2022 Integrated Resource Plan (IRP)

Public Advisory Meeting #4

9/19/2022

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Agenda and Introductions

Stewart Ramsay, Managing Executive, Vanry & Associates

Agenda

Time	Topic	Speakers
Morning **Starting at 10:00 AM**	Virtual Meeting Protocols and Safety	Chad Rogers, Director, Regulatory Affairs, AES Indiana
	Welcome and Opening Remarks	Kristina Lund, President & CEO, AES Indiana
	Stakeholder Presentations	Bhawramaett Broehm, Market Development Analyst, Wartsila Marcus Nichol, Senior Director, Nuclear Energy Institute
	IRP Schedule & Timeline	Erik Miller, Manager, Resource Planning, AES Indiana
	IRP Framework Review & Modeling Updates	Erik Miller, Manager, Resource Planning, AES Indiana
	Retirement & Replacement Analysis Results	Erik Miller, Manager, Resource Planning, AES Indiana
Break **12:00 PM – 12:30 PM**	Lunch	
Afternoon **Starting at 12:30 PM**	Replacement Resource Cost Sensitivity Analysis Results	Erik Miller, Manager, Resource Planning, AES Indiana
	Preliminary IRP Scorecard Results	Erik Miller, Manager, Resource Planning, AES Indiana
	Final Q&A and Next Steps	

Virtual Meeting Protocols and Safety

Chad Rogers, Director, Regulatory Affairs, AES Indiana

IRP Team Introductions

AES Indiana Leadership Team

Kristina Lund, President & CEO, AES Indiana

Aaron Cooper, Chief Commercial Officer, AES Indiana

Brandi Davis-Handy, Chief Customer Officer, AES Indiana

Tanya Sovinski, Senior Director, Public Relations, AES Indiana

Ahmed Pasha, Chief Financial Officer, AES Indiana

Tom Raga, Vice President Government Affairs, AES Indiana

Sharon Schroder, Senior Director, Regulatory Affairs, AES Indiana

Kathy Storm, Vice President, US Smart Grid, AES Indiana

AES Indiana IRP Planning Team

Joe Bocanegra, Load Forecasting Analyst, AES Indiana

Erik Miller, Manager, Resource Planning, AES Indiana

Scott Perry, Manager, Regulatory Affairs, AES Indiana

Chad Rogers, Director, Regulatory Affairs, AES Indiana

Mike Russ, Senior Manager, T&D Planning & Forecasting, AES Asset Management

Brent Selvidge, Engineer, AES Indiana

Will Vance, Senior Analyst, AES Indiana

Kelly Young, Director, Public Relations, AES Indiana

AES Indiana IRP Partners

Annette Brocks, Senior Resource Planning Analyst, ACES

Patrick Burns, PV Modeling Lead and Regulatory/IRP Support, Brightline Group

Eric Fox, Director, Forecasting Solutions, Itron

Jeffrey Huber, Overall Project Manager and MPS Lead, GDS Associates

Jordan Janflone, EV Modeling Forecasting, GDS Associates

Patrick Maguire, Executive Director of Resource Planning, ACES

Hisham Othman, Vice President, Transmission and Regulatory Consulting, Quanta Technology

Stewart Ramsey, Managing Executive, Vanry & Associates

Mike Russo, Forecast Consultant, Itron

Jacob Thomas, Market Research and End-Use Analysis Lead, GDS Associates

Melissa Young, Demand Response Lead, GDS Associates

Danielle Powers, Executive Vice President, Concentric Energy Advisors

Meredith Stone, Senior Project Manager, Concentric Energy Advisors

AES Indiana Legal Team

Nick Grimmer, Indiana Regulatory Counsel, AES Indiana

Teresa Morton Nyhart, Counsel, Barnes & Thornburg LLP

Welcome to Today’s Participants

Advanced Energy Economy
Alliance Coal
Barnes & Thornburg LLP
Bose, McKinney & Evans LLP
CenterPoint Energy
Citizens Action Coalition
City of Indianapolis
Clean Grid Alliance
Demand Side Analytics
Develop Indy | Indy Chamber
Energy Futures Group
Faith in Place
Hallador Energy
Hoosier Energy
Hoosier Environmental Council
IBEW Local Union 1395
Indiana Chamber
Indiana DG
Indiana Distributed Energy Alliance
Indiana Energy Association
Indiana Office of Energy Development
Indiana Utility Regulatory Commission
Indiana State Conference of the NAACP

IUPUI
M&G
Midwest Energy Efficiency Alliance
Midcontinent Independent System Operator (MISO)
NIPSCO
Nuclear Energy Institute
NuScale Power
Office of Utility Consumer Counselor
Power Takeoff
Purdue - State Utility Forecasting Group
Ranger Power
Rolls-Royce/ISS
Sierra Club
Solar United Neighbors
UUI Green Team
Wartsila

… and members of the AES Indiana team and the public!

Virtual Meeting Best Practices

Questions

- Your candid feedback and input is an integral part to the IRP process.
- Questions or feedback will be taken at the end of each section.
- Feel free to submit a question in the chat function at any time and we will ensure those questions are addressed.

Audio

- All lines are muted upon entry.
- For those using audio via Teams, you can unmute by selecting the microphone icon.
- If you are dialed in from a phone, press *6 to unmute.

Video

- Video is not required. To minimize bandwidth, please refrain from using video unless commenting during the meeting.

AES Purpose & Values

Accelerating the future of energy, **together**.

Safety first

Highest standards

All together

Safety First

1. AES Indiana strives to provide a place of employment that is free from recognized hazards and one that meets or exceeds governmental regulations regarding occupational health and safety.

2. AES Indiana considers occupational health and safety a fundamental value of the organization and is a key performance indicator of the overall success of the company.

3. AES Indiana's ultimate objective is that each day all AES Indiana people, contractors, and the public we serve return home to their family, friends, and community free from harm.

IRP Overview

Advisory Meeting #1 (January 24): AES Indiana Resource Planning team recapped the 2019 IRP Short-Term Action Plan, introduced the IRP resource planning process and model overview, and highlighted existing resources, replacement resource options and future IRPs.

Advisory Meeting #2 (April 12): AES Indiana Resource Planning team presented load scenarios, results of the market potential study, commodity forecasts and distribution system planning items, and shared additional analysis of reliability that will give insight into how AES Indiana is working to ensure any changes to its portfolio maintain reliable service 24/7/365 for its customers.

IRP Overview

Advisory Meeting #3 (June 27): AES Indiana's Resource Planning team discussed system planning and RTO reliability planning, presented content on modeling reliability, and provided an overview of Portfolio metrics and scorecard. We welcomed presentations from MISO, Sierra Club and Faith in Place.

Today, the AES Indiana Resource Planning team will cover results from preliminary core IRP modeling and the scorecard, which evaluates multiple strategies and scenarios using defined cost, environmental, reliability and risk metrics.

We thank you for your input into this important process!

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AES Indiana and the IRP

- The IRP is a unique opportunity for AES Indiana to engage with our customers, communities and stakeholders to analyze our energy future, together.

- The in-depth analysis and stakeholder input will position AES Indiana to best serve our customers' needs today and well into the future.

AES Indiana and Our Stakeholders

- The IRP process has allowed us to engage with many stakeholders through our Advisory Meetings and Technical Meetings and through their participation, questions, input and stakeholder presentations.

- We are listening and taking feedback seriously. Through our collaboration, the IRP team has:
  - Evaluated all feedback
  - Added the Clean Energy Strategy
  - Worked collaboratively with stakeholders on key inputs

Meeting our customers’ needs today and tomorrow

AES Indiana
is leading the
inclusive,
clean energy
transition.

Reliability

Affordability

Sustainability

Stakeholder Presentations

Bhawramaett Broehm, Market Development Analyst, Wartsila

Stakeholder Presentations

Marcus Nichol, Senior Director, Nuclear Energy Institute

IRP Schedule & Timeline

Erik Miller, Manager, Resource Planning, AES Indiana

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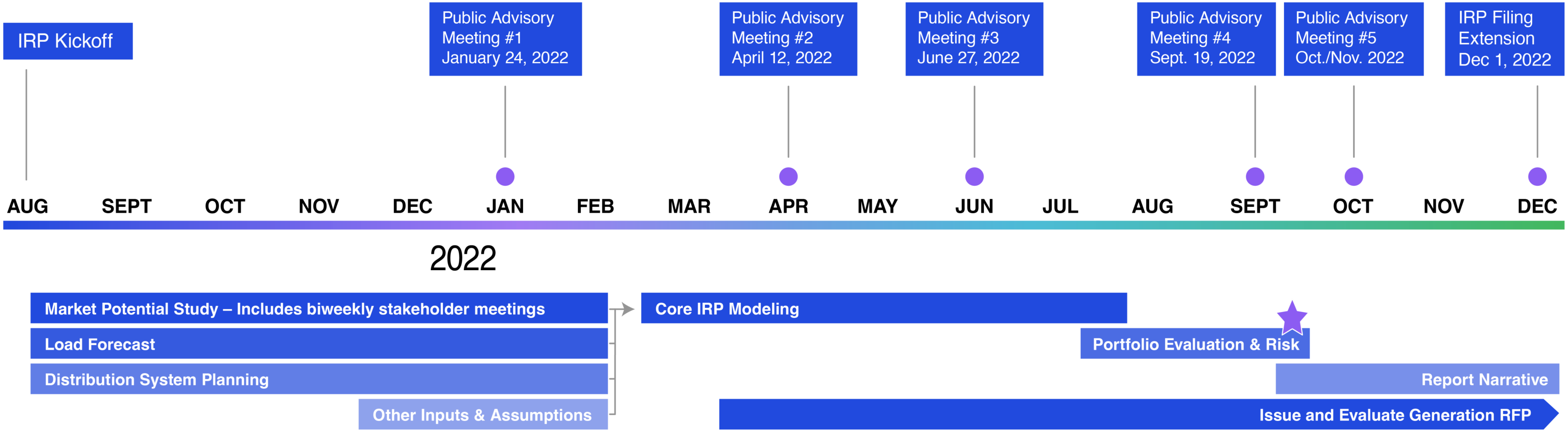
Updated 2022 IRP Timeline



● = Stakeholder Technical Meeting for stakeholders with executed NDAs held the week before each public stakeholder meeting

★ = Preferred Resource Portfolio selected

AES Indiana is available for additional touchpoints with stakeholders to discuss IRP-related topics.

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Public Advisory Schedule

Public Advisory Meeting #1 – January 24, 2022

- 2022 IRP Schedule & Progress
- 2019 IRP Recap
- Load, EV, DG Forecasts
- MPS Overview

Public Advisory Meeting #2 – April 12, 2022

- Load Scenarios
- MPS Results & DSM Inputs
- Replacement Resource Assumptions
- IRP Portfolio Matrix & Scenario Framework

Public Advisory Meeting #3 – June 27, 2022

- Stakeholder Presentations
- Portfolio Metrics & Scorecard Framework
- MISO Reliability Planning
- IRP Reliability Analysis
- Distribution System Plan

Public Advisory Meeting #4 – September 19, 2022

- Preliminary Modeling Results
- Preliminary Scorecard Results

Public Advisory Meeting #5 – October/November

- Risk Analysis
- Reliability Analysis
- Final Scorecard Review
- Preferred Resource Portfolio & Short-Term Action Plan

Topics for meeting 5 are subject to change.

IRP Process Overview

DSM Market Potential Study (MPS)
- → End Use Analysis
- → Comprehensive measure list
- → Measure uptake & potentials: MAP & RAP
- → Develop IRP model inputs (bundles)

Replacement Resource Costs
- → Cost assumptions from 2020 RFP and Consultants, e.g. Wood Mackenzie, NREL
- → New RFP issued

Distribution System Planning (DSP)
- → Bottom-up forecast on sample of constrained circuits
- → Assess EV and DG impacts
- → Load shapes inform IRP analysis

Load Forecast
- → Itron SAE Methodology
- → Base, High & Low Scenarios
- → IRP model peak and energy inputs

Core IRP Modeling & Evaluation

Capacity Expansion Modeling
- → Retirement and replacement analysis
- → Portfolio optimization

Production Cost Modeling & PVRR
- → Prod Cost - Portfolio dispatch analysis serve as PVRR inputs
- → Portfolio PVRR analysis
- → Stochastic risk analysis

Portfolio Evaluation & Short-Term Action Plan
- → Screen against Evaluation Criteria
- → Selection of Preferred Resource Portfolio & Short-Term Action Plan

IRP Submission Dec. 1, 2022

IRP-driven Filings
- → DSM Filing
- → Certificate of Public Convenience and Necessity (CPCN) Filing

Other Inputs & Assumptions
- → Portfolio and scenario framework
- → Power & Commodity Price Forecasts
- → Model Parameters & Constraints
- → Existing Resources

Contributors:
DSM MPS – GDS Associates
RFP – Sargent and Lundy
DSP – Internal & Conrad Technical Services
Load Forecast – Itron
PVRR Calculations – Concentric
Reliability Analysis – Quanta
IRP Modeling & Evaluation – Internal with ACES & Anchor Power support

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Modeling Updates & IRP Framework Review

Erik Miller, Manager, Resource Planning, AES Indiana

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Model Constraints

Capacity Expansion models require constraints to provide meaningful results. There are three main constraints AES Indiana utilized:

Limiting Capacity Purchases and Sales

→ Prevents the selection of a portfolio that relies excessively on market purchases for capacity or on uncertain revenues associated with selling capacity. The constraint is ~50 MW.

Limiting Energy Purchases and Sales

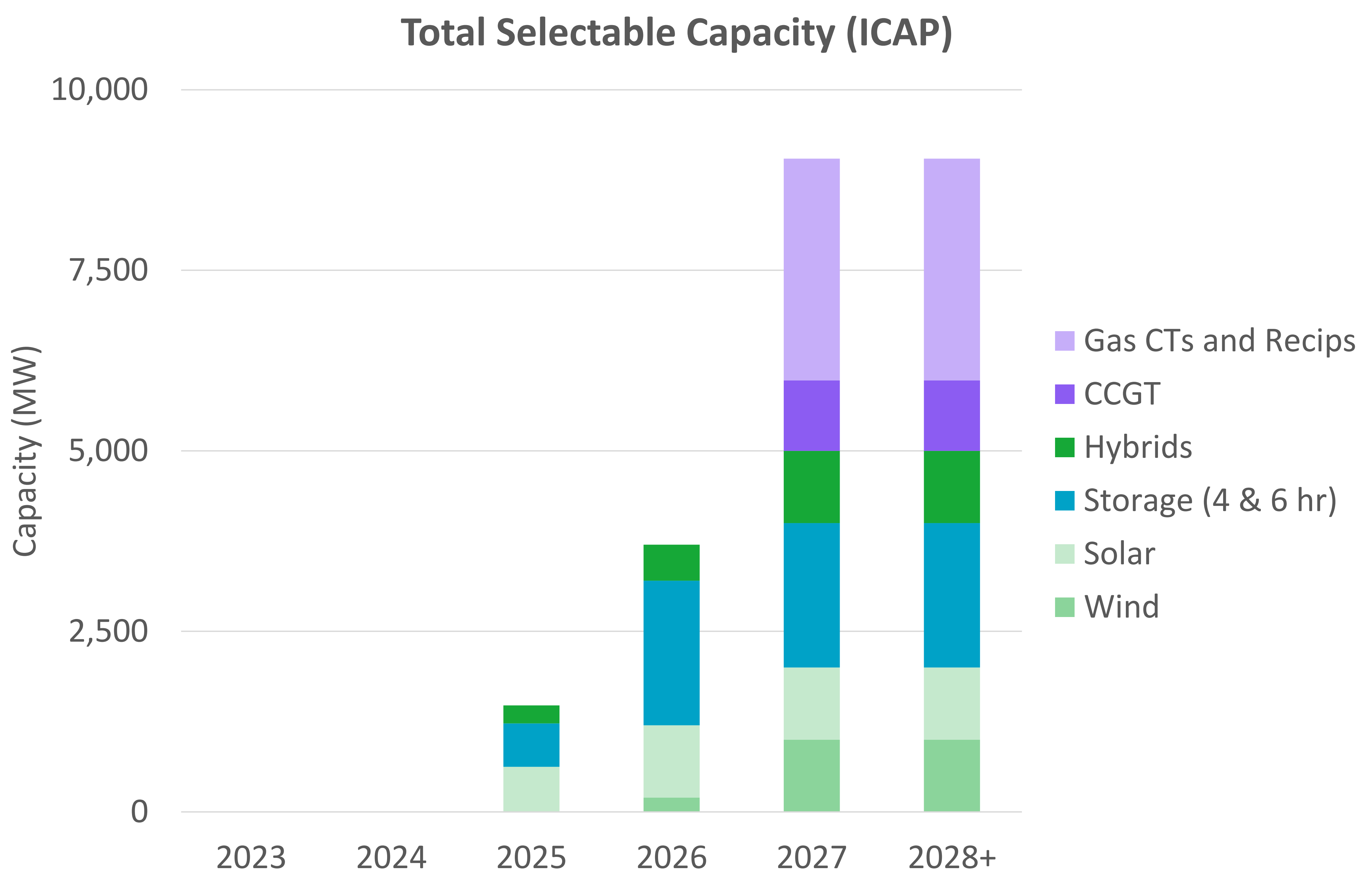
→ Selects a portfolio that covers at least 90% of AES Indiana's energy sales on an annual basis, limiting reliance on the market.

→ Also prevents a portfolio that sells more than 10% above AES Indiana's expected energy sales on an annual basis, limiting reliance on uncertain energy revenue. Excess generation is assumed to be curtailed.

Model Constraints *(continued)*

Limiting the Build of New Resources

- Prevents the model from selecting resources in the near term that cannot practically be executed and are not supported by recent RFP responses.
  - Earliest build is ~1,500 MW (ICAP) of Solar, Storage, and Hybrids in 2025
  - By 2027, can build ~1,000 MW (ICAP) of any technology per year
  - Over the 20-year time span, can build a max of ~2,000 MW of any one technology

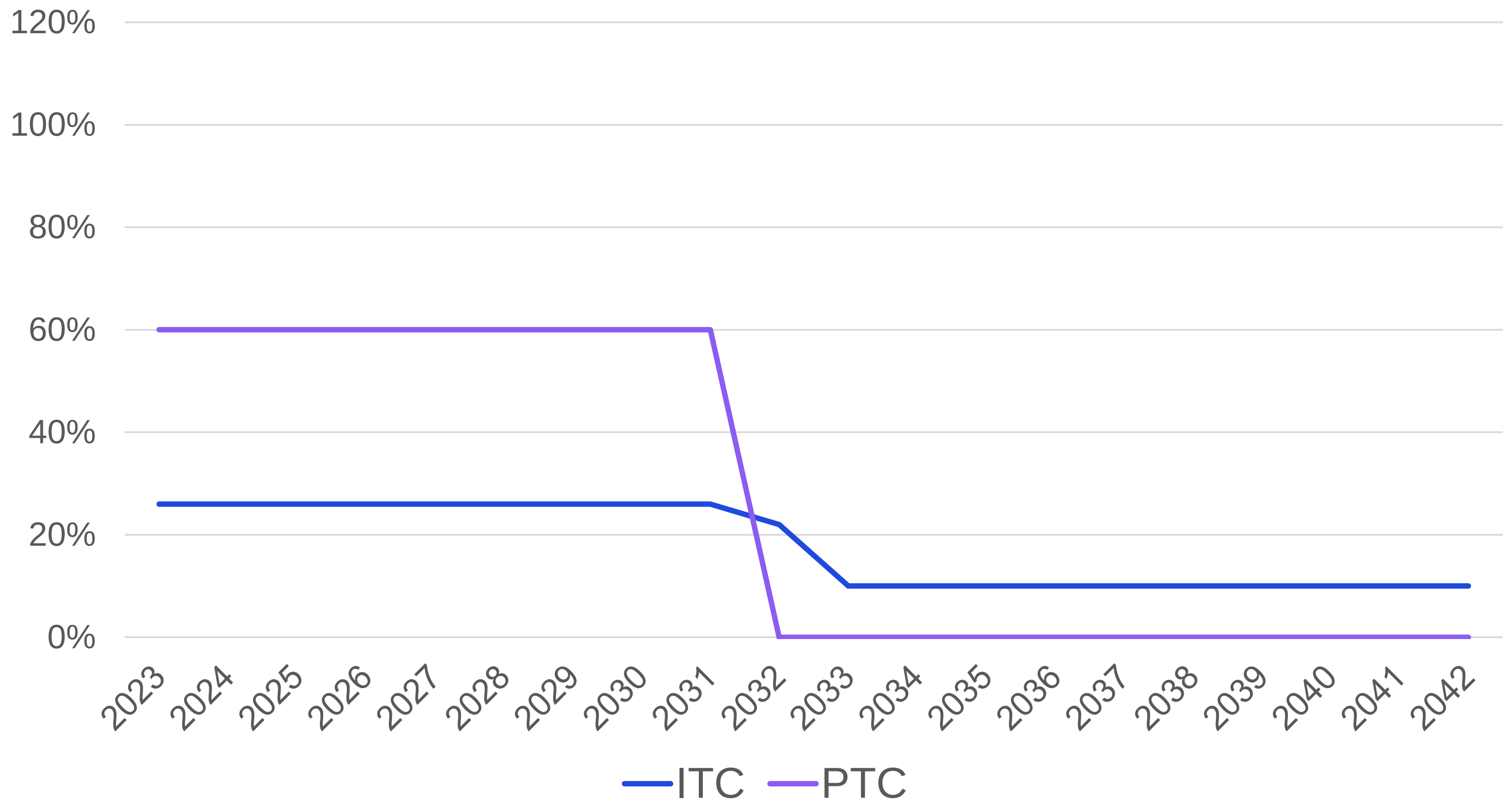


Modeling Updates

Inflation Reduction Act of 2022 (IRA) included in Current Trends

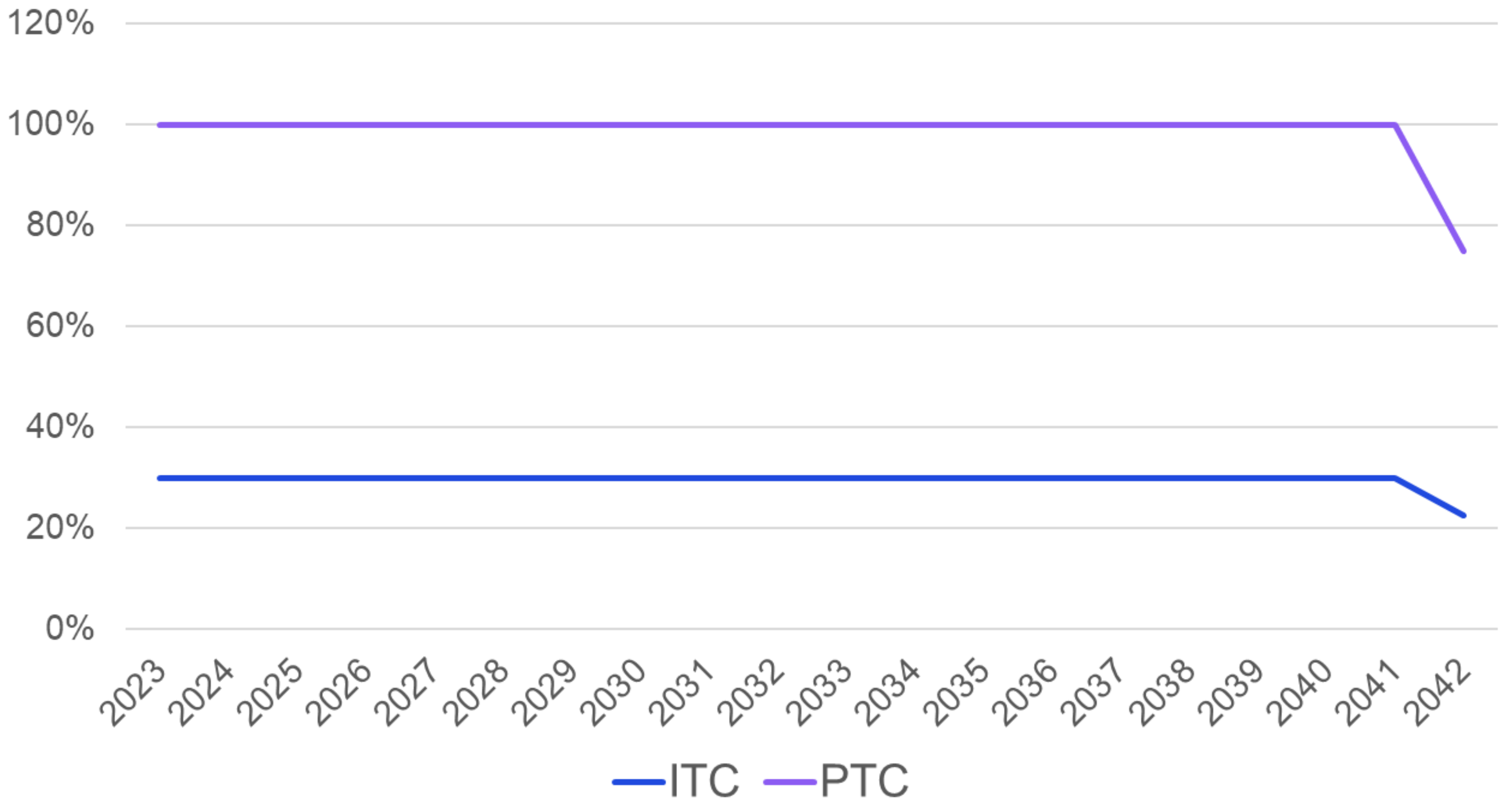
- IRA passed House and Senate and signed into law in August
- Legislation changes the Current Trends (Reference Case) assumptions for the ITC and PTC

