2022 Power Generation Plan
Initial Reference Case Results Discussion

Rate Advisory Committee Meeting – October 20, 2022

CPS ENERGY

CRA Charles River Associates

Today's Focus

- Review preliminary portfolio results for the Reference Scenario
- Our objective is to understand the data - compare multiple portfolios
- No decisions will be made today
- Not advocating for any portfolio until all information is gathered
- More information will be coming:
  - Reference Scenario bill impact & revenue requirements will be sent Nov 1st
  - Portfolio results for all scenarios & sensitivities sent by the Nov 17th RAC meeting

Agenda

- **Recap of September 15 RAC Meeting**
- Recap of Progress
- Revised Planning Objectives and Metrics
- Review of CPS Energy Resource Portfolio Definitions
- Review of Portfolio Performance under Planning Objectives and Metrics
- Timeline and Next Steps

Responses to RAC Member Comments and Questions

- During the September RAC meeting, members offered questions and comments related to five major topic areas:
  1. Process
  2. Objectives and Metrics
  3. Scenario Parameters
  4. Resource Options
  5. Data and Output Reporting
- A summary of detailed responses has been provided separately to RAC members. Some comments have been incorporated into today's presentation and will be accounted for as results are produced.

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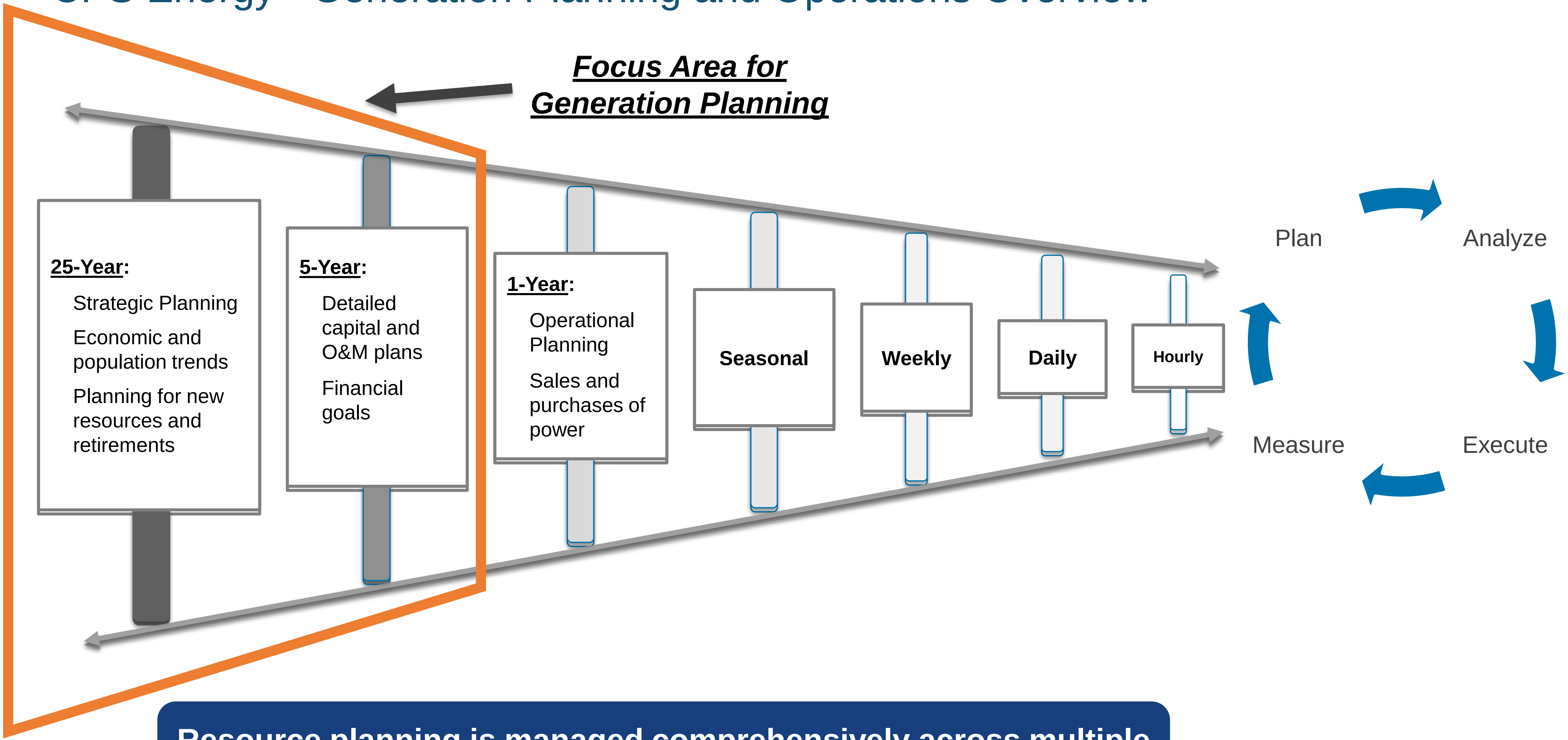
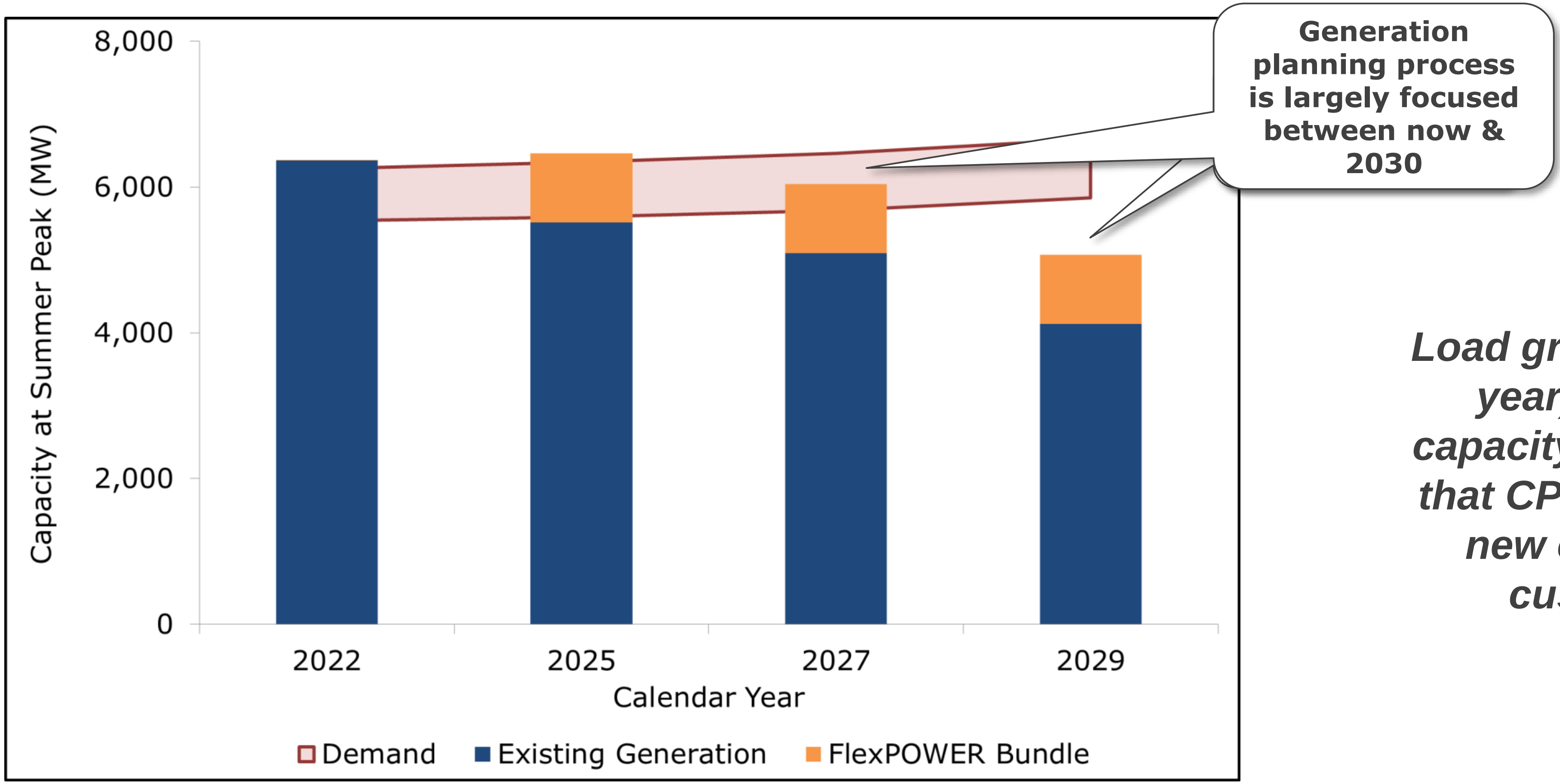
CPS Energy - Generation Planning and Operations Overview



Resource planning is managed comprehensively across multiple time horizons, with many iterations throughout the year.

Generation Planning is Focused on Meeting Needs Between Now & 2030



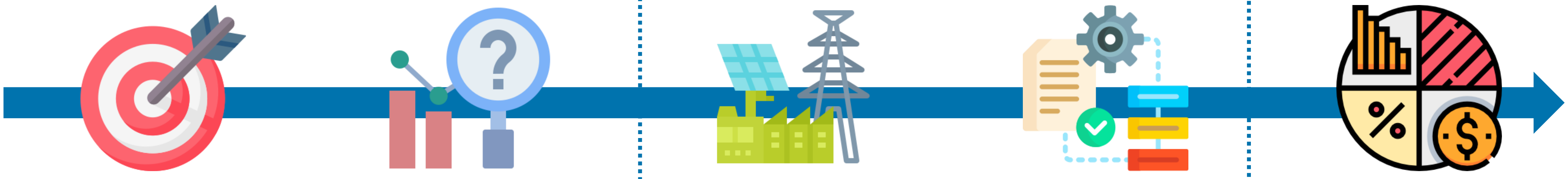
Load growth (~115 MW per year) and upcoming capacity retirements mean that CPS Energy will need new capacity to meet customer needs.

Note:
The graphic illustratively displays CPS Energy's expected supply-demand balance assuming the retirement schedules in Portfolios 1-3 and the addition of the FlexPOWER Bundle capacity. Different portfolio concepts in the generation planning process will evaluate different retirement timings, resulting in slightly different supply gaps over time.

CRA Power Generation Resource Planning Approach

Since the September meeting, the focus has been on refining resource portfolio options and performing Reference Case modeling and analysis

Today's Update



Identify Planning Objectives

Agree on planning objectives and metrics to measure the performance of the plan against each objective

Develop Market Scenarios

Identify key sources of uncertainty and the potential range of future outcomes, and design internally consistent future scenarios

Develop Resource Portfolios

Design options for future resource plans, often based on different future scenarios and priorities

Portfolio Modeling and Analysis

Evaluate the performance of each resource portfolio against each future scenario, stochastic uncertainty, & extreme risk events

Select Preferred Plan

Identify trade-offs from each resource portfolio and select the preferred portfolio

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- **Revised Planning Objectives and Metrics**
- Review of CPS Energy Resource Portfolio Definitions
- Review of Portfolio Performance under Planning Objectives and Metrics
- Timeline and Next Steps

Objectives and Metrics

Objectives and metrics have been further refined based on RAC feedback

Planning Objectives	Metrics	Measures
System Reliability & Climate Resiliency	Diversity of Generation Capacity Mix	Pie chart of generation mix in CPS Energy portfolio by fuel type (e.g. wind, solar, gas, coal, etc.) in 2030
	Capacity Headroom	Reserve Margin in 2030
	Climate Resiliency	Revenue requirements in extreme weather in 2030
		Market purchases in extreme weather in 2030
Environmental Sustainability	Progress Towards City of SA Climate Action & Adaptation Plan (CAAP) Goals	% reduction in CO_2 intensity from CPS Energy generation in 2030, relative to 2016 baseline
		The carbon intensity (CO_2 per MWh) of electricity generated by CPS Energy fleet in 2030 and 2040
		% reduction in electricity demand due to energy efficiency measures in 2030
Affordability	Bill Impact	Estimated monthly bills in 2030 (Reference & scenarios)
	Revenue Requirements	Present value of revenue requirements between 2023 and 2030
		Present value of revenue requirements between 2023 and 2050

Objectives and Metrics

Objectives and metrics have been further refined based on RAC feedback

Objectives	Metrics	Measures
System Flexibility	Market Purchases	% of CPS Energy electricity demand that is met through ERCOT market purchases in 2030
	Dispatchability	% of generating capacity in CPS Energy fleet that can have its output adjusted on demand in 2030
Workforce Impact	CPS Energy Workforce Impact	Estimated Number of CPS Energy Generation Employees in 2030
	Local Economic Impact	Total $ in capital expenditures for new generation capacity built in greater San Antonio area

Agenda

- Recap of September 15 RAC Meeting
- Recap of Progress
- Revised Planning Objectives and Metrics
- **Review of CPS Energy Resource Portfolio Definitions**
- Review of Portfolio Performance under Planning Objectives and Metrics
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CPS Energy Portfolios

Portfolios are a combination of CPS Energy resource decisions

Demand
Carbon Prices
Commodity Prices
Technology Costs

Scenarios
Future states of the world independent of CPS Energy resource decisions

- Reflect diverse, but possible, futures
- Include multiple linked and correlated key variables
- Independent of resources and resource plans

Focus of this section

Level/type of new capacity
Capacity retirements
Timing of new capacity
Demand-side programs

Portfolios
CPS Energy plans to meet customer requirements in the future

- A combination of decisions taken by CPS Energy to meet the challenges posed by the scenario or address other objectives
- Typically include decisions on new resources and retirements

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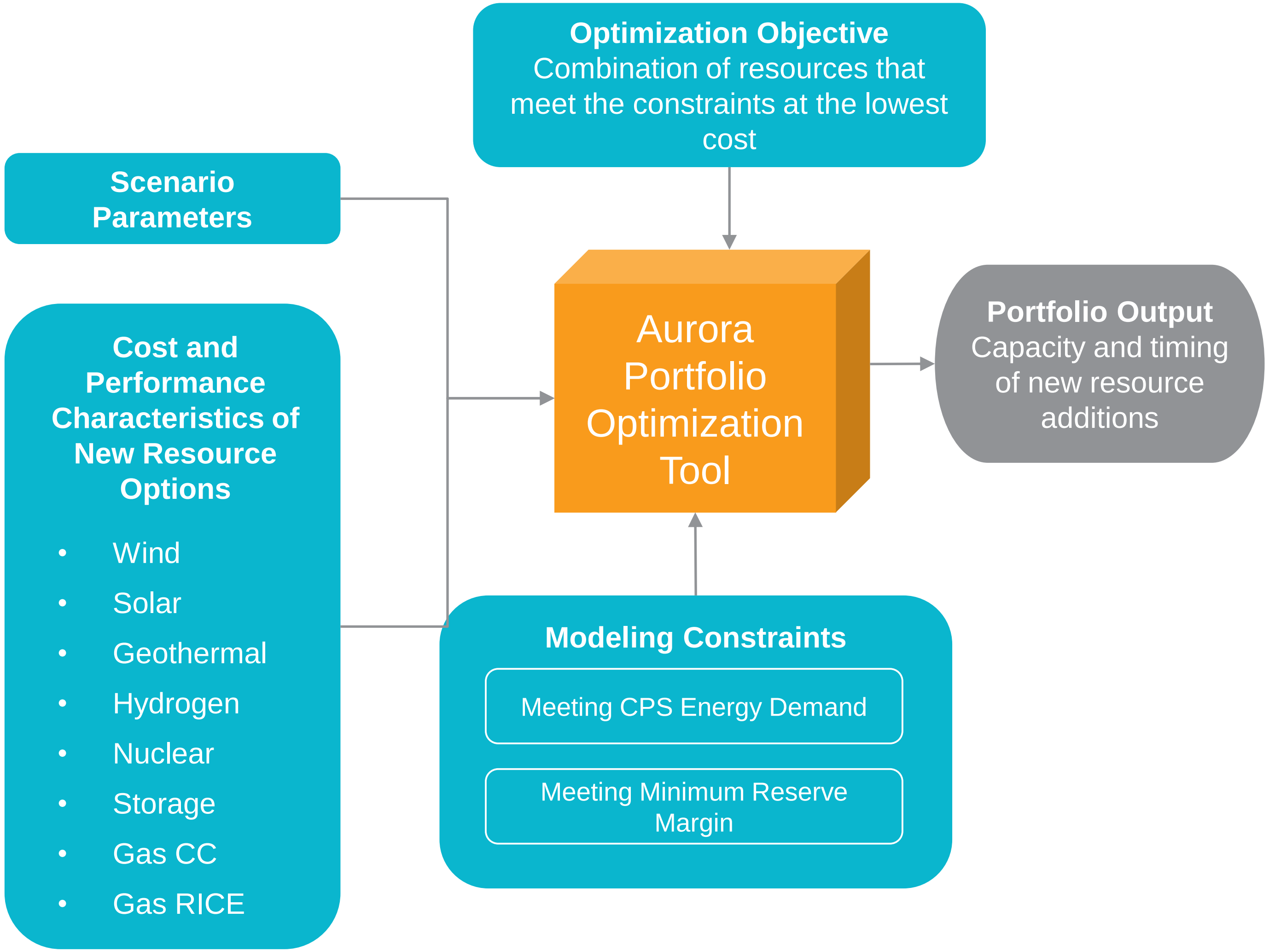
Portfolio Development Process



- Different resource types provide different contributions to CPS Energy's net peak:
  - **Thermal:** 100%
  - **Solar:** Declining contribution over time as net peak shifts further into the evening
  - **Wind:** 20 – 57% depending on location
  - **Storage:** Varying by storage duration and declining over time as net peaks become longer in duration
- Different resource types are expected to operate at different utilization or capacity factors:
  - **Thermal:** Depending on fuel prices and market electricity prices
  - **Solar:** 28%
  - **Wind:** 40 – 42% depending on location
  - **Storage:** Depending on market prices and duration of storage

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CPS Energy Portfolio Concepts

CRA modeled 9 candidate portfolio concepts for CPS Energy (P1 – P9). Each portfolio concept is a combination of a retirement schedule and allowed technologies to meet capacity gaps

	Portfolio	P1	P2	P3	P4	P5	P6	P7	P8	P9
	Allowed Technology to Meet Capacity Gaps	Gas	Blend 1	Renewables	Blend 2	Renewables				
Existing Fleet Retirement Dates	**Spruce 1**	Dec 2028		Dec 2028	Dec 2047	Mar 2025	Mar 2025	Mar 2025	Mar 2025	Mar 2028
	Spruce 2	Convert to gas in Dec 2027 and retire in Dec 2065		Dec 2027	Dec 2065	Mar 2028	Mar 2028	Mar 2028	Convert to gas in Dec 2025 and retire in Mar 2035	Convert to gas in Dec 2028 and retire in Mar 2035
	Braunig 1 - 3	Mar 2025		Mar 2025	Mar 2025	Mar 2025	Mar 2024	Mar 2024	Mar 2025	Mar 2025
	Sommers 1	Mar 2027		Mar 2027	Mar 2027	Mar 2027	Mar 2026	Mar 2026	Mar 2027	Mar 2027
	Sommers 2	Mar 2029		Mar 2029	Mar 2029	Mar 2029	Mar 2028	Mar 2028	Mar 2029	Mar 2029
	Arthur Von Rosenberg	Dec 2047		Dec 2047	Dec 2047	Dec 2047	Mar 2030	Mar 2030	Dec 2047	Dec 2047
	Rio Nogales	Dec 2049		Dec 2049	Dec 2049	Dec 2049	Mar 2030	Mar 2030	Dec 2049	Dec 2049
	Milton B Lee 1 – 4	Dec 2039		Dec 2039	Dec 2039	Dec 2039	Mar 2035	Mar 2040	Dec 2039	Dec 2039
	Milton B Lee 5 - 8	Dec 2045		Dec 2045	Dec 2045	Dec 2045	Mar 2035	Mar 2040	Dec 2045	Dec 2045

CPS Energy Portfolios (P1–P4) **Proposed by RAC Member Belmares** (P5–P9)

Notes:

1. *All unit retirements require ERCOT approval.*
2. *When units retire, ERCOT may require transmission reliability upgrades to the grid, which typically take 4 to 5 years (i.e. estimated completion in the 2026 to 2027 timeframe).*
3. *New generation resources may not be available until 2026, so bridge purchases will be considered as needed.*
4. *Spruce 2 gas conversion is likely not feasible before 2027, so bridge purchases will be considered in P8 as needed.*

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Cumulative Capacity Additions Between 2023 and 2030 (MW)

Portfolio	P1	P2	P3	P4	P5	P6	P7	P8	P9
Allowed Technology	Gas	Blend 1	Renewables	Blend 2	Renewables				
Combined Cycle (CC)[1]	2,260	1,380	500	1,380	500	500	500	500	500
Reciprocating Internal Combustion Engine (RICE)	606	808	N/A	202	N/A	N/A	N/A	N/A	N/A
Wind[2]	N/A	500	2,700	N/A	2,700	4,000	4,000	2,100	2,300
Solar[3]	880	1,180	1,180	880	1,180	1,420	1,280	1,380	1,180
Short-Duration Storage[4]	50	1,010	3,010	1,155	3,060	4,110	4,110	2,260	1,860
Long-Duration Storage[5,6]	N/A	50	100	-	100	100	100	100	100
Geothermal[6]	N/A	-	60	-	25	275	275	-	-
Hydrogen[6]	N/A	-	240	240	240	240	240	240	240
Nuclear – Small Modular	N/A	-	-	-	N/A	N/A	N/A	N/A	N/A
Total New Capacity	***3,796***	***4,928***	***7,790***	***3,857***	***7,805***	***10,645***	***10,505***	***6,580***	***6,180***
Spruce 2 Gas Conversion	785	785	Retire	Retain w/coal	Retire	Retire	Retire	785	785
Market Purchase 2026[7]	532	102	304	422	893	785	785	1,560	304
Market Purchase 2027[7]	N/A	N/A	253	N/A	947	20	20	1,771	606
Market Purchase 2028[7]	N/A	N/A	559	N/A	1,185	511	511	599	1,562
Market Purchase 2029[7]	N/A	N/A	917	N/A	913	N/A	N/A	600	750

Notes: 1) Includes FlexPower Bundle 500 MW 10-year gas tolling contract; 2) Includes both coastal and west wind; 3) Includes FlexPower Bundle solar; 4) Includes FlexPower Bundle storage, and includes 2-hour, 4-hour, and 8-hour storage; 5) 20-hour storage; 6) Selected only in 2030 due to assumed technology availability; 7) Represents bridged capacity purchase for the year at 23% premium to hourly market price.

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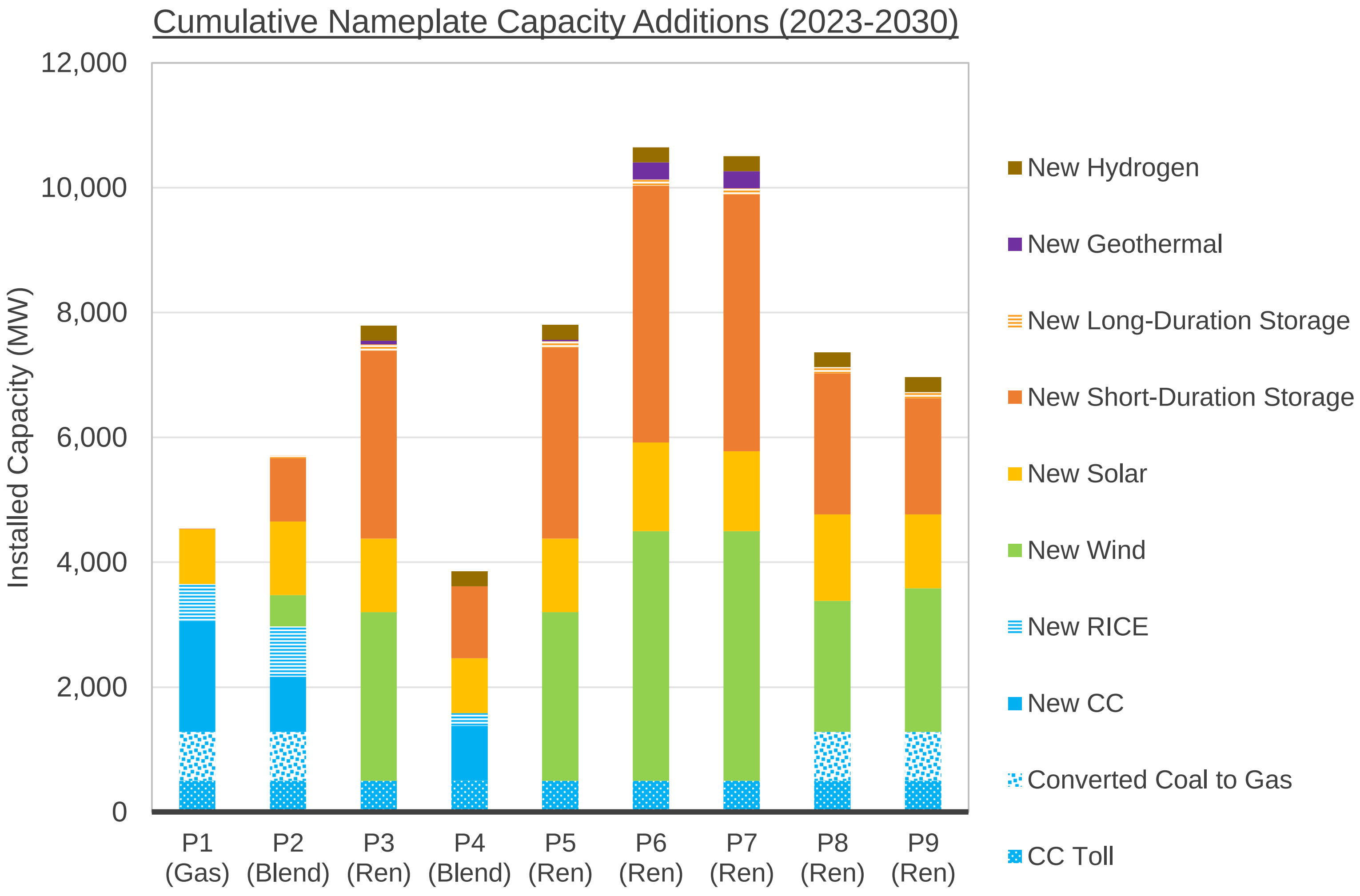
Cumulative Capacity Additions Between 2023 and 2030 (MW)

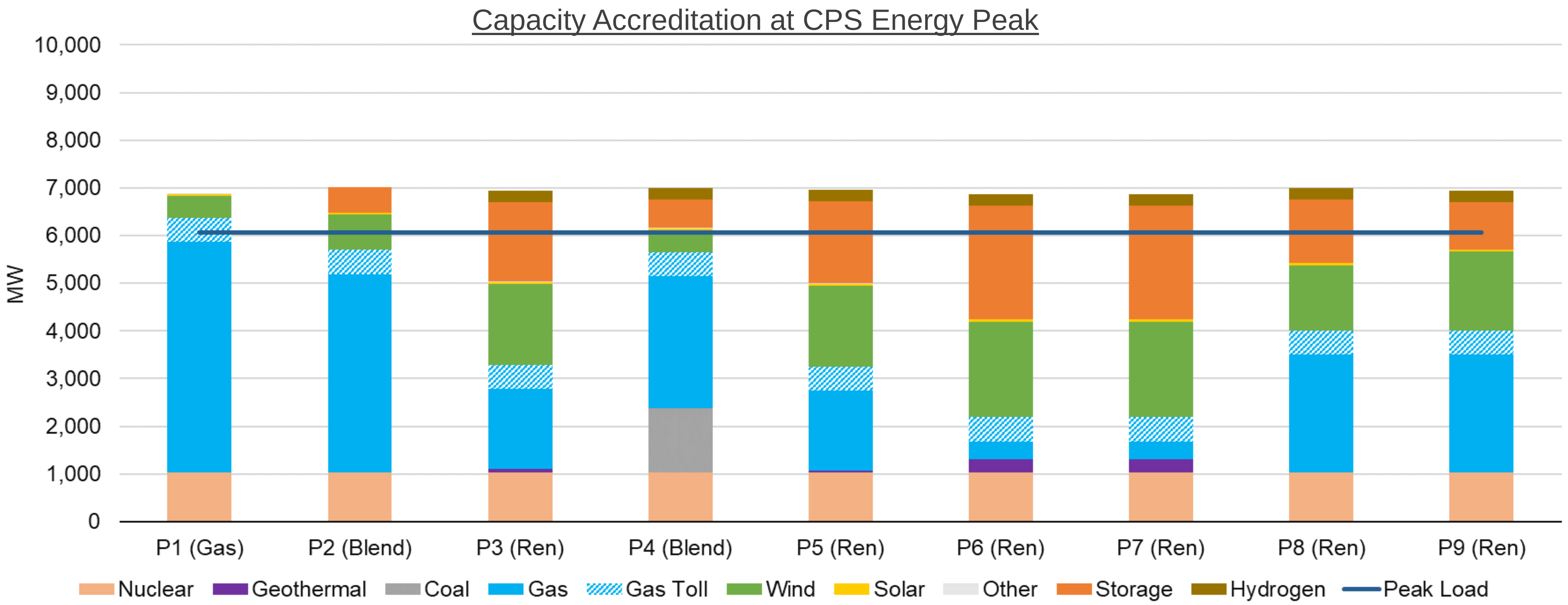
Key Observations

- The FlexPower Bundle gas combined cycle (CC) toll, solar, and 2-hour battery storage are included in all portfolios.
- Spruce 2 converts to natural gas in P1, P2, P8, and P9, and new gas CC and RICE are selected in P1, P2, and P4.
- In portfolios that do not allow new gas capacity (P3, P5 – P9), solar, wind and storage additions are generally selected to replace retired gas and coal capacity.
- Hydrogen-based capacity is selected in all portfolios but P1 in 2030, largely due to the value of the hydrogen Production Tax Credit in the Inflation Reduction Act. In general, hydrogen may provide optionality for CPS Energy to convert gas capacity to burn the fuel at later time if and when the technology has matured and economics become favorable.



