

Southwestern Electric Power Company

2024 IRP STAKEHOLDER MEETING

IRP Planning, Inputs & Assumptions

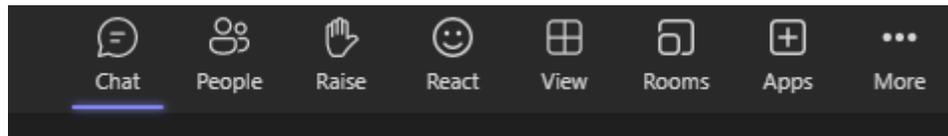
June 6, 2024

**SOUTHWESTERN
ELECTRIC POWER
COMPANY**

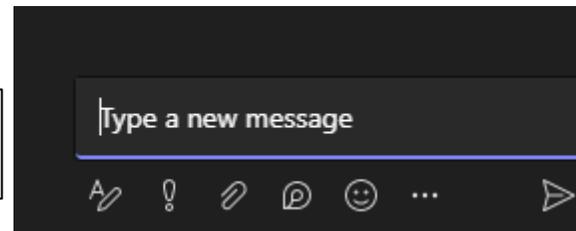
An **AEP** Company

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	Agenda Topic	Presenter
9:00 – 9:10	Welcome and Introductions <ul style="list-style-type: none"> Stakeholder Meeting Objectives Company Overview & Updates 	Lynn Ferry-Nelson/Greg Soller
9:10 – 9:35	IRP Process Past IRP Comments Review <ul style="list-style-type: none"> Key Changes 	Greg Soller
9:35 – 10:15	2024 IRP Objectives & Metrics <ul style="list-style-type: none"> Affordability, Rate Stability, Reliability, Sustainability Capacity Needs Review (Going In Position) <ul style="list-style-type: none"> SWEPCO Position Arkansas Jurisdictional Position 	Greg Soller
10:15 – 11:00	IRP Inputs <ul style="list-style-type: none"> Load Forecast Fundamentals and Market Scenario Analysis Technology Assumptions 	Trenton Feasel Mark O'Brien Greg Soller
11:00 - 11:30	Proposed Scenarios and Portfolios Proposed Portfolio Performance Metrics	Greg Soller
11:30	Adjourn	

Welcome & Introductions

SWEPCO Leadership Team

Tom Brice | Vice President, Regulatory and Finance

Lynn Ferry-Nelson | Director, Regulatory Services

Chris Martel | Regulatory Consultant Staff

Dreda Smith | Sr. Counsel

Sarah Tacker | Outside Counsel,

SWPECO IRP Planning Team

Kelly Pearce | Managing Director, Resource Planning & Strategy

Mark Becker | Managing Director, Resource Planning & Grid Solutions

Greg Soller | Manager, Resource Planning

Mark O'Brien | Director, Economic Forecasting

Trenton Feasel | Manager Economic Forecasting

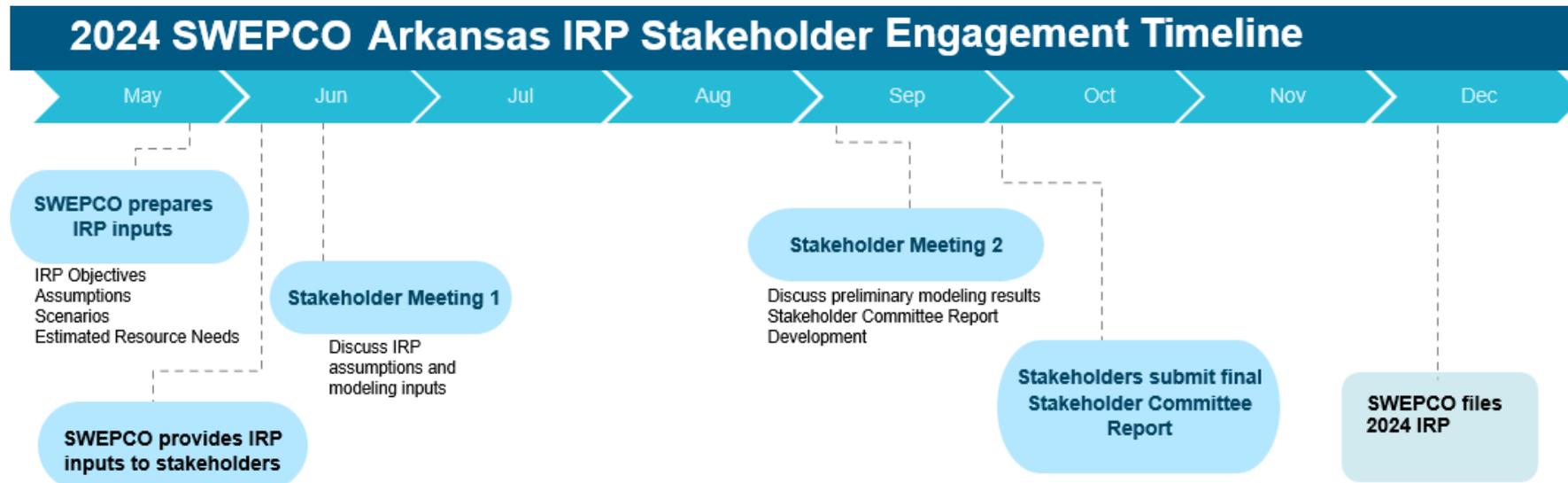
Stakeholder Meeting Objectives

Objectives for meeting include:

- ❑ **Transparency:** Share 2024 IRP Objectives and Assumptions at the beginning of our process
- ❑ **Gather Feedback:** Provide a forum for productive stakeholder feedback

SWEPCO welcomes stakeholder comments and input on any aspect of the IRP process, including:

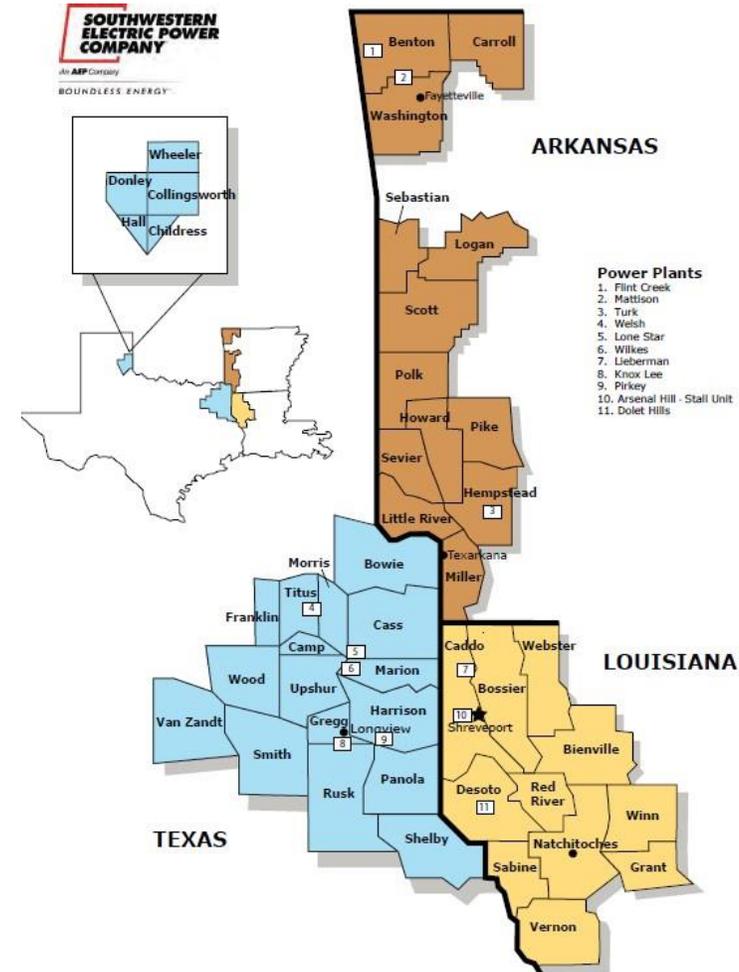
- SWEPCO Load Forecast
- Fundamental Pricing Assumptions
- Cost of technology options
- Sensitivity cases
- Proposed Portfolio Performance Metrics



About Southwestern Electric Power (SWEPCO)

- ❑ Southwestern Electric Power Company (SWEPCO) is headquartered in Shreveport, LA
- ❑ More than 550,000 customers in Louisiana, Arkansas and Texas.
 - 235,000 customers - LA
 - 191,000 customers - TX
 - 126,000 customers - AR
- ❑ SWEPCO also serves wholesale customers which represent about 12% of its load; additionally SWEPCO provides scheduling service for ~500MW
- ❑ SWEPCO participates in the Southwest Power Pool Regional Transmission Organization which establishes system reliability criteria

SWEPCO is a unit of American Electric Power (NYSE: AEP), which is one of the largest electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states.



2021 Renewables Request for Proposal / CPA Updates:

- **CPAs:**
 - Capacity Purchase Agreements approved in AR and LA and being used to meet PRM requirements for all jurisdictions
- **Renewable Facilities (Mooringsport, Diversion, Wagon Wheel – 999 MW total):**
 - NTP for Diversion issued 12/29/23 and Wagon Wheel NTP expected June 2024
 - Arkansas: Order approving settlement agreement, which approved Arkansas' jurisdictional share of the three facilities to serve SWEPCO's AR retail customers
 - Louisiana: Order approving settlement, which flexes up Louisiana's share of the three renewables facilities from the 2021 RFP, which will include the Texas jurisdiction's share
 - Texas: rejected the approval of all three of the renewable facilities
- **Other RFP Updates**
 - April 2023 Short-Term Capacity PPA Request for Proposals
 - Additional contracts signed to meet or supplement SWEPCO's SPP Planning Reserve Margin requirements
 - 2024 All-Source RFP – PSAs, PPAs, CPAs, and self-build proposal up to 2100 MW
 - Bids received April 2024
 - Bid analysis expected to be completed in July

IRP Rules - Section 4.1 - Objectives

The utility shall clearly state and support its objectives:

- The objectives of the Resource Plan include, but are not limited to, low cost, adequate and reliable energy services, economic efficiency; financial integrity of the utility; comparable consideration of demand supply resources; mitigation of risks; consideration of environmental impacts; and consistency with governmental regulations and policies.
- In meeting the objectives, the utility should put itself in a position to respond to anticipated economic conditions and technological advancements and changes, including environmental requirements.