Original – as presented in Public Advisory Meeting #2, April 12, 2022



Original Current Trends – Five one-year tax credit extensions

Updated – aligns with the IRA tax provisions



Revised Current Trends – Ten-year tax credit extension

*Years correspond to years projects first produce energy

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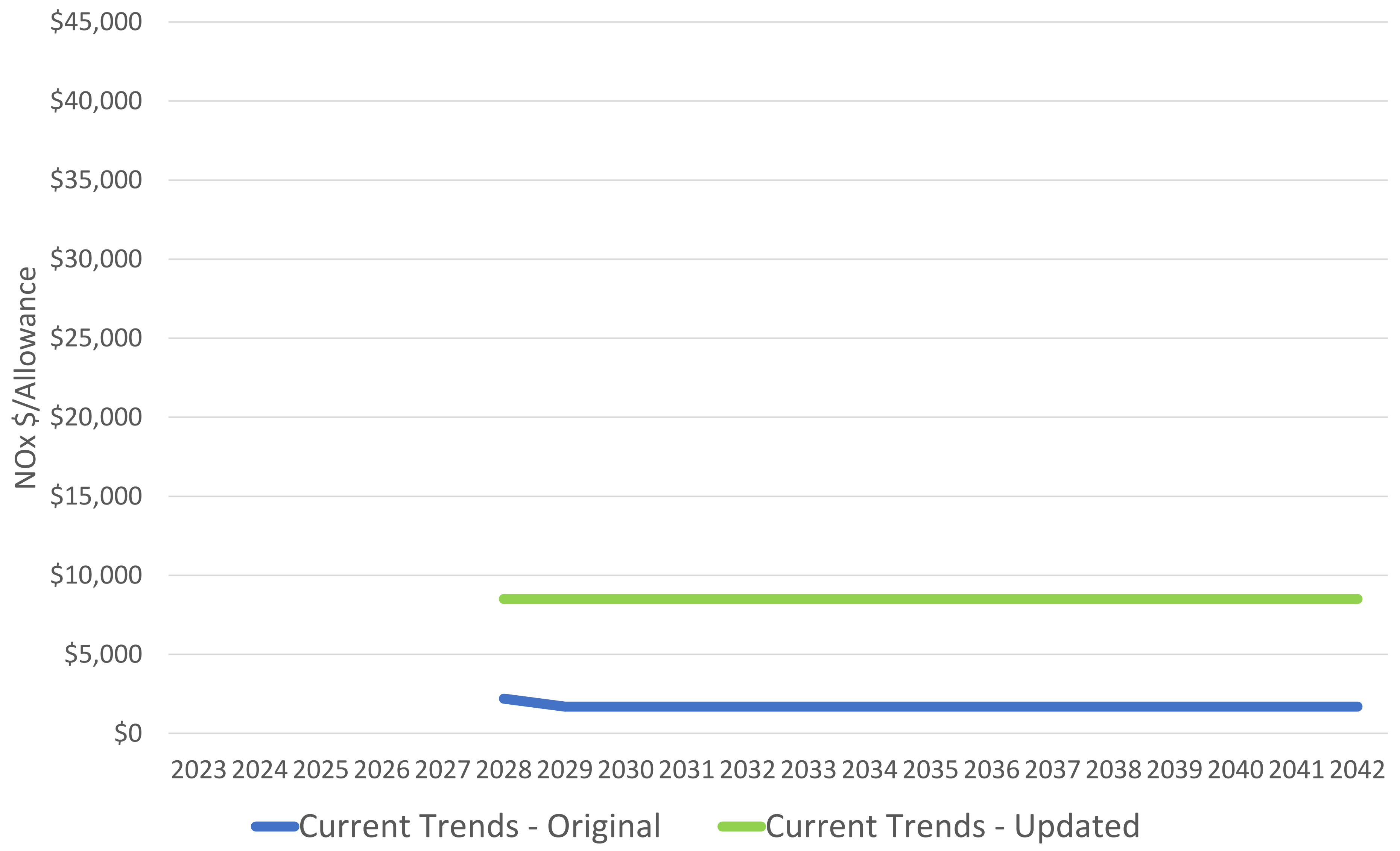
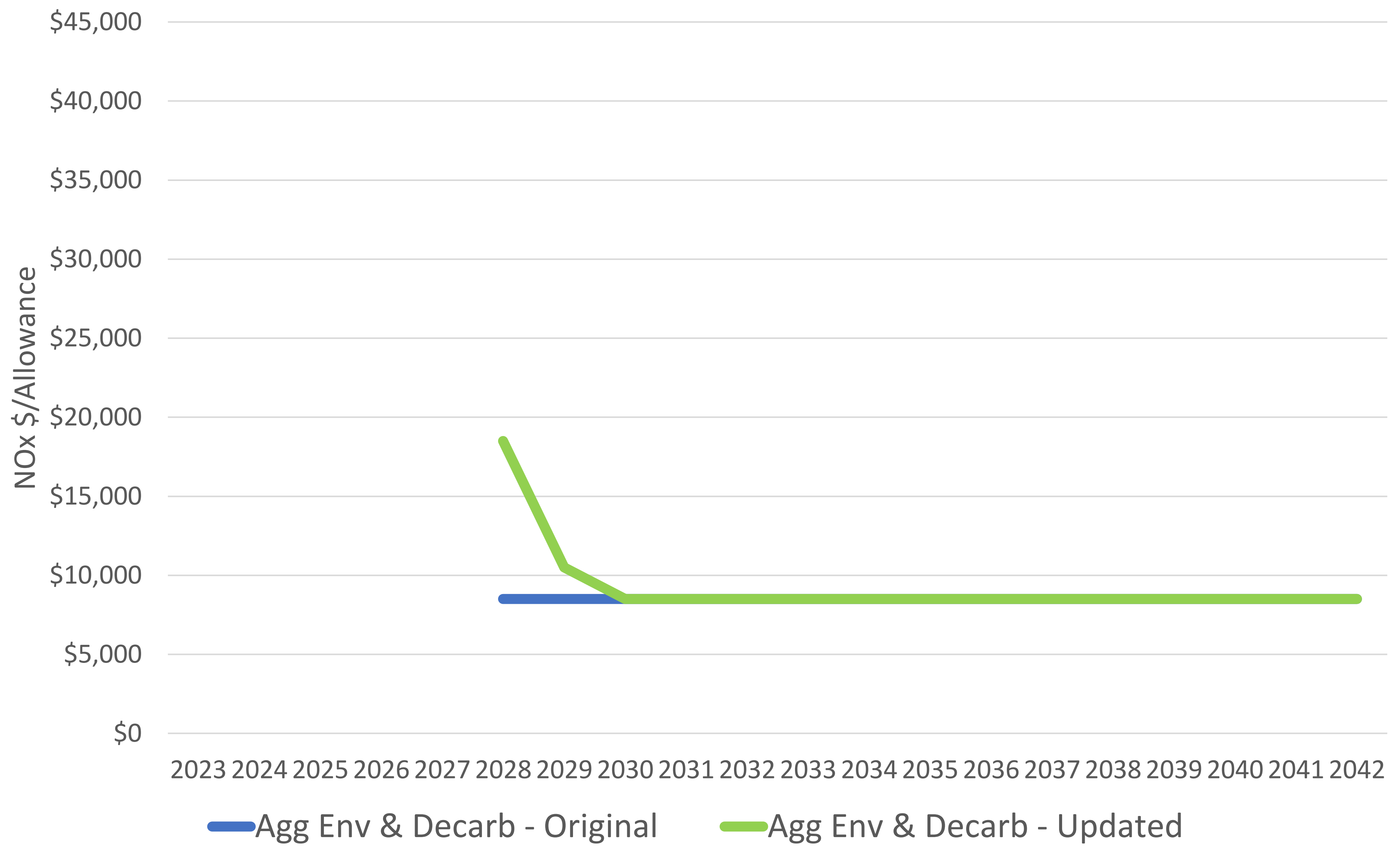
Modeling Updates

Forecast for NOx allowance prices updated based on current market trends

- Scarcity within the NOx allowance market has driven prices to historic highs
- Updated prices included in the Current Trends (Reference Case), Aggressive Environmental and Decarbonized Economy Scenarios

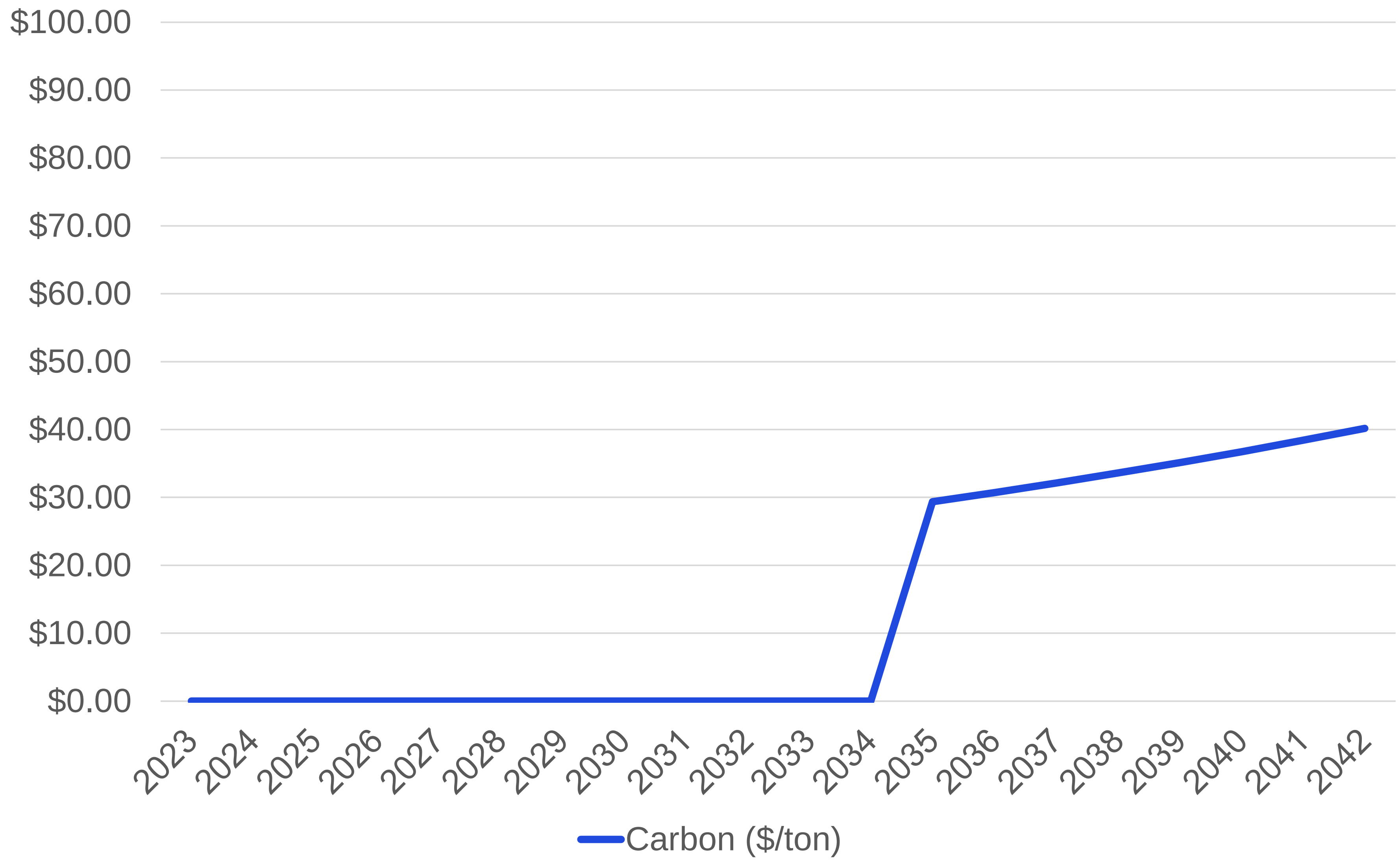


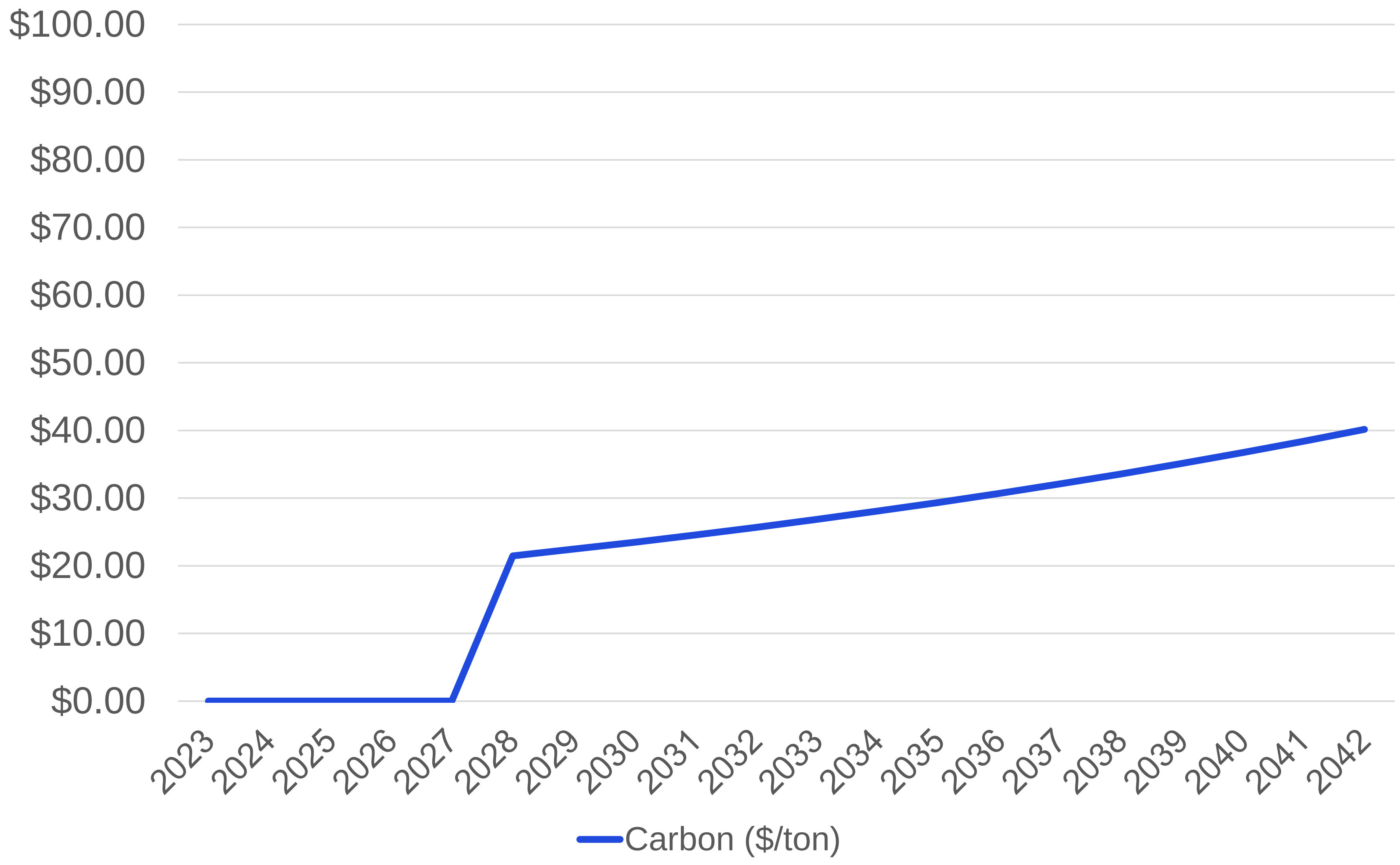


Modeling Updates

Carbon Tax moved from starting in 2035 to starting in 2028 in the Aggressive Environmental Scenario

- Change made to provide a reasonably aggressive environmental scenario
- Aligns with the Interagency Working Group Social Cost of Carbon Forecast (5% Discount Rate)

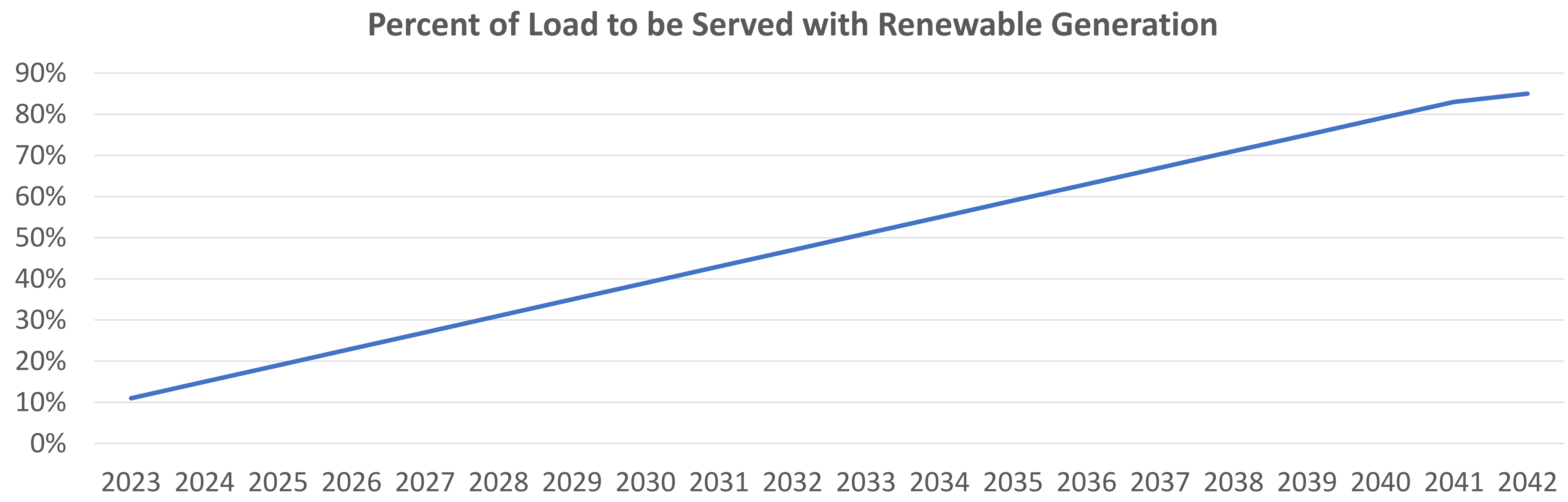




https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

Modeling the Decarbonized Economy Scenario

The Decarbonization Scenario captures a bookend with an aggressive grid transition to renewable energy generation. This is accomplished through a progressive Renewable Portfolio Standard (RPS):



RPS target, penalties, and grants are based on the theoretical Clean Energy Performance Program:

- Failure to hit the RPS results in a $40/MWh penalty, per MWh of shortfall
- Exceeding the RPS results in a $150/MWh grant, per MWh of exceedance

Structure for Today's Review

1 **Retirement & Replacement Analysis Review:** Review the optimized portfolios and complete the Portfolio Matrix

		Scenarios			
		No Environmental Action	Current Trends	Aggressive Environmental	Decarbonized Economy
Generation Strategies	No Early Retirement				
	Pete Refuel to 100% Gas (est. 2025)				
	One Pete Unit Retires (2026)				
	Both Pete Units Retire (2026 & 2028)				
	"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)				
	Encompass Optimization without predefined Strategy				

Portfolio cost (PVRR) will be calculated for each portfolio to complete Portfolio Matrix

- Review generation mixes and PVRR in the Current Trends (Reference Case)
- Complete the Portfolio Matrix and compare PVRR
- Review the Replacement Resource Cost Sensitivity Analysis

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Structure for Today's Review

2 Review key IRP Scorecard Metrics for the Current Trends (Reference Case)

	Affordability	Environmental Sustainability						Reliability, Stability & Resiliency	Risk & Opportunity						Economic Impact	
	20-yr PVRR	*CO_2 Emissions*	*SO_2 Emissions*	*NO_X Emissions*	*Water Use*	*Coal Combustion Products (CCP)*	*Clean Energy Progress*	*Reliability Score*	*Environmental Policy Opportunity*	*Environmental Policy Risk*	*Cost Opportunity*	*Cost Risk*	*Market Exposure*	*Renewable Capital Cost Risk (+50%)*	*Employees (+/-)*	*Property Taxes*
	Present Value of Revenue Requirements	Total portfolio CO2 Emissions (mmtons)	Total portfolio SO2 Emissions (tons)	Total portfolio NOx Emissions (tons)	Water Use (mmgal)	CCP (tons)	% Renewable Energy in 2032	Composite score from Reliability Analysis	Lowest PVRR across policy scenarios	Highest PVRR across policy scenarios	Mean - P95	P95 - Mean	20-year avg sales + purchases	Portfolio PVRR w/ renewable costs +50%	Total FTEs associated with generation	Total amount of property tax paid from AES IN assets
1																
2																
3																
4																
5																
6																

Calculations for each scoring metric will be included to complete the Scorecard

Strategies

- 1. No Early Retirement
- 2. Pete Refuel to 100% Natural Gas (est. 2025)
- 3. One Pete Unit Retires in 2026
- 4. Both Pete Units Retire in 2026 & 2028
- 5. "Clean Energy Strategy" – Both Pete Units Retire and replaced with Renewables in 2026 & 2028
- 6. Encompass Optimization without Predefined Strategy

- Review PVRR, emissions and economic metrics
- **Reliability and risk analysis still in-progress and will be presented in Meeting #5**

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I. Retirement and Replacement Analysis Results

Erik Miller, Manager, Resource Planning, AES Indiana

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Capacity vs. Energy in Resource Planning

These are two very different planning/market concepts.

1) Capacity Planning

- MISO requires utilities to have enough generation resources to meet their peak hour plus a reserve margin (buffer). This is called a Planning Reserve Margin Requirement (PRMR).
- Historically, MISO planning has been based on <u>only</u> the summer peak hour + buffer/PRMR.
- This changed earlier in the month when FERC approved MISO's seasonal construct – **Utilities now are required to have enough generation to serve their peak hour + buffer/PRMR in all four seasons – summer, fall, winter and spring.**
- With the seasonal construct, AES Indiana now has a higher winter peak hour + buffer/PRMR than summer.
- There's a market for capacity – thus, AES Indiana assigns a monetary value to capacity for modeling purposes - $89/kW-yr.

Capacity vs. Energy in Resource Planning cont'd

2) Energy Planning

- Most people are familiar with energy – this is a MWh that is produced or purchased to supply customers.
- For planning purposes, AES Indiana can build generation to supply energy for its customers or rely on the market. Relying on the market for energy comes with both price and reliability risks to customers.
- **Energy planning is where we can really make an impact on emissions.**

Differences in Resource Types

- Certain resources are better suited for supplying <u>capacity</u> –
  - Thermal and battery energy storage resources are dispatchable – therefore, MISO gives them almost full credit as a capacity resource in all seasons.
  - Wind and solar are not dispatchable (utilities can't control when they are on) – therefore, MISO correspondingly adjusts down their capacity value, e.g. a 200 MW solar resource receives zero capacity value (ELCC) in the winter.
  - A resource can be built for its <u>capacity</u> value and run very little to supply <u>energy</u>. **It's there when the system really needs it!**

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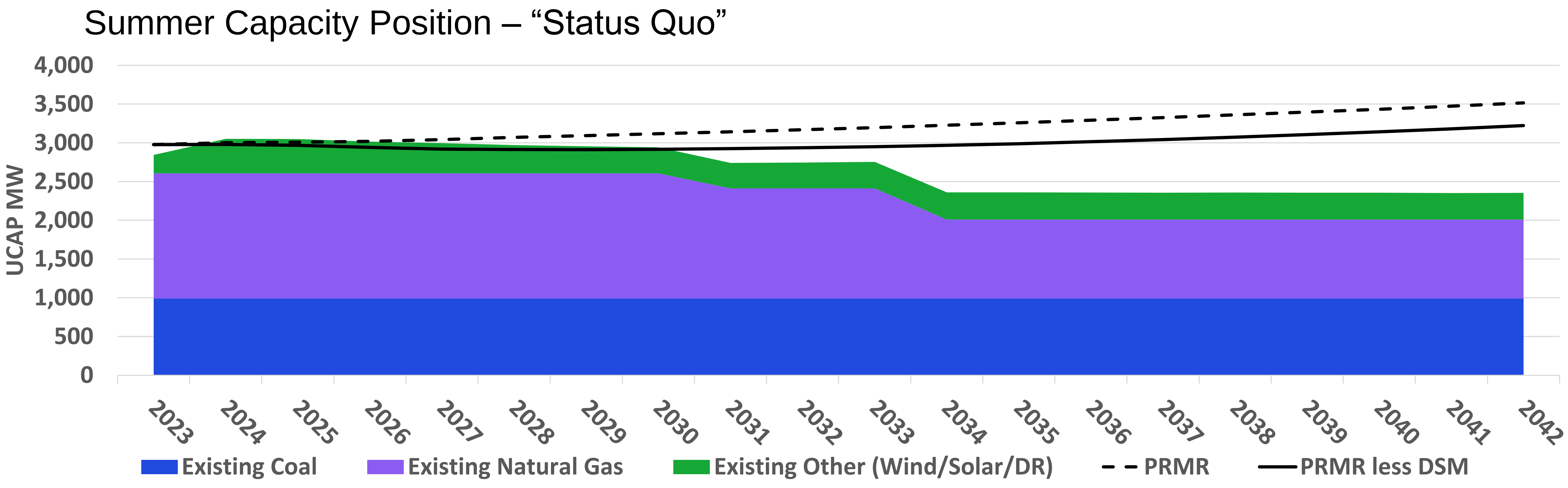
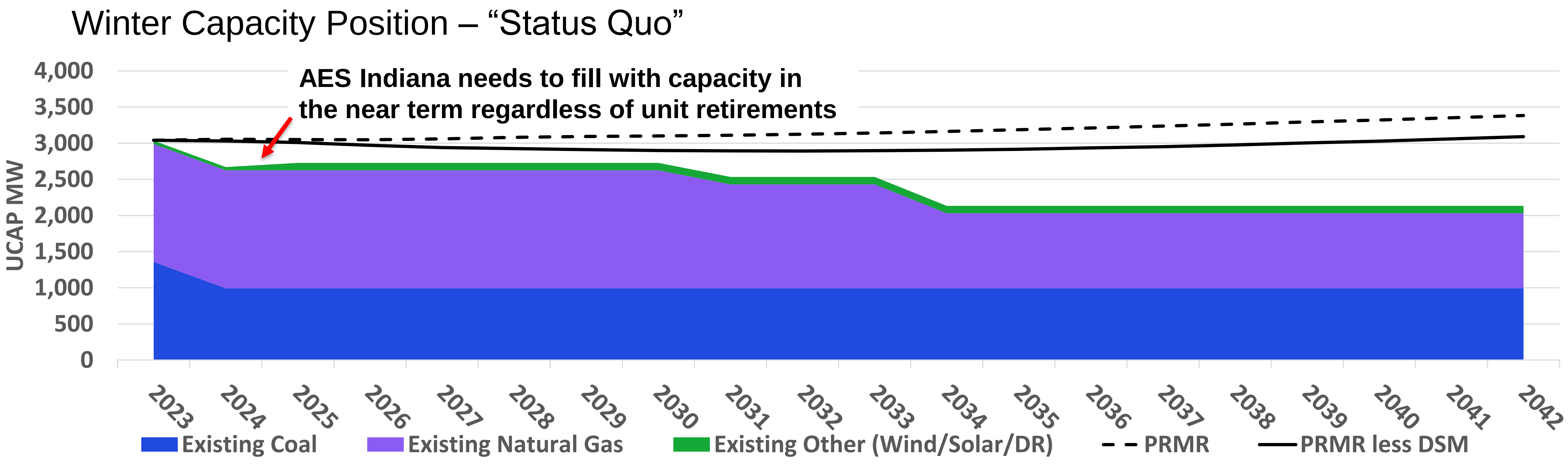
Summer vs. Winter Capacity Position





Historically, AES Indiana has only had to plan for its summer peak + buffer/PRMR.

This changed in early September when FERC approved MISO's four-season capacity construct.

AES has a winter capacity shortage in the near-term regardless of unit retirements.

Unfortunately, based on MISO's accreditation, solar receives no value in the winter and wind receives only 18% of it's full value.

The planning model can only select thermal or battery energy storage resources to fill this winter capacity need. Solar can be combined with battery energy storage if economic.

Summary of Scenario Driving Assumptions

Scenario	Load	EV	Dist Solar	Power	Gas	Coal	CO2
No Environmental Action – "No Env"	Low	Low	Low	Horizon Fundamental Forecast	Low	Base	None
Current Trends (Reference Case) – "Ref"	Base	Base	Base	Horizon Fundamental Forecast	Base	Base	Low
Aggressive Environmental – "AE"	High	High	High	Horizon Fundamental Forecast	High	Base	High
Decarbonized Economy – "Decarb"	High	Very High	High	Horizon Fundamental Forecast	Base	Base	None*

*Carbon targets will be modeled through a National Renewable Portfolio Standard

Current Trends Assumptions Review

The following slides provide the **Portfolio Summaries for the Current Trends Scenario – these are the candidate portfolios**. Portfolio Summaries will include the following:

- Generation mix and Unforced Capacity position
- Installed capacity over the planning period
- % energy mix to serve load
- DSM Selections
- PVRR

As a review, the **Current Trends Scenario** includes the **following driving assumptions**:

- Base Power, Gas, and Coal Prices
- Base NOx Prices
- ITC & PTC assumptions aligned with the Inflation Reduction Act
- Low Carbon Price at $6.49/ton starting in 2028 and escalating annually at 4.6%
- Base load, EV and customer solar forecasts

This section will conclude with a comparison of the PVRRs for the Strategies and Scenarios in the Portfolio Matrix.

Note: The Portfolio Summaries for the No Environmental Action, Aggressive Environmental and Decarbonized Economy scenarios are included in the appendix of this presentation.