2030 Supply-Demand Balance (MW) by Portfolio

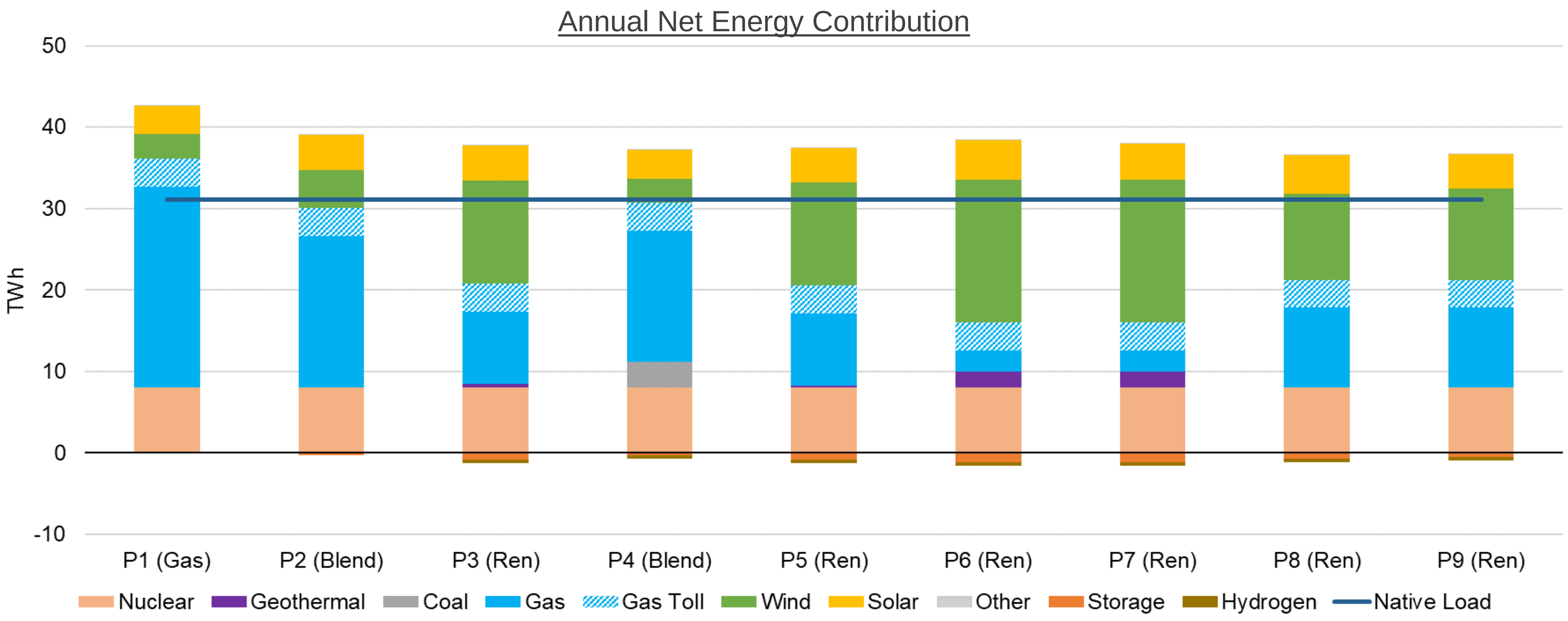
All portfolios are designed to have a reserve margin of at least 13.75% to maintain system reliability. Storage and natural gas plants are the primary dispatchable technologies by 2030.



Note: 1) Solar availability at the CPS Energy net peak is expected to be below 5% by 2030.

2030 Generation Mix (TWh) By Portfolio

All portfolios remain net long energy by 2030.



Notes: (1) Hydrogen is represented as a net negative contributor, given efficiency losses associated with converting green electricity to hydrogen, which can then be used for power generation; (2) energy efficiency will be added to the pie charts in the scorecard.

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Selected Technologies for Capacity Additions Vary Over Different Horizons

- Additions through 2029 include the FlexPower Bundle and established technologies like gas combined cycle, gas RICE, wind, solar, and short-duration storage.
- Over the long-term, long-duration storage, hydrogen, and geothermal resources are selected, although CPS Energy will have future opportunities to assess the long-term plan as technology evolves

Technology	Selected Between 2023 and 2029									Selected Between 2030 and 2039									Selected From 2040+								
	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9
FlexPower Bundle	✓	✓	✓	✓	✓	✓	✓	✓	✓																		
Gas CC	✓	✓		✓																							
Gas RICE	✓	✓		✓						✓	✓		✓						✓	✓		✓					
Wind		✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Solar		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Short Storage		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓		✓	✓		✓		✓		
Long Storage											✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
Geothermal											✓	✓		✓	✓	✓					✓						
Hydrogen											✓	✓	✓	✓	✓	✓	✓	✓			✓		✓		✓		✓

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Cumulative Capacity Additions Between 2031 and 2047 (MW)

Longer term additions include advanced emerging technologies, including enhanced geothermal, hydrogen, and long-duration storage technologies

Portfolio	P1	P2	P3	P4	P5	P6	P7	P8	P9
Allowed Technology	Gas	Blend 1	Renewables	Blend 2	Renewables				
Combined Cycle	N/A	-	N/A	-	N/A	N/A	N/A	N/A	N/A
Reciprocating Internal Combustion Engine (RICE)	3,838	2,020	N/A	1,616	N/A	N/A	N/A	N/A	N/A
Wind[1]	N/A	1,800	3,900	3,100	4,000	3,700	3,900	4,200	4,300
Solar	N/A	3,580	2,560	3,390	2,640	2,890	2,870	3,080	2,780
Short-Duration Storage[2]	N/A	1,700	500	-	450	50	350	50	50
Long-Duration Storage[3]	N/A	150	1,300	350	1,250	2,000	2,200	2,050	1,600
Geothermal	N/A	25	30	-	-	-	-	-	-
Hydrogen	N/A	720	1,440	480	1,440	1,440	960	1,200	1,440
Nuclear – Small Modular	N/A	-	-	-	N/A	N/A	N/A	N/A	N/A
Total New Capacity	***3,838***	***9,995***	***9,730***	***8,936***	***9,780***	***10,080***	***10,280***	***10,580***	***10,170***

Notes: 1) Includes both coastal and west wind; 2) Includes 2-hour, 4-hour, and 8-hour storage; 3) 20-hour storage

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Portfolio Summary

Abbreviation	Allowed Technologies	Action on Existing Generating Fleet	2030 Generation Mix
P1 (Gas)	Gas	Spruce 1 shut down in 2028. Spruce 2 converted to gas in 2027.	
P2 (Blend 1)	All	Spruce 1 shut down in 2028. Spruce 2 converted to gas in 2027.	
P3 (Ren)	Renewables	Spruce 1 shut down in 2028. Spruce 2 shut down in 2027.	
P4 (Blend 2)	All	Both Spruce units run on coal beyond 2040	

Abbreviation	Allowed Technologies	Action on Existing Generating Fleet	2030 Generation Mix
P5 (Ren)	Renewables	Spruce 1 shut down in 2025. Spruce 2 shut down in 2028.	
P6 (Ren)	Renewables	Spruce 1 shut down in 2025. Spruce 2 shut down in 2028. All gas units shut down by 2035.	
P7 (Ren)	Renewables	Spruce 1 shut down in 2025. Spruce 2 shut down in 2028. All gas units shut down by 2040.	
P8 (Ren)	Renewables	Spruce 1 shut down in 2025. Spruce 2 shut down in 2025, and re-opened as gas unit in 2028	
P9 (Ren)	Renewables	Spruce 1 shut down in 2028. Spruce 2 converted to gas in 2028	

- Nuclear
- Gas
- Solar
- Hydrogen
- Geothermal
- Gas Toll
- Other
- Energy Efficiency
- Coal
- Wind
- Storage

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Agenda

Recap of September 15 RAC Meeting

Recap of Progress

Revised Planning Objectives and Metrics

Review of CPS Energy Resource Portfolio Definitions

Review of Portfolio Performance under Planning Objectives and Metrics

Timeline and Next Steps

CPS Energy Portfolio Evaluation

Today we are providing the metric results for the 9 portfolios in the Reference Scenario. The metric results for the remaining scenarios will be provided during November RAC

Today's Focus

Reference Scenario

CBE Scenario

NZE Scenario

VMA Scenario

Reference Scenario + Extreme Weather Sensitivity

P 1 | P 2 | P 3 | P 4 | P 5 | P 6 | P 7 | P 8 | P 9

The same 9 portfolios apply across the 4 scenarios and extreme weather scenario sensitivity

Metric Results by November RAC

More STEP Sensitivity | Less STEP Sensitivity | Build v Buy Sensitivity

3 portfolio sensitivities to be run only in the Reference Scenario

Extreme weather sensitivity will be run for a single year, so is a different type of run than the other scenarios

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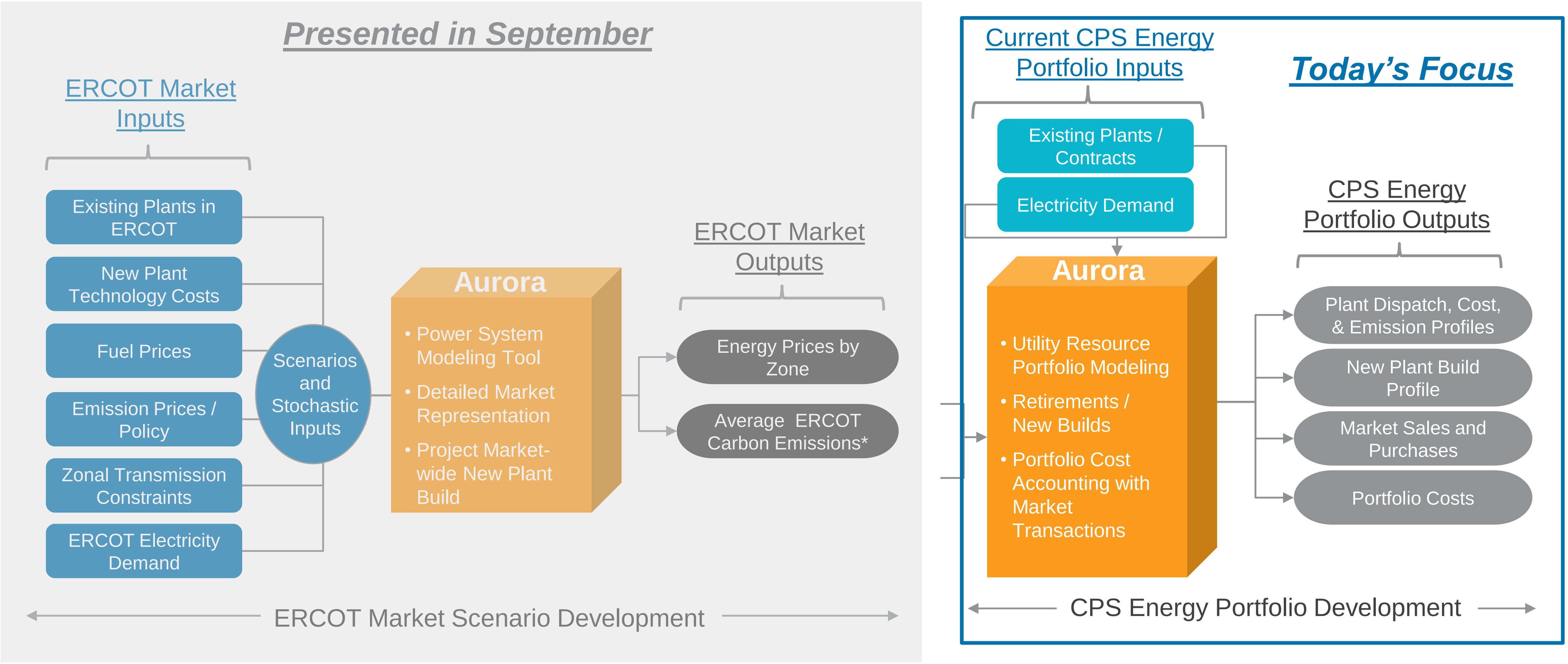
Recap of the Modeling Process

The modeling process includes ERCOT market analysis and CPS Energy-specific portfolio evaluation



Note: *This is used to measure carbon emissions from electricity purchases by CPS Energy

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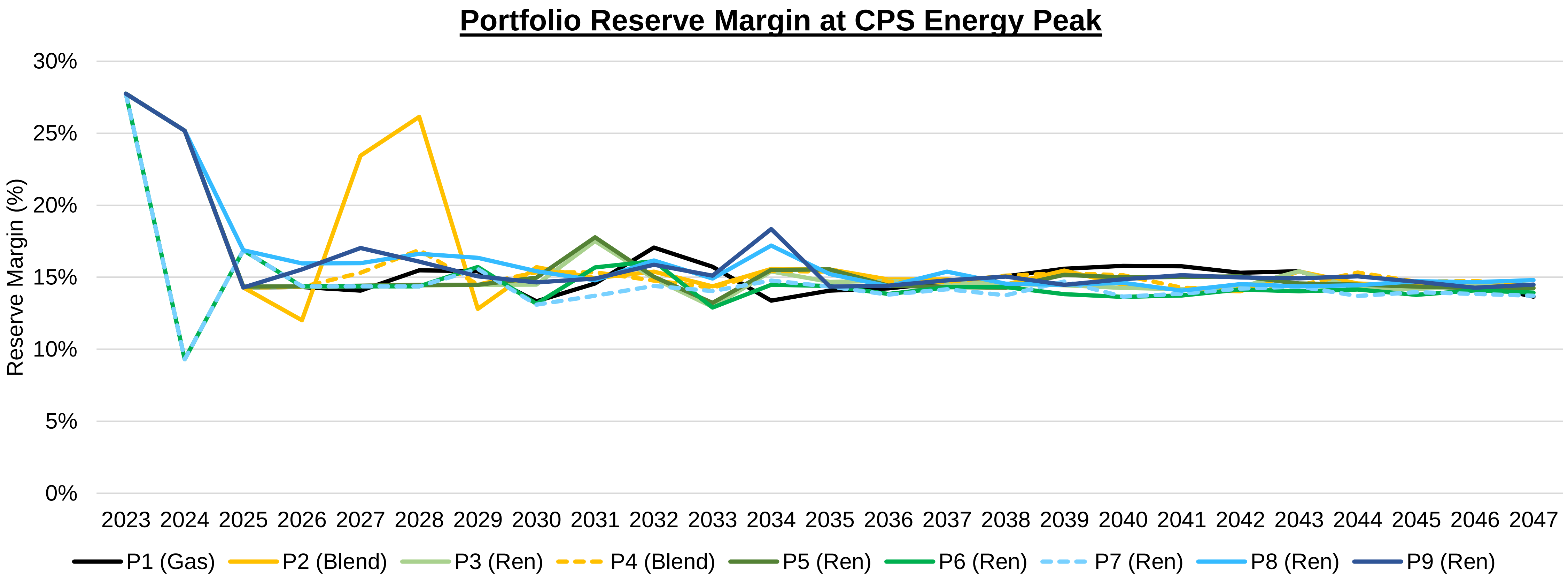
Capacity Headroom

All portfolios are optimized around a 13.75% reserve margin.



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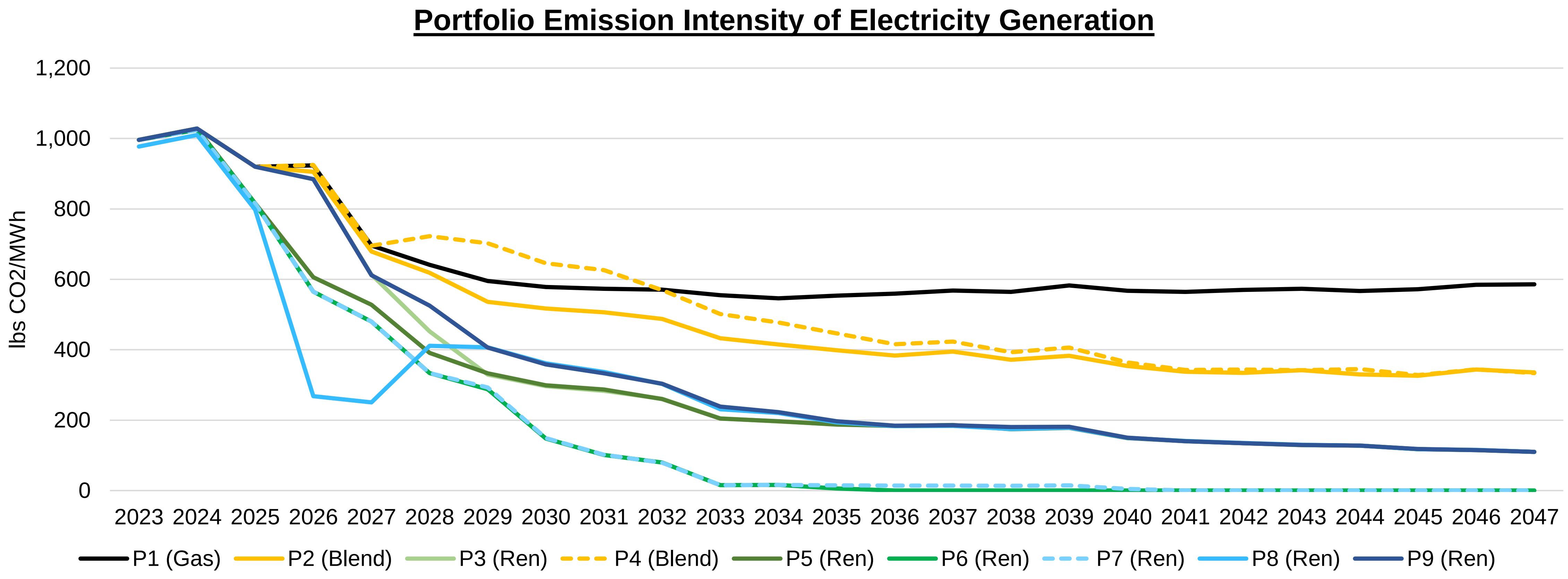
Portfolio Emission Intensity

Average emission intensity of electricity generated by CPS Energy declines across all portfolios



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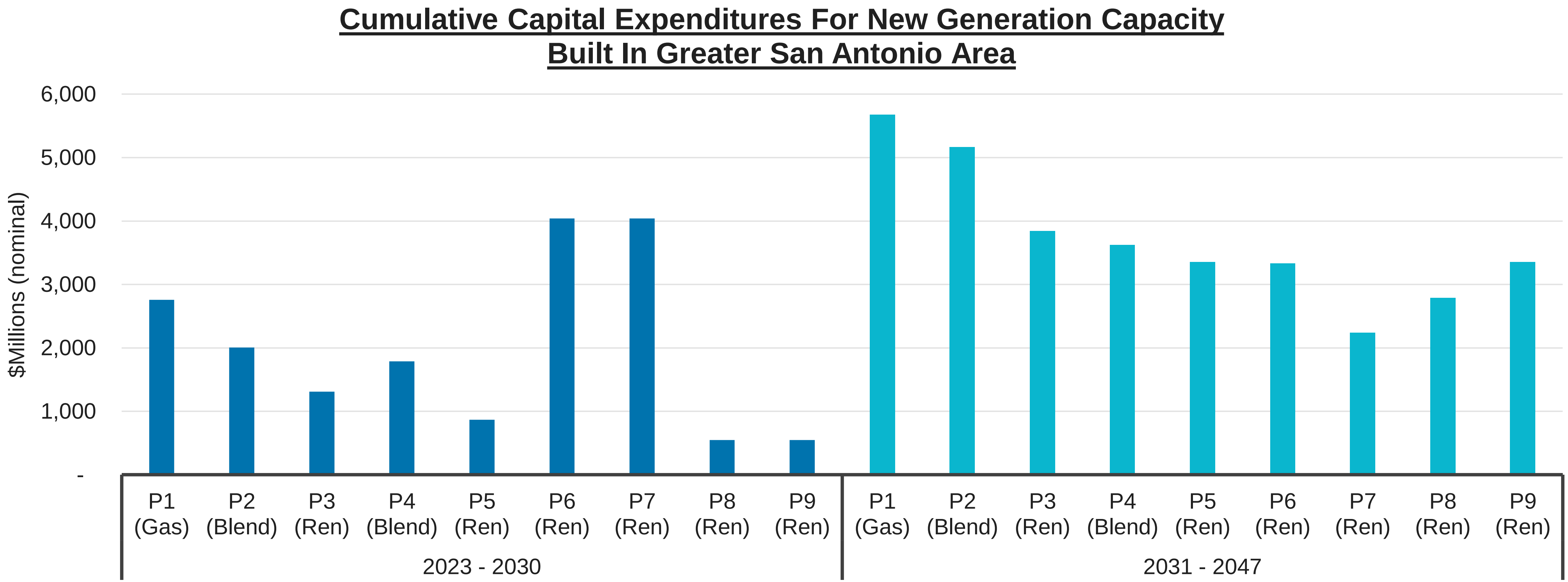
Local Economic Impact

All portfolios provide some investment in new generation capacity in the local area.



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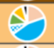
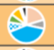
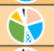
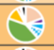
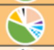
Portfolio Metric Results – Reference Scenario ONLY

- Preliminary Reference Scenario results follow in the next few slides
- No decisions will be made based on these preliminary metric results
- Slated for delivery at the November RAC meeting are:
  - 3 remaining scenarios: Carbon-Based Economy, Net Zero Carbon Emissions, and the Volatile Market
  - Affordability metrics
  - Sensitivity results: Extreme weather exposure, Expanded STEP, Scaled-Back STEP, & Build vs Buy

	System Reliability & Climate Resiliency				Environmental Sustainability				Affordability					System Flexibility		Workforce Impact	
	Diversity of Generation Mix	Capacity Headroom	Extreme Weather Exposure		Progress Towards City of SA CAAP Goals				Bill Impact			Revenue Requirements		Market Purchases	Dispatchability	CPS Energy Workforce Impact	Local Economic Impact
	Generation Mix (MWh)	Expected Reserve Margin (%)	Rev. Req. Extreme Weather ($Billion)	Extreme Weather Market Purchases (MWh)	% CO2 Intensity Reduction Relative to 2016 (Ref Scenario)	Emission Intensity (lbs CO2/MWh)		% reduction in demand due to energy efficiency	Monthly Bills (Ref Scenario) ($/Month)	Monthly Bills (Scenario Range) ($/Month)	Monthly Bills (Highest Scenario) ($/Month)	PV Revenue Requirements (Ref Scenario) ($Billion)	PV Revenue Requirements (Ref Scenario) ($Billion)	% of CPS Energy demand that is met through ERCOT market purchases	% of CPS Energy Capacity that is Dispatchable	Estimated Number of CPS Energy Generation Employees	Capital expenditures for new generation capacity built in greater San Antonio area ($Millions)
	2030	2030	2030	2030	2030	2030	2040	2030	2030	2030	2030	2023 – 2030	2023 – 2047				
P1		13.7%	In Work		37%	578	567	5.2%	In Work					1%	61%	260	2,758
P2		15.7%			44%	517	354	5.2%						4%	57%	250	2,004
P3		14.5%			68%	297	149	5.2%						13%	46%	110	1,310
P4		15.3%			30%	646	364	5.2%						7%	63%	290	1,787
P5		15.0%			68%	299	149	5.2%						13%	46%	100	866
P6		13.2%			84%	148	0	5.2%						18%	39%	110	4,041
P7		13.1%			84%	149	5	5.2%						18%	39%	110	4,041
P8		15.4%			61%	361	150	5.2%						11%	48%	150	548
P9		14.6%			61%	358	150	5.2%						9%	46%	150	548

Nuclear · Geothermal · Coal · Gas · Gas Toll · Wind · Solar · Other · Storage · Hydrogen · Energy Efficiency

Legend: Less Favorable | | | More Favorable

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Portfolio Metric Results – Reference Scenario ONLY

	System Reliability & Climate Resiliency				Environmental Sustainability				Affordability				
	Diversity of Generation Mix	Capacity Headroom	Extreme Weather Exposure		Progress Towards City of SA CAAP Goals				Bill Impact			Revenue Requirements	
	Generation Mix (MWh)	Expected Reserve Margin (%)	Rev. Req. Extreme Weather ($Billion)	Extreme Weather Market Purchases (MWh)	% CO2 Intensity Reduction Relative to 2016 (Ref Scenario)	Emission Intensity (lbs CO2/MWh)		% reduction in demand due to energy efficiency	Monthly Bills (Ref Scenario) ($/Month)	Monthly Bills (Scenario Range) ($/Month)	Monthly Bills (Highest Scenario) ($/Month)	PV Revenue Requirements (Ref Scenario) ($Billion)	PV Revenue Requirements (Ref Scenario) ($Billion)
	2030	*2030*	*2030*	*2030*	*2030*	*2030 | 2040*		*2030*	*2030*	*2030*	*2030*	*2023 – 2030*	*2023 – 2047*
P1		13.7%			37%	578	567	5.2%					
P2		15.7%			44%	517	354	5.2%					
P3		14.5%			68%	297	149	5.2%					
P4		15.3%			30%	646	364	5.2%					
P5		15.0%			68%	299	149	5.2%					
P6		13.2%			84%	148	0	5.2%					
P7		13.1%			84%	149	5	5.2%					
P8		15.4%			61%	361	150	5.2%					
P9		14.6%			61%	358	150	5.2%					

Nuclear · Geothermal · Coal · Gas
Gas Toll · Wind · Solar · Other
Storage · Hydrogen · Energy Efficiency

Notes:
1. *Lighter shade means "more favorable."*
2. *Gray shading represents metrics that will be populated after all scenario and sensitivity analysis.*

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Portfolio Metric Results – Reference Scenario ONLY

	System Flexibility		Workforce Impact	
	Market Purchases	Dispatchability	CPS Energy Workforce Impact	Local Economic Impact
	% of CPS Energy demand that is met through ERCOT market purchases	% of CPS Energy Capacity that is Dispatchable	Estimated Number of CPS Energy Generation Employees	Capital expenditures for new generation capacity built in greater San Antonio area ($Millions)
	2030	*2030*	*2030*	*2023 – 2030*
P1	1%	61%	260	2,758
P2	4%	57%	250	2,004
P3	13%	46%	110	1,310
P4	7%	63%	290	1,787
P5	13%	46%	100	866
P6	18%	39%	110	4,041
P7	18%	39%	110	4,041
P8	11%	48%	150	548
P9	9%	46%	150	548

Note:

1. Lighter shade means "more favorable."

Key Observations from Portfolio Metric Results – Reference Scenario

	System Reliability & Climate Resiliency			
	Diversity of Generation Mix	Capacity Headroom	Extreme Weather Exposure	
	Generation Mix (MWh)	Expected Reserve Margin (%)	Rev. Req. Extreme Weather ($Billion)	Extreme Weather Market Purchases (MWh)
	2030	*2030*	*2030*	*2030*
P1		13.7%		
P2		15.7%		
P3		14.5%		
P4		15.3%		
P5		15.0%		
P6		13.2%		
P7		13.1%		
P8		15.4%		
P9		14.6%		

Legend: Nuclear, Geothermal, Coal, Gas, Gas Toll, Wind, Solar, Other, Storage, Hydrogen, Energy Efficiency

System Reliability & Climate Resiliency

- Generation Mix
  - P8 and P9 have the most diverse generation mix, with no single fuel source accounting for more than half of total generation
  - P2, P4, P6 and P7 all perform similarly, with P2 and P4 being more gas-heavy and P6 and P7 more wind-heavy.
  - P1 has the least diverse generation mix with gas accounting for two-thirds of the total.
- Reserve Margin
  - All portfolios have an expected reserve margin range around 13 – 15%
  - P6 and P7 have the lowest reserve margin due to early retirements of Rosenberg and Rio Nogales, as well as potential limit on the market's ability to deliver sufficient new wind and storage additions to replace the retired capacity.

All unit Retirements require ERCOT approval & associated transmission reliability upgrades could determine final retirement dates.

Notes:

1. *Lighter shade means "more favorable."*
2. *Gray shading represents metrics that will be populated after scenario and sensitivity analysis.*

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Key Observations from Portfolio Metric Results – Reference Scenario

	Environmental Sustainability			
	Progress Towards City of SA CAAP Goals			
	% Emission Intensity Reduction Relative to 2016 (Ref Scenario)	Emission Intensity (lb CO2/MWh)		% reduction in demand due to energy efficiency
	2030	*2030 | 2040*		*2030*
P1	37%	578	567	5.2%
P2	44%	517	354	5.2%
P3	68%	297	149	5.2%
P4	30%	646	364	5.2%
P5	68%	299	149	5.2%
P6	84%	148	0	5.2%
P7	84%	149	5	5.2%
P8	61%	361	150	5.2%
P9	61%	358	150	5.2%

Note:
1. *Lighter shade means "more favorable."*

Environmental Sustainability

- CO2 Emission Intensity
  - By 2030, P2, P3, & P5 - P9 **out-perform the 2030 CAAP target** of 41% emission reduction (below 543 lb/MWh).
  - By 2030, P1 & P4 **do not meet the 2030 CAAP target** of 41% emission reduction (below 543 lb/MWh) without additional mitigation.
  - By 2040, P3, & P5 - P9 **out-perform the 2040 CAAP target** of 71% emission reduction (below 267 lb/MWh).
  - By 2040, P1, P2, & P4 **do not meet the 2040 CAAP target** of 71% emission reduction (below 267 lb/MWh) without additional mitigation.
- Energy Efficiency Contribution
  - The contribution of energy efficiency is the same across all portfolios and is based on the baseline Sustainable Tomorrow Energy Plan (STEP).
  - Sensitivity analysis to test the impact of an expanded STEP program and a scaled back STEP program is slated to be available at the November RAC meeting.

