmission options result in least cost and least risk portfolio that meets HB2021 targets

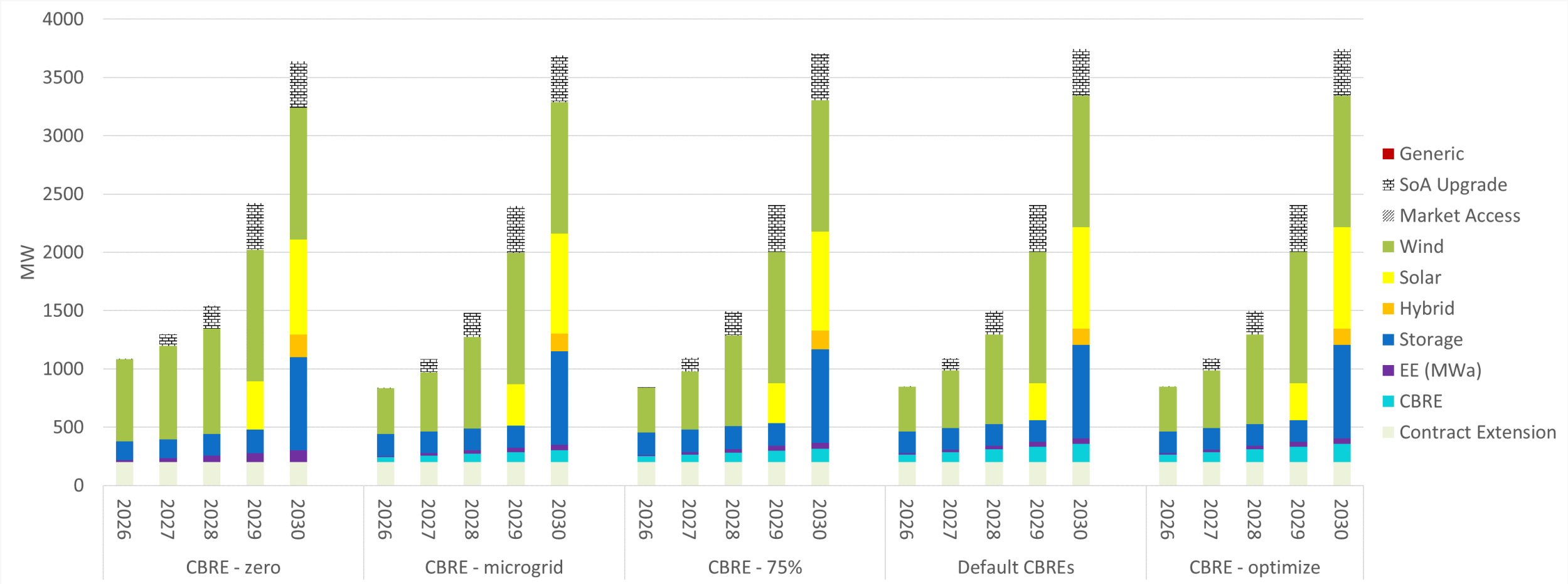
Key takeaway – The Preferred Portfolio should pursue all opportunities to increase access to current proxy resources in 2027 and include access to new transmission options in 2026 to minimize cost and risk



CBRE Portfolios

Portfolios	Portfolio Condition
Default CBREs	100% of CBRE achievable potential is selected
CBRE: 75%	75% of CBRE achievable potential is selected
CBRE: Unavailable	CBREs are unavailable
CBRE: Microgrids	Only Microgrid CBREs are available
Optimized CBREs	CBREs compete economically