A. No Early Retirement

Scenarios			
No Environmental Action	Current Trends	Aggressive Environmental	Decarbonized Economy
	$9,572		

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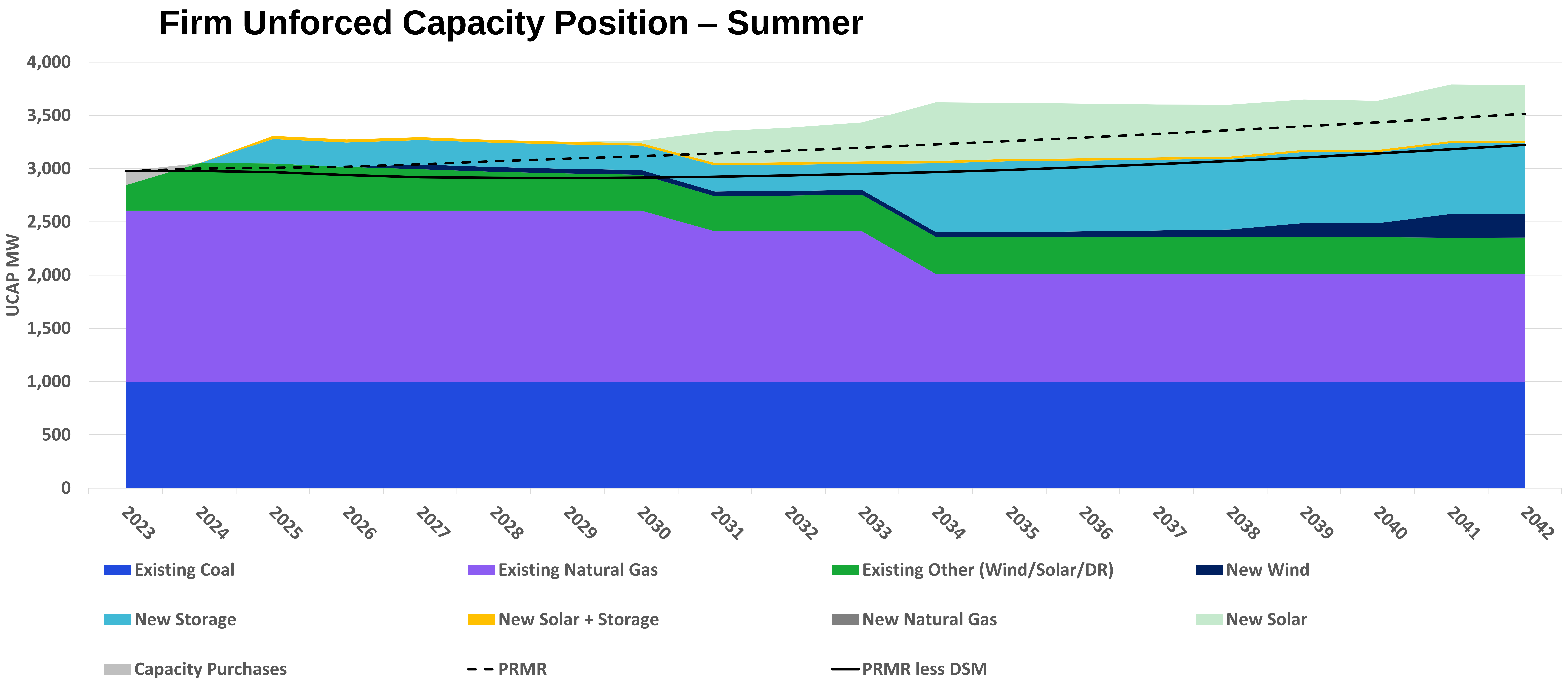
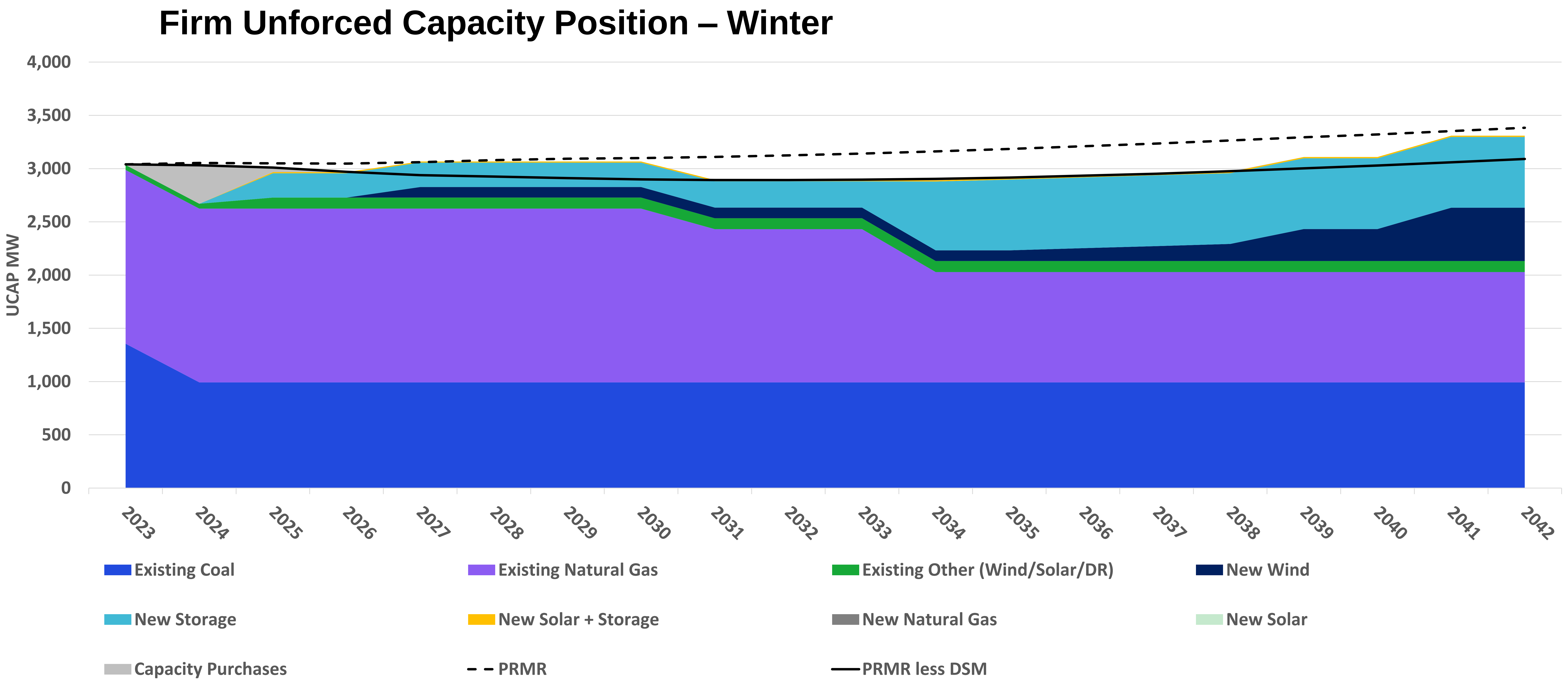
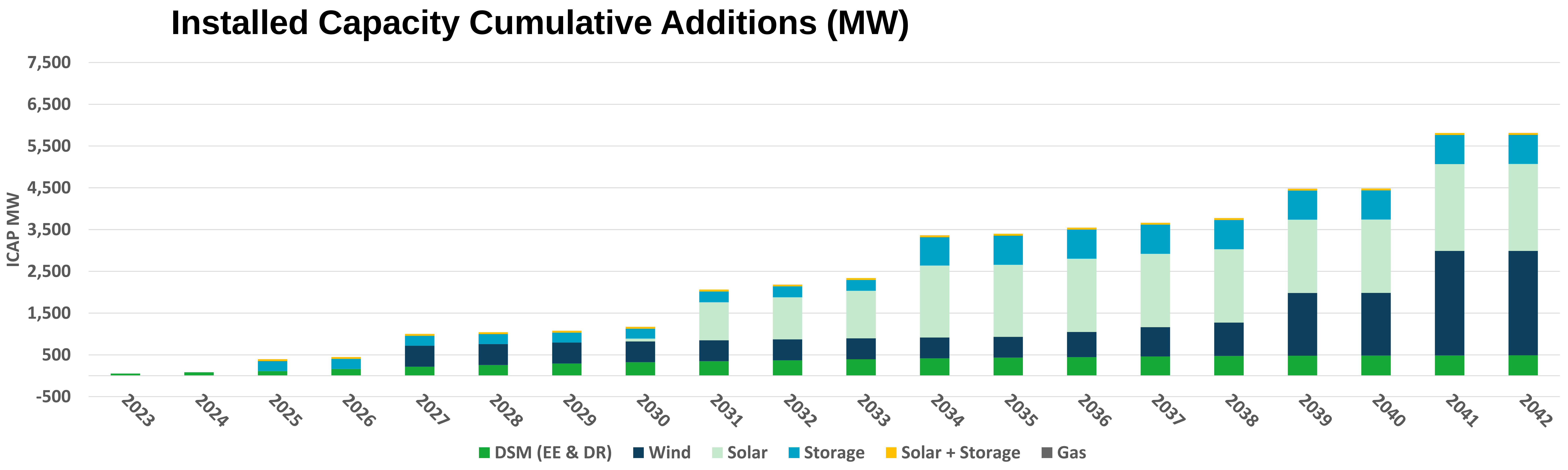
No Early Retirement: Current Trends *(Reference Case)*



No Early Retirement: Current Trends *(Reference Case)*



No Early Retirement: Current Trends *(Reference Case)*



Installed Capacity Incremental Additions (MW): 2023 - 2028

	2023	2024	2025	2026	2027	2028
Wind	0	0	0	0	500	0
Solar	0	0	0	0	0	0
Storage	0	0	240	0	0	0
Solar + Storage	0	0	45	0	0	0
Natural Gas	0	0	0	0	0	0

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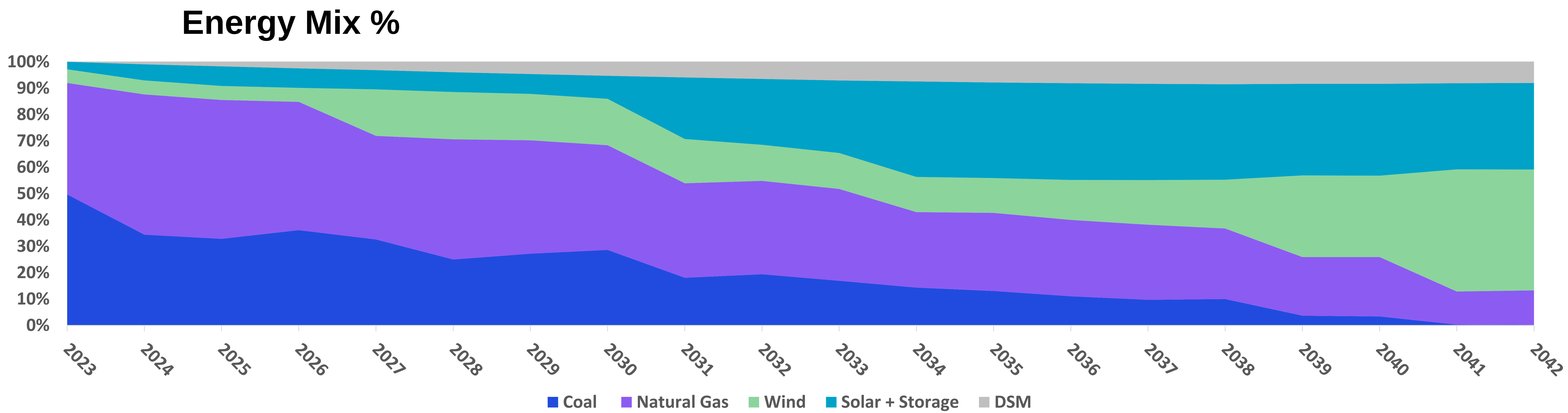
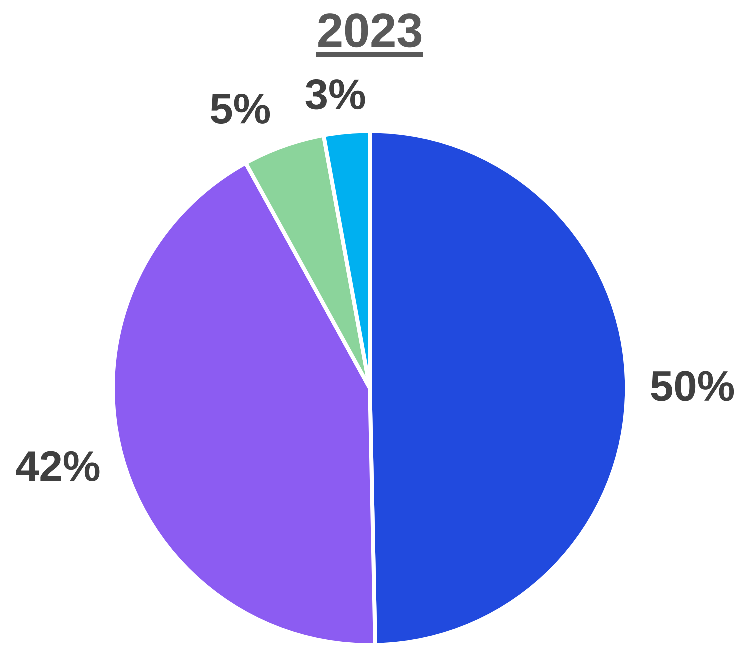
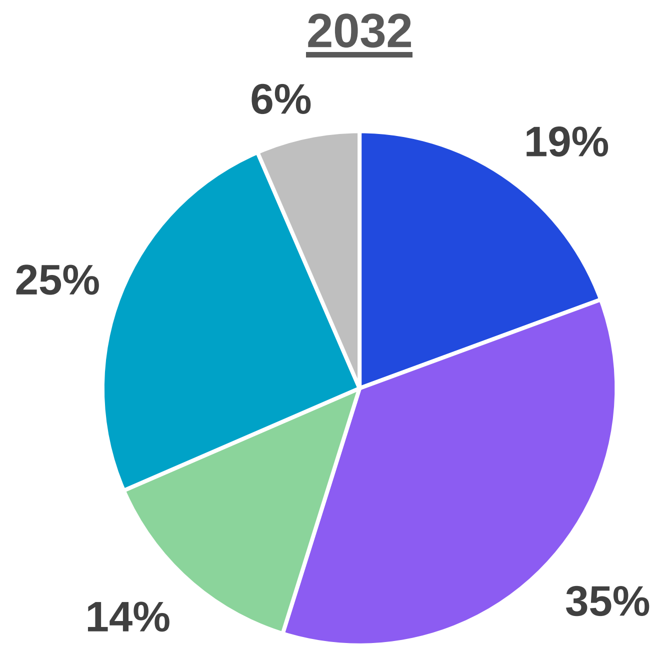
No Early Retirement: Current Trends *(Reference Case)*

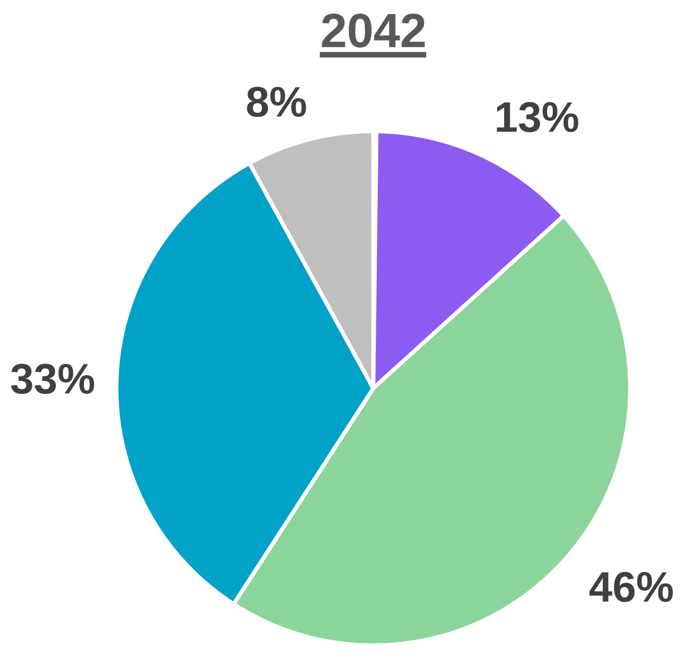




Thermal MWh %	92%
Renewable/DSM MWh %	8%



Thermal MWh %	55%
Renewable/DSM MWh %	45%



Thermal MWh %	13%
Renewable/DSM MWh %	87%

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No Early Retirement: Current Trends *(Reference Case)*

DSM Results

Energy Efficiency:

	Vintage 1	Vintage 2	Vintage 3
	2024 - 2026	2027 - 2029	2030 - 2042
Residential	Efficient Products - Lower Cost	Lower Cost Residential (excluding Income Qualified Weatherization (IQW))	Lower Cost Residential (excluding IQW)
	Efficient Products - Higher Cost		
	Behavioral		
	School Education	Higher Cost Residential (excluding IQW)	Higher Cost Residential (excluding IQW)
	Appliance Recycling		
	Multifamily		
	IQW	IQW	IQW
C&I	Prescriptive	C&I	C&I
	Custom		
	Custom RCx		
	Custom SEM		
Impacts	Avg Annual MWh	Avg Annual MWh	Avg Annual MWh
	134,263	141,526	146,428
	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out
	1.1%	1.1%	1.2%
	Cummulative Summer MW	Cummulative Summer MW	Cummulative Summer MW
	89 MW	92 MW	303 MW

Demand Response:

	2026 - 2042
Residential	Direct Load Control
	Residential Rates
C&I	Direct Load Control
	C&I Rates
	Cumulative Summer MW
	75 MW

Note: Boxes highlighted in purple denote DSM bundles that were selected by Encompass

No Early Retirement: Current Trends *(Reference Case)*

Portfolio Overview

Retirements

Harding Street:

- HS ST5 Nat Gas: 2030
- HS ST6 Nat Gas: 2030
- HS ST7 Nat Gas: 2033
  - **Total Nat Gas Retired MW: 618 MW**

Replacement Additions by 2042

- DSM: 490 MW
- Wind: 2,500 MW
- Solar: 2,080 MW
- Storage: 700 MW
- Solar + Storage: 45 MW
- Thermal: 0 MW

Current Trends PVRR Summary

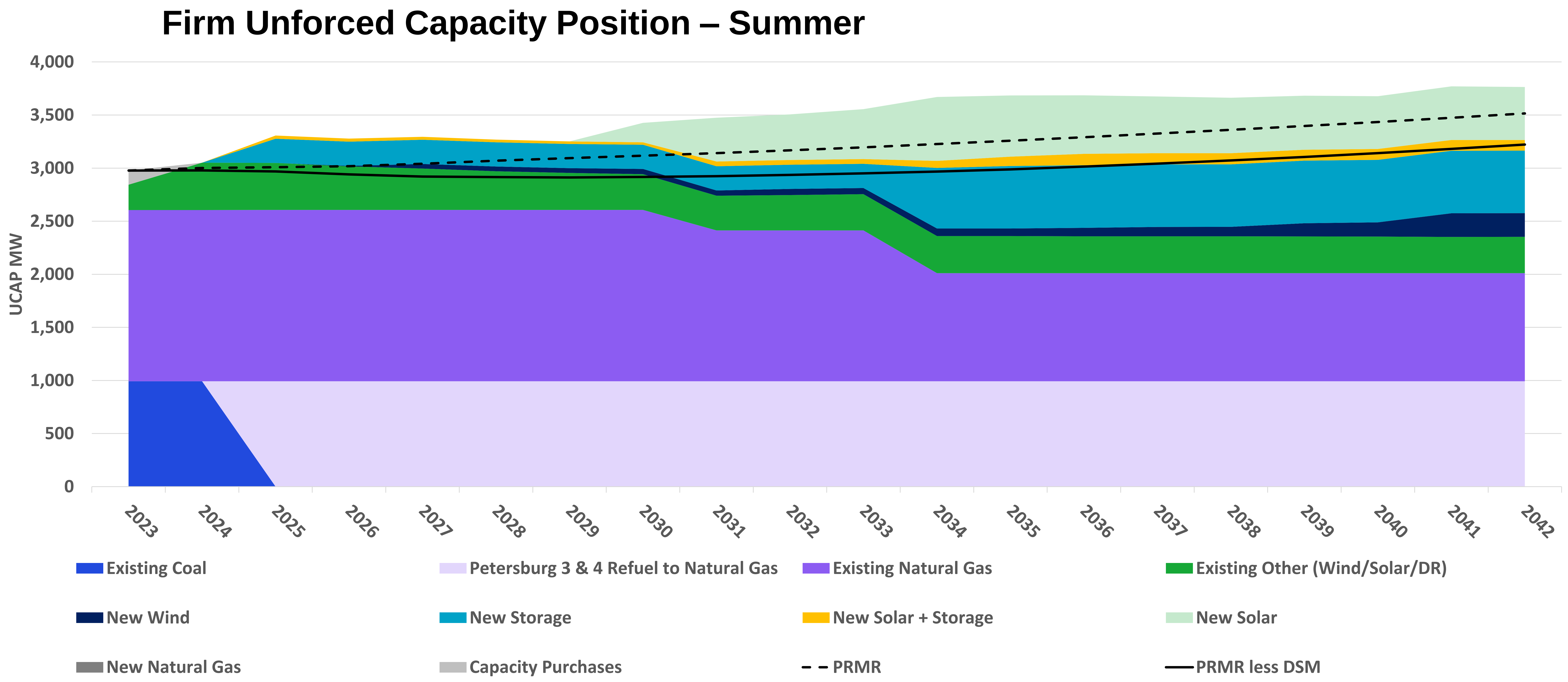
20-Year PVRR (2023$MM, 2023-2042)

Strategy	PVRR
No Early Retirement	$9,572
Pete Refuel to 100% Gas (est. 2025)	$9,330
One Pete Unit Retires (2026)	$9,773
Both Pete Units Retire (2026 & 2028)	$9,618
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,711
Encompass Optimization without predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027	$9,262

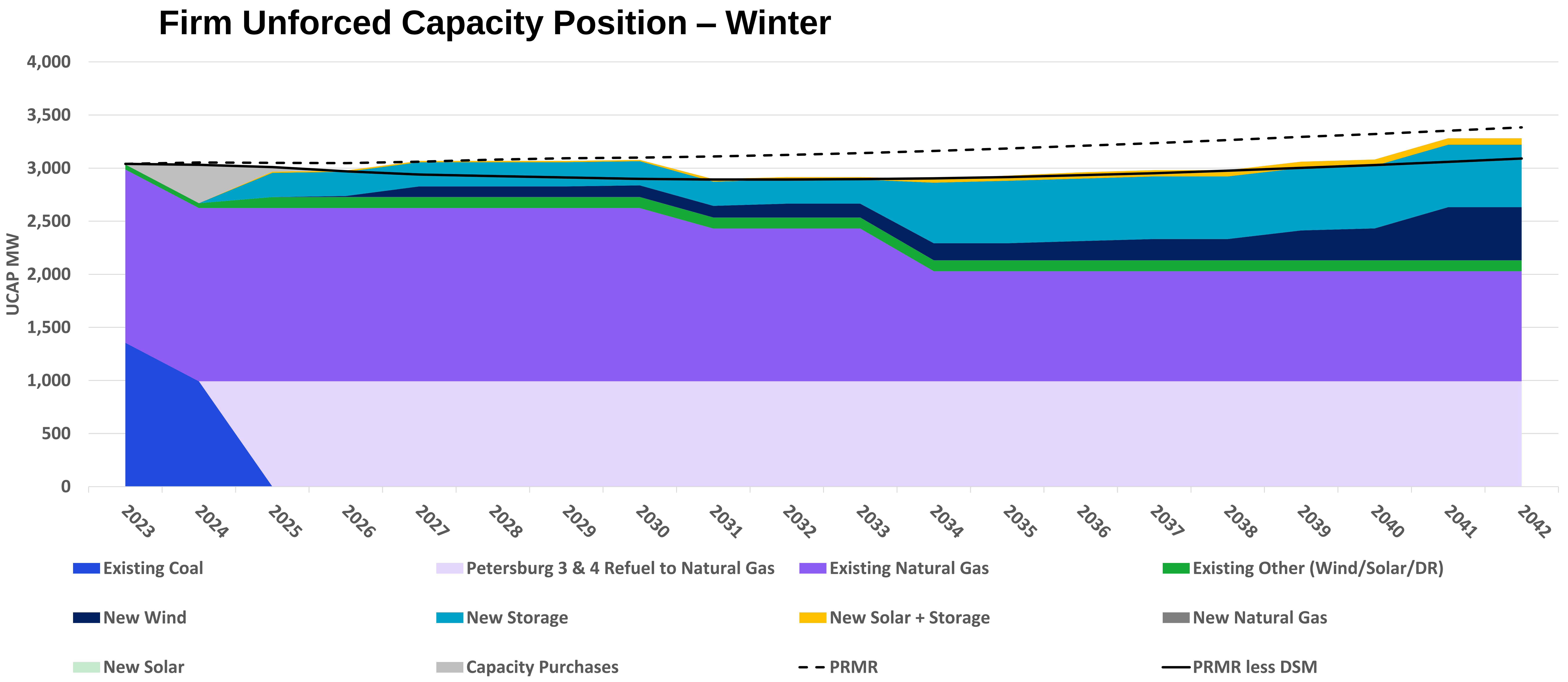
B. Pete Refuel by 2025

Scenarios			
No Environmental Action	Current Trends	Aggressive Environmental	Decarbonized Economy
	$9,330		

Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*



Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*



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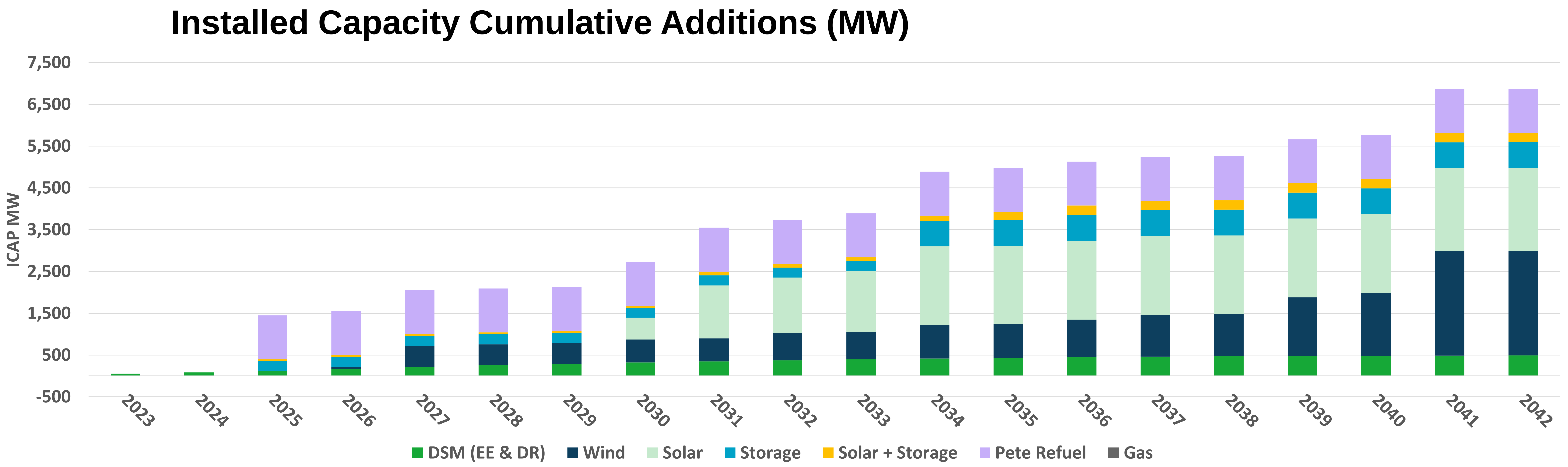
Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*



