SOUTHWESTERN PUBLIC SERVICE COMPANY INTEGRATED RESOURCE PLAN

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Water and Natural Resources Committee Meeting
Las Cruces, NM

October 4, 2013

XCEL ENERGY OVERVIEW

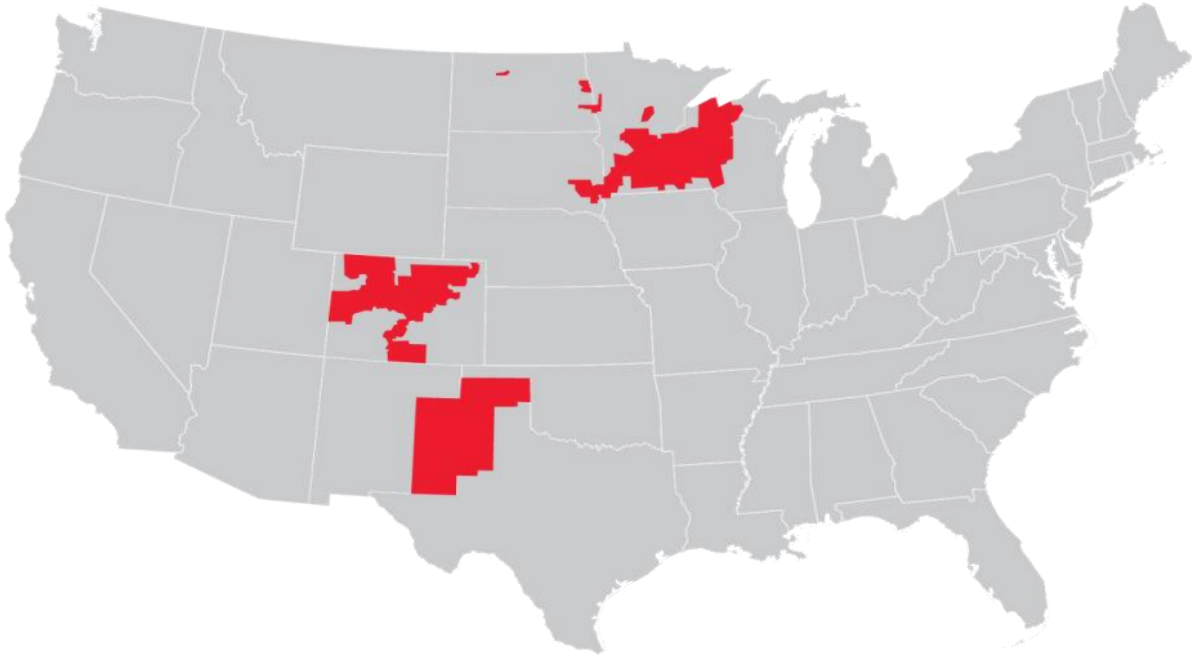
Fully Regulated and Vertically Integrated Utility