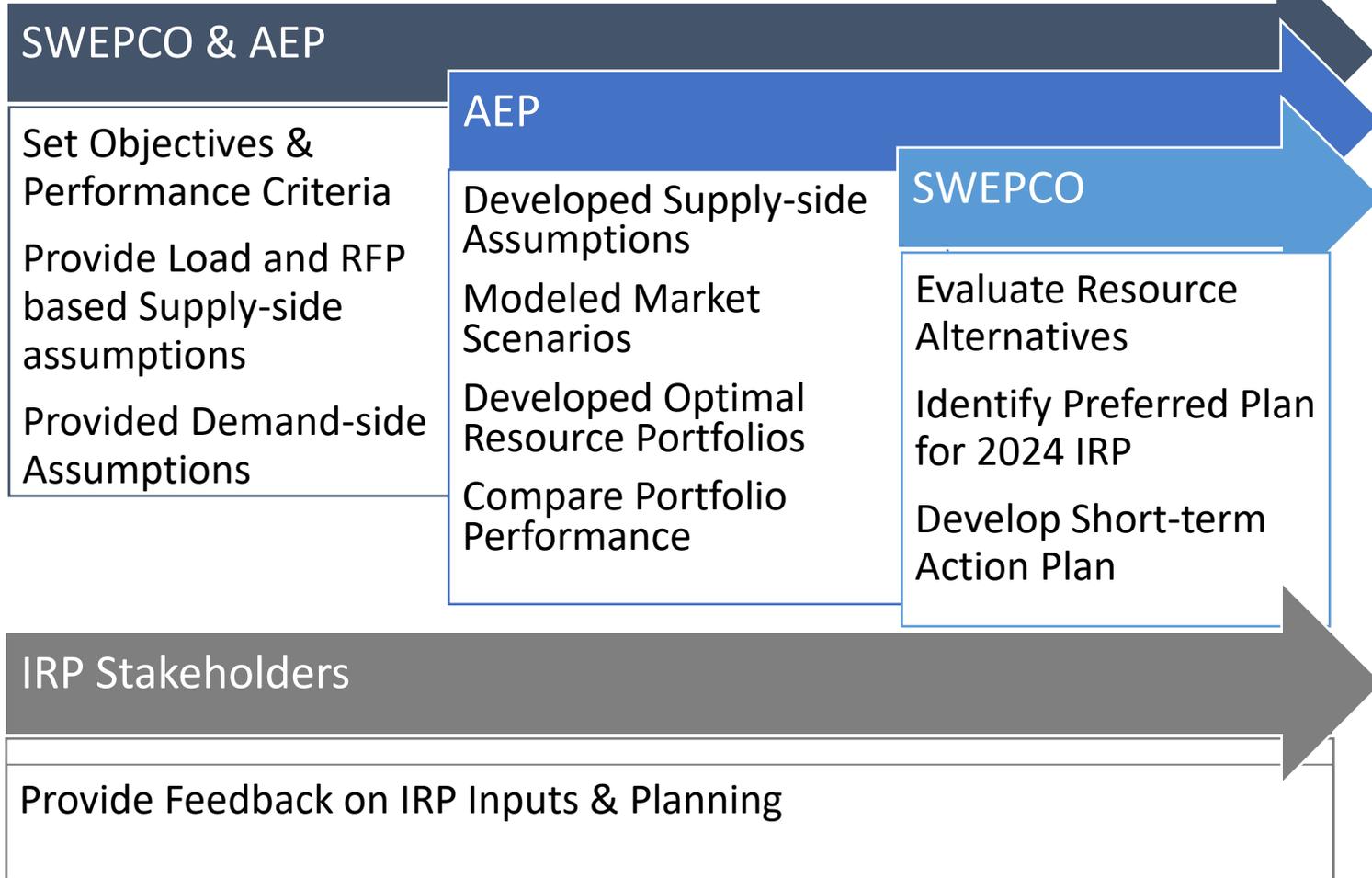
IRP Rules - Section 4.8 – Stakeholder Process

Each utility will organize and facilitate meetings of the Stakeholder Committee

- Stakeholder Committee to be broadly representative of:
 - Retail and wholesale customers
 - Independent power suppliers
 - Marketers
 - Other interested entities in the service area
- Stakeholders shall develop their own rules and procedures.
- Stakeholders should review utility objectives, assumptions, and estimated needs early in the planning cycle.
- Utility shall make a good faith effort to properly inform and respond to Stakeholder Committee.
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- A Report of the Stakeholder Committee should be included with the Resource Plan submittal.
- Stakeholders and General Staff may also submit comments to the Commission on Resource Plan after it has been submitted.
- Such comments should be taken into consideration by the utility in its preparation efforts and decisions concerning subsequent approval applications, as well as in its next planning cycle.
- If comments concerning the process and results warrant, the Commission may require the utility to re-evaluate and resubmit its Resource Plan for the current planning cycle to address concerns raised in the comments.

2024 IRP Process

Overview of 2024 IRP Responsibilities



2024 IRP Analysis Steps

- 1 Define IRP Objectives Aligned to Customer Needs
↓
- 2 Model SPP Market Scenarios to Test Future Risks
↓
- 3 Optimize DSM & New Supply, Define Candidate Portfolios
↓
- 4 Test Portfolios across Scenarios
↓
- 5 Compare Results & Identify the Preferred Plan

Five Year Action Plan from the 2021 IRP

- Continue the planning and regulatory actions to implement cost effective energy efficiency and demand response programs that reduce energy use and peak demand for SWEPCO customers
 - Status: SWEPCO deployed AMS in Texas and is deploying in Louisiana now, with plans to propose deployment in Arkansas in June 2024. AMS will facilitate EE and DR programs, as well as Time of Use tariffs in each state
- Continue to investigate opportunities to incorporate advanced technologies related to DER technology to provide both capacity relief and improved reliability
- Develop more refined estimates about which technologies and what quantity of resources can be integrated into the SWEPCO territory
- Seek to refine cost estimates and develop plans for the potential Welsh 1 gas conversion
 - Status: Self-build proposals submitted by AEP in 2024 RFP related to conversions at Welsh and Pirkey. Bid evaluation is underway.
- Continue to evaluate and/or conduct Request for Proposals (RFP) to explore opportunities to add cost-effective renewable generation in the near future to take advantage of the Federal Tax Credit
- Evaluate the Request for Proposals (RFP) to explore opportunities to add cost-effective capacity in the near future to meet capacity need in 2023-2024 as needed
 - Status: SWEPCO issued a RFP for PPAs, CPAs, PSAs, and self-build proposals for renewables as well as dispatchable generation in early 2024. Review of the bids is ongoing and results are expected in July 2024
- Be ready to adjust this Action Plan and future IRPs to reflect changing circumstances

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"> 20yr NPVRR 20yr 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) (at reqd IRP Planning Period) costs dispatched across all Scenarios
	Energy Market Exposure - Sales	Portfolio Range of market exposure sales NPVRR, MWh as % of internal Load
	Energy Market Exposure - Purchases	Portfolio Range 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

SPP Changes

SPP Planning Reserve Requirements are evolving

- SPP Planning Reserves are decreasing
- 2023: For LRE's, change implemented for Summer 2023 to 15% PRM
- SPP Expected to make further changes to summer PRM and implementing a Winter PRM in 2026/27PY. Expected changes include:
 - Summer PRM to 16%
 - Winter PRM to 36%
- Active discussion to move the Winter PRM to 44% by 2029/30PY
- SPP is also transitioning from a Net Dependable Capability (NDC), i.e., "ICAP", construct for thermal resources to an Accredited Capacity (ACAP) methodology.
- The ACAP methodology imposes, in addition to the Effective Load Carrying Capability (ELCC) for renewable and storage resources, a Performance Based Accreditation (PBA) to thermal resources along with a Fuel Assurance requirement in the winter.
- ACAP PRMs corresponding to accredited MWs are also applied

Impacts to SWEPCO IRP Assumptions

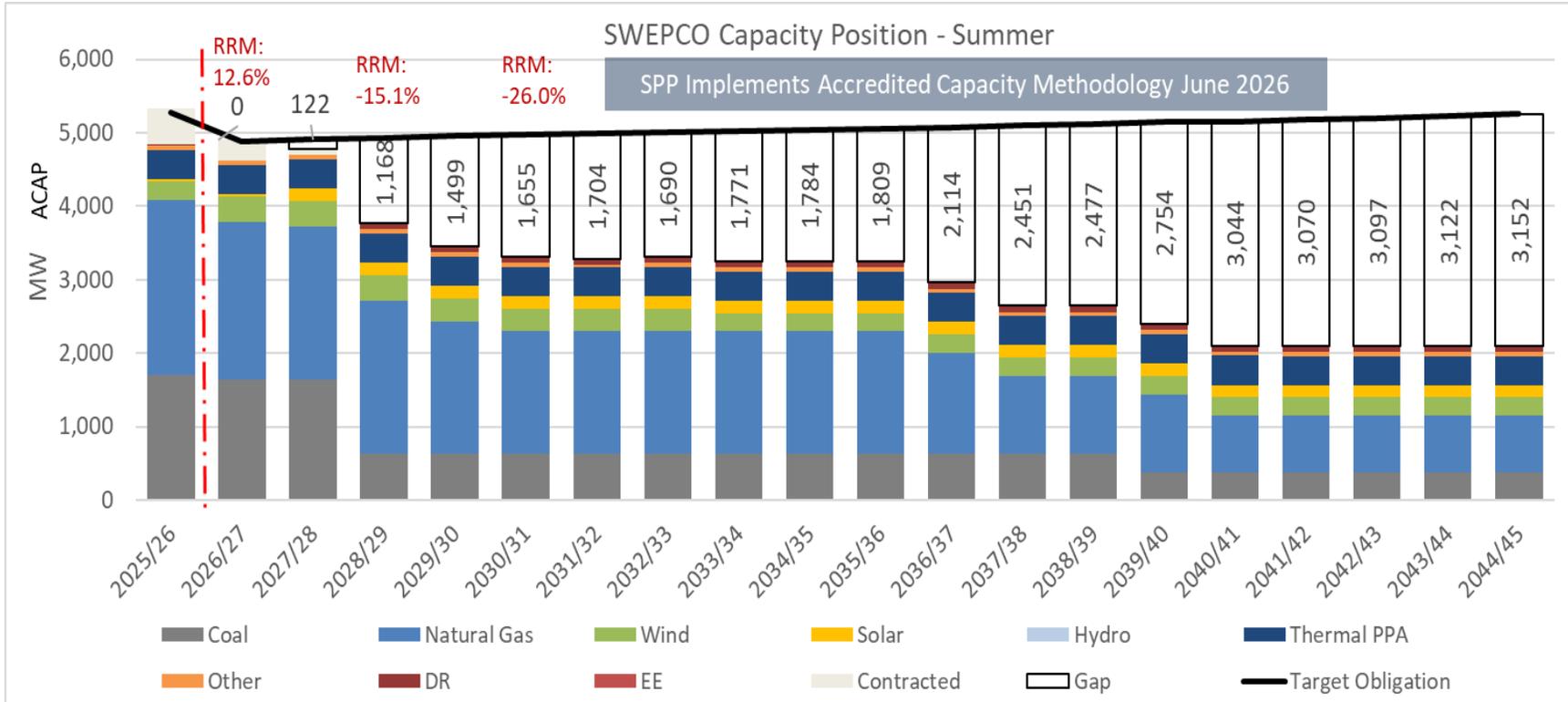
- SPP Uncertainty around PRM and prudent planning to consider SPP PRM Obligation as minimum capacity requirement for IRP purposes
- Assumes Winter PRM will grow to 42% by 2029
- SWEPCO integrating a 7% additional risk (contingency) PRM on top of SPP Minimum PRM for IRP purposes.



Source: SPP 2023 Resource Adequacy Report

Going-In Position - Summer

2024 SWEPCO AR IRP



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:

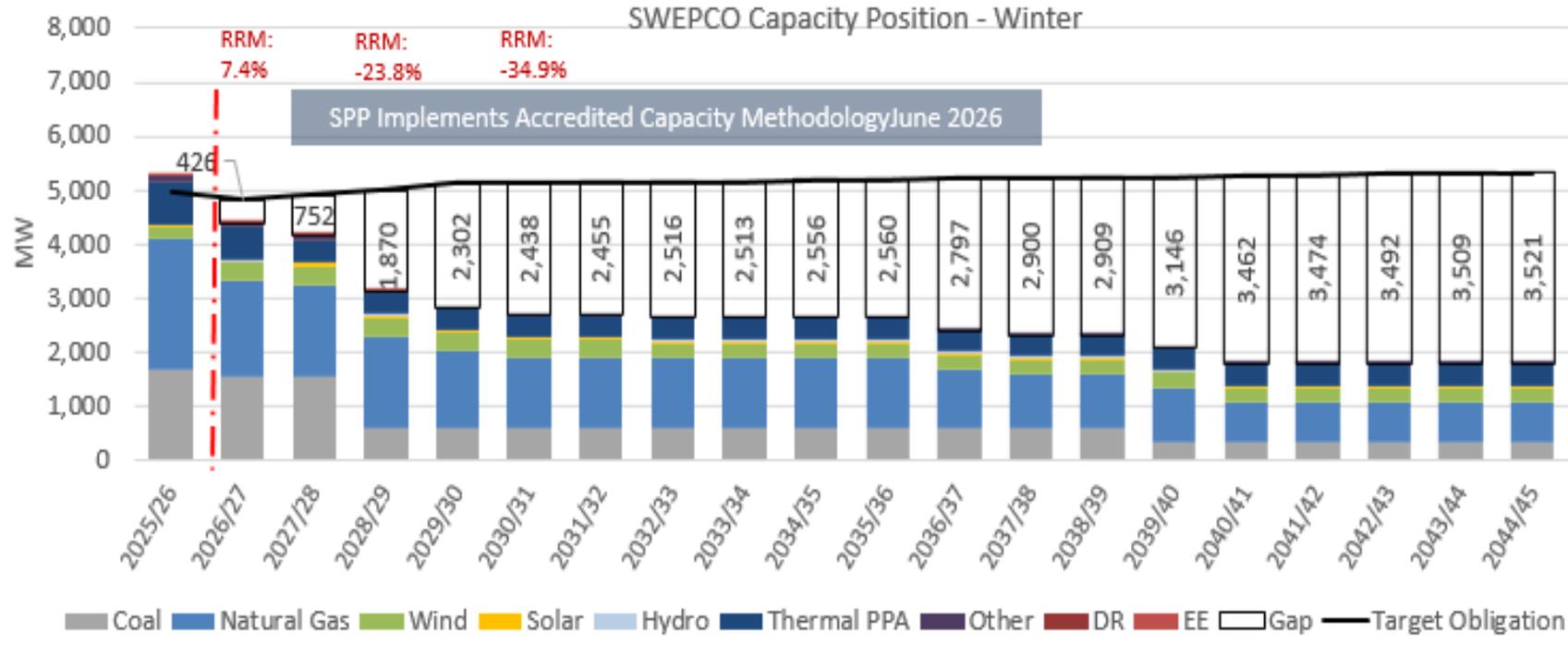
- PRM 15% through 2025, then 16% in 2026.
- Target Obligation Includes an additional 7% target contingency (~305MW)