Installed Capacity Incremental Additions (MW): 2023 - 2028

	2023	2024	2025	2026	2027	2028
Pete Refuel	0	0	1,052	0	0	0
Wind	0	0	0	50	450	0
Solar	0	0	0	0	0	0
Storage	0	0	240	0	0	0
Solar + Storage	0	0	45	0	0	0
Natural Gas	0	0	0	0	0	0

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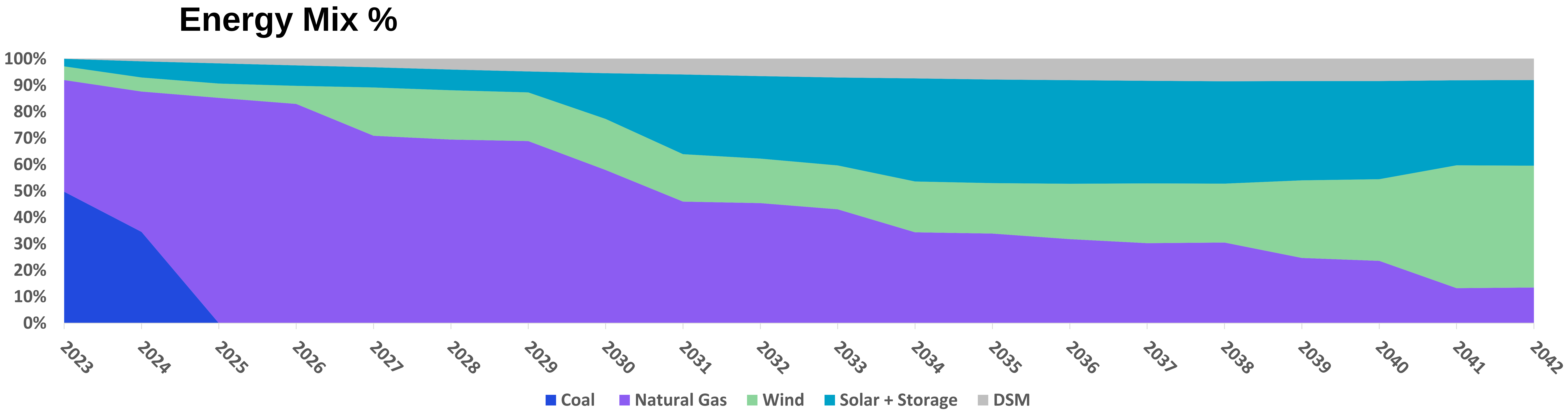
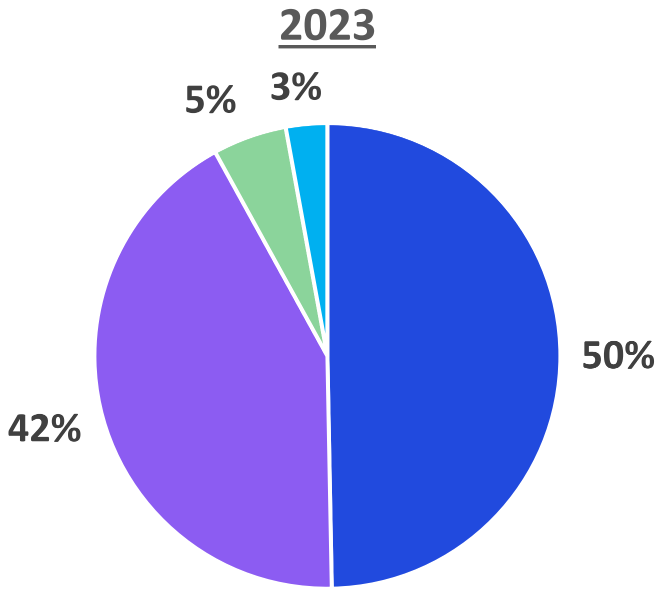
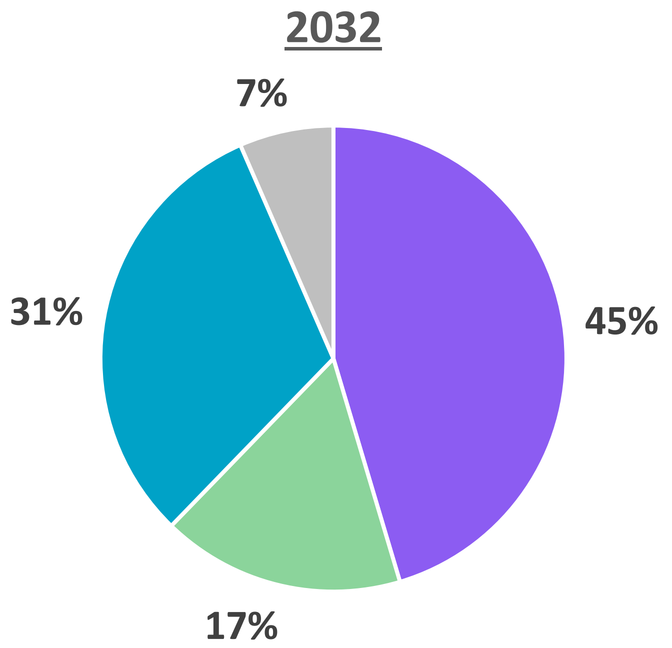
Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*

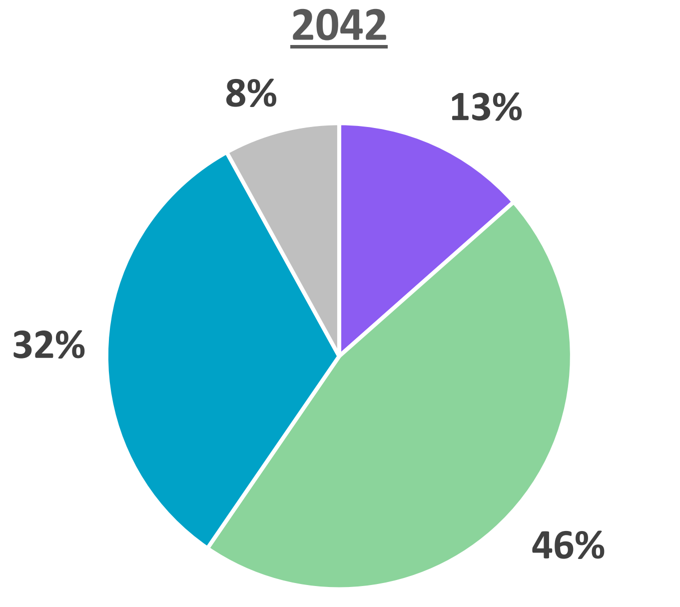




Thermal MWh %	92%
Renewable/DSM MWh %	8%



Thermal MWh %	45%
Renewable/DSM MWh %	55%



Thermal MWh %	13%
Renewable/DSM MWh %	87%

Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*

DSM Results

Energy Efficiency:

	Vintage 1 2024 - 2026	Vintage 2 2027 - 2029	Vintage 3 2030 - 2042
Residential	Efficient Products - Lower Cost	Lower Cost Residential (excluding Income Qualified Weatherization (IQW))	Lower Cost Residential (excluding IQW)
Residential	Efficient Products - Higher Cost		
Residential	Behavioral		
Residential	School Education	Higher Cost Residential (excluding IQW)	Higher Cost Residential (excluding IQW)
Residential	Appliance Recycling		
Residential	Multifamily		
Residential	IQW	IQW	IQW
C&I	Prescriptive	C&I	C&I
C&I	Custom		
C&I	Custom RCx		
C&I	Custom SEM		
Impacts	Avg Annual MWh	Avg Annual MWh	Avg Annual MWh
Impacts	131,578	141,526	146,428
Impacts	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out
Impacts	1.0%	1.1%	1.2%
Impacts	Cumulative Summer MW	Cumulative Summer MW	Cumulative Summer MW
Impacts	87 MW	92 MW	303 MW

Demand Response:

	2026 - 2042
Residential	Direct Load Control
Residential	Residential Rates
C&I	Direct Load Control
C&I	C&I Rates
	Cumulative Summer MW
	75 MW

Note: Boxes highlighted in purple denote DSM bundles that were selected by Encompass

Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*

Portfolio Overview

Retirements

Petersburg:

- Pete 3 & 4 Coal: 2025 Refuel with Nat Gas
  - **Total Refueled MW: 1,040 MW**

Harding Street:

- HS ST5 Nat Gas: 2030
- HS ST6 Nat Gas: 2030
- HS ST7 Nat Gas: 2033
  - **Total Nat Gas Retired MW: 618 MW**

Replacement Additions by 2042

- DSM: 490 MW
- Wind: 2,500 MW
- Solar: 1,983 MW
- Storage: 620 MW
- Solar + Storage: 225 MW
- Thermal: 0
- Pete 3 & 4 Refueled to Nat Gas: 1,000 MW

Current Trends PVRR Summary

20-Year PVRR (2023$MM, 2023-2042)

Strategy	PVRR
No Early Retirement	$9,572
Pete Refuel to 100% Gas (est. 2025)	$9,330
One Pete Unit Retires (2026)	$9,773
Both Pete Units Retire (2026 & 2028)	$9,618
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,711
Encompass Optimization without predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027	$9,262

C. One Pete Unit Retires (2026)

Scenarios			
No Environmental Action	Current Trends	Aggressive Environmental	Decarbonized Economy
	$9,773		

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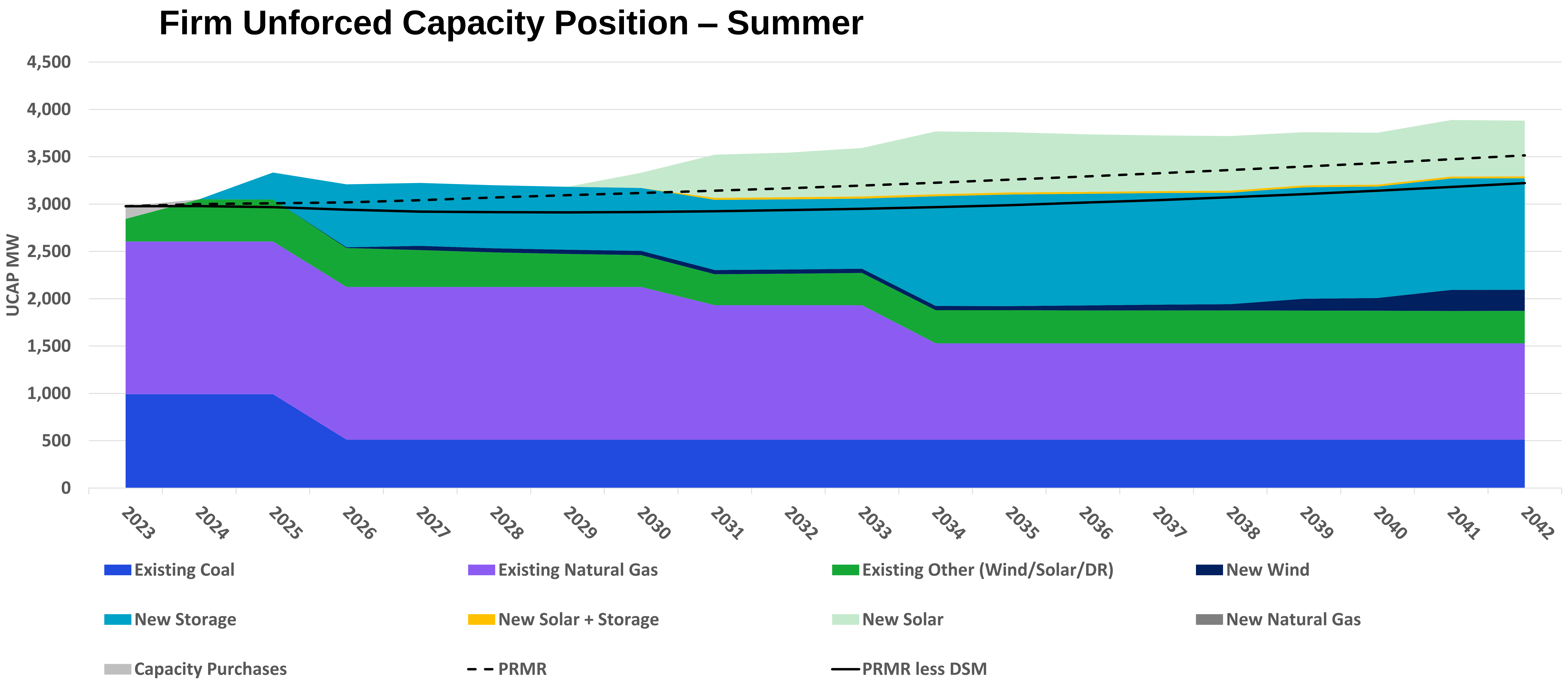
One Pete Unit Retires (2026): Current Trends *(Reference Case)*



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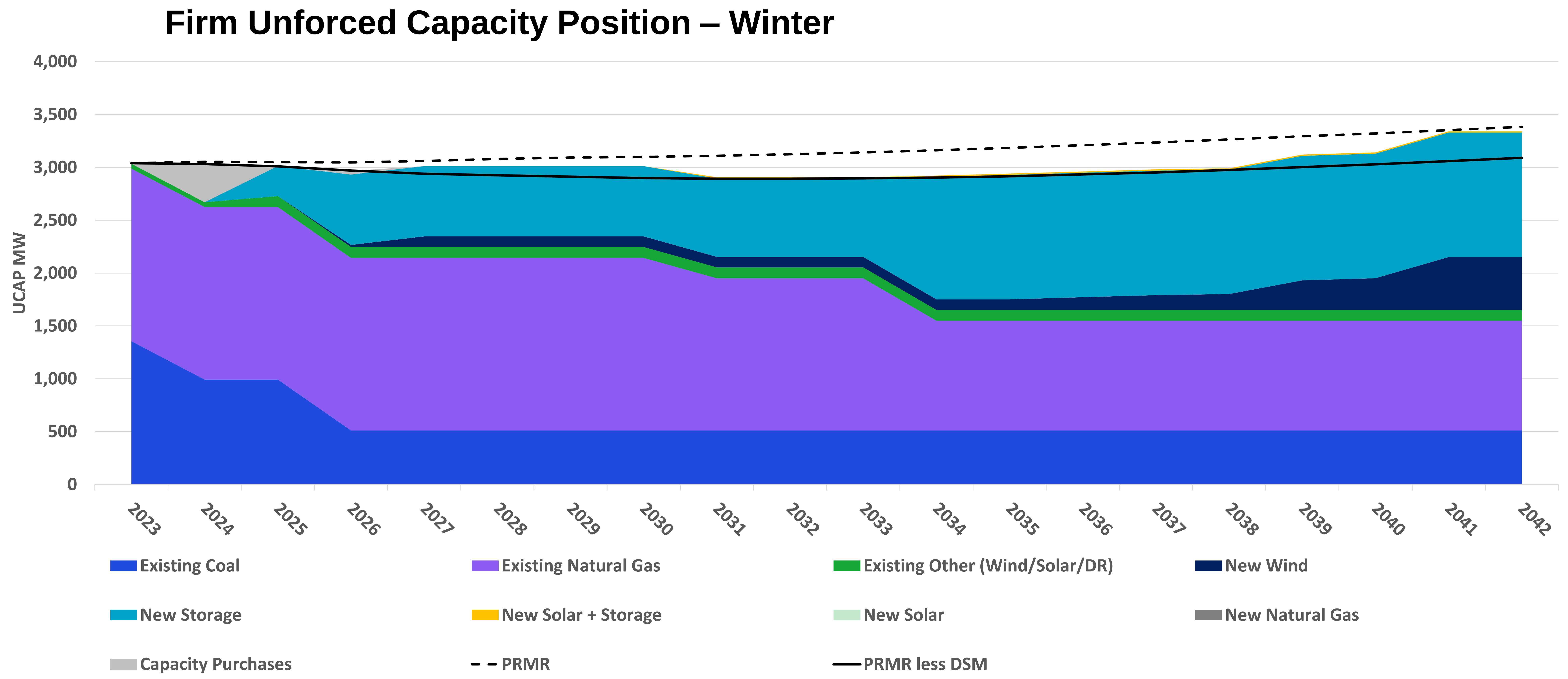
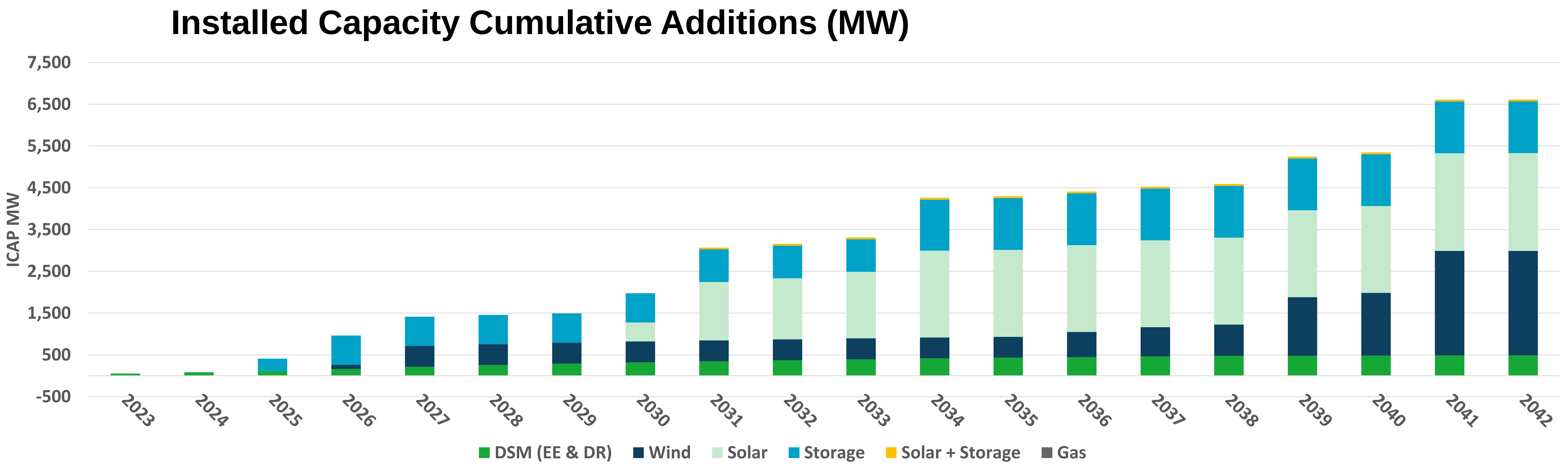
One Pete Unit Retires (2026): Current Trends *(Reference Case)*



One Pete Unit Retires (2026): Current Trends *(Reference Case)*



Installed Capacity Incremental Additions (MW): 2023 - 2028

	2023	2024	2025	2026	2027	2028
Wind	0	0	0	100	400	0
Solar	0	0	0	0	0	0
Storage	0	0	300	400	0	0
Solar + Storage	0	0	0	0	0	0
Natural Gas	0	0	0	0	0	0

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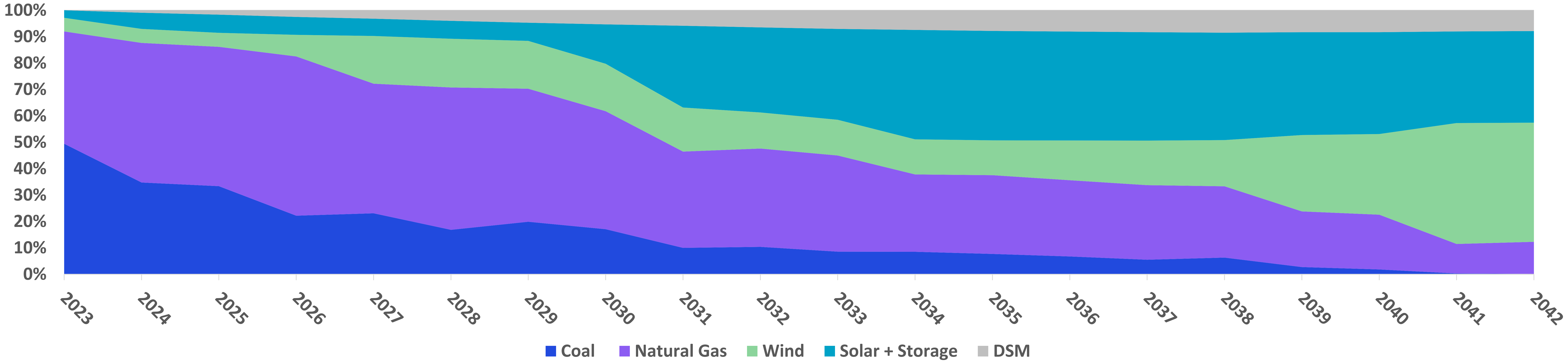
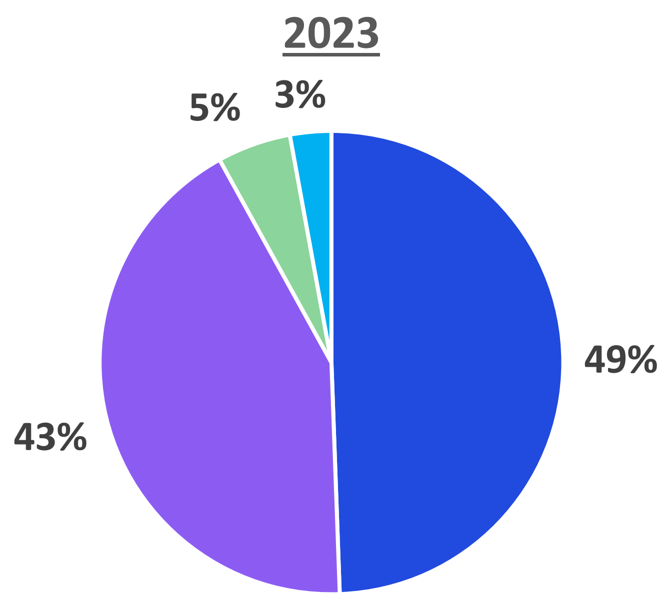
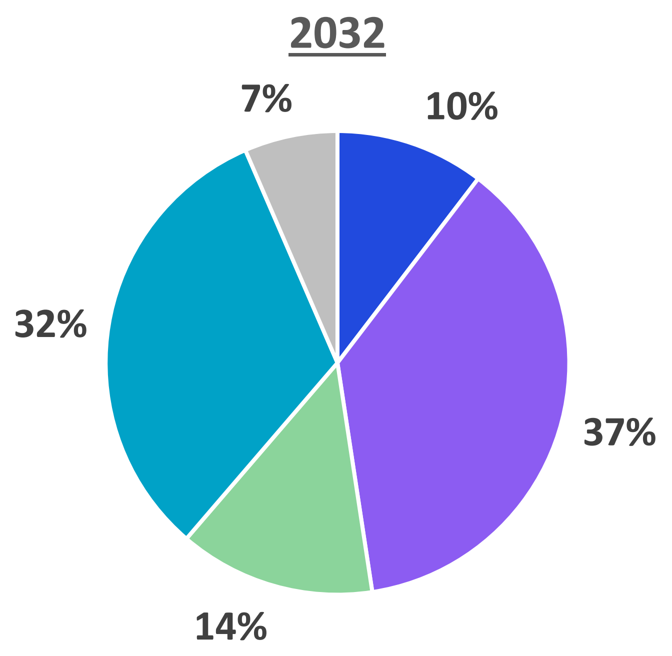
One Pete Unit Retires (2026): Current Trends *(Reference Case)*

Energy Mix %

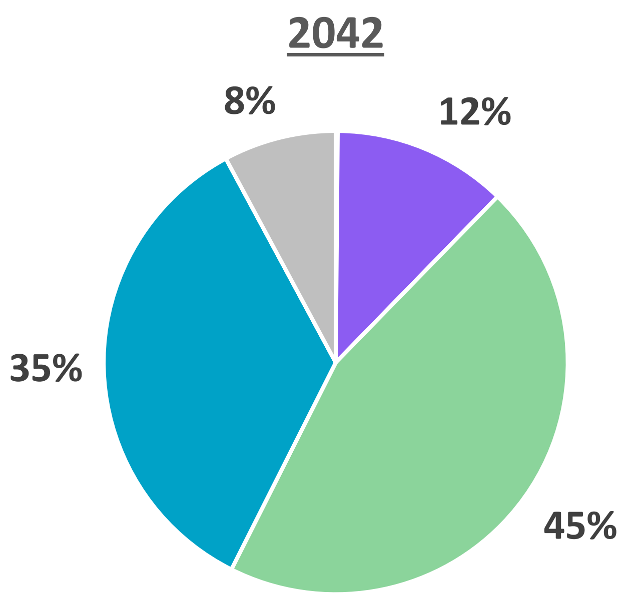




Thermal MWh %	92%
Renewable/DSM MWh %	8%



Thermal MWh %	48%
Renewable/DSM MWh %	52%



Thermal MWh %	12%
Renewable/DSM MWh %	88%

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One Pete Unit Retires (2026): Current Trends *(Reference Case)*

DSM Results

Energy Efficiency:

	Vintage 1	Vintage 2	Vintage 3
	2024 - 2026	2027 - 2029	2030 - 2042
Residential	Efficient Products - Lower Cost	Lower Cost Residential (excluding Income Qualified Weatherization (IQW))	Lower Cost Residential (excluding IQW)
Residential	Efficient Products - Higher Cost		
Residential	Behavioral		
Residential	School Education	Higher Cost Residential (excluding IQW)	Higher Cost Residential (excluding IQW)
Residential	Appliance Recycling		
Residential	Multifamily		
Residential	IQW	IQW	IQW
C&I	Prescriptive	C&I	C&I
C&I	Custom		
C&I	Custom RCx		
C&I	Custom SEM		
Impacts	Avg Annual MWh	Avg Annual MWh	Avg Annual MWh
Impacts	131,578	141,526	146,428
Impacts	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out
Impacts	1.0%	1.1%	1.2%
Impacts	Cummulative Summer MW	Cummulative Summer MW	Cummulative Summer MW
Impacts	87 MW	92 MW	303 MW

Demand Response:

	2026 - 2042
Residential	Direct Load Control
Residential	Residential Rates
C&I	Direct Load Control
C&I	C&I Rates
	Cumulative Summer MW
	75 MW

Note: Boxes highlighted in purple denote DSM bundles that were selected by Encompass

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One Pete Unit Retires (2026): Current Trends *(Reference Case)*

Portfolio Overview

Retirements

Petersburg:

- Pete 3 Coal: 2026
  - **Total Coal Retired MW: 520 MW**

Harding Street:

- HS ST5 Nat Gas: 2030
- HS ST6 Nat Gas: 2030
- HS ST7 Nat Gas: 2033
  - **Total Nat Gas Retired MW: 618 MW**

Replacement Additions by 2042

- DSM: 490 MW
- Wind: 2,500 MW
- Solar: 2,340 MW
- Storage: 1,240 MW
- Solar + Storage: 45 MW
- Thermal: 0 MW

Current Trends PVRR Summary

20-Year PVRR (2023$MM, 2023-2042)

Strategy	PVRR
No Early Retirement	$9,572
Pete Refuel to 100% Gas (est. 2025)	$9,330
One Pete Unit Retires (2026)	$9,773
Both Pete Units Retire (2026 & 2028)	$9,618
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,711
Encompass Optimization without predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027	$9,262

