SOUTHWESTERN PUBLIC SERVICE COMPANY
2023 NEW MEXICO INTEGRATED RESOURCE PLAN

1st In-Person Facilitated Stakeholder Meeting

June 13 – 14, 2023 – Roswell, New Mexico

SYSTEM OVERVIEW RECAP

Current Summer SPS Loads and Resources Table - Planning Load

LINE NO.	DESCRIPTION	2024	2025	2026	2027	2028	2029	2030
1	TOTAL ACCREDITED CAPACITY (MW)	5,418	5,411	5,158	4,918	4,472	3,178	3,170
2	FIRM LOAD OBLIGATION	4,332	4,580	4,680	4,735	4,881	4,898	5,032
3	TOTAL PLANNING RESERVE MARGIN	650	687	702	710	732	735	755
4	CAPACITY NEED	4,982	5,267	5,383	5,446	5,613	5,633	5,787
5	RESOURCE POSITION (MW): LONG/(SHORT)	436	144	(224)	(527)	(1,141)	(2,455)	(2,618)

- Resource Position is an important factor for determining the need for new generating resources during the planning period - It is ***not*** the only consideration

Existing Generation

Updated slide to include 2024

2024 Capacity Overview by Resource Type

Resource Type	Maximum Capability (MW)	Accredited Capacity (MW)
Coal	1,067	1,067
Coal to Gas	1,018	1,018
Gas – Steam	1,427	1,427
Gas – CT	822	822
Gas – CC	558	558
Wind	2,451	447
Solar	190	78*
Total	**7,533**	**5,418**

**NM Approved portion only*

- The maximum capability of a unit is the maximum output of a generator
- Accredited capacity considers a generators production during peak demand

Existing SPS Generating Resources

By request

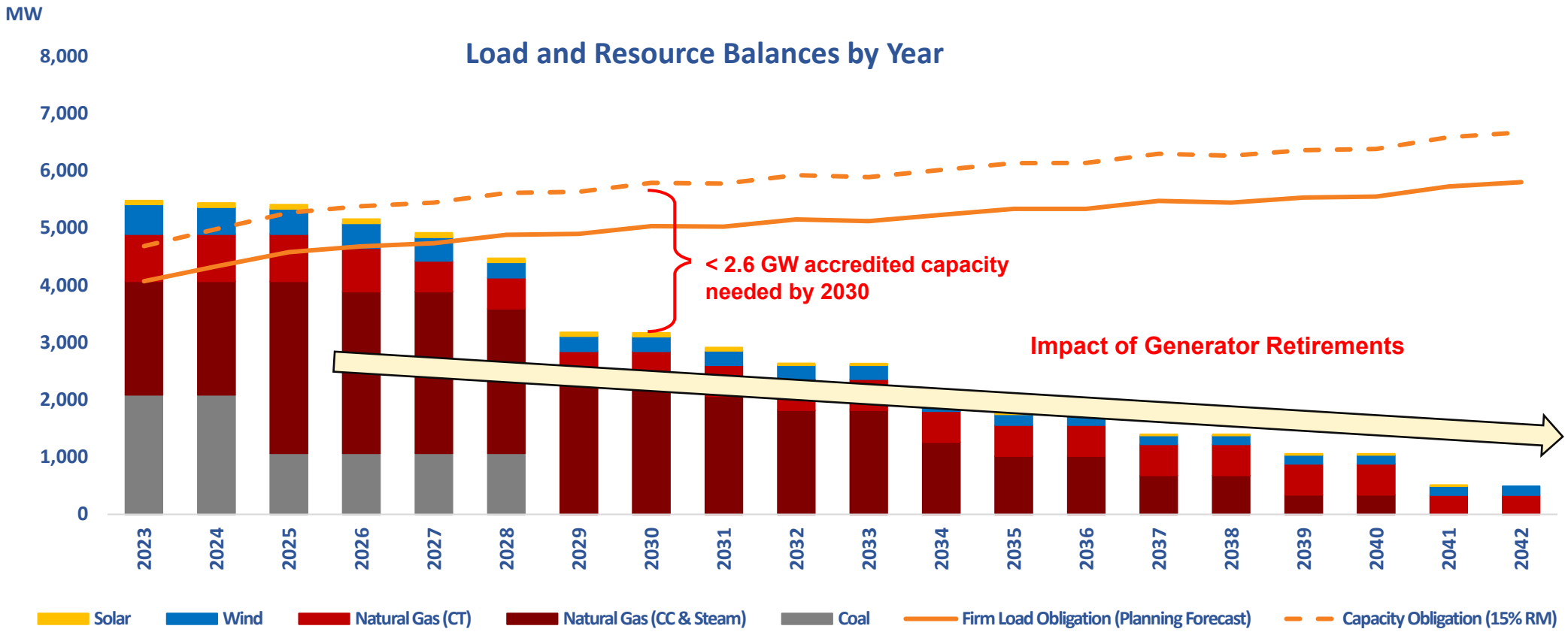
Plant Name	Fuel	Maximum Capability	COD Year	Retirement / Expire
Cunningham 2	Gas ST	183	1965	2025
Maddox 2	Gas CT	61	1976	2025
Blackhawk (PPA)	Gas CT	220	1999	2026
Nicholas 2	Gas ST	106	1962	2027
Plant X 4	Gas ST	189	1964	2027
Tolk 1	Coal	532	1982	2028
Tolk 2	Coal	535	1985	2028
Nicholas 1	Gas ST	107	1960	2028
Maddox 1	Gas ST	112	1967	2028
Nicholas 3	Gas ST	244	1968	2030
Jones 1	Gas ST	243	1971	2031
Jones 2	Gas ST	243	1974	2034
Hobbs (PPA)	Gas CC	558	2008	2034
Harington 1	Coal-to-Gas	339	1976	2036
Harington 2	Coal-to-Gas	339	1978	2038
Harington 3	Coal-to-Gas	340	1980	2040
Cunningham 3	Gas CT	106	1998	2040
Cunningham 4	Gas CT	101	1998	2040
Jones 3	Gas CT	166	2011	2056
Jones 4	Gas CT	168	2013	2058

Plant Name	Type	Maximum Capability	COD Year	Retirement / Expire
Caprock	Wind	80	2004	2024
San Juan	Wind	120	2005	2025
Wildorado	Wind	161	2007	2026
Spinning Spur	Wind	161	2012	2027
SunEd	Solar	50	2011	2031
Mammoth Wind	Wind	199	2014	2034
Palo Duro Wind	Wind	250	2014	2034
Roosevelt Wind	Wind	250	2015	2035
Chaves	Solar	70	2016	2041
Roswell	Solar	70	2016	2041
Hale	Wind	478	2019	2044
Sagamore	Wind	522	2020	2045
Lorenzo	Wind	80	2018	2048
Wildcat	Wind	150	2018	2048

Within the 20-year planning period:

- All existing thermal generation is scheduled to retire, except Jones 3 & 4 (234 MW)
- All renewable generation is scheduled to expire / retire except Sagamore, Hale, Lorenzo, Wildcat

New Mexico Load vs. Current Resources Balance - Planning Forecast (1),(2)