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)

Going-In Position (Winter)

2024 SWEPSCO AR IRP



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

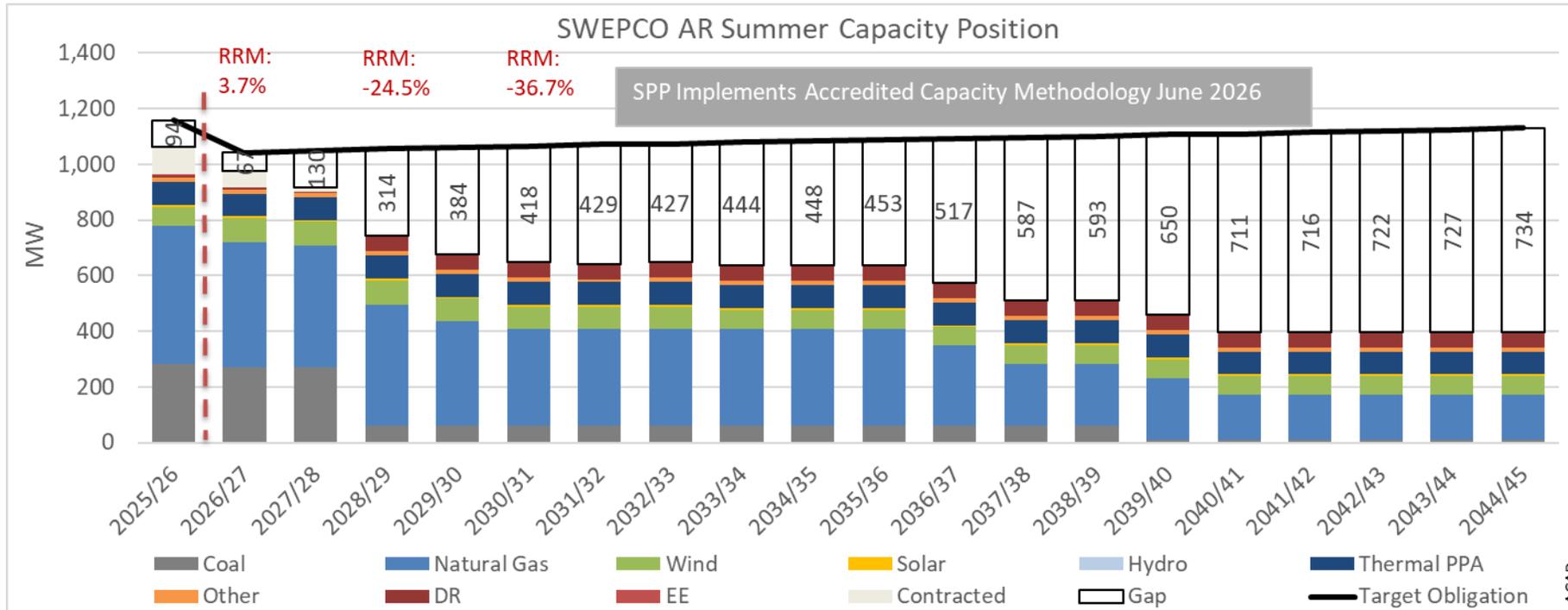
ICAP:

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

ACAP:

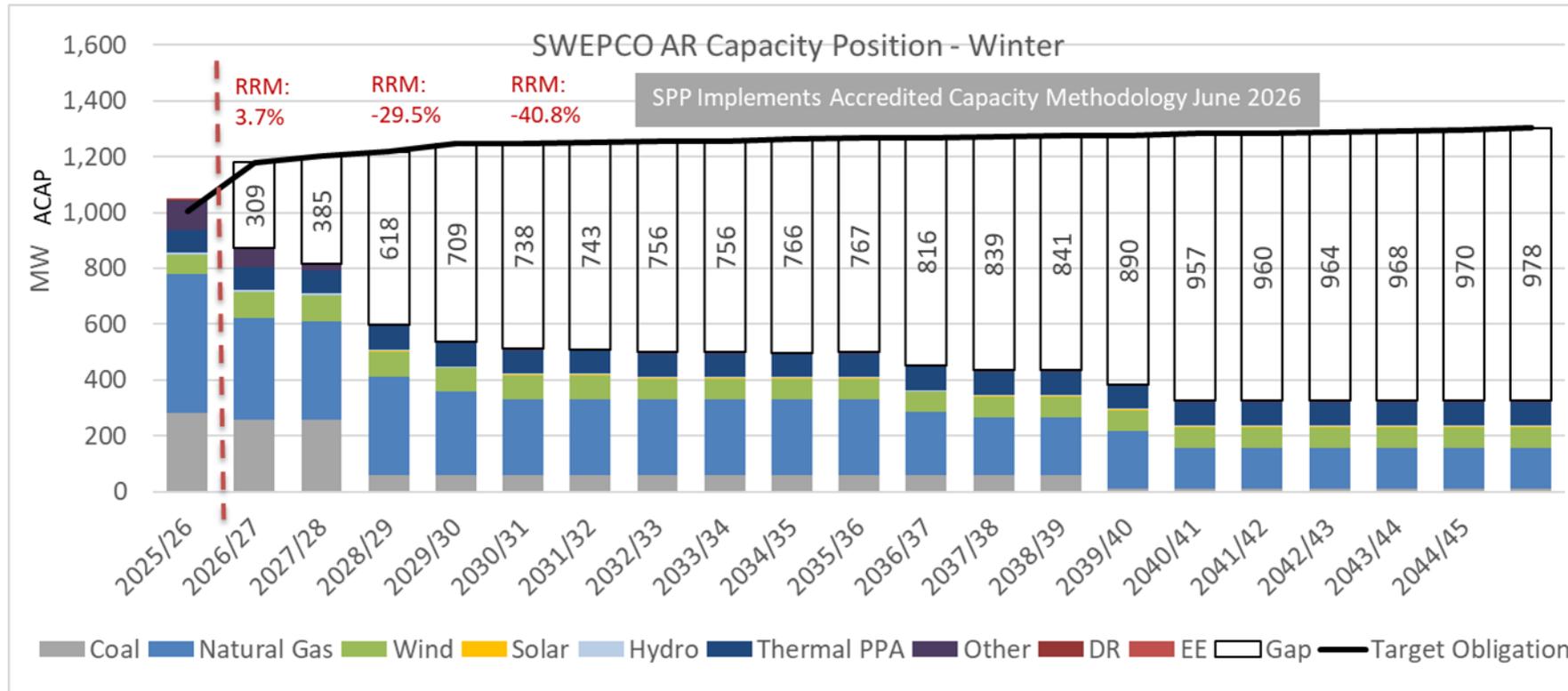
- ACAP PRM 15% through 2025, then 11% in 2026, +2%/yr through 2029.
- Thermal Resource Accredited Capacity reduction: ~790MW
- Target Obligation Includes an additional 6% target contingency (~260MW)

Arkansas Jurisdictional Position - Summer



- Arkansas jurisdictional percentage capacity need is larger than the full company needs assessment.

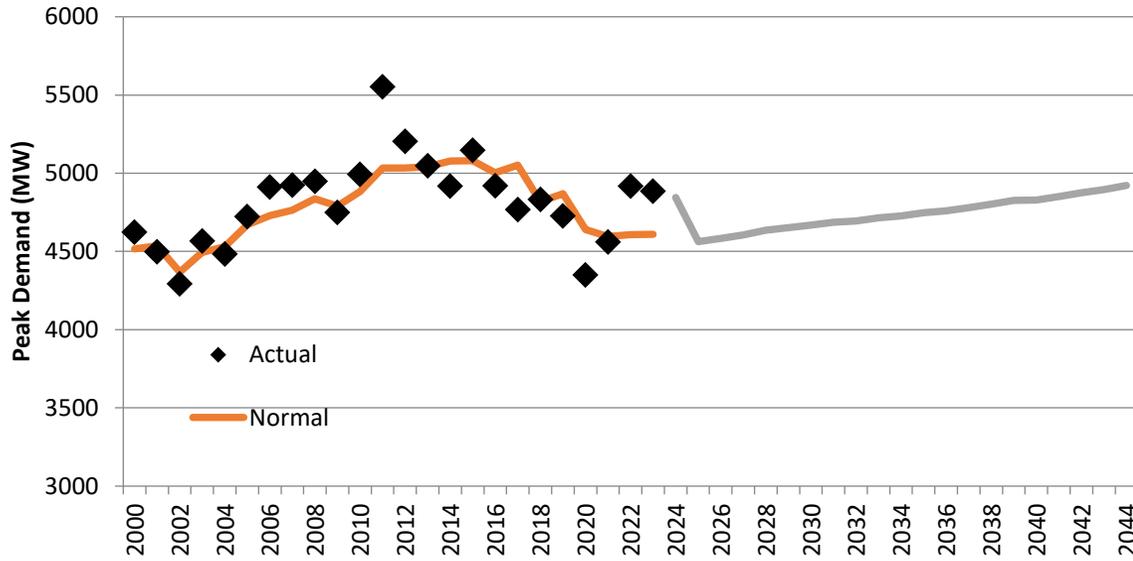
Arkansas Jurisdictional Position - Winter



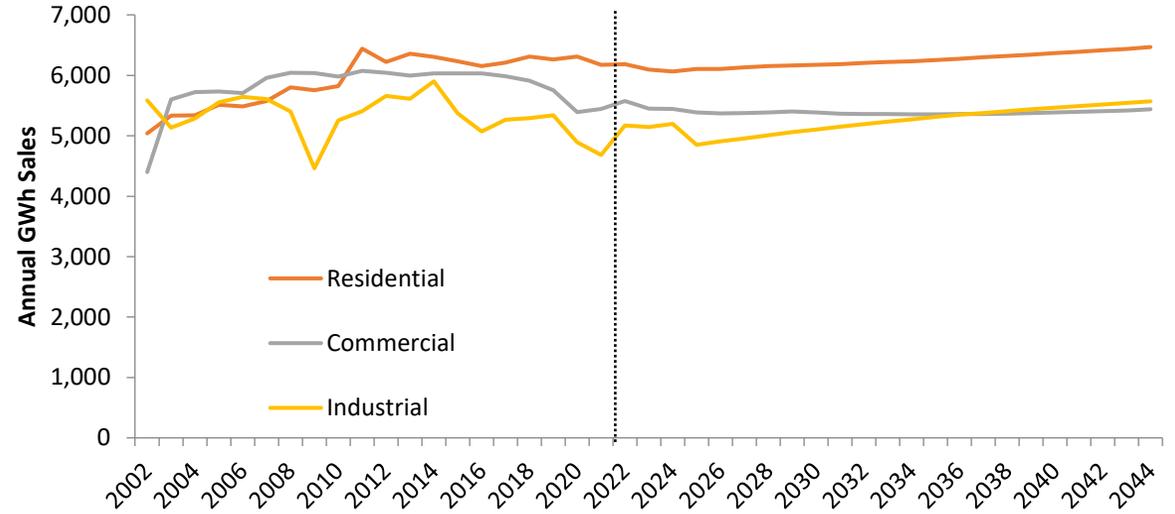
- Arkansas jurisdictional percentage capacity need is larger than the full company needs assessment.