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Key Observations from Portfolio Metric Results – Reference Scenario

	System Flexibility	
	Market Purchases	Dispatchability
	% of CPS Energy demand that is met through ERCOT market purchases	% of CPS Energy Capacity that is Dispatchable
	2030	*2030*
P1	1%	61%
P2	4%	57%
P3	13%	46%
P4	7%	63%
P5	13%	46%
P6	18%	39%
P7	18%	39%
P8	11%	48%
P9	9%	46%

Note:
1. *Lighter shade means "more favorable."*

System Flexibility

- Market Purchases (the degree we rely on ERCOT)
  - P1, P2, P4, and P9 have the lowest market purchases due to the reliance on controllable (dispatchable) generation.
  - P6 and P7 have the greatest reliance on market purchases due to the retirements of all coal and gas units by 2030 and the increased deployment of intermittent resources, resulting in in reliance on ERCOT during certain times of the year and day when wind and solar are not fully available.
- Dispatchability (the degree we control generation output)
  - P1, P2 and P4 have the highest share of capacity that is dispatchable, due largely to the additions of new gas units in the late 2020s.
  - P3, P5, P8 and P9 have existing gas and new storage and hydrogen additions that provide dispatchable capacity.
  - P6 and P7 have the lowest share of dispatchable capacity, as they rely heavily on wind and solar for energy contributions.

Key Observations from Portfolio Metric Results – Reference Scenario

	Workforce Impact	
	CPS Energy Workforce Impact	Local Economic Impact
	Estimated Number of CPS Energy Generation Employees	Capital expenditures for new generation capacity built in greater San Antonio area ($Millions)
	2030	*2023 – 2030*
P1	260	2,758
P2	250	2,004
P3	110	1,310
P4	290	1,787
P5	100	866
P6	110	4,041
P7	110	4,041
P8	150	548
P9	150	548

Note:
1. Lighter shade means "more favorable."

Workforce Impact

- CPS Energy Workforce Impact
  - P1, P2, and P4 retain the most CPS Energy jobs, due to fewer capacity retirements by 2030. New gas plants allow CPS Energy to re-deploy employees from retired plants.
  - P3, P5, P6, and P7 retain fewer jobs due to earlier retirements of CPS Energy-owned power plants.
- Local Economic Impact
  - P6 and P7 have the highest capital expenditures in the local area, driven largely by new geothermal capacity.
  - P1 and P2 include the most near-term gas additions, which are expected to be constructed in the local region.
  - Although P5, P8 and P9 add significant renewable capacity, it is expected that most wind and solar would be sited outside of the greater San Antonio area.

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Agenda

Recap of September 15 RAC Meeting

Recap of Progress

Revised Planning Objectives and Metrics

Review of CPS Energy Resource Portfolio Definitions

Review of Portfolio Performance under Planning Objectives and Metrics

Timeline and Next Steps

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Timeline – Generation Plan Update

	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RAC Agenda	Market & modeling intro (6/16)	CRA Process intro (7/21)	Dot plot / Scenario inputs / Process detail (8/18)	Scenario outputs / Portfolios (9/15)	Metrics – REF scenario (10/20)	RAC Q&A Mtg (11/3) Metrics – All scenarios/ Preferred Plan (11/17)	RAC Q&A Mtg (12/2) RAC Portfolios (12/6) RAC Mtg (12/15)
Public Input	RAC meeting date	RAC meeting date	RAC meeting date	Launch online survey & Press conference Employee Townhall (9/13) RAC meeting date	1st Public Open House (a.m. & p.m.) (10/6) RAC meeting date	Public Virtual Town Hall (11/1) RAC meeting date	2nd Public Open House (a.m. & p.m.) (12/1) RAC meeting date
RAC & RAC Peer Review				Review inputs & ERCOT scenario outputs	Review portfolio REF results	RAC developing report to BOT	RAC reports to BOT (12/19)
CPS Energy Preferred Plan						CRA incorporates feedback	BOT/RAC process
Metrics		Draft Metrics		Final Metrics			
Scenario Development		Scenario narratives	Scenario parameters	Sensitivity parameters			
Portfolio Construction			Portfolio definition				
Portfolio and Financial Analysis				Populated Metrics – REF scenario	Populated Metrics – All scenarios		

Note: Updates from Sep RAC meeting highlighted in yellow.

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Next Steps

- Provide full Reference Case metrics
- Evaluate portfolio performance in the 3 remaining scenarios plus sensitivities

Appendix: Portfolio Composition Details

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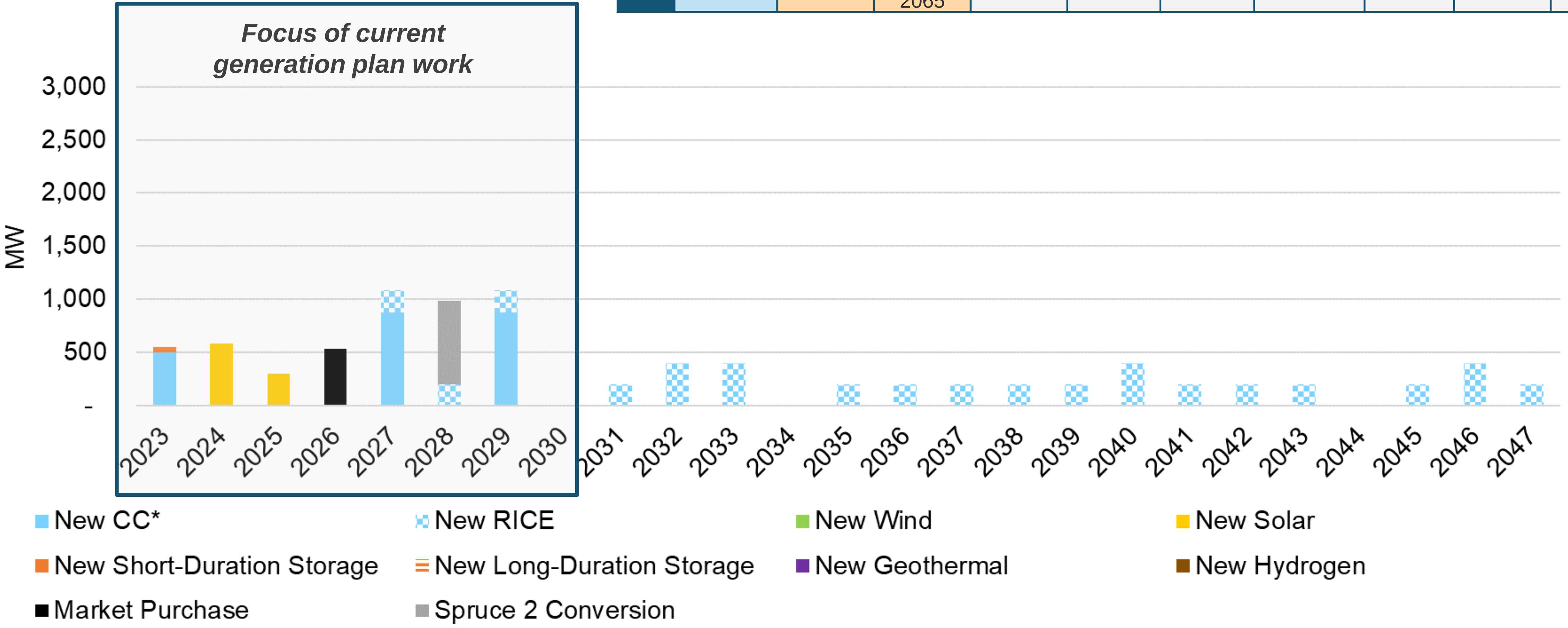
Portfolio 1 (Gas) – Annual Resource Additions

		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P1	Gas	Dec 2028	Convert to gas in Dec 2027 and retire in Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

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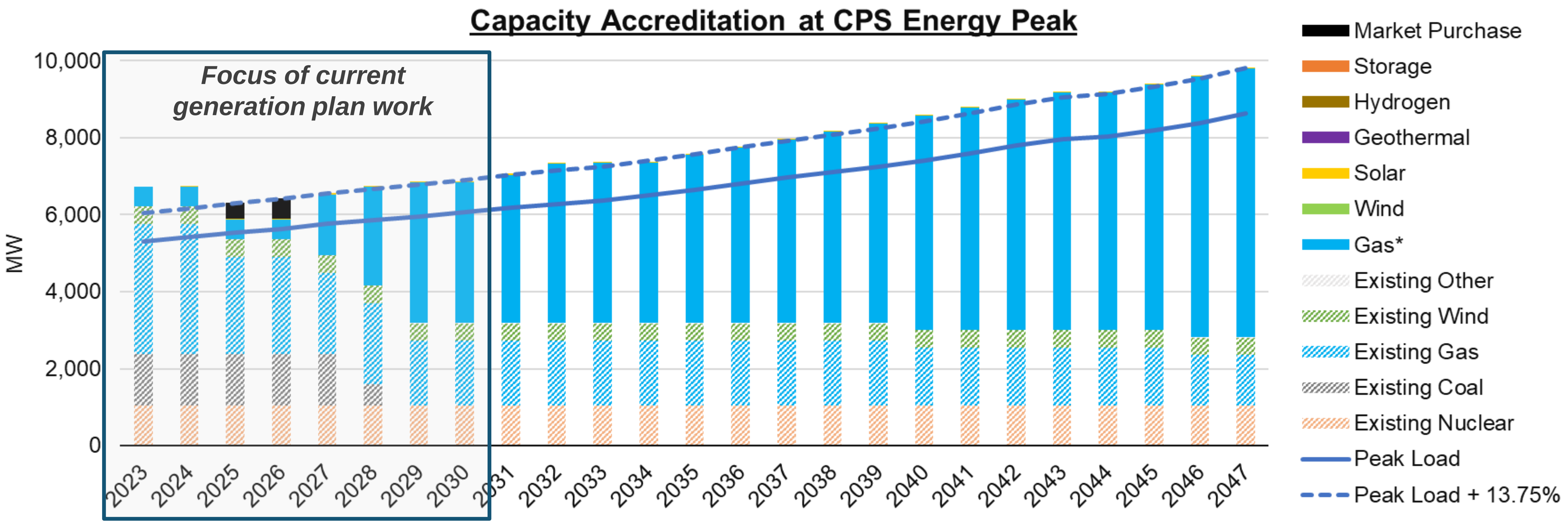
Portfolio 1 (Gas) – Annual Supply Demand Balance

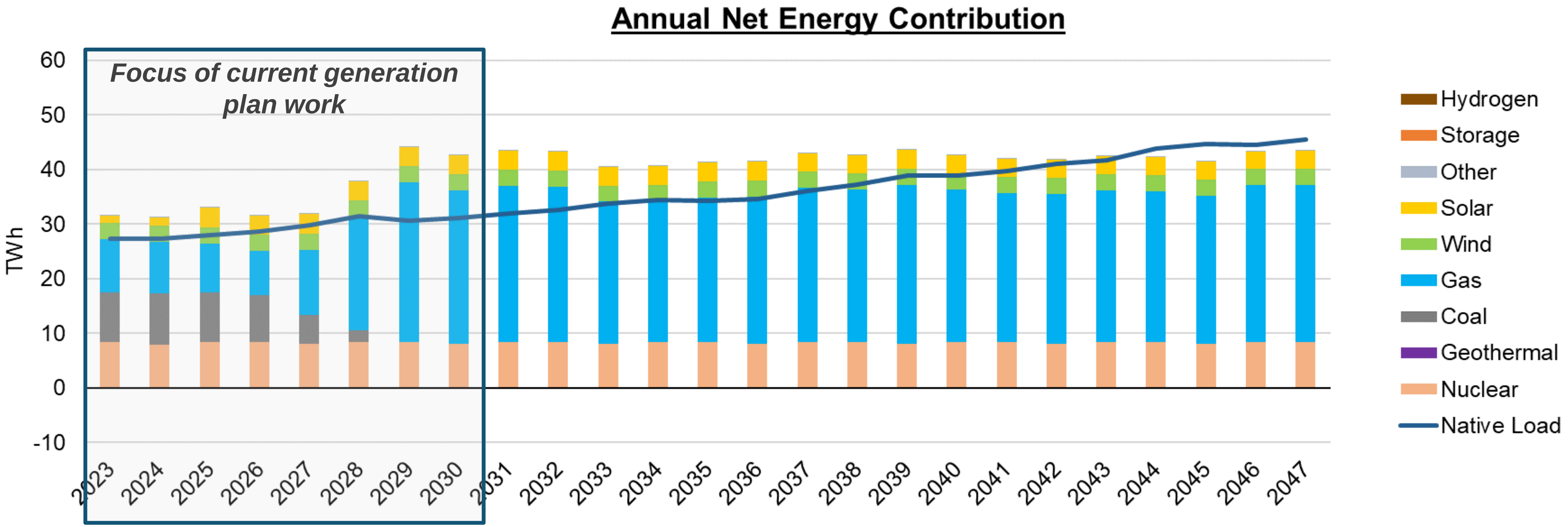
	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P1	Gas	Dec 2028	Convert to gas in Dec 2027 and retire in Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle and Spruce 2 coal-to-gas conversion

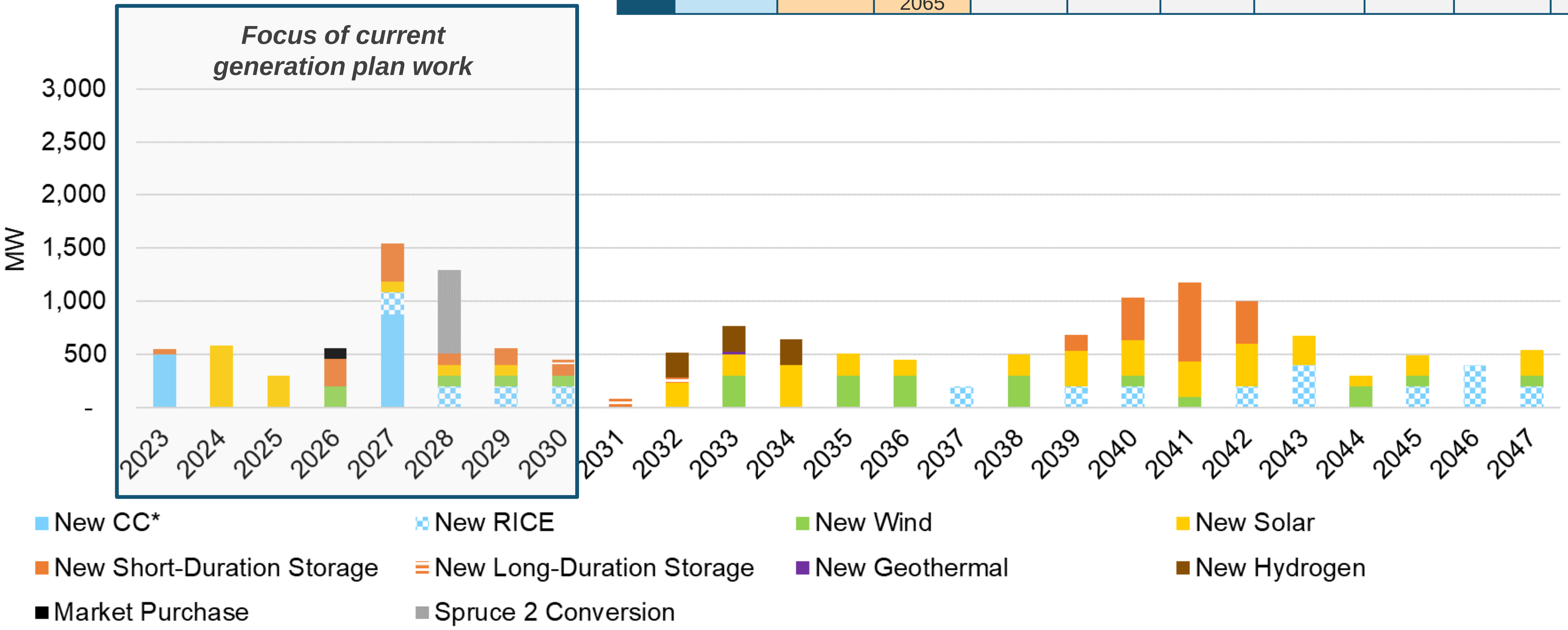
Portfolio 1 (Gas) – Annual Generation Mix (TWh)

	Allowed Tech.	Existing Fleet Retirement Dates: Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P1	Gas	Dec 2028	Convert to gas in Dec 2027 and retire in Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



Portfolio 2 (Blend 1) – Annual Resource Additions

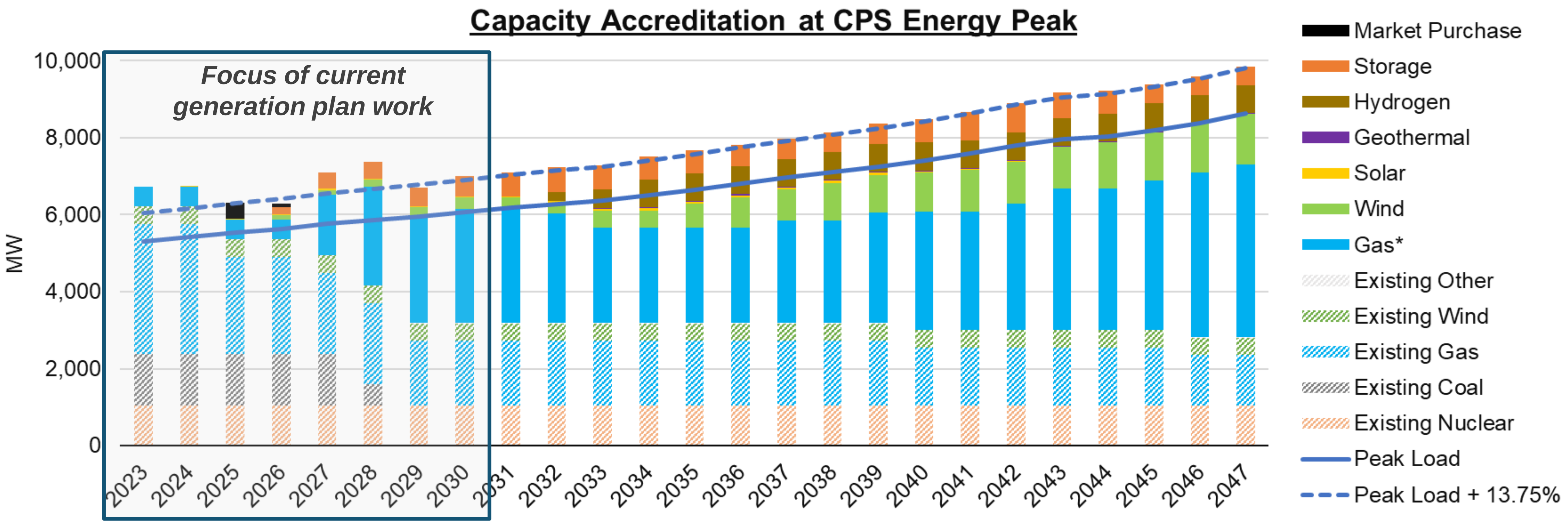
		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P2	Blend 1	Dec 2028	Convert to gas in Dec 2027 and retire in Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

Portfolio 2 (Blend 1) – Annual Supply Demand Balance

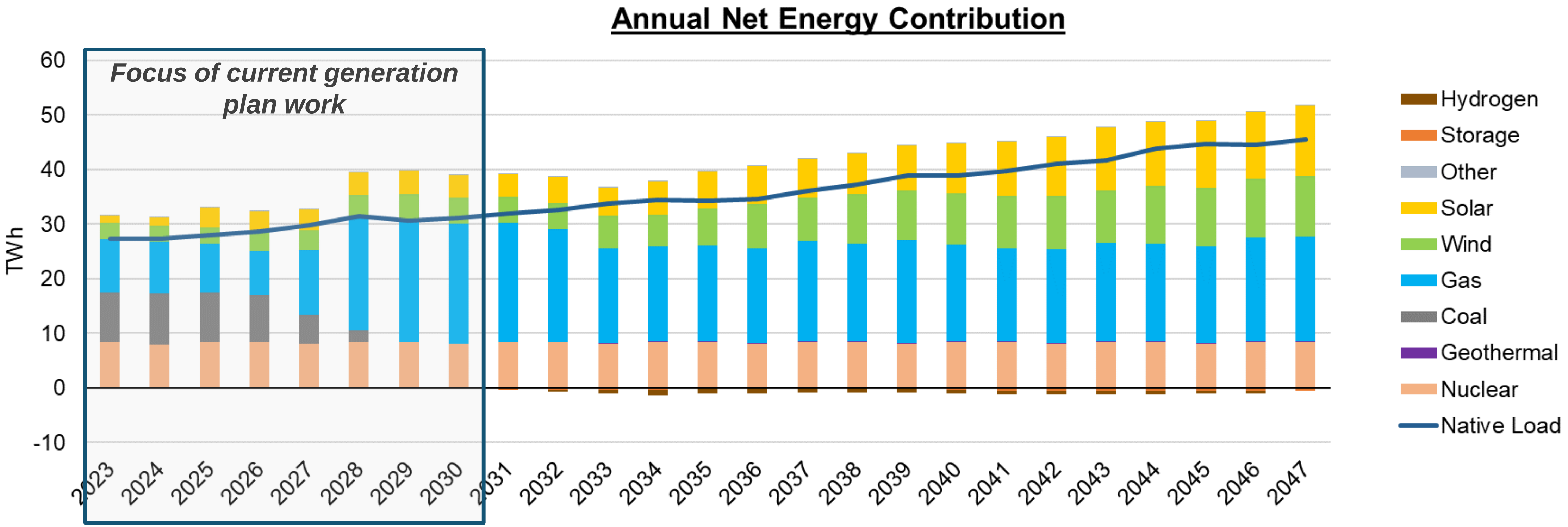
	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	**Spruce 2**	**Braunig 1 - 3**	**Sommers 1**	**Sommers 2**	**Arthur Von Rosenberg**	**Rio Nogales**	**Milton B Lee 1 – 4**	**Milton B Lee 5 - 8**
P2	Blend 1	Dec 2028	Convert to gas in Dec 2027 and retire in Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle and Spruce 2 coal-to-gas conversion.

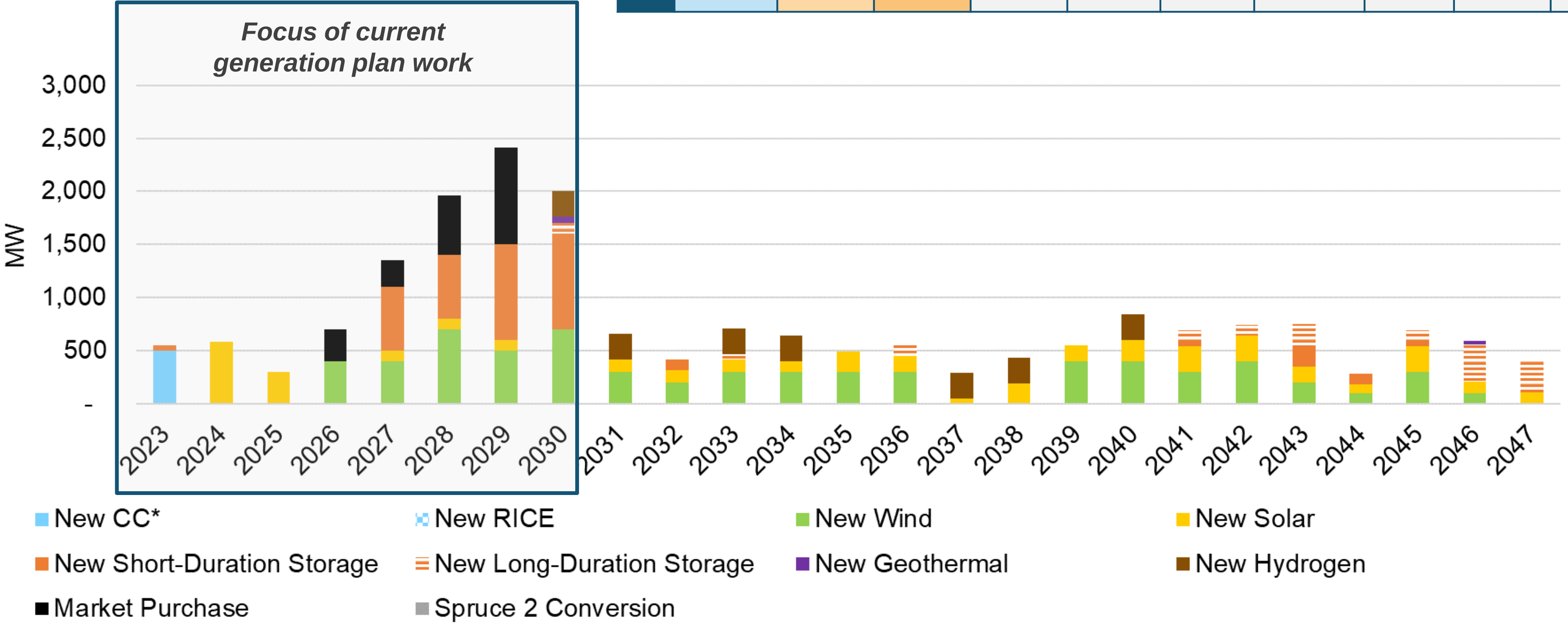
Portfolio 2 (Blend 1) – Annual Generation Mix (TWh)

		Existing Fleet Retirement Dates								
	Allowed Tech.	**Spruce 1**	**Spruce 2**	**Braunig 1 - 3**	**Sommers 1**	**Sommers 2**	**Arthur Von Rosenberg**	**Rio Nogales**	**Milton B Lee 1 – 4**	**Milton B Lee 5 - 8**
P2	Blend 1	Dec 2028	Convert to gas in Dec 2027 and retire in Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



Portfolio 3 (Renewables) – Annual Resource Additions

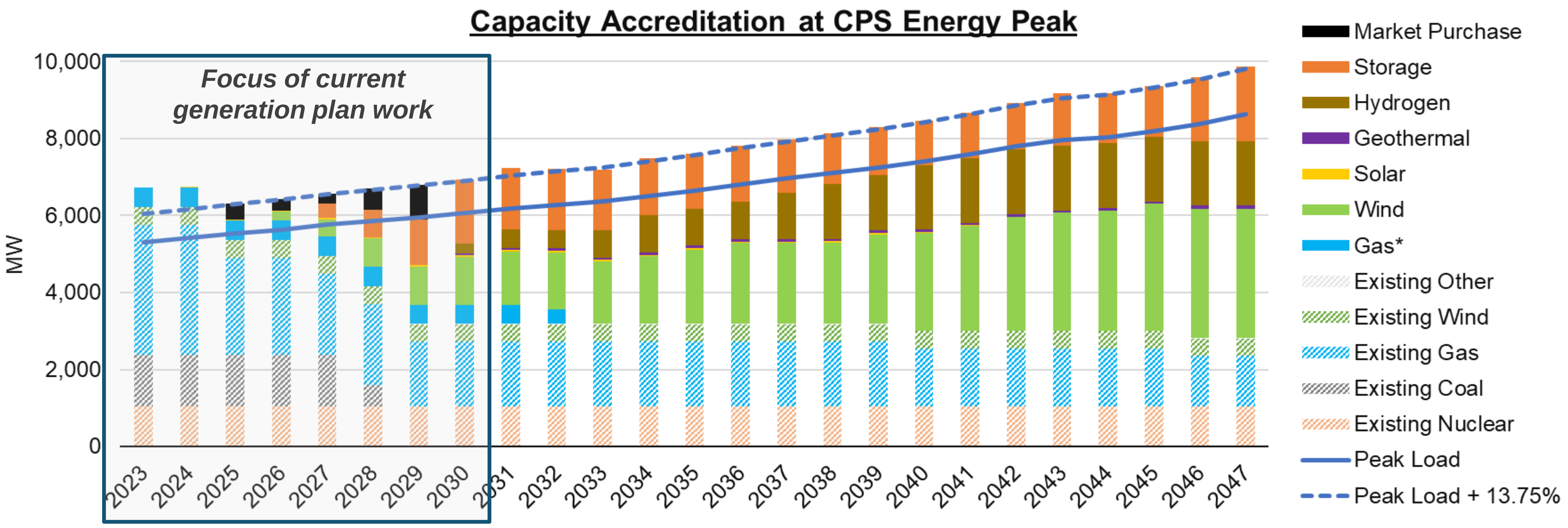
	Allowed Tech.	Existing Fleet Retirement Dates: Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P3	Renew-ables	Dec 2028	Dec 2027	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

Portfolio 3 (Renewables) – Annual Supply Demand Balance

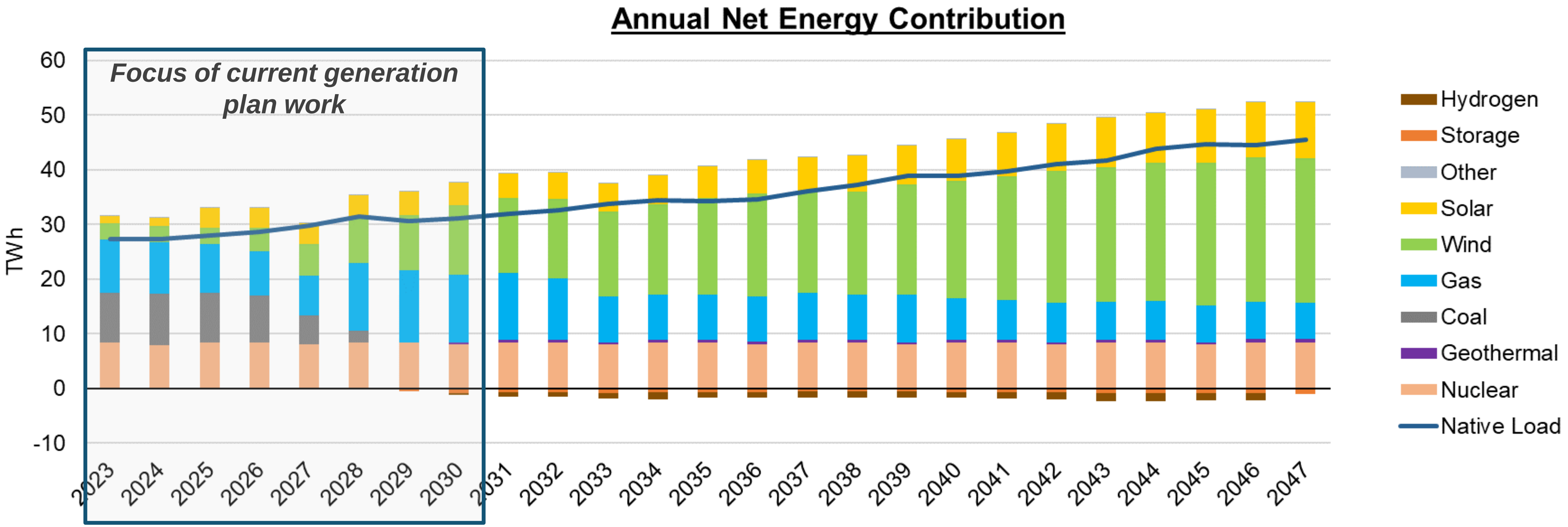
	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P3	Renew-ables	Dec 2028	Dec 2027	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle.

