KANSAS CORPORATION COMMISSION

2023 | ELECTRIC SUPPLY & DEMAND BIENNIAL REPORT

Serving the people of Kansas by regulating the State's energy infrastructure, oil and gas production and commercial trucking to ensure public safety.

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Kansas
Corporation Commission

Introduction

K.S.A. 2011 Supp. 66-1282 became effective July 1, 2011, and requires the Kansas Corporation Commission (KCC or Commission) to compile a report regarding electric supply and demand for all electric utilities in Kansas. The statute requires this report to include, but not be limited to: (1) Generation capacity needs and (2) system peak capacity needs and (3) renewable generation needs associated with the 2009 Kansas renewable energy standards.

To ensure that the KCC Staff has the information it needs to compile these reports, the KCC issued an Order on October 29, 2012, requiring electric generators in the state of Kansas to file annually, the data required to compile this report with the Commission under Docket 13-GIME-256-CPL. The current generators required to participate in this filing are as follows:

- Evergy Kansas (F.K.A Westar Energy and Kansas City Power & Light Company);
- Empire District Electric Company;
- Kansas Power Pool;
- Kansas Municipal Energy Agency;
- Kansas Electric Power Cooperatives;
- Midwest Energy;
- Sunflower Electric Power Corporation, which includes Mid-Kansas Electric Company assets; and
- Kansas City Board of Public Utilities

The eight entities listed above are also members of the Southwest Power Pool (SPP) and participate in the electricity integrated market across the 17-state SPP footprint. SPP is a regional transmission organization (RTO) responsible for ensuring reliable supply of power, adequate transmission infrastructure, and competitive wholesale electricity prices on behalf of its members for a 552,000-square-mile region, including more than 70,000 miles of high-voltage transmission lines in the Eastern Interconnection.[1] As electricity generation suppliers, the above listed companies are classified as Load Responsible entities (LREs) of SPP.

Under the authority vested in it by the Federal Energy Regulatory Commission, SPP uses a member/stakeholder process to establish criteria that mandate resource accreditation techniques and minimum resource supplies that must be met by its LREs. Recent action taken by SPP has established the need for the Planning Reserve Margin (PRM)[2] to be increased from 12% to 15% by the summer of

[1] See spp.org "about us."

[2] Planning Reserve Margin equals the difference in Deliverable or Prospective Resources and Net Internal Demand, divided by Net Internal Demand. Planning reserve margin is designed to measure the amount of generation capacity available to meet expected demand in planning horizon. Coupled with probabilistic analysis, calculated planning reserve margins have been an industry standard used by planners for decades as a relative indication of adequacy. *See https://www.nerc.com/pa/RAPA/ri/Pages/PlanningReserveMargin.aspx.*

2023. In conjunction with the increased PRM, SPP has agreed to modify the method of accrediting generation capacity to more accurately reflect the performance of each generator. This modification will be phased in over the next five years. Currently, accredited supply and PRM are based on the nameplate capacity of the generator and the summer peaking load of the system. Appendix C contains excerpts of a recent report provided by SPP[3] to its Regional State Committee[4] that provides more information on proposed accreditation techniques and the recent modification of the PRM.

Contents

[3] See Southwest Power Pool Regional State Committee Summary of Motions and Action Items, July 25, 2022.
[4] The SPP Regional State Committee provides collective state regulatory agency input on matters of regional importance related to the development and operation of bulk electric transmission. The SPP RSC is comprised of retail regulatory commissioners from agencies in Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota and Texas.

Section 1: Generation Capacity Needs and System Peak Capacity Planning

In furtherance of the FERC mandate, SPP publishes a series of regulations—called the SPP Criteria—governing the system operations of its members. SPP additionally requires its members to annually submit 10 year capacity and load projections to show how the utility will meet its ongoing system peak capacity responsibility (System Peak Responsibility) , including the reserve margin requirement outlined in the Criteria.[5] System Peak Responsibility may be satisfied by capacity from owned generation units, capacity purchased through long term wholesale power contracts (often called Power Purchase Agreements (PPAs)), full or partial requirements contracts, and short-term capacity contracts.[6]

Table 1 (page 4) shows the current and 20 year forecasted capacity and System Peak Responsibility (system peak load plus SPP's required reserve margin) for utilities operating in Kansas. This includes smaller municipal and cooperatives utilities that purchase electricity wholesale from larger state utilities through full requirements contracts, wherein these municipal and cooperative utilities' peak loads are incorporated into the larger utility's system requirements. Finally, two of the State's investor-owned utilities Evergy Kansas, Metro (F.K.A. Kansas City Power & Light (KCP&L)) and Empire District Electric Company (Empire), are multi-jurisdictional; therefore, the data shown in this report represents only their Kansas loads (peak demand) and their system capacity has been scaled to represent the capacity allocated to serving their Kansas load.

[5] SPP Tariff Attachment AA defines PRM to be 12% and that each utility maintain capacity required to meet its load and planning reserve obligations. The PRM requirement increases to 15% in June of 2023.

[6] Note Table 1.1 and the tables listed in Appendix A are intended to represent a utility's long-term position, and thus do not include short-term capacity contracts. Short-term capacity contracts are defined as a capacity contract greater than three months but less than a year in duration.