Load Forecast

SWEPCO Peak Demand Forecast

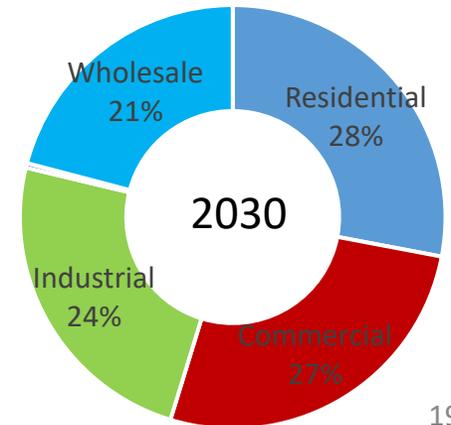
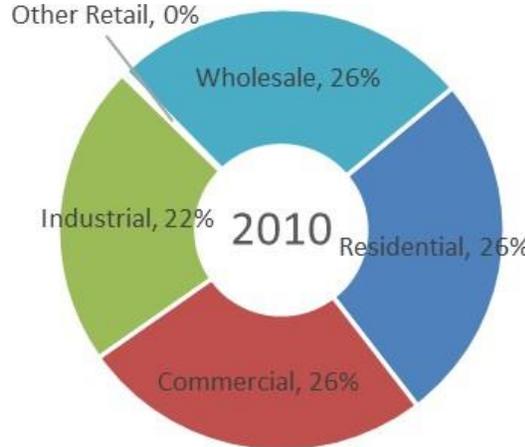


SWEPCO GWh Sales (Weather Normalized History & Forecast)



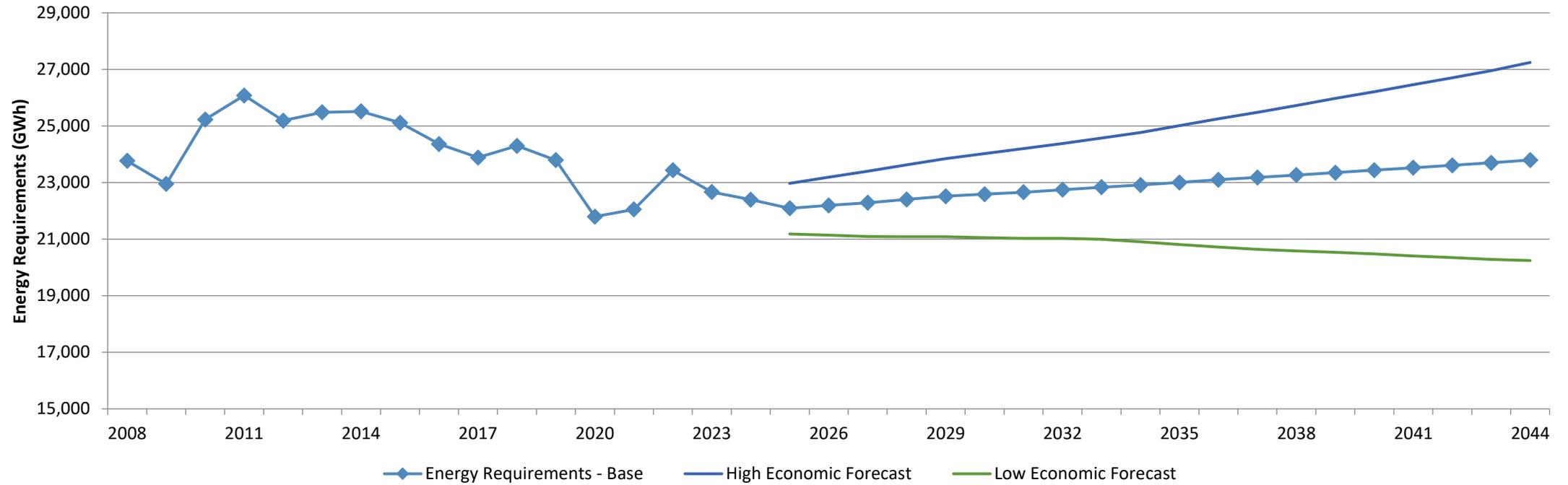
SWEPCO's peak demand forecast is relatively flat over the next decade. (CAGR -0.2% from 2024-2034.)

The growth in Residential sales (+0.3%) is being offset by projected declines in the Commercial (-0.2%) class sales over the next decade. Industrial sales are projected to be essentially flat (+0.1%).



Load Scenarios

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

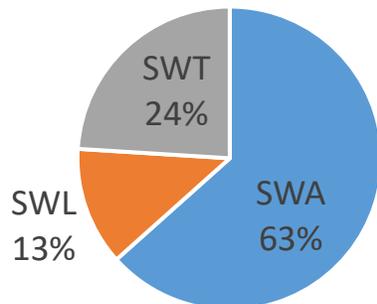


EV Projections

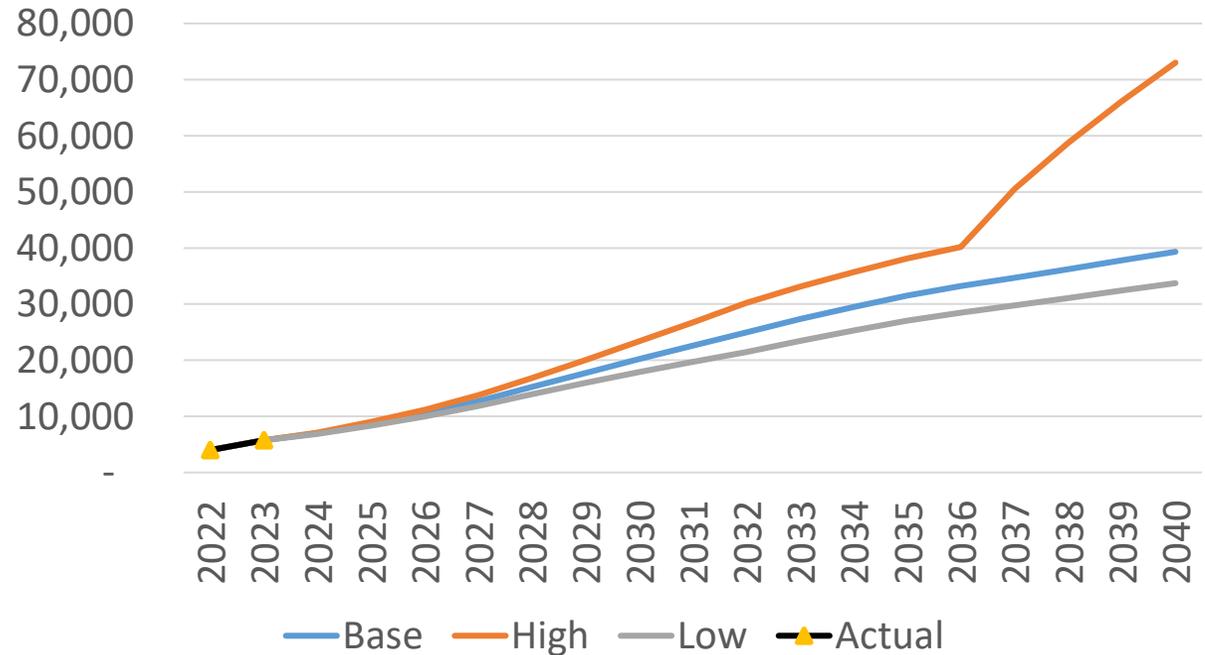
As of Q4-23, there were 5,758 electric vehicles (EVs) registered in SWEPCO's service territory, which is 0.3% of all vehicles registered.

SWEPCO's base projection for EVs assumes an average of 20% per year growth in EVs through 2030.

2030 EV Share



SWEPCO Electric Vehicle Projection

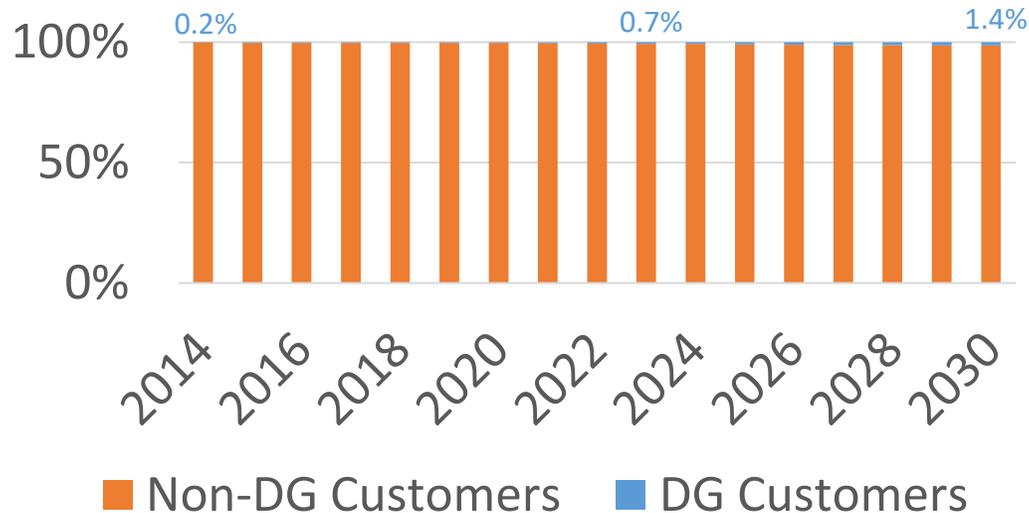


DG Projections

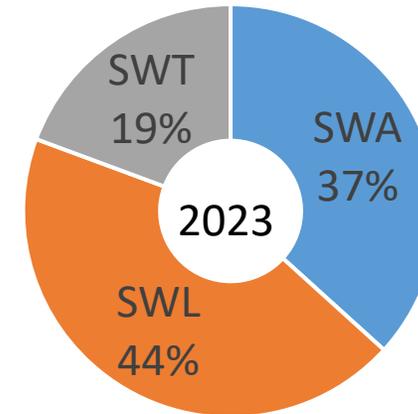
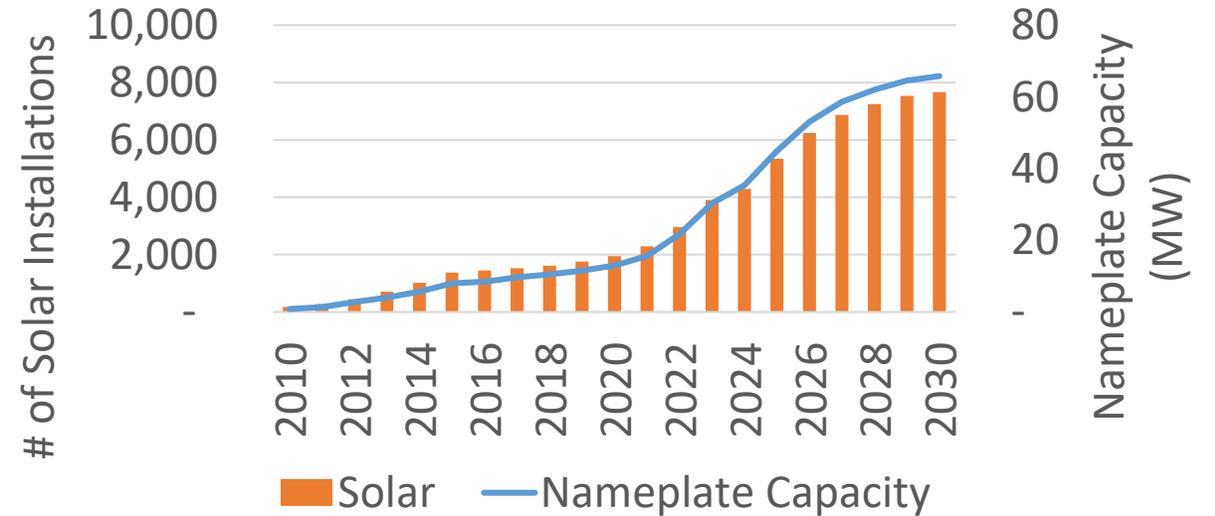
At the end of 2023, there were 3,903 customers with DG installations (0.7% of all customers).

