

Southwestern Electric Power Company

2024 IRP STAKEHOLDER MEETING

IRP Modeling Analysis

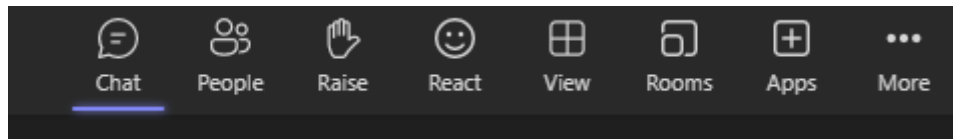
September 30, 2024



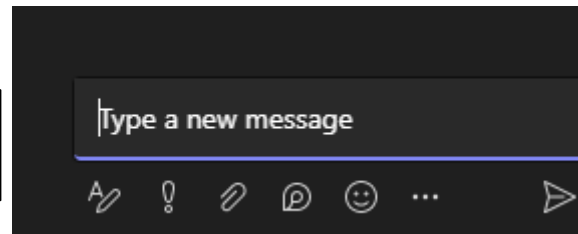
An **AEP** Company

Guidelines

1. Participants joining today's meeting will be in a "listen-only" mode.
2. During the presentation, please enter questions at any time into the Teams Q&A feature. Questions will be addressed after each section.
3. Time will be taken to answer questions related to the materials presented after each section.



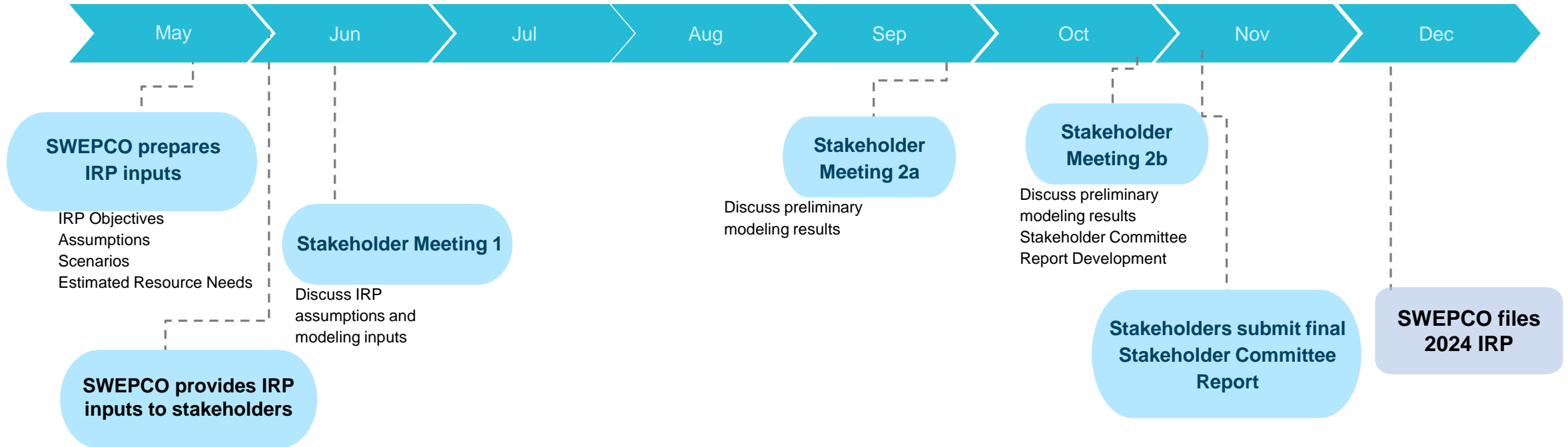
Click the Chat feature at the top of the Teams screen



Agenda

Time (AM CT)	Agenda Topic	Presenter
9:00 – 9:05	Welcome and Introductions	Greg Soller
9:05 – 9: 20	IRP Planning and Assumptions Review <ul style="list-style-type: none"> Stakeholder Comments Review 2024 IRP Objectives & Metrics Capacity Needs Review (Going In Position) 	Greg Soller
9:20 – 9:30	IRP Inputs <ul style="list-style-type: none"> Load Forecast Market Scenario Analysis Technology Assumptions 	Greg Soller
9:30 – 10:15	Portfolios Results <ul style="list-style-type: none"> Base High Low 	Jason Baker
10:15 – 10:30	Remaining analysis review Feedback/Questions Adjourn	Greg Soller

2024 SWEPCO IRP Stakeholder Engagement Timeline



Note: draft timeline is provided for preliminary planning purposes. All dates and activities are subject to change. SWEPCO may update this information as new information becomes available.

Stakeholder Comments Summary

Modeling Requests	SWEPCO Summarized Response ¹
Market Scenario Analysis	
EPA Final Rules (including under Base, High and Low regional environments)	EPA Proposed Rules provide insight to strict control on existing gas units, serve as proxy for resources to comply. Final Rule excludes specifics for existing gas resources.
Forced Coal Retirements	Scenario analysis does not assume specific resource replacements.
Technology Costs	
Include IRA Bonus Credits	Bonus credits are applicable to site specific resources that the IRP does not assume. The IRP will yield a portfolio of resources to guide the selection of new resources.
NW Arkansas Load Pocket	
Transmission alternative to serve load pocket	A transmission alternative will be included in the Company's EER Portfolio analysis.
Generation alternatives within the Load Pocket other than Flint Creek	The IRP does not include analysis of location-specific resources.
Transmission Modeling	
Model transmission upgrades incorporating AEPs clean energy strategy and corporate clean energy commitments	Transmission planning is a process separate from the IRP process, conducted by an independent entity, which in this case is SPP, and regional in scope.
Incorporate grid enhancing technologies in regional and long-term transmission planning process	

¹ Detailed feedback and Company responses can be found on SWEPCO IRP Website

Stakeholder Comments Summary

IRP Assumptions Inquiries	SWEPCO Summarized Response ¹
Update on RFPs by SWEPCO	Company conducting 2024 RFP, additional RFP not planned.
Load Forecast Clarifications	Update on inquiries related to datacenters, distributed generation, other factors.
Scenario Analysis clarifications	Feedback related to how EPA rule was considered and regional market analysis resource selections.
EPA 111d rule analysis with the IRP	
Cost assumptions for Flint reek and Turk plants to comply with the EPA rules	Confirmation of costs related to alternatives considered for compliance with EPA 111d rule.
Technology costs and quantity assumption clarifications	Confirmation of costs and associated quantities assumed in the IRP analysis.
RTO reform integration inquiries	Confirmation of SWEPCO’s continued engagement with SPP related to ongoing reforms.
Transmission Planning inquiries	Confirmation that Transmission Planning is outside the scope of the IRP.

¹ Detailed feedback and Company responses can be found on SWEPCO IRP Website

2024 IRP Objectives

SWEPCO set four objectives for the 2024 IRP Portfolio to achieve its mission of providing safe, reliable, affordable energy for customers and having a positive local impact on the communities it serves.

Objective	Purpose
Customer Affordability	Maintain focus on cost and risks to customers
Rate Stability	Maintain focus on cost volatility under varying future market conditions
Maintaining Reliability	Maintain reserve margin, diversity of portfolio, fleet resiliency to unexpected events
Sustainability	Maintain focus on portfolio environmental sustainability benefits

These objectives will guide the 2024 IRP analysis in the evaluation of resource alternatives and risks evaluated in each candidate portfolio.