Table 1—Overview of Current and Projected Total System Capacity and System Capacity Responsibility for Utilities Operating in Kansas

		Investor Owned Utilities (IOUs)	Cooperatives	Municipal Utilities
2021 Historical	Total System Capacity (MW)	8,430	2,061	1,354
	System Peak Responsibility (MW)	7,517	1,829	1,173
	System Capacity Surplus (Deficit)	914	232	181
2026 Projected	Total System Capacity (MW)	7,906	1,929	1,318
	System Peak Responsibility (MW)	7,652	1,941	1,255
	System Capacity Surplus (Deficit)	254	(12)	63
2031 Projected	Total System Capacity (MW)	7,309	1,817	1,295
	System Peak Responsibility (MW)	7,752	1,945	1,286
	System Capacity Surplus (Deficit)	(443)	(128)	9
2036 Projected	Total System Capacity (MW)	6,491	1,776	1,404
	System Peak Responsibility (MW)	7,927	1,955	1,311
	System Capacity Surplus (Deficit)	(1,432)	(179)	93
2041 Projected	Total System Capacity (MW)	4,288	1,775	1,227
	System Peak Responsibility (MW)	8,126	2,009	1,357
	System Capacity Surplus (Deficit)	(3,838)	(234)	(130)

Section 2: Renewable Energy Planning

In May 2009, the Kansas Legislature passed Senate Substitute bill for H. 2369, in part creating the Renewable Energy Standard Act (RESA) which requires all non-municipal utilities in Kansas to satisfy a portion of the utility's generation needs through renewable generation sources. In particular, the RESA—incorporated into statute as K.S.A. 66-1256 through 66-1262—required all utilities subject to its requirements to own or purchase renewable generation such that the nameplate capacity[1] of these generators was equal to 10% of the utility's average prior three-year annual peak retail sales for the years 2011 through 2015, 15% for the years 2016 through 2019, and 20% for all years after 2020.

Effective January 1, 2016 the Renewable Energy Standard Act was amended and the requirement to own or purchase renewable generation became a voluntary initiative. While most of the affected utilities continue to invest in renewable generation it is no longer a requirement under state law. Table 2 (page 6) shows each RESA affected utility's forecasted renewable capacity and the percentage of the utility's capacity that is due renewable generation.

[1]The KCC, through K.A.R. 82-16-1(e), has interpreted renewable generation capacity as being nameplate capacity.

Table 2—Overview of Voluntary Renewable Capacity for Utilities Operating in Kansas

		Investor Owned Utilities (IOUs)	Cooperatives	Municipal Utilities
2021 Historical	Kansas System Renewable Capacity (MW)	2,835	361	317
	Total System Peak (MW)	6,844	1,633	1,047
	Renewable Capacity (% of Peak Capacity)	41%	22%	30%
2026 Projected	Kansas System Renewable Capacity (MW)	2,956	361	303
	Total System Peak (MW)	6,755	1,687	1,091
	Renewable Capacity (% of Peak Capacity)	44%	21%	28%
2031 Projected	Kansas System Renewable Capacity (MW)	2,755	287	262
	Total System Peak (MW)	6,833	1,692	1,118
	Renewable Capacity (% of Peak Capacity)	40%	17%	23%
2036 Projected	Kansas System Renewable Capacity (MW)	1,358	134	237
	Total System Peak (MW)	6,976	1,700	1,148
	Renewable Capacity (% of Peak Capacity)	19%	8%	21%
2041 Projected	Kansas System Renewable Capacity (MW)	964	134	5
	Total System Peak (MW)	7,099	1,748	1,181
	Renewable Capacity (% of Peak Capacity)	14%	8%	0%

Appendix A: Commercial-Size Renewable Energy Generation[1]
Appendix A-1: Existing Renewable Generators within Kansas[2]

Renewable Generator (Total Nameplate Capacity)	County	Developer	Initial Month and Year of Operation	Utility Purchaser	Size
Prairie Queen Wind Farm (200 MW)	Allen	EDP Renewables	May 2019	Evergy Kansas Metro	200 MW
East Kansas Agri-Energy (2 MW)	Anderson	East Kansas Agri-Energy	June 2005	East Kansas Agri-Energy, LLC	2 MW
Flat Ridge 1 Wind Farm (94 MW)	Barber	BP Alternative Energy	March 2009	Evergy Kansas Central	94 MW
Flat Ridge 2 Wind Farm (470 MW)	Barber Harper Kingman	BP Alternative Energy Evergy	December 2012	AE Power Services LLC	470 MW
Elk River Wind Facility (150 MW)	Butler	PPM Energy (Ibedrola SA)	December 2005	Empire District Electric	150 MW
Prairie Sky Solar Farm (1 MW)	Butler	Kansas Electric Power Coop Inc.	February 2017	Kansas Electric Power Coop Inc.	1 MW
Bloom Wind (178 MW)	Clark and Ford	Norvento	June 2017	Capital Power (IPP)	178 MW
Cimarron Bend Wind Project I (200 MW)	Clark	Tradewind Energy for Enel Green Power North America (EGPNA)	December 2016	Kansas City Board of Public Utilities	100 MW
				Google	100 MW
Cimarron Bend Wind Project II (200 MW)	Clark	Tradewind Energy for Enel Green Power North America (EGPNA)	March 2017	Kansas City Board of Public Utilities	100 MW
				Google	100 MW
Cimarron Bend Wind Project III (199 MW)	Clark	Tradewind Energy for Enel Green Power North American (EGPNA)	January 2021	Evergy	150 MW
				Missouri Public Utility Alliance (MPUA)	30 MW
					19 MW
Cloud County (Meridian Way) Wind Farm (201 MW)	Cloud	EDP Renewables	December 2008	Empire District Electric	105 MW
				Westar Energy	96 MW
Waverly Wind (199 MW)	Coffey	EDP Renewables	January 2016	Evergy Kansas Metro	199 MW
Jayhawk Wind (197 MW)	Crawford	Apex Clean Energy	January 2022	Evergy	197 MW
Oak Grove Landfill (1.6 MW)	Crawford	Waste Corporation of Kansas	March 2010	Kansas City Board of Public Utilities	1.6 MW