By 2030, SWEPCO projects 1.4% of customers will have installed DG at their premise.

SWEPCO Solar DG Saturation



SWEPCO Solar DG Forecast



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

Enhanced Environmental Regulation

Scenario

Scenario Models EPA's 111d Rule Changes

- Proposed Rule Published May 11, 2023

Generators impacted:

- Exiting Coal units
- Existing natural gas units >300 MW
- New gas units

Scenario Summary:

- ~50% power price increase on expiration of IRA credits in 2046

Dispatchable Generation Options

Existing Coal Units Options to continue operation past 2032 must:

- Limit capacity factor to 20%, retire by 2035
- Blend 40% Natural Gas, retire by 2040
- Install CCS

Existing Natural Gas Units >300 MW and 50%

Capacity Factor:

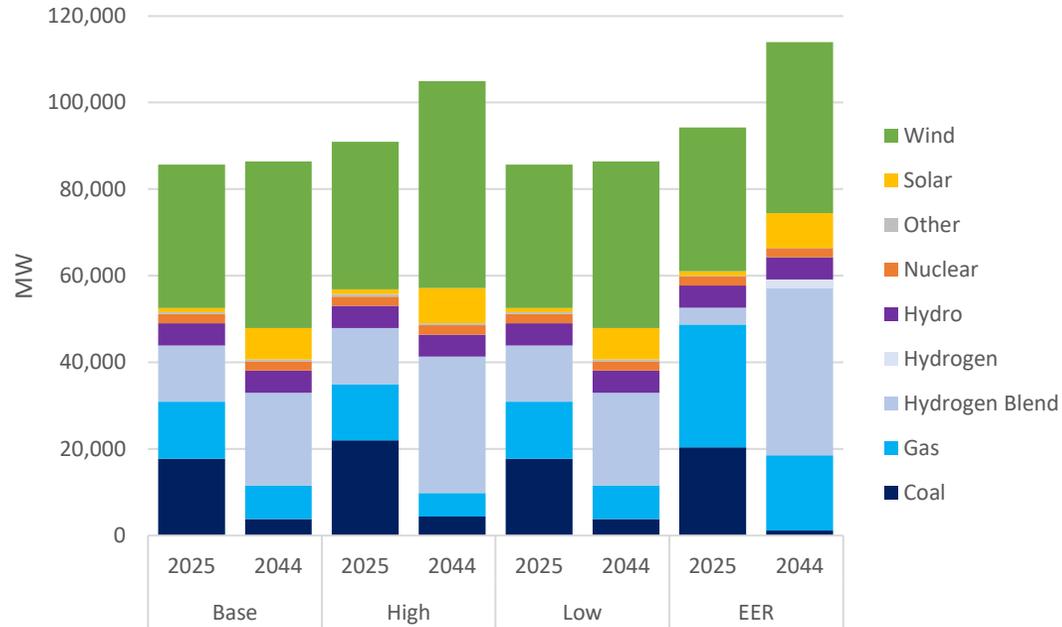
- Up to 96% hydrogen 4% natural gas fuel blend
- Install CCS

New Natural Gas Units:

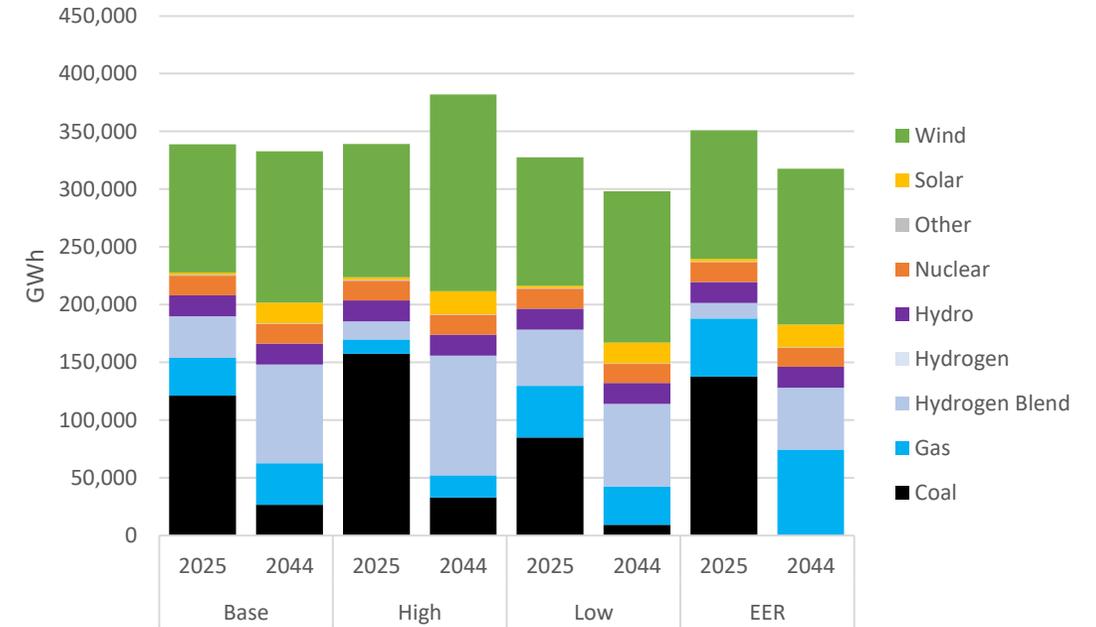
- Lower emitting fuels
- Hydrogen/natural gas blends (30%/70%, 4%/96% by vol)
- Install CCS

SPP Supply Mix Changes

Nameplate Capacity - SPP



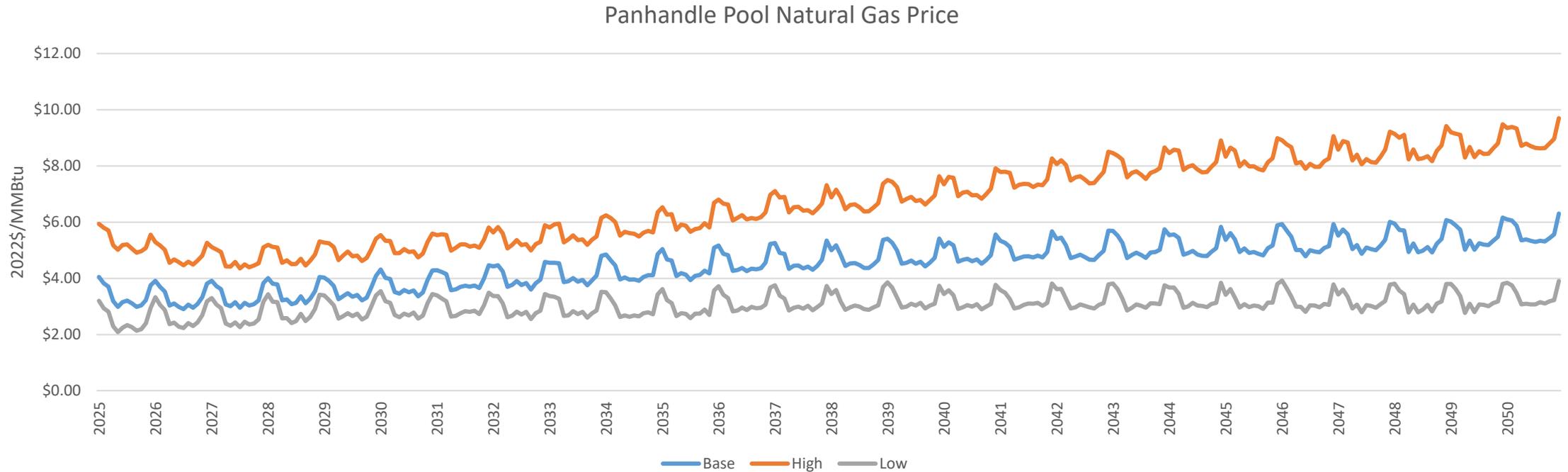
Total Generation - SPP



- Under all scenarios, coal is replaced primarily by NG/Hydrogen Blend units
- Wind represents 30% - 50% of installed capacity in all cases
- Solar sees significant growth in the long term

- Wind and natural gas fueled generation dominate the supply mix
- Natural gas/Hydrogen Blend units provide reliable, dispatchable generation as coal plants are retired

Natural Gas Inputs

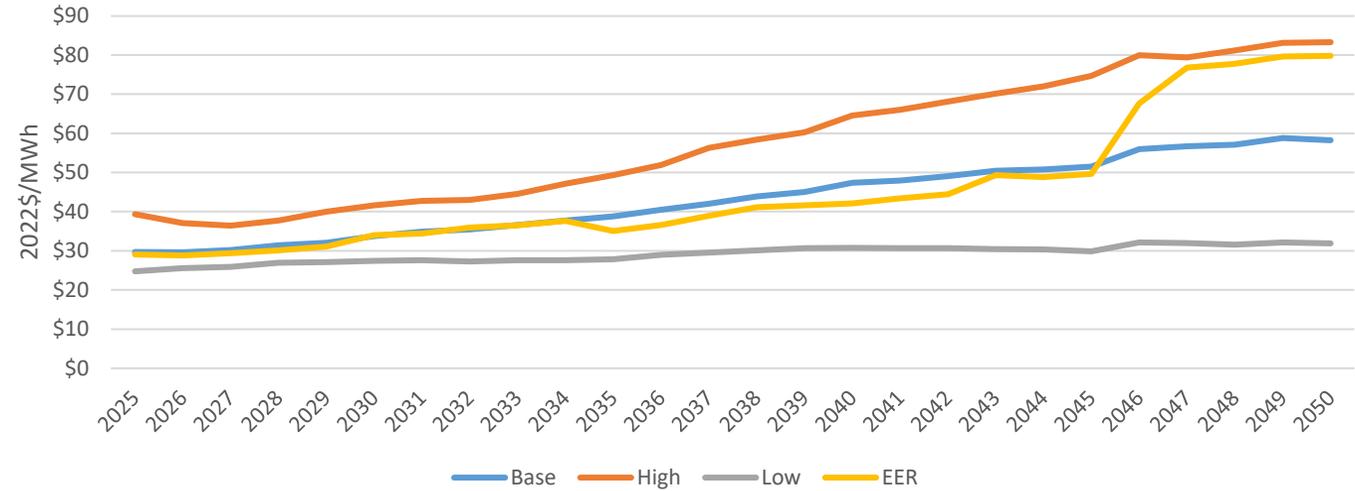


- Base case assumes that natural gas demand will increase as natural gas replaces coal
- High and Low cases have similar assumptions to Base except for WTI prices and LNG exports
 - High case assumes higher WTI prices and LNG exports
 - Low case assumes lower WTI prices and LNG exports