CBRE Portfolios: Resource Build



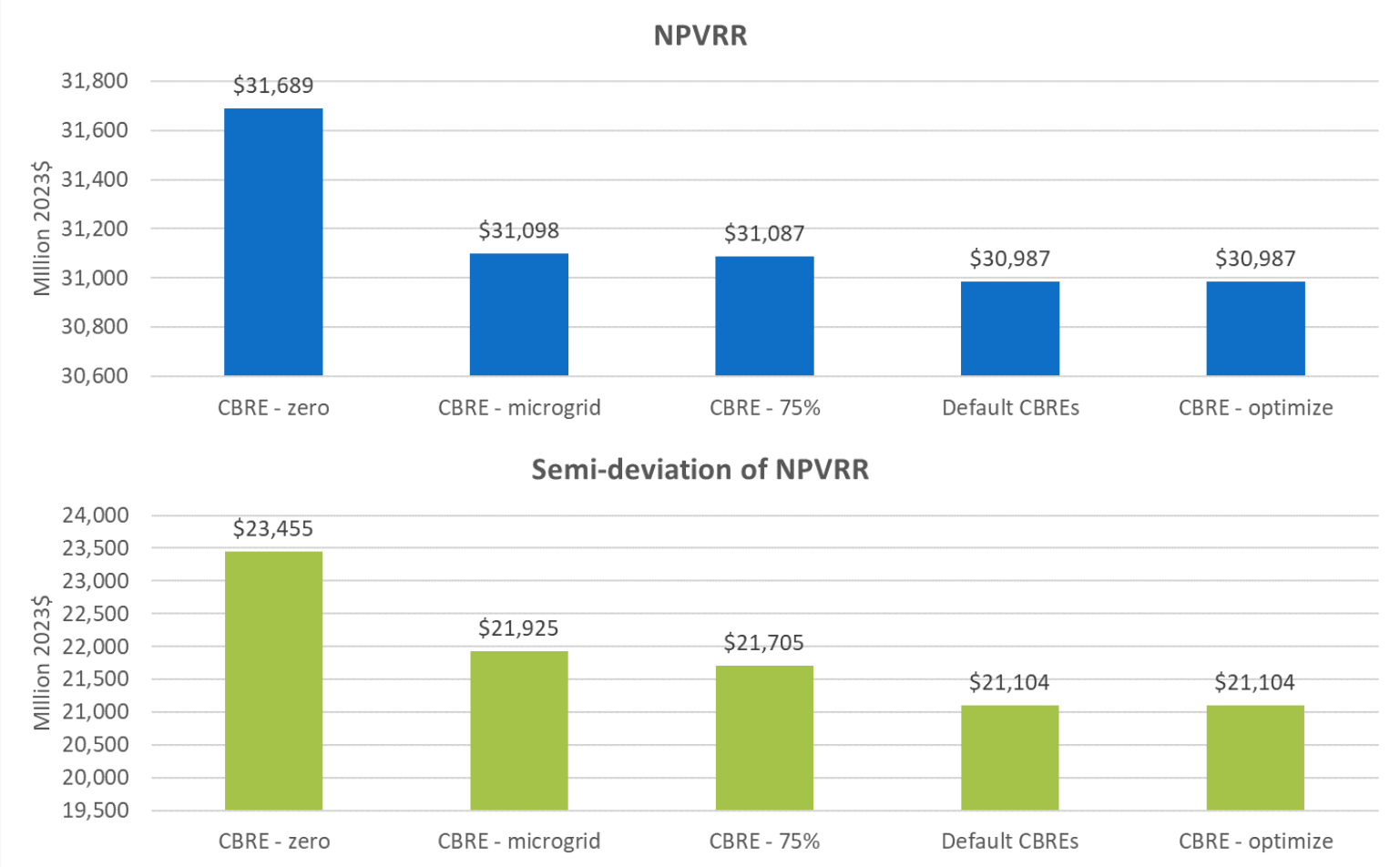
CBRE Portfolios: Insights

Distribution or sub-transmission connected CBREs can reduce cost, given transmission constraints

With the rCBI benefit and transmission constraint, 100% of the CBRE potential is selected

The Default CBRE and CBRE – Optimize portfolio provide the most community benefit based on pCBIs

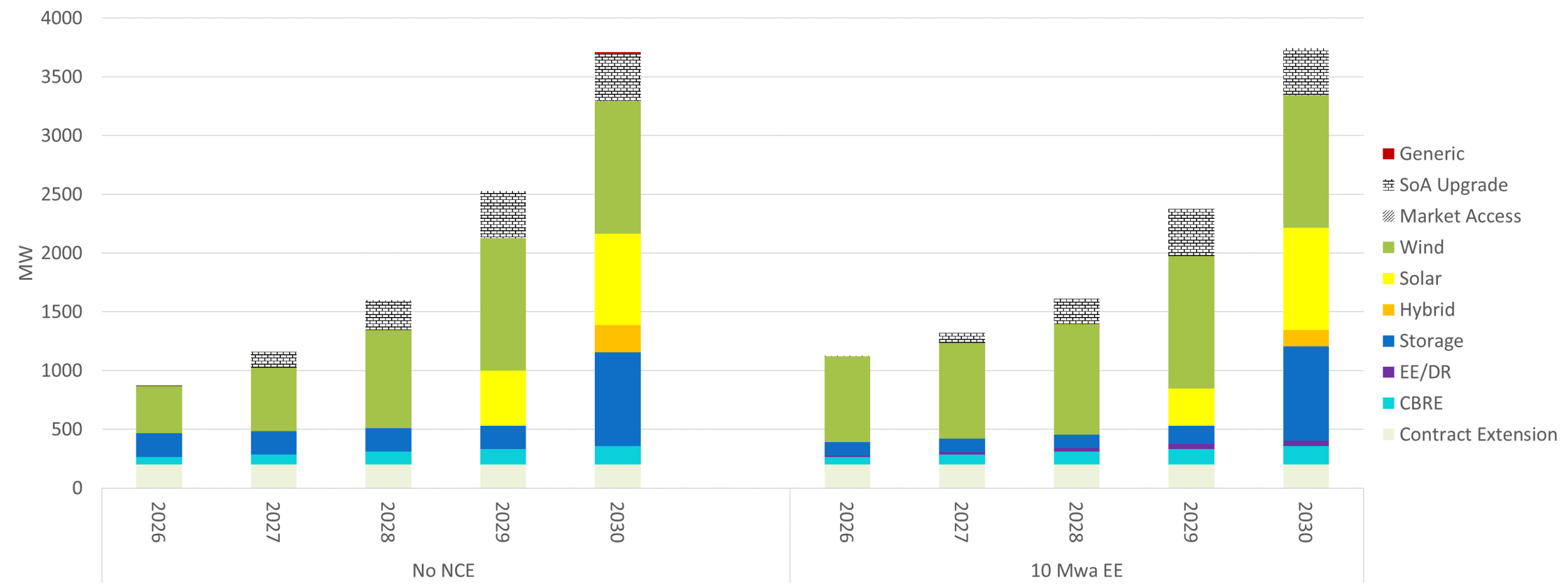
Key takeaway – The Preferred Portfolio should include 100% of CBRE potential to ensure a least cost, least risk portfolio that maximizes community benefits



Additional EE and DER Portfolios

Portfolios	Portfolio Condition
No NCE	No NCE DERs&EE available (Energy Trust and PGE cannot increase savings beyond current commitments)
10 MWa NCE EE	10MWa of NCE EE available in each year (Energy Trust increases their savings by 30%)