1. Based on Summer Planning Load Forecast, 1H23
2. Capacity MWs shown on an accredited “firm” basis

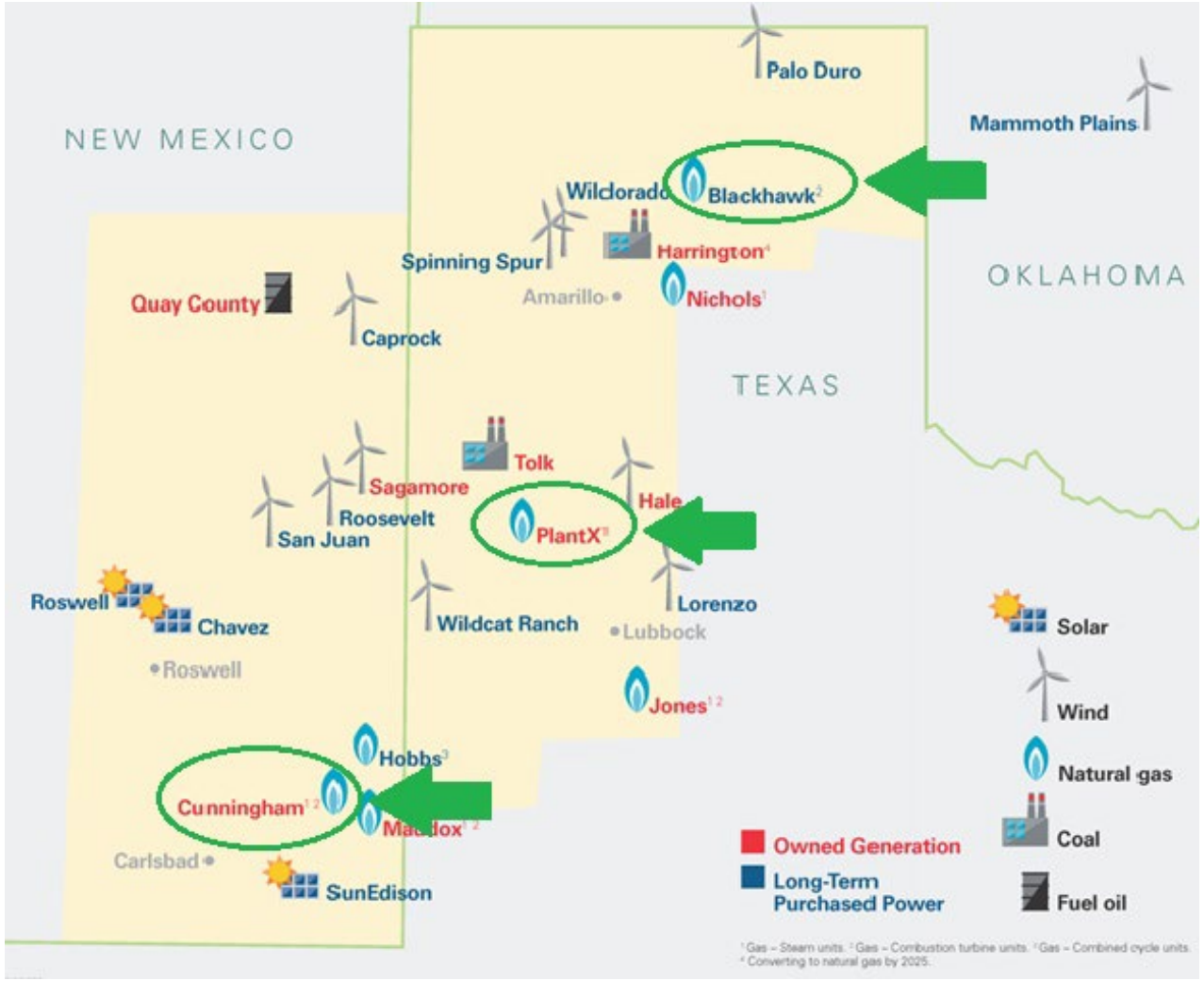
2021 ACTION PLAN UPDATE

2021 IRP – ACTION PLAN UPDATE

- SPS's initial 2021 IRP action plan did not identify the need for any new generating resources
- However, SPS supplemented the action plan to incorporate the following changes:
  - Passage of the Inflation Reduction Act
  - Increase in planning reserve margin requirement from 12% to 15%
  - Implementation of the ELCC methodology for renewable accreditation
  - Increased load growth – particularly in SE New Mexico
- In November 2022, in accordance with the supplemented action plan, SPS filed an all-source solicitation for new generating resources
- In June 2023, SPS announced the successful projects that would be advanced to contract negotiations*

*As negotiations are on-going, SPS cannot share commercially sensitive information at this time

2022 RFP Bid Selection

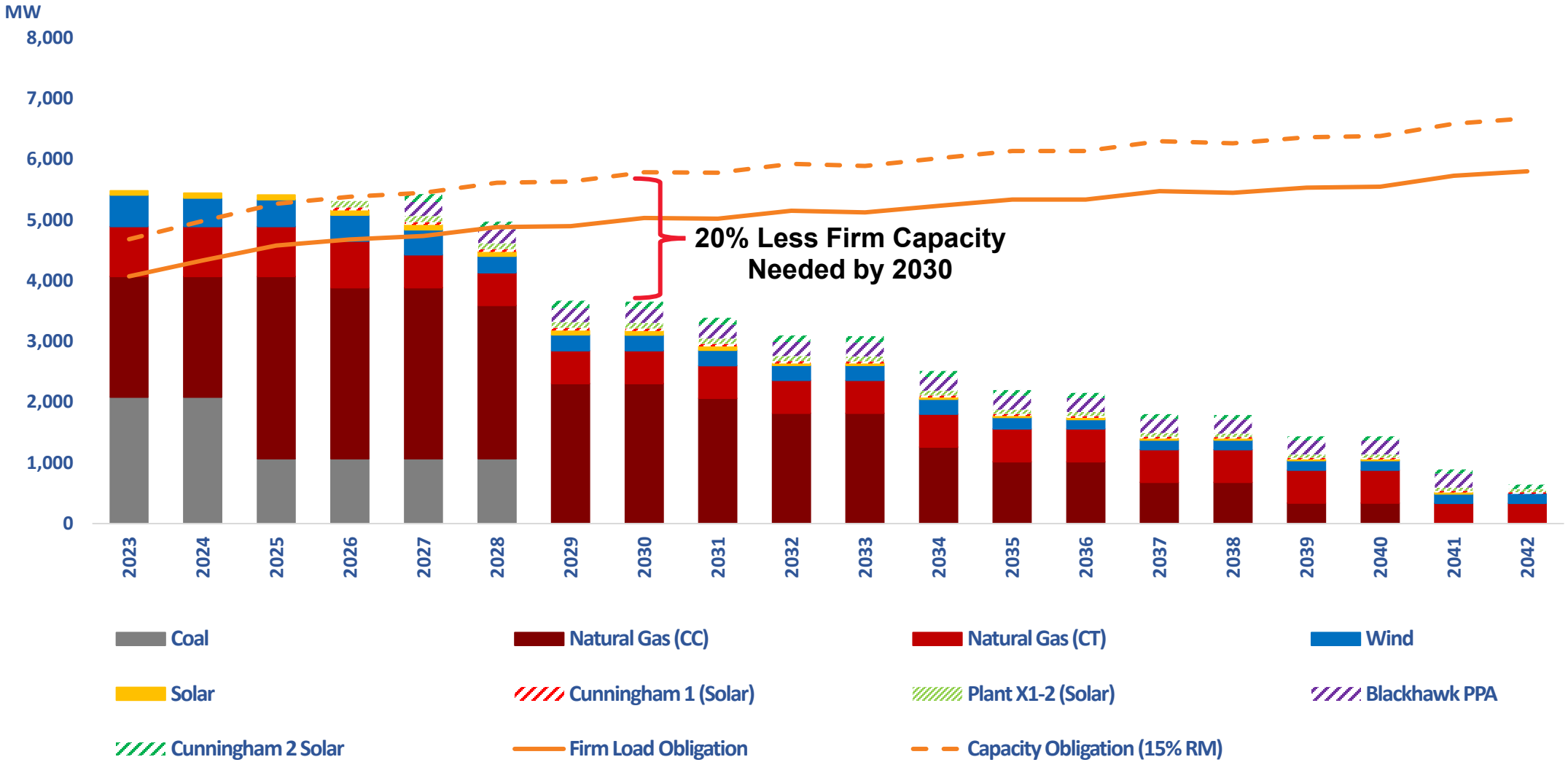


Bidder	Project	Tech	Size(MW)	COD
SPS	Plant X1-2 Solar	Solar	150	4/1//2026
SPS	Cunningham1 Solar	Solar	72	4/1/2026
SPS	Cunningham 2 Solar	Solar	196	4/1/2027
Contour Global	Blackhawk Station	Thermal	230	Existing

