SOUTHWESTERN PUBLIC SERVICE COMPANY
2023 NEW MEXICO INTEGRATED RESOURCE PLAN

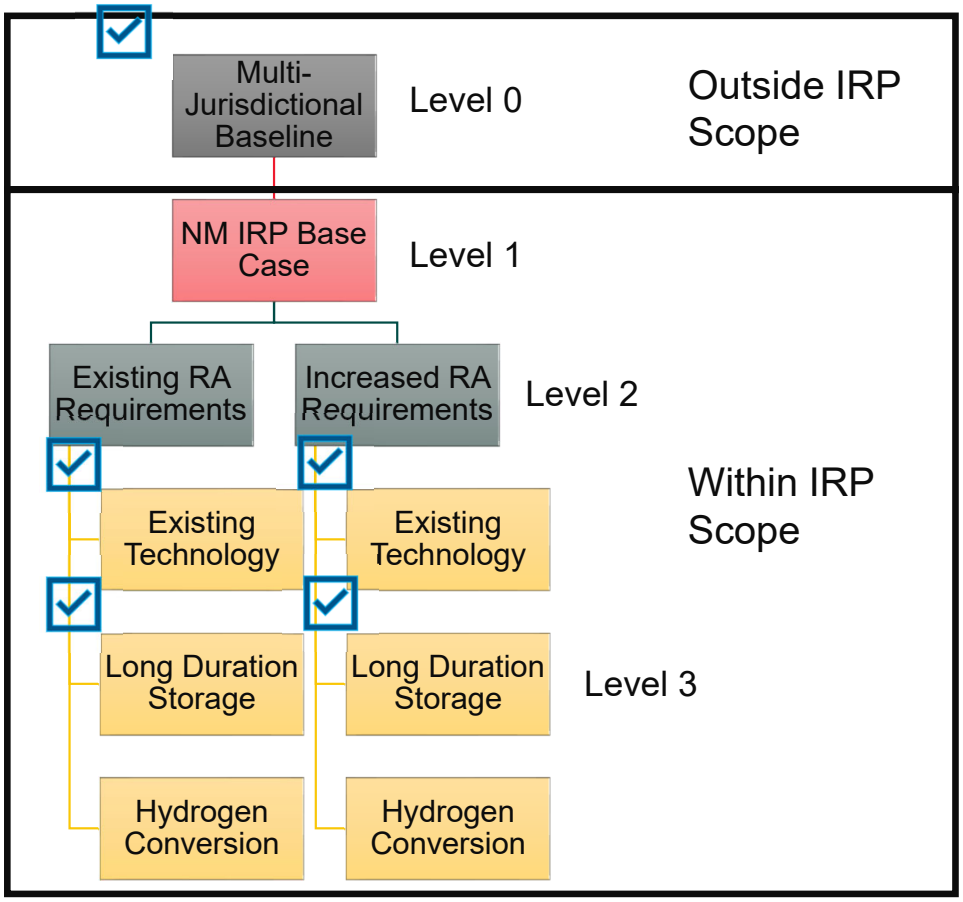
August 1-2, 2023

Important Notes

Although the modeling presented today incorporates updated final critical modeling assumptions, the results are still considered draft. SPS will continue to check the model inputs and outputs for accuracy. Any corrections or changes to the modeling inputs and assumptions may change the results. SPS will present full and final results prior to filing the IRP.

When determining the most cost-effective portfolio of resources, SPS relies upon generic cost estimates for modeling new generating resources. Future resource acquisitions will be dependent upon the firm pricing and availability of new resources.

SPS – Modeling Hierarchy



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

Load

- Financial Forecast (50% percentile)
- Planning Forecast (85% percentile)
- Electrification & Emerging Technologies Load

Gas

- Base Gas
- Low Gas
- High Gas

Transmission Network Upgrade Sensitivities

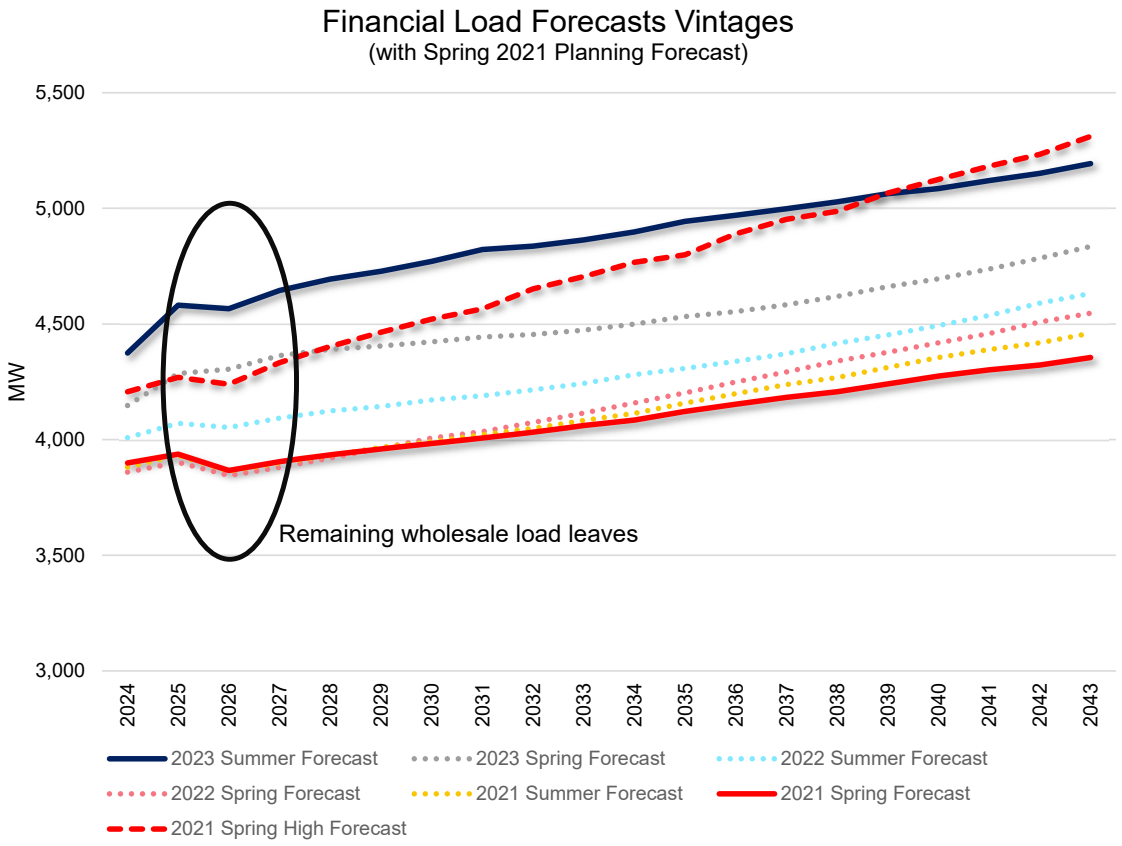
- $400/kW Trans. Network Upgrade Costs
- $600/kW Trans. Network Upgrade Costs

UPDATED LOAD & ENERGY ASSUMPTIONS

Demand & Energy Forecast

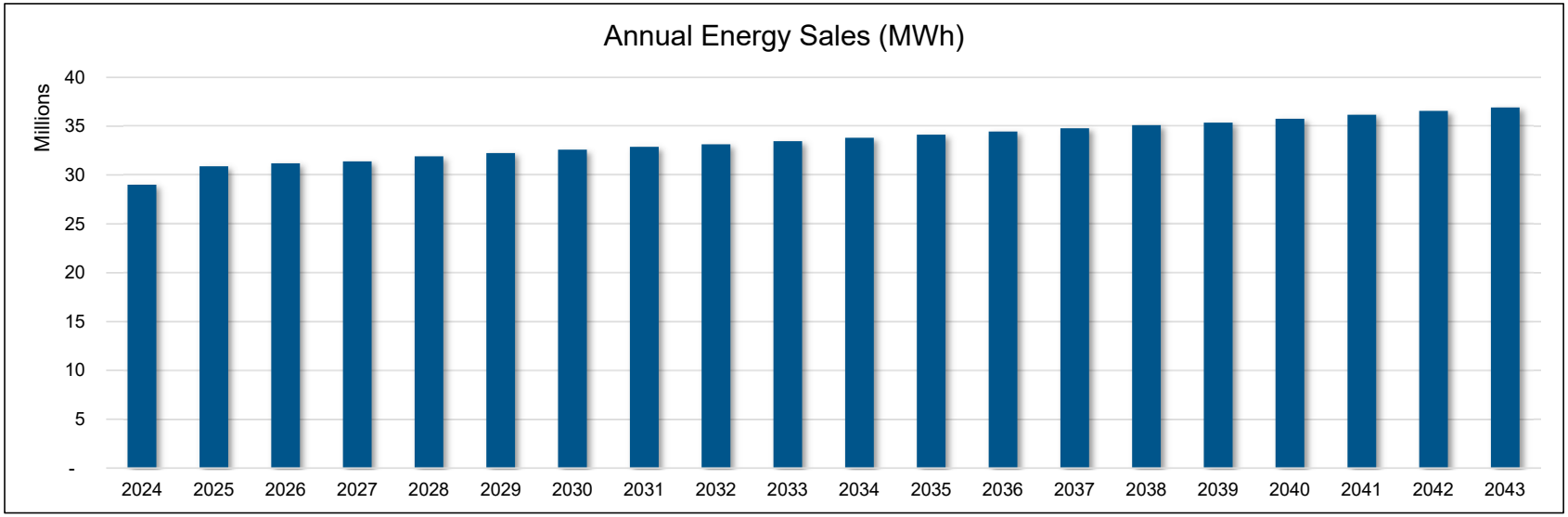
- Demand and Energy forecast is a *critical* modeling input
- Modeling three alternative underlying demand and energy forecasts
  - Financial Forecast (conservative)
  - Planning Forecast (medium)
  - Emerging Technologies & Electrification (high)
- The *Financial Forecast* is focus of today's modeling results
- Under the most conservative load forecast the capacity and resource need is the smallest
- The modeling presented today includes an updated demand and energy forecast

Summer Demand Forecast
(Financial Forecast)



- SPS releases two load forecasts each year (Spring and Summer)
- Compared to the 2021 IRP financial forecast (base) the current financial forecast has increased by 838 MW by 2043 (with most of the growth occurring before the end of this decade)
- The current financial forecast is up to 327 MW higher than the 2021 IRP planning forecast (high)

Annual Energy Forecast
(Financial Forecast)



- Under the financial forecast, Energy sales are projected to increase from 29 million MWh to 37 million MWh between 2024 and 2043
- Does not include the energy required to charge battery energy storage

Summer Loads & Resources Table
(Financial Forecast)

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Peak Demand	4,375	4,581	4,566	4,645	4,695	4,728	4,771	4,822	4,837	4,864
Planning Reserve Margin Requirement (15%)	656	687	685	697	704	709	716	723	726	730
Capacity Need	5,031	5,268	5,251	5,342	5,399	5,438	5,487	5,546	5,562	5,593
Accredited Capacity	5,418	5,411	5,158	4,918	4,472	3,178	3,170	2,916	2,636	2,635
Capacity Position	**387**	**142**	**(93)**	**(424)**	**(927)**	**(2,260)**	**(2,317)**	**(2,629)**	**(2,926)**	**(2,959)**