Additional EE and DER Portfolios: Resource Build



Additional EE and DER Portfolios: Insights

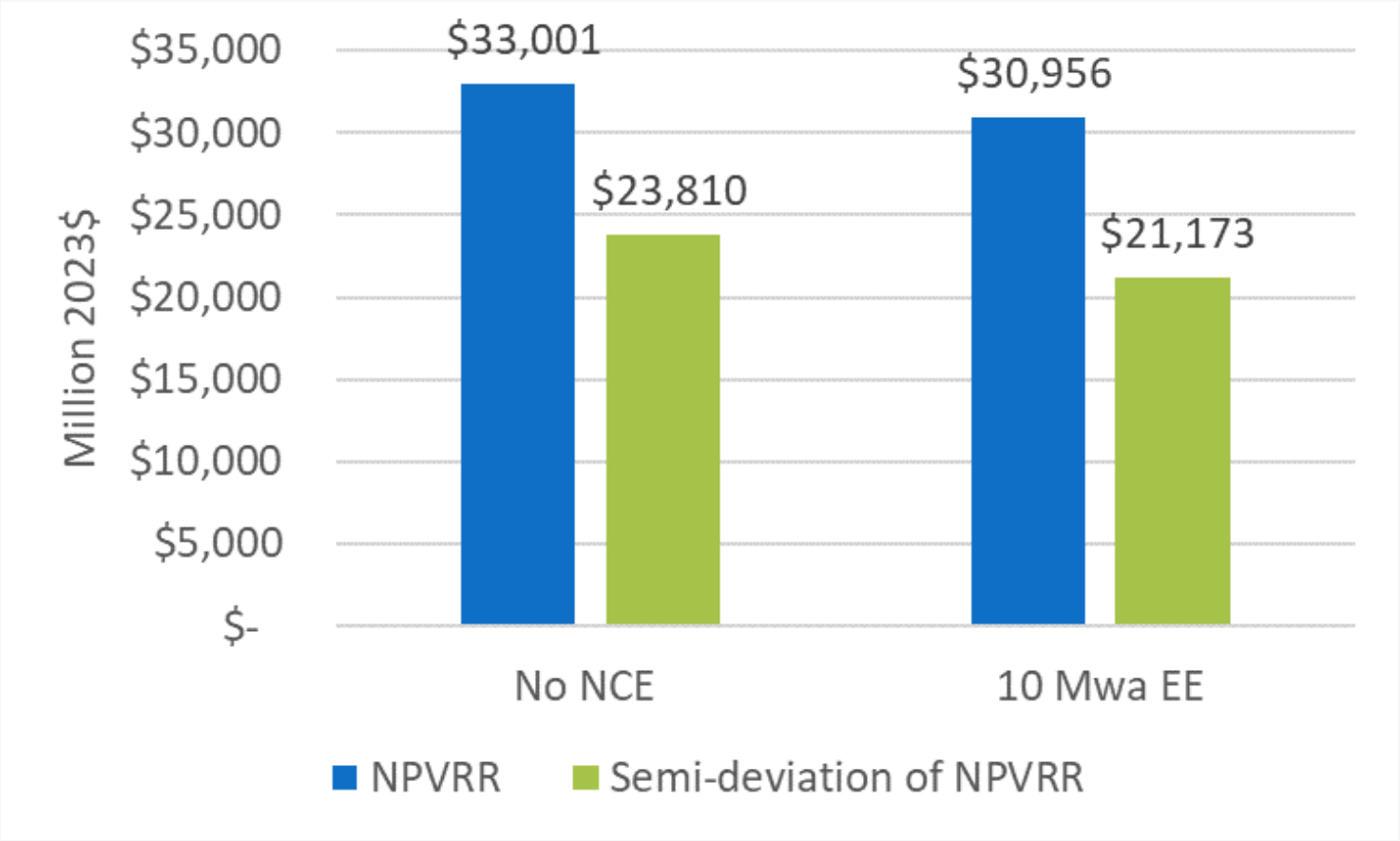
Given transmission constraints, additional EE could be an effective strategy to decrease costs and risk

Additional demand response is not chosen because of current costs and because it is a capacity product

There is procurement risk and cost pressure associated with additional quantities of EE

Key takeaway – Preferred portfolio should include the cost-effective levels of additional EE

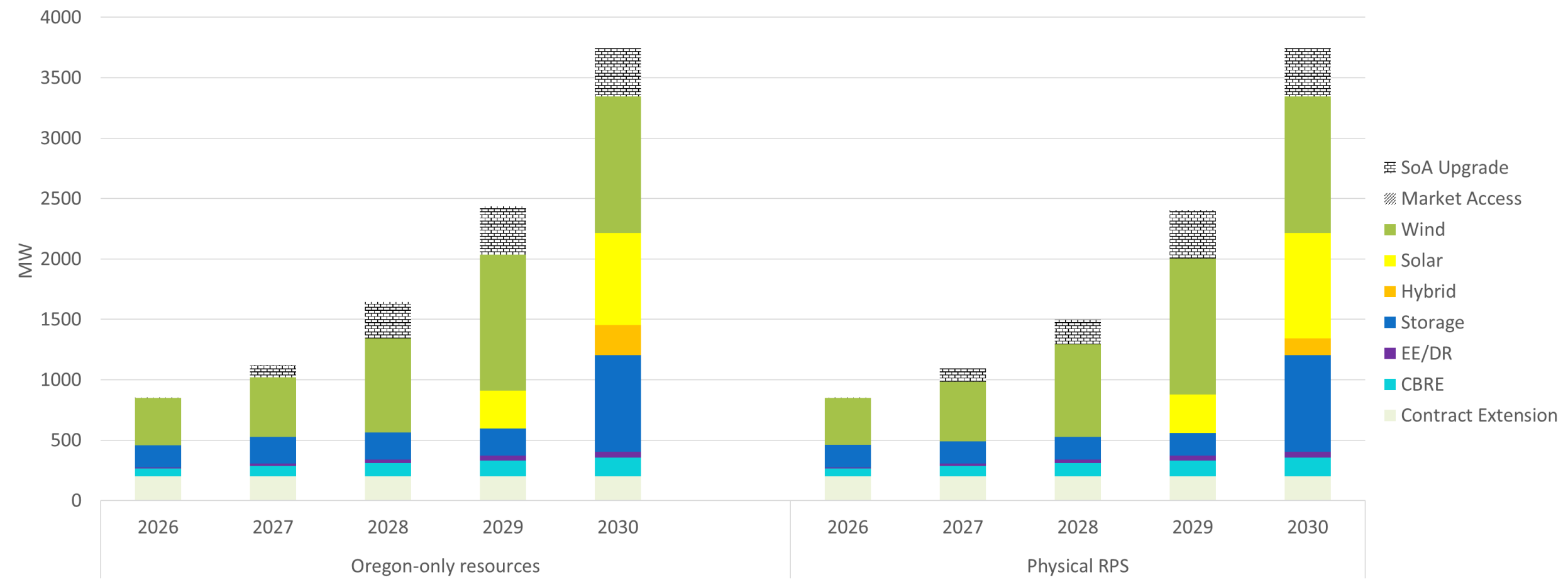
Forecasted to be 90MWa by 2028



Targeted Policy Portfolios

Portfolios	Portfolio Condition
Oregon-only resources	Limit resource availability to Oregon-sited only
Physical RPS	Enforce physical RPS compliance