Recommend portfolio will more than triple the size of SPS's solar fleet from 190 MW to 608 MW

SPS is also continuing to explore battery energy storage proposals from the November 2022 RFP – More to follow

Load vs. Current and Recommended Future Resources Balance[(1)]



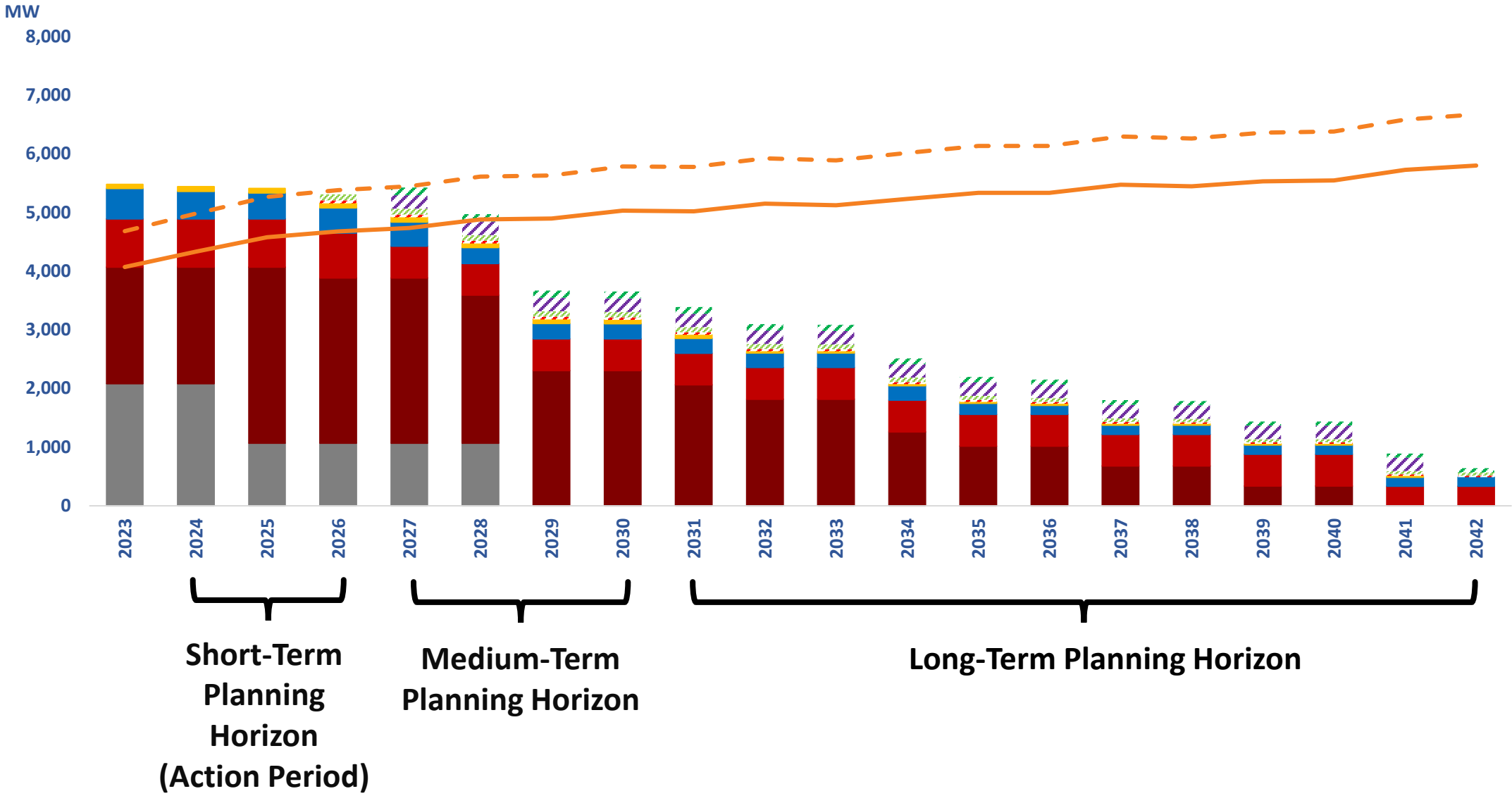
1 Capacity MWs shown on an accredited "firm" basis

2023 IRP - MODELING APPROACH

Determining the cost of resource portfolios

- SPS uses the EnCompass production cost model to determine the most cost-effective portfolio(s) of resources to meet projected future energy demand
- Resource Portfolios must meet predetermined reliability and clean energy requirements (e.g., planning reserve margin requirements)
- System costs are calculated on a present value revenue requirement basis ("PVRR")
- Results are only as accurate as the modeling inputs - critical inputs are often subject to sensitivity analysis (e.g., load forecasts, gas prices)
- Qualitative factors, often outside the scope of the model, should also be considered
- The lowest cost portfolio of resources *may not* be the optimal portfolio

Load vs. Current and Recommended Future Resources Balance



Multi-Jurisdictional Utilities

Information Only

> ***17.7.3.8 D:***
> *A multi-jurisdictional utility shall include in its IRP a description of its resource planning requirements in the other state(s) where it operates, and a description of how it is coordinating the IRP with its out-of-state resource planning requirements.*