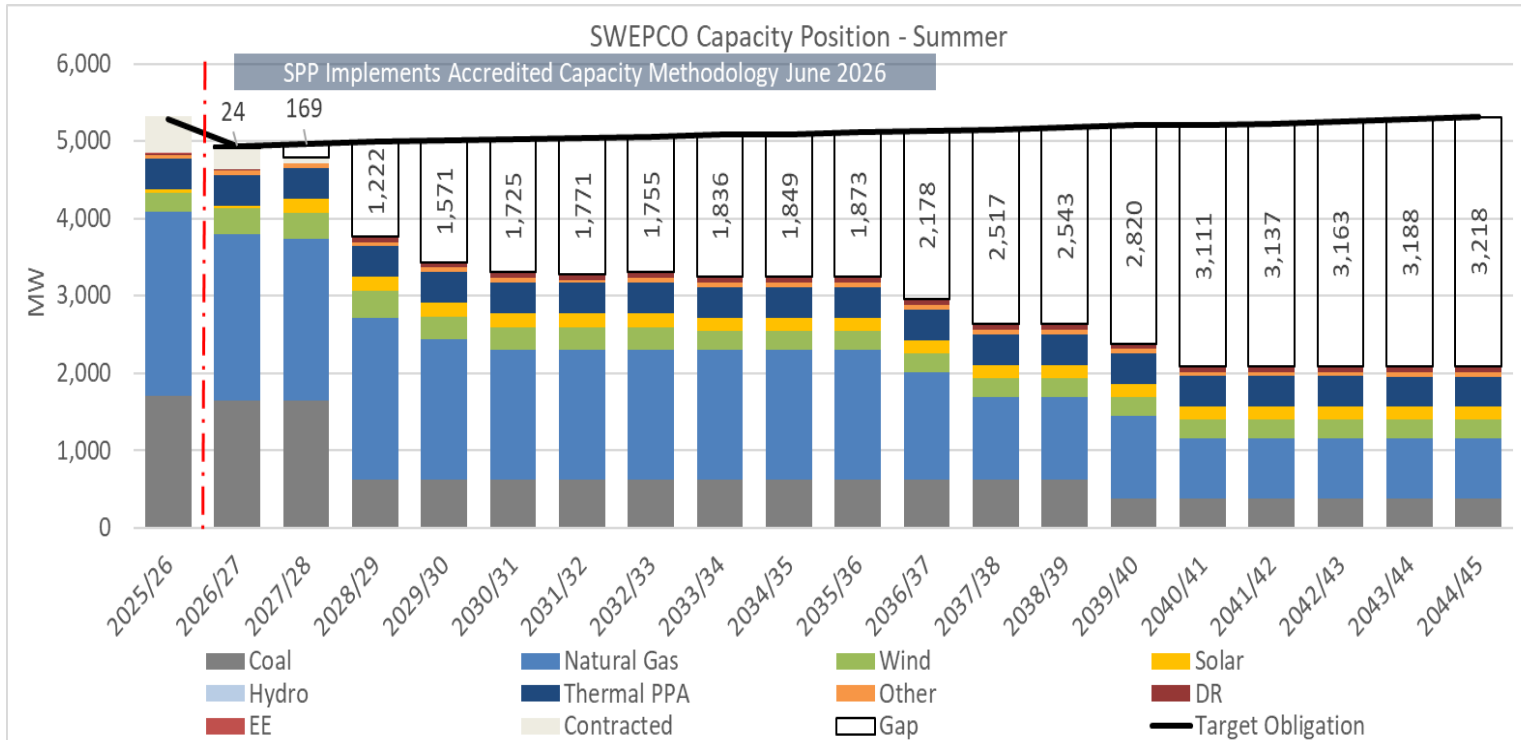
These objectives will manifest in the IRP Portfolio Performance Indicators, used by SWEPCO to measure the performance of different resource plans and compare trade-offs between alternatives when identifying the Preferred Plan for the 2024 IRP.

Portfolio Performance Indicators

Performance Indicators identify the methods to evaluate analysis results towards the Objectives.
Metrics are the specific measurements to quantify results.

Objective	Performance Indicators	Metric Description
Customer Affordability	Net Present Value Revenue Requirement (NPVRR) Levelized Rate (\$/MWh)	<ul style="list-style-type: none"> 30yr NPVRR 30yr Levelized Rate (NPVRR/Levelized Energy)
	Near-Term Rate Impacts (CAGR)	7-year CAGR of Annual Rate
Rate Stability	Portfolio Resilience	Range of Portfolio NPVRR and associated Rate Impact (\$/MWh) costs dispatched across all Scenarios
	Energy Market Exposure - Sales	Average of market exposure sales NPVRR, MWh as % of internal Load
	Energy Market Exposure - Purchases	Average of market exposure purchases NPVRR, MWh as % of internal Load
Maintaining Reliability	Reserve Margin	Target Reserve Margin
	Fleet Resiliency	% Dispatchable Capacity of Company Peak Load
	Resource Diversity	Shannon-Weiner Diversity Index inclusive of Capacity and Energy Diversity
Sustainability	Emissions Reductions	CO ₂ , NO _x , SO ₂ reductions compared to 2005 levels

Going-In Position - Summer



SWEPCO Capacity Need

- 2023 RFP Resources included.
- Welsh units cease burning coal in 2028, removed from Going-In position pending economic selection of gas conversion

ICAP:

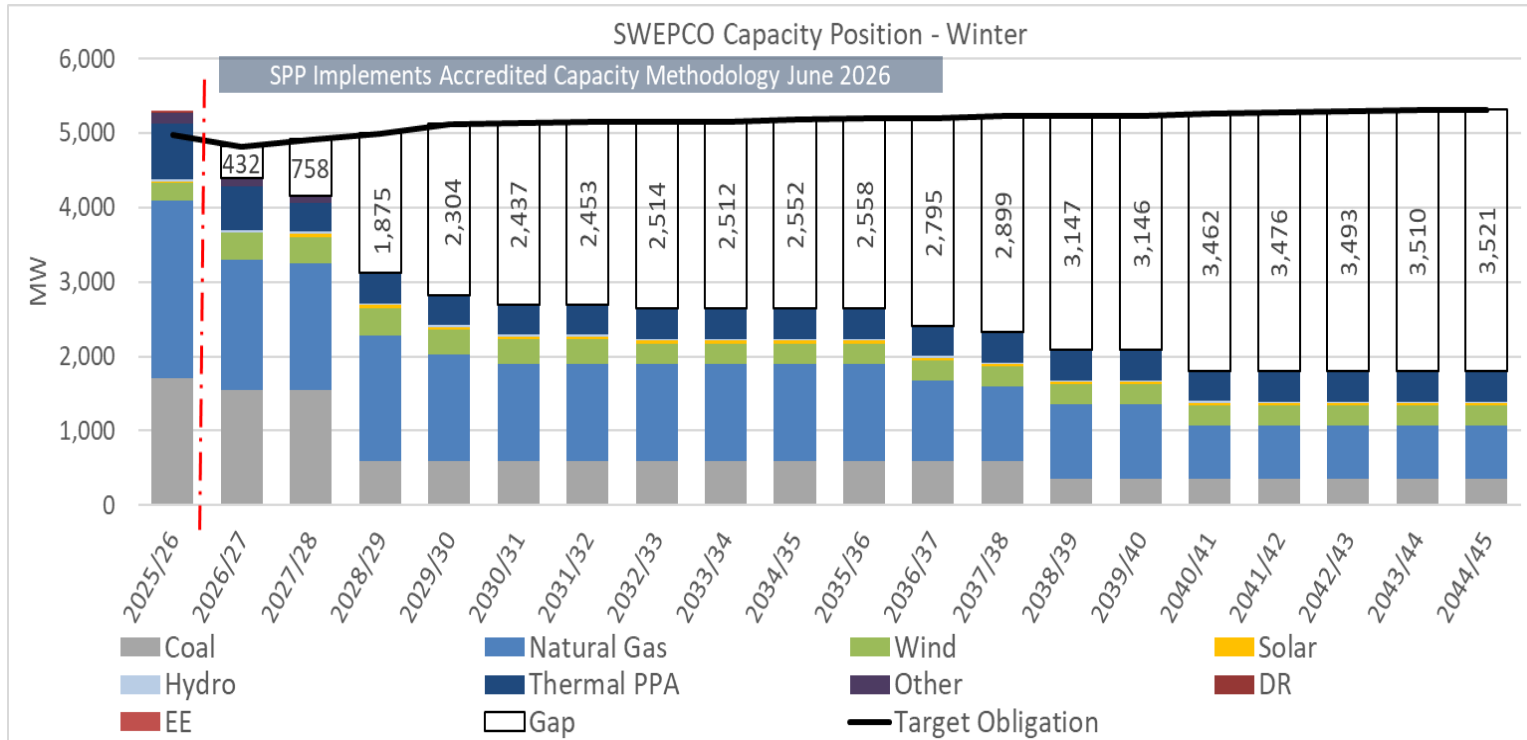
- PRM 15% through 2025, then 16% in 2026.
- Target Obligation Includes an additional 7% target contingency (~305MW)

ACAP:

- ACAP PRM 15% through 2025, then 5% in 2026.
- Thermal Resource Accredited Capacity reduction: ~300MW
- Target Obligation Includes an additional 6% target contingency (~260MW)

Note: SPP ACAP PRM is not finalized

Going-In Position (Winter)