Four OpCos
Across 8 States

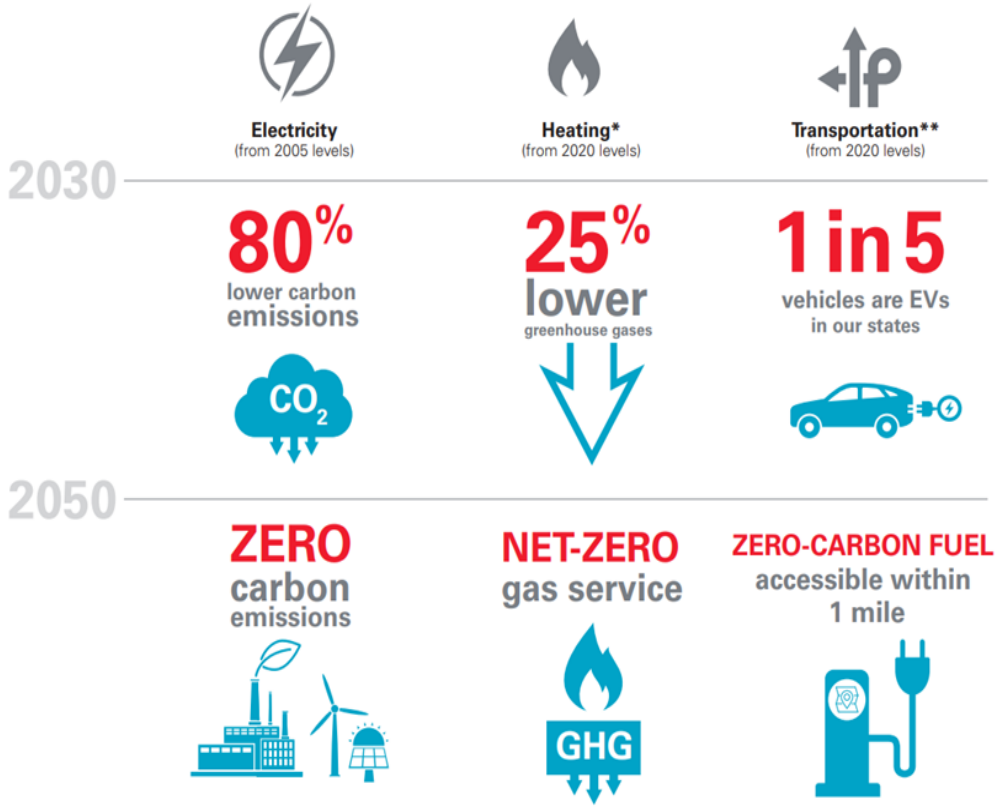
3.8 Million
Electric Customers

$60 Billion
Enterprise Value

2.1 Million
Natural Gas Customers



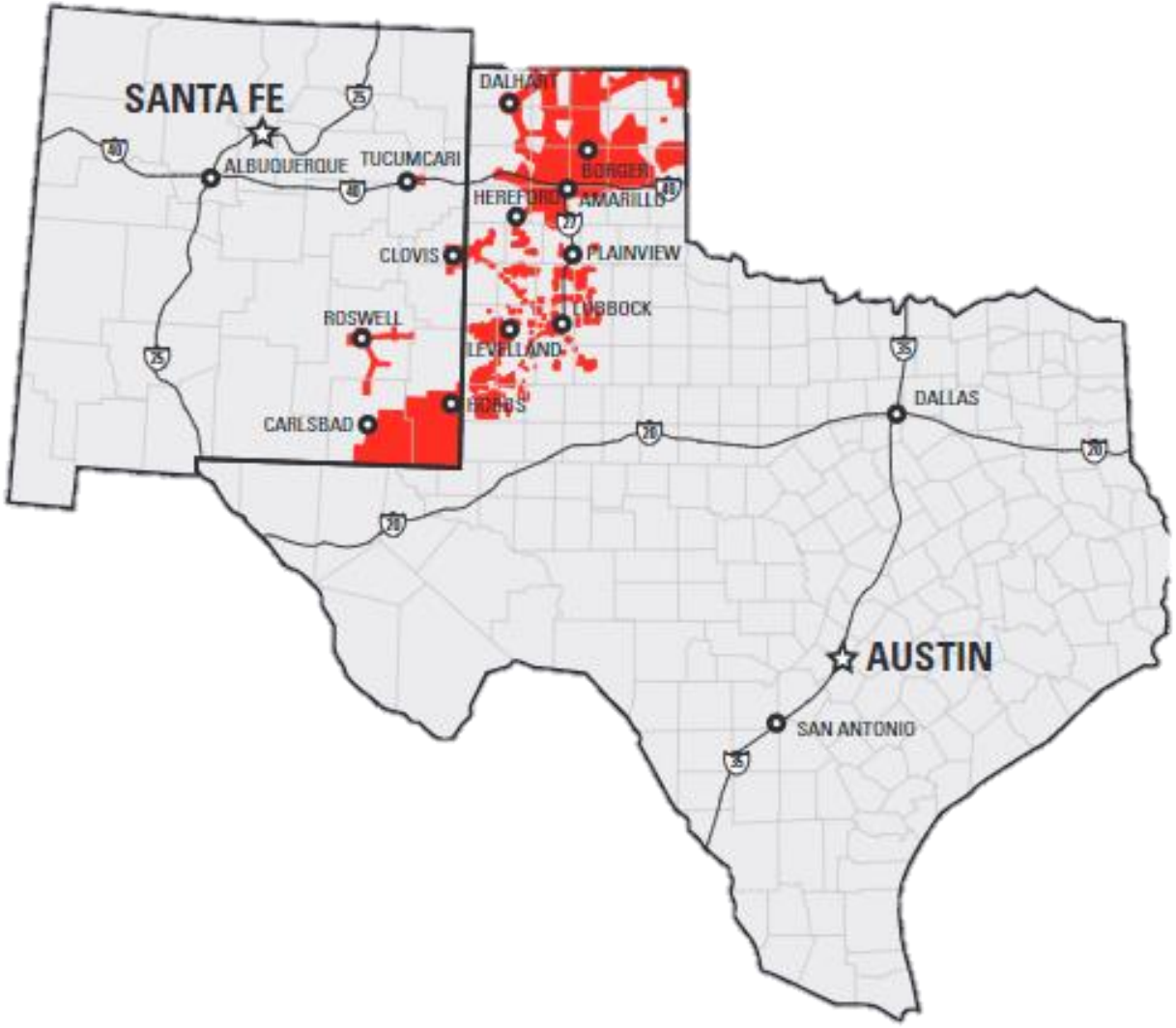