	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Peak Demand	4,899	4,943	4,970	4,998	5,028	5,063	5,085	5,120	5,151	5,193
Planning Reserve Margin Requirement (15%)	735	742	745	750	754	759	763	768	773	779
Capacity Need	5,634	5,685	5,715	5,748	5,782	5,822	5,848	5,887	5,924	5,972
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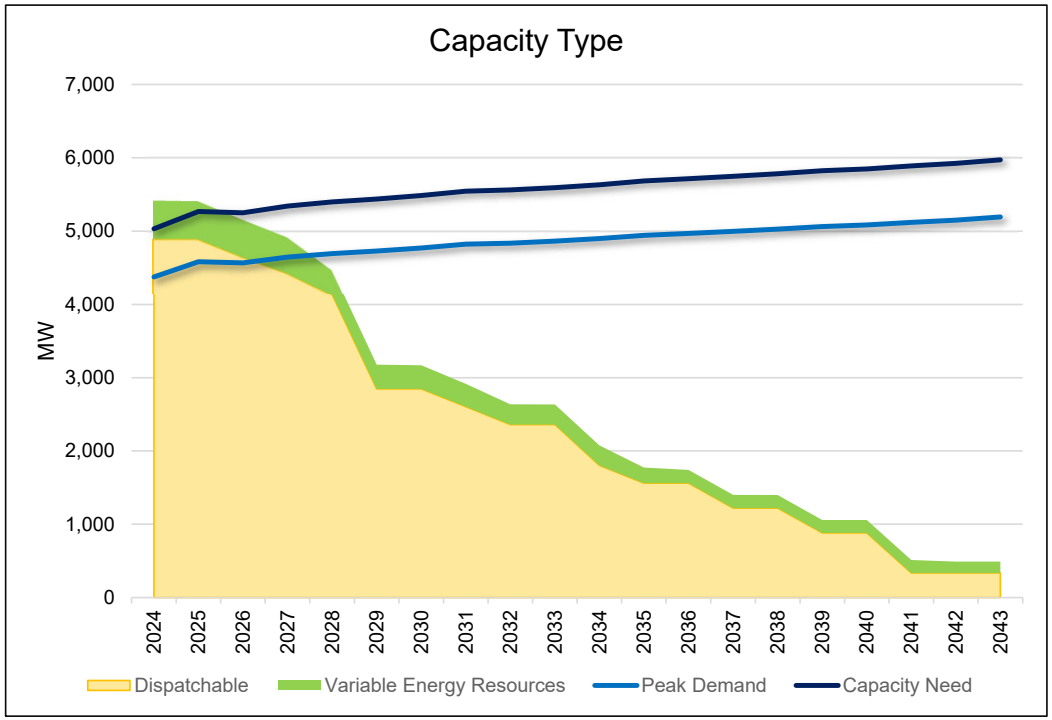
Capacity Position	**(3,559)**	**(3,912)**	**(3,975)**	**(4,348)**	**(4,384)**	**(4,765)**	**(4,790)**	**(5,377)**	**(5,434)**	**(5,482)**

- The new resources selected from SPS's 2022 RFP will resolve the capacity need through 2027
- However, even under the most conservative load growth assumptions, SPS has a substantial and growing capacity need over the next 20-years

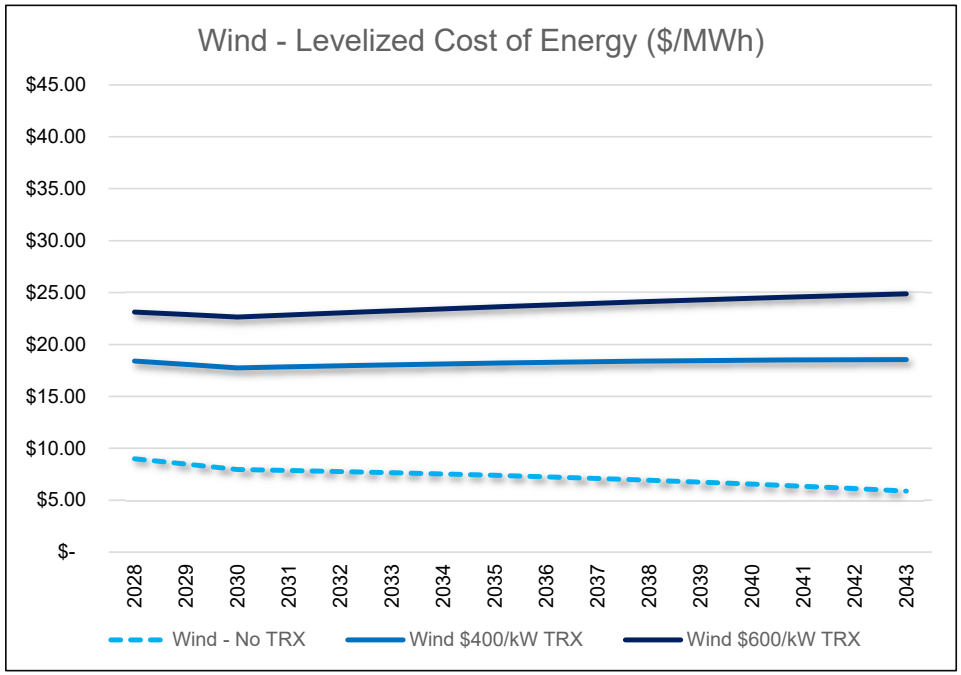
Existing Summer Accredited Capacity Mix

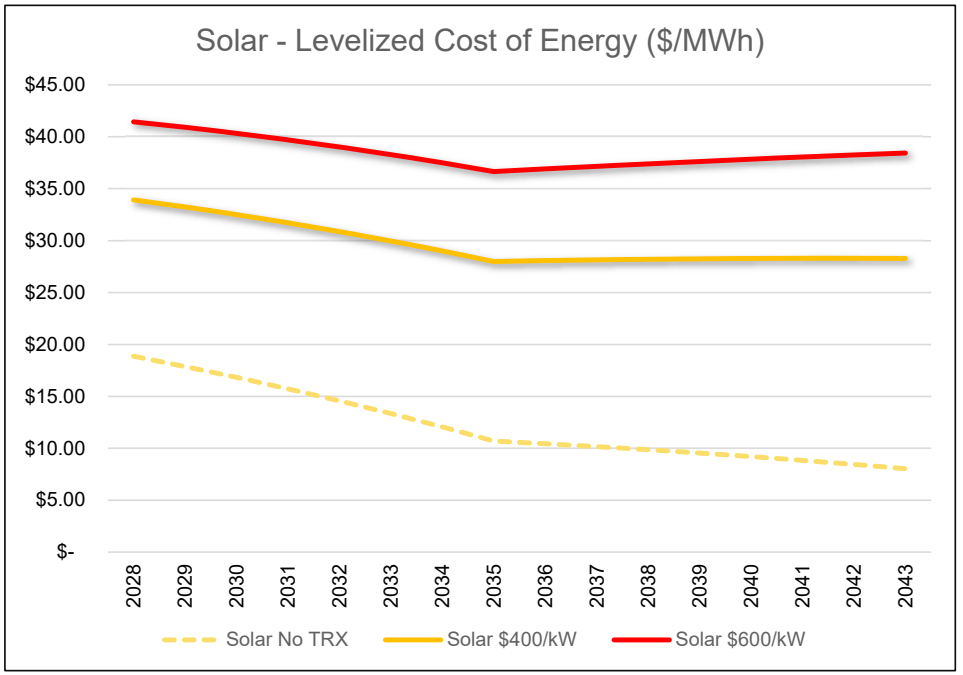


- Accredited capacity considers a generator's contribution to meeting peak demand
- Variable energy resources includes solar and wind resources
- Dispatchable resources can provide energy when called upon – includes CTs, CCs, and BESS
- Cannot maintain a reliable system with only variable energy resources – requires dispatchable resources to either generate or charge/discharge