SWEPCO Capacity Need

- 2023 RFP Resources included.
- Welsh units cease burning coal in 2028, removed from Going-In position pending economic selection of gas conversion

ICAP:

- PRM 15% through 2025, then 36% in 2026, +2%/yr through 2029.
- Target Obligation Includes an additional 7% target contingency (~290MW)

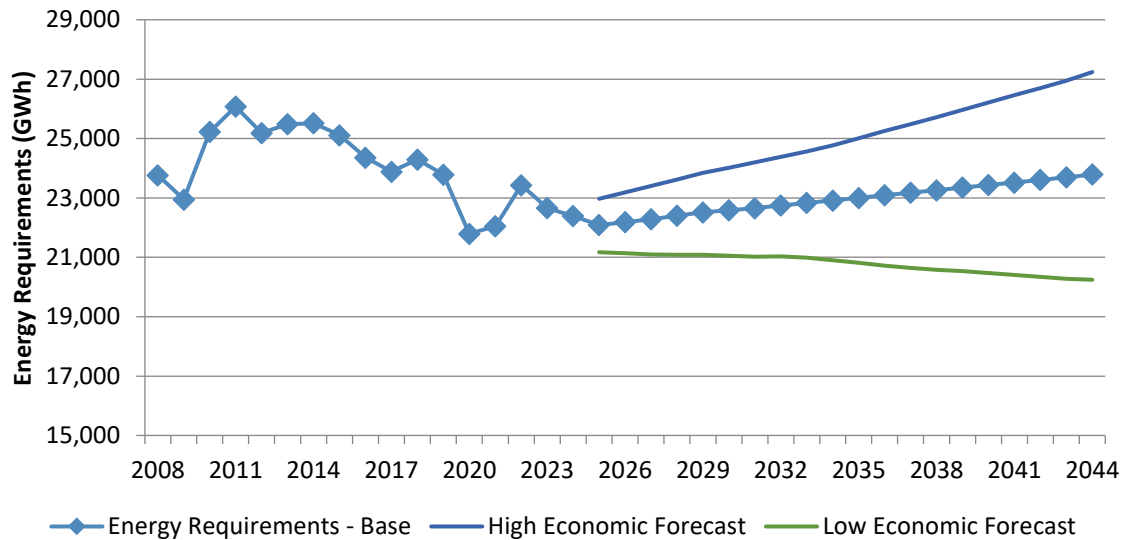
ACAP:

- ACAP PRM 15% through 2025, then 12% in 2026, +2%/yr through 2029.
- Thermal Resource Accredited Capacity reduction: ~790MW
- Target Obligation Includes an additional 6% target contingency (~260MW)

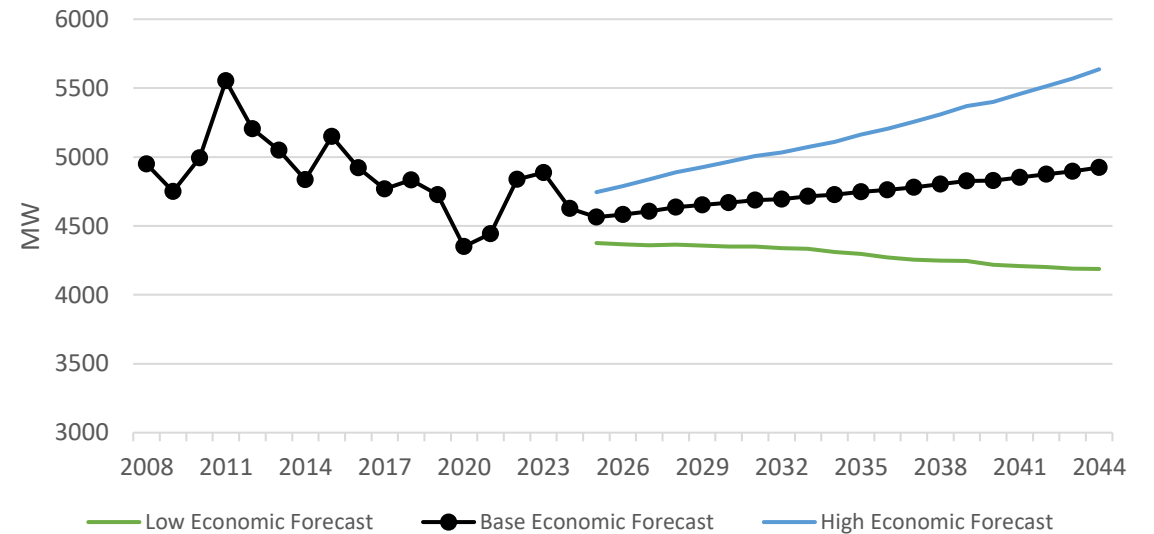
Note: SPP ACAP PRM is not finalized

Load Scenarios

**SWEPCO
Load Forecast Scenarios
Energy Requirement (GWh)**



SWEPCO Demand Forecast Scenarios



Market Scenarios

Scenario	Load	Gas Price	Env. Regs
Base	Base	Base	Base
High	High	High	Base
Low	Low	Low	Base
Enhanced Environmental Regulation (EER)	Base	Base	111(d) Informed

Baseline Assumptions – New Resources

Technology	First Year	Capacity (MW)	Installed Cost (\$/kW)	Full Load Heat Rate (btu/kWh)	Variable O&M (\$/MWh)	Fixed O&M (\$/kW-yr)
Base Load						
SMALL MODULAR REACTOR NUCLEAR POWER PLANT, 600 MW	2036	600	9,300	10,440	4.46	141.00
COMBUSTION TURBINE F CLASS, COMBINED-CYCLE, F- Class	2032	760	1,130	6,600	2.76	23.89
COMBUSTION TURBINE H CLASS, 1100-MW COMBINED CYCLE (RFP)	2032	1,030	1,490	6,370	2.57	16.81
COMBUSTION TURBINE H CLASS, COMBINED-CYCLE SINGLE SHAFT, 430 MW (RFP)	2032	420	1,680	6,430	3.51	19.43
COMBUSTION TURBINE H CLASS, COMBINED-CYCLE SINGLE SHAFT W/90% CO2 CAPTURE, 430 MW (RFP)	2032	380	3750	7,120	8.04	38.03
Peaking						
COMBUSTION TURBINE F CLASS, 240-MW SIMPLE CYCLE (RFP)	2031*	230	1,140	9,910	6.09	9.48
COMBUSTION TURBINES AERODERIVATIVE, 100-MW SIMPLE CYCLE (RFP)	2031	110	1,780	9,120	6.36	22.07
INTERNAL COMBUSTION ENGINES, 20 MW (RFP)	2031	20	2,800	8,300	7.70	47.59
Intermittent						
BATTERY ENERGY STORAGE SYSTEM, 50 MW / 200 MWH, 4hr (RFP)	2029	50	1,850		0.00	53.11
BATTERY ENERGY STORAGE SYSTEM, 50 MW / 300 MWH, 6hr (RFP)	2029	50	2,370		0.00	79.66
BATTERY ENERGY STORAGE SYSTEM, 50 MW / 400 MWH, 8hr (RFP)	2029	50	3,550		0.00	106.21
BATTERY ENERGY STORAGE SYSTEM, 50 MW / 500 MWH, 10hr (RFP)	2029	50	4,540		0.00	132.76
BATTERY ENERGY STORAGE SYSTEM, FORM, 20 MW / MWH, 100hr	2029	20	2,800		0.00	18.00
ONSHORE WIND, LARGE PLANT FOOTPRINT, 200 MW	2032	200	2,260		0.00	28.48
SOLAR PHOTOVOLTAIC, 150 MWAC	2029	150	2,040		0.00	18.30
SOLAR PHOTOVOLTAIC WITH BATTERY ENERGY STORAGE SYSTEM, 150 MWx200 MWh	2029	150	2,620		0.00	39.54

* An early CT alternative for up to 480MW in 2029 is offered assuming the re-use an existing company interconnection.