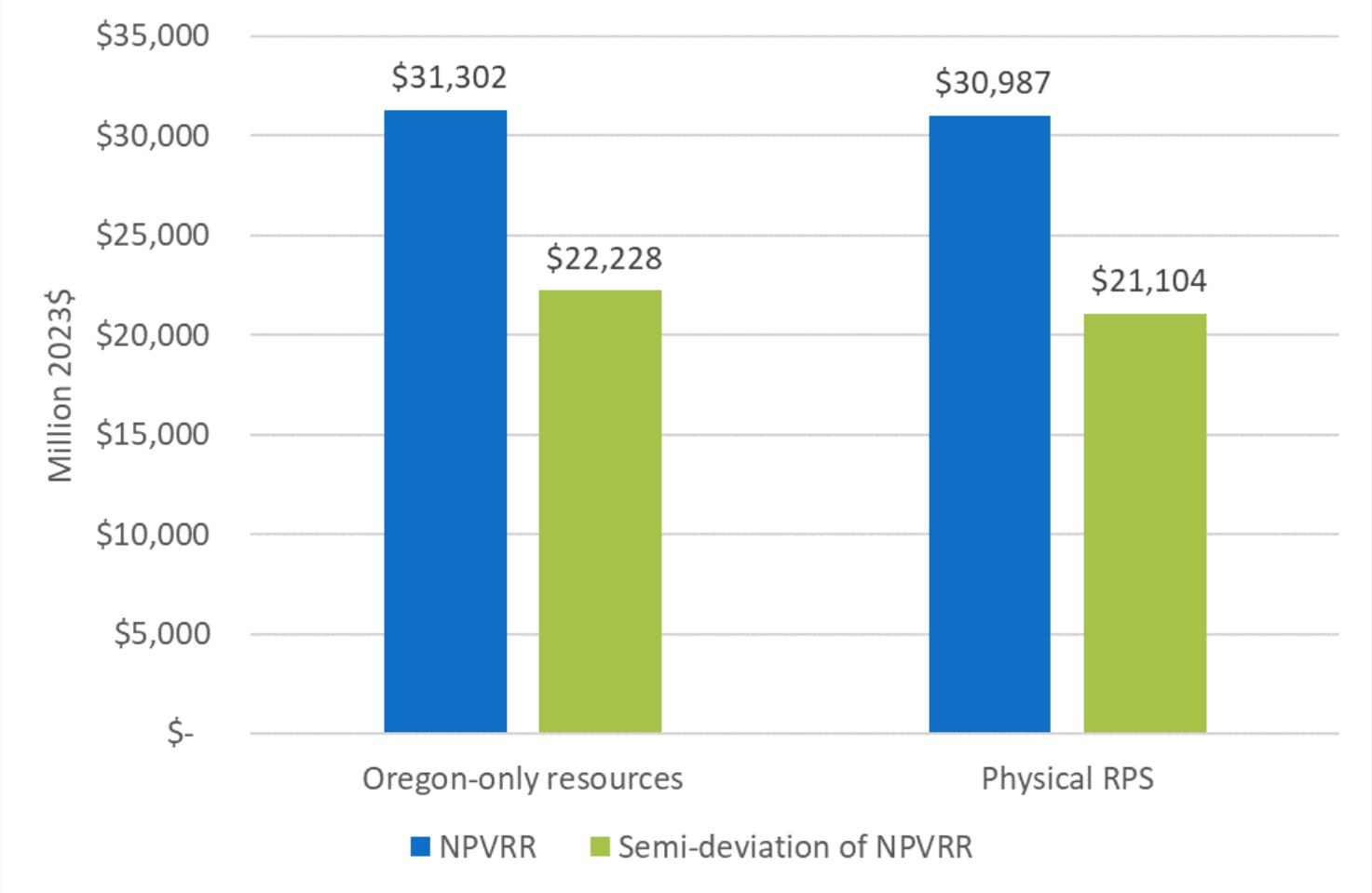
Targeted Policy Portfolios



Targeted Policy Portfolios: Insights

Reliance on Oregon-only resources increases costs and risk due to lower resource diversity

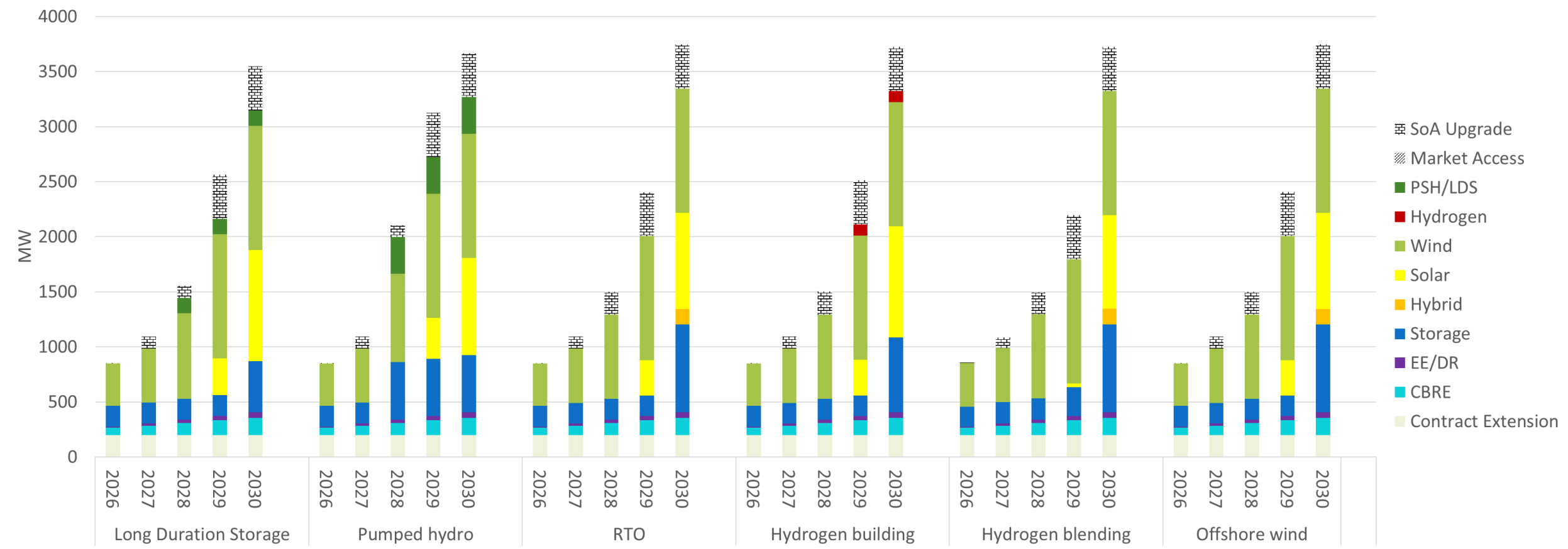
Physical RPS constraint is non-binding because of HB 2021 requirements



Emerging Technology Portfolios

Portfolios	Portfolio Condition
Pumped hydro	333 MW of PSH in 2028
Hydrogen blending	Blending of hydrogen at existing NG plants
Hydrogen building	100MW of hydrogen in 2027
Offshore wind – informational	500 MW of offshore wind in 2032
Long Duration Storage	139 MW of 24 hr battery in 2028
RTO - informational	200 MW Reduction in Capacity Need