2023 NREL COST DATA & UPDATED ELCC PROJECTIONS

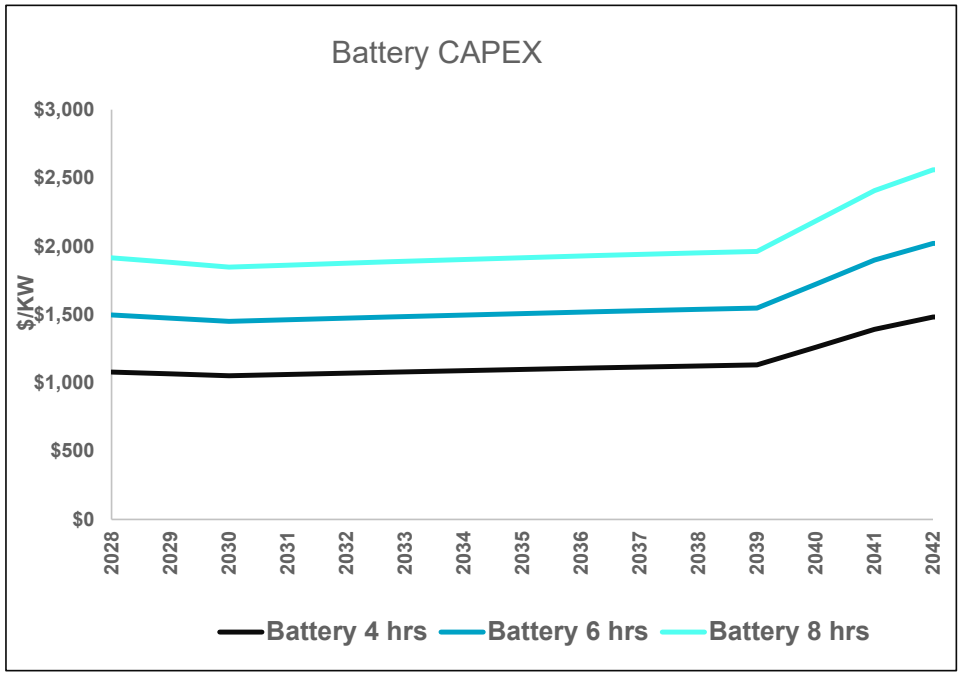
Generic Wind & Solar Resources - LCOE

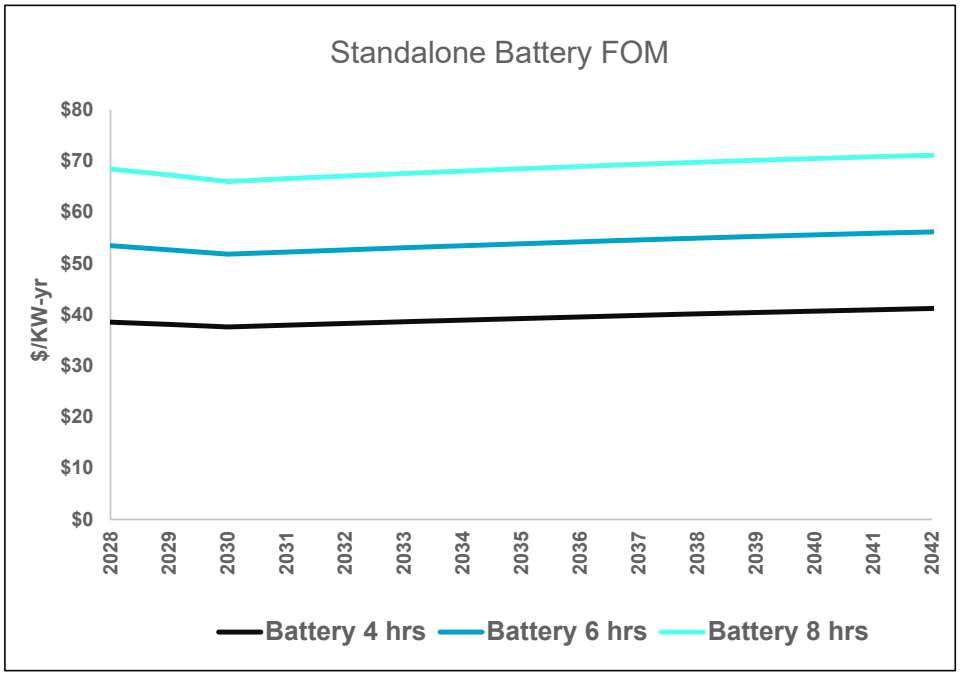




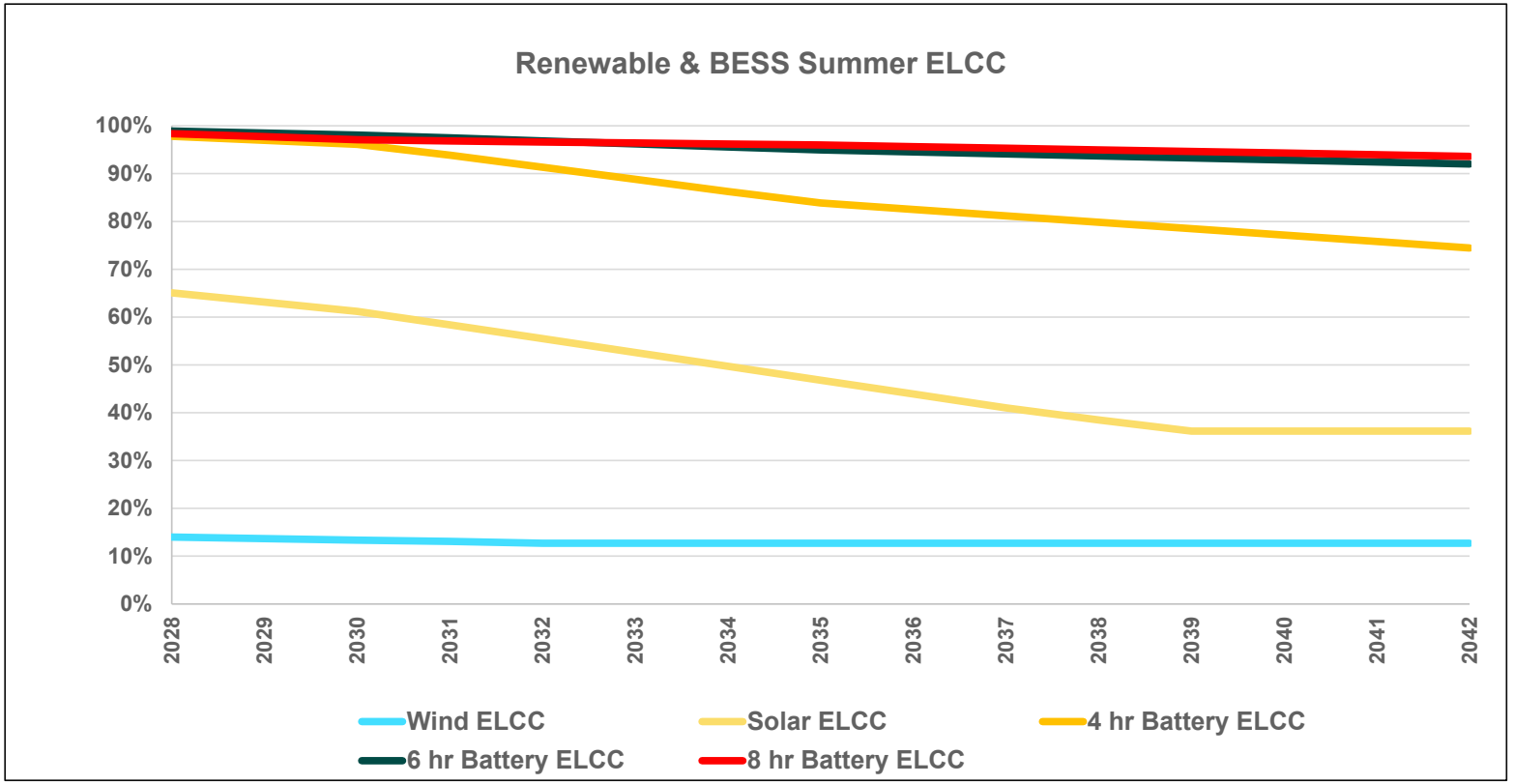
- SPS is evaluating renewable resources under two cost sensitivities for transmission network upgrades - $400/kW and $600/kW (some exceptions apply)
- Future resource procurements will be subject to firm pricing and availability