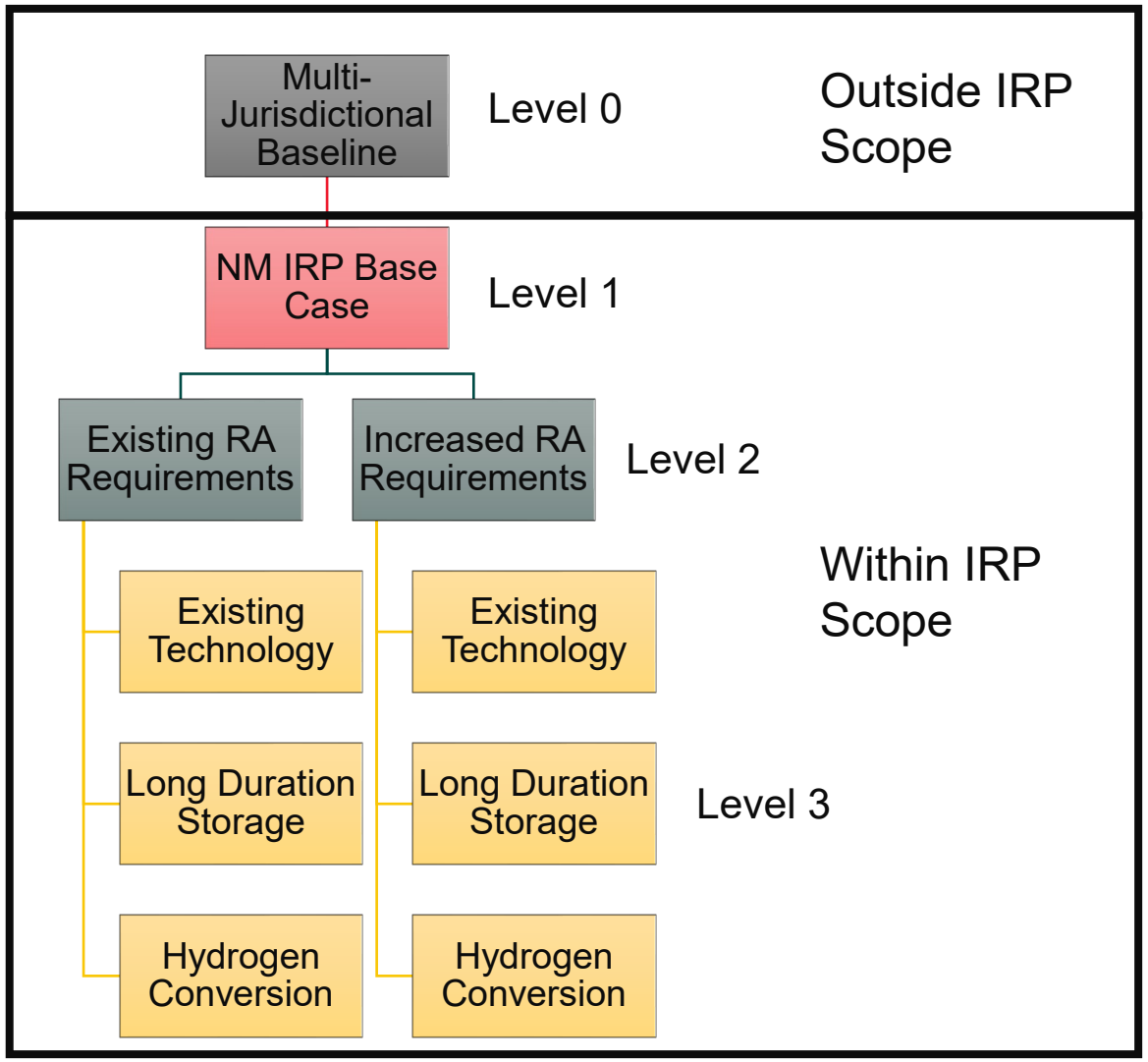
SPS

- Is a multi-jurisdictional utility serving retail customers in Texas, and wholesale customers;
- Is not required to file an IRP in Texas;
- Conducts resource planning analyses on a system-wide basis

Before conducting any analysis, SPS will first perform EnCompass modeling excluding any jurisdictional specific requirements (e.g., renewable portfolio standards) to establish a baseline for out-of-state decision-making purposes only.

This analysis ***will not*** form SPS's base case in the 2023 NM IRP. All scenarios included in the 2023 NM IRP ***will be*** compliant with NM jurisdictional rules and requirements

SPS – Modeling Hierarchy



SPS will evaluate the following sensitivities for each of its level 3 analysis:

Load

- Base Load (50% percentile)
- High Load (85% percentile)
- Electrification & Emerging Technologies Load (per key accounts recommendation)

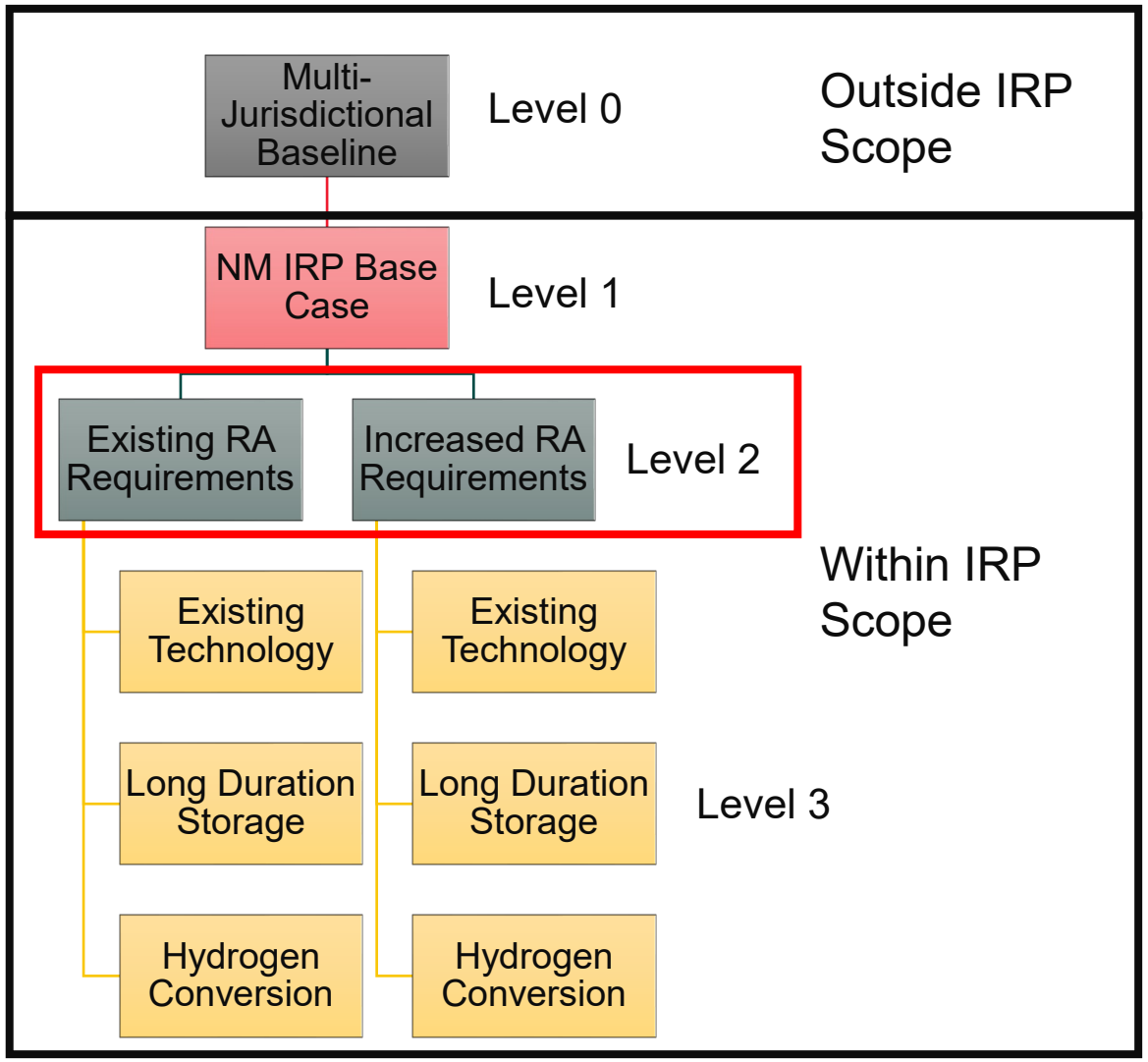
Gas

- Base Gas
- Low Gas
- High Gas

Transmission Network Upgrade Sensitivities

- Base Transmission Network Upgrade Costs
- High Transmission Network Upgrade Costs