[1] Based on Energy Information Administration Reports 923 and 860, dated September 2022.
[2] Based on information in footnote 1 and Kansas Corporation Commission Docket filings.

Renewable Generator (Total Nameplate Capacity)	County	Developer	Initial Month and Year of Operation	Utility Purchaser	Size
Diamond Vista (299 MW)	Dickenson and Marion	Enel Green Power North America	January 2019	Kohler, City of Springfield, Tri-County Electric Cooperative of Oklahoma	299 MW
Bowersock Hydro-electric Dam (7.1 MW)	Douglas	Kansas River Hydro Project	1920	Kansas City Board of Public Utilities	7.1 MW
Caney River (200 MW)	Elk	Trade Wind Energy	November 2011	Tennessee Valley Authority	200 MW
Buckeye Wind Energy (200.5 MW)	Ellis	Invenergy, LLC	August 2015	KMEA	200.5 MW
Fort Hays State University Wind Farm I (2 MW)	Ellis	Harvest the Wind Network, LLC	November 2013		2 MW
Fort Hays State University Wind Farm II (2 MW)	Ellis	Harvest the Wind Network, LLC	November 2013		2 MW
Post Rock (201 MW)	Ellsworth and Lincoln	Wind Capital Group	September 2012	Evergy Kansas Central	201 MW
Smoky Hills Phase 1 (100.8 MW)	Ellsworth and Lincoln	Trade Wind Energy	January 2008	Sunflower Electric	50.4 MW
				Kansas City Board of Public Utilities	25.2 MW
				Midwest Energy	25.2 MW
Smoky Hills Phase 2 (148.5 MW)	Ellsworth and Lincoln	Trade Wind Energy	November 2008	Sunflower Electric (allocated to MKEC system)	24 MW
				Midwest Energy	24 MW
				City Power and Light (Independence, Mo.)	15 MW
				City Utilities of Springfield, Mo.	50 MW
				Unallocated (SPP EIM)[1]	35.5 MW
Spearville Wind Energy Facility Phase I (100.5 MW)	Ford	EDF Renewable Energy	September 2006	Evergy Kansas Metro	100.5 MW
Spearville Wind Energy Facility Phase II (48 MW)	Ford	EDF Renewable Energy	December 2010	Evergy Kansas Metro	48 MW
Spearville Wind Energy Facility Phase III (108 MW)	Ford	EDF Renewable Energy	October 2012	Evergy Kansas Metro	108 MW
Western Plains Wind Farm (280 MW)	Ford	Infinity Wind	March 2017	Evergy Kansas Central	280 MW
Iron Star (298 MW)	Ford	Engie North America	December 2021	---------	298 MW
Ironwood (168 MW)	Ford and Hodgeman	Duke Energy Generation Services	August 2012	Evergy Kansas Central	168 MW
Buffalo Dunes (250 MW)	Grant and Haskell	Trade Wind Energy	December 2013	Enel Green Power	187 MW
				Alabama Power Company	63 MW

[1] Unallocated wind energy can be sold through the Southwest Power Pool's Energy Imbalance Market place.