Comprehensive Sustainability Goals



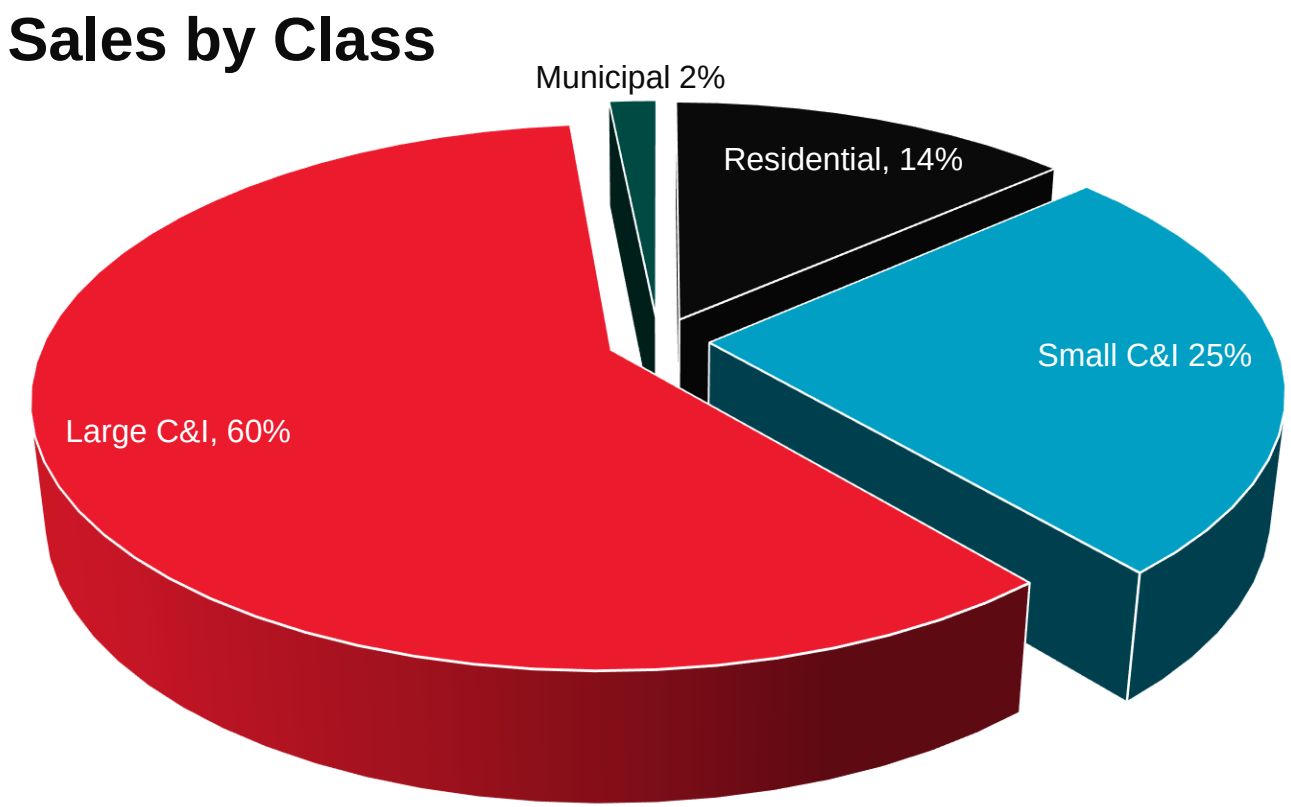
SPS New Mexico service territory

SPS serves approx. 125,000 customers in the following 16 towns in New Mexico:

Artesia	Carlsbad
Clovis	Dexter
Eunice	Hagerman
Hobbs	Jal
Lake Arthur	Loving
Malaga	Otis
Portales	Roswell
Texico	Tucumcari

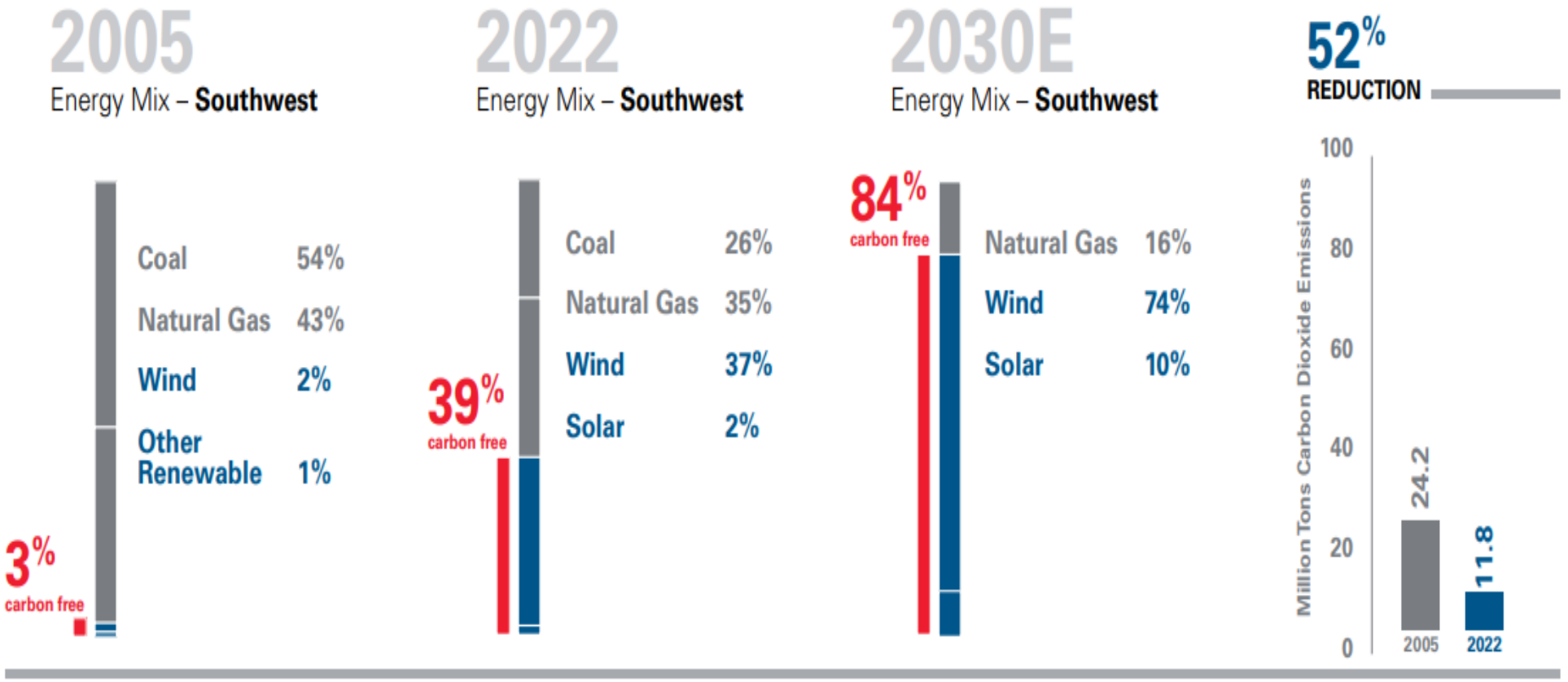


New Mexico Customers



Note: Data Represents Calendar 2022.