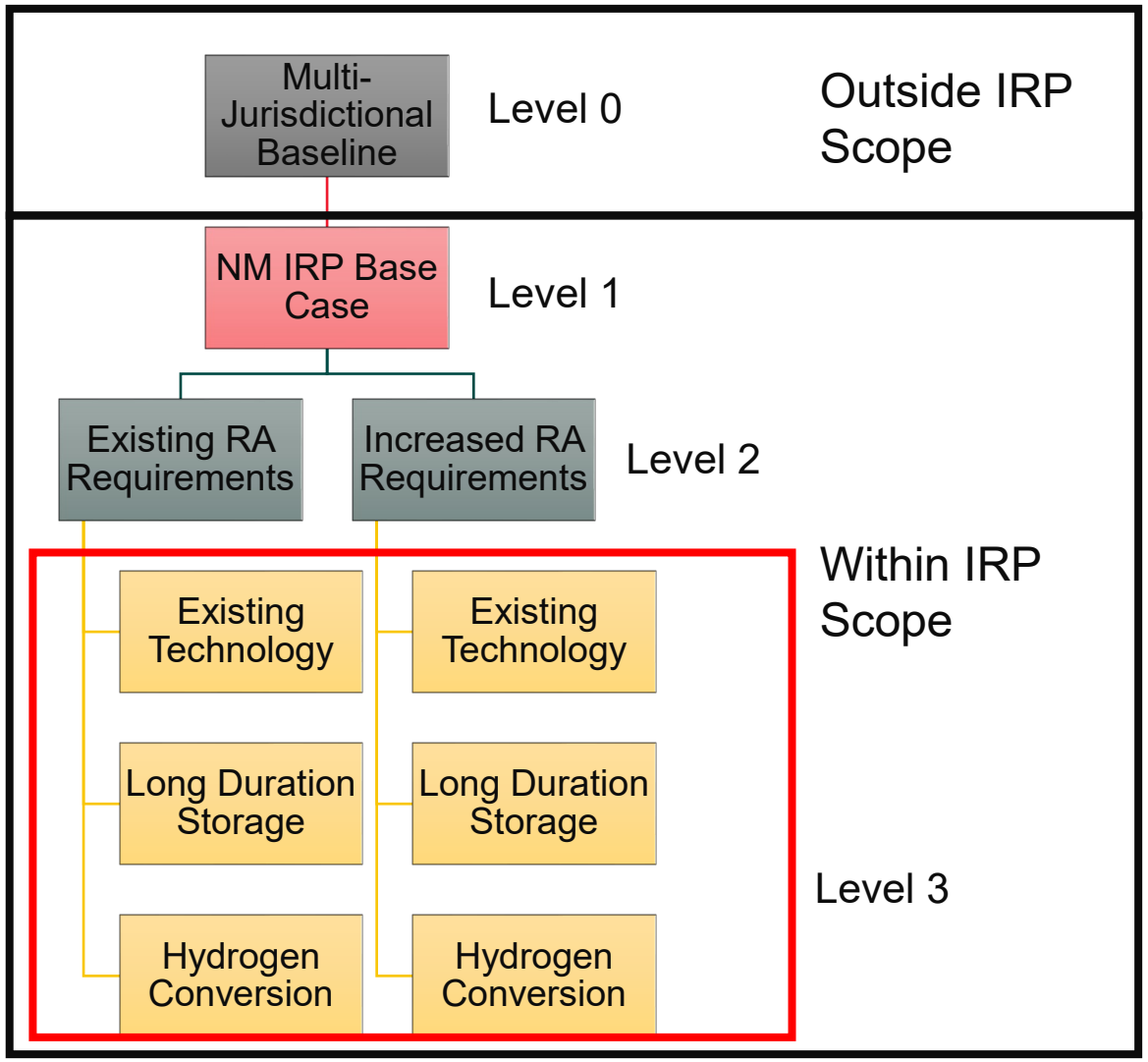
SPS – Modeling Hierarchy



Existing Resource Adequacy Requirements
Modeling will include the Southwest Power Pool's existing 15% planning reserve margin in all months

Increased Resource Adequacy Requirements
Through discussions with the Southwest Power Pool, SPS anticipates the planning reserve margin will increase with a more stringent winter requirement likely. Beginning 2028, Modeling will include a 20% planning reserve margin requirement in the Winter and an 18% PRM in the Summer

SPS – Modeling Hierarchy

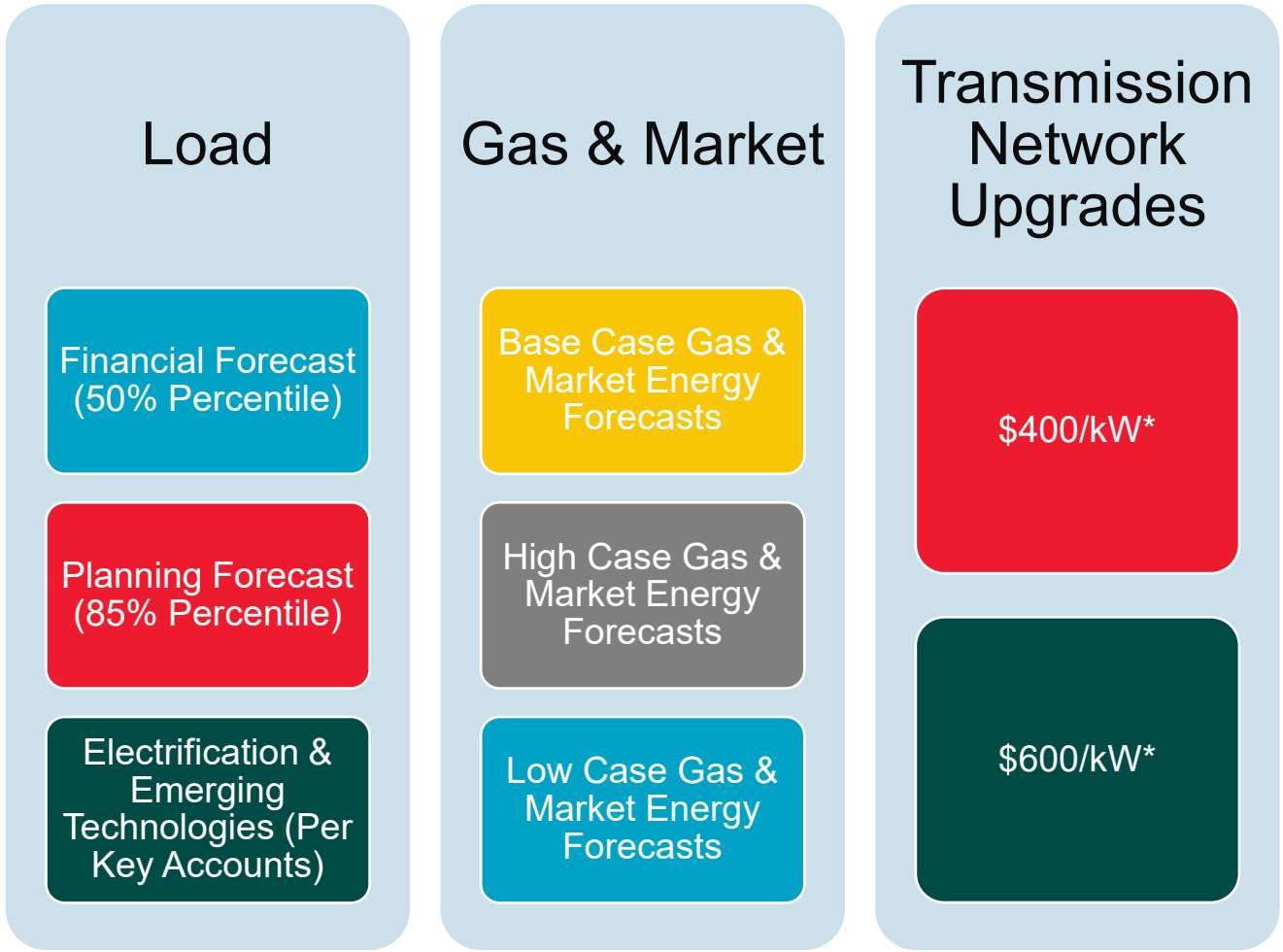


Existing Technology
Modeling will not include any new gas generation. The only new supply-side generating resources available for selection will be solar, wind, and 4-, 6-, and 8-hour lithium-ion battery energy storage systems (“BESS”)

Long Duration Storage
As existing technology, plus addition of 100-hour long duration BESS

Hydrogen Conversion
Allow new firm and dispatchable gas generation assuming conversion to 100% hydrogen before 2040