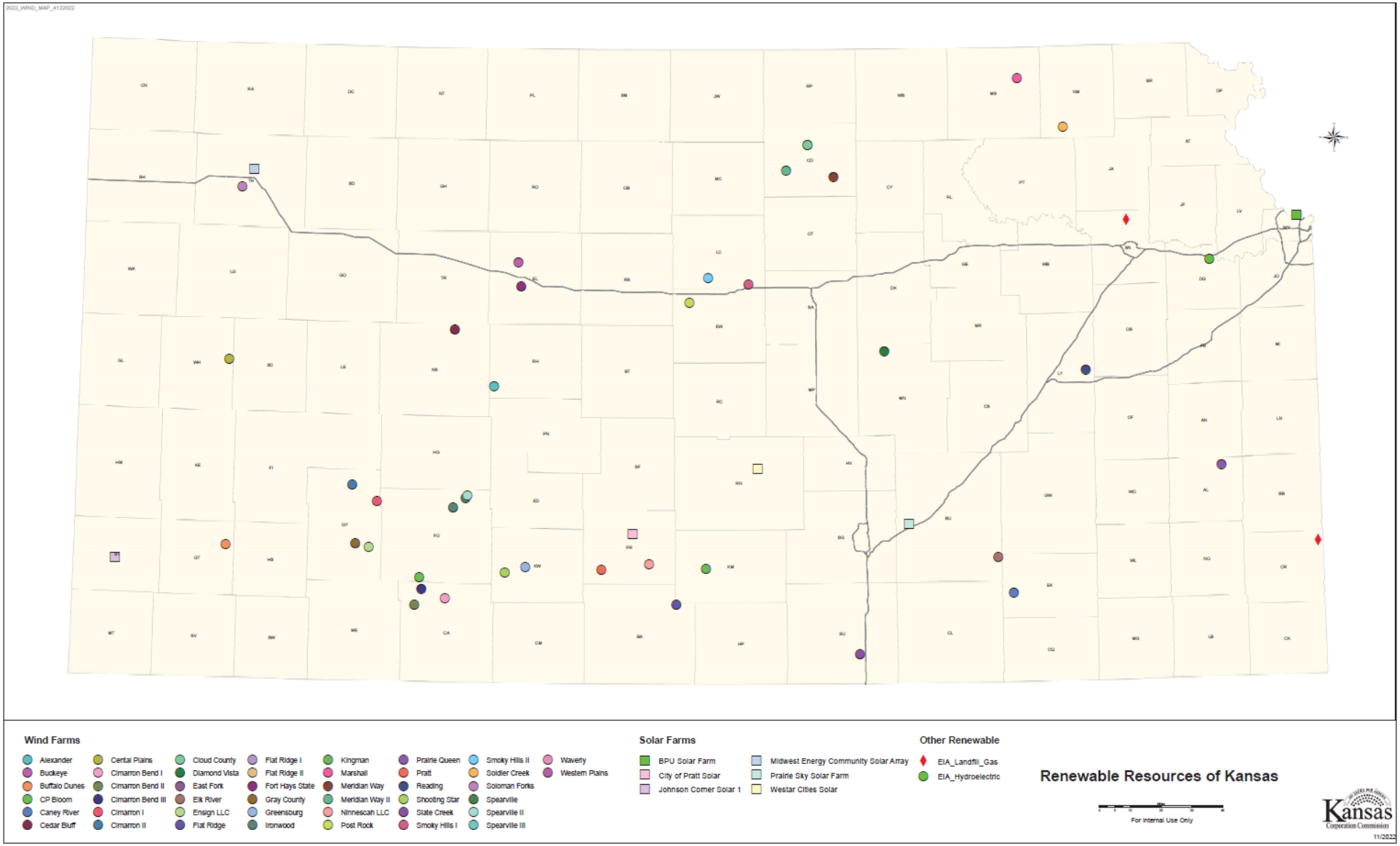
Renewable Generator (Total Nameplate Capacity)	County	Developer	Initial Month and Year of Operation	Utility Purchaser	Size
Cimarron Energy Project (Cimarron I) (166 MW)	Gray	CPV Renewable Energy	November 2012	Tennessee Valley Authority	166 MW
Cimarron Energy Project (Cimarron II) (131 MW)	Gray	CPV Renewable Energy	June 2012	Evergy Kansas Metro	131 MW
Ensign Wind Energy (99 MW)	Gray	NextEra Energy Resources	November 2012	Evergy Kansas Metro	99 MW
Gray County Wind Farm (112.2 MW)	Gray	NextEra Energy Resources, LLC	November 2001	Sunflower Electric (allocated to MKEC system)	51 MW
				Evergy Kansas Metro	60 MW
				Unallocated	1 MW
Flat Ridge III (128 MW)	Kingman	Wood Construction for AEP Renewables	December 2021	Evergy Kansas Central	128 MW
Kingman Wind Energy I (107 MW)	Kingman	NextEra Energy Resources, LLC	December 2016	Evergy Kansas Central	107 MW
Shooting Star (104 MW)	Kiowa	Infinity Wind Power	September 2012	Sunflower	104 MW
Greensburg (12.5 MW)	Kiowa	John Deere / Exelon	February 2010	Kansas Power Pool	12.5 MW
Reading Wind Farm (200 MW)	Lyon Osage	Southern Power	July 2020	Royal Caribbean	200 MW
Irish Creek (300 MW)	Marshall	NextEra Energy Resources, LLC	December 2021		301 MW
Marshall Energy (74 MW)	Marshall	RPM Access	May 2016	Missouri Joint Municipal Electric Utility Commission	74 MW
Marshall Wind Farm (72 MW)	Marshall	BHE Renewables, LLC	May 2016	Kansas Municipal Energy Agency	7 MW
				Missouri Joint Municipal Electric Utility Commission	20 MW
				Kansas Power Pool	25 MW
				City of Independence, MO	20 MW
Beloit	Mitchell		June 2022	KMEA	2 MW
Neosho Ridge Wind Farm	Neosho	Apex Wind Energy	May 2021	Liberty Utilities- Empire District Electric	301 MW
Soldier Creek	Nemaha	NextEra Energy Resources, LLC	January 2020	Evergy Kansas Central	300 MW
Cedar Bluff Wind Farm (200 MW)	Ness	NextEra Energy Resources	December 2015	Evergy Kansas Central	200 MW
Ninnescah Wind Energy (208 MW)	Pratt	NextEra Energy Resources, LLC	December 2016	Evergy Kansas Central	208 MW
Pratt Wind Energy Center (244 MW)	Pratt	NextEra Energy Resources, LLC	December 2018	Evergy Kansas Metro	244 MW
Pretty Prairie Wind Farm	Reno	Pretty Prairie Wind	2019	Iron Mountain	220 MW