Portfolios

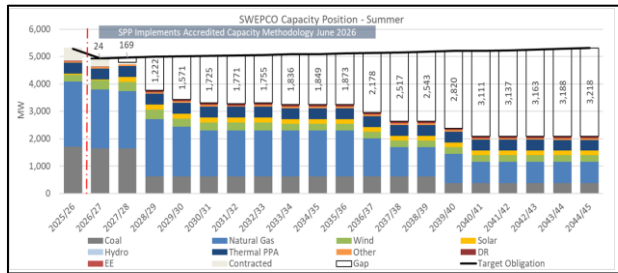
Portfolio	Scenario	SWEPCO Load	Gas Price	Technology Cost	Env. Regs
Base Fundamentals	Base	Base	Base	Base	Base
High Load	High	High	High	Base	Base
Low Load	Low	Low	Low	Base	Base
Enhanced Environmental Regulations (EER)	EER	Base	Base	Base	111(d) Informed

Alternative Portfolios Sensitivities

Portfolio	Scenario	SWEPCO Load	Gas Price	Technology Cost	Env. Regs
High Fundamentals	High	Base	High	Base	Base
Low Fundamentals	Low	Base	Low	Base	Base
High Technology Costs	Base	Base	Base	Base + 25%	Base
Low Technology Costs	Base	Base	Base	Base - 25%	Base

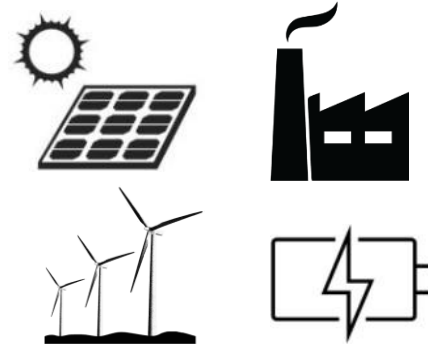
Selection of the Preferred Plan

Going in View



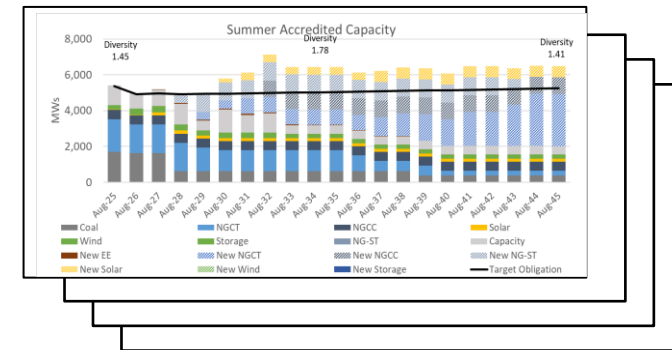
The going in positions shows a need for new capacity to meet SWEPSCO customer requirements

Resource Options



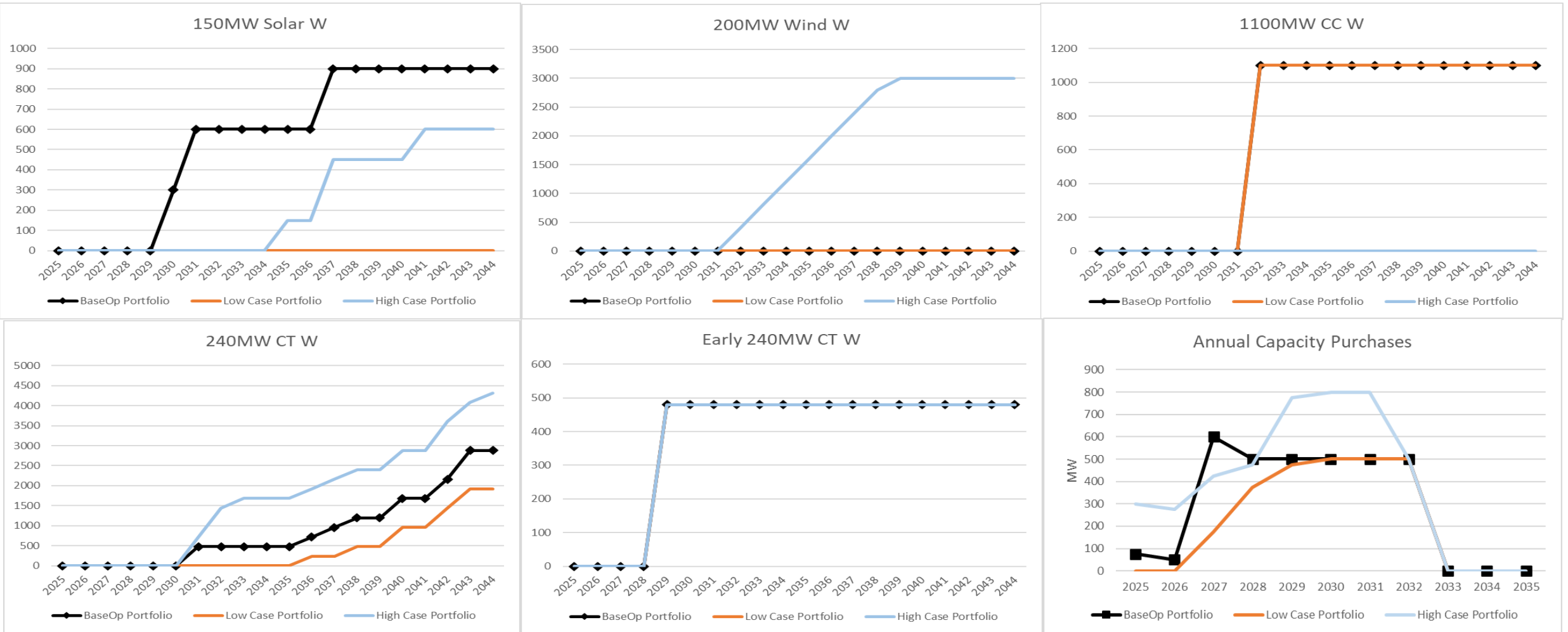
SWEPSCO will use PLEXOS to evaluate resource options under different market conditions and test specific strategies

Candidate Portfolios



The resulting set of portfolios will be evaluated against the IRP Performance Indicators to identify a Preferred Plan that maintains reliability and best maintains affordable and stable rates while also achieve emissions reduction targets

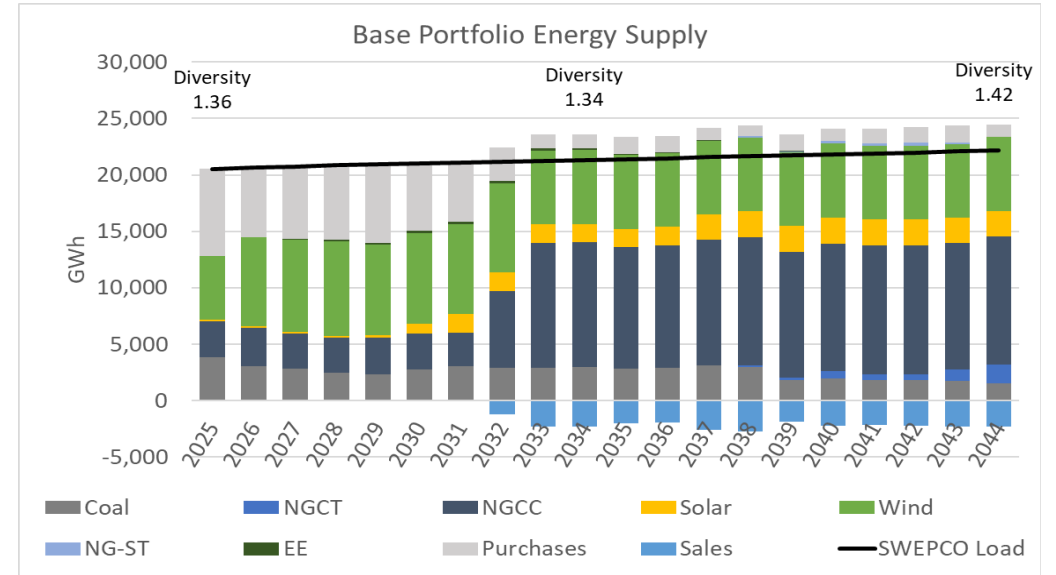
Cumulative Resource Addition Comparisons



- All three portfolios selected Welsh 1&3 conversions and early CT (480MW)