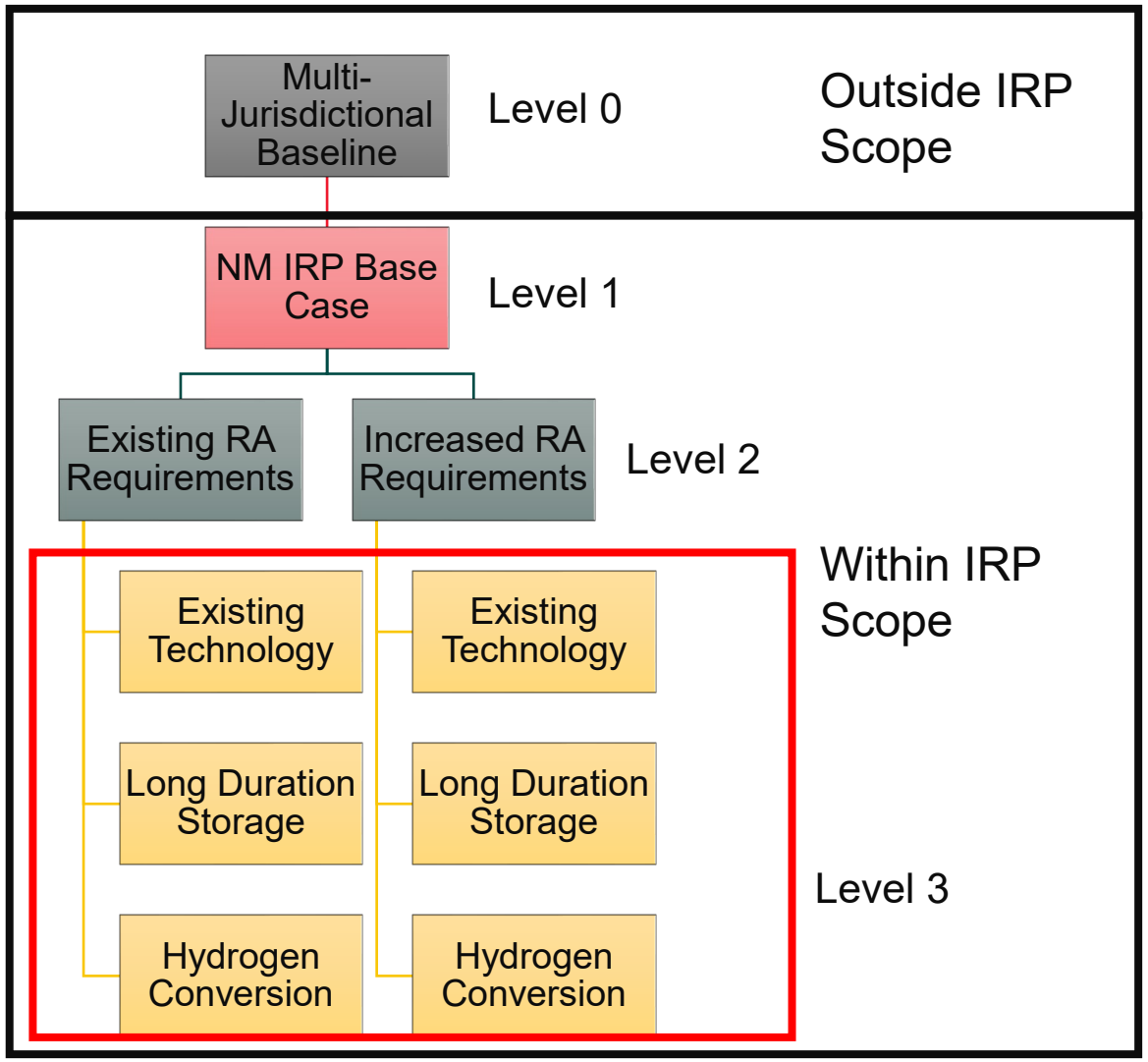
SPS – Modeling Hierarchy

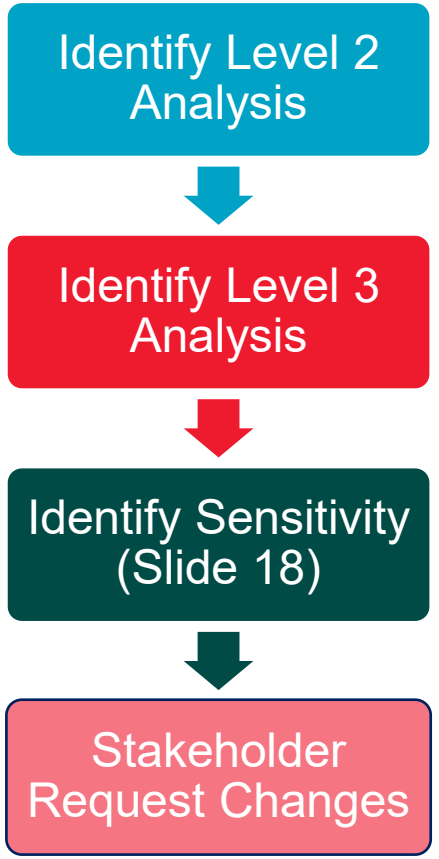


Transmission Network Upgrades – The following generation will not incur any network upgrade costs:

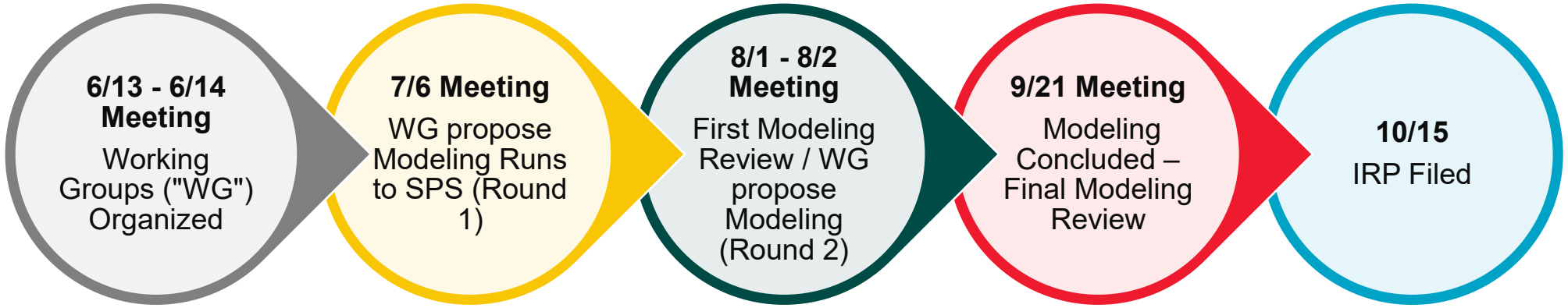
- 1,100 MW of accredited capacity interconnected at Tolk (generator replacement)
- 1,000 MW of wind and/or solar at Harrington (surplus interconnection)
- 1:1 for accredited capacity replacement as gas-steam retires
- Battery energy storage (assume it will be co-located at existing or proposed wind or solar facility)
- Simple Cycle gas CT (assume it will be co-located at existing or proposed wind or solar facility)

Stakeholder Modeling Requests





Modeling Timeline



Production Cost Modeling is a time and labor-intensive process, SPS respectively requests the working groups submit modeling runs requests ahead of the meeting on July 6, 2023. This will allow time for discussion and development of any inputs and assumptions

SPS will then review completed modeling with stakeholders during the meeting on August 1, 2023

APPENDIX

IRP PRESENTATION - SPP

Jarred Cooley – Director, Strategic Planning

IRP Stakeholder meeting – Roswell, NM

June 14, 2023

TOPICS TO COVER

- **Discuss SPP**
- **Resource Adequacy efforts at SPP**
- **Considerations as part of the IRP**

What is the Southwest Power Pool?