Renewable Generator (Total Nameplate Capacity)	County	Developer	Initial Month and Year of Operation	Utility Purchaser	Size
(220 MW)					
Westar Community Solar (1 MW)	Reno	SoCore Energy	July 2017	Evergy Kansas Central	1 MW
Alexander Wind Farm (51 MW)	Rush	New Jersey Resources Corp.	December 2015	Kansas City Board of Public Utilities & Yahoo! Inc.	48.3 MW
Rolling Meadows Landfill (5.6 MW)	Shawnee	Waste Management	January 2010	Evergy Kansas Central	5.6 MW
Johnson Corner Solar Project (20 MW)	Stanton	Lightsource BP	April 2020	Sunflower Electric Power	20 MW
Slate Creek Wind Project (150 MW)	Sumner	EDF Renewable Energy	December 2015	Great Plains Energy Inc.	150 MW
East Fork Wind Farm	Thomas	ENGIE North America	March 2020	Brown-Forman	196 MW
Midwest Energy Community Solar Garden (1 MW)	Thomas	Clean Energy Collective	February 2015	Midwest Energy	1 MW
Solomon Forks and Solomon Forks East (474 MW)	Thomas	Engie North America	July 2019	T-Mobile, Target	276 MW
Central Plains Wind Farm (99 MW)	Wichita	RES America	March 2009	Evergy Kansas Central	99 MW
Board of Public Utilities Solar Farm (1 MW)	Wyandotte	Board of Public Utilities	September 2017	Board of Public Utilities	1 MW

Appendix A-2: Announced New Renewable Generation within Kansas

Renewable Generator (Total Nameplate Capacity)	County	Developer	Initial Month and Year of Operation	Utility Purchaser	Size
Plum Nellie Wind Farm, LLC	Cloud	EDP Renewables	October 2025		201.6 MW
Sunflower Energy Center, LLC	Marion		August 2023		200 MW

Renewable Generation in Kansas



Appendix B: Inventory of Major Power Plants Serving Kansas Loads

Operating Utility	Power Plant Name Unit / Primary Fuel Source (B-Base, I-Intermediate, P-Peaking)	County	Ownership	Nameplate Capacity (MW)	Initial Year of Operation	2021 Net Generation (MWh)
Wolf Creek Nuclear Operating Corporation	**Wolf Creek** Nuclear (B)	Coffey	Evergy Kansas Metro (94%) KEPCo (6%)	1,268	1985	8,574,875
Evergy Kansas Central (EKC)	**Jeffrey Energy Center** Coal (B)	Pottawatomie	EKC (92%) Evergy Kansas Metro (8%)	2,160	1978 - 1983	8,340,406
	Lawrence Energy Center Coal (B)	Douglas	EKC (100%)	517	1960 - 1971	1,888,956
	Hutchinson Natural gas (P)	Reno	EKC (100%)	213	1974	32,959
	Gordon Evans Natural gas (P) Diesel (P)	Sedgwick	EKC (100%)	378	1969 - 2001	144,770
	Emporia Energy Center Natural gas (LF) and Natural gas (P)	Lyon	EKC (100%)	733	2008-2009	311,844
	Spring Creek Energy Center Natural gas (P)	Logan, Oklahoma	EKC (100%)	338	2001	323,995
	Central Plains Wind Farm Wind	Wichita	EKC (100%)	99	2009	151,059
	Flat Ridge 1 Wind Farm Wind	Barber	EKC (100%)	50	2009	47,580
	Western Plains Wind Farm Wind	Ford	EKC (100%)	281	2017	1,099,871
Evergy Kansas Metro (EKM)	**LaCygne** Coal (B)	Linn	EKM (50%) EKC (50%)	1,599	1973 - 1977	6,390,767
	Osawatomie Natural gas (P)	Miami	EKM (100%)	102	2003	37,771
	West Gardner Natural gas (P)	Johnson	EKM (100%)	408	2003	55,524