Emerging Technology Portfolios

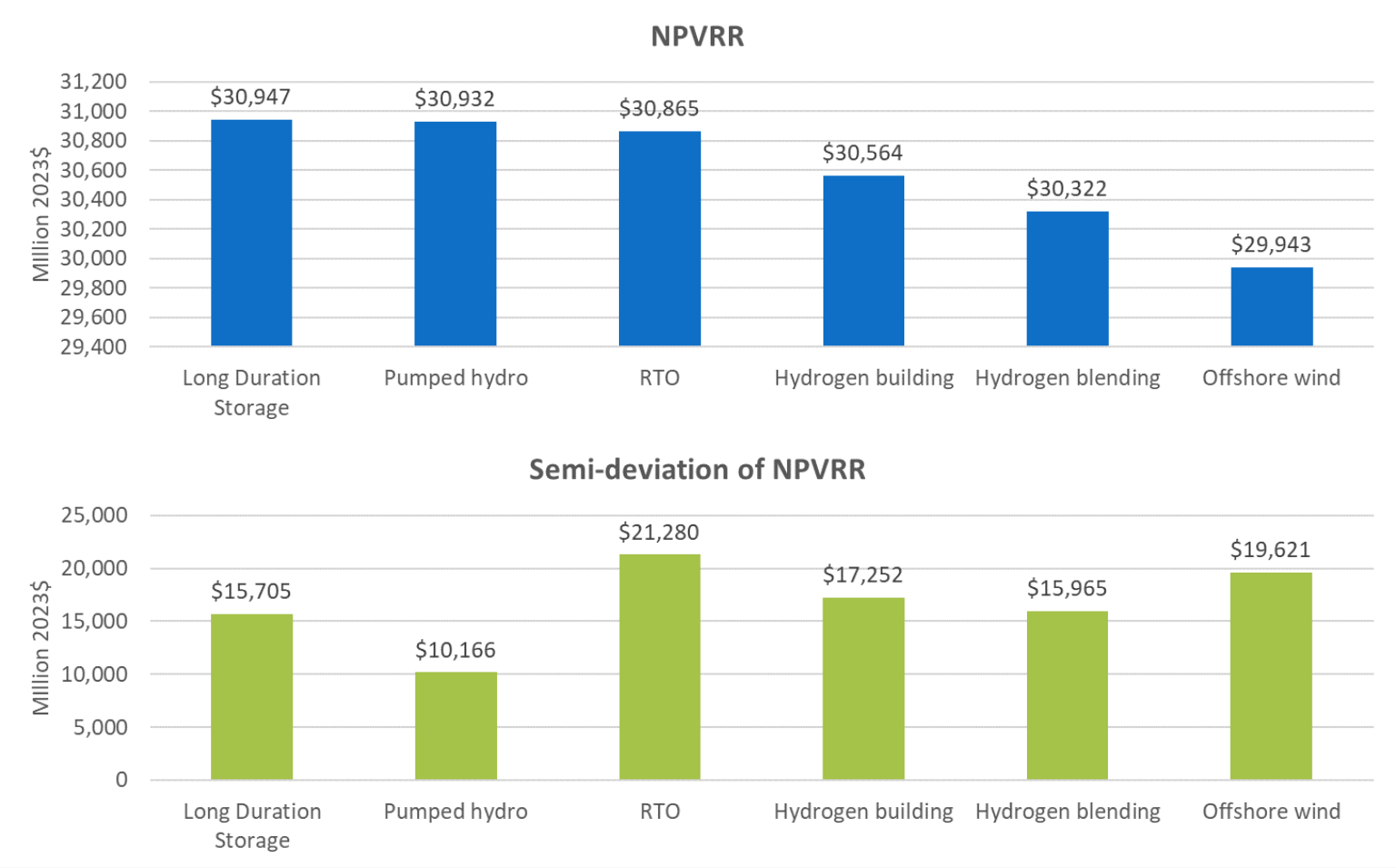


Emerging Technology Portfolios: Insights

Transmission solutions are lower cost than emerging technologies reviewed

Emerging technologies can diversify transmission risks if available in time

Key takeaway – PGE should continue exploring emerging technology as part of potential risk mitigation strategies



Resource Buildout Robustness Analysis

Resource Buildout Robustness Analysis

Purpose – to test the robustness of the 2026-2030 resource build to future technological and economic development of emerging technologies

Method of analysis – vary cost and timing of availability of Generic emerging technology resource with 50% capacity factor and 100% ELCC

Year	Cost of Generic Resource			
	$100/kW-yr	$250/kW-yr	$500/kW-yr	$1000kW-year
2029	Case 1	Case 5	Case 9	Case 13
2030	Case 2	Case 6	Case 10	Case 14
2031	Case 3	Case 7	Case 11	Case 15
2032	Case 4	Case 8	Case 12	Case 16

Compared against base case where Generic resource available in 2031 for $1000/kW-year.

All cases:

- Add 155 MW of CBREs
- Add 400 MW SoA in 2027
- Available 400 MW each of WY and NV Tx in 2026

Resource Buildout Robustness Analysis

Cost of Generic Resource	Results
$1000/kW-yr	• Resource build is unaffected though 2030, regardless of year of availability
$500/kW-yr	• Generic is only selected after 2030 • Increase in wind and transmission resources in action plan window • Decrease in solar, storage, and EE in action plan window
$250/kW-yr	• Generic Resource is added as early as 2030 • Decrease in EE, wind and Tx in action plan window • Increase in solar and hybrids in action plan window
$100/kW-yr	• Generic resource is selected in first year of availability • Substantial impacts on resource build in action plan window

Resource Buildout Robustness Analysis Takeaways

Timing

- Resource actions within the action plan window (2026-28) is driven by needs and is minimally impacted by emerging technologies
- If costs are sufficiently low, emerging technologies available after the 2030 can impact the resource build prior to 2030

Cost

- For an emerging technology to enter the portfolio prior to 2030, a competitive price will need to be under $500 per kW-year
- A price of $100/kW-year could result in approximately 500MW of emerging technology added through 2030

Takeaway

Near-term resource additions (particularly within the action plan window) are relatively robust and are low/no regret options despite potential emerging technologies that may disrupt resource additions in the long-term

Preferred Portfolio

Nihit Shah

Preferred Portfolio

Created based on key insights gained through analysis of 40 portfolios:

Linear decarbonization glidepath from 2026-2030

Balances cost and risk and the rate of GHG reductions

Select 100% of CBREs available

Minimizes cost and maximizes community benefit

Incorporates 'cost-effective' quantities of EE and DR

Minimizes cost and risk

400 MW of South Alston congestion relief in 2027

Minimizes cost and ensure reliability

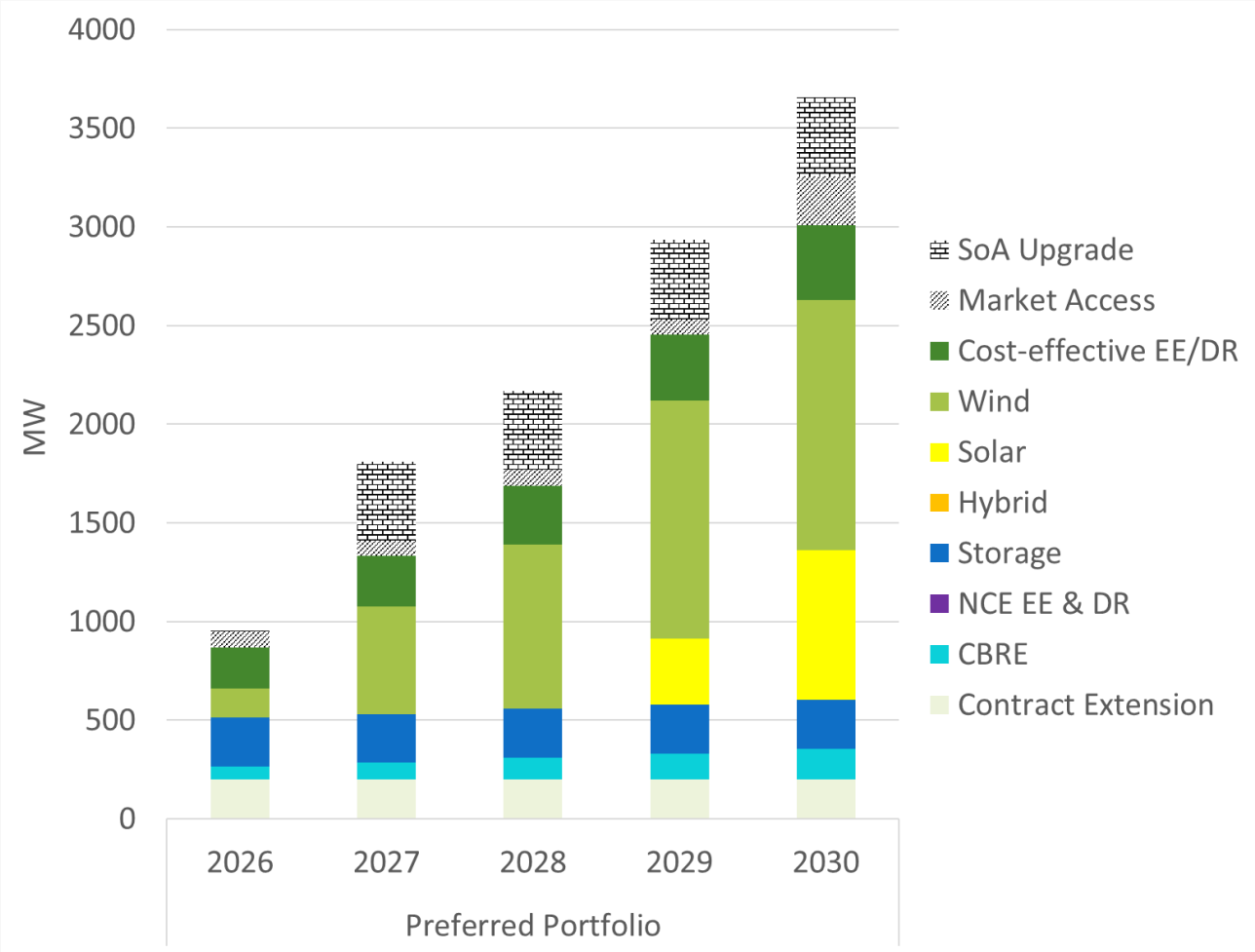
Access to 400 MW each of NV and WY Tx starting in 2026