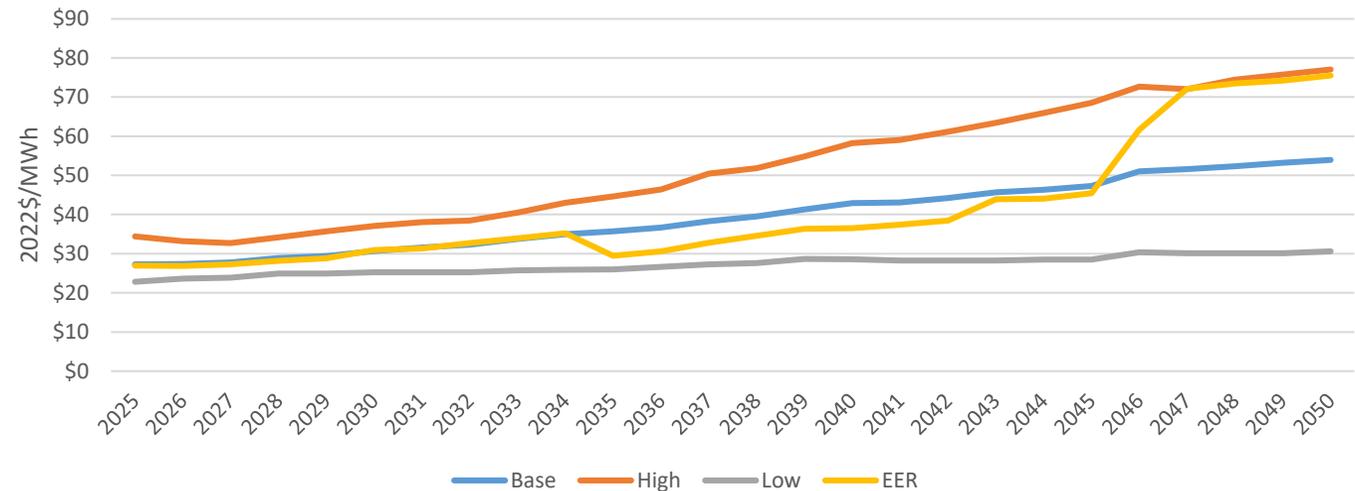
SPP Market Prices

- Base, High, and Low scenario energy prices are driven by natural gas prices
- EER scenario energy prices are driven by IRA incentives for hydrogen production and carbon capture
 - IRA incentives are assumed to expire 2046 – note increase in market prices
- Peak/Off-Peak spread averages are as follows:
 - Base: \$3.79/MWh
 - High: \$5.57/MWh
 - Low: \$2.00/MWh
 - EER: \$4.28/MWh

On-Peak Power Price (SPP South Hub)

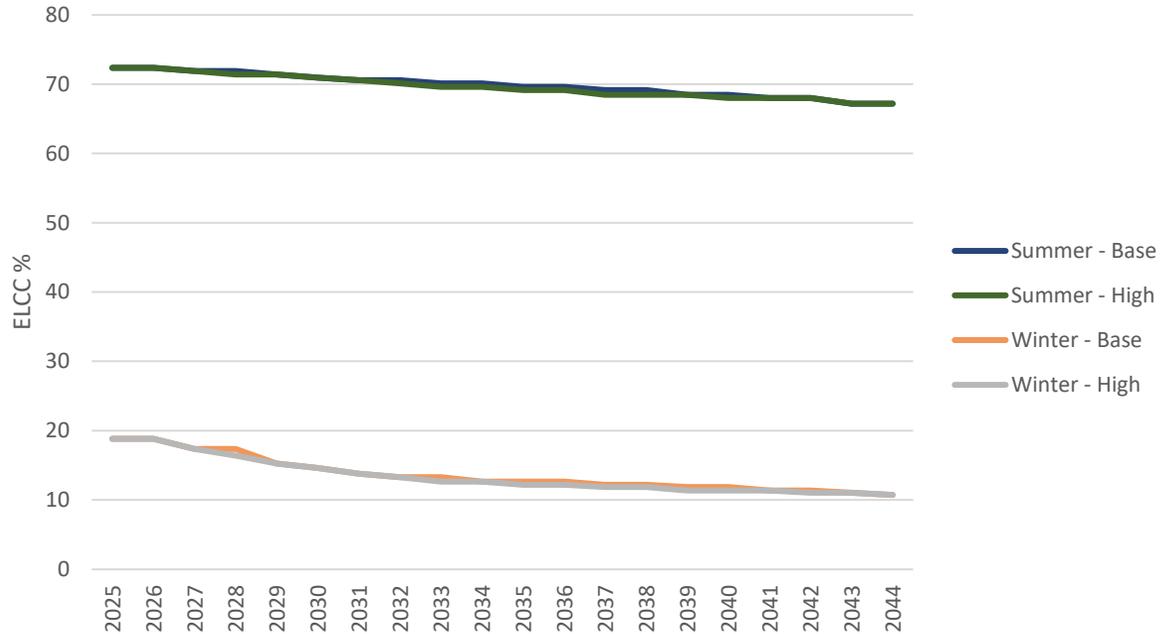


Off-Peak Power Price (SPP South Hub)

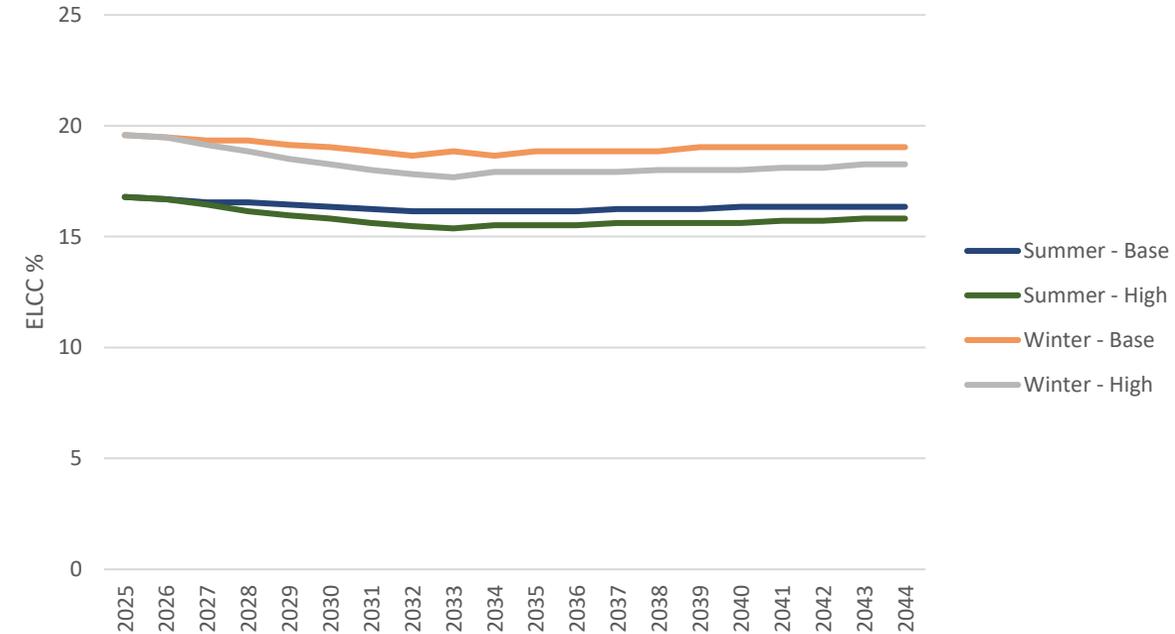


Solar & Wind ELCC Accreditation Values

Solar ELCC Values - SPP



Wind ELCC Values - SPP



- Solar ELCC accreditation values are based on SPP’s “2020 ELCC Wind and Solar Study Report” dated July 2021
- Wind ELCC accreditation values are based on SPP’s “2022 ELCC Wind and Solar Study Report” dated November 2022
- ELCC is calculated based on installed nameplate capacity divided by the peak demand for each year
- As the percent of installed nameplate capacity increases, the ELCC accreditation value decreases

Assumption Development

Supply-side resources assumptions were developed based on authoritative third-party sources.

Intermediate & Peaking Options

Renewable Options

Advanced Generation Options

Annual Energy Outlook 2023
with projections to 2050



Annual Energy Outlook 2023 Release at Resources for the Future

Joseph DeCarolis, EIA Administrator
Angelina LaRose, Assistant Administrator for Energy Analysis

March 16, 2023
www.eia.gov/aao



#AEO2023



Annual Technology Baseline:
The 2023 Electricity Update

Brian Mirletz, Laura Vimmerstedt, Sertac Akar, Greg Avery, Dana Stright,
Dipyo Akintipe, Chad Augustine, Phillip Bellor, Stuart Cohen, Wesley Cole,
Patrick Duffly, Annika Eberle, David Feldman, Partho Kurup, Daniel Mulas
Hernandez, Vignesh Ramasamy, Owen Roberts, Evan Rosenlab, Anna Schiller,
Tyler Shanks, Erik Witter, Jarett Zuboy (National Renewable Energy Laboratory)
Gbadebo Olatosun (Oak Ridge National Laboratory)
Jeffrey Hoffmann (U.S. Department of Energy, Office of Fossil Energy and
Carbon Management)
July 24, 2023

Step 1: Sourcing baseline technology costs and performance assumptions from EIA Annual Energy Outlook 2023



Step 2: Applying changes to technology cost and performance over time based on the Moderate Case projection by the National Renewable Energy Laboratory's Annual Technology Baseline 2023



Step 3: Applying IRA tax credits for eligible resources and other estimated cost adders such as Interconnection costs, NG Reservation fees and estimated congestion costs

Step 1: Collate projections of technology costs and performance from various third-party sources



Step 2: Analyze projections, identify outliers and form central estimates of technology costs and performance over time

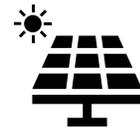
Supply Side Resources

SWEPSCO evaluated three categories of supply side resources to identify the optimal resource mix that is resilient to future uncertainties.



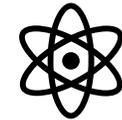
Intermediate & Peaking Options

- H-Class 430 MW single-shaft natural gas combined cycle (NGCC)*
- H-Class 1,080 MW multi-shaft NGCC*
- F-Class 760 MW multi-shaft NGCC*
- 430 MW H-class single shaft NGCC with 90% carbon capture
- F-Class 240 MW natural gas combustion turbine (NGCT*)
- 100 MW aeroderivative unit
- 20 MW reciprocating engine



Renewable & Storage Options

- Utility-scale onshore wind
- Utility-scale solar photovoltaic
- Utility-scale hybrid solar photovoltaic (3:1)
- Storage Resources
 - Lithium-ion battery: 4, 6, 8, 10-hour
 - 100-hour