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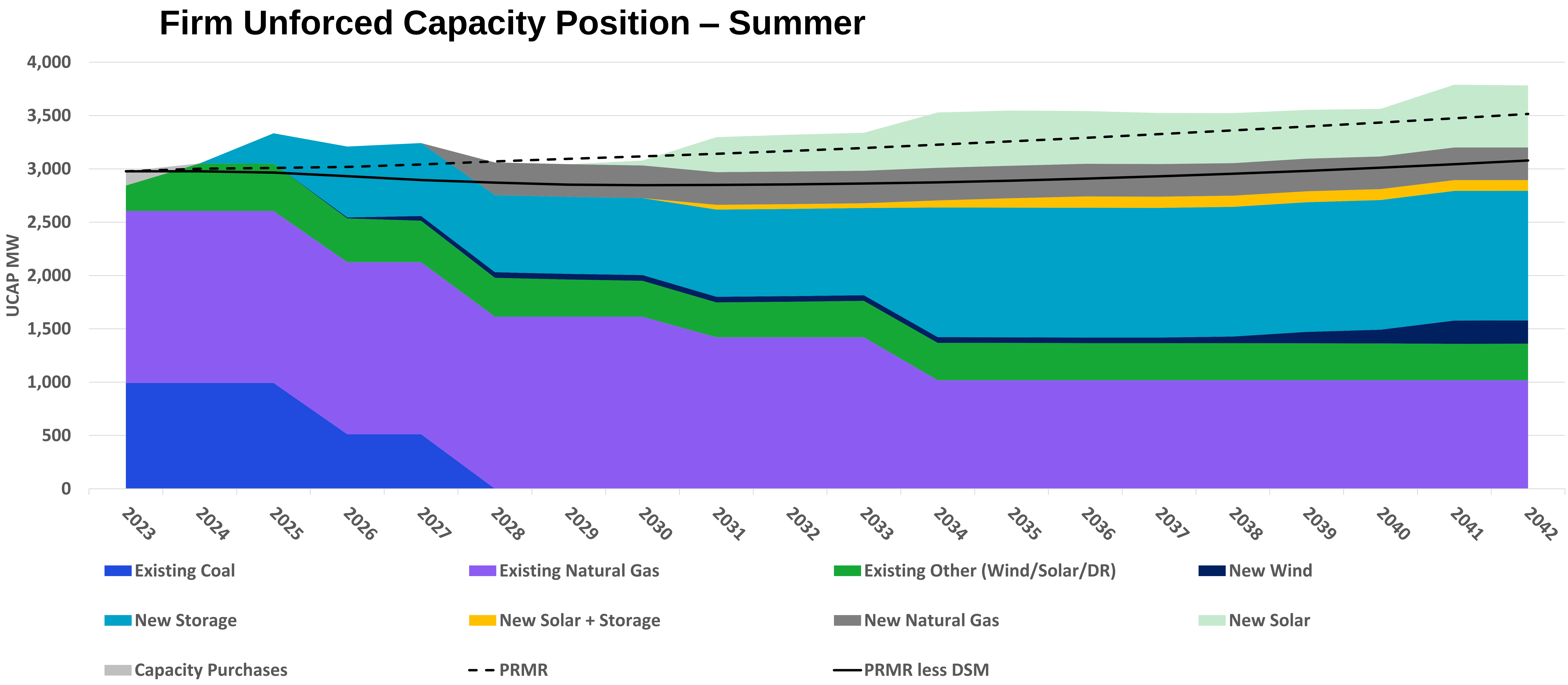
D. Both Pete Units Retire (2026 & 2028)

Scenarios			
No Environmental Action	Current Trends	Aggressive Environmental	Decarbonized Economy
	$9,618		

Indiana

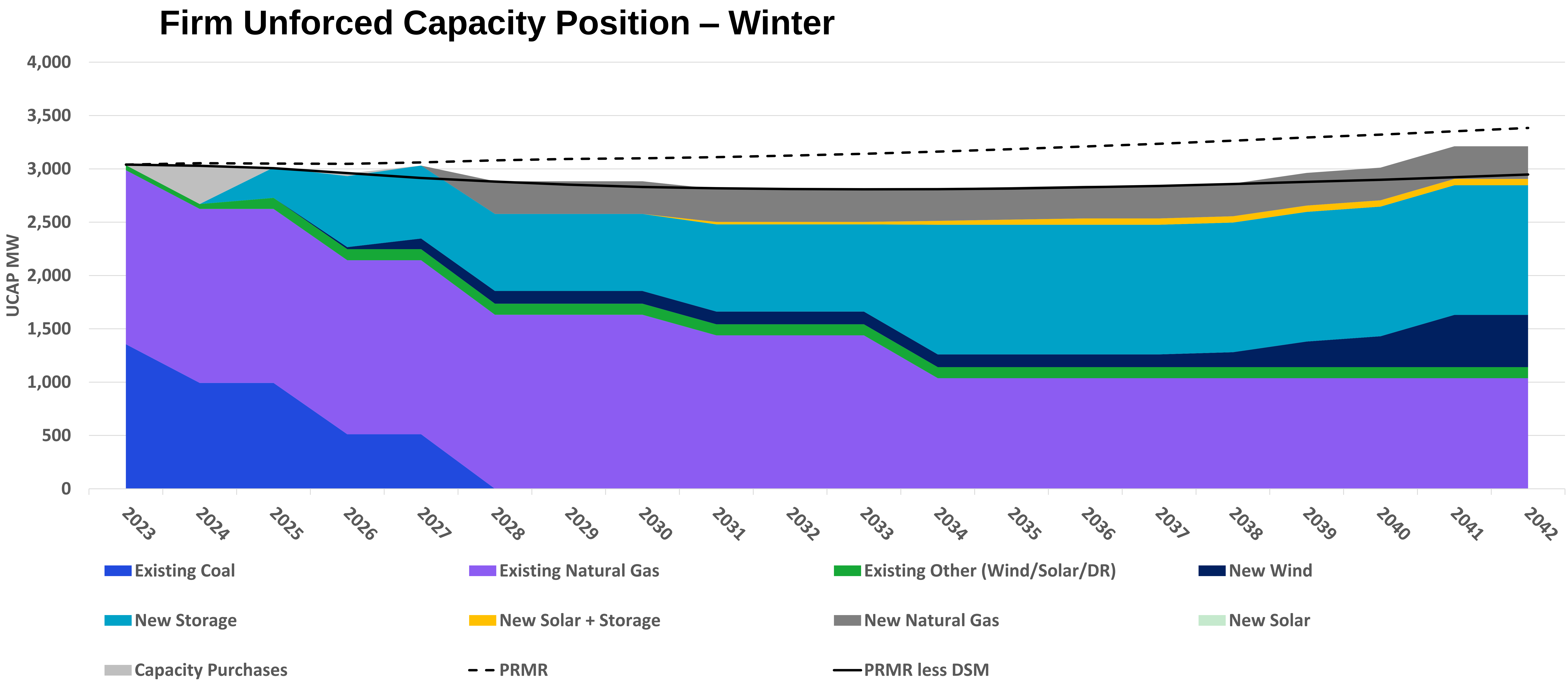
Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028



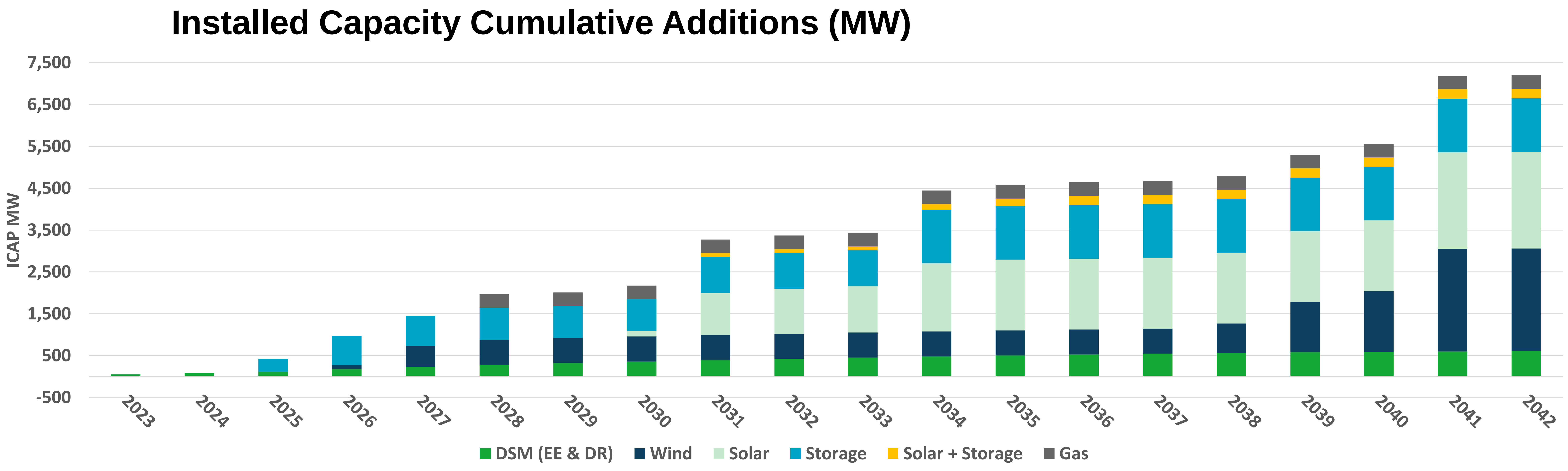
Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028



Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028



Installed Capacity Incremental Additions (MW): 2023 – 2028

	2023	2024	2025	2026	2027	2028
Wind	0	0	0	100	400	100
Solar	0	0	0	0	0	0
Storage	0	0	300	400	20	40
Solar + Storage	0	0	0	0	0	0
Natural Gas	0	0	0	0	0	325

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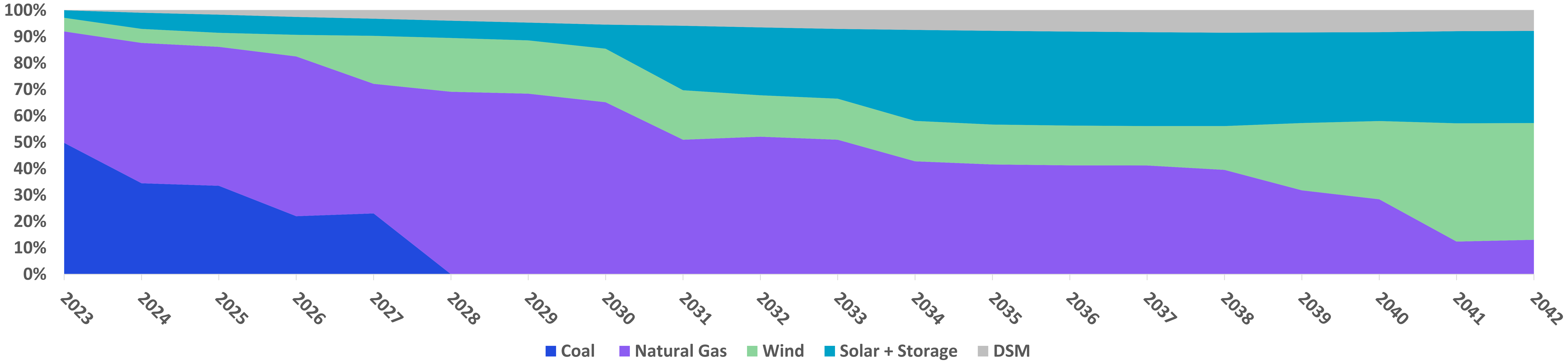
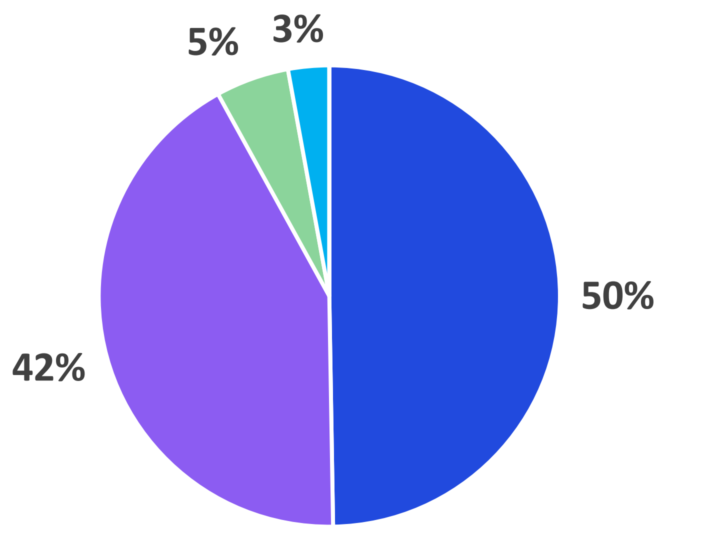
Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028

Energy Mix %

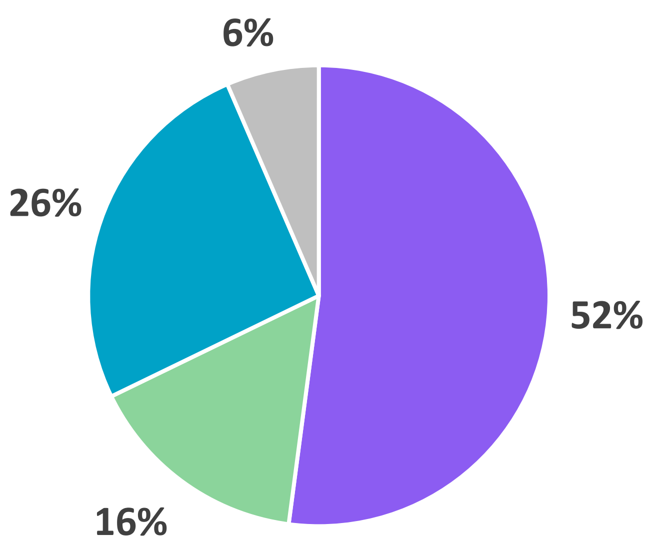


2023



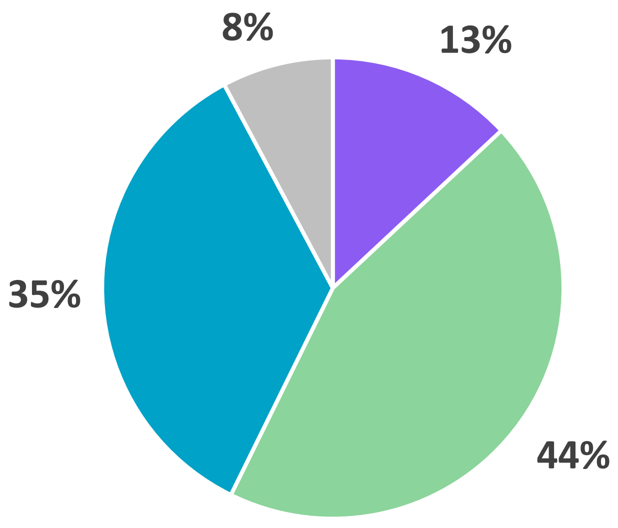
Thermal MWh %	92%
Renewable/DSM MWh %	8%

2032



Thermal MWh %	52%
Renewable/DSM MWh %	48%

2042



Thermal MWh %	13%
Renewable/DSM MWh %	87%

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Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028

DSM Results

Energy Efficiency:

	Vintage 1	Vintage 2	Vintage 3
	2024 - 2026	**2027 - 2029**	**2030 - 2042**
Residential	Efficient Products - Lower Cost	Lower Cost Residential (excluding Income Qualified Weatherization (IQW))	Lower Cost Residential (excluding IQW)
	Efficient Products - Higher Cost		
	Behavioral		
	School Education	Higher Cost Residential (excluding IQW)	Higher Cost Residential (excluding IQW)
	Appliance Recycling		
	Multifamily		
	IQW	IQW	IQW
C&I	Prescriptive	C&I	C&I
	Custom		
	Custom RCx		
	Custom SEM		
Impacts	Avg Annual MWh	Avg Annual MWh	Avg Annual MWh
	131,578	141,526	146,428
	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out
	1.0%	1.1%	1.2%
	Cummulative Summer MW	Cummulative Summer MW	Cummulative Summer MW
	87 MW	92 MW	303 MW

Demand Response:

	2026 - 2042
Residential	Direct Load Control
	Residential Rates
C&I	Direct Load Control
	C&I Rates
	Cumulative Summer MW
	195 MW

Note: Boxes highlighted in purple denote DSM bundles that were selected by Encompass

Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028

Portfolio Overview

Retirements

Petersburg:
- Pete 3 Coal: 2026
- Pete 4 Coal: 2028
  - **Total Coal Retired MW: 1,040 MW**

Harding Street:
- HS ST5 Nat Gas: 2030
- HS ST6 Nat Gas: 2030
- HS ST7 Nat Gas: 2033
  - **Total Nat Gas Retired MW: 618 MW**

Replacement Additions by 2042

- DSM: 610 MW
- Wind: 2,450 MW
- Solar: 2,308 MW
- Storage: 1,280 MW
- Solar + Storage: 225 MW
- Thermal: 325 MW

Current Trends PVRR Summary

20-Year PVRR (2023$MM, 2023-2042)

Strategy	PVRR
No Early Retirement	$9,572
Pete Refuel to 100% Gas (est. 2025)	$9,330
One Pete Unit Retires (2026)	$9,773
Both Pete Units Retire (2026 & 2028)	$9,618
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,711
Encompass Optimization without predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027	$9,262

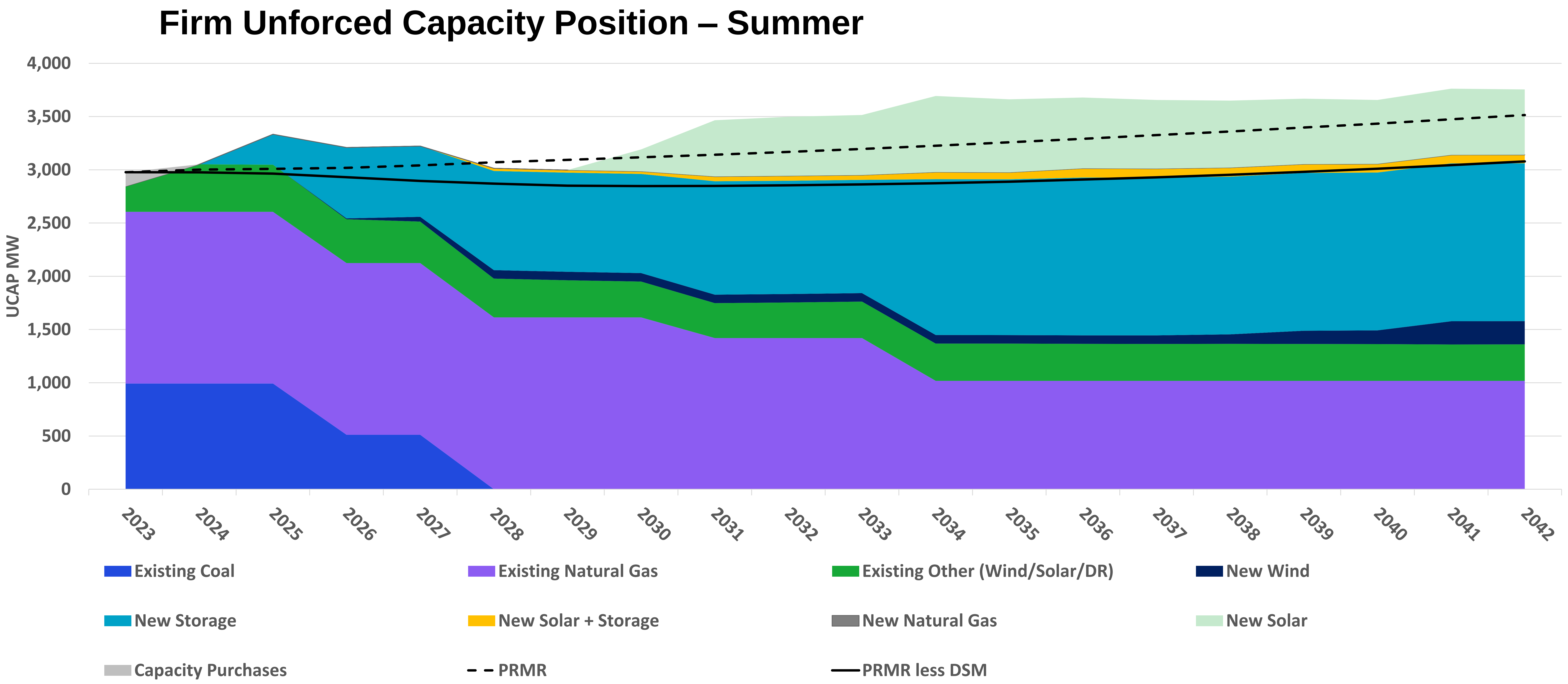
E. Clean Energy Strategy

Retire & Replace Pete with Clean Energy

Scenarios			
No Environmental Action	Current Trends	Aggressive Environmental	Decarbonized Economy
	$9,711		

Clean Energy Strategy: Current Trends *(Reference Case)*

Retire & Replace Pete with Clean Energy



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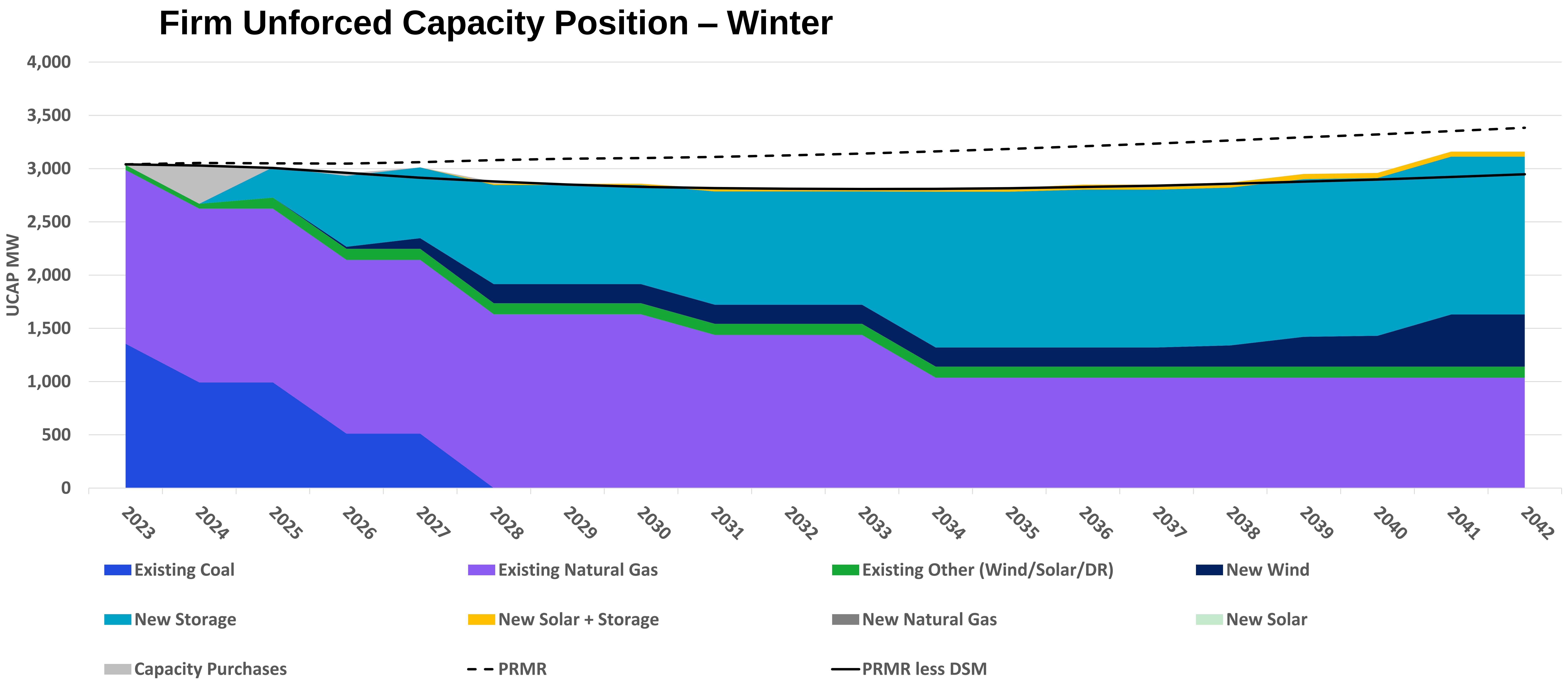
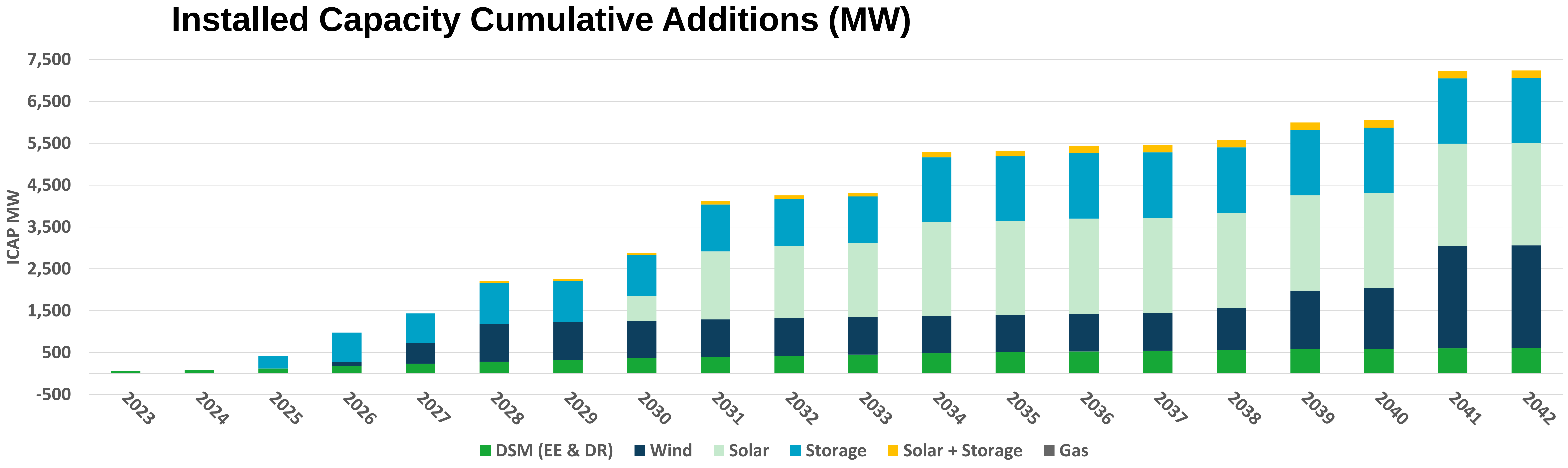
Clean Energy Strategy: Current Trends *(Reference Case)*

Retire & Replace Pete with Clean Energy



Clean Energy Strategy: Current Trends *(Reference Case)*

Retire & Replace Pete with Clean Energy



Installed Capacity Incremental Additions (MW): 2023 – 2028

	2023	2024	2025	2026	2027	2028
Wind	0	0	0	100	400	400
Solar	0	0	0	0	0	0
Storage	0	0	300	400	0	280
Solar + Storage	0	0	0	0	0	45
Natural Gas	0	0	0	0	0	0