Transitioning to Renewables



SPS IRP Overview

July 2021
Filed 2021 IRP
(Action Plan
Period 2022 –
2025)

Nov 2022
Issued RFP

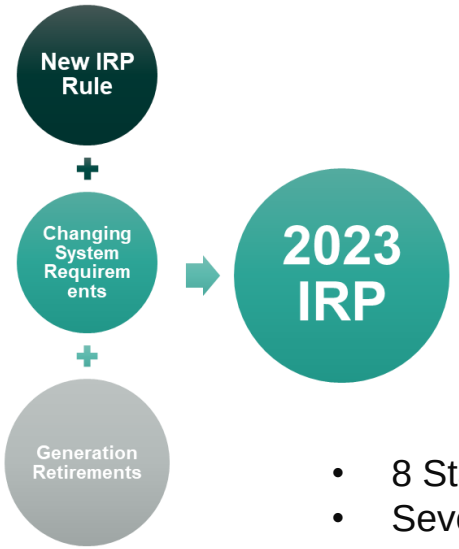
Procurement
and Building

2021 IRP

Nov 2022
Filed
Update to
2021 IRP

Feb 2023
RFP Bids
Received

2024-2027
Resources
Online



Apr – Oct 2023
Facilitated
Stakeholder
Process

July 2024 Issue
RFP

2023 IRP

Oct 13, 2023
File 2023 IRP

2028-2030
Resources
Online

- 8 Stakeholder meetings, 2 of which were in person in Roswell and Hobbs NM
- Several interim working group meetings to address modeling inputs, Statement of Need and Action Plan
- Wide range of stakeholders represented
- 133 individuals from 77 different organizations attended Stakeholder meetings.

IRP Modeling Results
Statement of Need Inputs

- All scenarios included a substantial build out of new renewable generation ranging from 4,281MW to 6,631MW of wind and solar generation between 2028 and 2030
- New dispatchable additions ranged from 1,043MW to 4,290MW during the same period
- Total resource additions ranged from 5,324MW to 10,211MW
- For context, SPS currently has ~7,500MW of installed capacity with an accredited capacity of 5,400 and a system peak of ~4,200MW

Key Modeling Takeaways

SPS Scenarios

STRENGTHS

- A continued and substantial need for new, low-cost, renewable generation through the end of the decade and beyond
- The build-out of new renewable generation requires additional dispatchable capacity that conforms with New Mexico's Energy Transition Act

OPPORTUNITIES

- There's an increasing need for alternative, carbon-free, dispatchable, and economic technologies over the 20-year planning period
- SPS's 2023 IRP analysis evaluated long-duration storage and hydrogen-fired combustion turbines technologies, however, alternative, carbon-free, and dispatchable technologies are/will become available and are encouraged to bid into RFP

WEAKNESSES

- Currently, lithium-ion battery energy storage is the predominate, commercially-available carbon-free, dispatchable technology – However, its duration is relatively limited (i.e., 4 – 8 hours)