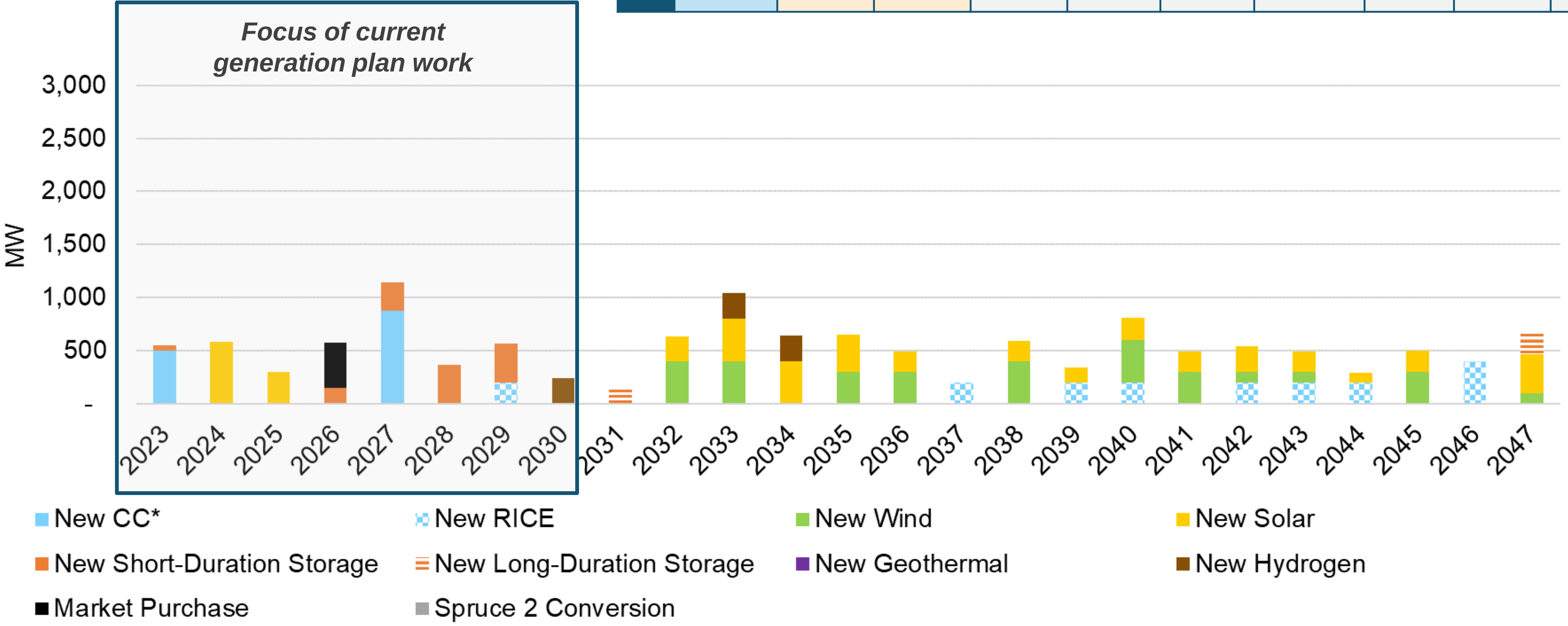
Portfolio 3 (Renewables) – Annual Generation Mix (TWh)

		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P3	Renew-ables	Dec 2028	Dec 2027	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



Portfolio 4 (Blend 2) – Annual Resource Additions

	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P4	Blend 2	Dec 2047	Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

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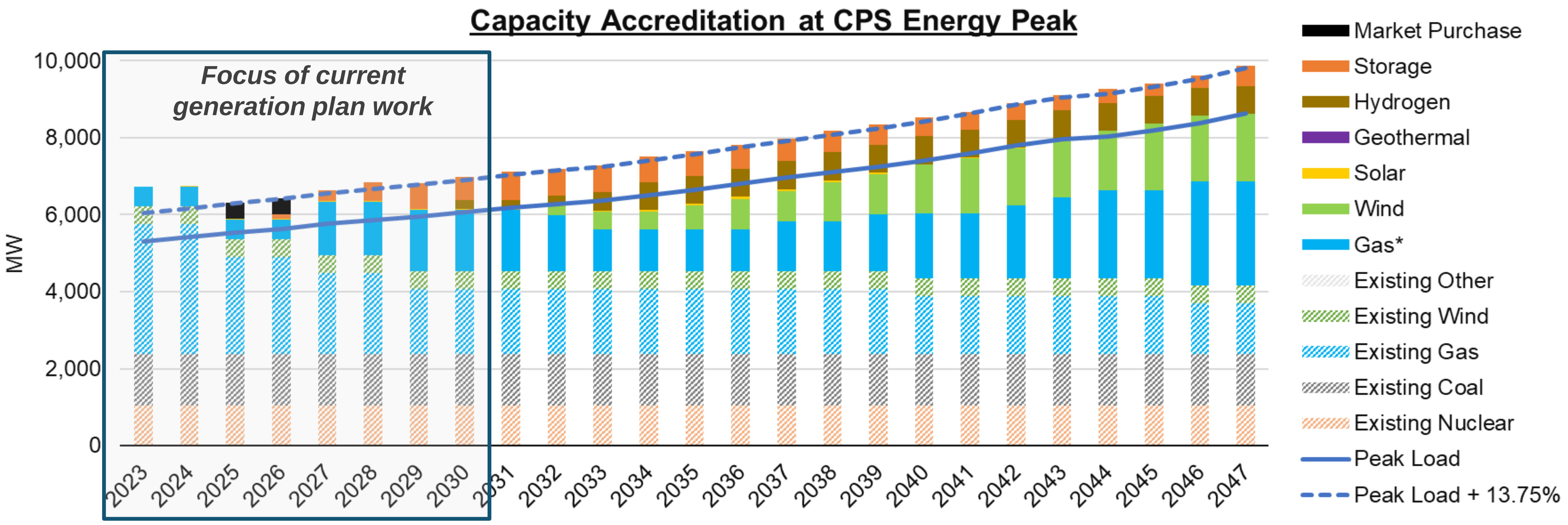
Portfolio 4 (Blend 2) – Annual Supply Demand Balance

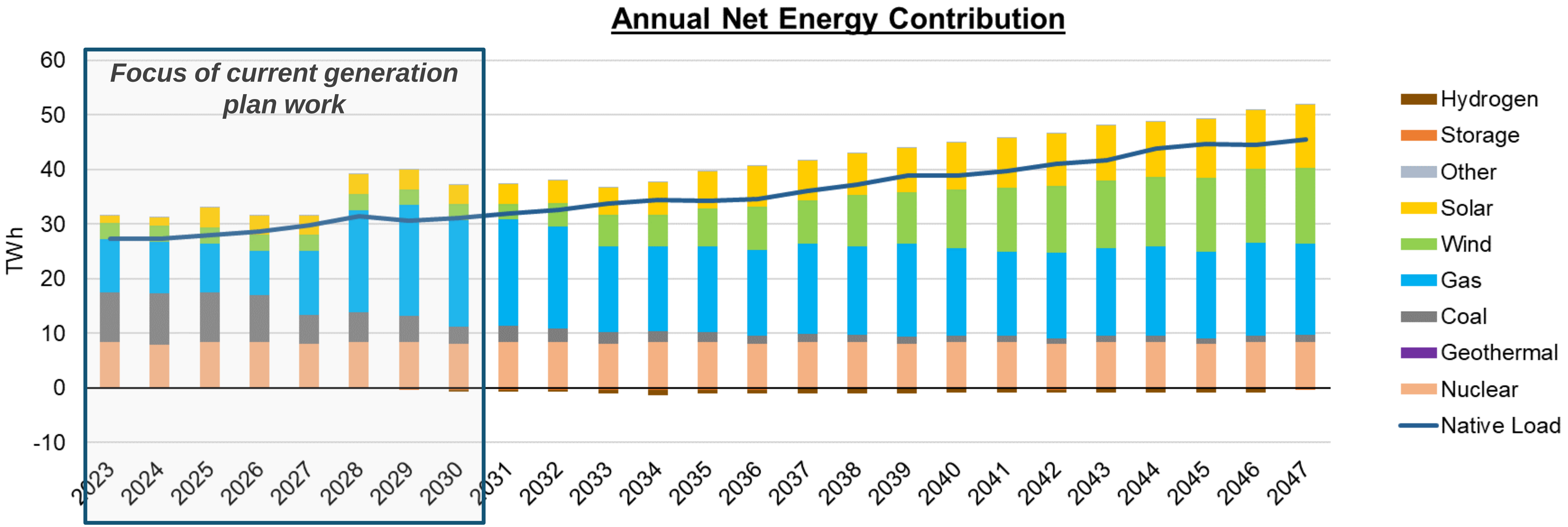
		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P4	Blend 2	Dec 2047	Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle.

Portfolio 4 (Blend 2) – Annual Generation Mix (TWh)

		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P4	Blend 2	Dec 2047	Dec 2065	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



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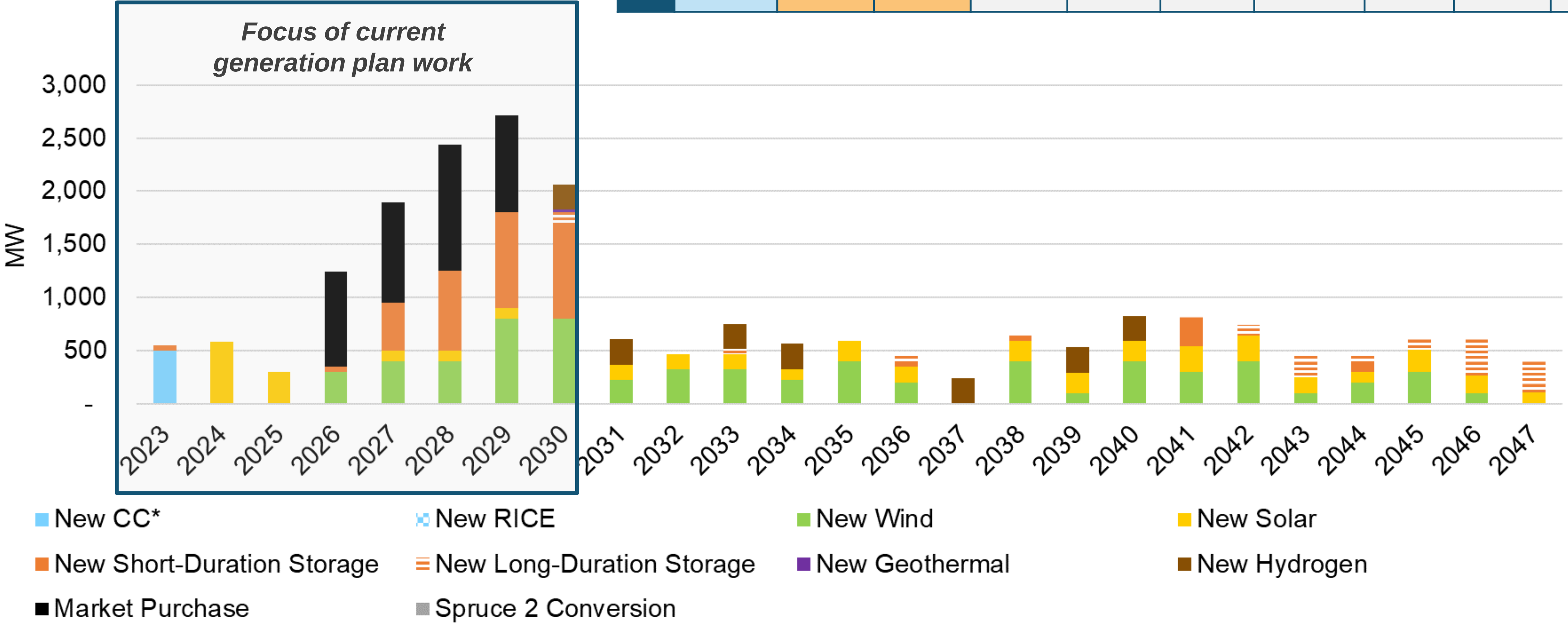
Portfolio 5 (Renewables) – Annual Resource Additions

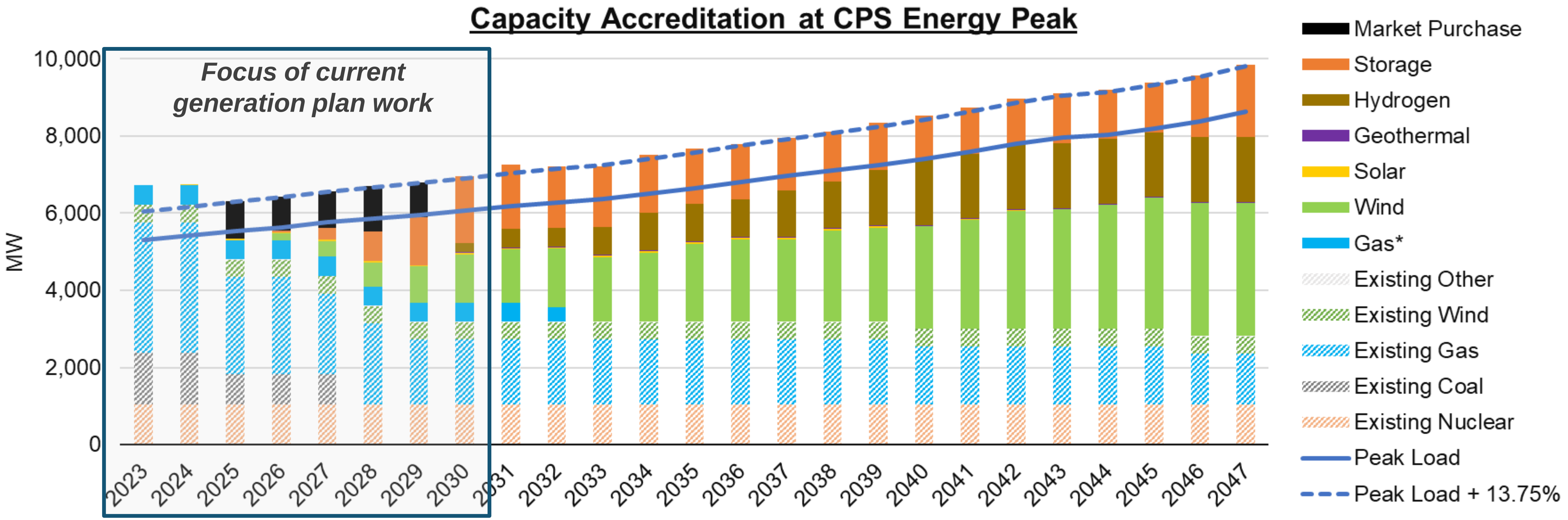
	Allowed Tech.	Existing Fleet Retirement Dates: Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P5	Renew-ables	Mar 2025	Mar 2028	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

Portfolio 5 (Renewables) – Annual Supply Demand Balance

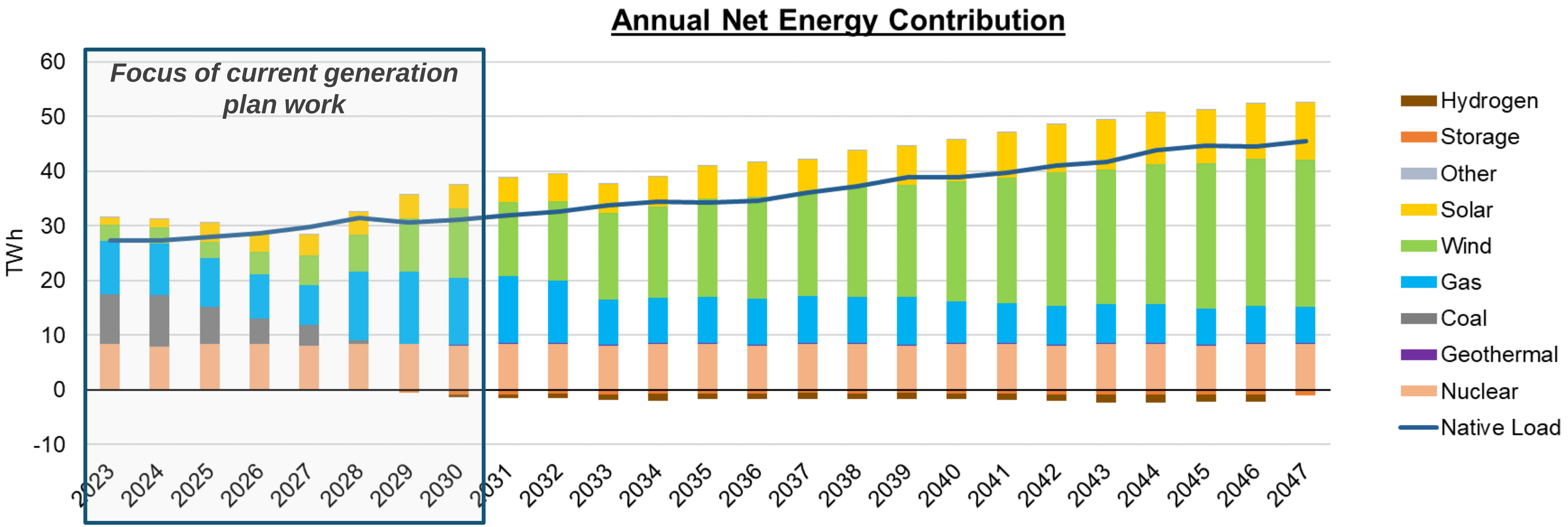
	Allowed Tech.	Existing Fleet Retirement Dates: Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P5	Renew-ables	Mar 2025	Mar 2028	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle.

Portfolio 5 (Renewables) – Annual Generation Mix (TWh)

	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P5	Renew-ables	Mar 2025	Mar 2028	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



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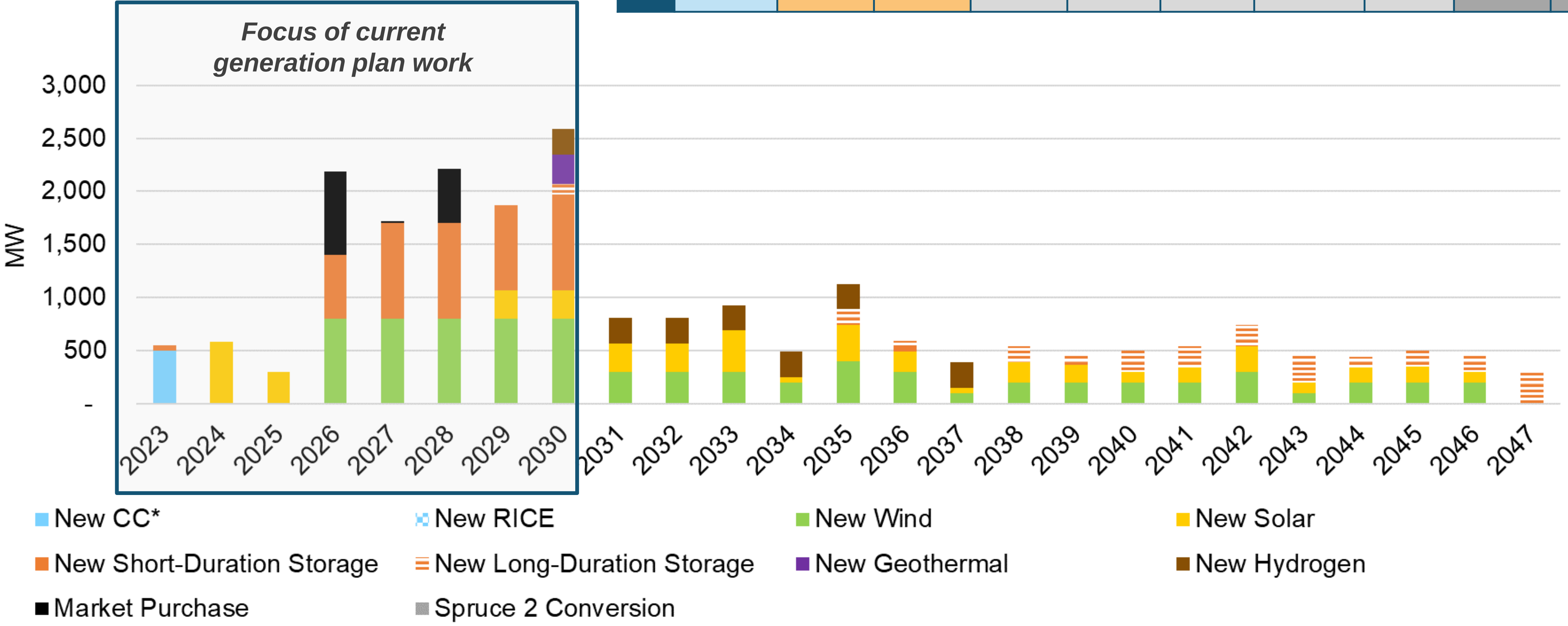
Portfolio 6 (Renewables) – Annual Resource Additions

	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P6	Renew-ables	Mar 2025	Mar 2028	Mar 2024	Mar 2026	Mar 2028	Mar 2030	Mar 2030	Mar 2035	Mar 2035



**The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.*

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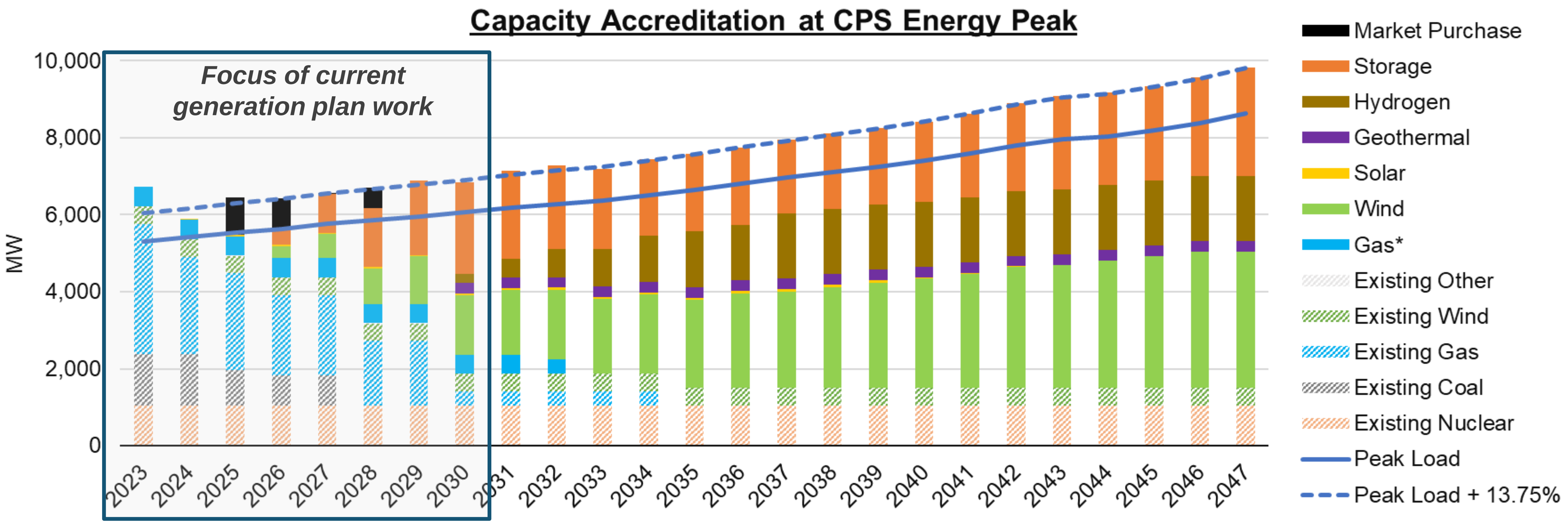
Portfolio 6 (Renewables) – Annual Supply Demand Balance

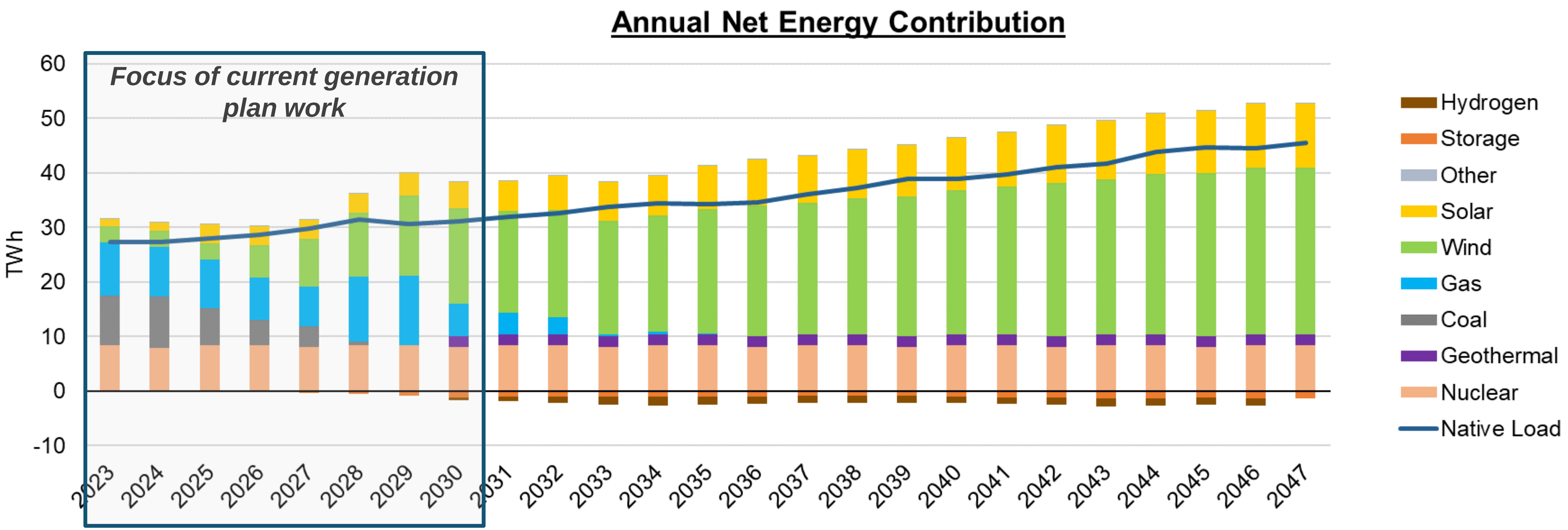
		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P6	Renew-ables	Mar 2025	Mar 2028	Mar 2024	Mar 2026	Mar 2028	Mar 2030	Mar 2030	Mar 2035	Mar 2035