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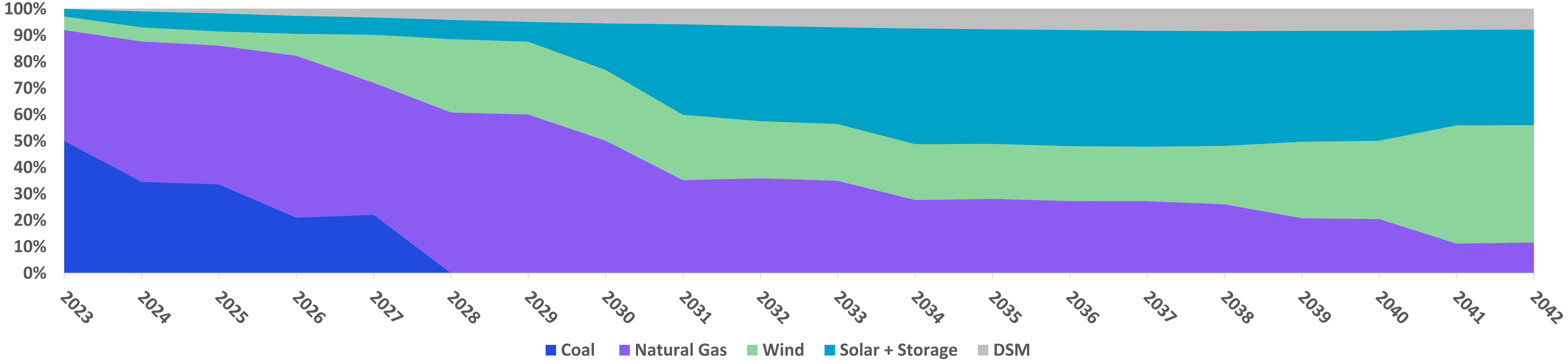
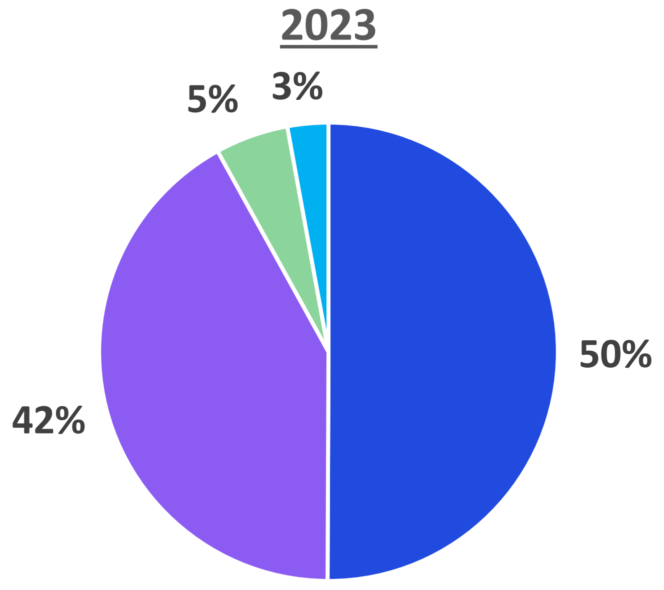
Clean Energy Strategy: Current Trends *(Reference Case)*

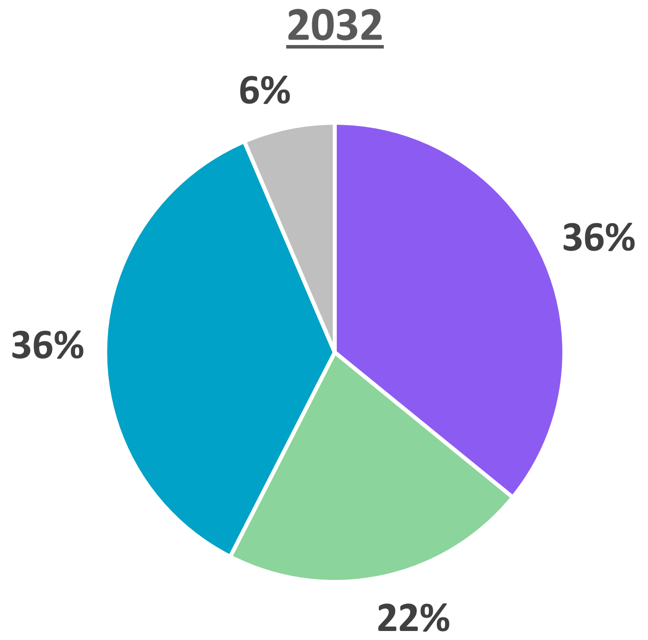
Retire & Replace Pete with Clean Energy

Energy Mix %

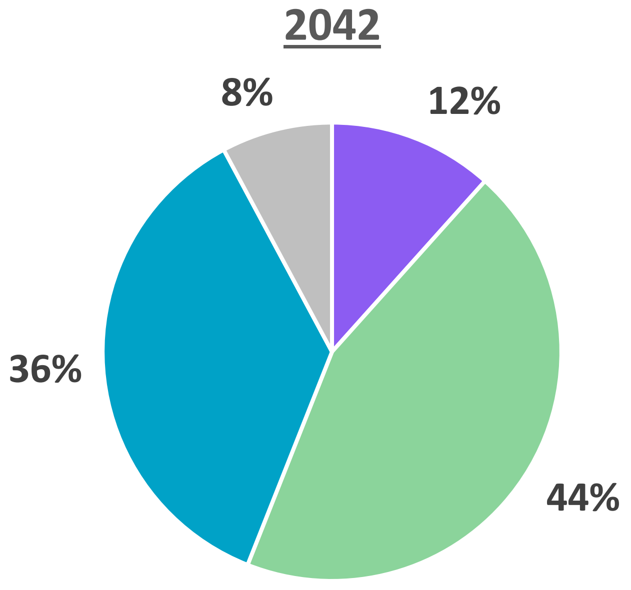




Thermal MWh %	92%
Renewable/DSM MWh %	8%



Thermal MWh %	36%
Renewable/DSM MWh %	64%



Thermal MWh %	12%
Renewable/DSM MWh %	88%

Clean Energy Strategy: Current Trends *(Reference Case)*

Retire & Replace Pete with Clean Energy

DSM Results

Energy Efficiency:

<table>
<tr><th></th><th>Vintage 1
2024 - 2026</th><th>Vintage 2
2027 - 2029</th><th>Vintage 3
2030 - 2042</th></tr>
<tr><td rowspan="7">Residential</td><td>Efficient Products - Lower Cost</td><td rowspan="3">Lower Cost Residential (excluding Income Qualified Weatherization (IQW))</td><td rowspan="3">Lower Cost Residential (excluding IQW)</td></tr>
<tr><td>Efficient Products - Higher Cost</td></tr>
<tr><td>Behavioral</td></tr>
<tr><td>School Education</td><td rowspan="3">Higher Cost Residential (excluding IQW)</td><td rowspan="3">Higher Cost Residential (excluding IQW)</td></tr>
<tr><td>Appliance Recycling</td></tr>
<tr><td>Multifamily</td></tr>
<tr><td>IQW</td><td>IQW</td><td>IQW</td></tr>
<tr><td rowspan="4">C&I</td><td>Prescriptive</td><td rowspan="4">C&I</td><td rowspan="4">C&I</td></tr>
<tr><td>Custom</td></tr>
<tr><td>Custom RCx</td></tr>
<tr><td>Custom SEM</td></tr>
<tr><td rowspan="6">Impacts</td><td>Avg Annual MWh</td><td>Avg Annual MWh</td><td>Avg Annual MWh</td></tr>
<tr><td>134,263</td><td>141,526</td><td>146,428</td></tr>
<tr><td>% of 2021 Sales ex. Opt-Out</td><td>% of 2021 Sales ex. Opt-Out</td><td>% of 2021 Sales ex. Opt-Out</td></tr>
<tr><td>1.1%</td><td>1.1%</td><td>1.2%</td></tr>
<tr><td>Cummulative Summer MW</td><td>Cummulative Summer MW</td><td>Cummulative Summer MW</td></tr>
<tr><td>89 MW</td><td>92 MW</td><td>303 MW</td></tr>
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Demand Response:

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<tr><th></th><th>2026 - 2042</th></tr>
<tr><td rowspan="2">Residential</td><td>Direct Load Control</td></tr>
<tr><td>Residential Rates</td></tr>
<tr><td rowspan="2">C&I</td><td>Direct Load Control</td></tr>
<tr><td>C&I Rates</td></tr>
<tr><td rowspan="2"></td><td>Cumulative Summer MW</td></tr>
<tr><td>195 MW</td></tr>
</table>

Note: Boxes highlighted in purple denote DSM bundles that were selected by Encompass

Clean Energy Strategy: Current Trends *(Reference Case)*

Retire & Replace Pete with Clean Energy

Portfolio Overview

Retirements

Petersburg:
- Pete 3 Coal: 2026
- Pete 4 Coal: 2028
  - **Total Coal Retired MW: 1,040 MW**

Harding Street:
- HS ST5 Nat Gas: 2030
- HS ST6 Nat Gas: 2030
- HS ST7 Nat Gas: 2033
  - **Total Retired Nat Gas MW: 618 MW**

Replacements by 2042

- DSM: 610 MW
- Wind: 2,450 MW
- Solar: 2,438 MW
- Storage: 1,560 MW
- Solar + Storage: 180 MW
- Thermal: 0 MW

Current Trends PVRR Summary

20-Year PVRR (2023$MM, 2023-2042)

Strategy	PVRR
No Early Retirement	$9,572
Pete Refuel to 100% Gas (est. 2025)	$9,330
One Pete Unit Retires (2026)	$9,773
Both Pete Units Retire (2026 & 2028)	$9,618
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,711
Encompass Optimization without predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027	$9,262

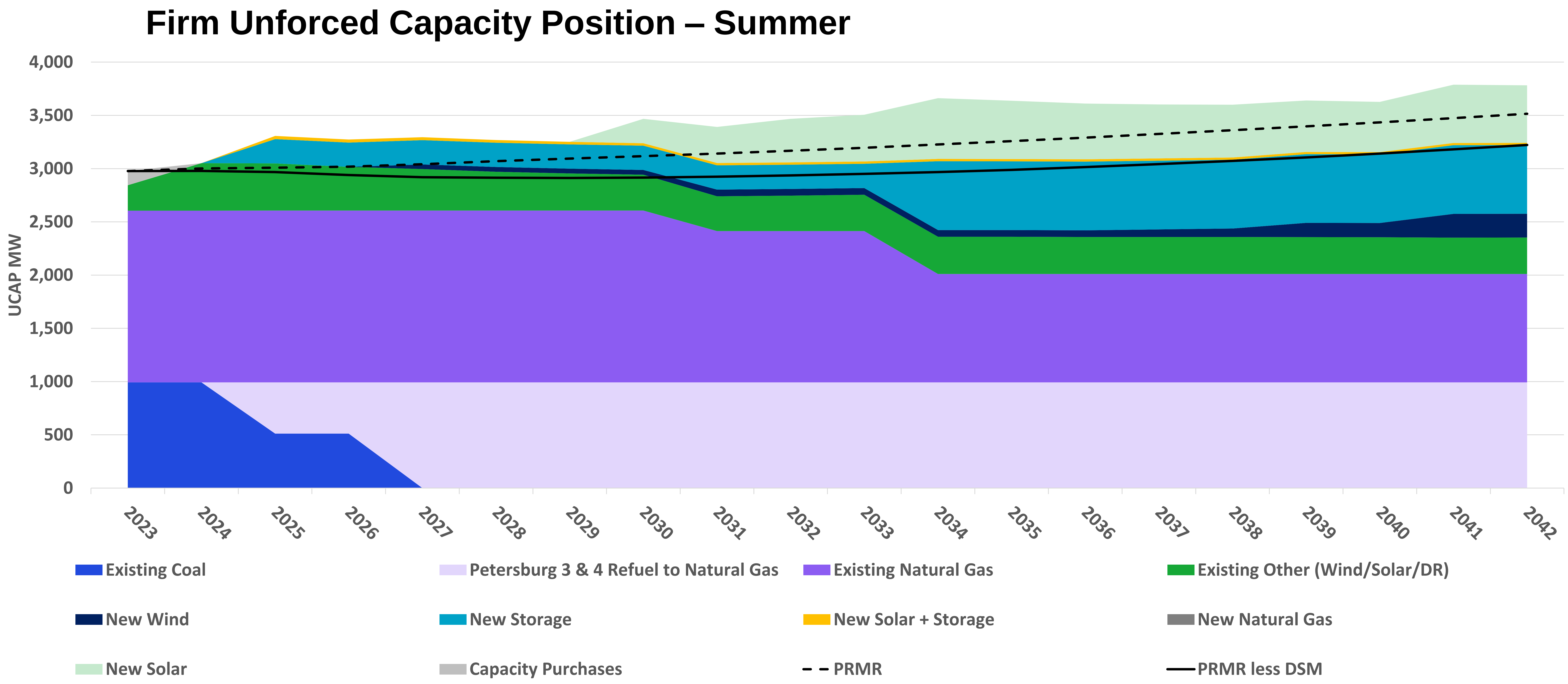
F. Encompass Optimization

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

Scenarios			
No Environmental Action	**Current Trends**	**Aggressive Environmental**	**Decarbonized Economy**
	$9,262		

Encompass Optimization: Current Trends *(Reference Case)*

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027



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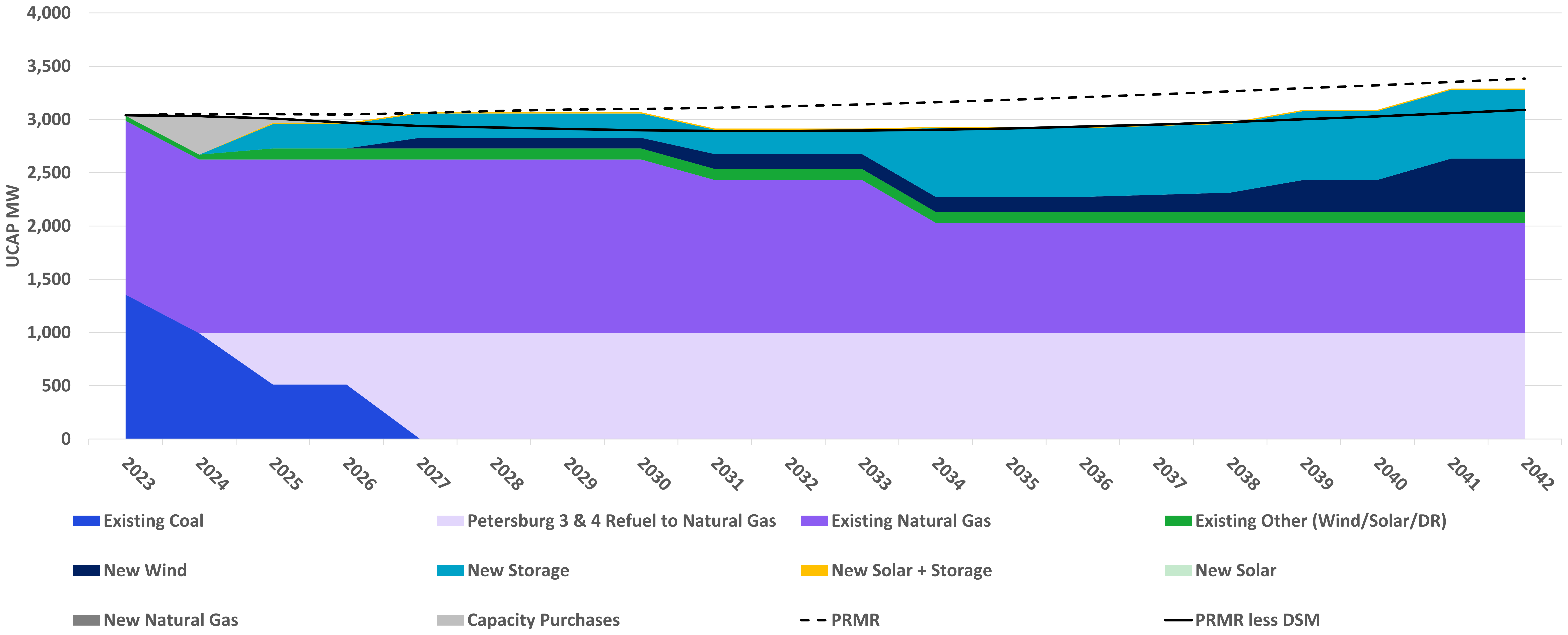
Encompass Optimization: Current Trends *(Reference Case)*

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

Firm Unforced Capacity Position – Winter



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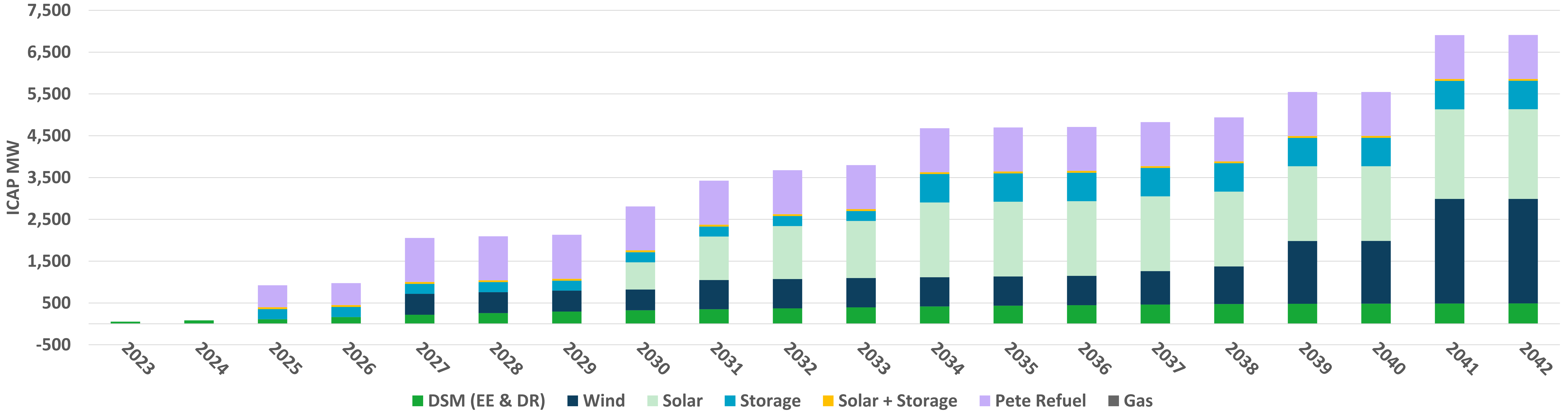
Encompass Optimization: Current Trends *(Reference Case)*

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

Installed Capacity Cumulative Additions (MW)



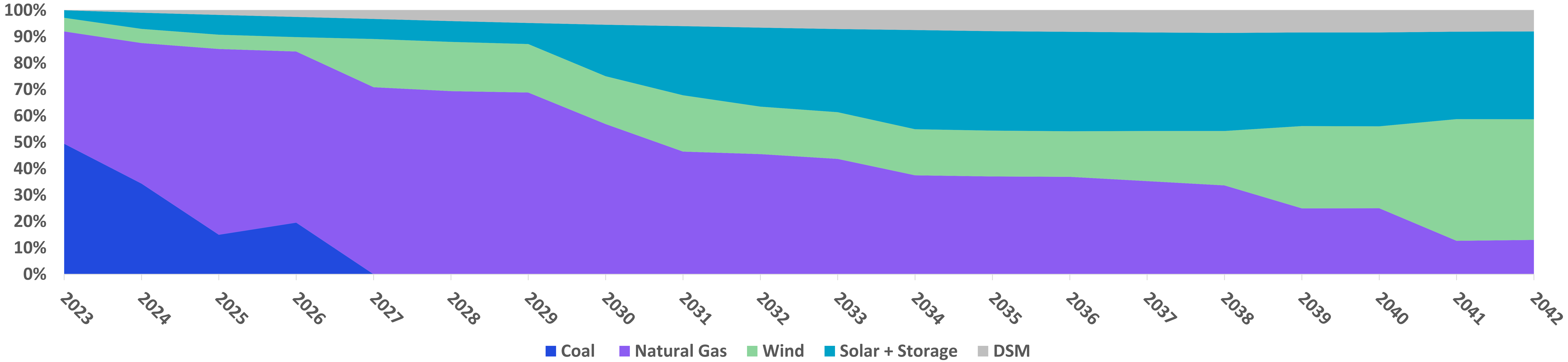
Installed Capacity Incremental Additions (MW): 2023 - 2028

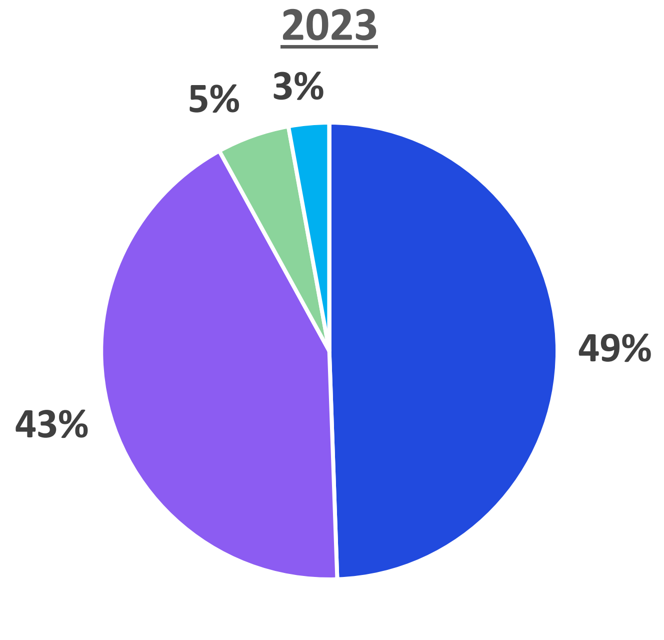
	2023	2024	2025	2026	2027	2028
Pete Refuel	0	0	526	0	526	0
Wind	0	0	0	0	500	0
Solar	0	0	0	0	0	0
Storage	0	0	240	0	0	0
Solar + Storage	0	0	45	0	0	0

Encompass Optimization: Current Trends *(Reference Case)*

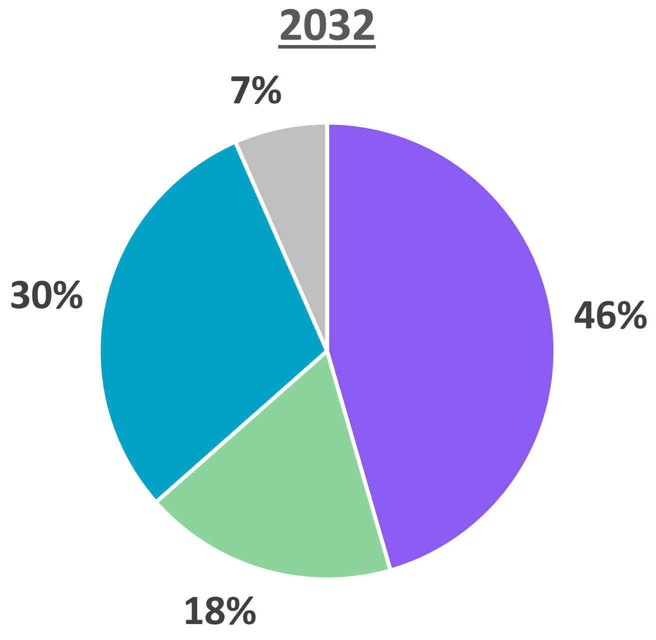
Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

Energy Mix %

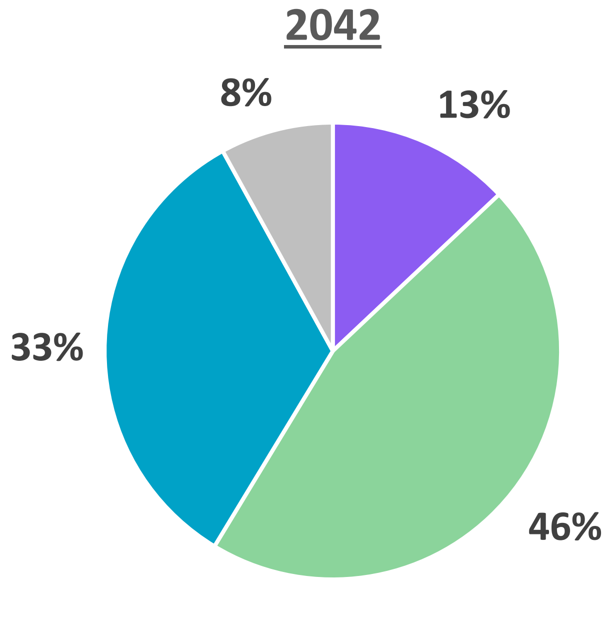




Thermal MWh %	92%
Renewable/DSM MWh %	8%



Thermal MWh %	46%
Renewable/DSM MWh %	54%



Thermal MWh %	13%
Renewable/DSM MWh %	87%

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Encompass Optimization: Current Trends *(Reference Case)*

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

DSM Results

Energy Efficiency:

	Vintage 1	Vintage 2	Vintage 3
	2024 - 2026	2027 - 2029	2030 - 2042
Residential	Efficient Products - Lower Cost	Lower Cost Residential (excluding Income Qualified Weatherization (IQW))	Lower Cost Residential (excluding IQW)
	Efficient Products - Higher Cost		
	Behavioral		
	School Education	Higher Cost Residential (excluding IQW)	Higher Cost Residential (excluding IQW)
	Appliance Recycling		
	Multifamily		
	IQW	IQW	IQW
C&I	Prescriptive	C&I	C&I
	Custom		
	Custom RCx		
	Custom SEM		
Impacts	Avg Annual MWh	Avg Annual MWh	Avg Annual MWh
	134,263	141,526	146,428
	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out	% of 2021 Sales ex. Opt-Out
	1.1%	1.1%	1.2%
	Cummulative Summer MW	Cummulative Summer MW	Cummulative Summer MW
	89 MW	92 MW	303 MW

Demand Response:

	2026 - 2042
Residential	Direct Load Control
	Residential Rates
C&I	Direct Load Control
	C&I Rates
	Cumulative Summer MW
	75 MW

Note: Boxes highlighted in purple denote DSM bundles that were selected by Encompass

Encompass Optimization: Current Trends *(Reference Case)*

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

Portfolio Overview

Retirements

Petersburg:

- Pete 3 Coal: 2026
- Pete 4 Coal: 2028
  - **Total Refueled MW: 1,040 MW**

Harding Street:

- HS ST5 Nat Gas: 2030
- HS ST6 Nat Gas: 2030
- HS ST7 Nat Gas: 2033
  - **Total Nat Gas Retired MW: 618 MW**

Replacement Additions by 2042

- DSM: 490 MW
- Wind: 2,500 MW
- Solar: 2,145 MW
- Storage: 680 MW
- Solar + Storage: 45 MW
- Thermal: 0
- Pete 3 & 4 Refueled to Nat Gas: 1,052 MW

Current Trends PVRR Summary

20-Year PVRR (2023$MM, 2023-2042)

Strategy	PVRR
No Early Retirement	$9,572
Pete Refuel to 100% Gas (est. 2025)	$9,330
One Pete Unit Retires (2026)	$9,773
Both Pete Units Retire (2026 & 2028)	$9,618
Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,711
Encompass Optimization without predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027	$9,262

Portfolio Matrix

20-Year PVRR (2023$MM, 2023-2042)

		Scenarios			
		No Environmental Action	**Current Trends (Reference Case)**	**Aggressive Environmental**	**Decarbonized Economy**
Generation Strategies	**No Early Retirement**	$7,111	$9,572	$11,349	$9,917
	Pete Refuel to 100% Gas (est. 2025)	$6,621	$9,330	$11,181	$9,546
	One Pete Unit Retires (2026)	$7,462	$9,773	$11,470	$9,955
	Both Pete Units Retire (2026 & 2028)	$7,425	$9,618	$11,145	$9,923
	"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$9,211	$9,711	$11,184	$9,690
	Encompass Optimization without predefined Strategy	$6,610	$9,262	$10,994*	$9,572

Encompass Optimization Results by Scenario:

Refuels Petersburg Units 3 & 4 in 2025	Refuels Petersburg Unit 3 in 2025 & Refuels Petersburg Unit 4 in 2027	Refuels Petersburg Unit 4 in 2027*	Refuels Petersburg Unit 3 in 2025 & Refuels Petersburg Unit 4 in 2027

*Refueling Pete 3 & 4 at the same time provides cost efficiencies. These efficiencies are not captured when only one unit refuels.