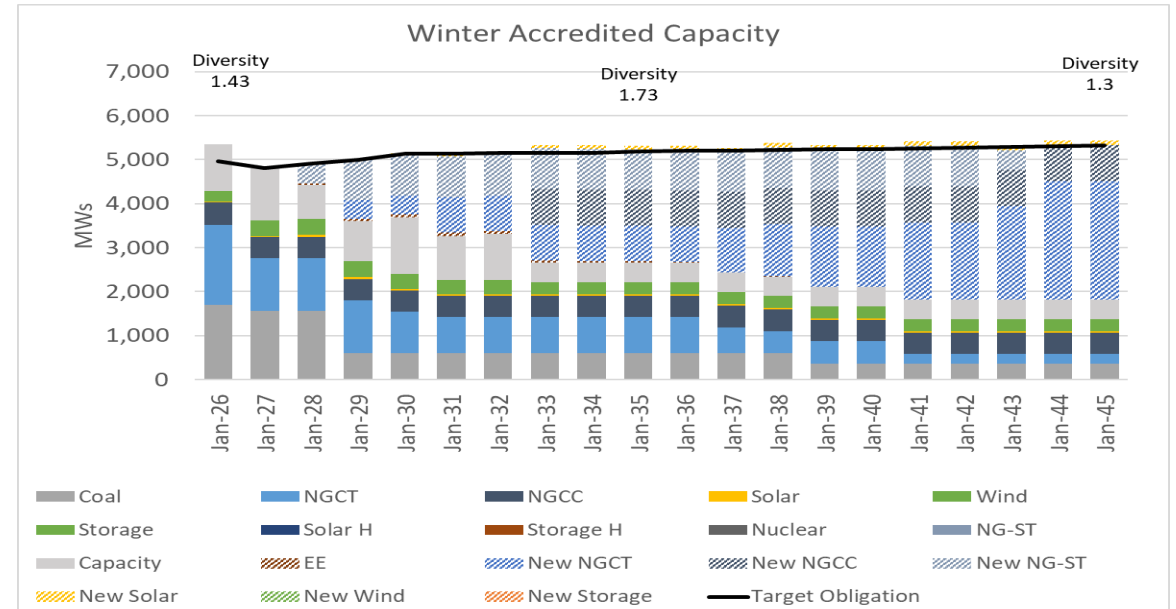
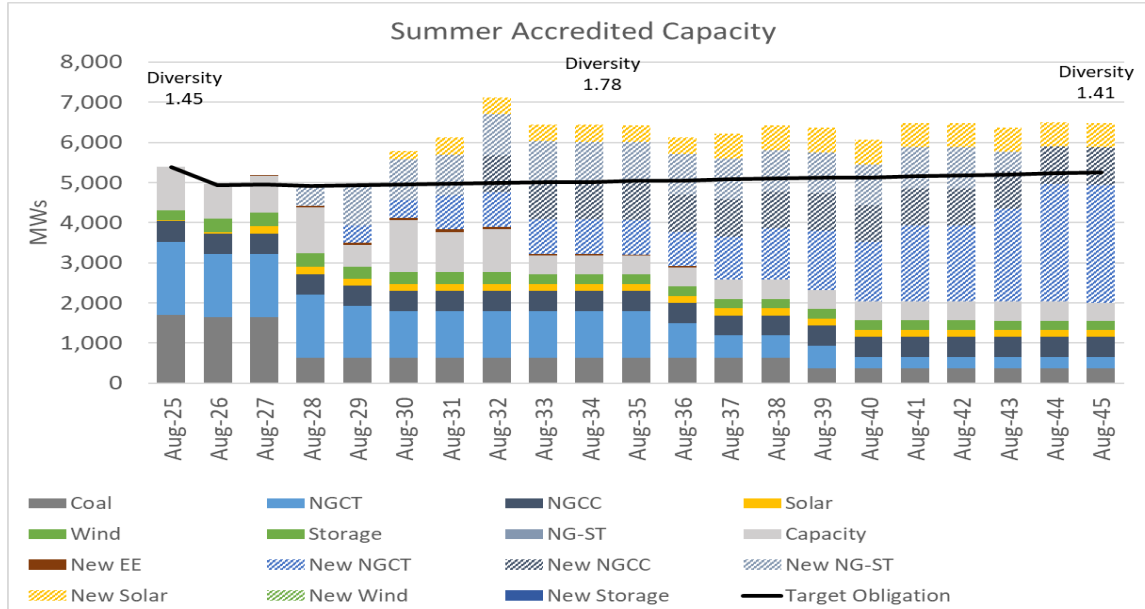
Base Optimized Findings

Base Optimized Case Capacity Additions										
SPP Planning Year	Cum. New EE	New Solar	New Wind	New Storage	New CT	New CC	WSH Fuel Switch	STMP	Energy Exports (%)	Energy Imports (%)
2025/26	0	0	0	0	0	0	0	75	0	38
2026/27	0	0	0	0	0	0	0	50	0	30
2027/28	19	0	0	0	0	0	0	600	0	31
2028/29	36	0	0	0	0	0	1053	500	0	32
2029/30	53	0	0	0	480	0	0	500	0	33
2030/31	73	300	0	0	0	0	0	500	0	29
2031/32	96	300	0	0	480	0	0	500	0	25
2032/33	97	0	0	0	0	1,100	0	500	6	14
2033/34	97	0	0	0	0	0	0	0	11	6
2034/35	97	0	0	0	0	0	0	0	11	6
2035/36	97	0	0	0	0	0	0	0	9	7
2036/37	97	0	0	0	240	0	0	0	9	7
2037/38	94	300	0	0	240	0	0	0	12	5
2038/39	91	0	0	0	240	0	0	0	13	4
2039/40	89	0	0	0	0	0	0	0	8	7
2040/41	86	0	0	0	480	0	0	0	10	5
2041/42	82	0	0	0	0	0	0	0	10	6
2042/43	65	0	0	0	480	0	0	0	10	6
2043/44	52	0	0	0	720	0	0	0	10	7
2044/45	37	0	0	0	0	0	0	0	10	5
Total		900	0	0	3,360	1,100	1,053	3,225		



- Portfolio Optimization considered seasonal capacity requirements and market energy risk mitigation.
- Resource additions leverage market capacity and early resource alternatives through 2029.
- Solar additions contribute towards energy position with some summer capacity benefit
- Combined Cycle resource supports the large capacity needs by 2032 while also serving to mitigate market energy reliance.
- Market Energy Purchases decline with resource selections while still offering ability for some sales into the market.

Base Optimized Findings

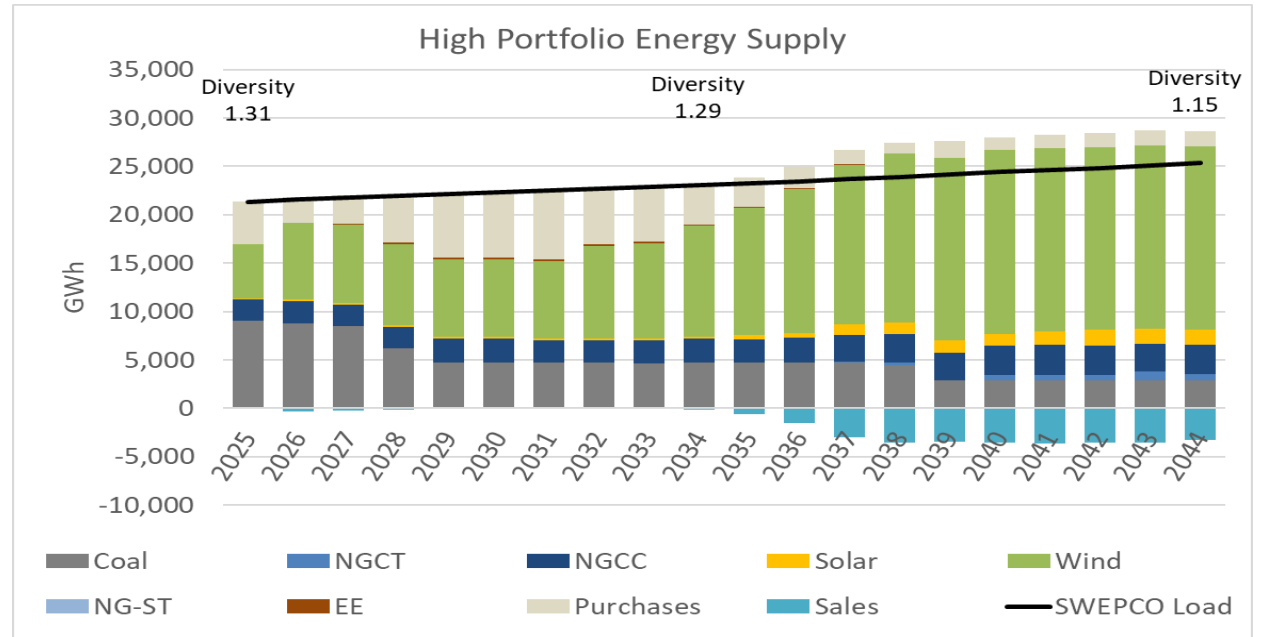


- Winter capacity needs are the controlling season to meet SPP capacity obligations.
- Renewable resources contribute towards capacity obligations but in limited amounts.
- Total portfolio includes dispatchable resources capable of serving company demand.