**Gas includes the gas tolling contract in the FlexPower Bundle.*

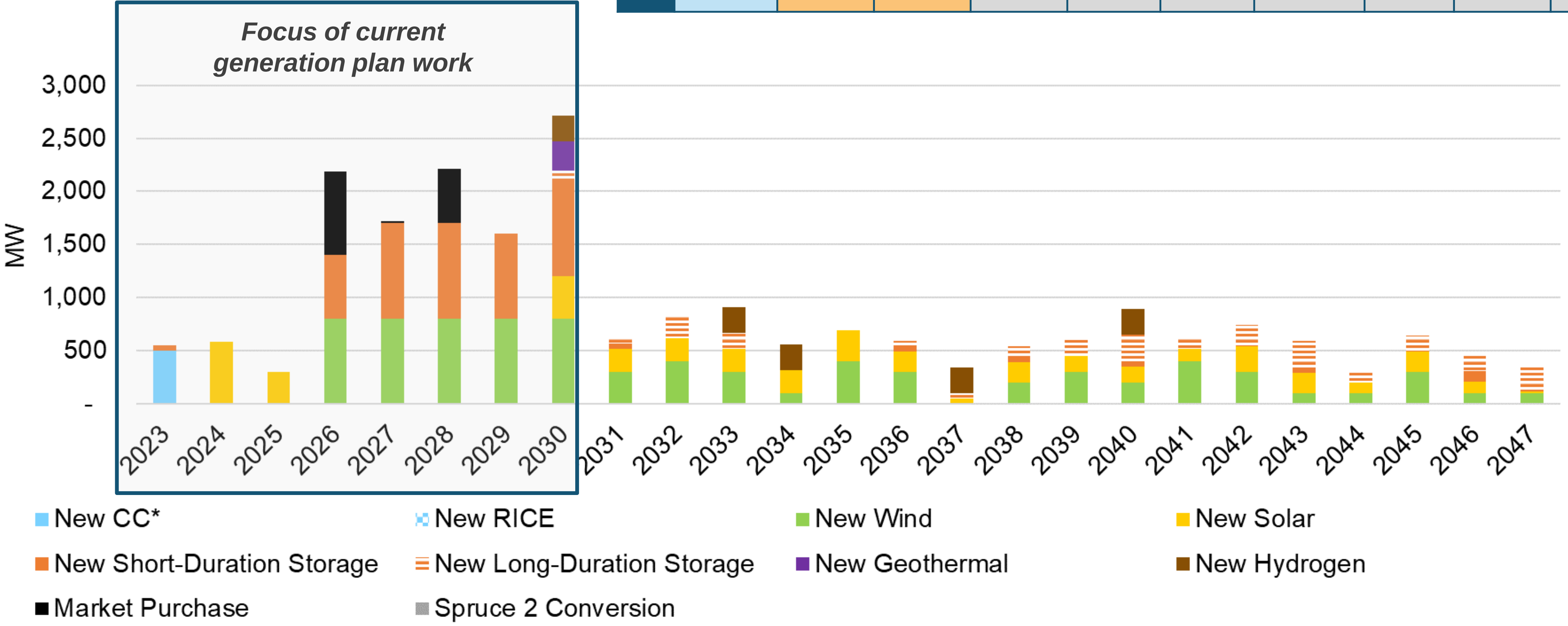
Portfolio 6 (Renewables) – Annual Generation Mix (TWh)

		Existing Fleet Retirement Dates								
	Allowed Tech.	**Spruce 1**	**Spruce 2**	**Braunig 1 - 3**	**Sommers 1**	**Sommers 2**	**Arthur Von Rosenberg**	**Rio Nogales**	**Milton B Lee 1 – 4**	**Milton B Lee 5 - 8**
P6	Renew-ables	Mar 2025	Mar 2028	Mar 2024	Mar 2026	Mar 2028	Mar 2030	Mar 2030	Mar 2035	Mar 2035



Portfolio 7 (Renewables) – Annual Resource Additions

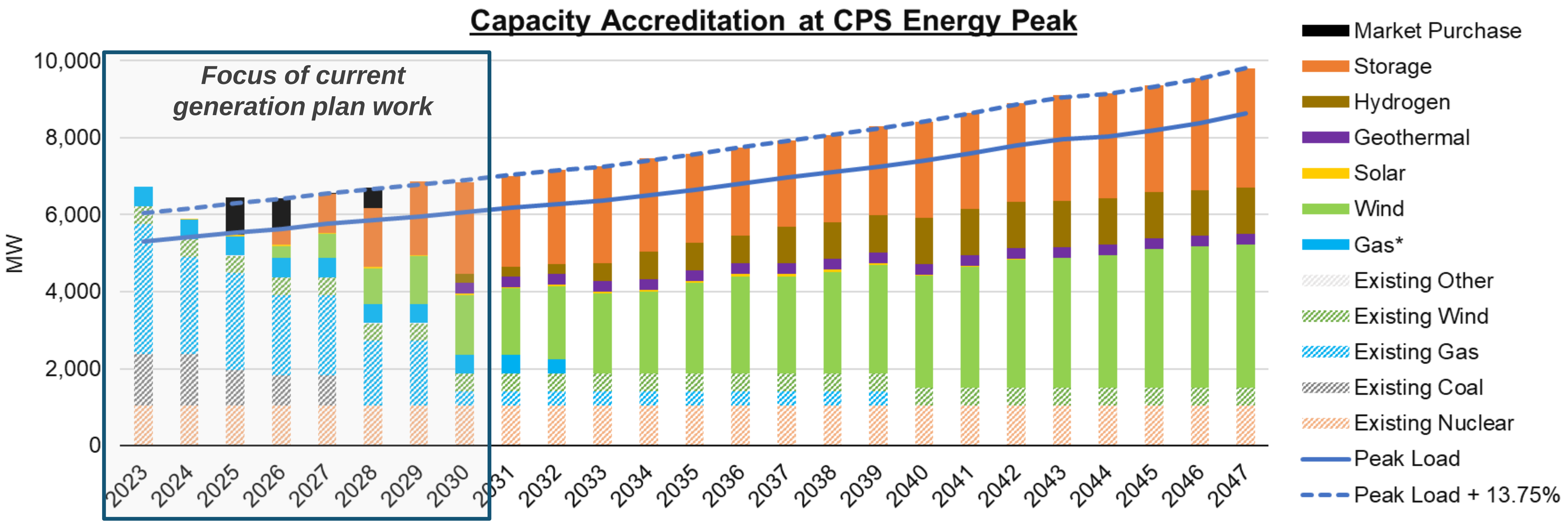
		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P7	Renew-ables	Mar 2025	Mar 2028	Mar 2024	Mar 2026	Mar 2028	Mar 2030	Mar 2030	Mar 2040	Mar 2040



*The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

Portfolio 7 (Renewables) – Annual Supply Demand Balance

		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P7	Renew-ables	Mar 2025	Mar 2028	Mar 2024	Mar 2026	Mar 2028	Mar 2030	Mar 2030	Mar 2040	Mar 2040

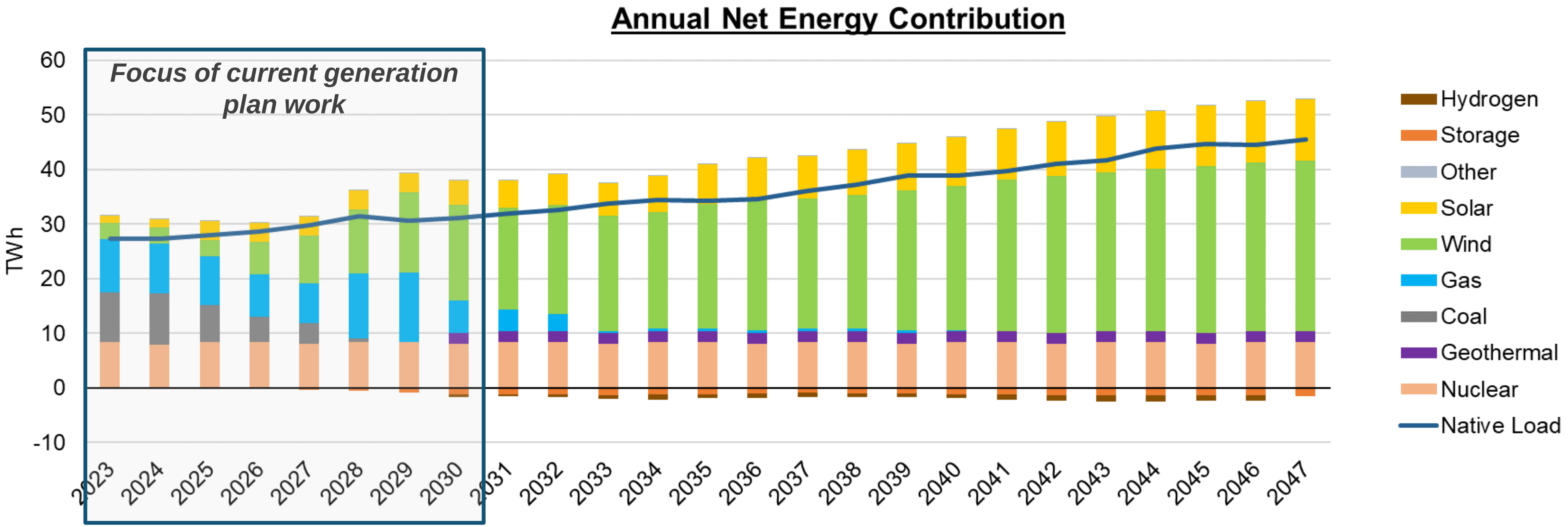


**Gas includes the gas tolling contract in the FlexPower Bundle.*

Charles River Associates

Portfolio 7 (Renewables) – Annual Generation Mix (TWh)

	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P7	Renew-ables	Mar 2025	Mar 2028	Mar 2024	Mar 2026	Mar 2028	Mar 2030	Mar 2030	Mar 2040	Mar 2040



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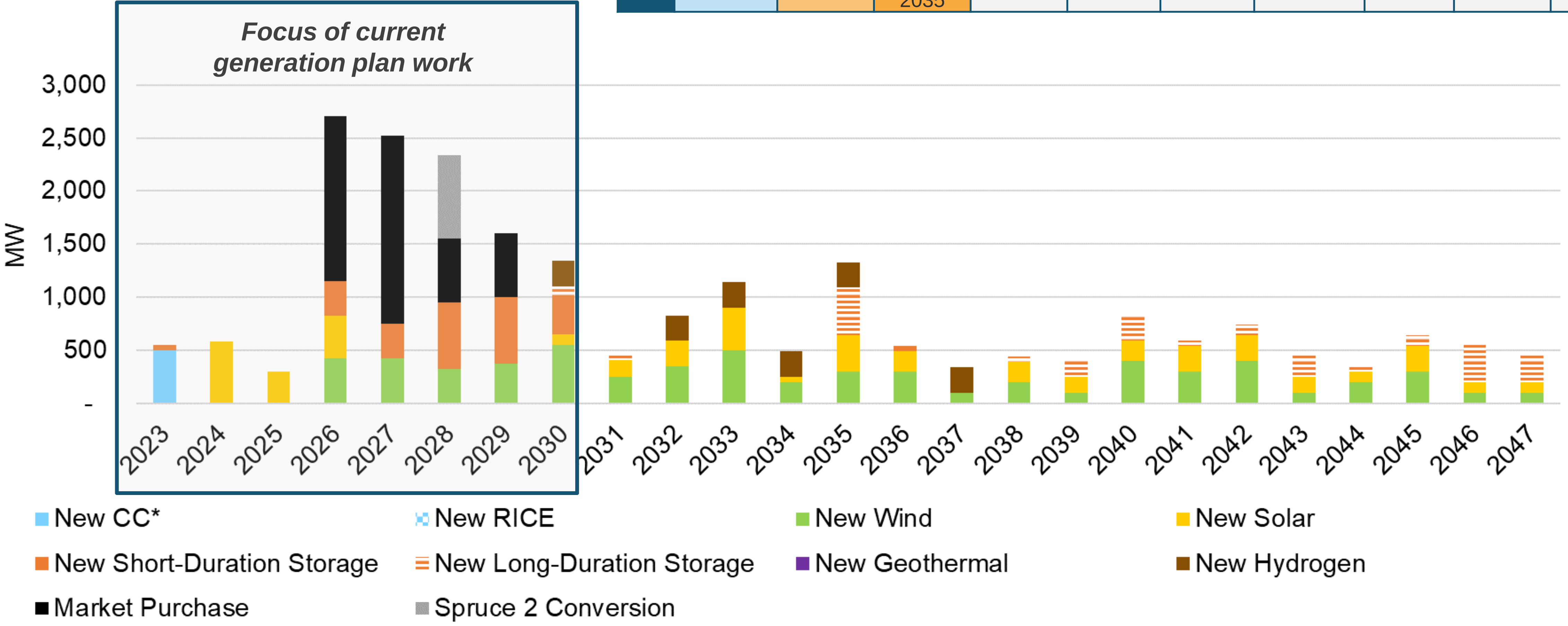
Portfolio 8 (Renewables) – Annual Resource Additions

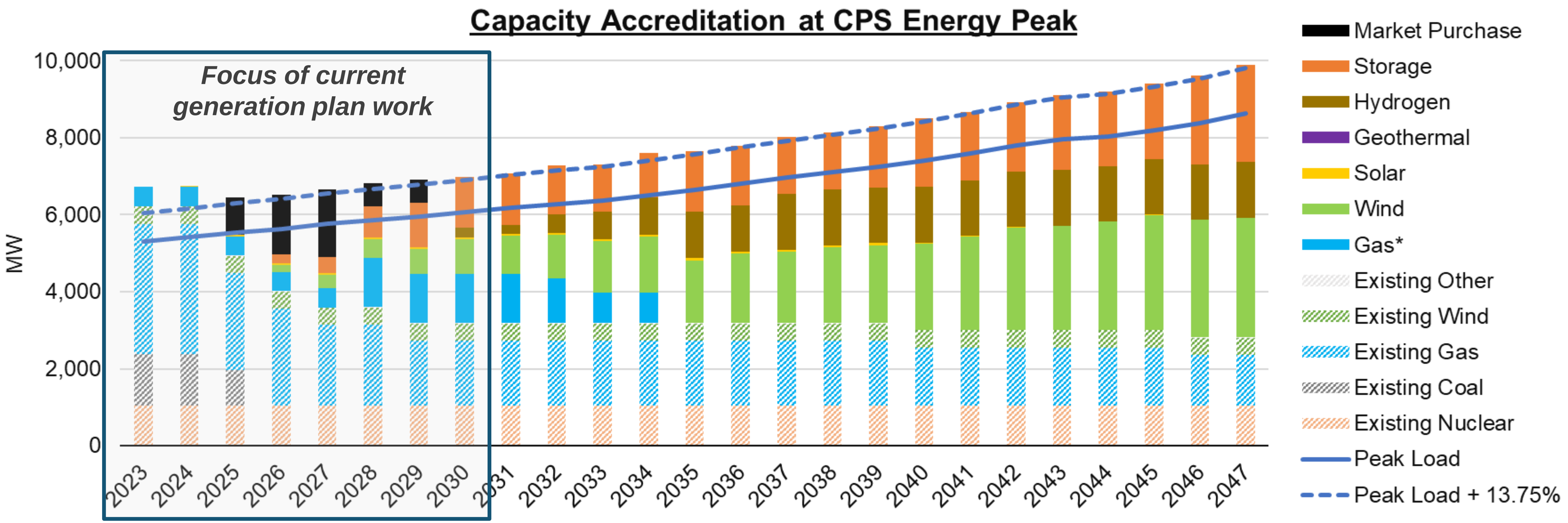
		Existing Fleet Retirement Dates								
	Allowed Tech.	Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P8	Renew-ables	Mar 2025	Convert to gas in Dec 2025 and retire in Mar 2035	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

Portfolio 8 (Renewables) – Annual Supply Demand Balance

	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	**Spruce 2**	**Braunig 1 - 3**	**Sommers 1**	**Sommers 2**	**Arthur Von Rosenberg**	**Rio Nogales**	**Milton B Lee 1 – 4**	**Milton B Lee 5 - 8**
P8	Renew-ables	Mar 2025	Convert to gas in Dec 2025 and retire in Mar 2035	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle and Spruce 2 coal-to-gas conversion.

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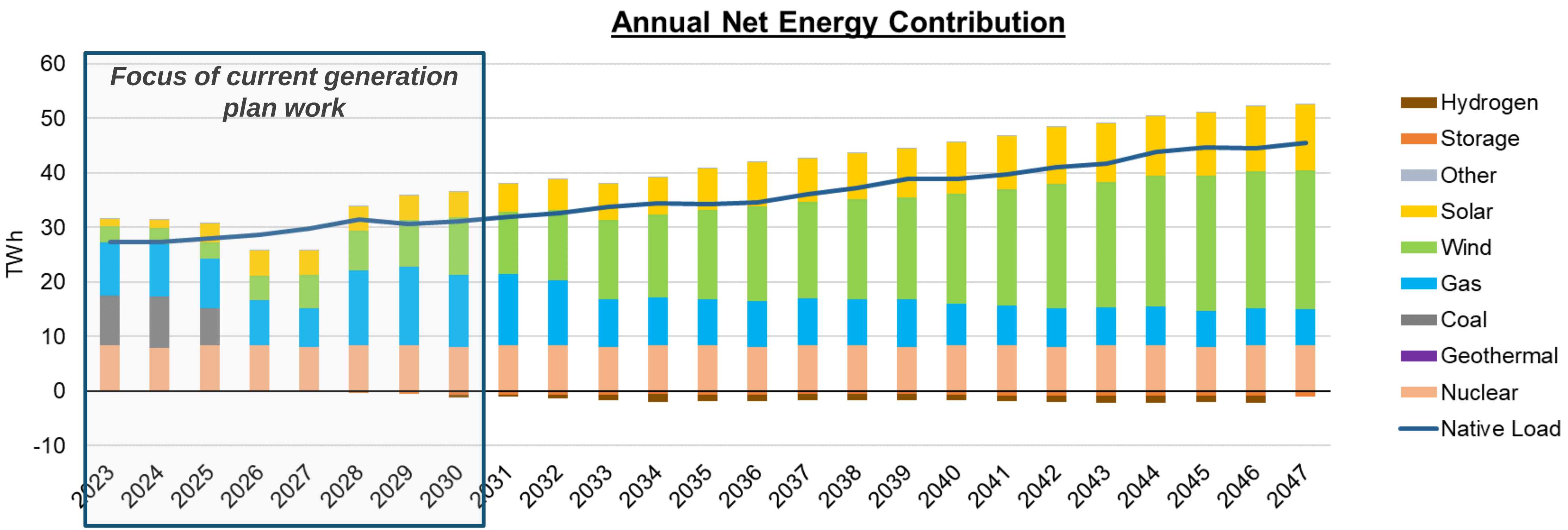
Portfolio 8 (Renewables) – Annual Generation Mix (TWh)

	Allowed Tech.	Existing Fleet Retirement Dates: Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P8	Renew-ables	Mar 2025	Convert to gas in Dec 2025 and retire in Mar 2035	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



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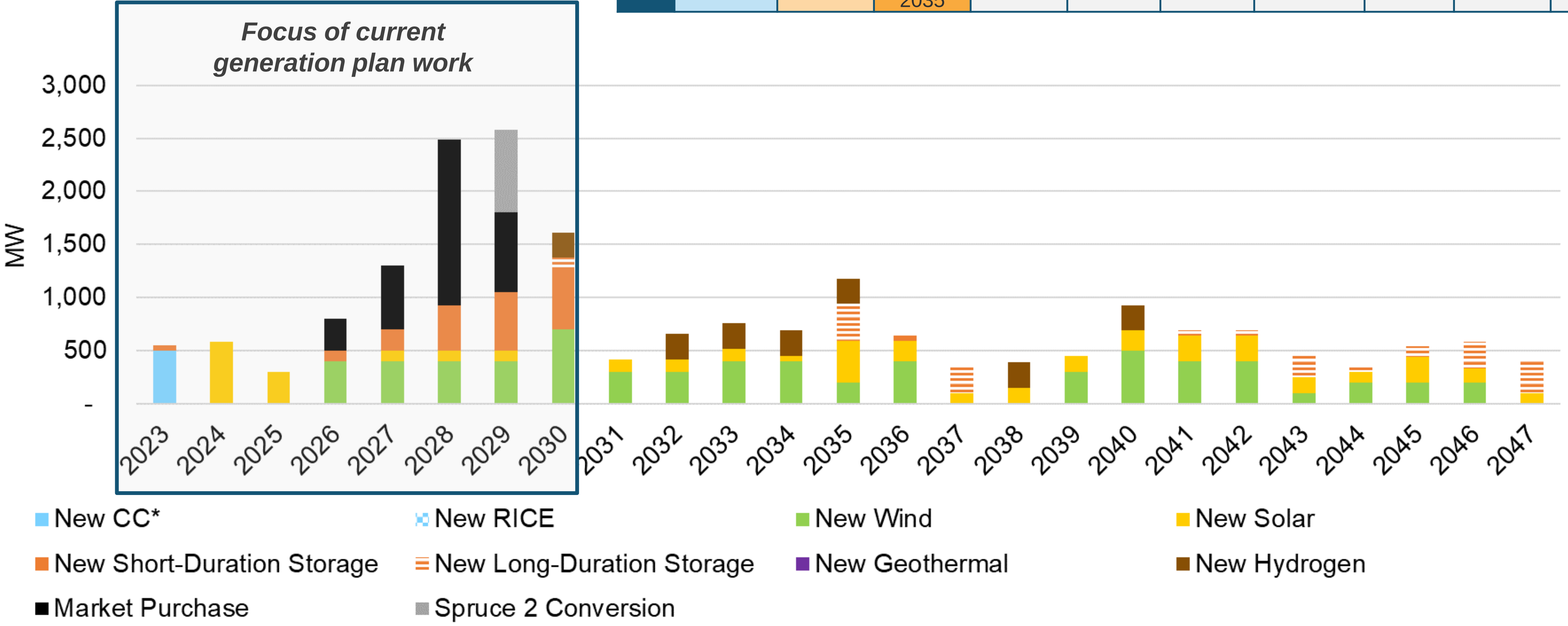
Portfolio 9 (Renewables) – Annual Resource Additions

	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P9	Renew-ables	Mar 2028	Convert to gas in Dec 2028 and retire in Mar 2035	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*The 2023 New CC (combined cycle) is the gas tolling contract in the FlexPower Bundle.

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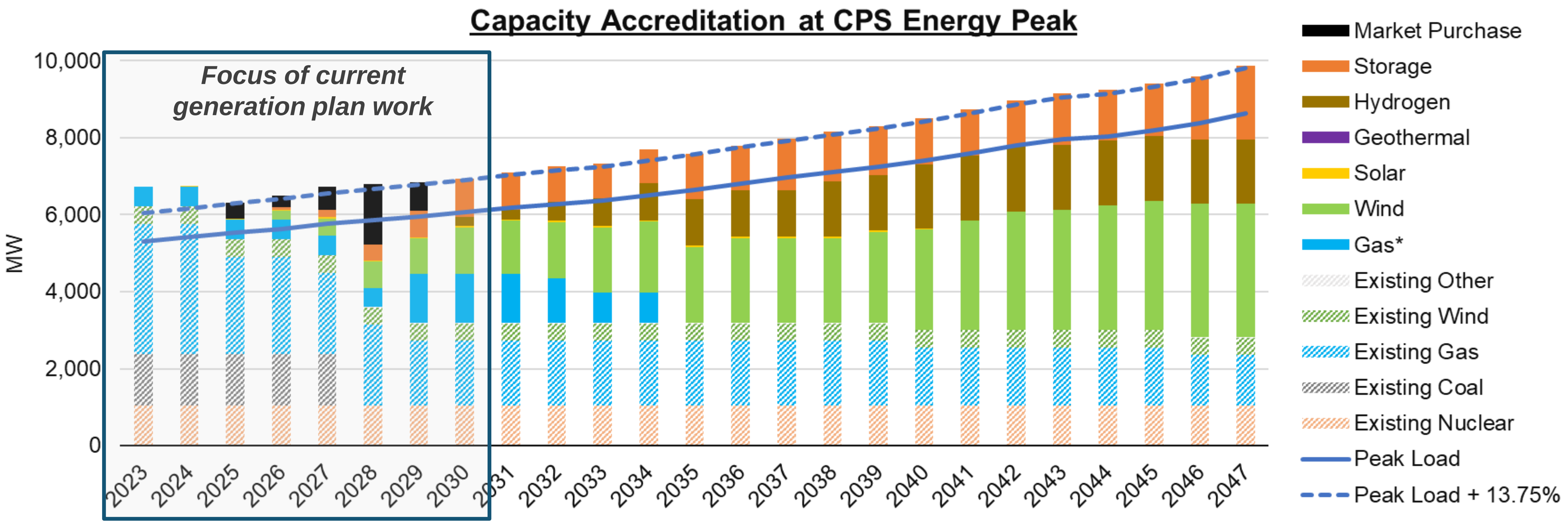
Portfolio 9 (Renewables) – Annual Supply Demand Balance

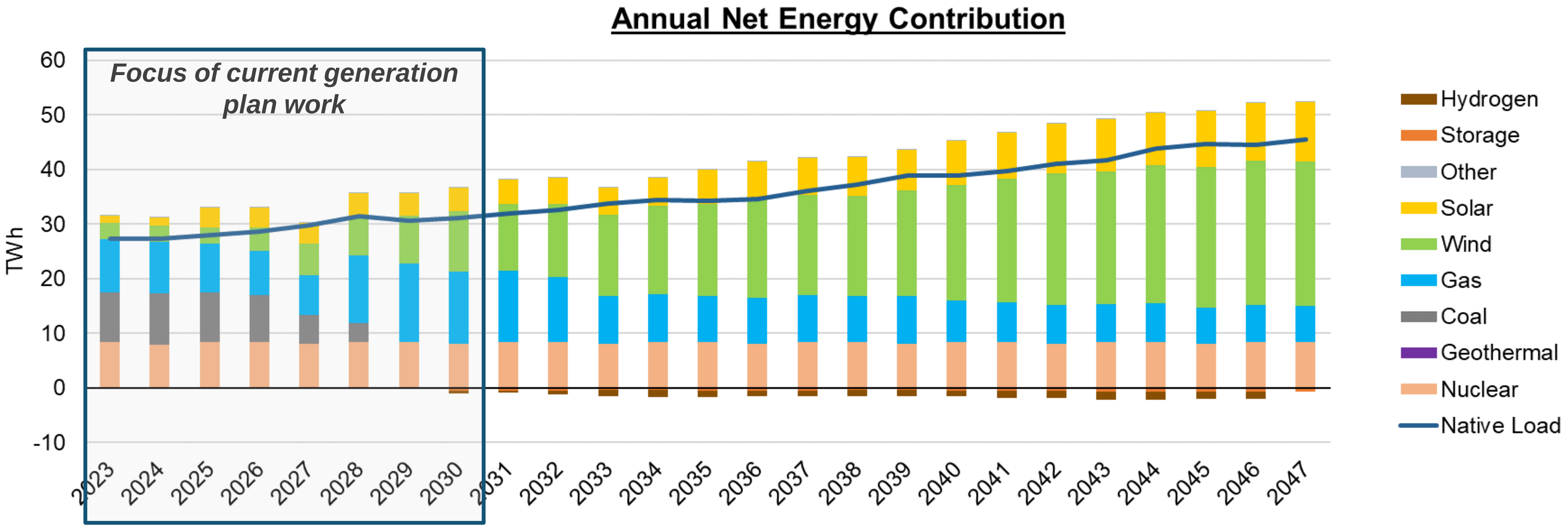
	Allowed Tech.	Existing Fleet Retirement Dates								
		Spruce 1	Spruce 2	Braunig 1 - 3	Sommers 1	Sommers 2	Arthur Von Rosenberg	Rio Nogales	Milton B Lee 1 – 4	Milton B Lee 5 - 8
P9	Renew-ables	Mar 2028	Convert to gas in Dec 2028 and retire in Mar 2035	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



*Gas includes the gas tolling contract in the FlexPower Bundle and Spruce 2 coal-to-gas conversion.