Break for Lunch

Time	Topic	Speakers
Afternoon Starting at 12:30 PM	Replacement Resource Cost Sensitivity Analysis	Erik Miller, Manager, Resource Planning, AES Indiana
	Preliminary IRP Scorecard Results	Erik Miller, Manager, Resource Planning, AES Indiana

Replacement Resource Cost Sensitivity Analysis

Erik Miller, Manager, Resource Planning, AES Indiana

Replacement Resource Cost Sensitivity Analysis Overview

As part of this IRP, AES Indiana conducted a sensitivity analysis on the capital costs for replacement resources. The analysis was conducted in response to the current volatility of replacement resource capital cost caused by supply constraints and potential solar tariffs.

How the analysis was performed

- Using secondary data sources and the responses from AES Indiana's past two RFPs that were issued in 2020 and the spring of 2022, the IRP team created low, base and high levels of replacement resource costs.
  - Low – low costs were based on the avg of the contemporary replacement resource capital cost forecasts from Wood Mackenzie, NREL and BNEF and benchmarked against the responses from AES Indiana's 2020 RFP.
  - Base – base costs were based on the lower half of the 2022 RFP responses.
  - High – high costs were based on the upper half of the 2022 RFP responses.
  - Capacity Expansion (Retirement & Replacement) analysis was performed for each

Current Trends strategies at the three different replacement resource cost levels.

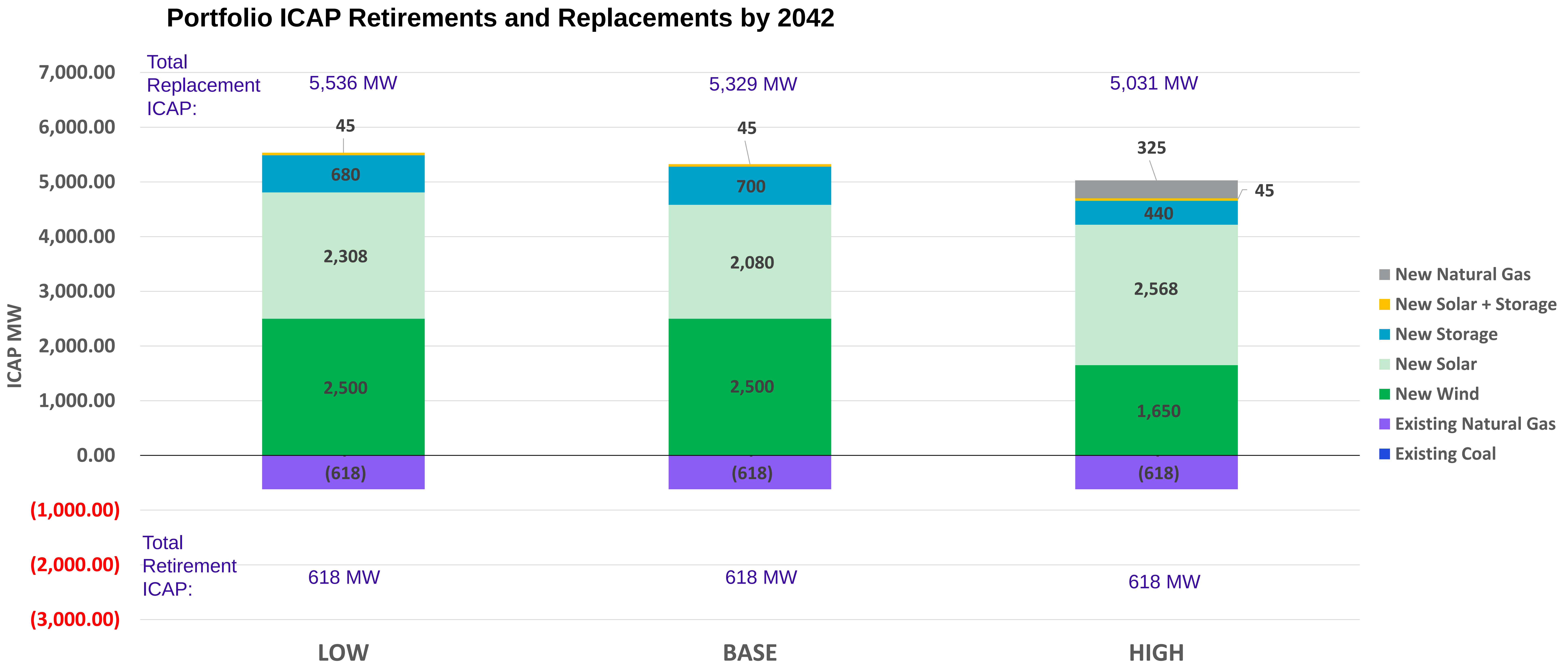
The following slides present the range of generation additions for each strategy that result from running capacity expansion with the different cost levels.

Low, Base and High replacement resource costs (nominal $/kW unsubsidized) in 2025

	Low	Base	High
Wind	$1,477	$1,909	$2,340
Solar	$1,036	$1,364	$1,925
4-hr Storage	$1,016	$1,253	$1,447
6-hr Storage	$1,525	$1,880	$2,170
Hybrid	$985	$1,270	$1,689
CCGT	$1,028	$1,120	$1,212
Frame CT	$868	$945	$1,023
Aero CT	$1,328	$1,447	$1,566
Recip	$1,277	$1,391	$1,505

Replacement Resource Cost Sensitivity

No Early Retirement



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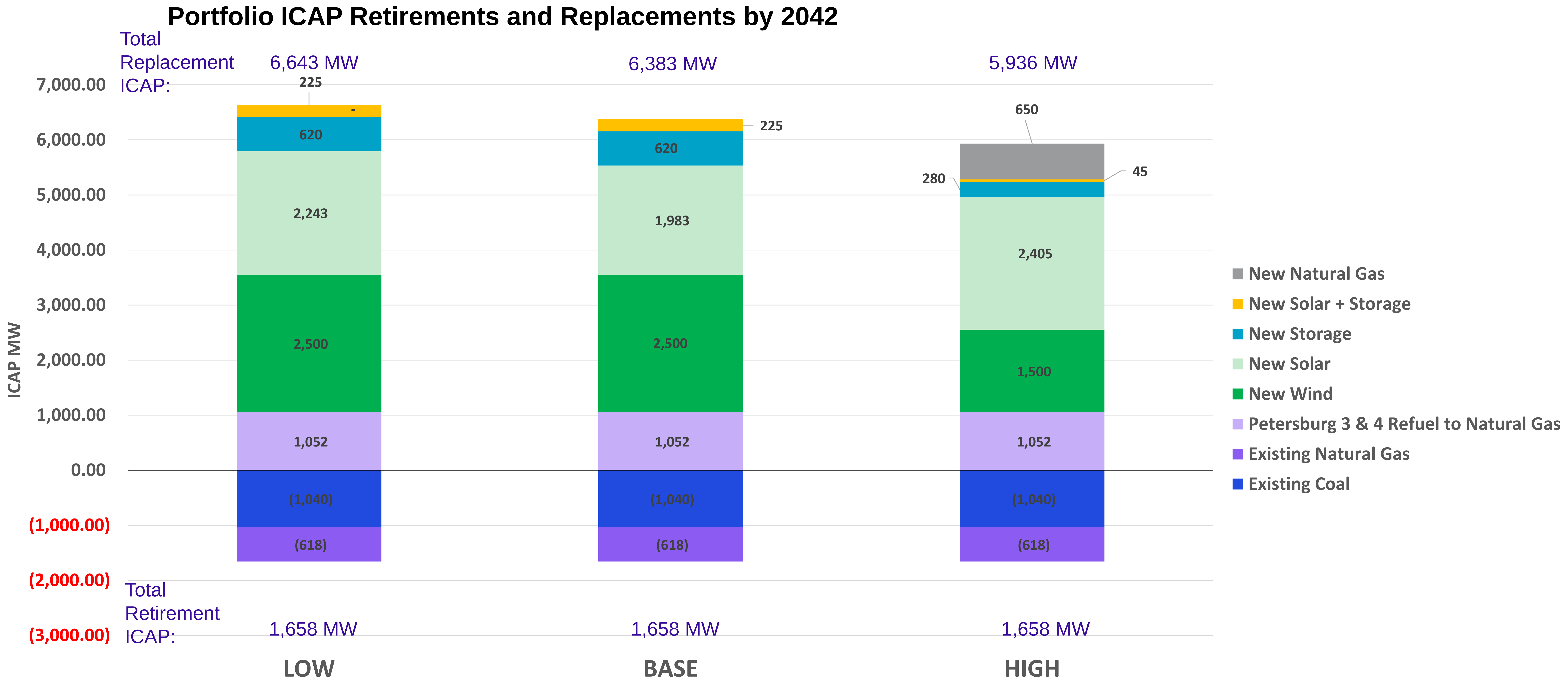
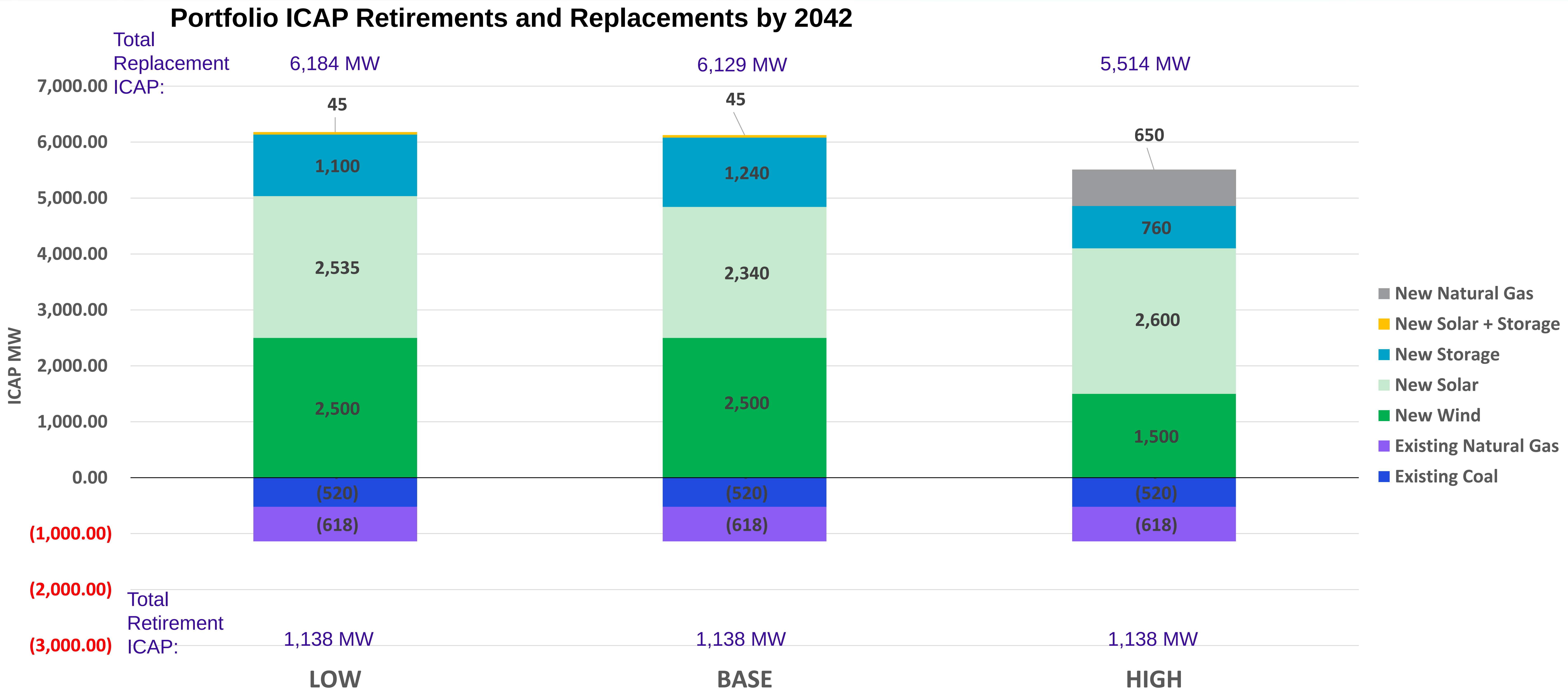
Replacement Resource Cost Sensitivity

Pete Refuel by 2025



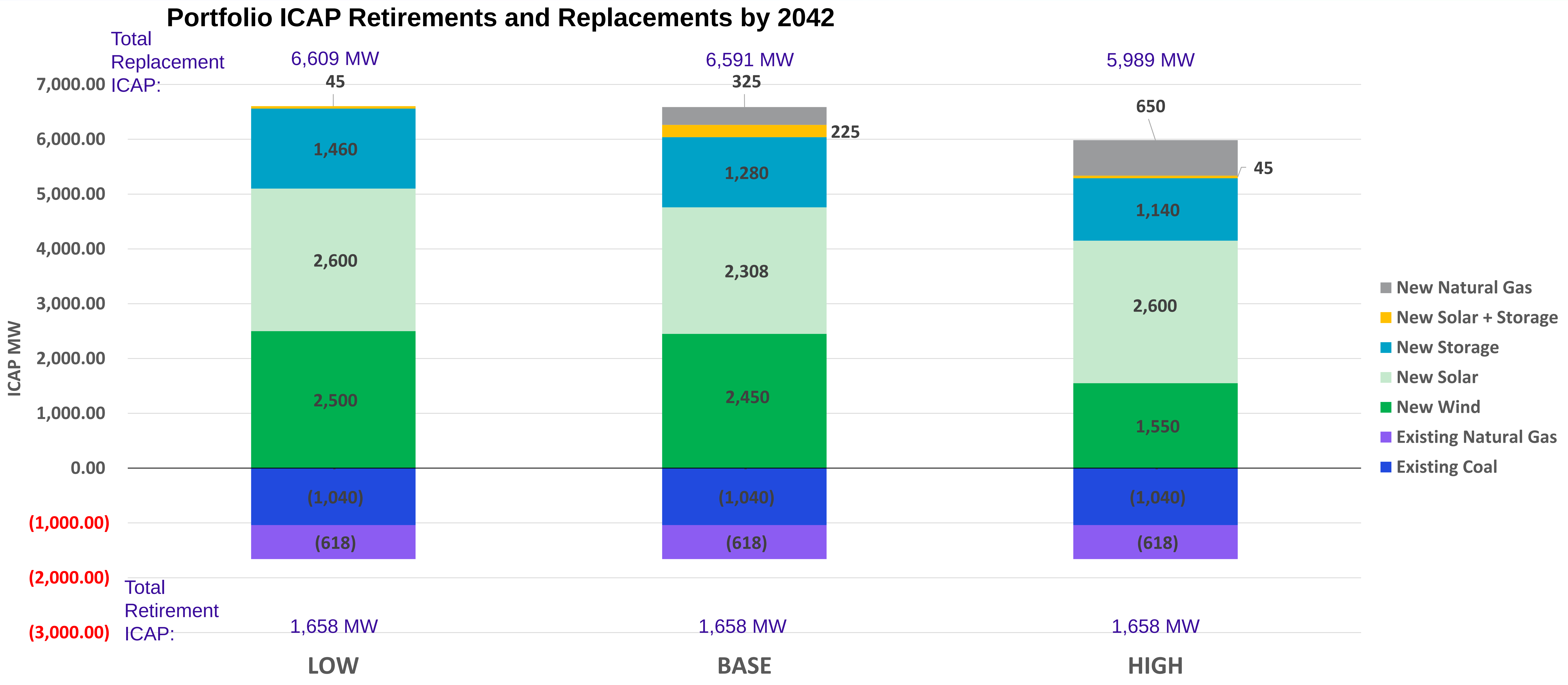
Replacement Resource Cost Sensitivity

One Pete Unit Retires



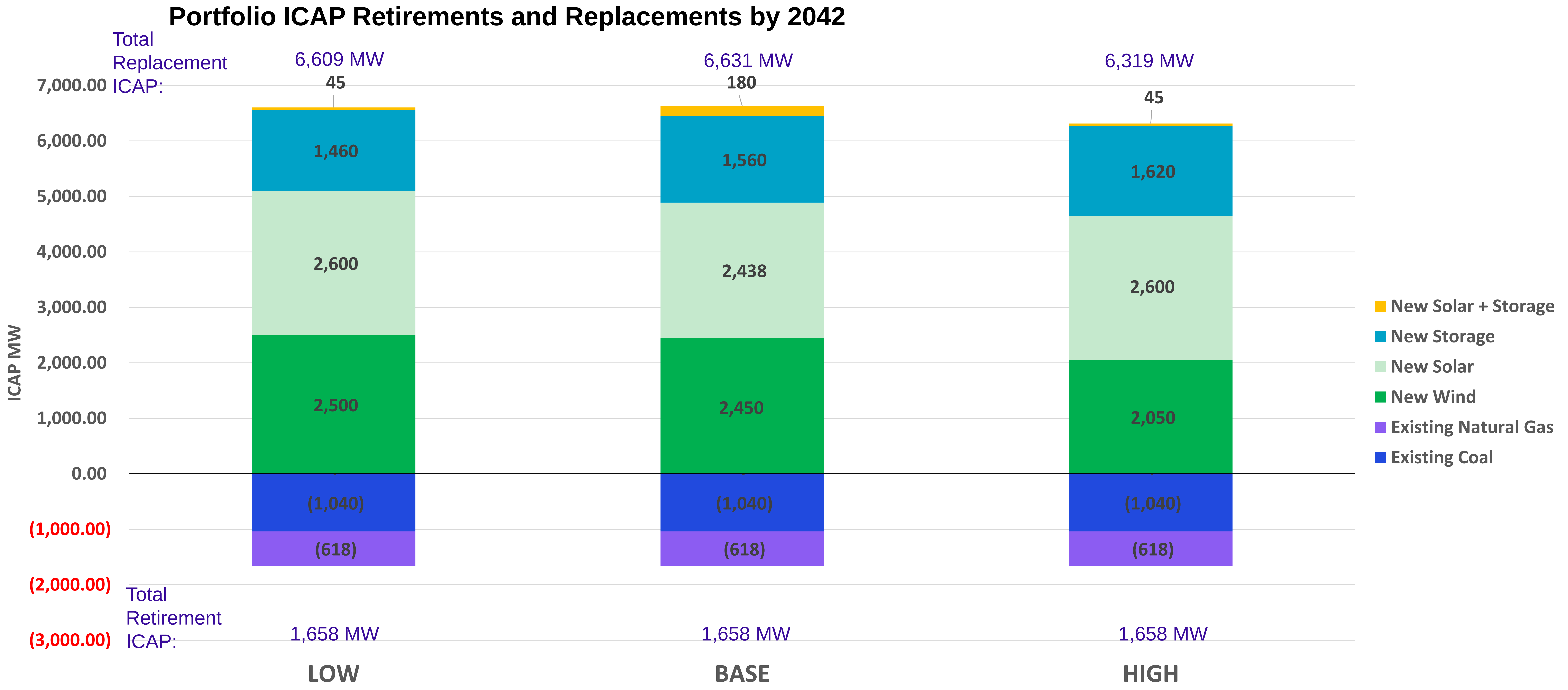
Replacement Resource Cost Sensitivity

Both Pete Unite Retire



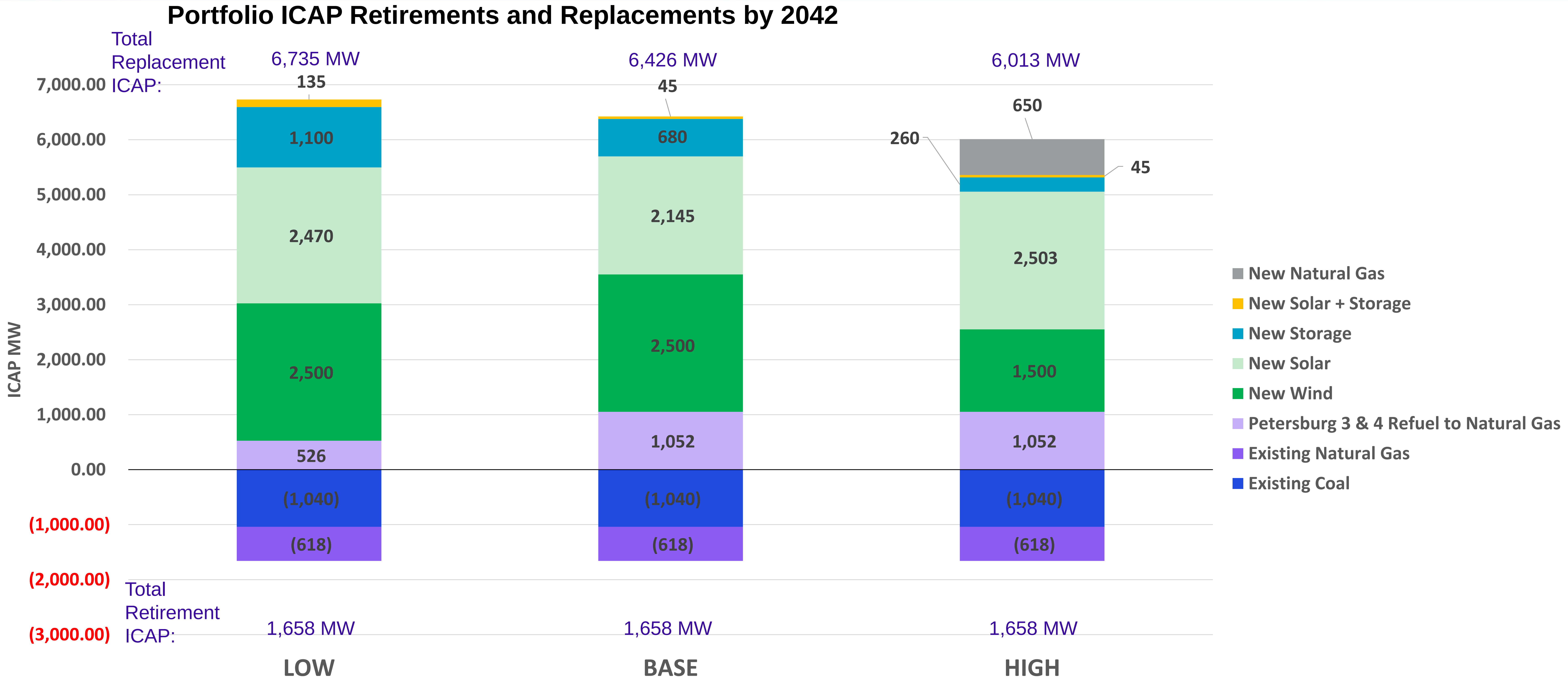
Replacement Resource Cost Sensitivity

Clean Energy Strategy



Replacement Resource Cost Sensitivity

Encompass Optimization



Replacement Resource Cost Sensitivity

Key Takeaways & PVRR Results

- As capital costs increase, fewer renewables are built for their energy value to the portfolio.
- As capital costs increase, newly constructed natural gas becomes more cost effective – less high price volatility with the cost to construct natural gas.
- Across the range of Replacement Resource Costs, refueling Petersburg provides a low PVRR.

20-Year PVRR (2023$MM, 2023-2042)

Generation Strategies	Current Trends (Reference Case) Low	Base	High
No Early Retirement	$9,054	$9,572	$9,876
Pete Refuel to 100% Gas (est. 2025)	$8,698	$9,330	$9,661
One Pete Unit Retires (2026)	$9,081	$9,773	$10,181
Both Pete Units Retire (2026 & 2028)	$8,790	$9,618	$10,178
"Clean Energy Strategy" Both Pete Units Retire and Replaced with Wind, Solar & Storage (2026 & 2028)	$8,787	$9,711	$10,586
Encompass Optimization without predefined Strategy	$8,670*	$9,262	$9,624

Encompass Optimization Portfolios		
Low	**Base**	**High**
Refuels Petersburg Unit 3 in 2025*	Refuels Petersburg Unit 3 in 2025 & Refuels Petersburg Unit 4 in 2027	Refuels Petersburg Unit 3 in 2025 & Refuels Petersburg Unit 4 in 2027

*Refueling Pete 3 & 4 at the same time provides cost efficiencies. These efficiencies are not captured when only one unit refuels.

Preliminary IRP Scorecard Results

Erik Miller, Manager, Resource Planning, AES Indiana

Preliminary Scorecard Results

Affordability, Environmental Sustainability and Risk & Opportunity metrics for the Current Trends portfolios

	Affordability	Environmental Sustainability						Reliability, Stability & Resiliency	Risk & Opportunity						Economic Impact	
	20-yr PVRR	*CO_2 Emissions*	*SO_2 Emissions*	*NO_X Emissions*	*Water Use*	*Coal Combustion Products (CCP)*	*Clean Energy Progress*	*Reliability Score*	*Environmental Policy Opportunity*	*Environmental Policy Risk*	*Cost Opportunity*	*Cost Risk*	*Market Exposure*	*Renewable Capital Cost Risk (+50%)*	*Employees (+/-)*	*Property Taxes*
	Present Value of Revenue Requirements (2023 $000,000)	CO2 Emissions (mmtons) 2023 - 2032	SO2 Emissions (tons) 2023 - 2032	NOx Emissions (tons) 2023 - 2032	Water Use (mmgal) 2023 - 2032	CCP (tons) 2023 - 2032	% Renewable Energy in 2032	Composite score from Reliability Analysis	Lowest PVRR across policy scenarios	Highest PVRR across policy scenarios	Mean - P95	P95 - Mean	20-year avg sales + purchases	Portfolio PVRR w/ renewable costs +50%	Total FTEs associated with generation	Total amount of property tax paid from AES IN assets (2023 $000,000)
1	$ 9,572	73.2	49,944	34,755	28.4	5,126	45%									$ 173
2	$ 9,330	54.5	13,402	19,501	7.9	1,417	55%									$ 211
3	$ 9,773	65.2	37,102	33,243	26.7	4,813	52%									$ 215
4	$ 9,618	58.6	25,506	23,102	15.0	2,700	48%									$ 248
5	$ 9,711	55.3	25,254	23,303	14.8	2,676	64%									$ 262
6	$ 9,262	56.6	18,503	22,559	10.9	1,970	54%									$ 203

Metrics Still in Progress

Strategies

- **1.** No Early Retirement
- **2.** Pete Refuel to 100% Natural Gas (est. 2025)
- **3.** One Pete Unit Retires in 2026
- **4.** Both Pete Units Retire in 2026 & 2028
- **5.** “Clean Energy Strategy” – Both Pete Units Retire and replaced with Renewables in 2026 & 2028
- **6.** Encompass Optimization without Predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

Complete Scorecard review and selection of the Preferred Resource Portfolio will be topics for Public Advisory Meeting # 5.