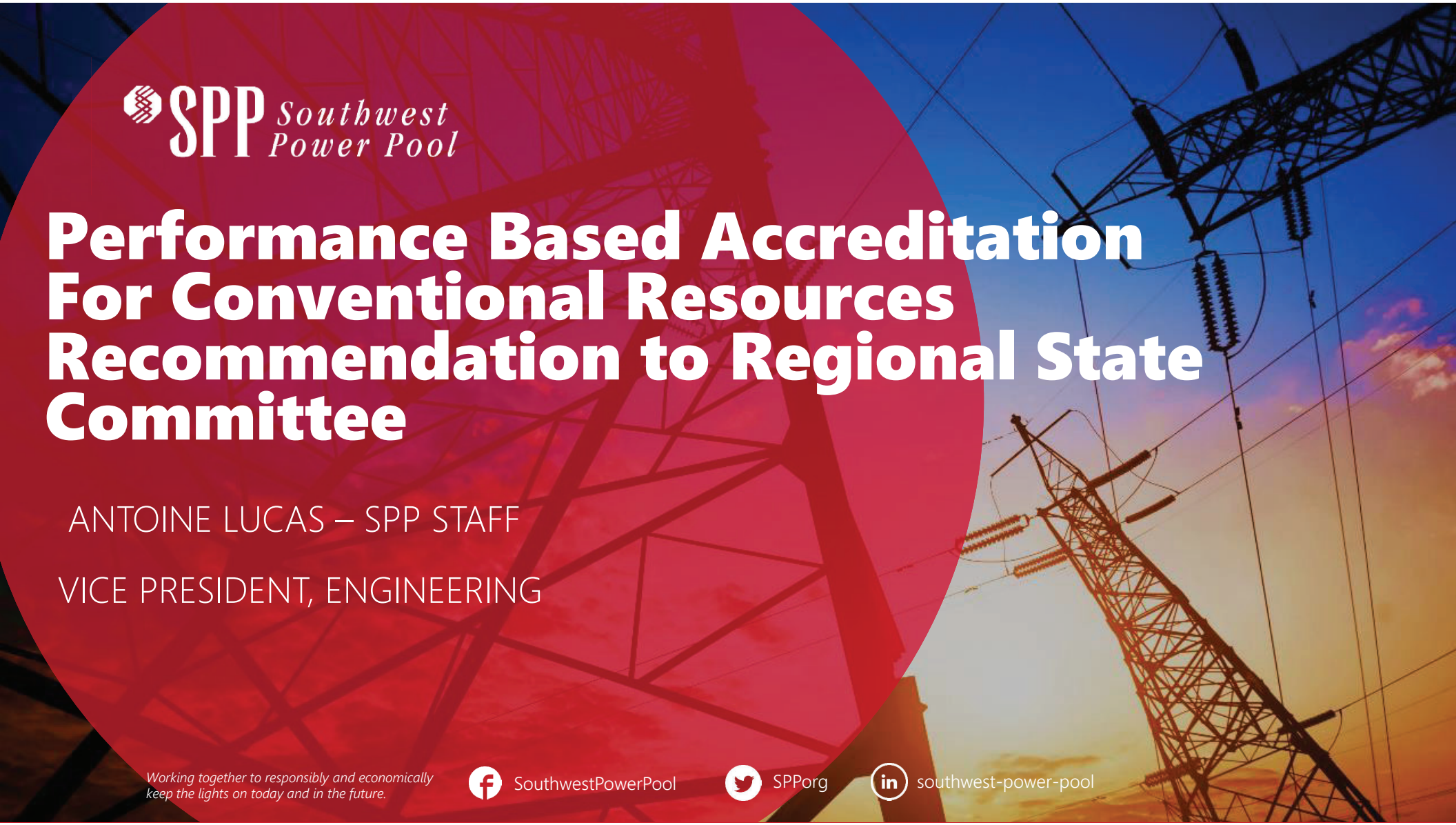
Operating Utility	Power Plant Name Unit / Primary Fuel Source (B-Base, I-Intermediate, P-Peaking)	County	Ownership	Nameplate Capacity (MW)	Initial Year of Operation	2021 Net Generation (MWh)
	Iatan I Coal (B)	Platte, Missouri	EKM (70%) Evergy MO West (18%) Empire (12%)	726	1980	53,093
	Iatan II Coal (B)	Platte, Missouri	EKM (54.71%) Every MO West (18%) Empire (12%) MJMEUC (11.76%) KEPCo (3.53%)	999	2010	7,798,473
	Hawthorn Coal (B)	Jackson, Missouri	EKM (100%)	569	1969	37,789
	Hawthorn Combine Cycle Natural gas (P)	Jackson, Missouri	EKM (100%)	313	1997 - 2000	2,714,419
	Hawthorn Combustion Turbine Natural gas (P)	Jackson, Missouri	EKM (100%)	166	2000	100,388
	Northeast Station Natural gas (P) and Distillate fuel oil (P)	Jackson, Missouri	EKM (100%)	490	1972-1985	22,130
	Spearville Wind Farm Wind	Ford	EKM (100%)	257	2006 - 2012	537,186
Kansas City Board of Public Utilities (KC-BPU)	**Quindaro** Coal (B)	Wyandotte	KC-BPU (100%)	131	1974-1977	0
	Quindaro Combustion Turbine Natural gas (P) and Distillate fuel oil (P)	Wyandotte	KC-BPU (100%)	239	1965 - 1971	10,602
	Nearman Creek Coal (B)	Wyandotte	KC-BPU (100%)	261	1981	1,3188,531
	Nearman Creek Combustion Turbine Natural gas (P)	Wyandotte	KC-BPU (100%)	94	2006	7,571
Kansas Electric Power Cooperative, Inc. (KEPCo)	**Sharpe** Distillate fuel oil (I)	Coffey	KEPCo (100%)	20	2002	2,744
Sunflower Electric Power Corporation (Sunflower)	**Holcomb Station** Coal (B)	Finney	Sunflower (100%)	349	1983	1,599,571