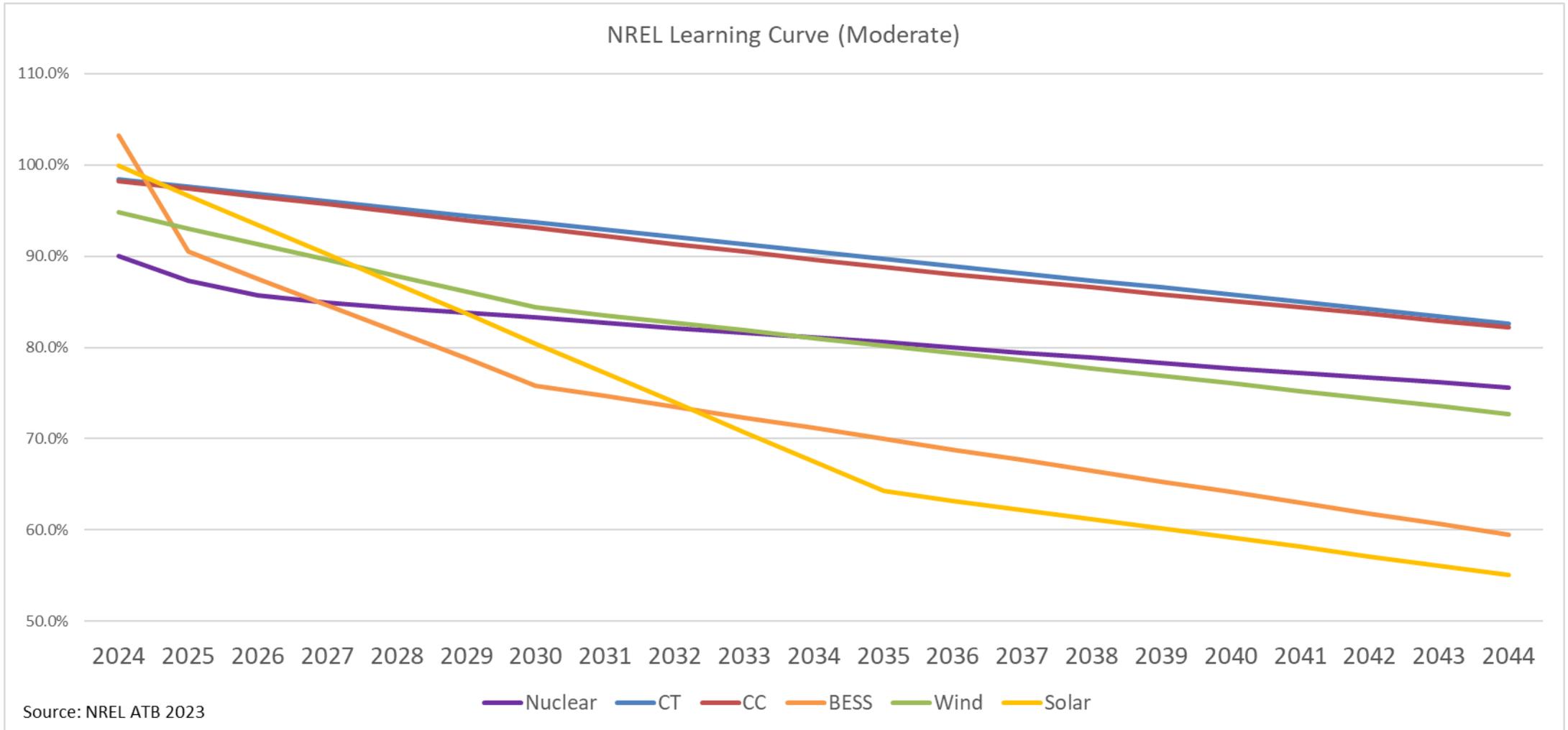
Advanced Generation Options

- Small modular nuclear reactors

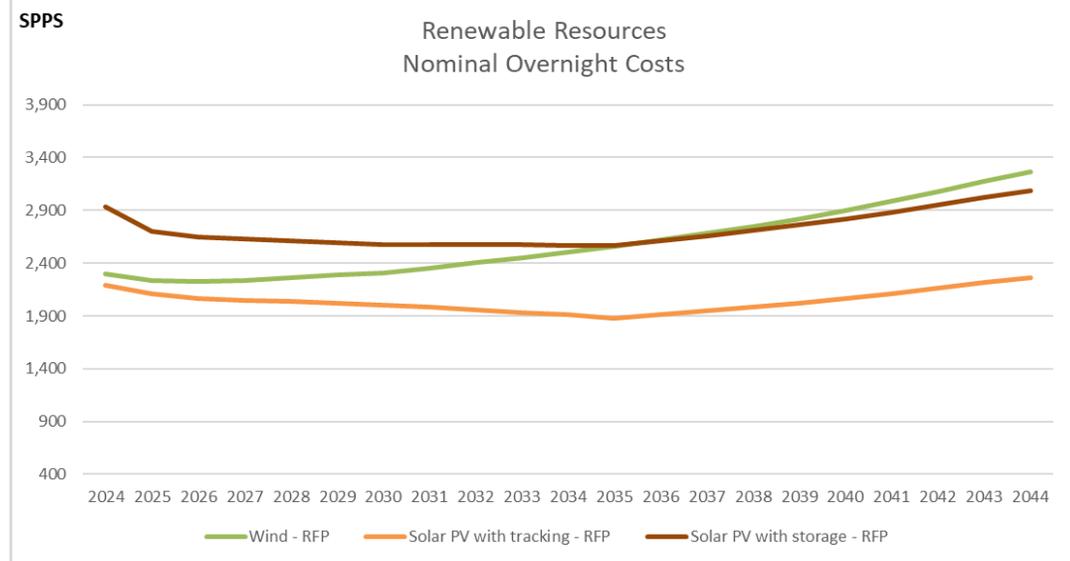
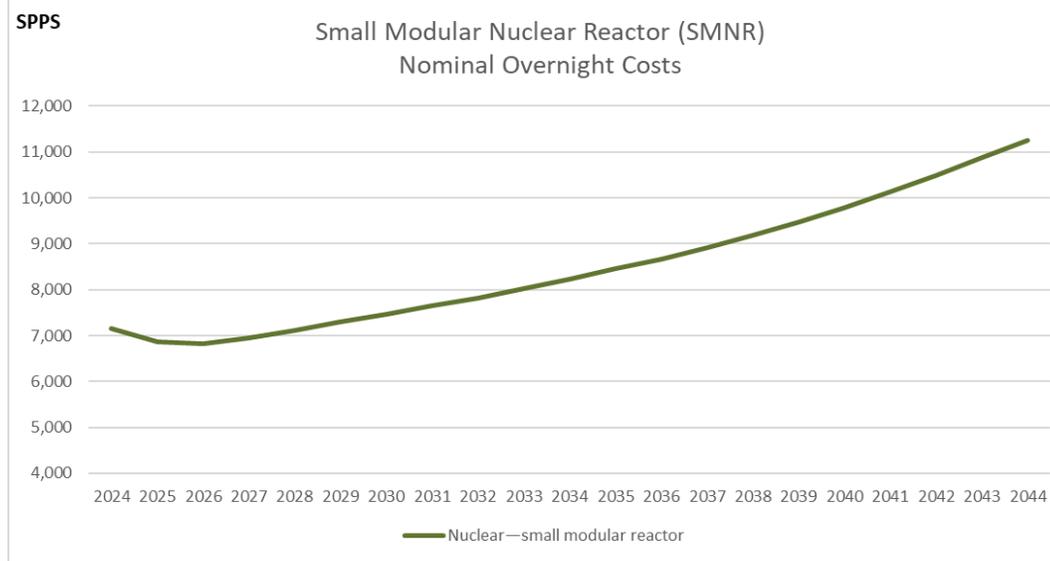
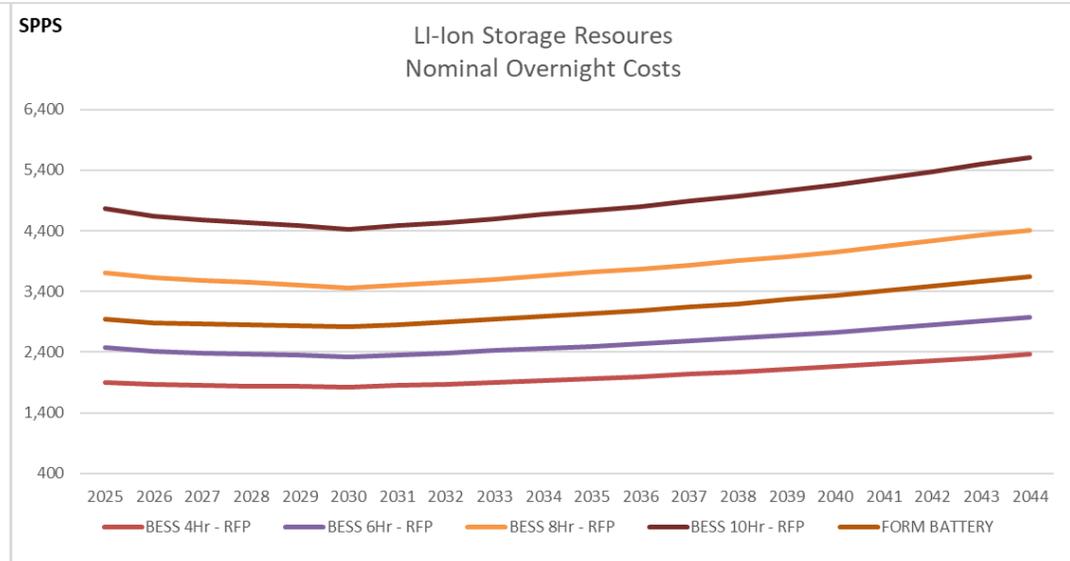
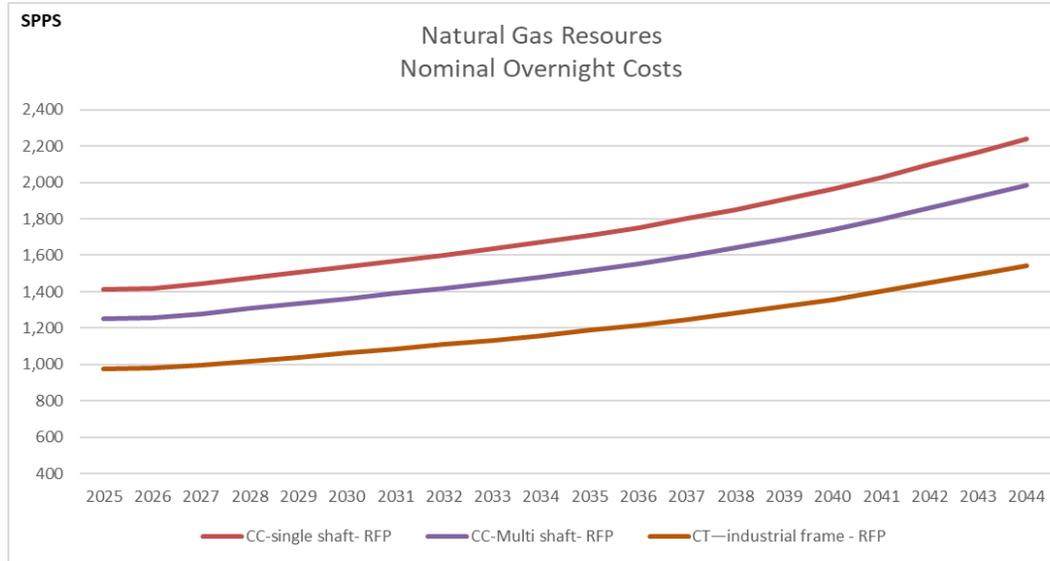
Baseline Assumptions – New Resources

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	2029	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

Technology Learning Curves



Technology Cost Projections



Resource Cost Adjustments

IRA Tax Credits

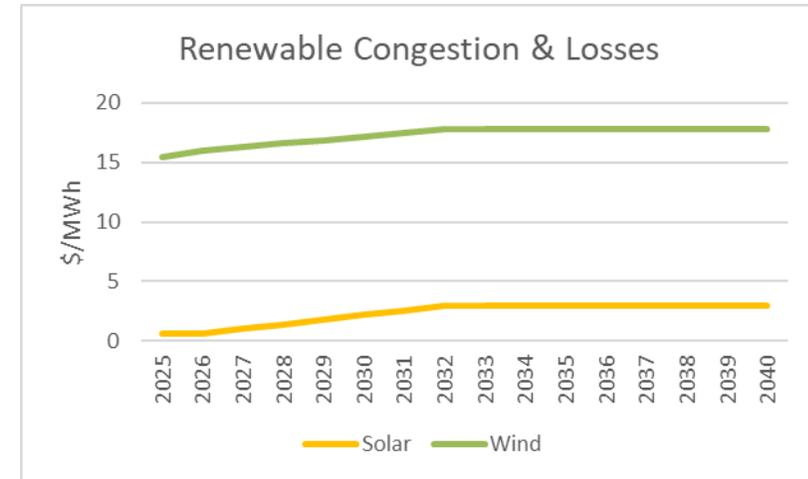
	PTC CREDITS % *	ITC Credits % *	CO ₂ Seq. Credit (\$/tonne)
2023	100%	30%	
2024	100%	30%	
2025	100%	30%	85
2026	100%	30%	87
2027	100%	30%	89
2028	100%	30%	91
2029	100%	30%	93
2030	100%	30%	95
2031	100%	30%	97
2032	100%	30%	99
2033	100%	30%	
2034	100%	30%	
2035	75%	26%	
2036	50%	22%	
2037	0%	0%	
2038	0%	0%	
2039	0%	0%	
2040	0%	0%	

SPP Network & Interconnection

Resource Type	NW & IC (\$/kW)
Thermal	\$32
Wind	\$113
Solar	\$157

Source:
Thermal: LBL, Wind & Solar:
SWEPCO RFP Analysis

Firm Gas Reservation	\$0.2441/ MMBtu
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Source:
AEP Transmission Planning