Portfolio 9 (Renewables) – Annual Generation Mix (TWh)

		Existing Fleet Retirement Dates								
	Allowed Tech.	**Spruce 1**	**Spruce 2**	**Braunig 1 - 3**	**Sommers 1**	**Sommers 2**	**Arthur Von Rosenberg**	**Rio Nogales**	**Milton B Lee 1 – 4**	**Milton B Lee 5 - 8**
P9	Renew-ables	Mar 2028	Convert to gas in Dec 2028 and retire in Mar 2035	Mar 2025	Mar 2027	Mar 2029	Dec 2047	Dec 2049	Dec 2039	Dec 2045



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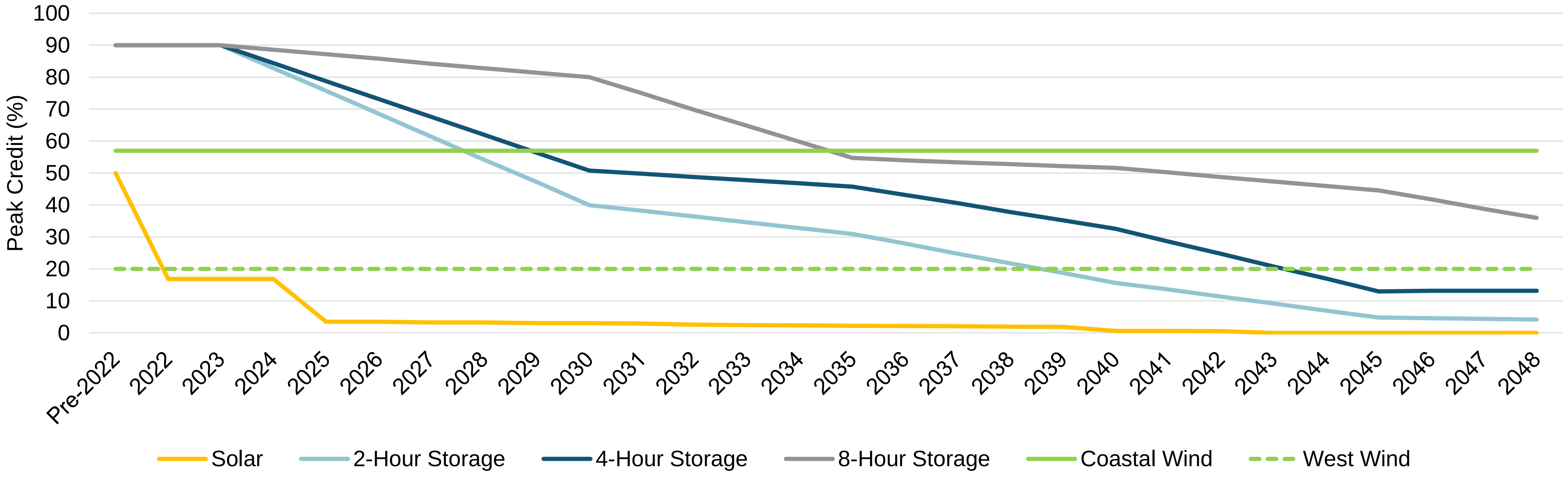
Reserve Margin Assumptions

Parameter	Assumption
Reserve Margin on CPS Energy Native Load Peak	13.75 – 15.00%
Market Purchase Limit	4% of annual native load
Market Sale Limit	20% of annual native load



Technology Availability and Build Limits

<table>
<tr><th rowspan="2">Technology</th><th rowspan="2">Block Size (MW)</th><th rowspan="2">First Available Year</th><th colspan="3">Annual Build Limit (MW) 2026 - 2030</th><th colspan="3">Annual Build Limit (MW) 2031 - 2040</th><th colspan="3">Annual Build Limit (MW) 2041 +</th></tr>
<tr><th>P1 (Gas)</th><th>P2/P4 (Blend)</th><th>P3/P5-P9 (RES)</th><th>P1 (Gas)</th><th>P2/P4 (Blend)</th><th>P3/P5-P9 (RES)</th><th>P1 (Gas)</th><th>P2/P4 (Blend)</th><th>P3/P5-P9 (RES)</th></tr>
<tr><td>H-Class Combined Cycle 2x1</td><td>880</td><td>2027</td><td colspan="2">880</td><td></td><td colspan="2">880</td><td></td><td colspan="2">880</td><td></td></tr>
<tr><td>Reciprocating Internal Combustion Engines (11 Units)</td><td>202</td><td>2027</td><td colspan="2">404</td><td></td><td colspan="2">404</td><td></td><td colspan="2">404</td><td></td></tr>
<tr><td>Coastal Wind</td><td>100</td><td>2026</td><td></td><td>300</td><td>400</td><td></td><td colspan="2">400</td><td></td><td colspan="2">500</td></tr>
<tr><td>West Wind</td><td>100</td><td>2026</td><td></td><td>300</td><td>400</td><td></td><td colspan="2">400</td><td></td><td colspan="2">500</td></tr>
<tr><td>Solar</td><td>100</td><td>2026</td><td></td><td>300</td><td>400</td><td></td><td>400</td><td>500</td><td></td><td colspan="2">500</td></tr>
<tr><td>2-Hour Lithium Ion Batt.</td><td>50</td><td>2026</td><td></td><td colspan="2">300</td><td></td><td colspan="2">300</td><td></td><td colspan="2">400</td></tr>
<tr><td>4-Hour Lithium Ion Batt.</td><td>50</td><td>2026</td><td></td><td>150</td><td>300</td><td></td><td colspan="2">300</td><td></td><td colspan="2">400</td></tr>
<tr><td>8-Hour Lithium Ion Batt.</td><td>50</td><td>2027</td><td></td><td>100</td><td>300</td><td></td><td>200</td><td>300</td><td></td><td>300</td><td>400</td></tr>
<tr><td>20-Hour Flow Battery</td><td>50</td><td>2030</td><td></td><td colspan="2">100</td><td></td><td>200</td><td>500</td><td></td><td>300</td><td>500</td></tr>
<tr><td>Enhanced Geothermal</td><td>30</td><td>2030</td><td></td><td colspan="2">300</td><td></td><td colspan="2">300</td><td></td><td colspan="2">600</td></tr>
<tr><td>Hydrogen</td><td>240</td><td>2030</td><td></td><td colspan="2">240</td><td></td><td colspan="2">240</td><td></td><td colspan="2">240</td></tr>
<tr><td>Nuclear – Small Modular</td><td>600</td><td>2030</td><td></td><td>600</td><td></td><td></td><td>600</td><td></td><td></td><td>600</td><td></td></tr>
</table>

Specifying Build Limits

Historical and expected renewable resource additions across ERCOT are significant, but growth may be constrained by supply chain limitations, interconnection requirements, and permitting and construction time

	Solar			**Wind**			**Battery**		
Year	**ERCOT Cumulative Installed (MW)**	**ERCOT Growth (MW)**	**CPS Energy Share of Growth* (MW)**	**ERCOT Cumulative Installed (MW)**	**ERCOT Growth (MW)**	**CPS Energy Share of Growth* (MW)**	**ERCOT Cumulative Installed (MW)**	**ERCOT Growth (MW)**	**CPS Energy Share of Growth* (MW)**
2020	3,974	1,692	100	25,121	2,083	123	225	10	1
2021	8,274	4,300	253	28,417	1,261	74	833	122	7
2022	14,983	6,710	395	38,052	3,296	194	3,468	608	36
2023	30,717	15,734	926	40,913	9,635	567	8,322	2,634	155
2024	39,498	8,781	517	41,916	2,861	168	8,877	4,855	286
Range			***100 - 926***			***74 - 567***			***1 - 286***

Actual through Aug-22 (2020–2022); *Projections from Sep-22 onwards* (2022–2024)

Source: ERCOT – Resource Capacity Trend Charts

- For wind and solar, capacity additions across ERCOT (adjusted for CPS Energy's share of ERCOT demand) have been around 100 – 900 MW per year, with a large increase expected for 2023 before declining in 2024. CPS Energy annual build "limits" have been specified based on these ERCOT-wide observations, with slightly lower near-term limits to account for transmission constraints and supply chain issues.
- Capacity additions for storage are expected to increase over the next few years, and CPS Energy annual build "limits" assume that 300 MW per year could be acquired for various duration types. Build limits for longer-duration storage are limited in the short-term, but grow over time to reflect expectations of technology and supply chain advancement.

**CPS Energy share of energy demand in ERCOT is projected to be around 5.9% over this decade. 5.9% was applied to the total ERCOT-wide growth figure to derive the CPS Energy share of growth.*

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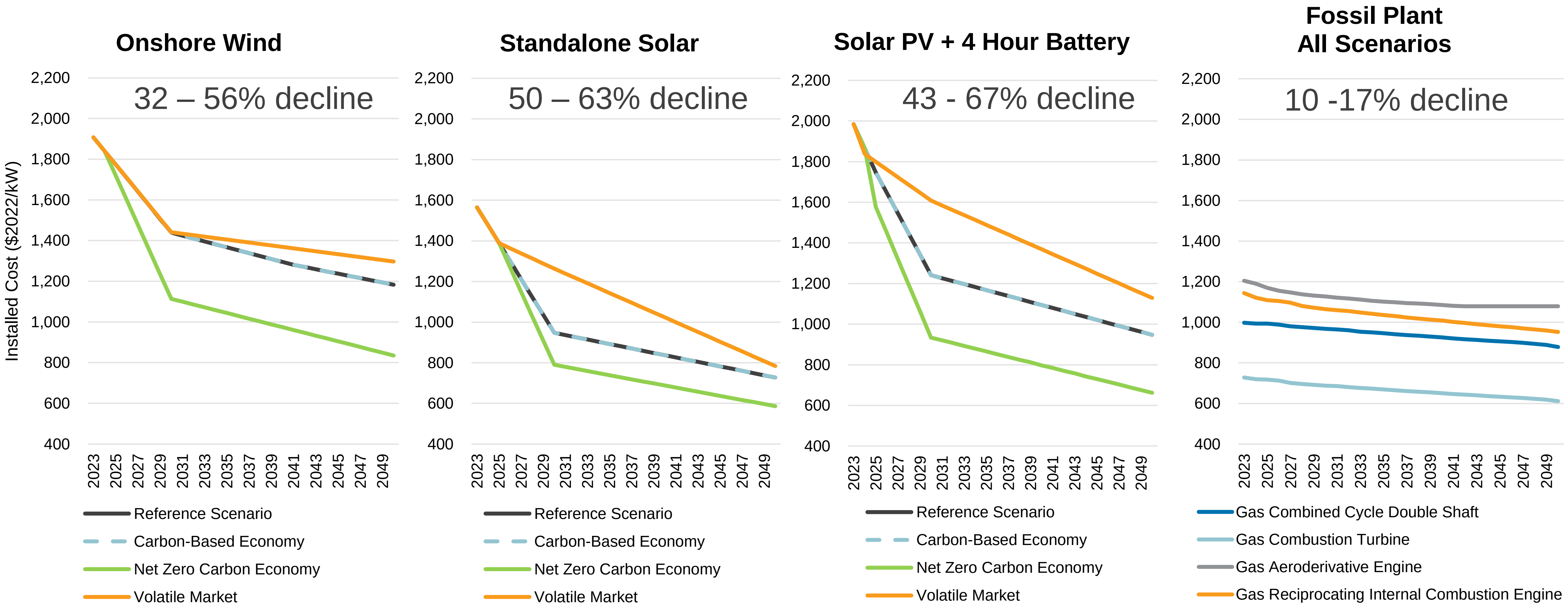
Appendix: Installed Cost & Levelized Cost of Electricity

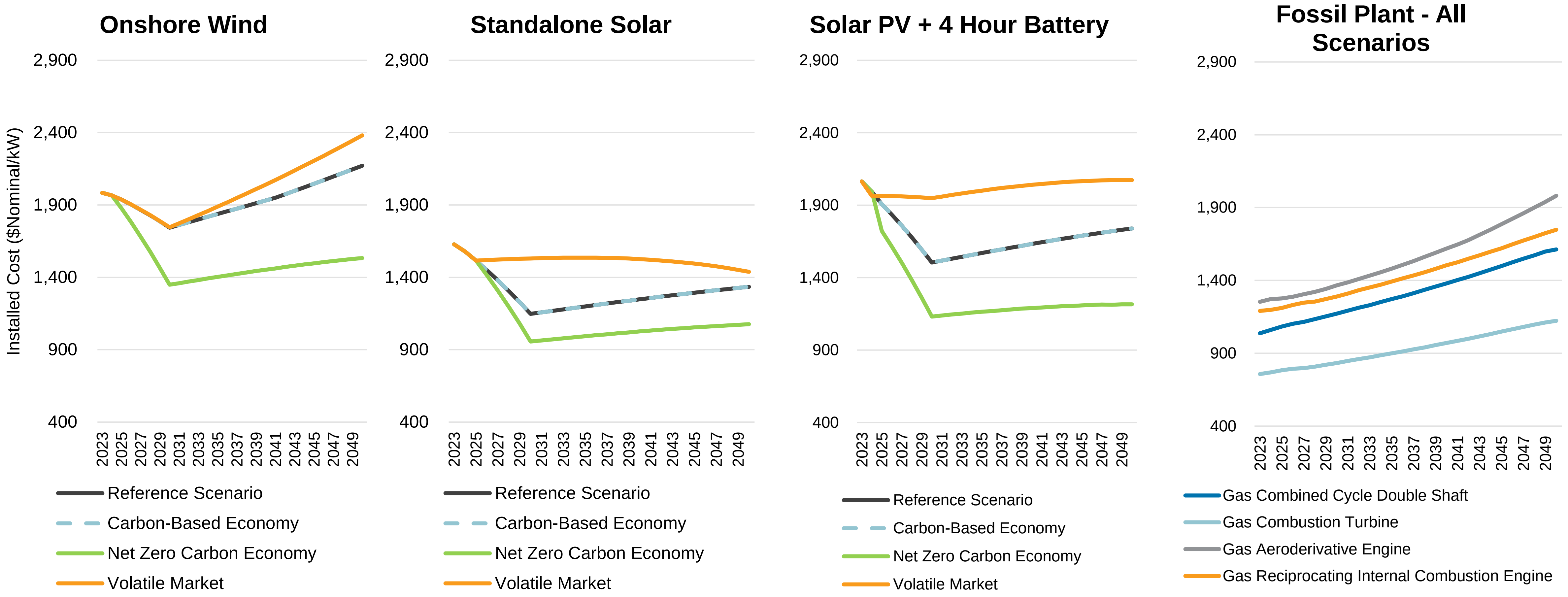
Installed Technology Cost Scenarios ($2022) – Renewable & Fossil

Technology cost assumptions were developed based on well-established third-party sources



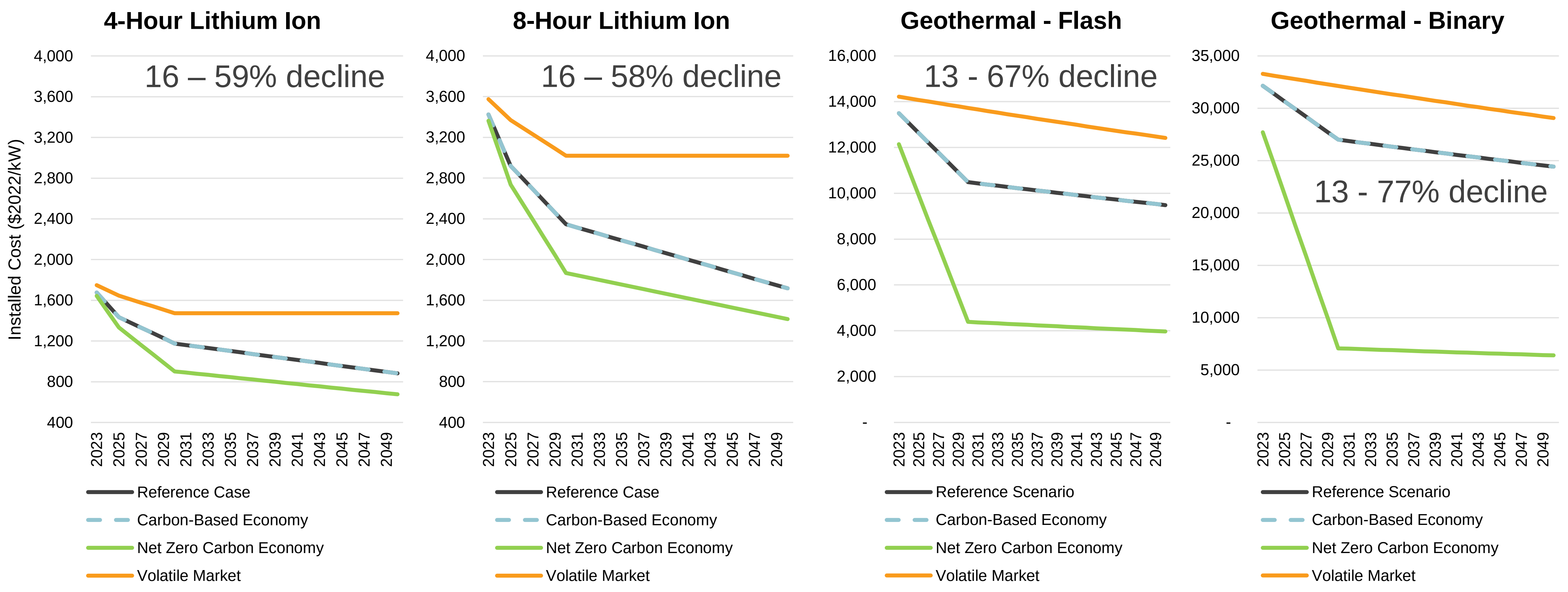
Installed Technology Cost Scenarios ($Nominal) – Renewable & Fossil

Technology cost assumptions were developed based on well-established third-party sources



Installed Technology Cost Scenarios ($2022) – Lithium Ion and Geothermal

Technology cost assumptions were developed based on authoritative third-party sources



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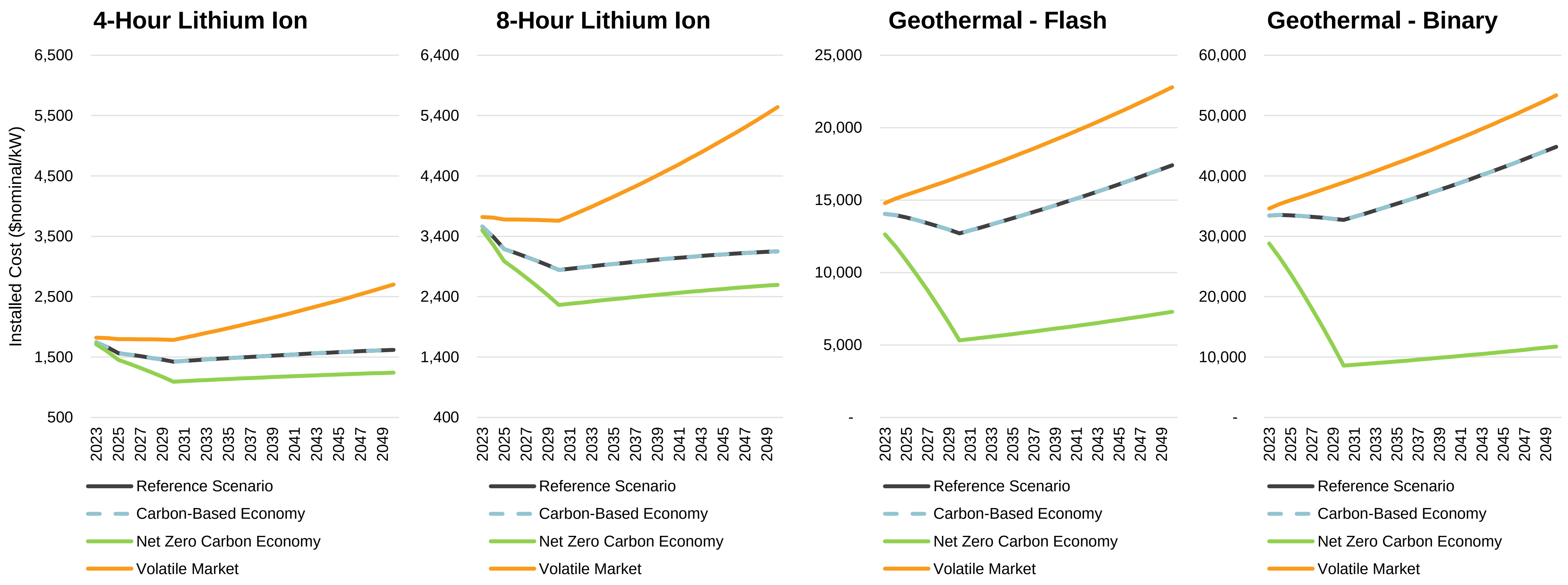
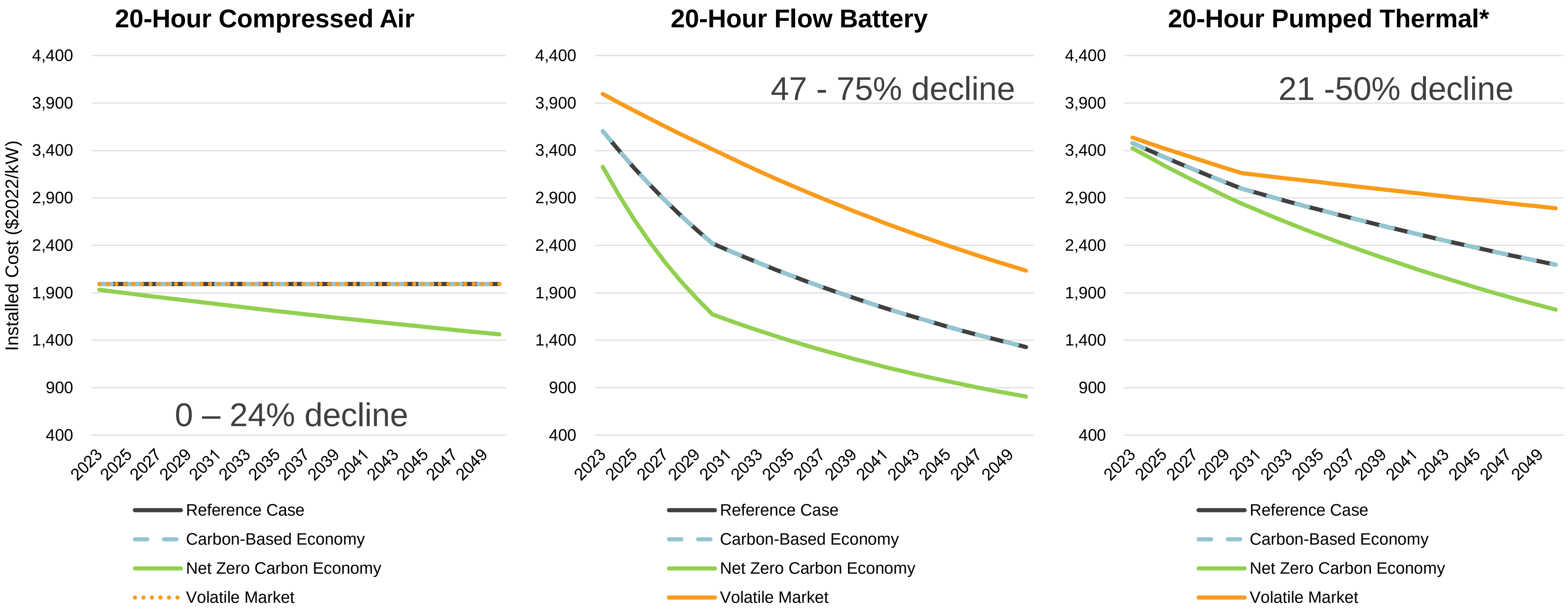
Installed Technology Cost Scenarios ($Nominal) – Lithium Ion and Geothermal

Technology cost assumptions were developed based on authoritative third-party sources



Installed Technology Cost Scenarios ($2022) – Long Duration Storage

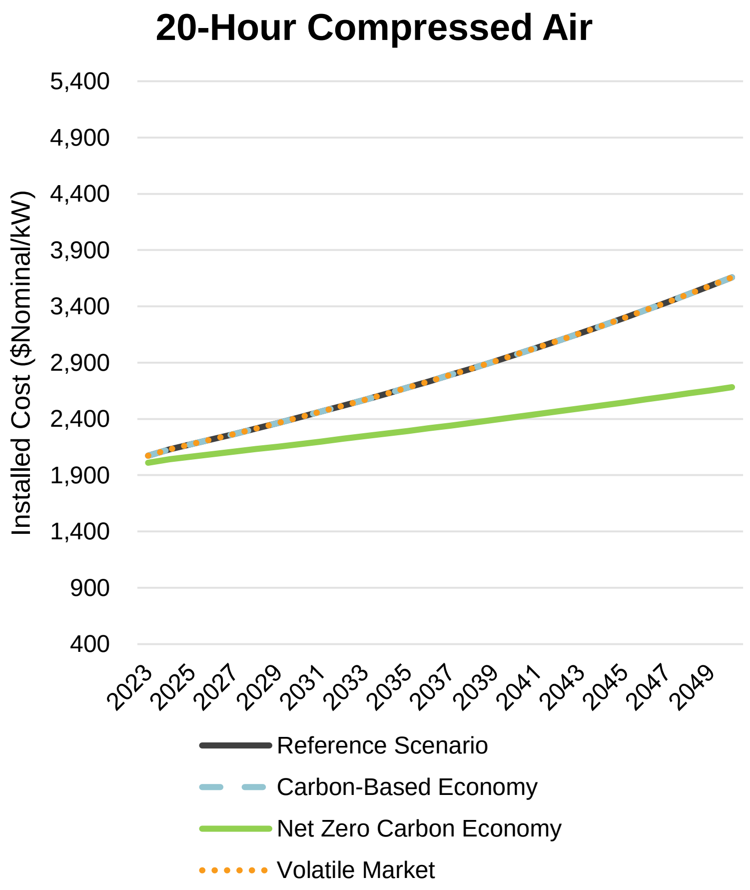
Technology cost assumptions were developed based on authoritative third-party sources

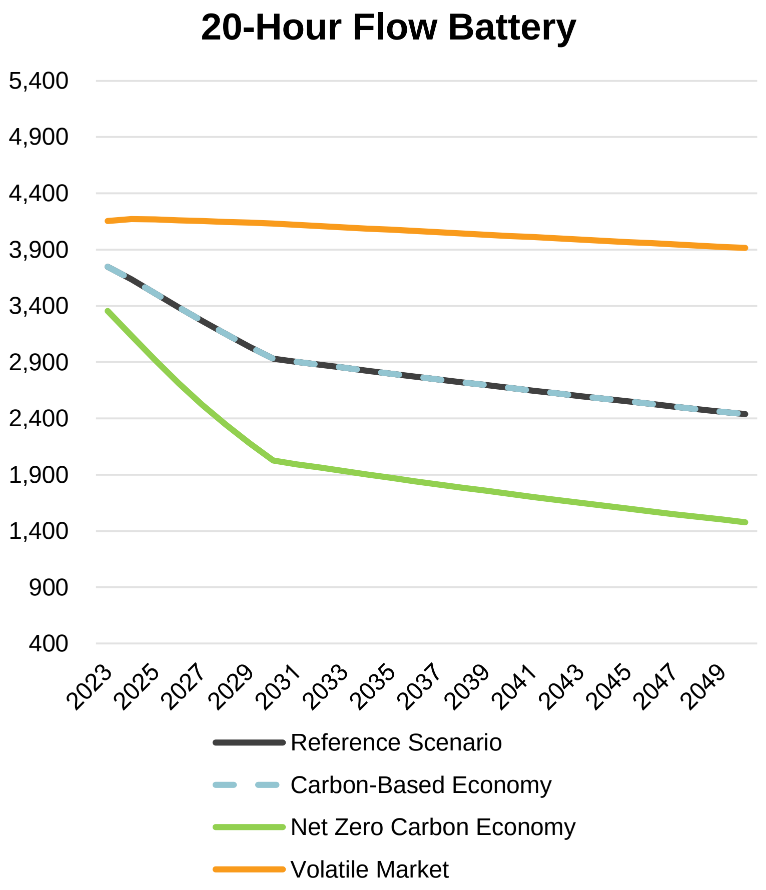


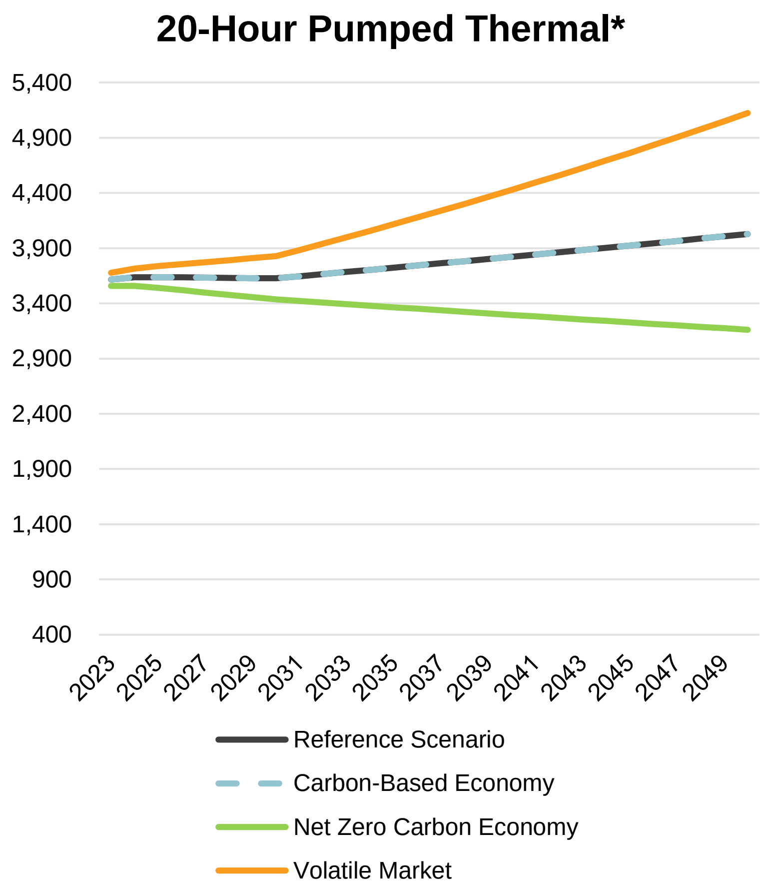
*Note: *Pumped thermal uses electricity to drive a heat pump to store electricity as heat. When electricity is required, the heat is turned back into electricity using a heat engine.*

Installed Technology Cost Scenarios ($Nominal) – Long Duration Storage

Technology cost assumptions were developed based on authoritative third-party sources