Reliability	
Planning Reserves	Fleet Resiliency
% Reserve Margin	Dispatchable Capacity
2034	2034
Summer % Winter % (ACAP)	Dispatchable Nameplate MW % of Company Peak Demand
42.4% 26.9%	4,857 107.5%

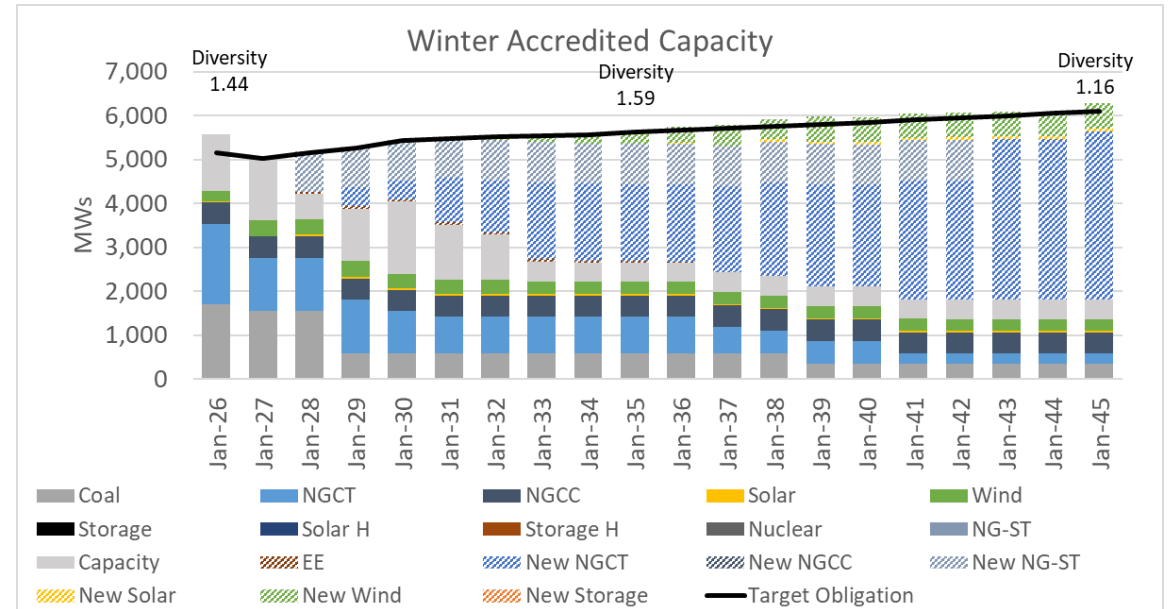
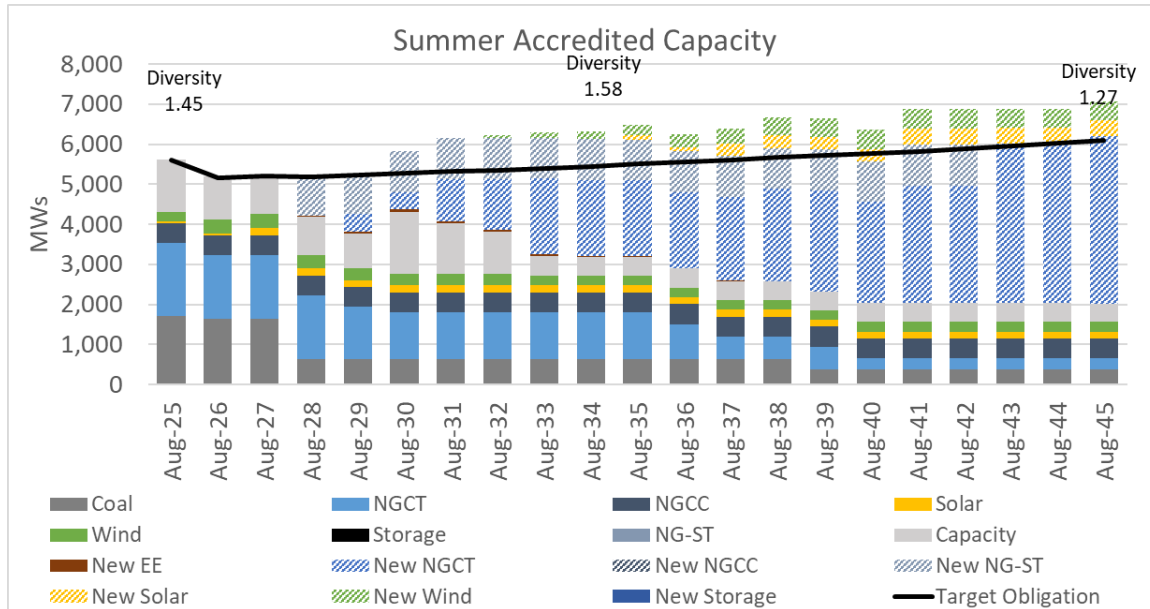
High Optimized Findings

High Optimized Case Capacity Additions										
SPP Planning Year	Cum. New EE	New Solar	New Wind	New Storage	New CT	New CC	WSH Fuel Switch	STMP	Energy Exports (%)	Energy Imports (%)
2025/26	0	0	0	0	0	0	0	300	0	21
2026/27	0	0	0	0	0	0	0	275	1	13
2027/28	20	0	0	0	0	0	0	425	1	13
2028/29	36	0	0	0	0	0	1053	475	1	23
2029/30	52	0	0	0	480	0	0	775	0	30
2030/31	70	0	0	0	0	0	0	800	0	30
2031/32	85	0	0	0	720	0	0	800	0	32
2032/33	86	0	400	0	720	0	0	500	0	25
2033/34	87	0	400	0	240	0	0	0	0	25
2034/35	87	0	400	0	0	0	0	0	1	18
2035/36	87	150	400	0	0	0	0	0	3	13
2036/37	87	0	400	0	240	0	0	0	6	10
2037/38	85	300	400	0	240	0	0	0	12	6
2038/39	83	0	400	0	240	0	0	0	15	5
2039/40	81	0	200	0	0	0	0	0	14	7
2040/41	78	0	0	0	480	0	0	0	15	5
2041/42	74	150	0	0	0	0	0	0	15	6
2042/43	56	0	0	0	720	0	0	0	14	6
2043/44	43	0	0	0	480	0	0	0	14	6
2044/45	29	0	0	0	240	0	0	0	13	6
Total		600	3,000	0	4,800	0	1,053	4,350		



- Portfolio Optimization considered seasonal capacity requirements and market energy risk mitigation.
- Resource additions leverage market capacity and early resource alternatives through 2029.
- Wind additions contribute towards energy position with some summer capacity benefit
- Combustion Turbine resources support the large capacity needs by 2032 while also serving to mitigate market energy reliance.
- Market Energy Purchases increase with resource selections while still offering ability for some sales into the market.