Operating Utility	Power Plant Name Unit / Primary Fuel Source (B-Base, I-Intermediate, P-Peaking)	County	Ownership	Nameplate Capacity (MW)	Initial Year of Operation	2021 Net Generation (MWh)
	Garden City Station Natural gas (I) and Natural gas (P)	Finney	Sunflower (100%)	256	1968 - 1979	11,441
	Fort Dodge 4	Ford	Sunflower (100%)	149	1969	910
	Great Bend 3	Barton	Sunflower (100%)	82	1963	(1,045)
	Cimarron River 1 Natural Gas (B)	Seward	Sunflower (100%)	65	1963-1968	554
	Clifton 1 Natural Gas (P)	Washington	Sunflower (100%)	88	1974	11,182
	Rubart Station Natural Gas (I)	Grant	Sunflower (100%)	120	2014	51,776
Liberty Utilities (Empire)	**Riverton** Natural gas (P)	Cherokee	Empire (100%)	268	2007-2016	638
	Riverton Combustion Turbine Natural gas (P)	Cherokee	Empire (100%)	33	1988	1,331,689
	Empire Energy Center Natural gas (P)	Jasper, Missouri	Empire (100%)	379	1978 - 2003	230,947
	Ozark Beach Hydro (B)	Taney, Missouri	Empire (100%)	16	1931	50,484
	State Line Combine Cycle Natural gas (P)	Jasper, Missouri	Empire (60%) EKC (40%)	568	1997-2001	1,274,521
	State Line Combustion Turbine Natural gas (P)	Jasper, Missouri	Empire (100%)	123	1995	671,991
Plum Point Energy Associates, LLC (Plum)	**Plum Point Energy** Coal (B)	Mississippi, Arkansas	Plum (56.85%) MJMEUC (22.11%) Empire (7.52%) East Texas Coop. (7.52%) Mississippi Municipal Energy Agency (6%)	720	2010	4,046,219
Midwest Energy, Inc. (Midwest)	**Colby** Dual Fuel (P)	Thomas	Midwest (100%)	16	1970	54
	Bird City Distillate fuel oil (P)	Cheyenne	Midwest (100%)	4	1965-1966	141
	Goodman Energy Center Natural gas (P)	Ellis	Midwest (100%)	104	2008-2016	88,301

Appendix C: SPP Discussion of Accredited Capacity and Resource Adequacy

SPP Acronym Glossary

CAWG	**Cost Allocation Working Group:** analyzes and implements cost allocation methodologies for transmission facilities within the SPP region.
ELCC	**Effective Load Carrying Capacity:** a measurement of that resource's ability to produce energy when the grid is most likely to experience electricity shortfalls.
EUE	**Expected Unserved Energy:** the amount of energy not supplied due to supply-related emergencies.
GI	**Generator Interconnection:** connects generation to the grid.
GO	**Generator Operator:** the entity that operates a generating facility.
ICAP	**Installed Capacity:** the amount of energy a station is able to produce.
IRATF	**Improved Resource Availability Task Force:** responsible for addressing recommendations related to fuel assurance and resource planning and availability.
LOLE	**Loss of Load Expectation:** the expected number of days or hours per period which there is insufficient capacity to serve load. An analysis is typically performed to determine the amount of capacity that needs to be acquired to meet a desired reliability target.
LRE	**Load Responsible Entity:** any Asset Owner participating in the Integrated Marketplace with registered physical assets that are either load (power consumption) or firm Export Interchange Transactions (A Market Participant schedule for exporting Energy out of the SPP Balancing Authority Area).
MMU	**Market Monitoring Unit**: ensures that the markets administered by the independent system operator (ISO) function efficiently and appropriately, and protects both consumers and participants in the markets.
MOPC	**Markets and Operations Policy Committee:** SPP's largest stakeholder committee and acts as a technical and policy advisory group to the SPP Board of Directors.
PBA	**Performance Based Accreditation:** a methodology that is used to measure the actual historical performance of a conventional generator resource to ensure that the resource is reliable and available to meet system needs.
PRM	**Planning Reserve Margin:** maintain a generating capacity in excess of an entity's Net Peak Demand by providing the sufficient capacity and demand requirements.
RAR	**Resource Adequacy Requirement**: meant to ensure there is enough capacity available to meet the needs of all end-use customers in SPP.
RSC	**Regional State Committee from SPP:** provides collective state regulatory agency input on matters of regional importance related to the development and operation of bulk electric transmission.
SAWG	**Supply Adequacy Working Group**: develops and oversees policies and procedures related to reliable supply adequacy within the SPP footprint.
UCAP	**Unforced Capacity**: installed capacity rated at summer conditions that excludes forced outages or forced deratings, calculated for each Capacity Resource on the 12-month period from October to September without regard to the ownership of or the contractual rights to the capacity of the unit.
WWE	**Winter Weather Event**



Performance Based Accreditation For Conventional Resources Recommendation to Regional State Committee

ANTOINE LUCAS – SPP STAFF

VICE PRESIDENT, ENGINEERING

Working together to responsibly and economically keep the lights on today and in the future.