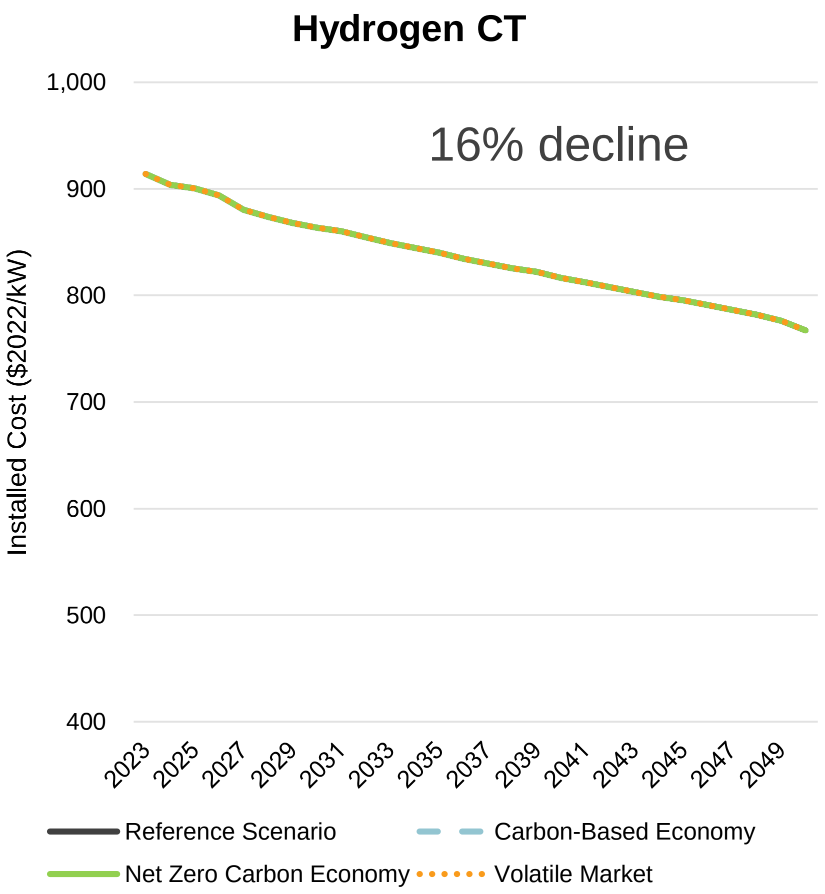


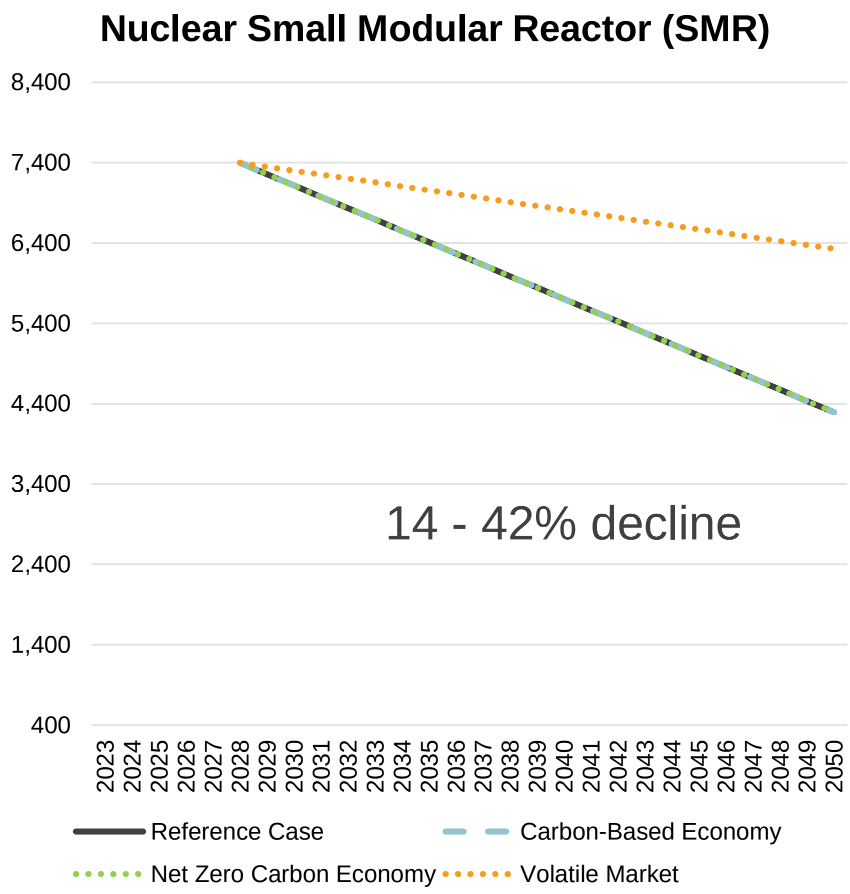


*Note: *Pumped thermal uses electricity to drive a heat pump to store electricity as heat. When electricity is required, the heat is turned back into electricity using a heat engine.*

Installed Technology Cost Scenarios ($2022) – Hydrogen & SMR

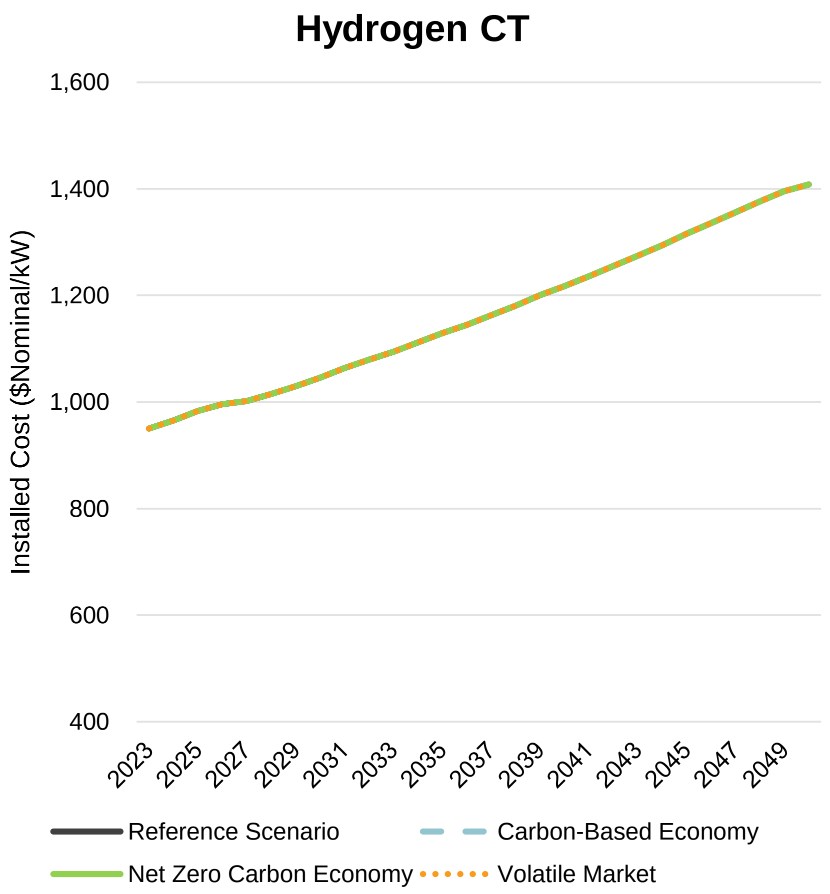
Technology cost assumptions were developed based on authoritative third-party sources

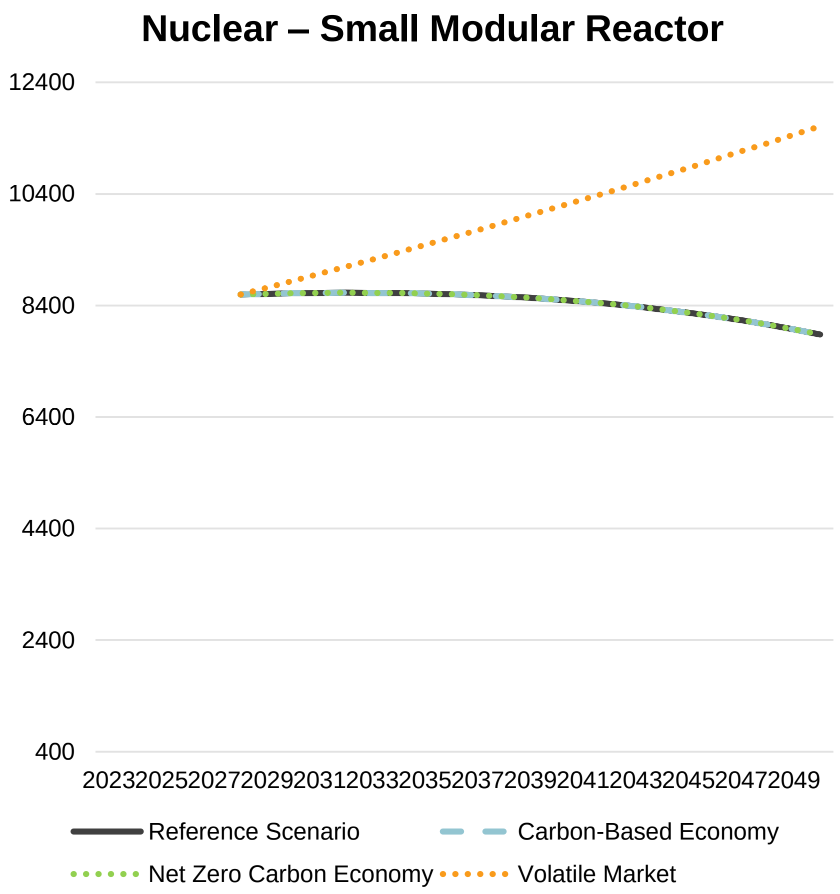




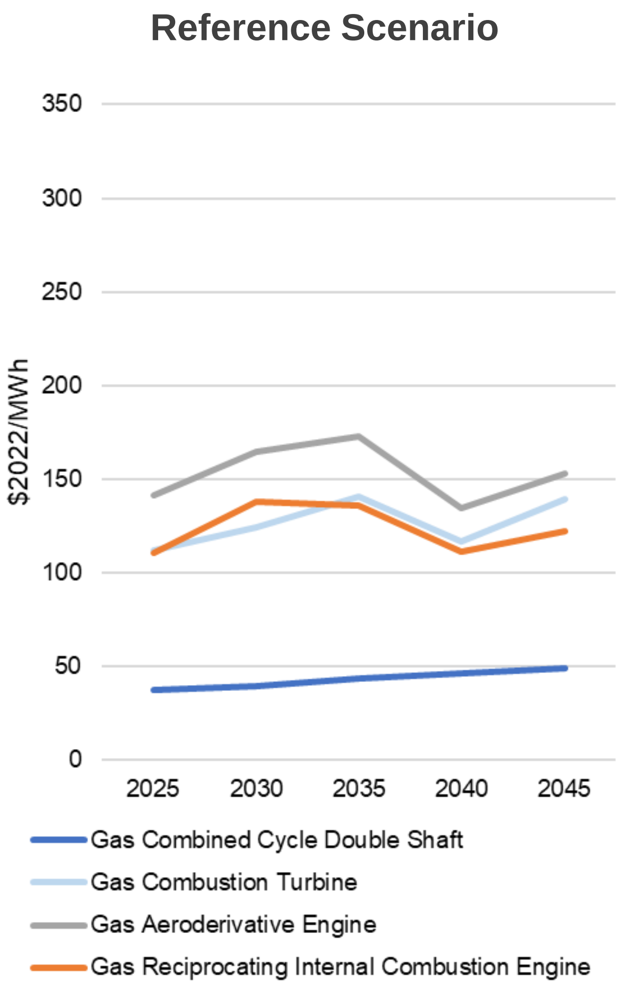
Installed Technology Cost Scenarios ($Nominal) – Hydrogen & SMR

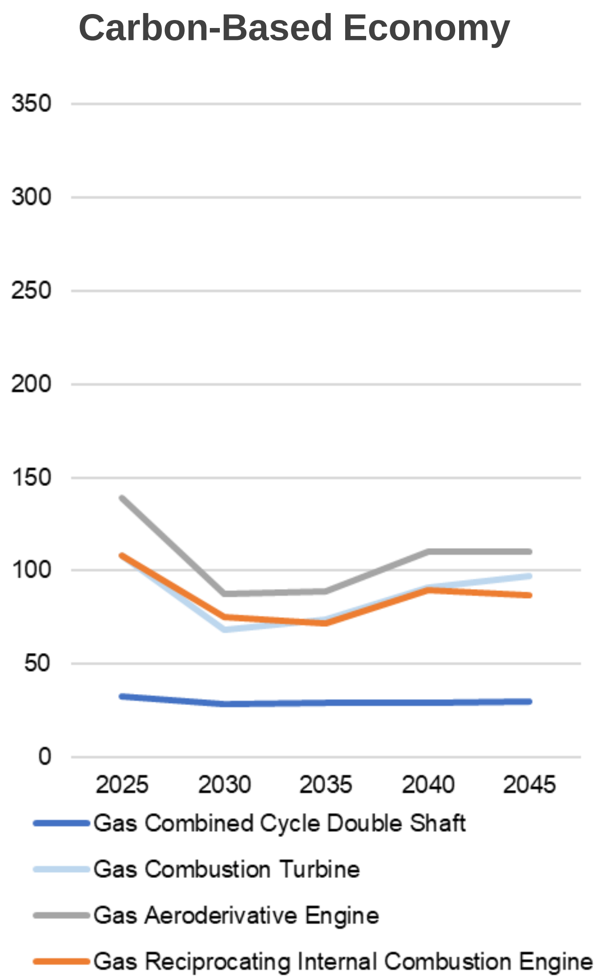
Technology cost assumptions were developed based on authoritative third-party sources

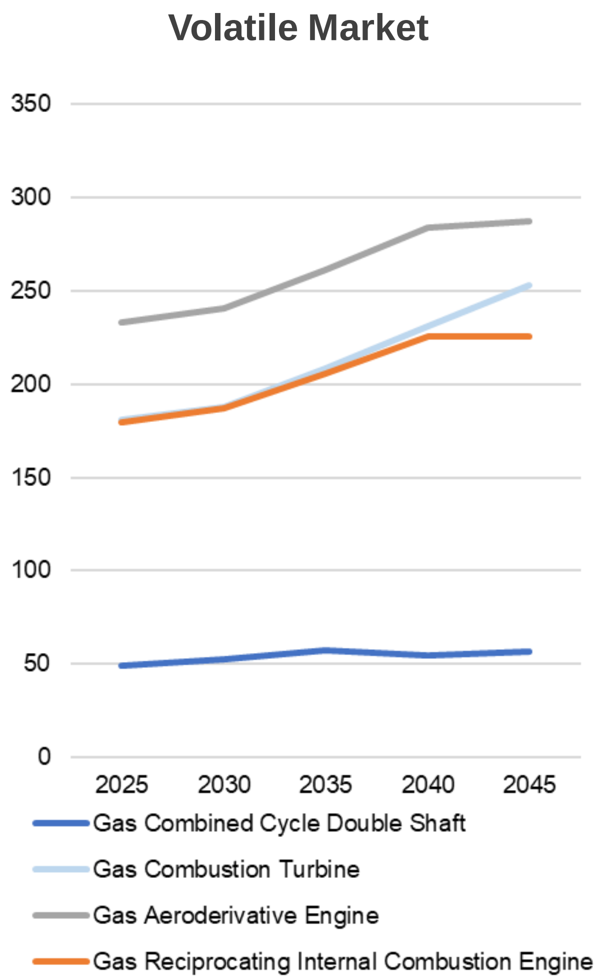


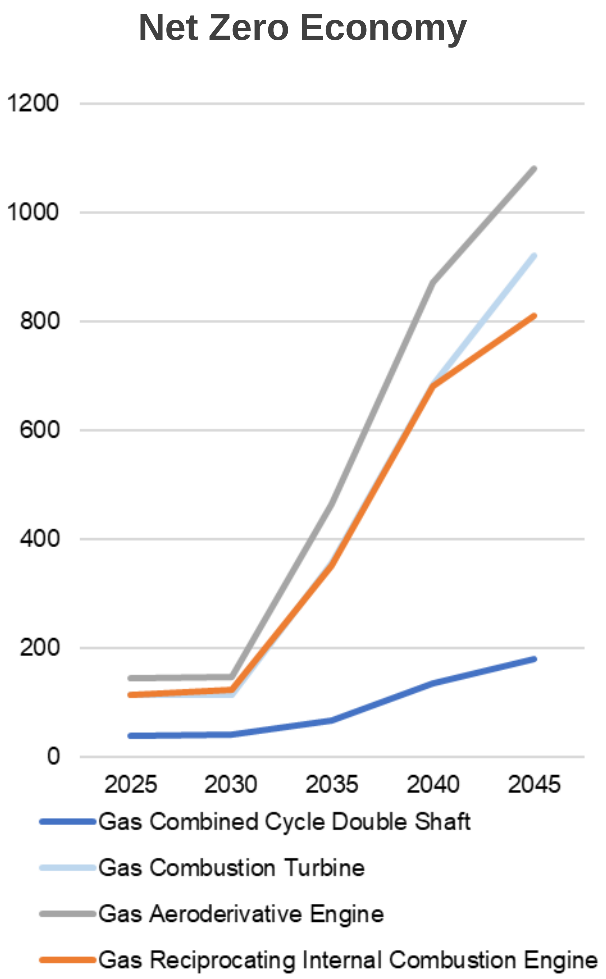


Levelized Cost of Electricity ($2022) – Natural Gas Resources



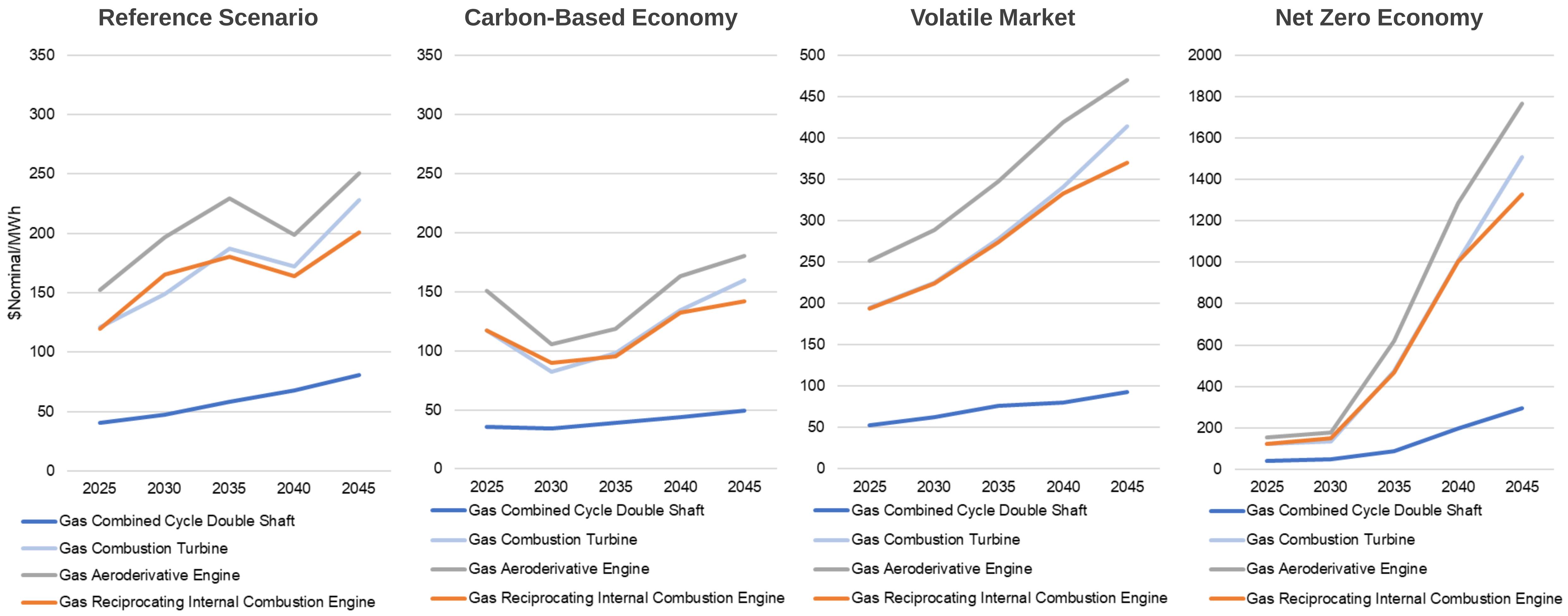






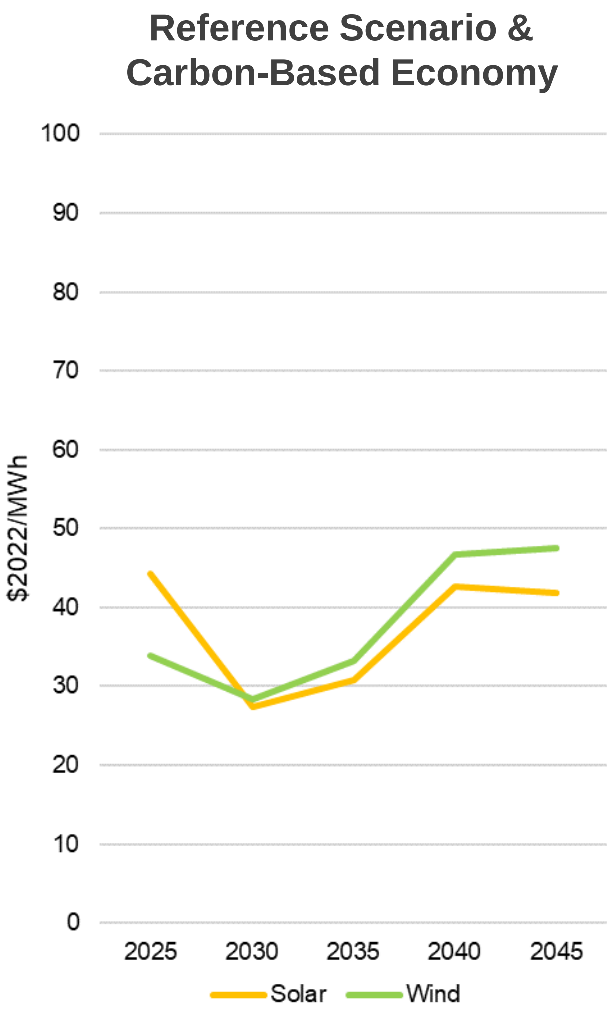
Note: Expected capacity factors vary by technology and scenario and are based on ERCOT market scenario analysis results.

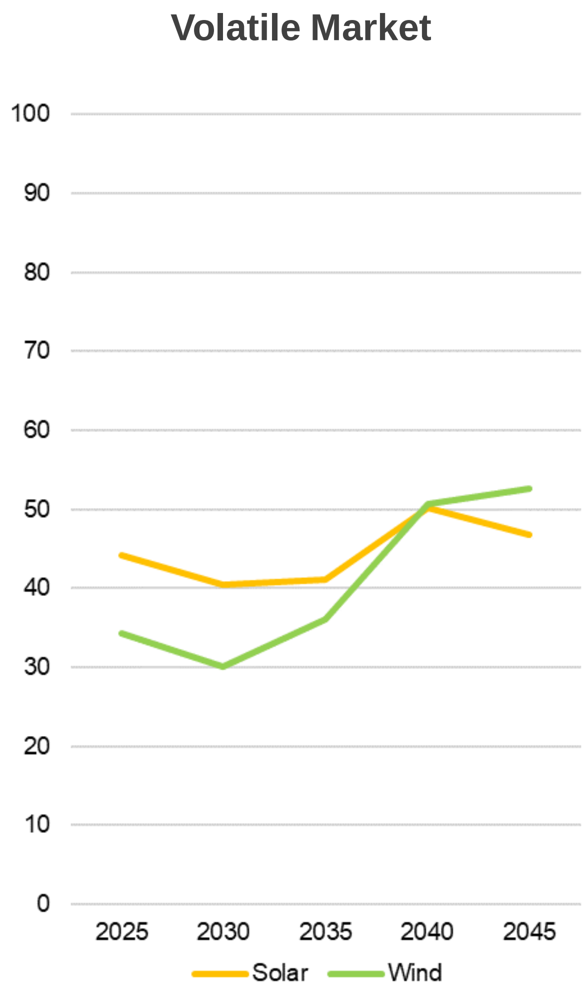
Levelized Cost of Electricity ($Nominal) – Natural Gas Resources

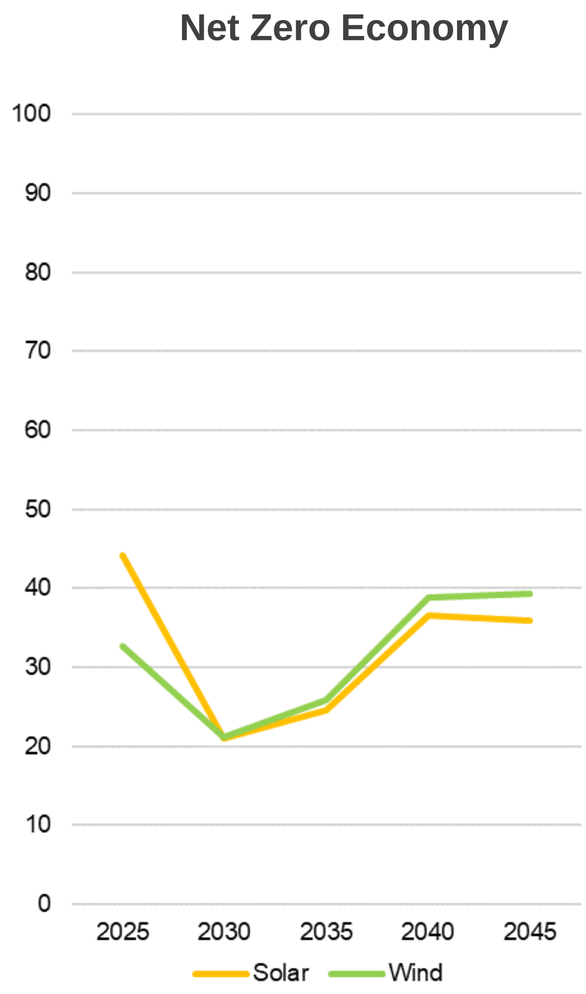


Note: Expected capacity factors vary by technology and scenario and are based on ERCOT market scenario analysis results.

Levelized Cost of Electricity ($2022) – Wind & Solar







Notes: 1) Costs are inclusive of the impact of Production Tax Credits under the Inflation Reduction Act.
2) Costs include expected congestion between likely project sites and CPS Energy load.

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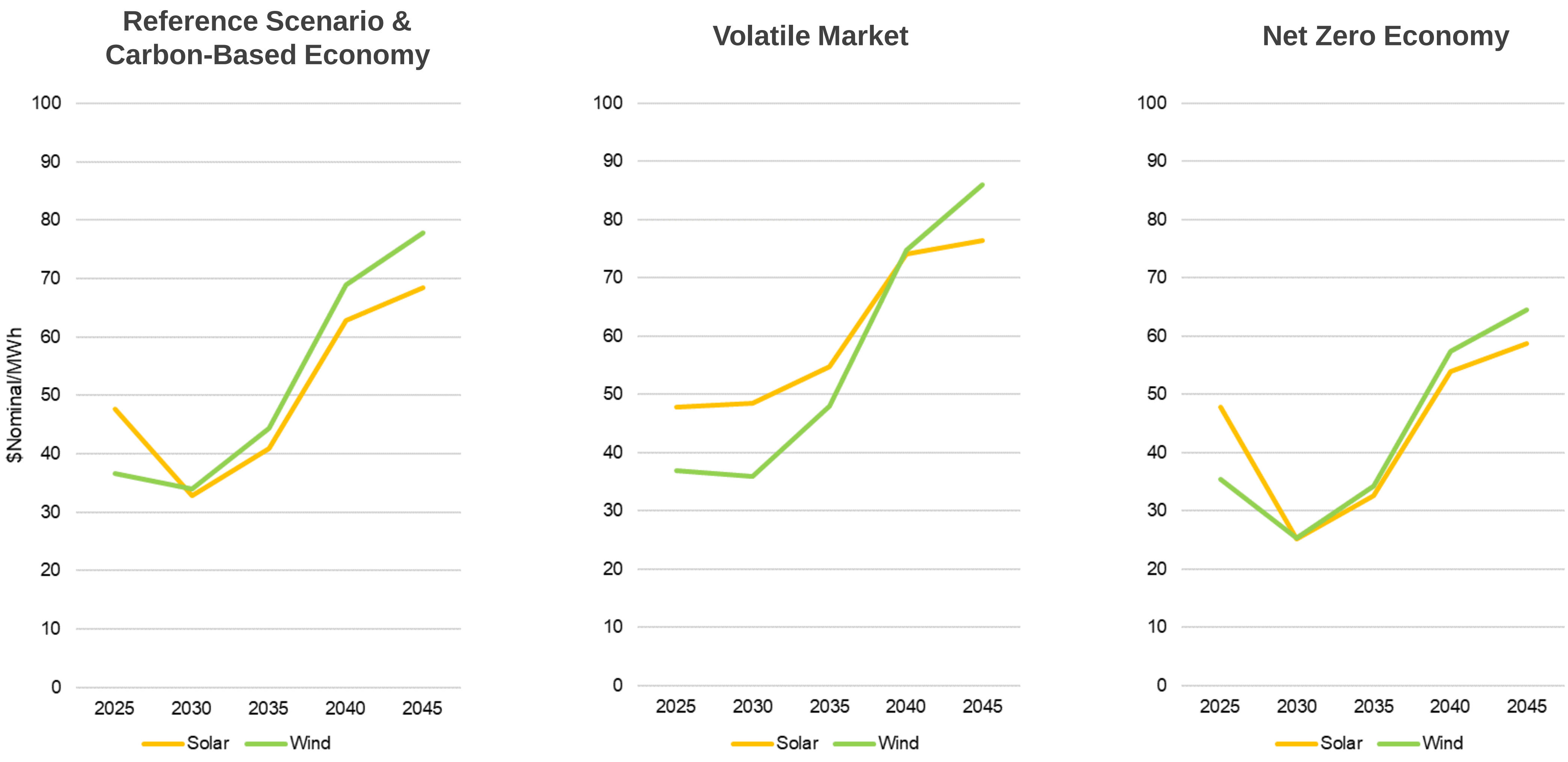
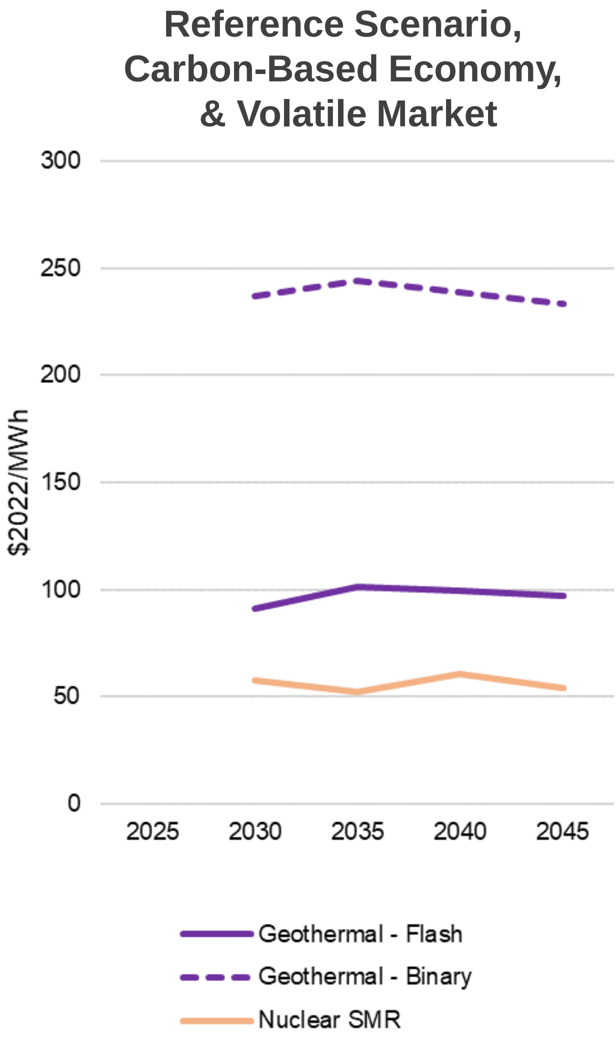
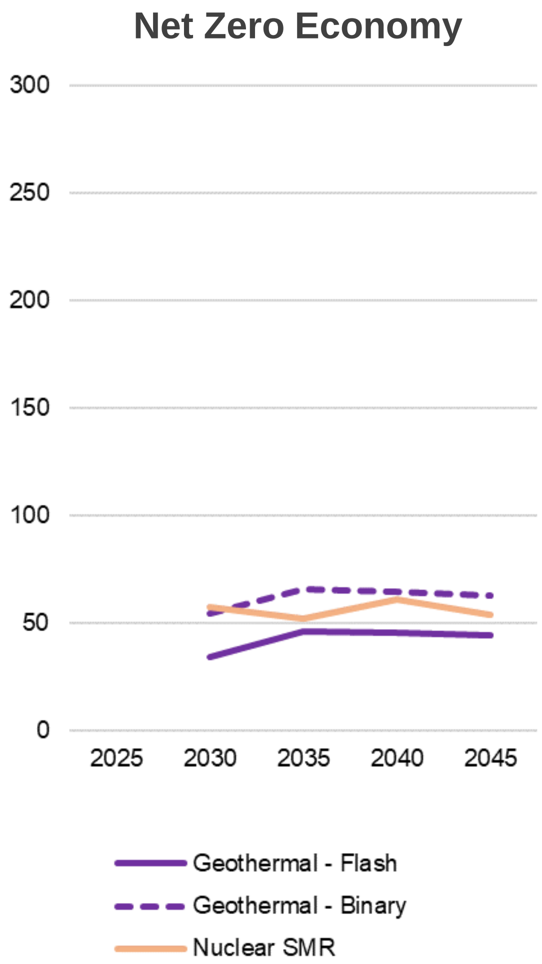
Levelized Cost of Electricity ($Nominal) – Wind & Solar



Notes: 1) Costs are inclusive of the impact of Production Tax Credits under the Inflation Reduction Act.
2) Costs include expected congestion between likely project sites and CPS Energy load.