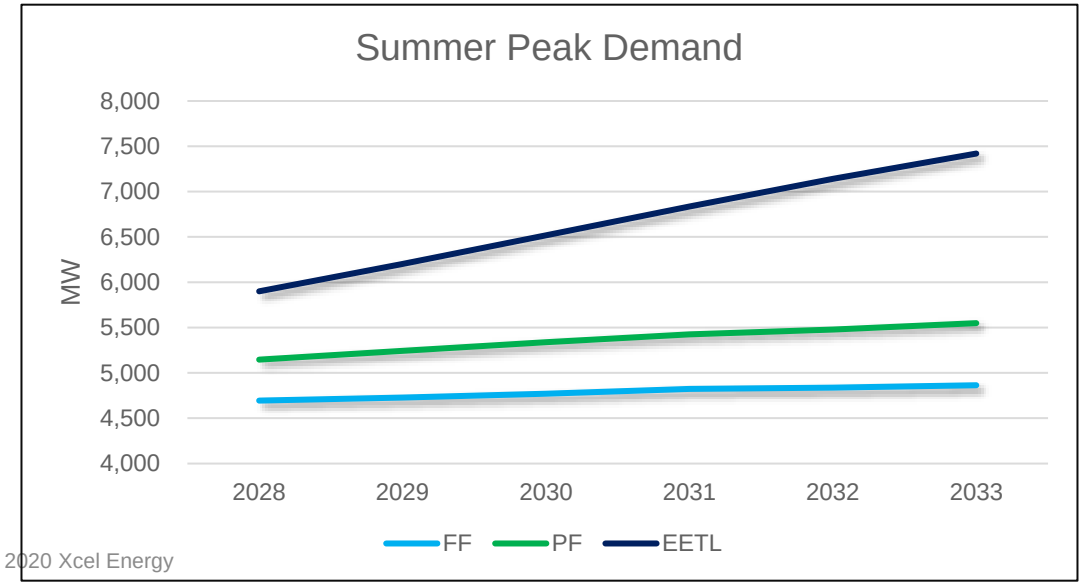
THREATS

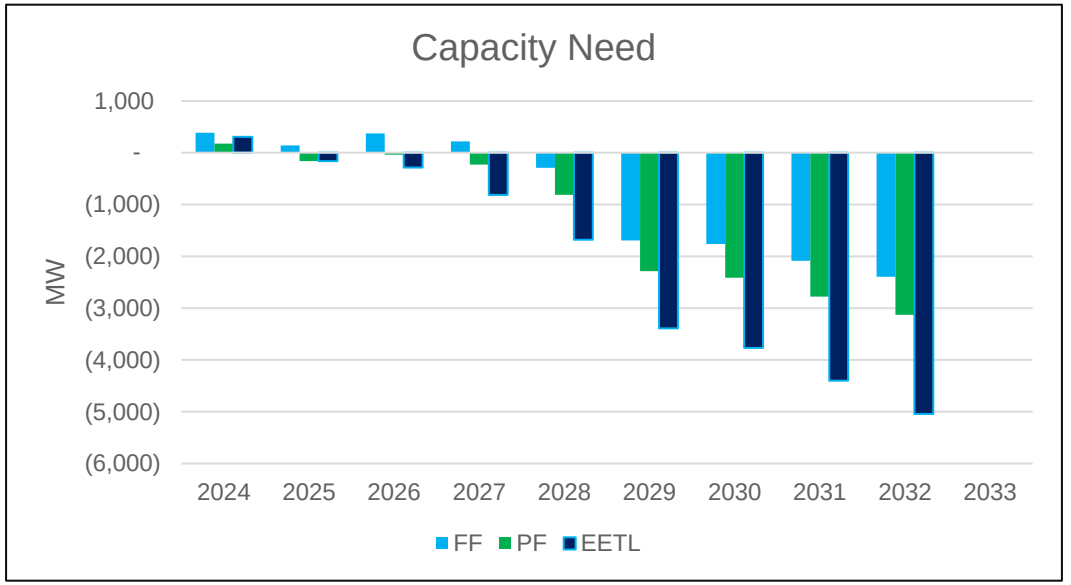
- Relying solely on wind, solar, and short-duration battery energy storage is not economical and presents reliability challenges

Capacity Need Summary

Load Growth, Retirements, & Resource Adequacy Requirements

- SPS is forecasting a Summer peak demand of between 4,771MW and 6,517MW by 2030
- Assuming the existing Southwest Power Pool PRM of 15%, SPS's capacity need is between 1,760MW and 3,768MW in 2030
- Capacity need increases to 1,903MW and 3,963MW under a hypothetical 18% summer PRM requirement
- Includes retirement of 1,825 MW of thermal retirements by 2030





IRP Modeling Results

New Generating Resources: Cost and Technical Capability Certainties

- SPS relied upon generic cost estimates and projected performance capabilities
- The level of accuracy is dependent upon the maturity of the technology
- Actual cost estimates and performance capabilities will be determined by future competitive solicitations
- SPS's 2023 IRP analysis concentrated on long-duration storage and hydrogen-fired combustion turbines technologies, however, other technologies are available and are encouraged to bid into RFPs