The Southwest Power Pool (SPP) is:

- A 501(c)(6) nonprofit corporation, based in Little Rock, AR
- FERC approved Regional Transmission Operator (RTO) since 2004
- 114 members, diverse membership
- Stakeholder driven
- Integrated Marketplace – Day ahead and real time market
- A Tariff Administrator
- Independent Board of Directors (9)


Alberta Electric System Operator
Ontario Independent Electric System Operator
ISO New England
New York ISO
Midcontinent ISO
PJM Interconnection
California ISO
Southwest Power Pool
Electric Reliability Council of Texas

MEMBERS IN 14 STATES

- Arkansas
- Iowa
- Kansas
- Louisiana
- Minnesota
- Missouri
- Montana
- Nebraska
- New Mexico
- North Dakota
- Oklahoma
- South Dakota
- Texas
- Wyoming

Benefits of being part of SPP

- Access to larger pool of generation resources – low cost energy
- Decrease generation reserves
- Collaborative Transmission Planning
- Generation Interconnection Queue
- Load interconnection requests
- Outage coordination
- Cost Allocation
- Training Opportunities
- Compliance

SPP Generation Interconnection Queue

Definitive Interconnection System Impact Study (DISIS)

- Current Queue – 561 projects, 111.5 GW
- 7 cluster studies currently in progress
- DISIS-2023-001 window will remain open

Studies consist of three phases (outlined in Attachment V of the SPP OATT)

- Phase 1 – reliability impact
- Phase 2 – reliability and stability impact
- Phase 3 – reliability and stability, issuance Generation Interconnection Agreement (GIA)
  - Between Phases 1 and 2 and Phases 2 and 3, generators are required to pay or are withdrawn

What SPP does not do

SPP does not do:

- Transmission – Siting, Construction, or Permitting
- Generation – Planning, Siting, Construction, or Permitting
- All the NERC and FERC compliance activities
- Planning for transmission facilities below 100 kV

RESOURCE ADEQUACY AND IMPACTS TO IRP

Resource Adequacy at SPP

Widely viewed as the most critical topic at SPP currently

SPP Open Access Transmission Tariff and bylaws gives authority on Resource Adequacy methodology to the Regional State Committee (RSC)

- RSC is comprised of one Commissioner per state in SPP's footprint (14)
  - Chair O'Connell is on the RSC for NM
- SPP Board of Directors (BOD) can:
  - Approve same proposal as RSC
  - Defer authority to the RSC
  - Approve alternative proposal

Resource Adequacy at SPP

Multiple groups (mix of stakeholders and regulators) have direct input to the RSC and BOD:

- Supply Adequacy Working Group
- Cost Allocation Working Group
- Improved Resource Availability Task Force
  - Created following Winter Storm Uri, likely going away by end of the year
- Resource and Energy Adequacy Leadership (REAL) Team
  - Created January 2023
  - This group will be driving a lot of the Resource Adequacy policy going forward
- Grid of the Future / Strategic Planning

Reliability focus - IRATF

Following Winter Storm Uri – SPP

- Inertia – looking at market solution
- Primary frequency response – looking at market solution
- Ramp – looking at assignment to load serving entities
- Flexibility
- Fuel assurance

REAL TASK PRIORITIZATION

IN-PERSON SESSION

MAY
- Market Mechanisms
- Value of Loss Load
- Review SIRs

JULY
- Fuel Assurance
- Ramp Flexibility
- Incremental Load on RA

SEPTEMBER
- RA Methodology/Tools
- LRE RA Policies
- EUE Methodologies

NOVEMBER
- Future Capacity Accreditation & PRM
- RA Accreditation Policy Adjustments
- RA Seasonal Application Construct

VIRTUAL SESSION

JUNE 2hr
- Future Grid Study

AUGUST 4hr
- Regional RTO RA Polices

OCTOBER 4hr
- Generator Interconnection
- Transmission Policy & Outages

DECEMBER 3hr
- State Capacity Policies

What has happened thus far (2022-2023) – Key Items

SPP RSC and/or BOD have:

- Approved change in PRM from 12% to 15% for Summer 2023
- Approved Planning Based Accreditation for conventional units (FERC filing late 2023)
- Approved Sufficiency value curve (FERC approved)
- Approved language for non-tariff violation if pay deficiency payment on PRM (FERC approved)
- Approved Winter deliverability requirement

FERC reject the SPP ELCC filing March 2023 – SPP working on new filing

Planning Reserve Margin

Currently have a Planning Reserve Margin (PRM) of 15% - Set forth by SPP

- Was approved to be moved from 12% to 15% July of 2022
  - Implementation is Summer 2023
  - This is a minimum requirement to meet
- Value driven by the Loss of Load Expectation (LOLE) study
- Failure to meet the PRM will result in Deficiency Payments (outlined in SPP tariff)

ELCC and PBA

Effective Load Carry Capability (ELCC)

- Applies to renewables

Performance Based Accreditation (PBA)

- Applies to conventional resources

SPP and stakeholders working on finalizing ELCC and PBA for RSC and SPP BOD approvals Oct 2023

What is coming up at SPP (not firm dates):

- Winter PRM (Part 1): create a winter PRM for 2023-2024 at 15% (mirror summer's PRM)
  - Expected SPP approvals - July 2023
- Winter PRM (Part 2): create a stand-alone winter PRM for 2025-2026 (separate from summer)
  - Expected SPP approvals - January 2024
- Performance Based Accreditation (PBA) and Effective Load Carry Capability (ELCC)
  - Expected SPP approvals - October 2023
- Summer PRM: looking to increase the existing Summer PRM in next 2 years (LOLE study being worked on currently)

Additional Items at SPP

Expected SPP approvals – October 2023

- Ramping requirements for Summer 2026
- Strengthen firm fuel requirements
- Demand Response policies related to capacity accreditation for interruptible load

Expected SPP Approvals - 2024

- Improve generation maintenance and outage policies
- Creation of Value of Loss of Load (VOLL) and Expected Unserved Energy (EUE) metrics and associated policies

Considerations to include in IRP modeling:

- ELCC and PBA implementation by SPP
- Upcoming changes to implement at Winter PRM by SPP
- Upcoming changes to implement an increased Summer PRM by SPP
- Changes to how demand response resources are accredited by SPP

Other item – Reliability

- Ramping, inertia, frequency response, fuel diversity, etc.
- Not captured in the models but critical to keeping the lights on

QUESTIONS?

APPENDIX

STAFF recommends the IRATF:

Approve the recommendations summarized below:

- **Inertia**:
  - MWG to design and implement changes to the Market logic to ensure SPP BAA is operating with adequate Inertia response.
  - MWG to determine the Market product needed to ensure adequate headroom for providing Inertia and compensate for lost opportunity costs
  - GIUF to establish inertial response capability requirements applicable to all new resources.
- **Primary Frequency Response**:
  - MWG design and implement changes to the Market logic to ensure SPP BAA is operating with adequate Primary Frequency Response.
  - MWG to determine the Market product needed to ensure adequate headroom for providing Primary Frequency Response and compensate for lost opportunity costs
- **Ramp**:
  - SPP staff develop a Revision Request for allocating a share of the required Ramp attribute quantity to operate SPP BAA reliable, to LREs through Attachment AA
- **Flexibility**:
  - SPP Staff, working with MWG & SAWG to develop a common understanding of what the attribute flexibility means for SPP BAA.
- **Fuel assurance**:
  - SPP Staff, working with MWG & SAWG to develop a common understanding of what the attribute fuel assurance means for SPP BAA
- **RPA1.6 yearly attribute adequacy assessment**:
  - SPP Staff perform a yearly RPA1.6 type of effort based on new ITP scenarios and report results to impacted stakeholder groups.
- **RPA1.7 biennial policy assessment**:
  - SPP Staff perform a biennial RPA1.7 effort to re-assess for all reliability attributes the need for market product, policies or requirements and report results to impacted stakeholder groups and RSC

Western Services (Not Applicable to SPS)

- Markets+
  - Currently in Development, Phase 2 in progress
- RTO West
  - 6 utilities currently investigating
- Western Reliability Coordinator
- Western Energy Imbalance Services Market (WEIS)
  - Launched 2021 – real time market, buy and sell energy
- Western Resource Adequacy Program (WRAP)
- Western Interconnection Unscheduled Flow Mitigation Plan