High Optimized Findings

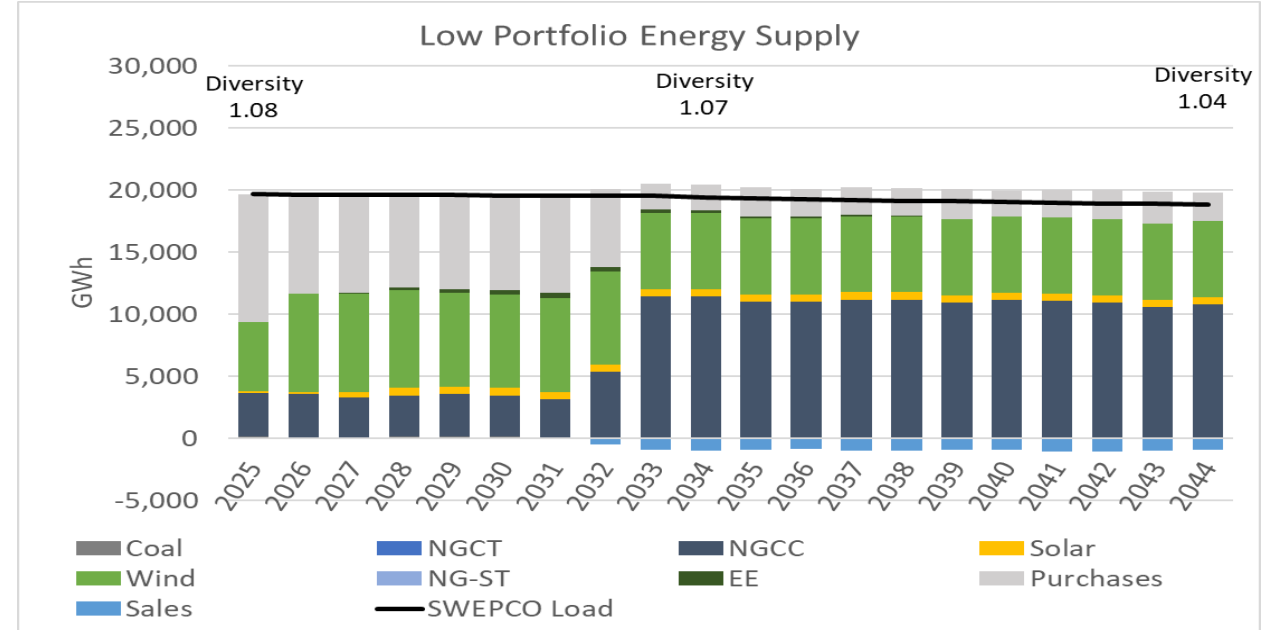


- Winter capacity needs are the controlling season to meet SPP capacity obligations.
- Higher energy needs results in wind resource selection over the CC in the near term.
- Total portfolio includes dispatchable resources capable of serving company demand.

Reliability	
Planning Reserves	Fleet Resiliency
% Reserve Margin	Dispatchable Capacity
2034	2034
Summer % Winter % (ACAP)	Dispatchable Nameplate MW
	% of Company Peak Demand
28.9% 24.7%	5,205 106.2%

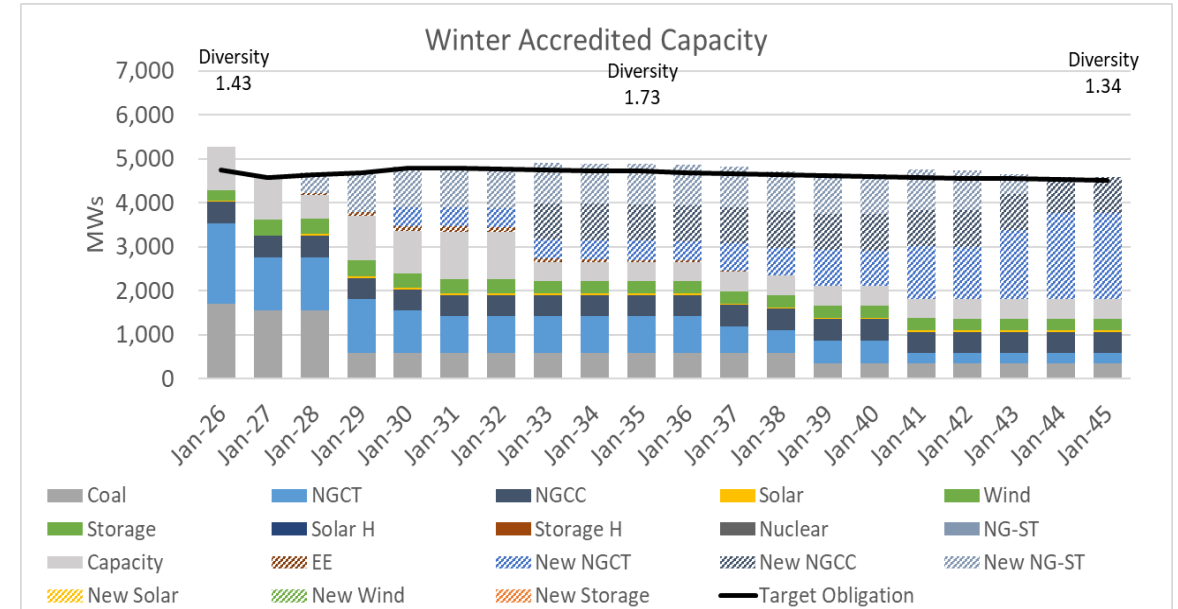
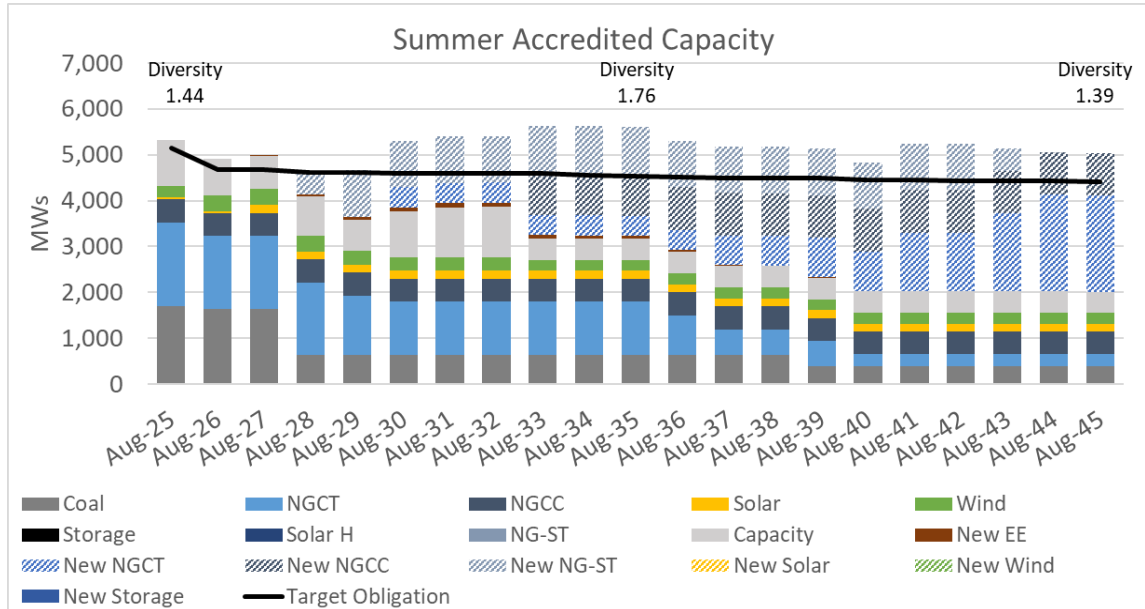
Low Optimized Findings

Low Case Capacity Additions										
SPP Planning Year	Cum. New EE	New Solar	New Wind	New Storage	New CT	New CC	WSH Fuel Switch	STMP	Energy Exports (%)	Energy Imports (%)
2025/26	0	0	0	0	0	0	0	0	0	52
2026/27	0	0	0	0	0	0	0	0	0	41
2027/28	31	0	0	0	0	0	0	175	0	40
2028/29	52	0	0	0	0	0	1053	375	0	38
2029/30	87	0	0	0	480	0	0	475	0	39
2030/31	126	0	0	0	0	0	0	500	0	39
2031/32	178	0	0	0	0	0	0	500	0	40
2032/33	178	0	0	0	0	1,100	0	500	3	32
2033/34	178	0	0	0	0	0	0	0	5	10
2034/35	178	0	0	0	0	0	0	0	5	11
2035/36	178	0	0	0	0	0	0	0	5	12
2036/37	178	0	0	0	240	0	0	0	4	12
2037/38	171	0	0	0	0	0	0	0	5	12
2038/39	168	0	0	0	240	0	0	0	5	12
2039/40	160	0	0	0	0	0	0	0	5	13
2040/41	154	0	0	0	480	0	0	0	5	11
2041/42	142	0	0	0	0	0	0	0	5	12
2042/43	122	0	0	0	480	0	0	0	6	12
2043/44	100	0	0	0	480	0	0	0	5	14
2044/45	73	0	0	0	0	0	0	0	5	12
Total		0	0	0	2,400	1,100	1,053	2,525		



- Portfolio Optimization considered seasonal capacity requirements and market energy risk mitigation.
- Resource additions leverage market capacity and early resource alternatives through 2029.
- Combined Cycle resource supports the large capacity needs by 2032 while also serving to mitigate market energy reliance.
- Market Energy Purchases increase with resource selections while still offering ability for some sales into the market.