* 4 year safe harbor assumed

Technology Proposed Modeling Limits

Technology	First Year Available	Block Size (MW)	Annual Limit (MW)	Cumulative Technology Total [MW]
NGCC H-Class Single-Shaft	2032	418	836	4598
NGCC H-Class Multi-Shaft	2032	1100	1100	4400
NGCC F-Class Multi-Shaft	2032	760	760	4560
NGCC H-Class Single-shaft with 90% Carbon Capture	2032	390	780	4290
NGCT F-Class 240 MW	2031	240	720	4560
100 MW Aeroderivative	2031	105	210	945
20 MW Reciprocating Engines	2031	21	105	900
4-Hour Duration Lithium-Ion Battery	2029	50	50	250
6-Hour Duration Lithium-Ion Battery	2029	50	100	500
8-Hour Duration Lithium-Ion Battery	2029	50	100	500
10-Hour Duration Lithium-Ion Battery	2029	50	50	250
100-Hour Duration Storage	2029	20	20	200
Utility-scale Onshore Wind Tier 1	2029	75	300	3000
Utility-scale Onshore Wind Tier 2	2029	75	300	
Utility-scale Solar Photovoltaic Tier 1	2029	50	600	4500
Utility-scale Solar Photovoltaic Tier 2	2029	50	600	
Utility-scale Solar + Storage (3:1)	2029	150	300	1500
Small Modular Reactor	2036	300	600	4,500
Short Term Market Purchases	2024	1	200	400

Existing Site Technology Assumptions

Technology	First Year Available	Block Size (MW)	Annual Limit (MW)	Cumulative Technology Total [MW]
Welsh 1 (&3) Unit Fuel Conversion	2028	525	1050	1050
Early NGCT F-Class 240 MW**	2029	240	480	480

Demand Side Resources

Draft Energy Efficiency Bundles

Residential Energy Efficiency Bundles

Bundle	Installed Cost (\$/kWh)	Yearly Potential Savings (MWh) 2027-2031	Yearly Potential Savings (MWh) 2032-2036	Yearly Potential Savings (MWh) 2037-2041	Yearly Potential Savings (MWh) 2042-2046	Bundle Life
Thermal Shell - AP	\$0.20	4,839	2,639	3,286	3,455	10
Thermal Shell - HAP	\$0.30	14,936	1,335	919	0	10
Heating/Cooling - AP	\$0.72	48,168	12,034	1,508	1,526	18
Heating/Cooling - HAP	\$1.09	6,832	0	0	0	18
Water Heating - AP	\$0.48	12,013	4,880	5,631	3,351	14
Water Heating - HAP	\$0.67	28,528	4,574	5,273	0	14
Appliances - AP	\$0.22	17,643	1,800	2,059	1,891	13
Appliances - HAP	\$0.31	4,272	0	0	0	12
Lighting - AP	\$0.08	1,406	0	0	0	31
Lighting - HAP	\$0.12	930	0	0	0	30
Behavioral Programs	\$0.05	13,737	0	0	0	2

Energy Efficiency bundles will be developed to optimize selection of EE resources as part of the total least reasonable cost solution.

Commercial Energy Efficiency Bundles

Bundle	Installed Cost (\$/kWh)	Yearly Potential Savings (MWh) 2027-2031	Yearly Potential Savings (MWh) 2032-2036	Yearly Potential Savings (MWh) 2037-2041	Yearly Potential Savings (MWh) 2042-2046	Bundle Life
Heat Pump - AP	\$11.48	35,003	4,667	4,832	5,384	19
Heat Pump - HAP	\$17.31	19,838	0	0	0	19
HVAC Equipment - AP	\$0.09	5,162	766	711	0	15
HVAC Equipment - HAP	\$0.16	3,770	0	0	0	15
Indoor Screw-In Lighting - AP	\$0.01	3,295	0	0	0	6
Indoor Screw-In Lighting - HAP	\$0.02	1,399	0	0	0	6
Indoor HID/Fluor. Lighting - AP	\$0.11	22,595	2,094	0	0	14
Indoor HID/Fluor. Lighting - HAP	\$0.16	2,511	0	0	0	14
Outdoor Lighting - AP	\$0.18	4,652	580	0	0	15
Outdoor Lighting - HAP	\$0.26	5,168	0	0	0	15

Proposed Candidate 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

Proposed 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 (Resource Screening - RFP) + 25%	Base
Low Technology Costs	Base	Base	Base	Base (Resource Screening - RFP) - 25%	Base

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 7-yr Rate CAGR, <i>Reference Case</i>	Long Term 20-yr NPVRR, <i>Reference Case</i>	Portfolio Resilience: High Minus Low Scenario Range, 20-yr NPVRR	Energy Market Risk Purchases	Energy Market Risk Sales	Planning Reserves % Reserve Margin	Fleet Resiliency: Dispatchable Capacity	Resource Diversity	Emission Reductions: % Reduction from 2005 Baseline - Reference Case CO ₂ , NO _x , SO ₂		
Year Ref.	2025-2031	2025-2044	2025-2044	2033 2044	2033 2044	2033 2044	2033 2044	2033 2044	2044		
Units	%	\$MM Levelized Rate	\$MM Levelized Rate	NPVRR of Market Purchases % of Total Demand	NPVRR of Market Sales % of Total Demand	%	Dispatchable Nameplate MW % of Company Peak Demand	Portfolio Index	% Reduction CO ₂ NO _x SO ₂		
Reference Portfolio											

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

Customer Affordability

The Customer Affordability indicators compare the cost to customers under Reference Scenario conditions over the short- and long-term. These metrics illustrate differences in performance under the expected case.

Performance Indicator	Metric	Description
Short-term	7-year Rate CAGR under the Reference Scenario (2025-2031)	<ul style="list-style-type: none"> • SWEPCO measures and considers the expected Compound Annual Growth Rate (“CAGR”) of expected system costs for the years 2025-2031 as the metrics for the short-term performance indicator. • A lower number is better, indicating slower growth in customer rates.
Long-term	20-yr NPVRR under the Reference Scenario (2025-2044)	<ul style="list-style-type: none"> • SWEPCO measures and considers the growth in Net Present Value Revenue Requirement (“NPVRR”) over 20 years as the long-term metric. • NPVRR represents total long-term cost paid by SWEPCO related to power supply. This includes plant O&M costs, fuel costs, environmental costs, net purchases and sales of energy and capacity, property and income taxes, and the return on capital. • SWEPCO also evaluates the levelized rate for this indicator, which is the fixed charge needed on a per MWh basis to recover the 20-yr NPVRR. • A lower number is better, indicating lower costs to supply customers with power.

Rate Stability

The Rate Stability indicators compare the risk that cost to customers will be higher than expected, either due to a change in fundamental market conditions or due to short-duration high-impact events, like extreme weather.

Performance Indicator	Metric	Description
Portfolio Resilience	High Minus Low Scenario Range 20-yr NPVRR (2025-2044)	<ul style="list-style-type: none"> • SWEPCO measures and considers the range of 20-yr NPVRR reported by each portfolio across all SPP market scenarios. This metric reports the difference between the highest and lowest cost scenarios reported by the candidate portfolio on an NPVRR and levelized rate basis. • A lower number is better, indicating a tighter grouping of expected customer costs across a wide range of long-term market conditions.
Energy Market Risk	2033 & 2044 Portfolio Range of market exposure Purchases NPVRR, MWh as % of internal Load	<ul style="list-style-type: none"> • SWEPCO measures and considers the reliance of each candidate portfolio on market purchases to balance seasonal generation with customer load. • The metric reports the cost of market purchases and MWhs in 2033 & 2044 • Closer to zero indicates less reliance on the market to meet customer needs
	2033 & 2044 Portfolio Range of market exposure sales NPVRR, MWh as % of internal Load	<ul style="list-style-type: none"> • SWEPCO measures and considers the reliance of each candidate portfolio on market sales to balance seasonal generation with customer load. • The metric reports the revenues of market sales and MWhs in 2033 & 2044 • Closer to zero indicates less reliance on the market to meet customer needs

Reliability

The Reliability indicators compare the amount of excess reserves, the amount of dispatchable capacity in the fleet, and the technology diversity of the SWEPCO generating mix across candidate portfolios.

Performance Indicator	Metric	Description
Planning Reserves	Reserve Margin % 2025-2044	<ul style="list-style-type: none"> SWEPCO measures and considers the amount of average amount of firm capacity in each candidate portfolio over the next 20 years on a seasonal basis. A higher number is better, indicating more reserves are available to meet SPP requirements.
Fleet Resiliency	Nameplate MW of dispatchable units in 2033 and 2044	<ul style="list-style-type: none"> SWEPCO measures and considers the total amount of dispatchable units added to the portfolio by years 2033 and 2044 to compare candidate resource plans. The metric for this indicator is the total Nameplate MW of ramping technologies included in the candidate resource plan. A higher number is better, indicating greater ability to ramp generation up or down to react to market conditions and follow load.
Resource Diversity	Sum of the Capacity Diversity Index and Energy Diversity Index in 2033 and 2044	<ul style="list-style-type: none"> SWEPCO measures and considers the capacity and energy diversity of new technologies added to its portfolio when comparing candidate portfolios. The metric will include a capacity diversity index and an energy diversity index for each Portfolio in year 2033 and 2044. A higher number is better, a portfolio that includes diverse resources for both capacity and energy delivery mitigates customers to performance risk when conditions for that technology are unfavorable.

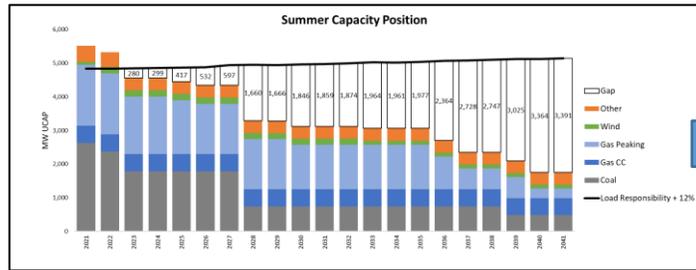
Sustainability

SWEPCO also considered a Sustainability indicator to compare portfolio performance towards meeting corporate sustainability targets.

Performance Indicator	Metric	Description
CO ₂ , NO _x , SO ₂ , Emissions	2033 & 2044 % Reduction from 2005 Baseline - Reference Case	<ul style="list-style-type: none"> SWEPCO measures and considers the total amount of expected CO₂, NO_x and SO₂ emissions of each candidate portfolio on the Scorecard. This metric compares the forecast emissions of candidate portfolios in 2033 and 2044 under Reference Case market conditions with SWEPCO's actual historical emissions from the year 2005. A higher number is better, indicating greater levels of emissions reductions have been achieved and customers are less exposed to potential future CO₂ costs.

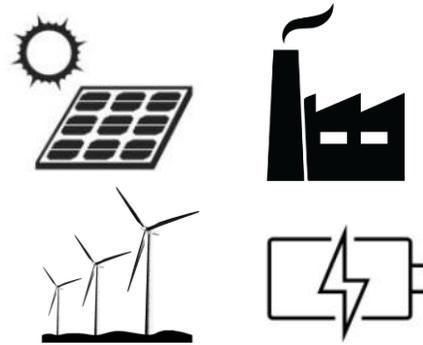
Selection of the Preferred Plan

Going in View



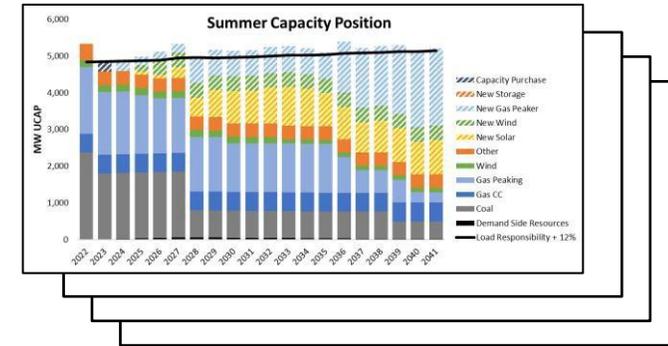
The going in positions shows a need for new capacity to meet SWEPCO customer requirements

Resource Options



SWEPCO 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

Stakeholder Feedback

Feedback and Discussion

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/>