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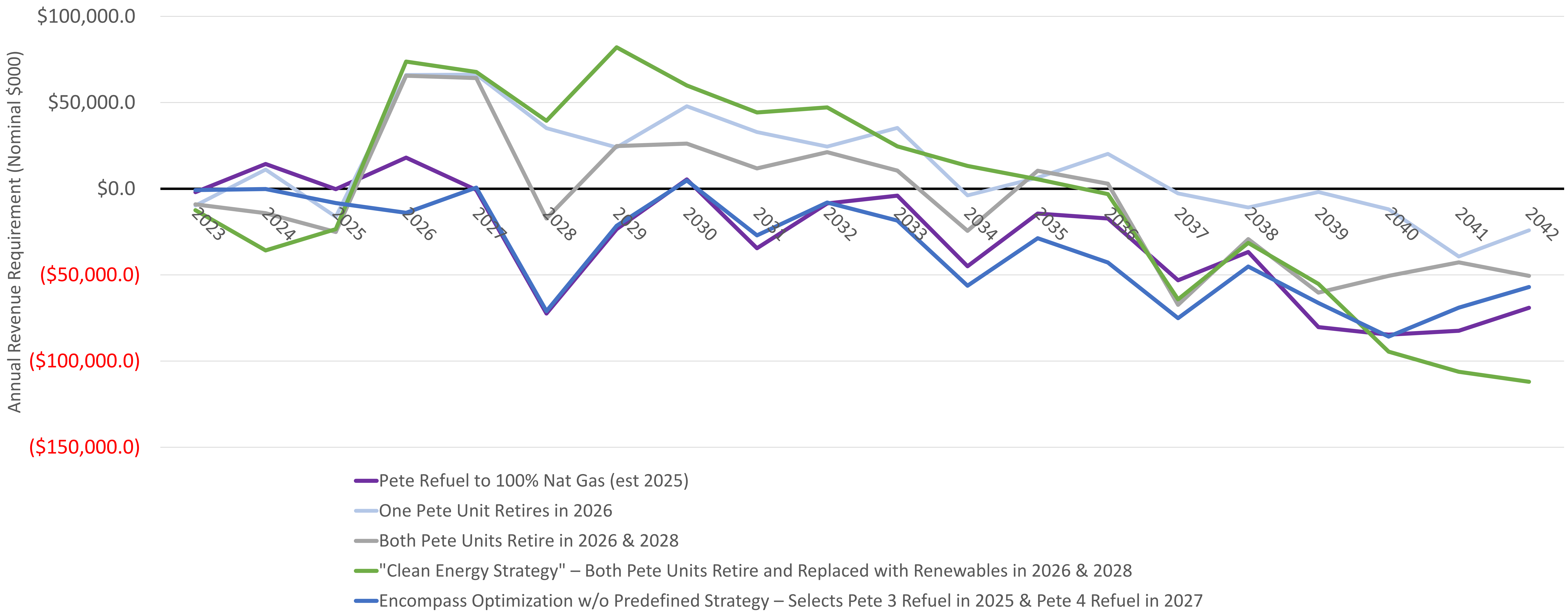
IRP Annual Revenue Requirement

Compared to the No Retirement ("Status Quo") Scenario

Presented revenue requirement is only for incremental generation capital expenditures



Final Q&A and Next Steps

Public Advisory Meeting

Public Advisory Meeting #1	Public Advisory Meeting #2	Public Advisory Meeting #3	Public Advisory Meeting #4	Public Advisory Meeting #5
Jan. 24, 2022	**April 12, 2022**	**June 27, 2022**	**Sept. 19, 2022**	**Oct./Nov. 2022**

- All meetings will be available for attendance via Teams. Meetings in 2022 may also occur in-person.
- A Technical Meeting will be held the week preceding each Public Advisory Meeting for stakeholders with nondisclosure agreements. Tech Meeting topics will focus on those anticipated at the next Public Advisory Meeting.
- Meeting materials can be accessed at ***www.aesindiana.com/integrated-resource-plan.***

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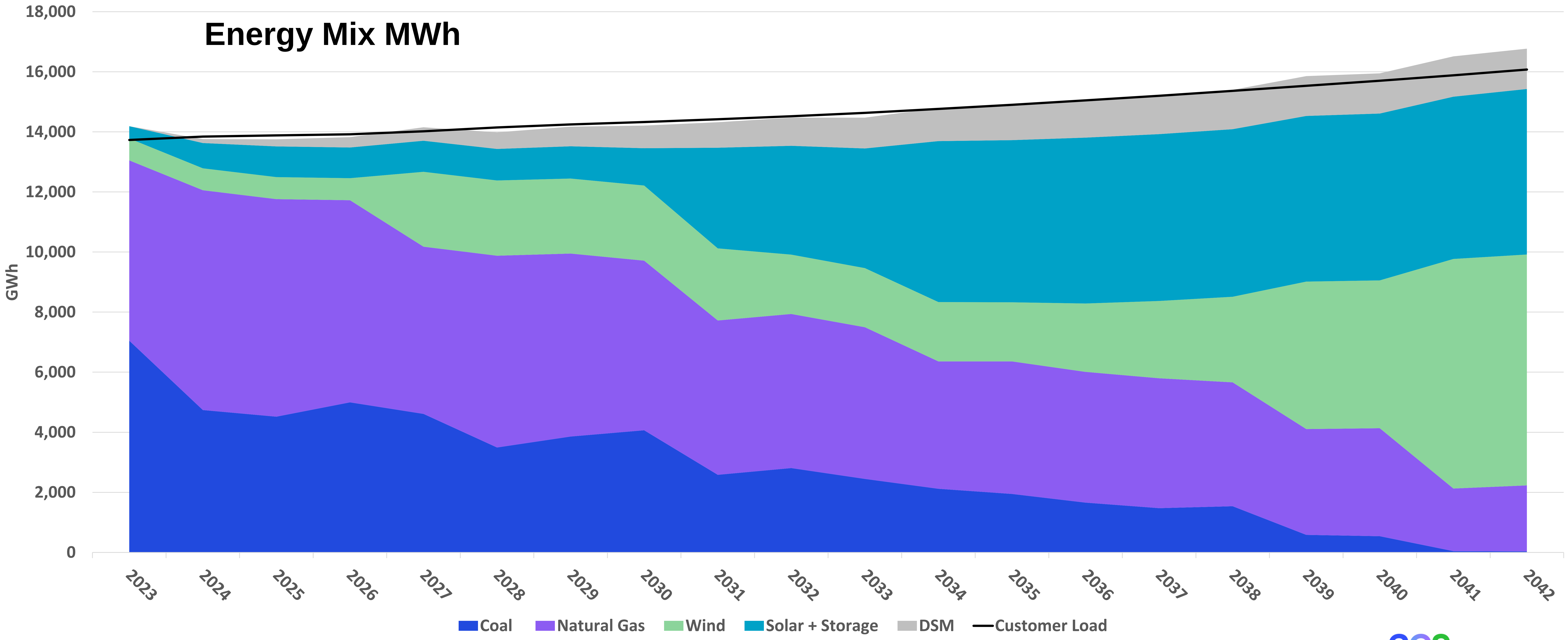
Thank You

Appendix

No Early Retirement: Current Trends *(Reference Case)*



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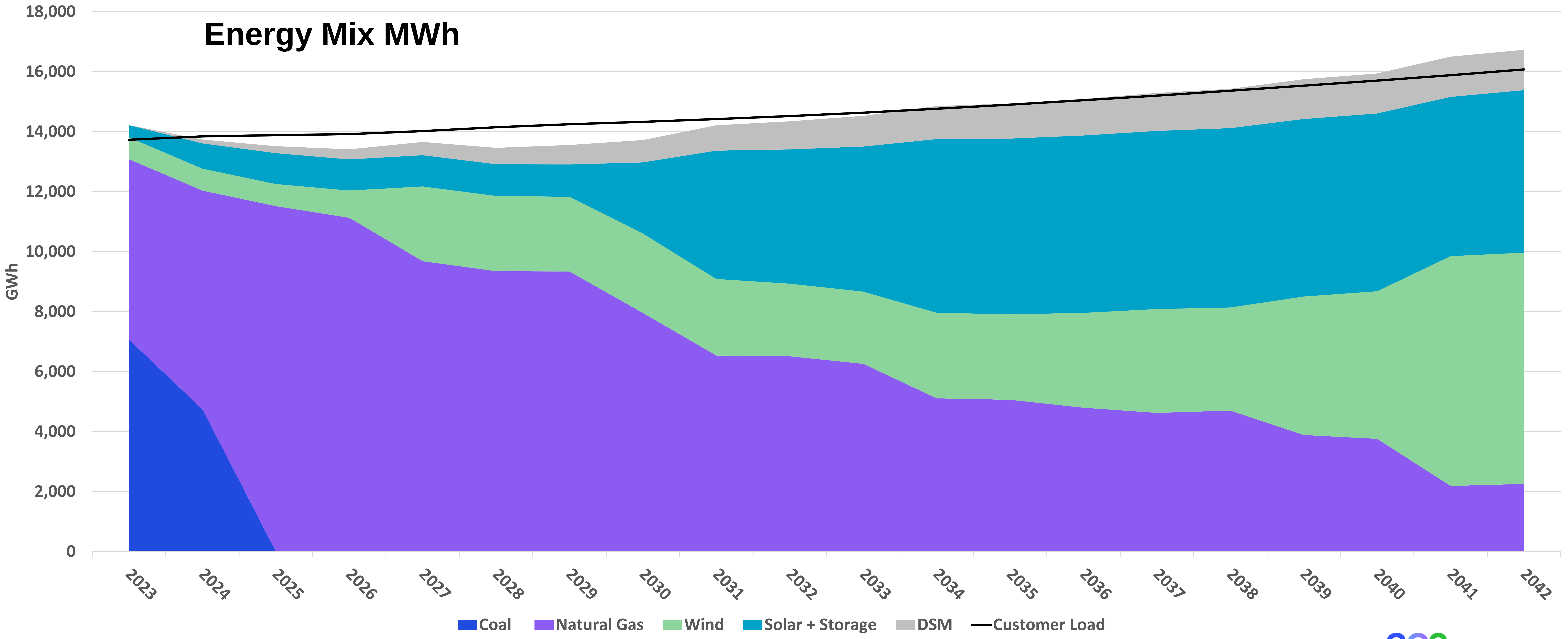
Pete 3 & 4 Refuel in 2025: Current Trends *(Reference Case)*



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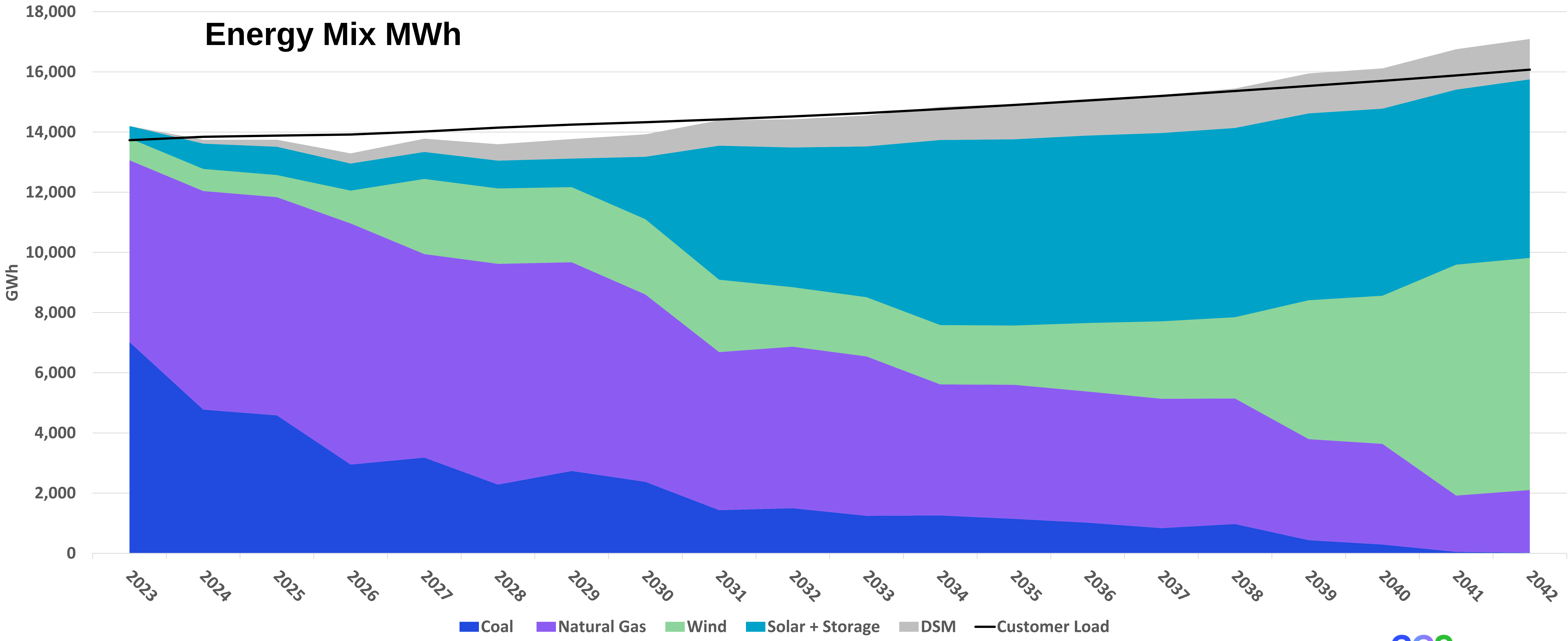
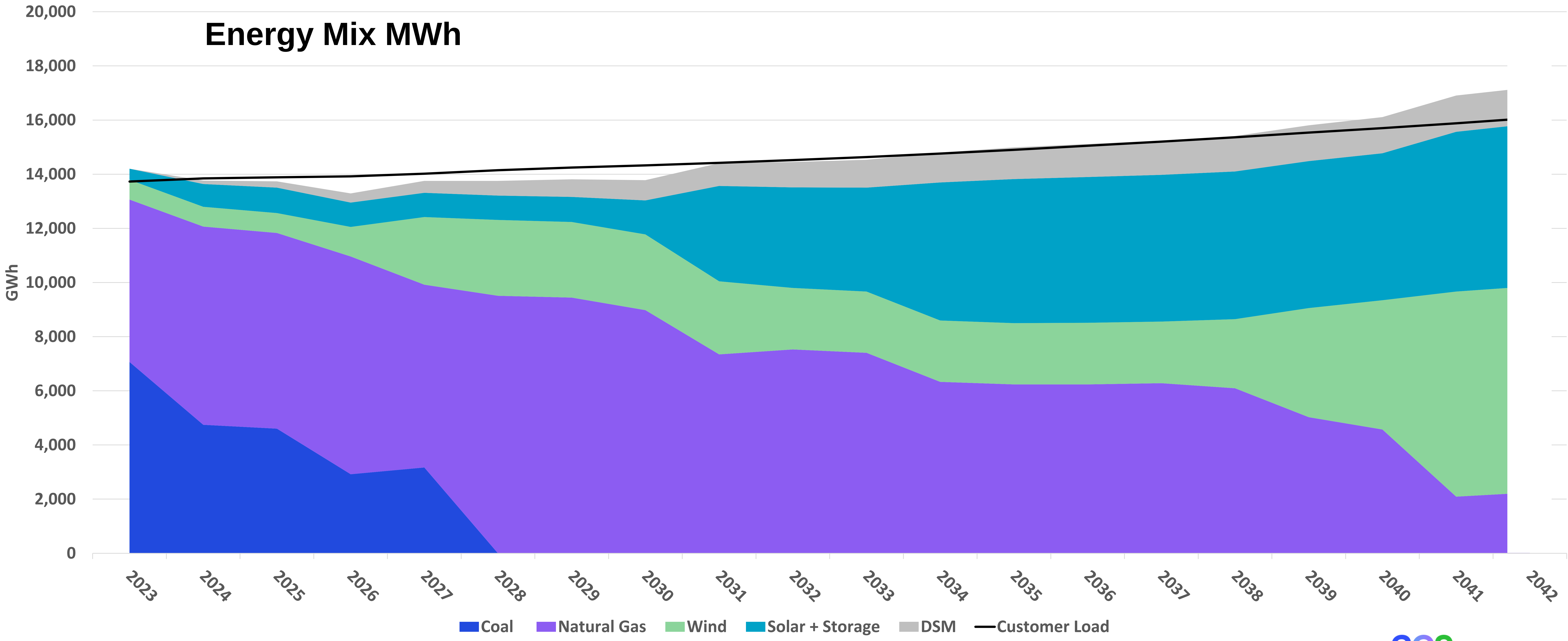
One Pete Unit Retires (2026): Current Trends *(Reference Case)*



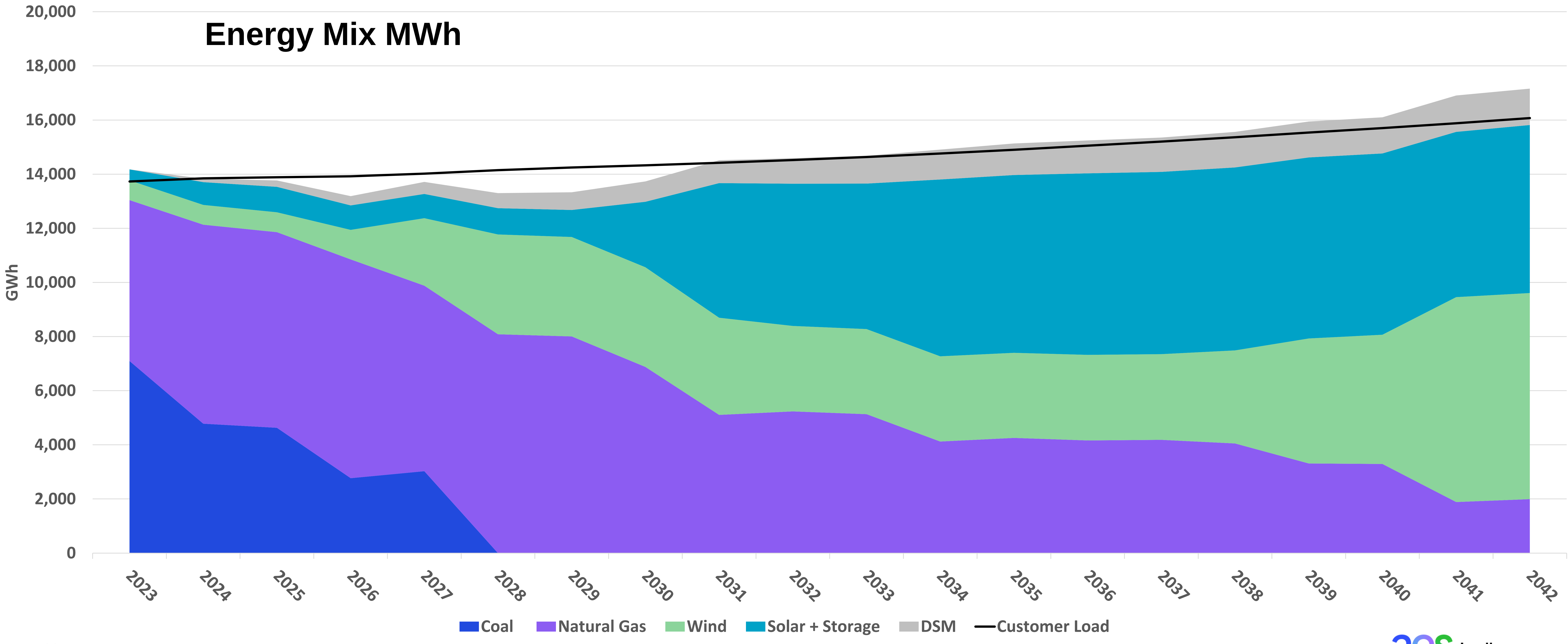
Both Pete Units Retire: Current Trends *(Reference Case)*

2026 & 2028



Clean Energy Strategy: Current Trends *(Reference Case)*

Retire & Replace Pete with Clean Energy



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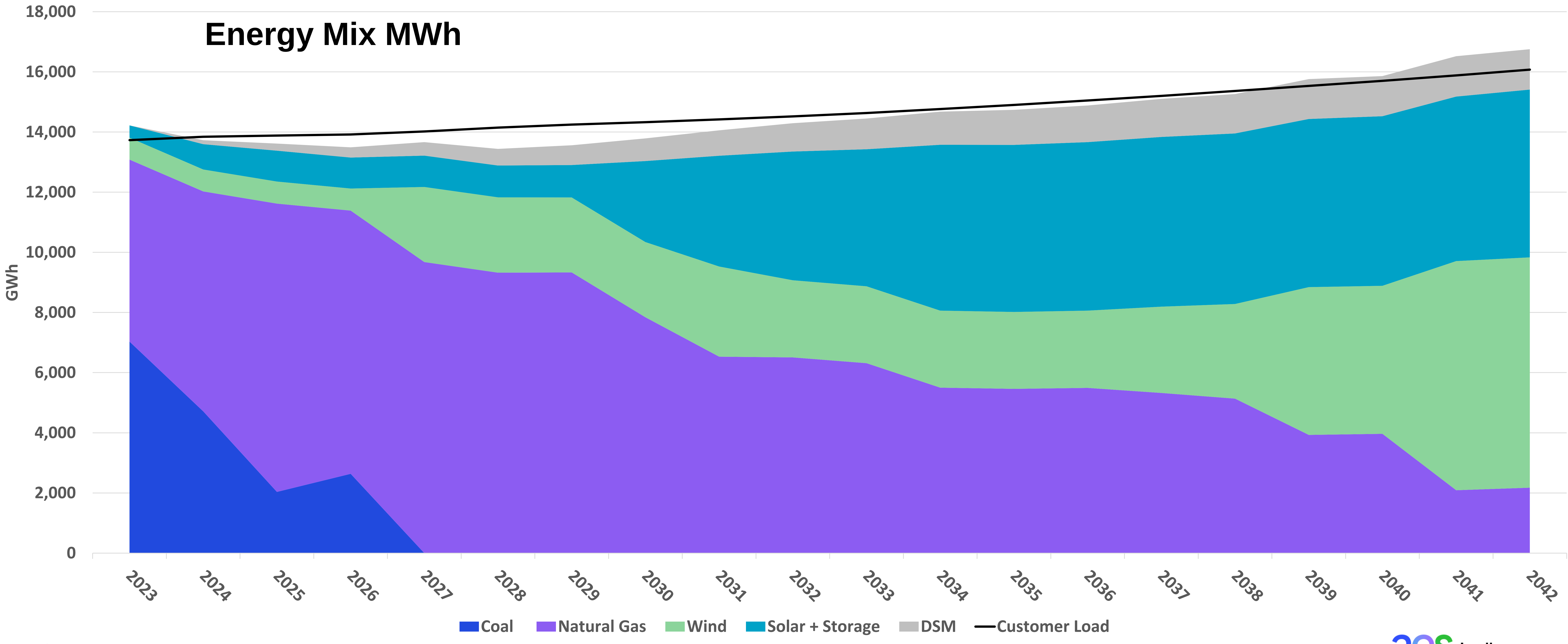
Encompass Optimization: Current Trends *(Reference Case)*

Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027



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Environmental Sustainability Metrics

Environmental Sustainability					
CO_2 Emissions	***SO_2 Emissions***	***NO_X Emissions***	***Water Use***	***Coal Combustion Products (CCP)***	***Clean Energy Progress***
Total portfolio CO2 Emissions (mmtons) 2023 - 2042	Total portfolio SO2 Emissions (tons) 2023 - 2042	Total portfolio NOx Emissions (tons) 2023 - 2042	Water Use (mmgal) 2023 - 2042	CCP (tons) 2023 - 2042	% Renewable Energy in 2032
101.9	64,991	45,605	36.7	6,611	45%
72.5	13,513	22,146	7.9	1,417	55%
88.1	45,544	42,042	26.7	4,813	52%
79.5	25,649	24,932	15.0	2,700	48%
69.8	25,383	24,881	14.8	2,676	64%
76.1	18,622	25,645	10.9	1,970	54%

→ **Strategies**

- **1.** No Early Retirement
- **2.** Pete Refuel to 100% Natural Gas (est. 2025)
- **3.** One Pete Unit Retires in 2026
- **4.** Both Pete Units Retire in 2026 & 2028
- **5.** "Clean Energy Strategy" – Both Pete Units Retire and replaced with Renewables in 2026 & 2028
- **6.** Encompass Optimization without Predefined Strategy – Selects Pete 3 Refuel in 2025 & Pete 4 Refuel in 2027

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IRP Acronyms

Note: A glossary of acronyms with definitions is available at https://www.aesindiana.com/integrated-resource-plan.

IRP Acronyms

- ACEE: The American Council for an Energy-Efficient Economy
- AMI: Advanced Metering Infrastructure
- AD: Ad Valorem
- AD/CVD: Antidumping and Countervailing Duties
- ADMS: Advanced Distribution Management System
- BESS: Battery Energy Storage System
- BNEF: Bloomberg New Energy Finance
- BTA: Build-Transfer Agreement
- BTU: British Thermal Unit
- C&I: Commercial and Industrial
- CAA: Clean Air Act
- CAGR: Compound Annual Growth Rate
- CCGT: Combined Cycle Gas Turbines
- CCP: Coal Combustion Products
- CCS: Carbon Dioxide Capture and Storage
- CDD: Cooling Degree Day
- CIS: Customer Integrated System
- COD: Commercial Operation Date
- CONE: Cost of New Entry
- CP: Coincident Peak
- CPCN: Certificate of Public Convenience and Necessity
- CT: Combustion Turbine
- CVD: Countervailing Duties
- CVR: Conservation Voltage Reduction
- DER: Distributed Energy Resource
- DERA: Distributed Energy Resource Aggregation
- DERMS: Distributed Energy Resource Management System
- DG: Distributed Generation
- DGPV: Distributed Generation Photovoltaic System
- DLC: Direct Load Control
- DOC: U.S. Department of Commerce
- DOE: U.S. Department of Energy
- DR: Demand Response
- DRR: Demand Response Resource
- DSM: Demand-Side Management
- DMS: Distribution Management System
- DSP: Distribution System Planning
- EE: Energy Efficiency
- EFORd: Equivalent Forced Outage Rate Demand
- EIA: Energy Information Administration
- ELCC: Effective Load Carrying Capability
- EM&V: Evaluation Measurement and Verification
- ESCR: Effective Selective Catalytic Reduction System
- EV: Electric Vehicle
- FLOC: Federated Learning of Cohorts
- FTE: Full-Time Employee
- GDP: Gross Domestic Product
- GFL: Grid-Following System
- GIS: Geographic Information System
- GT: Gas Turbine
- HDD: Heating Degree Day
- HVAC: Heating, Ventilation, and Air Conditioning
- IAC: Indiana Administrative Code
- IBR: Inverter-Based Resource
- IC: Indiana Code
- ICE: Intercontinental Exchange
- ICAP: Installed Capacity
- IEEE: Institute of Electrical and Electronics Engineers

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IRP Acronyms

- IRA: Inflation Reduction Act
- IRP: Integrated Resource Plan
- ICE: Internal Combustion Engine
- IQW: Income Qualified Weatherization
- ITC: Investment Tax Credit
- IURC: Indiana Regulatory Commission
- kW: Kilowatt
- kWh: Kilowatt-Hour
- MATS: Mercury and Air Toxics Standards
- MaxGen: Maximum Generation
- MDMS: Meter Data Management System
- MISO: Midcontinent Independent System Operator
- MMGAL: One Million Gallons
- MMTons: One Million Metric Tons
- MPS: Market Potential Study
- MW: Megawatt
- Nat Gas: Natural Gas
- NDA: Nondisclosure Agreement
- NOX: Nitrogen Oxides
- NPV: Net Present Value
- NREL: National Renewable Energy Laboratory
- NTG: Net to Gross
- OMS: Outage Management System
- PLL: Phase-Locked Loop
- PPA: Power Purchase Agreement
- PRA: Planning Resource Auction
- PSSE: Power System Simulator for Engineering
- PTC: Renewable Electricity Production Tax Credit
- PRMR: Planning Reserve Margin Requirement
- PV: Photovoltaic
- PVRR: Present Value Revenue Requirement
- PY: Planning Year
- RA: Resource Adequacy
- RAN: Resource Availability and Need
- RAP: Realistic Achievable Potential
- RCx: Retrocommissioning
- REC: Renewable Energy Credit
- REP: Renewable Energy Production
- RFP: Request for Proposals
- RIIA: MISO's Renewable Integration Impact Assessment
- RPS: Renewable Portfolio Standard
- SCADA: Supervisory Control and Data Acquisition
- RTO: Regional Transmission Organization
- SAC: MISO's Seasonal Accredited Capacity
- SAE: Small Area Estimation
- SCR: Selective Catalytic Reduction System
- SEM: Strategic Energy Management
- SO2: Sulfur Dioxide
- SMR: Small Modular Reactors
- ST: Steam Turbine
- SUFG: State Utility Forecasting Group
- T&D: Transmission and Distribution
- TOU: Time-of-Use
- TRM: Technical Resource Manual
- UCT: Utility Cost Test
- UCAP: Unforced Capacity
- VAR: Volt-Amp Reactive
- VPN: Virtual Private Network
- WTP: Willingness to Participate
- XEFORd: Equivalent Forced Outage Rate Demand excluding causes of outages that are outside management control

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