BESS – Cost Assumptions



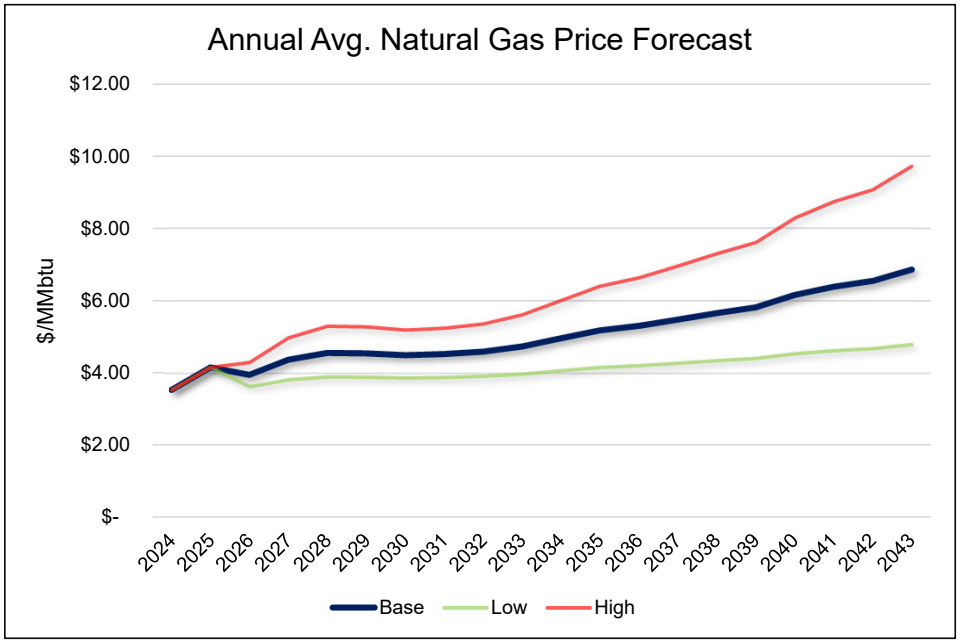


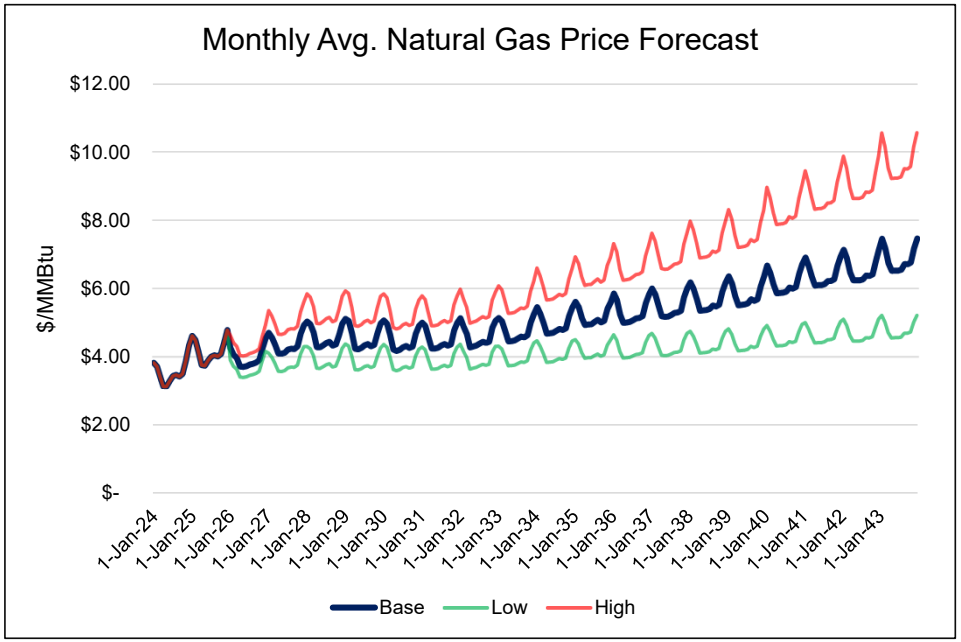
Forecasted ELCC Values – Summer



NATURAL GAS & MARKET ENERGY PRICE FORECASTS

Natural Gas Price Forecasts - Final

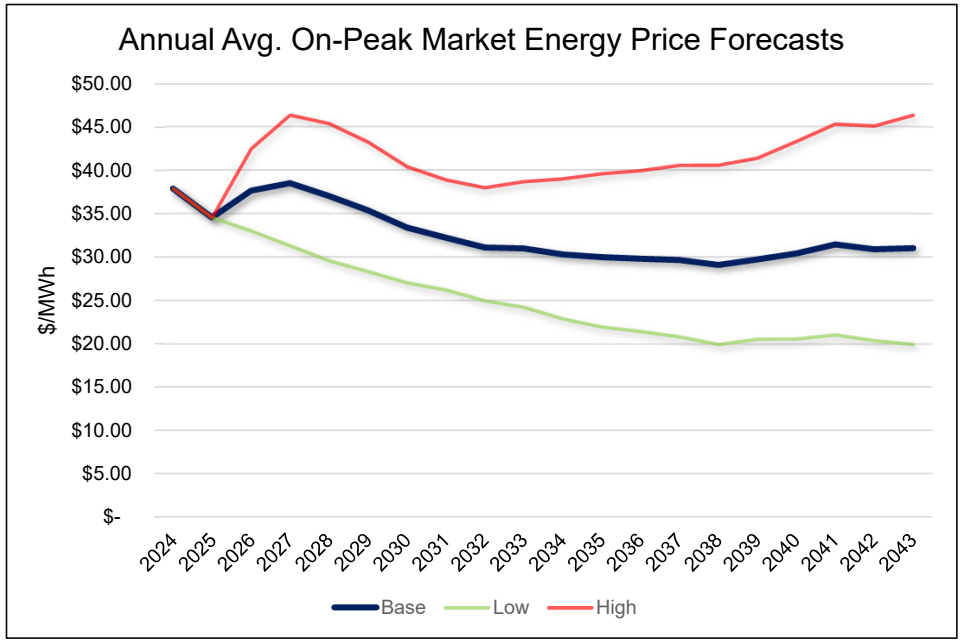


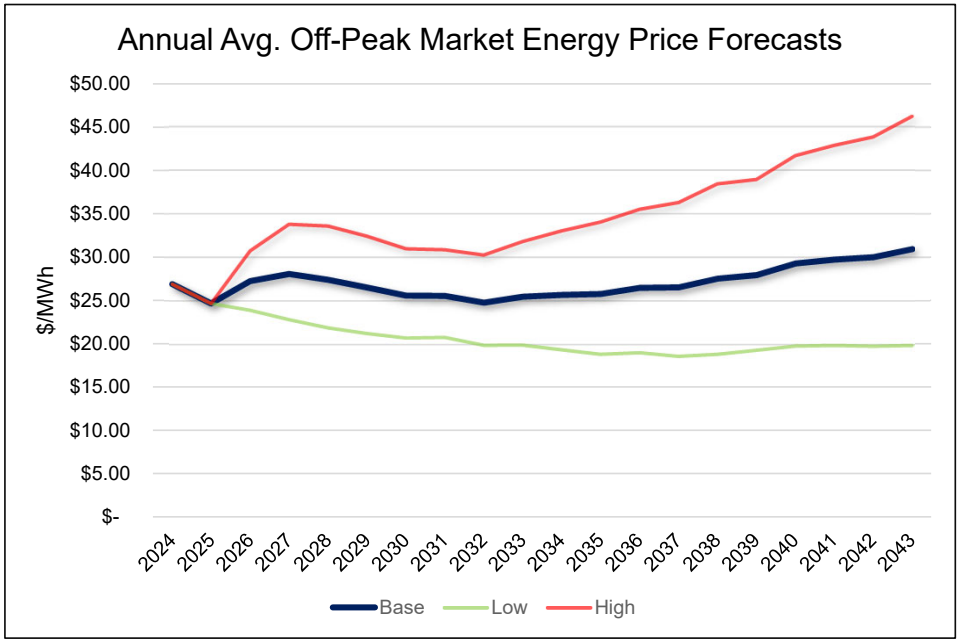


Presented in nominal dollars

SPS will present analyses using a base, low, and high natural gas and market energy price forecasts.

Market Energy Price Forecasts - Final





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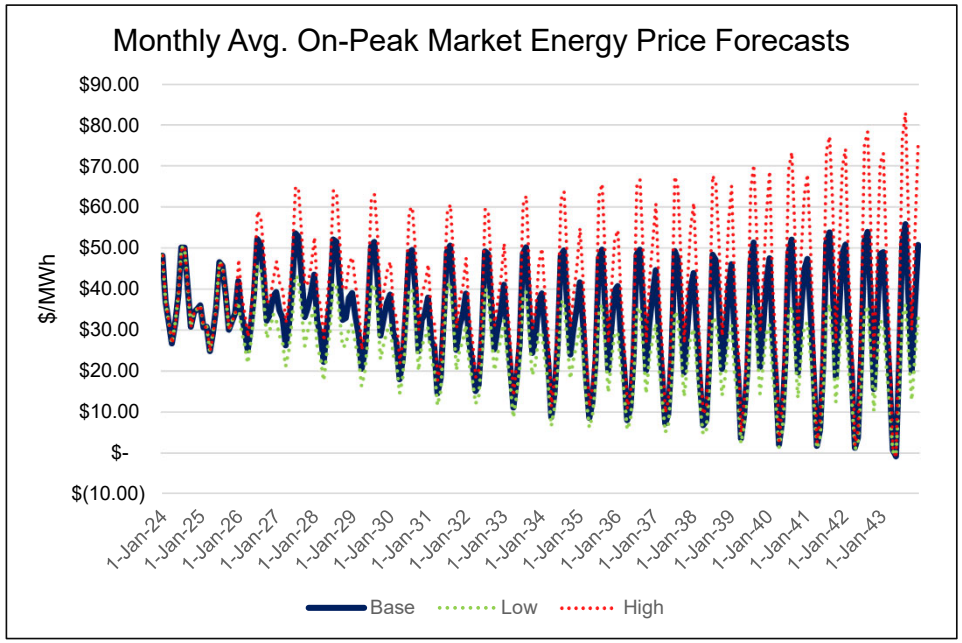

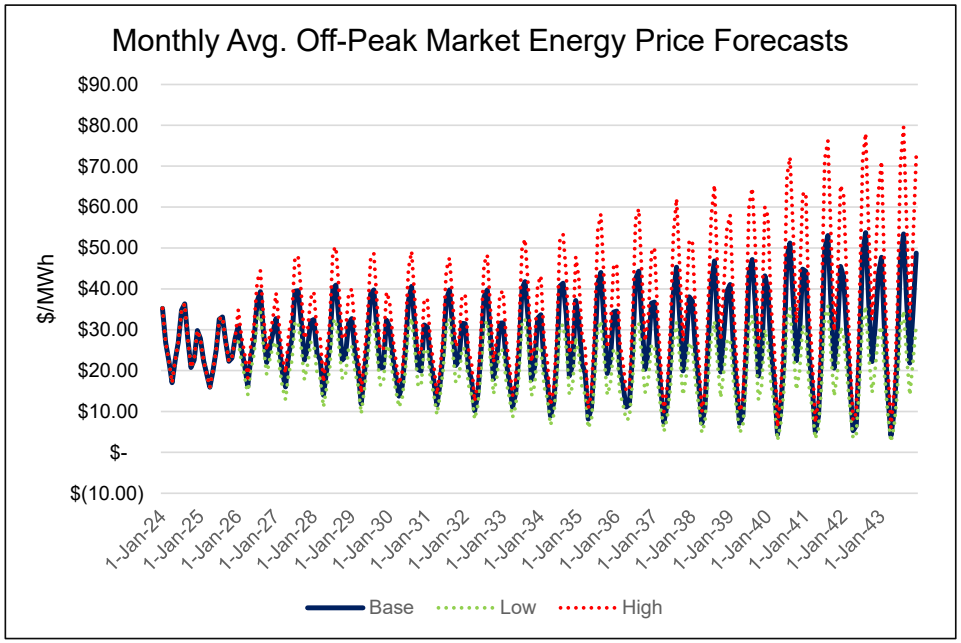

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MULTI-JURISDICTIONAL BASELINE

Multi-Jurisdictional Baseline

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

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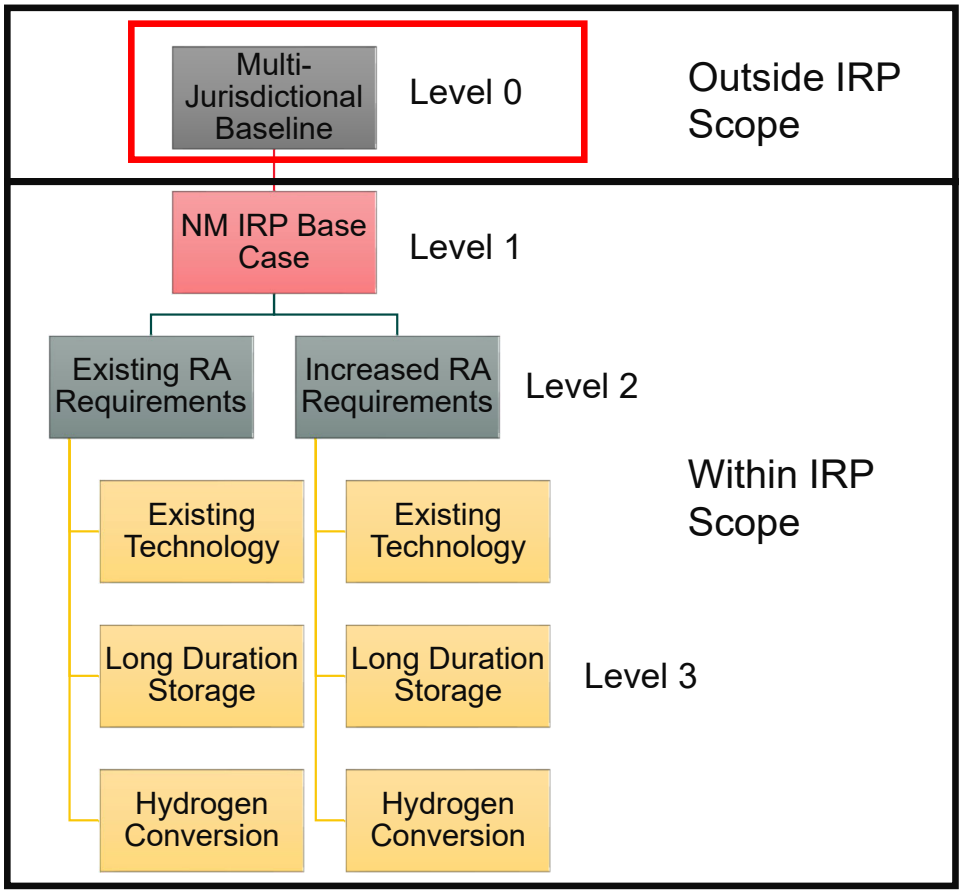