Sales and Demand Forecast Overview

- Xcel Energy's Sales, Energy, and Demand forecasting team creates multi-year forecasts of class-level customer counts and sales by state and system-level energy and peak demands
  - Forecasts are key inputs to many planning processes, including the Integrated Resource Plan

- Forecasts are developed using:
  - Regression/statistical analysis
  - Trend analysis
  - Contract terms

- Exogenous adjustments include:
  - Demand Side Management
  - Distributed generation solar
  - Electric Vehicles
  - Individual large customer information

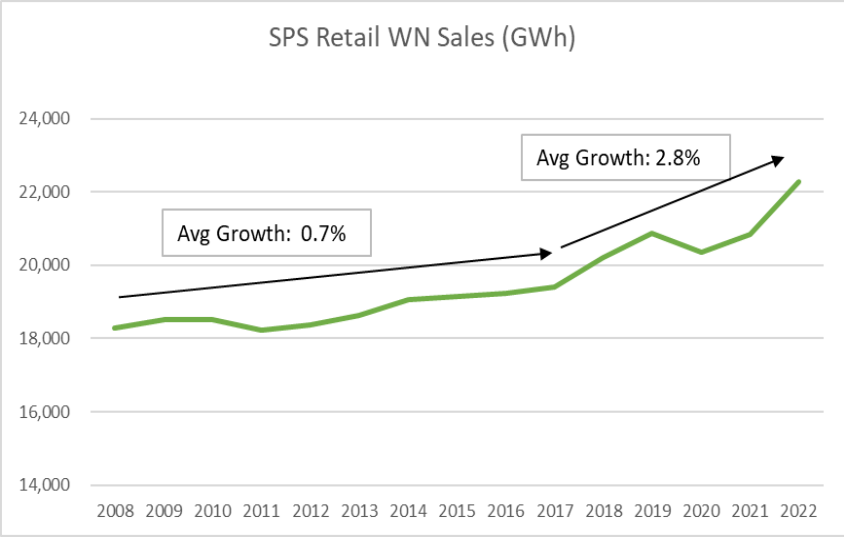
- Forecast scenarios
  - Base Load (50th percentile)
  - High Load (85th percentile)
  - Electrification and Emerging Technologies

Inputs and Key Drivers

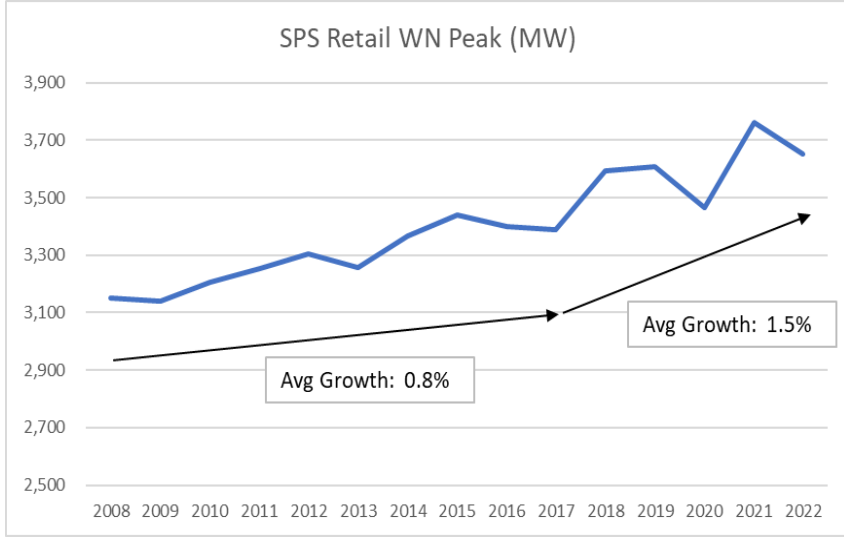
- Key inputs to the models include:
  - Historical sales, customer counts, and weather
  - Historical economic trends – drivers include housing stock, population, personal income, employment, state/metro gross product and oil production

- Key forecast drivers include:
  - Forecasted service territory economics – provided by an external vendor, IHS Markit
  - Weather – 30-year normals used in the forecasts, data from NOAA for select weather stations
  - Demand Side Management
  - Distributed Solar
  - Electric Vehicles
  - Large customer additions and expansions

Sales and Peak Trends

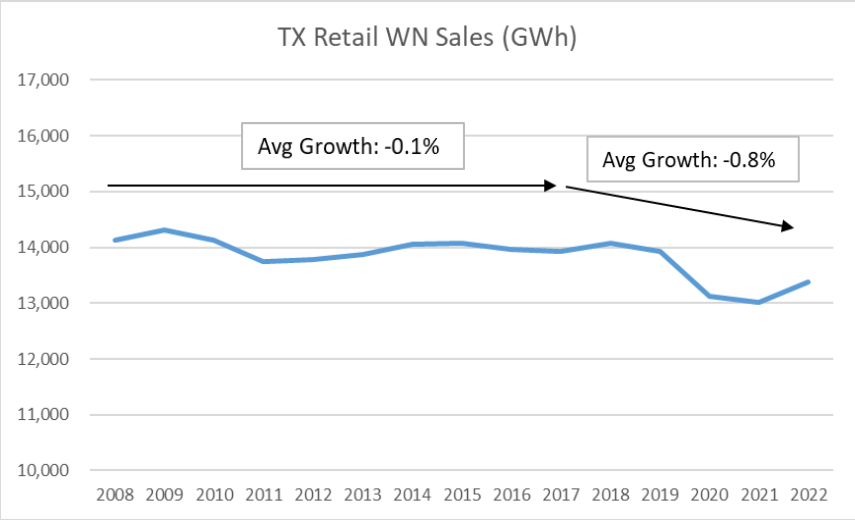


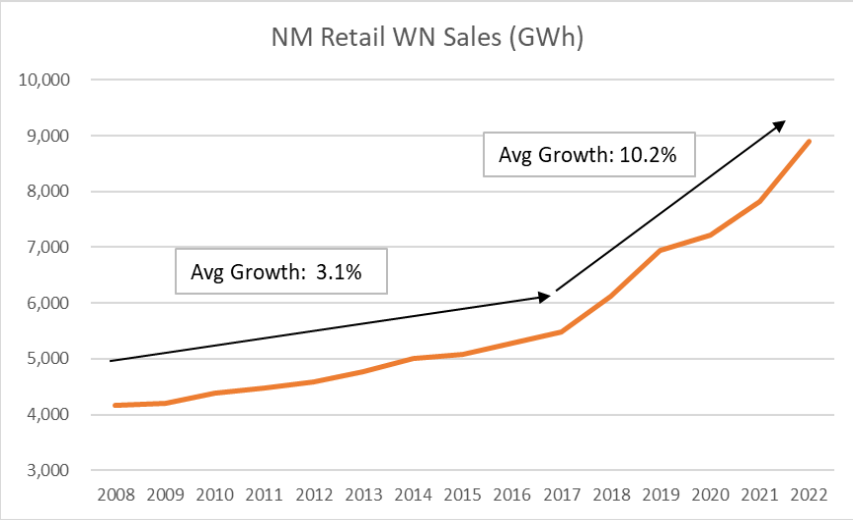
- Retail sales growth has accelerated since 2017, even with a pandemic related decline in 2020
- Driven primarily by expansion of the oil and gas industry in New Mexico
- Growth expected to continue through the forecast period



- Retail peak growth has also accelerated since 2017
- Growth expected to continue with economic growth and the addition of new, large loads

Sales Trends by State





- TX sales flat before a pandemic related decline in 2020
- Customer requests from high usage/high load factor industries expected to drive stronger growth in TX

- NM sales have shown strong growth since 2017
- Driven primarily by increases in sales to the oil and gas sector
- Expansion of oil and gas sector expected to continue, with significant potential for growth from electrification