Commercially Available (Costs are well known)	Emerging Technologies (Costs are less known)
• Wind • Solar • Battery Energy Storage • Combustion Turbine Generators • Combined Cycle Generation	• Long-Duration Energy Storage • Hydrogen Infrastructure & Costs

Carbon Free Technology Initiative

- Members: 100+ EEI member utility participants, 5 NGOs, EPRI, NEI, others
- Facilitated workgroups identified priority technologies and approaches
- Advocacy led to success in tripling of DOE's RD&D budget through IIJA
- Identified and recommend policies for five technology groups
- www.carbonfreetech.org

Advanced Renewables

Zero Carbon Fuels (H2) ●

Advanced Nuclear

Carbon Capture Utilization & Sequestration ●

Advanced EE & Long Duration Storage

● Proposed by EPA as compliance pathway for emissions reduction for fossil fuel units

Potential Carbon Reduction Pathways – 2020-2050

2020s - "Foundation for the Future"

- **Execute** on traditional solar, wind and storage investments to meet 80% by 2030 goals
- **Monitor and research** advanced technology developments, partly through 3rd party technology fund investments and partnerships with universities / collaborations such as LCRI
- **Pilot** select advanced technology and LDC solutions

2030s - "Implement Some Deep Tech"

- **Implement or start construction** on first round of CF 2050 technology that has been proven commercially viable
- **Focus first** on lower cost carbon reduction tech that have begun to come down the cost curve
- **Mix of** long duration energy storage, hydrogen, nuclear SMR, carbon capture and LDC solutions

2040s - "The Last 10%"

- **Shut down, capture carbon or blend hydrogen** at final gas plants
- **Implement** relatively more expensive carbon reduction generation and storage as needed
- **Finalize** any gas LDC decarbonization, depending on policy path

Carbon Free Technologies: What we are evaluating

Zero-Carbon Generation+

- Geothermal
- Hydro (advanced)
- Wind & Solar (Advanced)

Nuclear

- Small Modular / Advanced Reactors
- Fusion

Carbon Capture

- Point Source – Flue gas
- Allam Cycle

Hydrogen & Clean Fuels

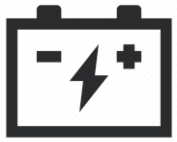
(Generation and/or Storage + Gas System)

- Blending Hydrogen in CTs/CCs

Gas LDC

- Clean Fuels- Carbon free Hydrogen and RNG
- Heat pumps, ground source geothermal, other

- Electrolysis
- Power to Gas / low Carbon Fuels
- Hydrogen Storage



Storage

- Non-lithium Batteries
- Flow Batteries
- Thermal
- Geologic
- Pumped Hydro (Advanced)
- Compressed & Liquid Air Storage
- Gravity-based

Environmental

- Carbon Profile
- Other Environmental Considerations

Technical

- Flexibility/Dispatchability
- Technology Risk Level
- Scalability
- Efficiency

Fit

- Public Acceptance
- Siting

Operations / Efficiency / Other

- Digital, Automation, Operations & Management
- Distributed Energy Resources & Management
- Direct Air Carbon Capture†

Current IIJA Applications

Topic	Submitted	DOE Funds Requested
LDES: Form Energy, MN & CO	**March 3**	**$70 million**
GRIP: Xcel Energy Grid Resiliency – Smart Grid LTE – All OpCos	March 17	$50 million
GRIP: CO State Grid Resiliency – (prime: CO Energy Office)	March 17	$50 million; $30 million earmarked for Xcel Energy
GRIP: Wildfire Mitigation & Extreme Weather Resilience (Grid Resiliency)- All OpCos	April 6	$100 million
H2 Hub: Western Interstate Hydrogen Hub (WISHH)- PSCo	April 7	$526 million
H2 Hub: Heartland Hydrogen Hub (Heartland)- NSP	April 7	$560 million
GRIP: Joint Transmission Interconnection Queue Projects and Portfolios, JTIQ (prime: MN Dept. of Commerce)	May 19	$225 million
Hydro-Electric: Cabin Creek Generation Upgrades - PSCo	June 20	$5 million
LDES: Ambri Battery - SPS	September 15	$5 million
Maximum award total		**$1.57 billion**