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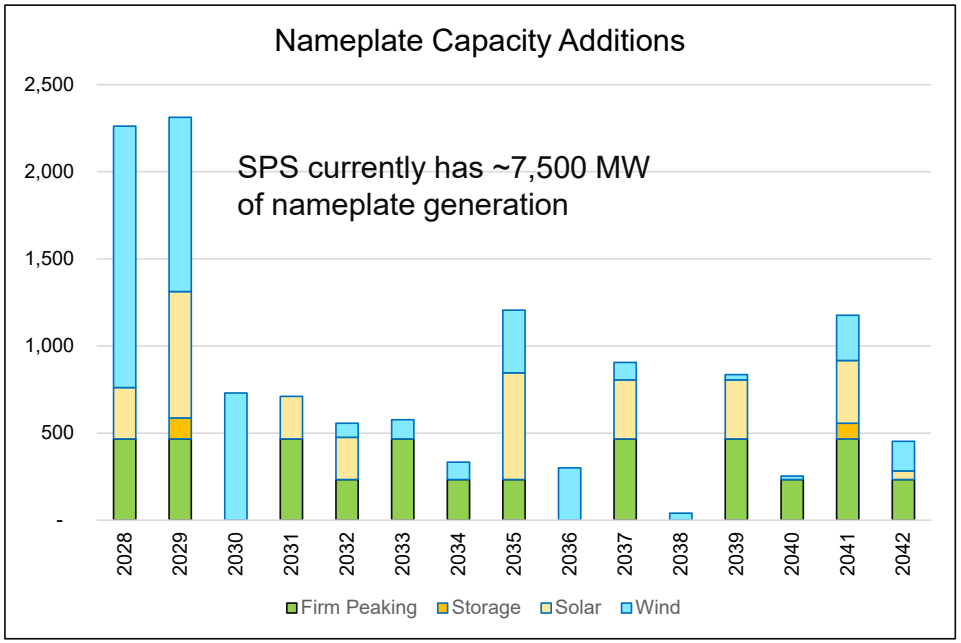
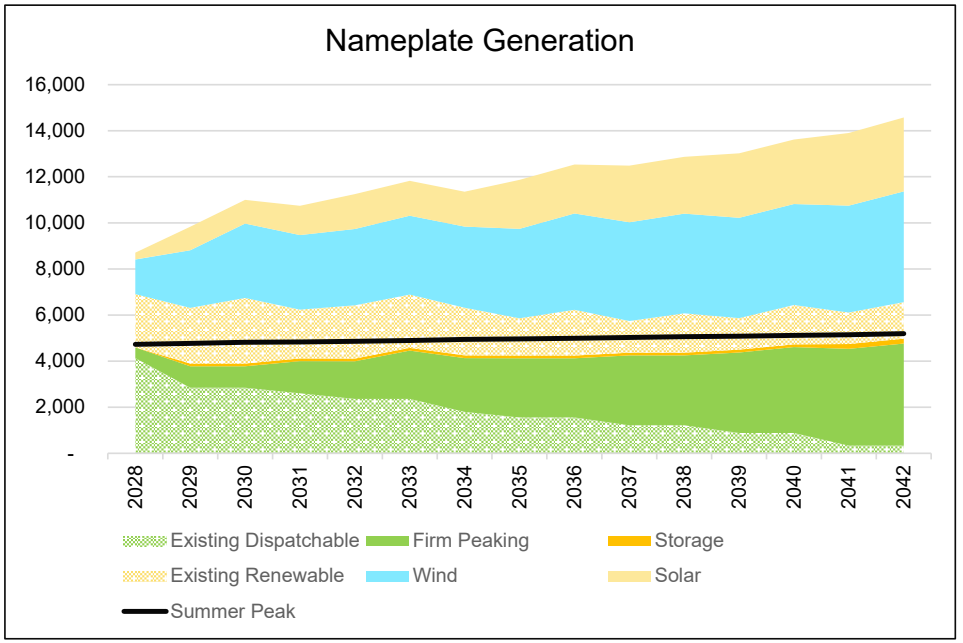
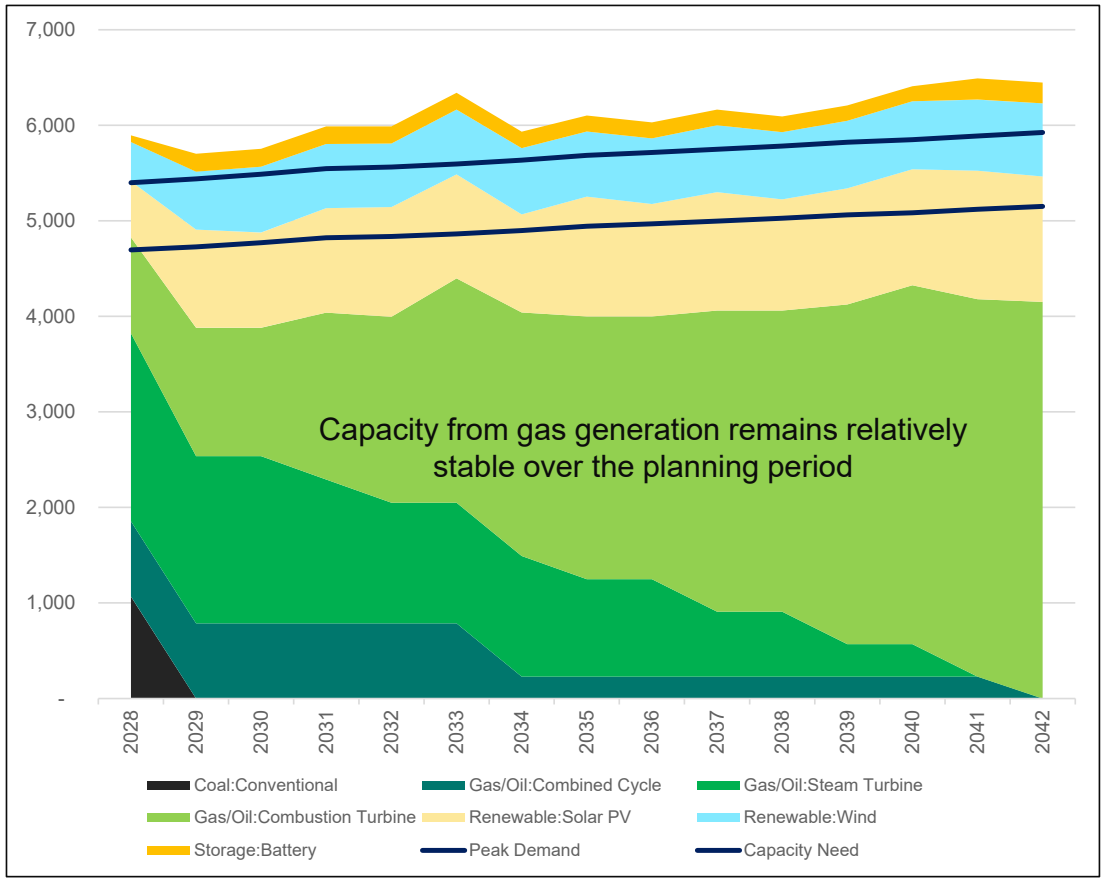
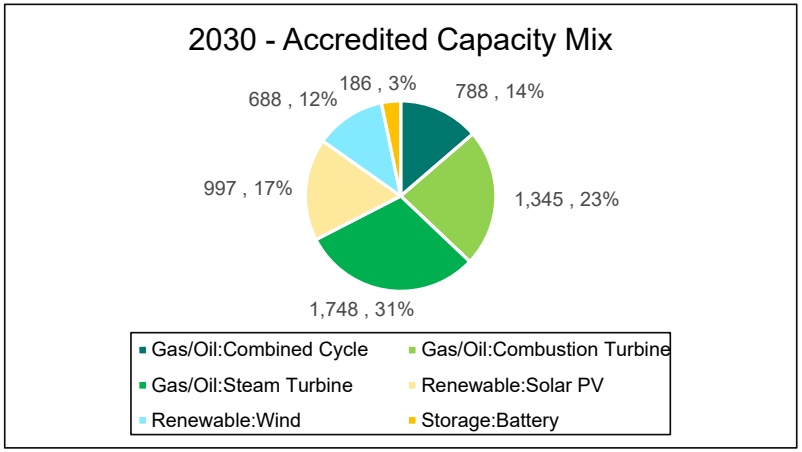


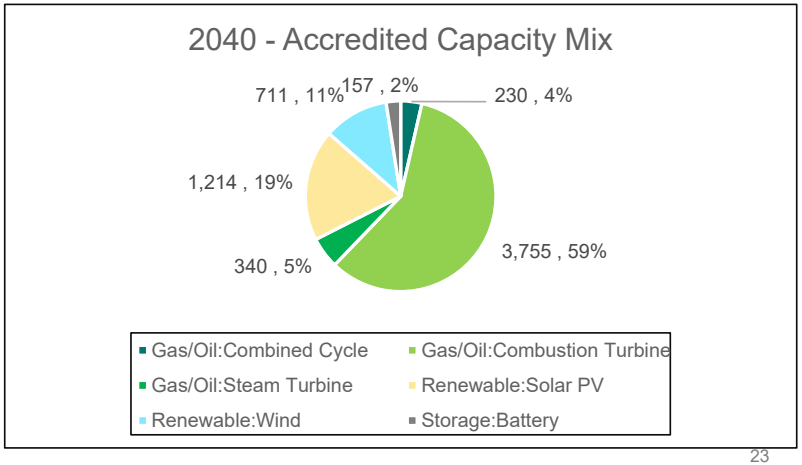


	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Existing Renewable	2,315	2,414	2,845	2,119	2,313	2,312	2,069	1,620	1,983	1,370	1,709	1,370	1,709	1,370	1,590
Existing Dispatchable	4,133	2,847	2,847	2,603	2,360	2,360	1,802	1,559	1,559	1,220	1,220	881	881	334	334
Storage	-	120	120	120	120	120	120	120	120	120	120	120	120	210	210
Wind	1,500	2,500	3,230	3,230	3,310	3,420	3,520	3,880	4,180	4,280	4,320	4,350	4,370	4,630	4,800
Solar	295	1,021	1,021	1,265	1,508	1,508	1,508	2,121	2,121	2,460	2,460	2,799	2,799	3,159	3,209
Firm Peaking	467	933	933	1,400	1,633	2,100	2,333	2,566	2,566	3,033	3,033	3,500	3,733	4,199	4,433
Total	**8,710**	**9,835**	**10,996**	**10,737**	**11,244**	**11,820**	**11,352**	**11,866**	**12,529**	**12,483**	**12,862**	**13,020**	**13,612**	**13,902**	**14,576**

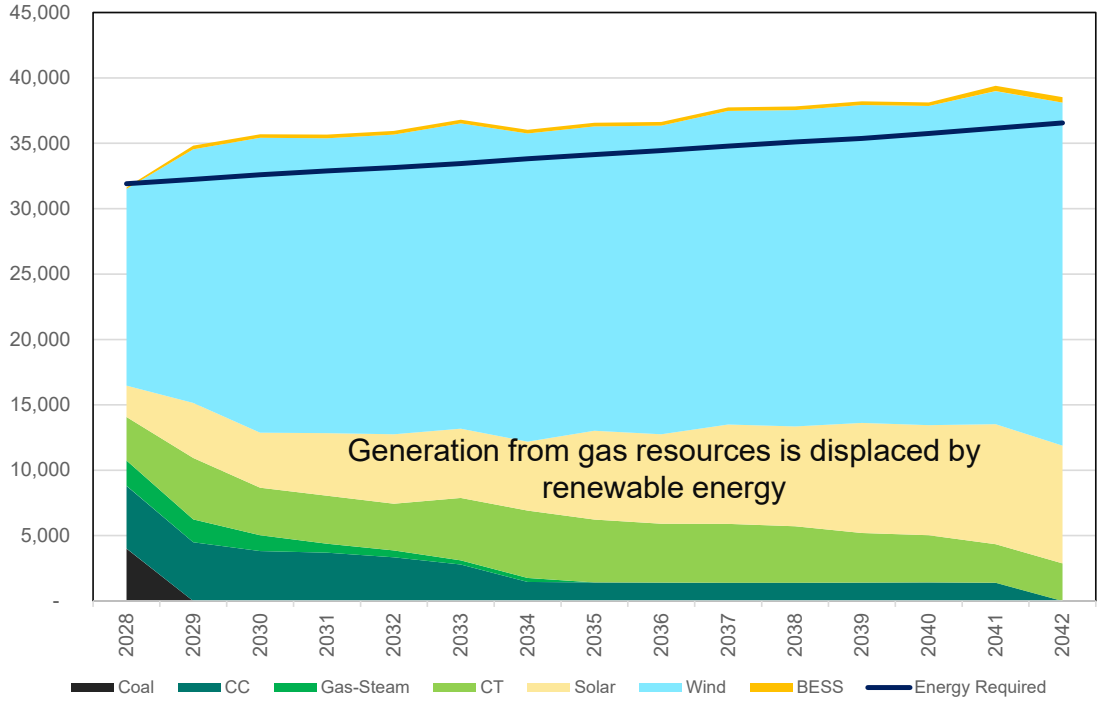
Accredited Capacity (MW)