Minimizes cost and risk

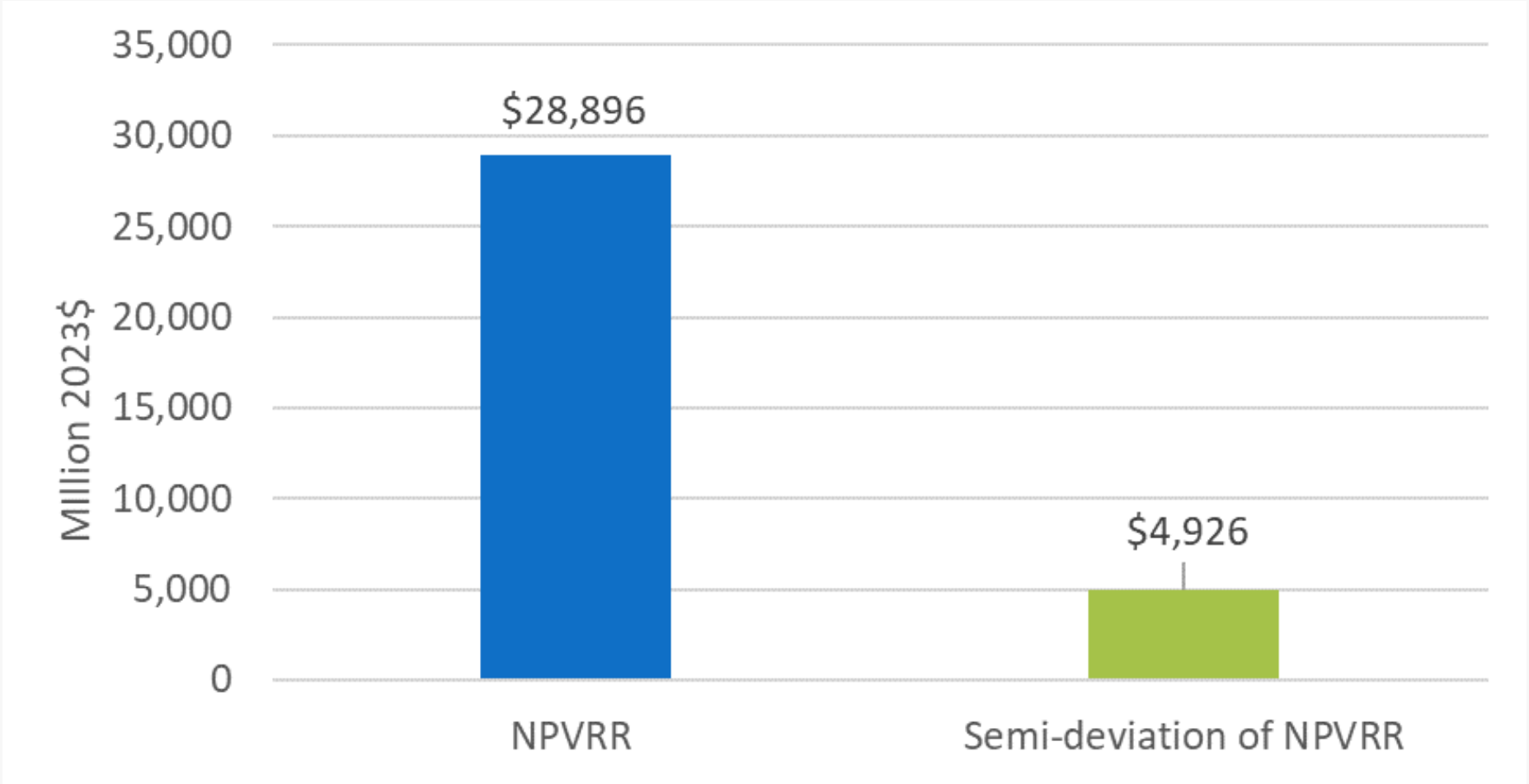
Preferred Portfolio: Resource Build

Cumulative Resource Additions (MW)					
	2026	2027	2028	2029	2030
Wind	146	546	833	1207	1269
Solar	0	0	0	332	758
Hybrid	0	0	0	0	0
Storage	247	247	247	247	247
CBRE	66	85	110	132	155
WY Tx	79	79	79	79	141
NV Tx	0	0	0	0	109
SoA Tx	0	400	400	400	400
NCE EE & DR	0	0	0	0	0
Cost-effective EE (MWa)*	30	60	90	123	156
Cost-effective DR*	180	195	208	213	223

** Estimates of system need have already incorporated forecasts of cost-effective EE & DR – these are shown here for informational purposes*



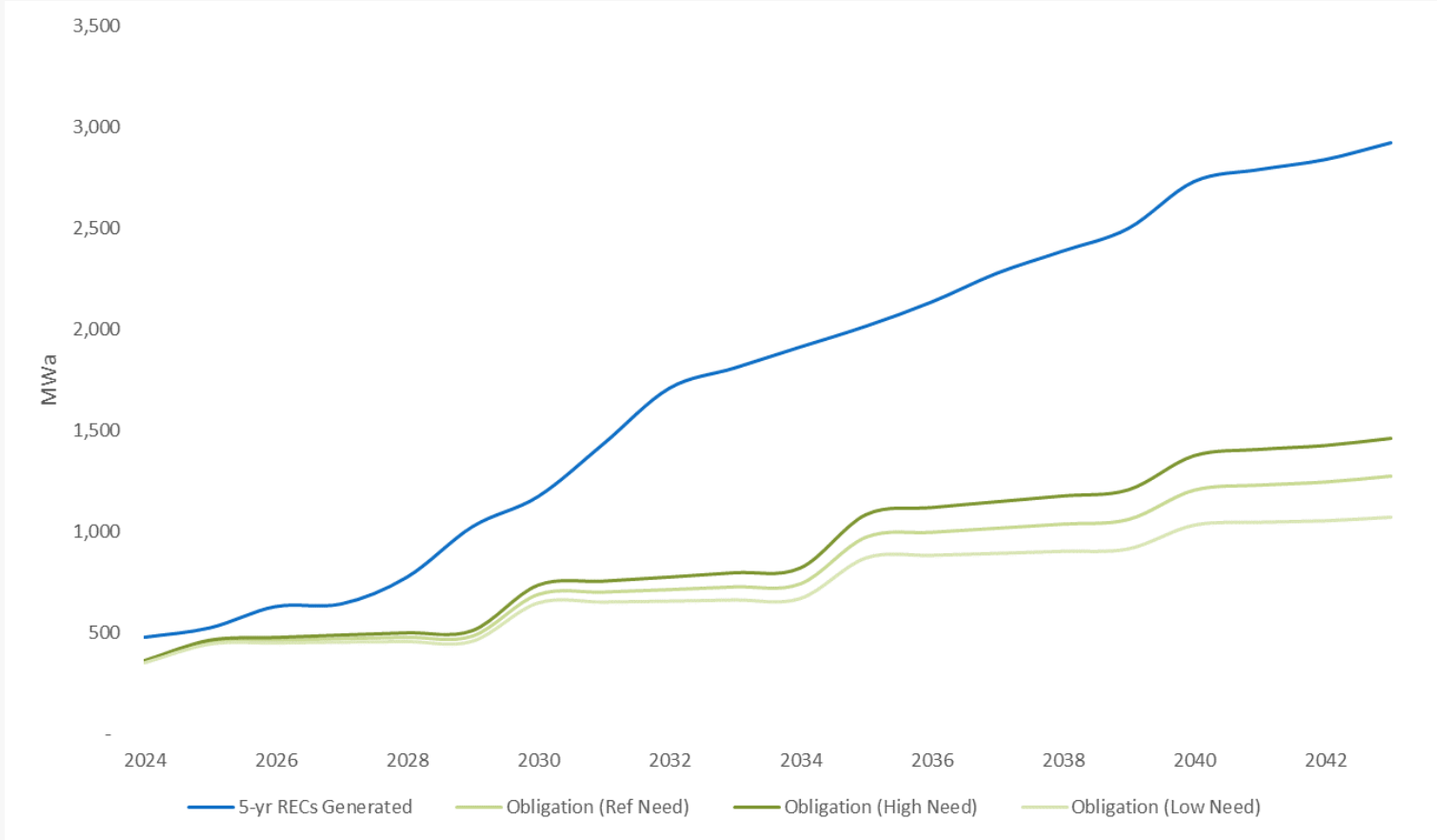
Preferred Portfolio: Cost and Risk Metrics



Preferred Portfolio: Resulting RPS Position

Generation of RECs from existing and incremental RPS resources in the Preferred portfolio is forecasted to enable PGE to be compliant with RPS requirements.

Because of the need to build new non-emitting resources to comply with HB 2021, the number of RECs forecast to be generated by PGE's portfolio will exceed RPS requirements.