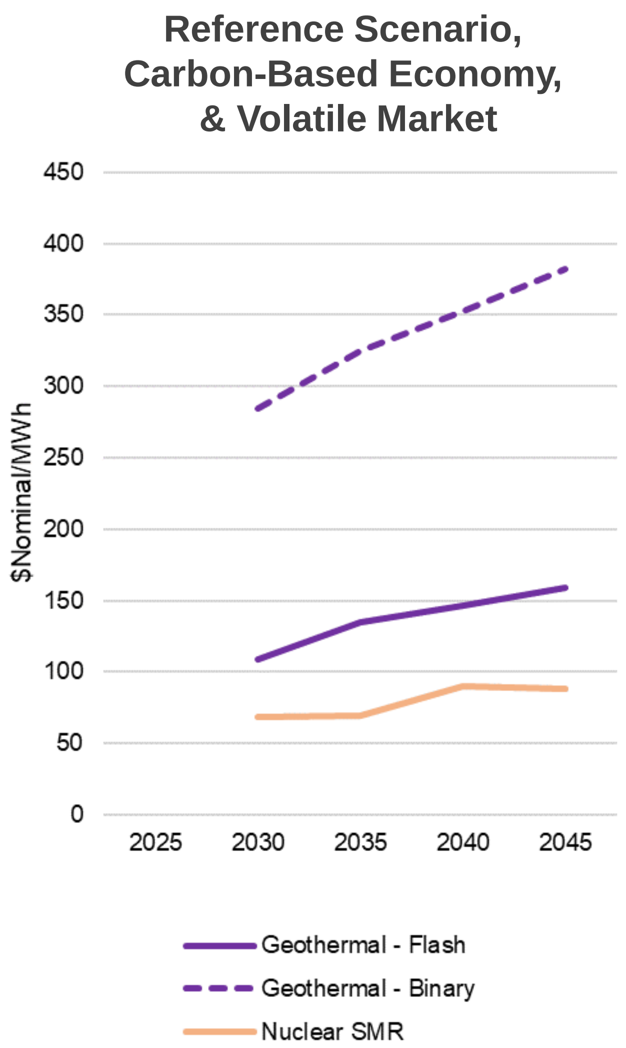
Levelized Cost of Electricity ($2022) – Geothermal & Nuclear

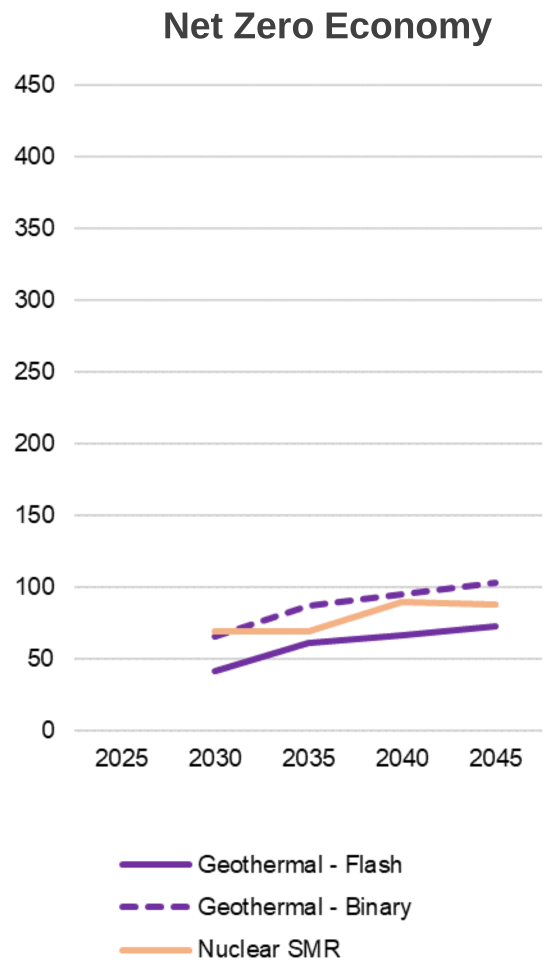




Notes: 1) Nuclear SMR costs are inclusive of the impact of Investment Tax Credits under the Inflation Reduction Act.
2) Geothermal costs are inclusive of the impact of Production Tax Credits under the Inflation Reduction Act.

Levelized Cost of Electricity ($Nominal) – Geothermal & Nuclear





Notes: 1) Nuclear SMR costs are inclusive of the impact of Investment Tax Credits under the Inflation Reduction Act.
2) Geothermal costs are inclusive of the impact of Production Tax Credits under the Inflation Reduction Act.

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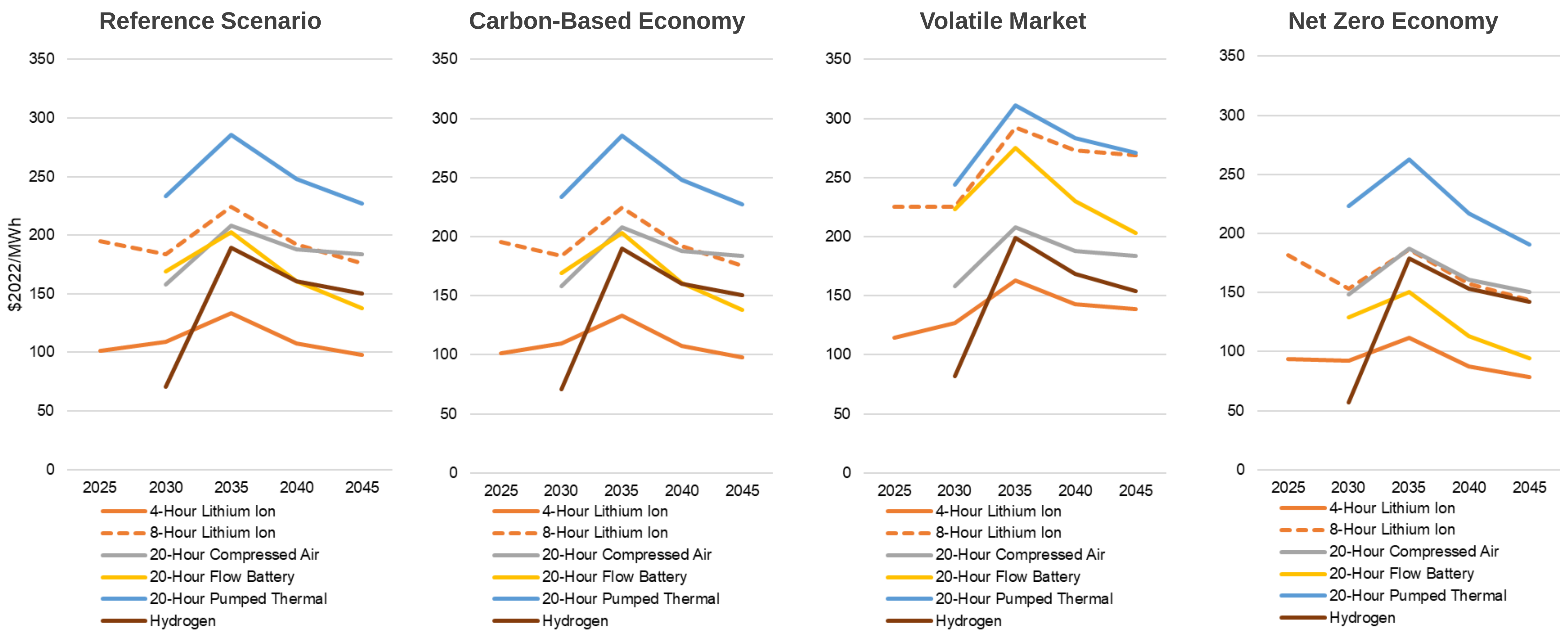
Levelized Cost of Electricity ($2022) – Storage Resources



Note: All technologies are assumed to have the same effective capacity factor associated with charging and discharging, although capacity factors vary by year and scenario. All storage technology costs, except Hydrogen, are inclusive of the impact of the Investment Tax Credits under the Inflation Reduction Act. Hydrogen costs are inclusive of the impact of the hydrogen Production Tax Credit.

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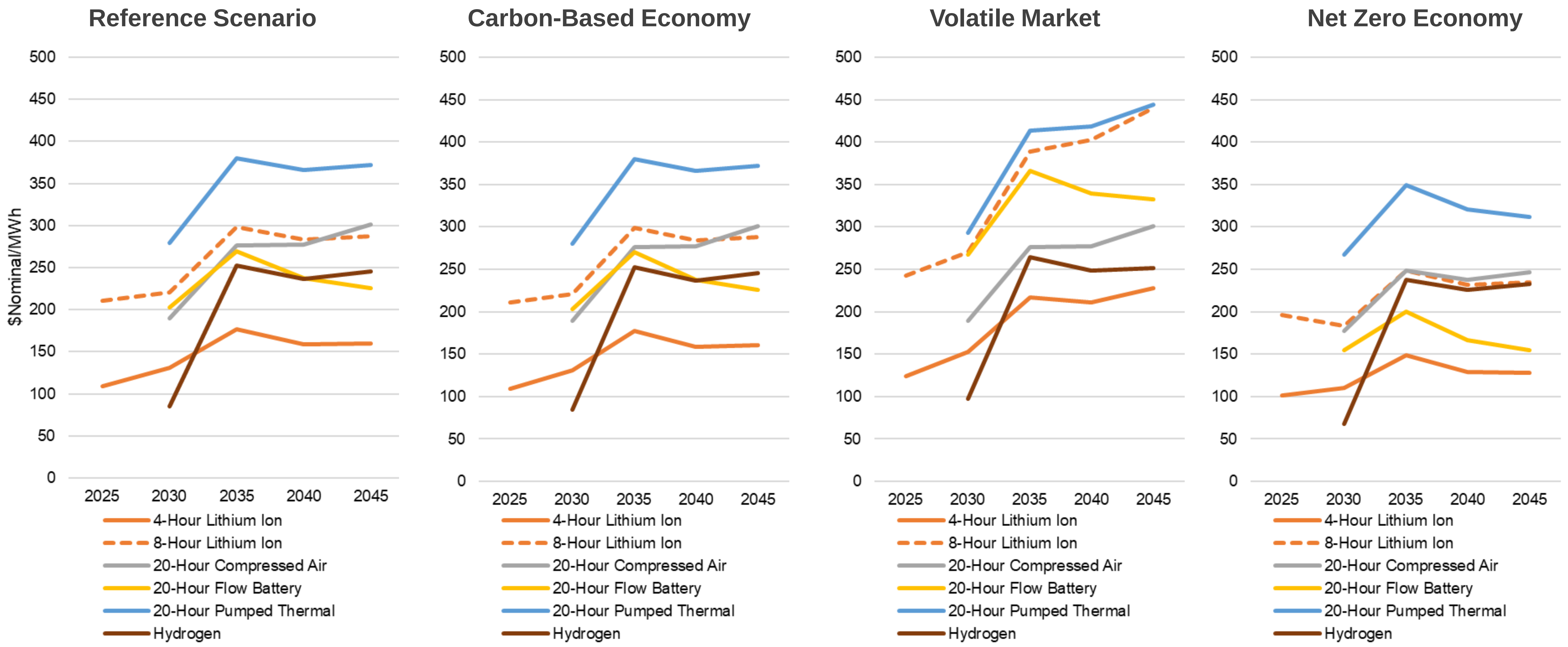
Levelized Cost of Electricity ($Nominal) – Storage Resources



Note: All technologies are assumed to have the same effective capacity factor associated with charging and discharging, although capacity factors vary by year and scenario. All storage technology costs, except Hydrogen, are inclusive of the impact of the Investment Tax Credits under the Inflation Reduction Act. Hydrogen costs are inclusive of the impact of the hydrogen Production Tax Credit.

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Appendix: ERCOT Scenario Recap

Key ERCOT Scenario Input Variables

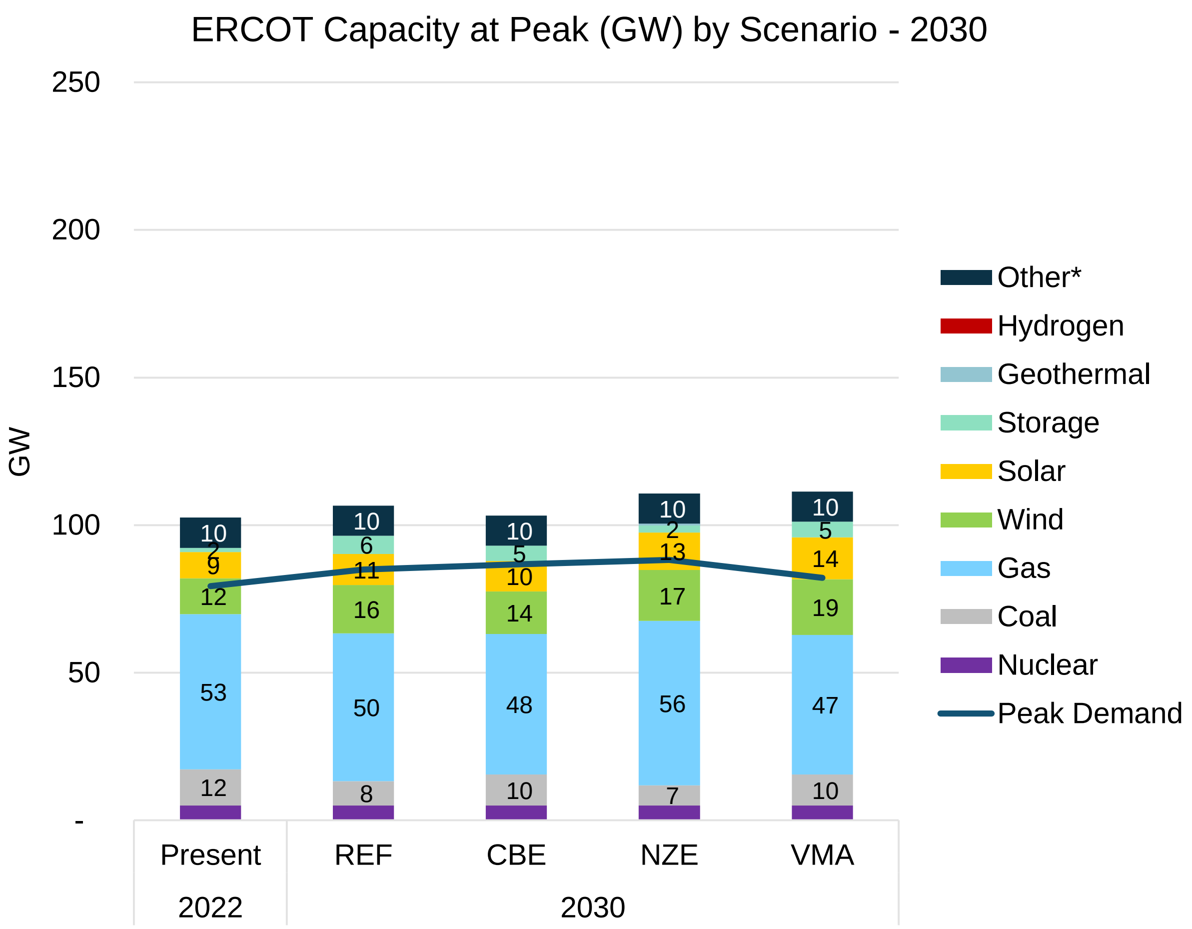
Each scenario comprises a combination of five input variables whose levels vary across the scenarios as shown below

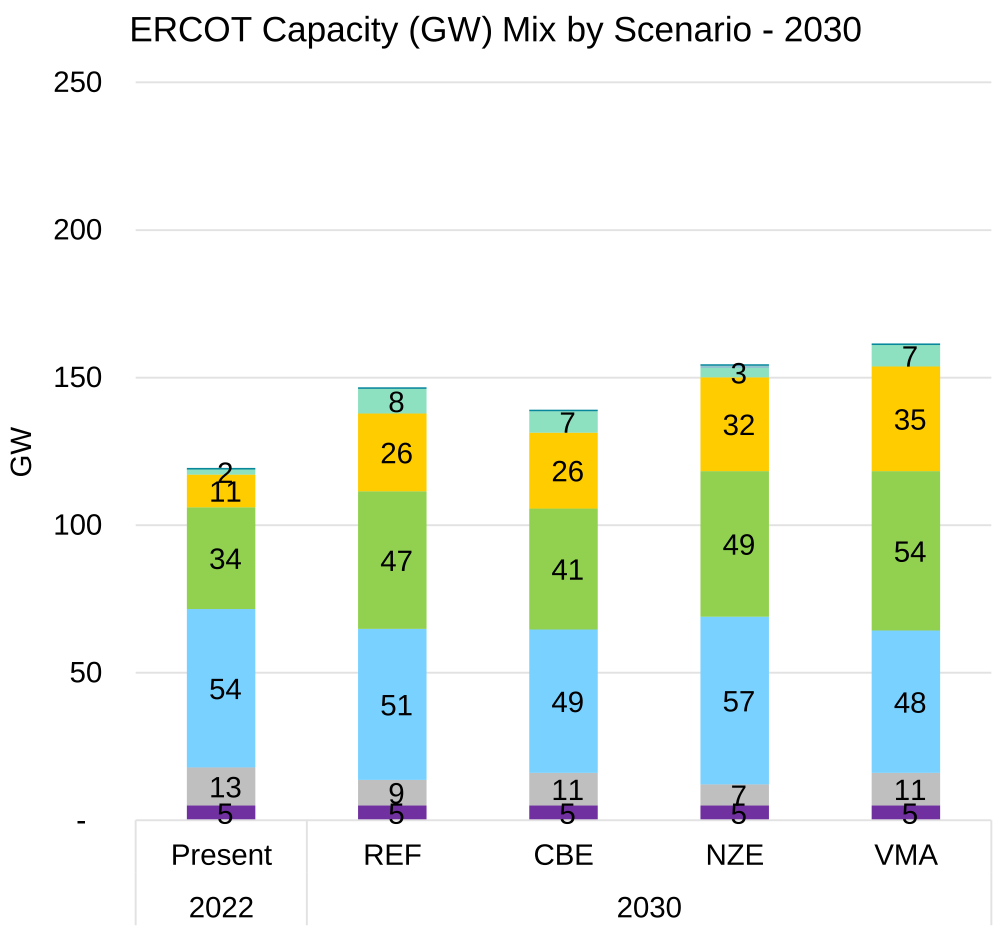
ERCOT Scenario	**Natural Gas Prices**	**Carbon Policies**	**Technology Costs**	**Demand Growth**	**ERCOT Market Design Change**
Reference Scenario (REF)	Baseline	Baseline carbon price	Baseline	Baseline	Confirmed changes only
Carbon-Based Economy (CBE)	Low due to production increases	No carbon price	Baseline	High demand driven by low fuel and carbon prices	Confirmed changes only
Net Zero Carbon Economy (NZE)	Low due to electrification drive	High carbon price	Fast decline + Inflation Reduction Act Tax Credits*	High demand driven by electrification	Capacity market launched & seasonal reserve margins
Volatile Market (VMA)	High	No carbon price to alleviate inflation pressure	Slow decline + Inflation Reduction Act Tax Credits*	Low demand due to high natural gas prices	Confirmed changes only

**Note that all CPS Energy portfolio analysis will incorporate IRA tax credit provisions*

2030 ERCOT Market Capacity (GW) Mix

The model simulation optimizes a least-cost regional capacity expansion plan under each scenario's input drivers.

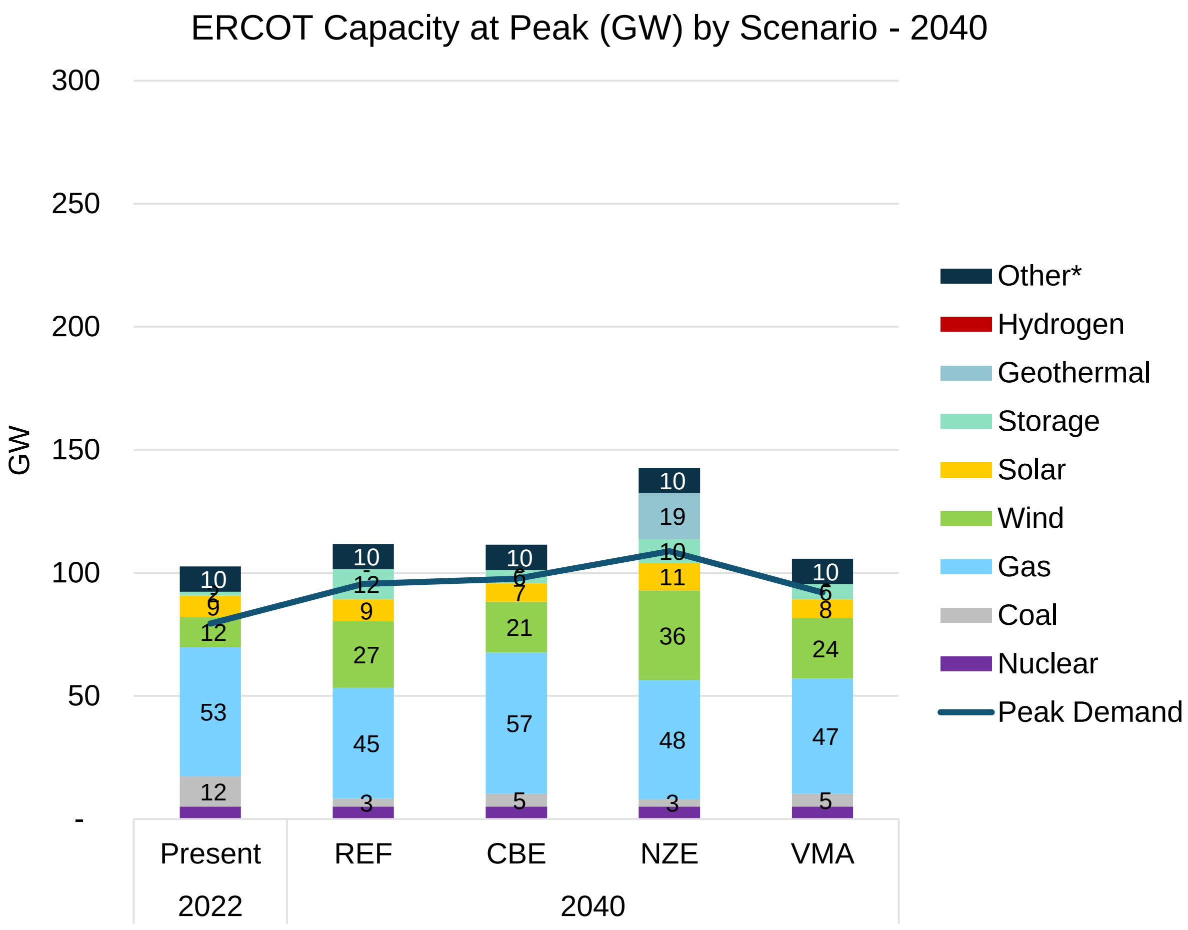


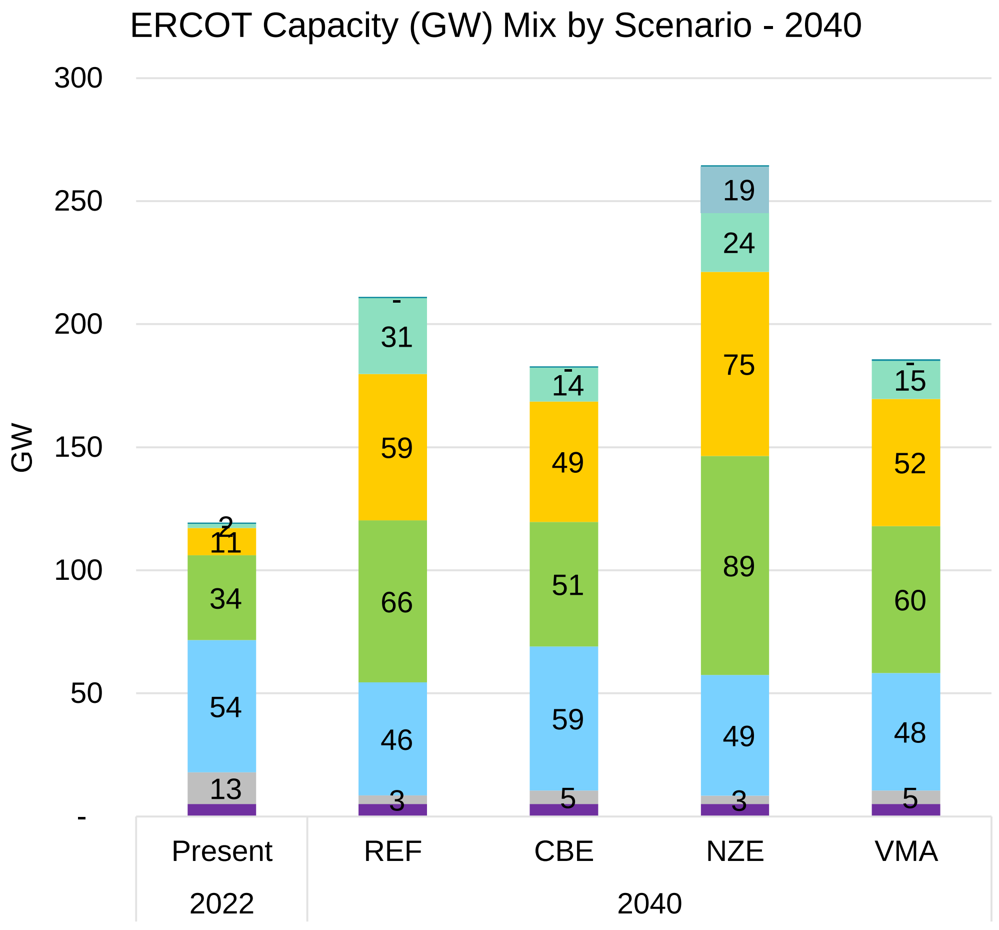


Note:
1. There is limited hydro, hydrogen, and geothermal capacity.
2. *Other includes contributions from EE/DR, imports, switchable capacity, capacity from available mothballed plants, and private network capacity. The estimates are included by ERCOT in its Capacity, Demand and Reserves report and have been incorporated for reserve margin modeling purposes.

2040 ERCOT Market Capacity (GW) Mix

The model simulation optimizes a least-cost regional capacity expansion plan under each scenario's input drivers.





Notes:
1. There is limited hydro and hydrogen generation.
2. Geothermal is the low-cost resource option from a long-term capacity expansion perspective in NZE but could be representative of other "baseload" zero-emitting technologies.
3. *Other includes contributions from EE/DR, imports, switchable capacity, capacity from available mothballed plants, and private network capacity. The estimates are included by ERCOT in its Capacity, Demand and Reserves report and have been incorporated for reserve margin modeling purposes.