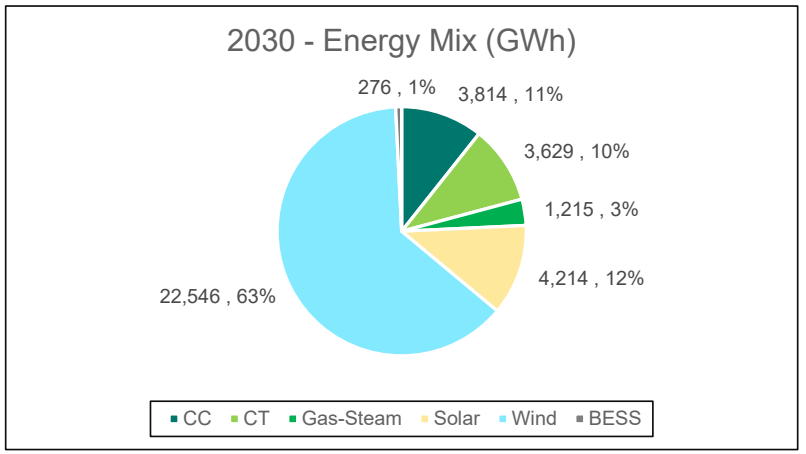


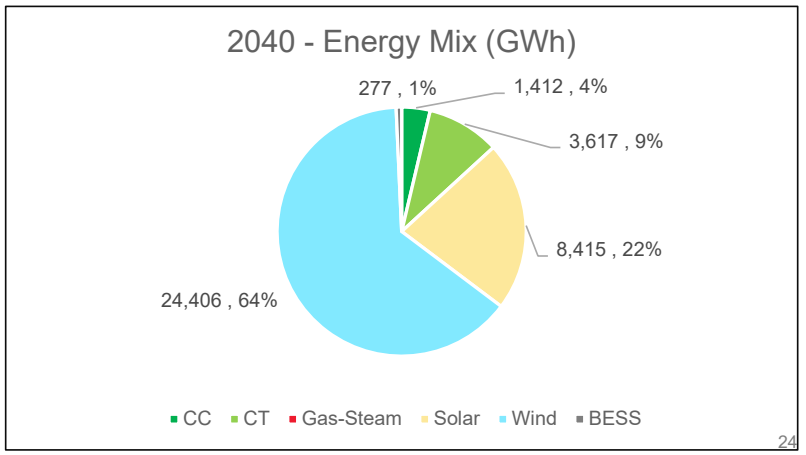




Energy (GWh)







- 76% renewable generation + BESS in 2030 increasing to 87% in 2040 which exceeds RPS Requirements 50% and 80%, respectively (Note: This analysis does not include an RPS constraint)

Key Takeaways

- Multi-Jurisdictional baseline under the financial load forecast (most conservative assumption) assuming a 15% PRM, requires the fewest new generating resources
- SPS's capacity need is 2,317 MW in 2030, increasing to 4,790 MW in 2040
- SPS's recently filed CCN solves approximately 600 MW of this need
- To fulfil the remaining capacity need, EnCompass adds:

Technology	2030	2040
Storage	120	120
Wind	3,230	4,370
Solar	1,021	2,799
Firm Peaking	933	3,733

- 76% renewable energy + BESS in 2030, increasing to 87% BESS in 2040
- Lowest Bookend for 2024 RFP would seek 1,053 MW of dispatchable resources and 4,251 MW of variable energy resources (subject to pricing and availability of projects submitted)

[COMMERCIALLY AVAILABLE] EXISTING CARBON-FREE TECHNOLOGIES

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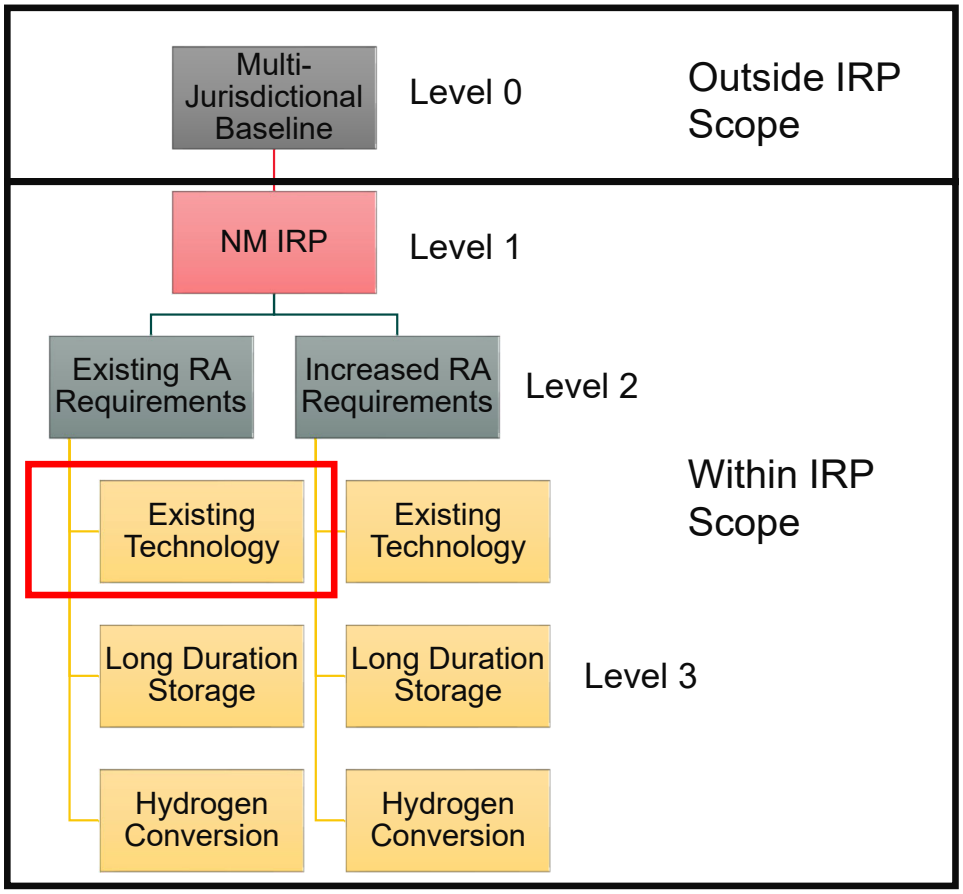

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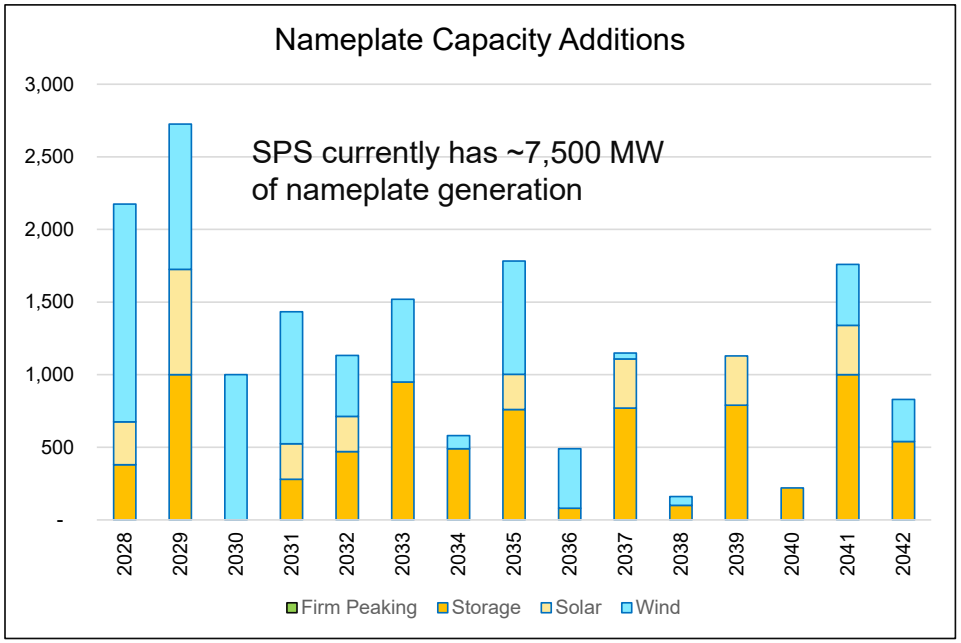