Low Optimized Findings



- Winter capacity needs are the controlling season to meet SPP capacity obligations.
- Total portfolio includes dispatchable resources capable of serving company demand.

Reliability	
Planning Reserves	Fleet Resiliency
% Reserve Margin	Dispatchable Capacity
2034	2034
Summer % Winter % (ACAP)	Dispatchable Nameplate MW
	% of Company Peak Demand
36.9% 27.9%	4,679 MW
	113.9%

Portfolio Performance Comparison

- The IRP Performance Indicators compare the performance of the candidate portfolios under each of the four IRP Objectives.
- The results inform the Company on the trade-offs between candidate portfolios across performance indicators and metrics defined under each objective.

	Customer Affordability		Rate Stability			Reliability			Sustainability		
Portfolio	Short Term	Long Term	Portfolio Resilience:	Energy Market Risk	Energy Market Risk	Planning Reserves	Fleet Resiliency	Resource Diversity	Emission Reductions		
	7-yr Rate (RR) CAGR	Portfolio NPVRR	High Minus Low Scenario Range, Portfolio NPVRR	Purchases	Sales	% Reserve Margin	Dispatchable Capacity	Shannon-Weiner Diversity Index	% Change from 2005 Baseline CO ₂ , NO _x , SO ₂		
Year Ref.	2025-2031	2025-2054	2025-2054	2028-2034	2028-2034	2034 2044	2034 2044	2034 2044	2034		
Units	%	\$MM Levelized Rate (\$/MWh)	\$MM	Average Cost of Market Purchases (\$000) AVG MWh% of AVG SWEPCO Demand	Average Revenue of Market Sales (\$000) AVG MWh% of AVG SWEPCO Demand	Summer % Winter % (ACAP)	Dispatchable Nameplate MW % of Company Peak Demand	Portfolio Index (Accredited Capacity+ Energy Diversity)	% Reduction CO ₂ NO _x SO ₂		

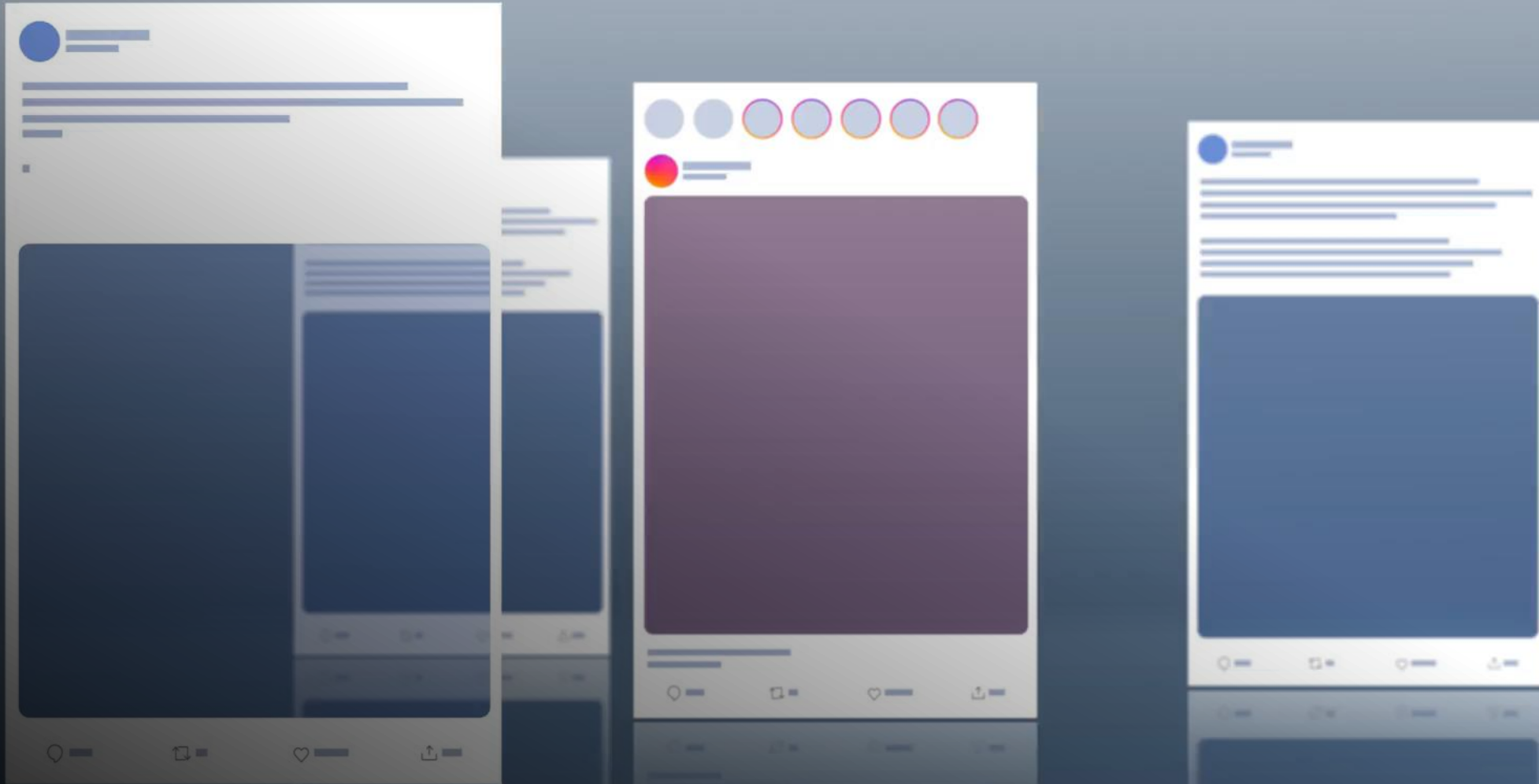
- Performance Indicators identify the methods to evaluate analysis results towards the Objectives
- Metrics are the specific measurements to quantify results

Performance Indicator Matrix Results

	Customer Affordability		Rate Stability		Reliability			Sustainability			
Portfolio	Short Term	Long Term	Portfolio Resilience:	Energy Market Risk	Energy Market Risk	Planning Reserves	Fleet Resiliency	Resource Diversity	Emission Reductions		
	7-yr Rate (RR) CAGR	Portfolio NPVRR	High Minus Low Scenario Range, Portfolio NPVRR	Purchases	Sales	% Reserve Margin	Dispatchable Capacity	Shannon-Weiner Diversity Index	% Change from 2005 Baseline CO ₂ , NO _x , SO ₂		
Year Ref.	2025-2031	2025-2054	2025-2054	2028-2034	2028-2034	2034	2034	2034	2034		
Units	%	\$MM Levelized Rate (\$/MWh)	\$MM	Average Cost of Market Purchases (\$000) AVG MWh% of AVG SWEPCO Demand	Average Revenue of Market Sales (\$000) AVG MWh% of AVG SWEPCO Demand	Summer % Winter % (ACAP)	Dispatchable Nameplate MW % of Company Peak Demand	Portfolio Index (Accredited Capacity+ Energy Diversity)	% Reduction CO ₂ NO _x SO ₂		
Base Portfolio	6.25%	\$16,661 \$48.4		\$139,430 20.5%	\$30,018 4.0%	42.4% 26.9%	4,857 107.5%	1.8+1.3 = 3.1	66.6%	91.6%	98.7%
High Portfolio	6.42%	\$21,863 \$57.58		\$248,433 27.8%	\$1,718 0.2%	28.9% 24.7%	5,205 106.2%	1.6+1.3 = 2.9	73.1%	88.9%	98.0%
Low Portfolio	5.51%	\$11,263 \$36.97		\$158,537 27.7%	\$8,853 1.7%	36.9% 27.9%	4,679 113.9%	1.8+1.1 = 2.8	80.0%	98.5%	100.0%
EER Portfolio											
High Gas, Base Load Sensitivity											
Low Gas, Base Load Sensitivity											
High Technology Costs											
Low Technology Costs											

*Levelized Rates and NPVRR metrics are for generation component only. Metrics are for comparison only and do not represent the final costs which will apply to ratepayers.

Feedback and Discussion



**SOUTHWESTERN
ELECTRIC POWER
COMPANY**

Closing Remarks

- Thank you for your participation!
- Further questions and feedback should be provided to SWEPCO-AR-IRP@aep.com

<https://www.swepco.com/community/projects/arkansasirp/>