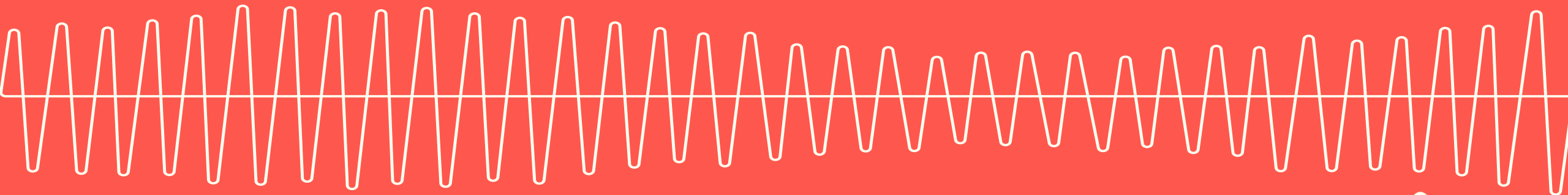


QUESTIONS/ DISCUSSION

WAIVER/IRP FILING UPDATE

SETH WIGGINS

ROUNDTABLE 23-1



PGE WAIVER REQUEST OF DRAFT IRP

PGE has requested a waiver of guideline 2(c)

> Guideline 2(c) states that "[t]he utility must provide a draft IRP for public review and comment prior to filing a final plan with the Commission."

Filed: November 22, 2022, https://edocs.puc.state.or.us/efdocs/HAO/lc73hao135925.pdf

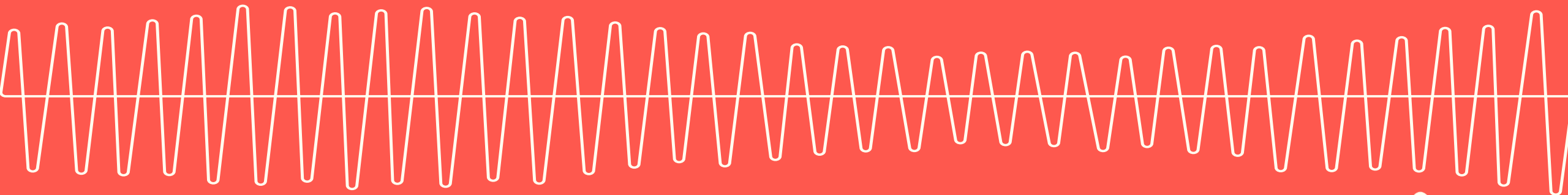
Staff recommended, PGE supported, and the Commission approved a partial waiver

- IRP Filing Date: March 31, 2023 (Order 21-422)
- Initial comments 30 days following filing, PGE's response 30 days after comments
- Aim to complete docket by end of 2023

DRAFT ACTION PLAN

SETH WIGGINS

ROUNDTABLE 23-1



Five Components of IRP/CEP Action Plan

The IRP/CEP Action has five main components

1. Customer Actions
2. Community Based Renewable Energy Action
3. Energy Action
4. Capacity Action
5. Transmission Expansion

1. Customer Actions

i. Energy Efficiency

- Acquire all cost-effective EE - ETO forecasts a cumulative 90 MWa 2026-2028 (*estimates from ETO)*

ii. Demand Response*

- Incorporate customer additions of 211/158 MW of summer/winter DR by 2028 (*estimates from DSP pt. II*)

2. Community-Based Renewable Energy Action

CBREs are renewable energy systems that promote climate resilience and:

- Provide direct community benefit through a benefits agreement or ownership; or
- Result in increased resiliency or community stability, local jobs, economic development or direct energy cost savings to families and small businesses.

Conduct an RFP for community-based renewable energy resources (CBREs)

- Set up a new RFP process focused on CBREs procurement
- Evaluation and scoring of projects led by communities
- Community benefits are a key element of the scoring matrix

Action plan target is 66 MW in 2026

Our target is to achieve 155 MW of CBREs by 2030

- Aligned with Multnomah County and city of Portland goals

3. Energy Action

Conduct an RFP for non-emitting energy resources

Current Reference Case 2030 energy need: 872 MWa

Assuming a consistent yearly acquisition, PGE needs to add 174 MWa (872 MWa/5 years) per year

- This action assumes the forecasted cost-effective levels of EE and DR will materialize

CBRE additions could reduce this 2030 need by up to a total of ~30 MWa (to 842 MWa)

4. Capacity Action

Initiate an RFP to meet 2026 capacity needs

Current reference 2026 capacity need: 506 MW summer, 429 MW winter

This will take a staged approach. Simultaneously, PGE will:
1. Pursue cost-competitive options in the bilateral market
2. Acquire and incorporate customer and CBRE resources

Then, PGE will:
3. Conduct RFP for remaining 2026 capacity needs

The capacity action will ensure near-term resource adequacy is maintained

5. Transmission Expansion

Request Commission acknowledgement that additional transmission capacity on- and off- system is needed

Current estimates of existing transmission system suggest insufficient transmission capacity available to support the acquisition of off-system resources required for 2030 and beyond

Pursuing options to upgrade Bethel-Round Butte line (from 230 kV to 500 kV)

This option provides near-term relief to transmission constraints and opens access to a diverse set of resources for future PGE load service

Continue to study additional transmission expansion options

Commission acknowledgement will provide flexibility in our exploration of expanded transmission options

QUESTIONS/ DISCUSSION

NEXT STEPS

A recording from today's webinar will be available in one week

Upcoming Roundtables:

- February 23
- March TBD

Upcoming IRP Filing Date:

- March 31, 2023

THANK YOU

CONTACT US AT:
IRP@PGN.COM

An

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kind of energy

PGE

ACRONYMS

CBI (iCBI, rCBI, pCBI): community benefit indicators
CEP: clean energy plan
ETO: energy trust of Oregon
CBRE: community based renewable energy
RFP: request for proposal
MYP: multi-year plan
DSP: distribution system plan
EJ: environmental justice
EE: energy efficiency
GHG: greenhouse gas
ODOE: Oregon department of energy
CBIAG: community benefits and impacts advisory group
LOLH: loss of load hours
DR: demand response
HB2021: House Bill 2021

MW: megawatt
ELCC: effective load carrying capacity
MWa: mega watt average
kW: kilowatt
RPS: renewable portfolio standard
Tx: Transmission
BPA: Bonneville Power Administration
NCE: non-cost effective
NPVRR: net present value revenue requirement
PSH: pumped storage hydro
NG: natural gas
SoA: South of Allston
REC: renewable energy credit
VPP: virtual power plan

12:30 – 1:00 pm BREAK