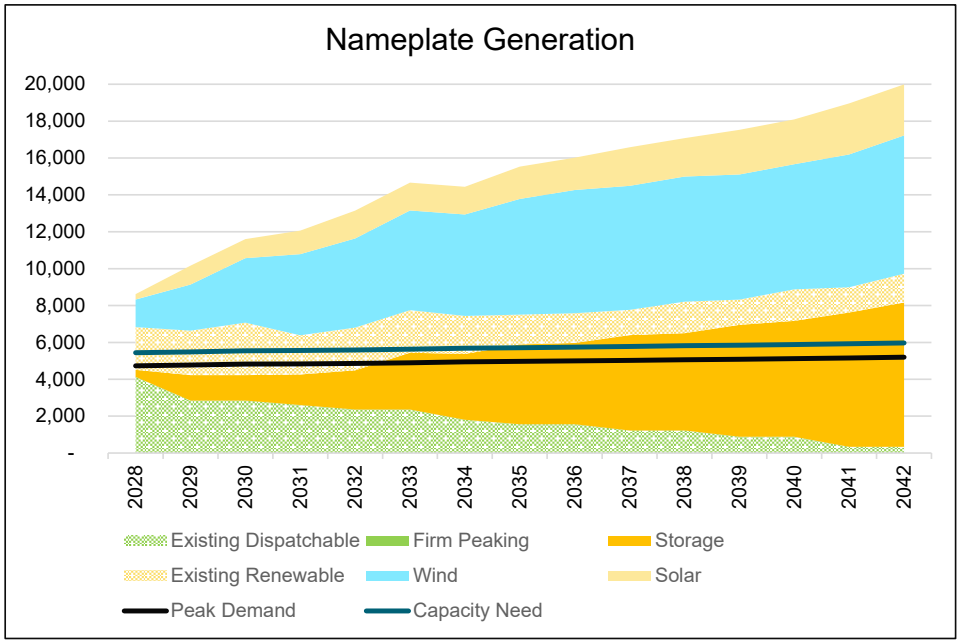

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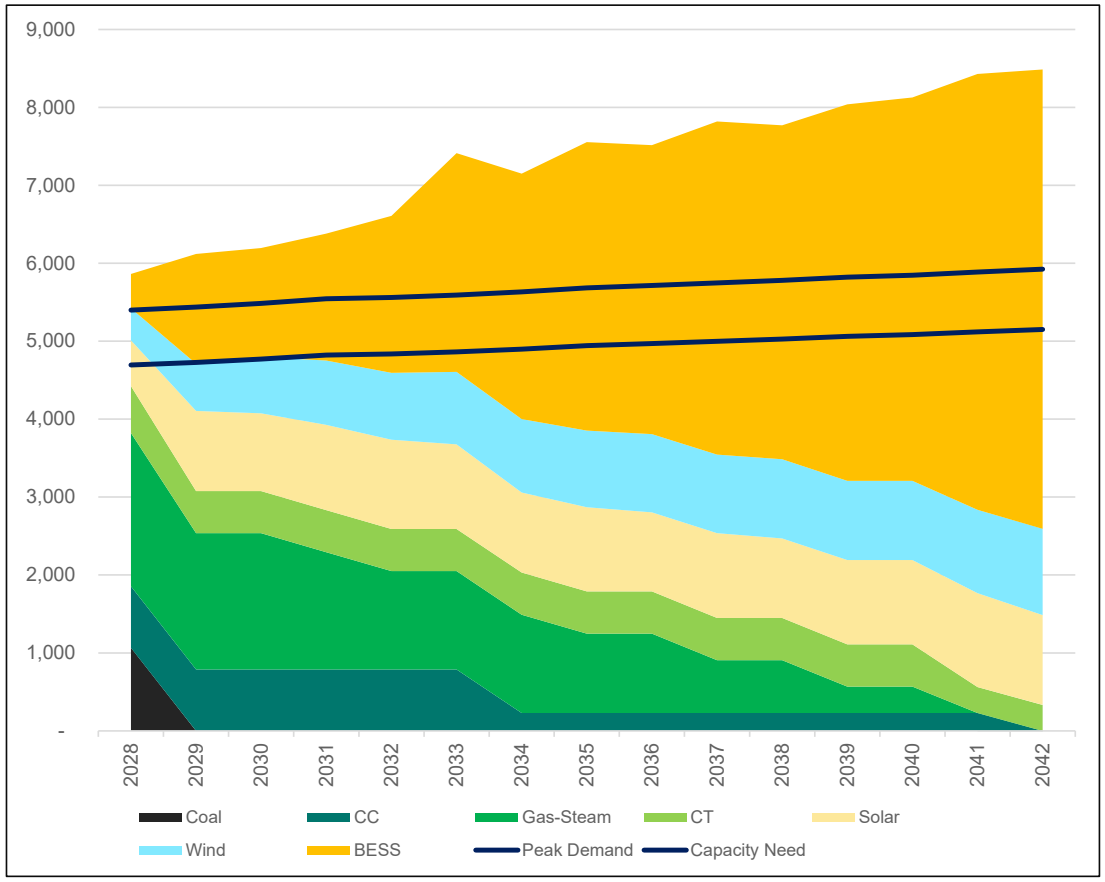
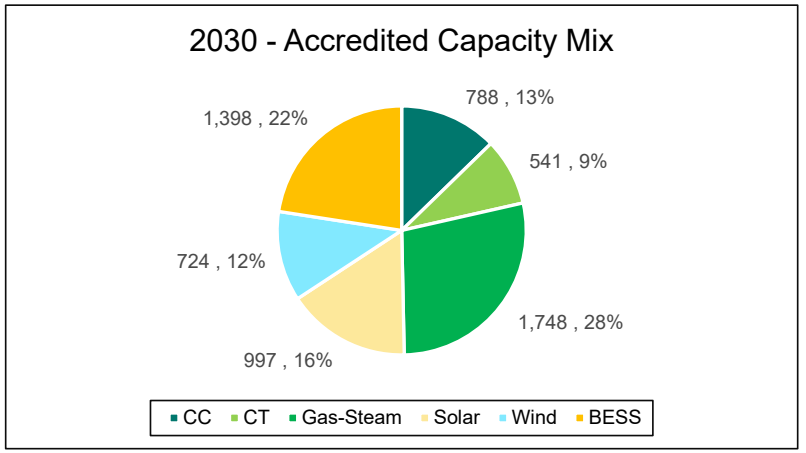
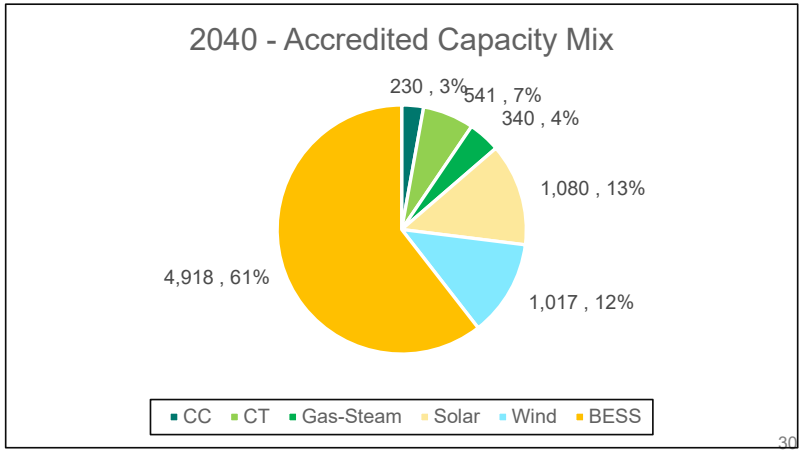
Existing Renewable	2,315	2,414	2,845	2,119	2,313	2,312	2,069	1,620	1,613	1,370	1,709	1,370	1,709	1,370	1,570
Existing Dispatchable	4,133	2,847	2,847	2,603	2,360	2,360	1,802	1,559	1,559	1,220	1,220	881	881	334	334
Storage	380	1,380	1,380	1,660	2,130	3,080	3,570	4,330	4,410	5,180	5,280	6,070	6,290	7,290	7,830
Wind	1,500	2,500	3,500	4,410	4,830	5,400	5,490	6,270	6,680	6,720	6,780	6,780	6,780	7,200	7,490
Solar	295	1,021	1,021	1,265	1,508	1,508	1,508	1,751	1,751	2,090	2,090	2,429	2,429	2,769	2,769
Firm Peaking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**8,623**	**10,162**	**11,593**	**12,057**	**13,141**	**14,660**	**14,439**	**15,530**	**16,013**	**16,580**	**17,079**	**17,530**	**18,089**	**18,963**	**19,993**

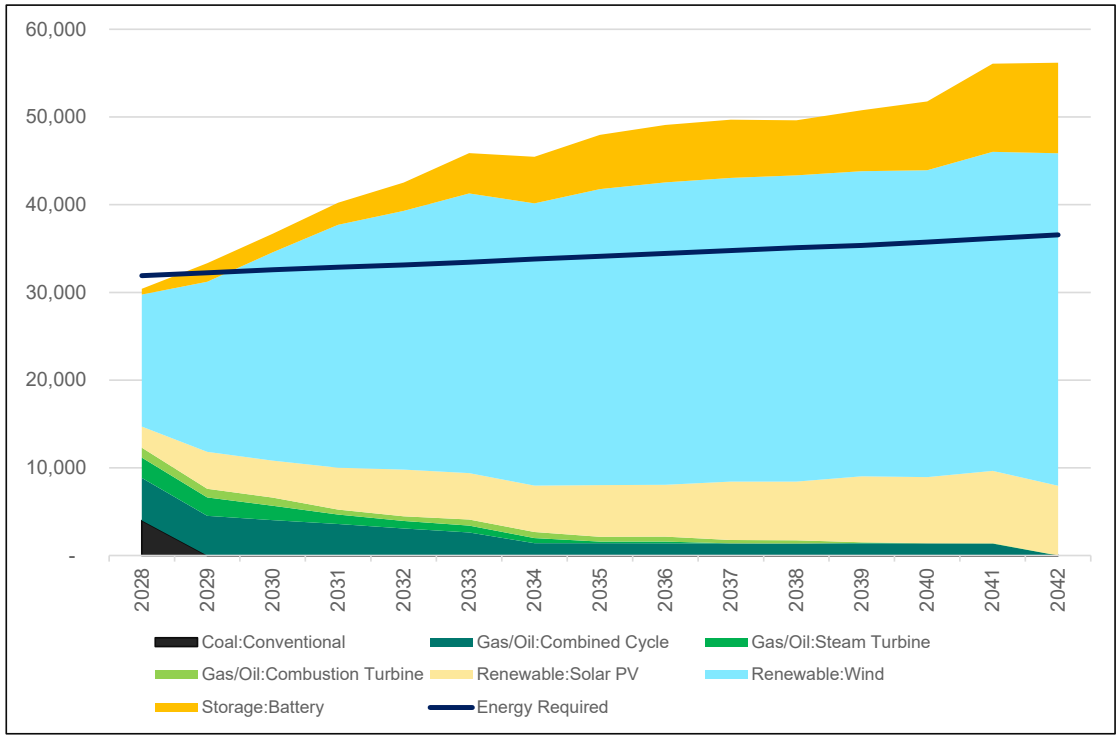
Accredited Capacity

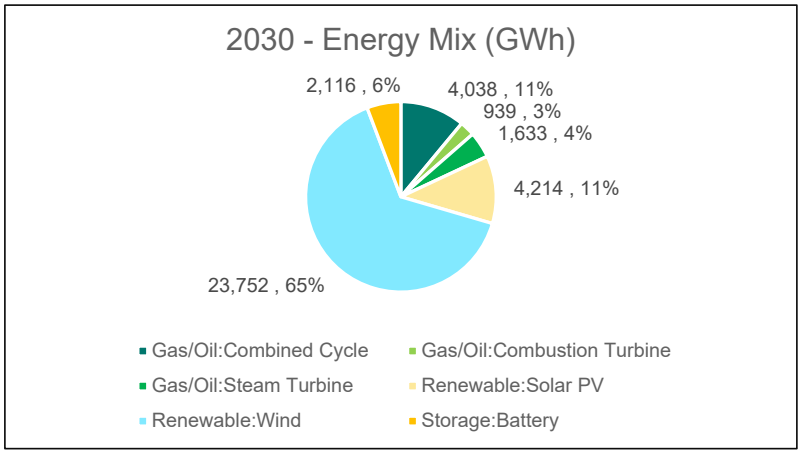


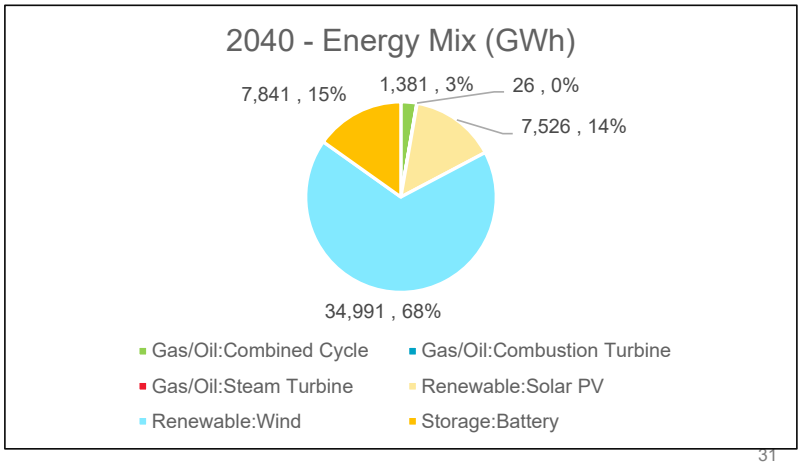




Energy (GWh)







- 81% renewable + BESS in 2030 increasing to almost 97% in 2040

Key Takeaways

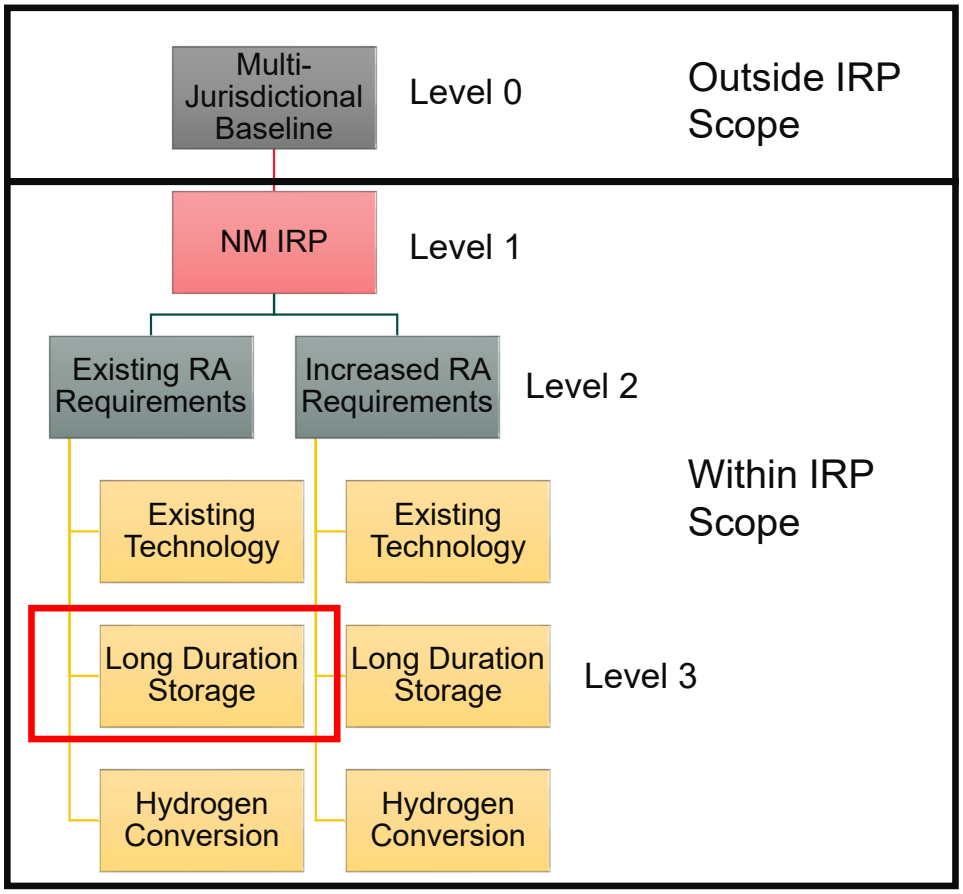
- SPS's capacity need is 2,317 MW in 2030, increasing to 4,790 MW in 2040
- SPS's recently filed CCN solves approximately 600 MW of this need
- To fulfil the remaining capacity need, EnCompass adds:

	2030	2040
Storage	1,380	6,290
Wind	3,500	6,780
Solar	1,021	2,429
Firm Peaking	-	-

- Outcome 79% renewable energy in 2030, increasing to 95% in 2040
- High Bookend for 2024 RFP would seek 1,380 MW of dispatchable resources and 4,521 MW of variable energy resources (subject to pricing and availability of projects submitted)

[COMMERCIALLY AVAILABLE] EXISTING CARBON-FREE TECHNOLOGIES + LONG DURATION BATTERY ENERGY STORAGE

SPS – Modeling Hierarchy



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

Load
- Financial Forecast (50% percentile)
- Planning Forecast (85% percentile)
- Electrification & Emerging Technologies Load

Gas
- Base Gas
- Low Gas
- High Gas

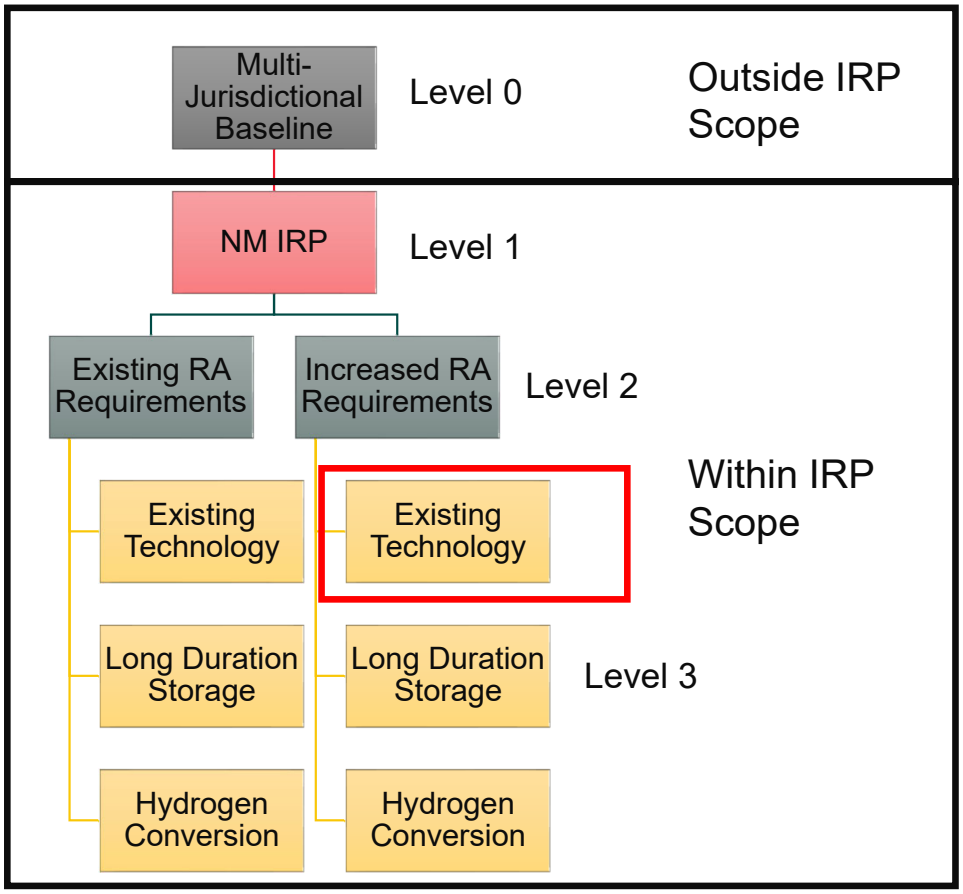
Transmission Network Upgrade Sensitivities
- Base Transmission Network Upgrade Costs
- High Transmission Network Upgrade Costs

PLACEHOLDER

- EnCompass did not select any long-duration battery energy storage projects (100-hours), therefore the results are identical to the existing technologies case
- SPS intends to ‘force’ a long-duration battery energy storage project into the EnCompass model to quantifiable the impact

INCREASED RESOURCE ADEQUACY REQUIREMENTS

SPS – Modeling Hierarchy



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

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- Base Gas
- Low Gas
- High Gas

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

Summer Loads & Resources Table
(Financial Forecast) – 18% PRM

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Peak Demand	4,375	4,581	4,566	4,645	4,695	4,728	4,771	4,822	4,837	4,864
Planning Reserve Margin Requirement (18%)	787	825	822	836	845	851	859	868	871	875
Capacity Need	5,162	5,406	5,388	5,481	5,540	5,580	5,630	5,690	5,707	5,739
Accredited Capacity	5,418	5,411	5,158	4,918	4,472	3,178	3,170	2,916	2,636	2,635
Capacity Position	**256**	**5**	**(230)**	**(563)**	**(1,067)**	**(2,402)**	**(2,460)**	**(2,774)**	**(3,071)**	**(3,105)**

	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Peak Demand	4,899	4,943	4,970	4,998	5,028	5,063	5,085	5,120	5,151	5,193
Planning Reserve Margin Requirement (18%)	882	890	895	900	905	911	915	922	927	935
Capacity Need	5,780	5,833	5,864	5,898	5,933	5,974	6,000	6,041	6,078	6,128
Accredited Capacity	2,075	1,773	1,740	1,399	1,398	1,058	1,058	511	490	490
Capacity Position	**(3,706)**	**(4,060)**	**(4,124)**	**(4,498)**	**(4,535)**	**(4,917)**	**(4,943)**	**(5,530)**	**(5,588)**	**(5,638)**

- 18% Summer PRM increases SPS's capacity need by 131 MW to 156 MW between 2024 and 2043 under the financial load forecast
- The new resources selected from SPS's 2022 RFP will resolve the capacity need through 2027
- However, even under the most conservative load growth assumptions, SPS has a substantial and growing capacity need over the next 20-years

Additional Resource - Nameplate
(Financial Forecast) – 18% PRM

	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Existing Renewable	2,315	2,414	2,845	2,119	2,313	2,312	2,069	1,620	1,613	1,370	1,709	1,370	1,709	1,370	1,570
Existing Dispatchable	4,133	2,847	2,847	2,603	2,360	2,360	1,802	1,559	1,559	1,220	1,220	881	881	334	334
Storage	670	1,670	1,670	1,970	2,440	3,410	3,920	4,760	4,820	5,600	5,710	6,500	6,730	7,730	8,280
Wind	1,500	2,500	3,500	4,500	4,970	5,550	5,700	6,280	6,750	6,790	6,850	6,850	6,850	7,280	7,570
Solar	295	1,021	1,021	1,265	1,508	1,508	1,508	1,751	1,751	2,090	2,090	2,429	2,429	2,769	2,769
Firm Peaking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**8,913**	**10,452**	**11,883**	**12,457**	**13,591**	**15,140**	**14,999**	**15,970**	**16,493**	**17,070**	**17,579**	**18,030**	**18,599**	**19,483**	**20,523**

	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Existing Renewable	2,315	2,414	2,845	2,119	2,313	2,312	2,069	1,620	1,613	1,370	1,709	1,370	1,709	1,370	1,570
Existing Dispatchable	4,133	2,847	2,847	2,603	2,360	2,360	1,802	1,559	1,559	1,220	1,220	881	881	334	334
Storage	380	1,380	1,380	1,660	2,130	3,080	3,570	4,330	4,410	5,180	5,280	6,070	6,290	7,290	7,830
Wind	1,500	2,500	3,500	4,410	4,830	5,400	5,490	6,270	6,680	6,720	6,780	6,780	6,780	7,200	7,490
Solar	295	1,021	1,021	1,265	1,508	1,508	1,508	1,751	1,751	2,090	2,090	2,429	2,429	2,769	2,769
Firm Peaking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**8,623**	**10,162**	**11,593**	**12,057**	**13,141**	**14,660**	**14,439**	**15,530**	**16,013**	**16,580**	**17,079**	**17,530**	**18,089**	**18,963**	**19,993**

	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Existing Renewable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Existing Dispatchable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Storage	290	290	290	310	310	330	350	430	410	420	430	430	440	440	450
Wind	-	-	-	90	140	150	210	10	70	70	70	70	70	80	80
Solar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Firm Peaking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**290**	**290**	**290**	**400**	**450**	**480**	**560**	**440**	**480**	**490**	**500**	**500**	**510**	**520**	**530**

IDENTIFIED RESOURCE NEED

Identified Resource Need Through 2030

Technology	Multi-Jurisdictional Baseline	Existing Technologies – 15% PRM	Existing Technologies – 18% PRM
Storage	120	1,380	1,670
Firm Peaking	933	-	-
Dispatchable	**1,530**	**1,380**	**1,670**
Wind	3,230	3,500	3,500
Solar	1,021	1,021	1,021
Variable Energy Resources	**4,251**	**4,521**	**4,521**

Under the Financial Forecast, SPS has identified a need of between 1,380 MW and 1,670 MW of dispatchable capacity and 4,251 MW to 4,521 MW of variable energy resources before Summer 2030

Actual capacity need is subject to firm pricing and resource availability

Identified Resource Need Through 2040

Technology	Multi-Jurisdictional Baseline	Existing Technologies – 15% PRM	Existing Technologies – 18% PRM
Storage	120	6,290	6,730
Firm Peaking	3,733	-	-
Dispatchable	**3,853**	**6,290**	**6,730**
Wind	4,370	6,780	6,850
Solar	2,799	2,429	2,429
Variable Energy Resources	**7,169**	**9,209**	**9,279**

Under the Financial Forecast, SPS has identified a need of between 3,853 MW and 6,730 MW of dispatchable capacity and 7,169 MW to 9,279 MW of variable energy resources before Summer 2040

Actual capacity need is subject to firm pricing and resource availability