SouthwestPowerPool SPPorg southwest-power-pool

CURRENT ACCREDITATION

SPP Resource Adequacy process applies generation capability testing to conventional generation for accreditation

- One-hour duration during summer season
- Defines and verifies net maximum capability, considering other limitations
- Capability test result is used as accredited capacity

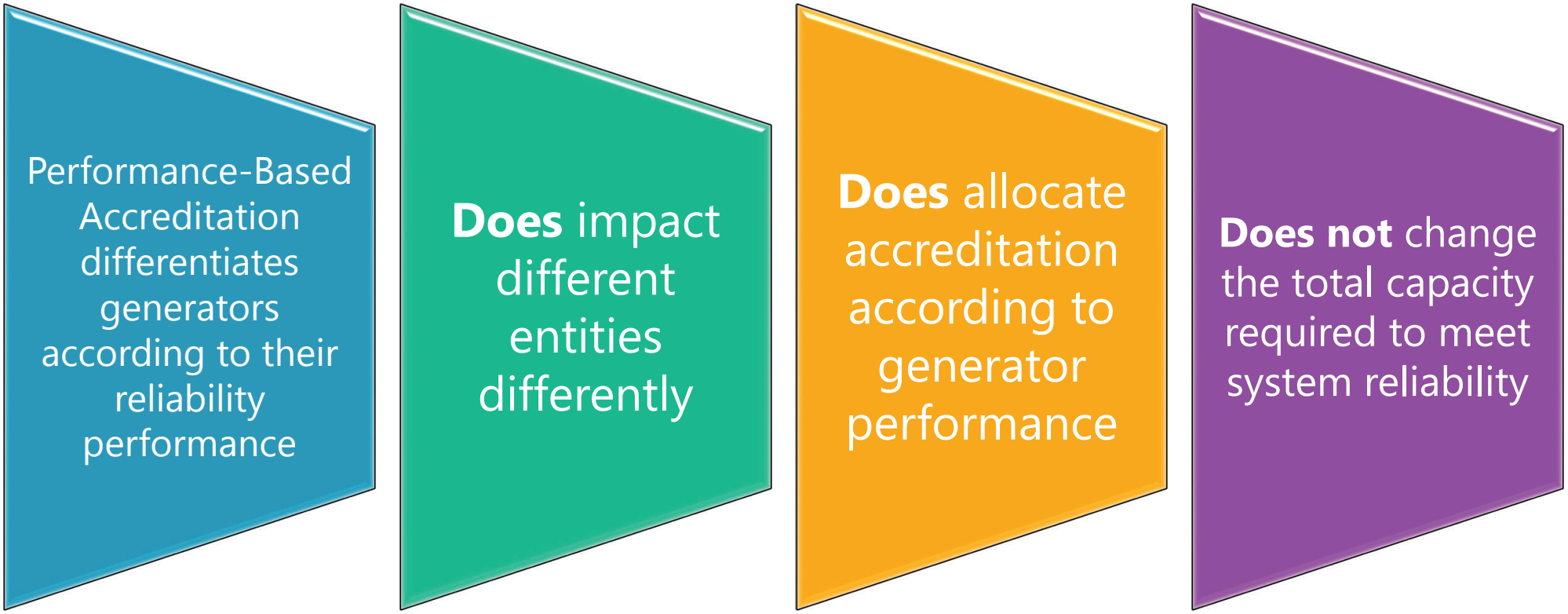
No consideration of performance or contribution to reliability

- Historical outages are assessed in the Loss Of Load Expectation (LOLE) study and factor into Planning Reserve Margin (PRM) calculation

Consideration of performance or availability would

- Quantify each resource's contribution to reliability
- Make resource owners responsible for a portion of forced outages (compared to today – handled in the PRM)
  - Incentivize increased resource performance during peak seasons

WHAT IS PERFORMANCE BASED ACCREDITATION?



PERFORMANCE-BASED ACCREDITATION BENEFITS

VALUES conventional resources that are reliable and available to perform when needed most

INCENTS underperforming resources to improve

ENSURES appropriate capacity value to calculate PRM

PROVIDES capability to meet system needs

- Natural disasters & unexpected events aren't included in performance-based accreditation

PERFORMANCE BASED ACCREDITATION IMPACT TO PRM & RAR

Installed Capacity (ICAP) PRM (that accredits all conventional resources at their nameplate) socializes historical outages in PRM value

- LREs meet this PRM using resources' nameplate value

Unforced Capacity (UCAP) PRM socializes certain outages (those not include in the calculation) in PRM value, but most outages will be captured through the accreditation de-rate of conventional resources

- Results in a lower PRM
- LREs meet PRM using UCAP value of their resources
- LREs with poorer performing resources may need more installed capacity while those with higher performing resources will need less

Planning Reserve Margin Recommendation for Regional State Committee

ANTOINE LUCAS – SPP STAFF

VICE PRESIDENT, ENGINEERING

Working together to responsibly and economically keep the lights on today and in the future.

SouthwestPowerPool SPPorg southwest-power-pool

PLANNING RESERVE MARGIN (PRM) TODAY

12% annual PRM requirement:
Measure of capacity required to maintain reliability based on summer peak

SPP uses Loss Of Load Expectation (LOLE) analyses to determine PRM

SPP tariff has enforceable summer requirement (load + PRM)

- Load Responsible Entities must demonstrate they meet requirement in summer

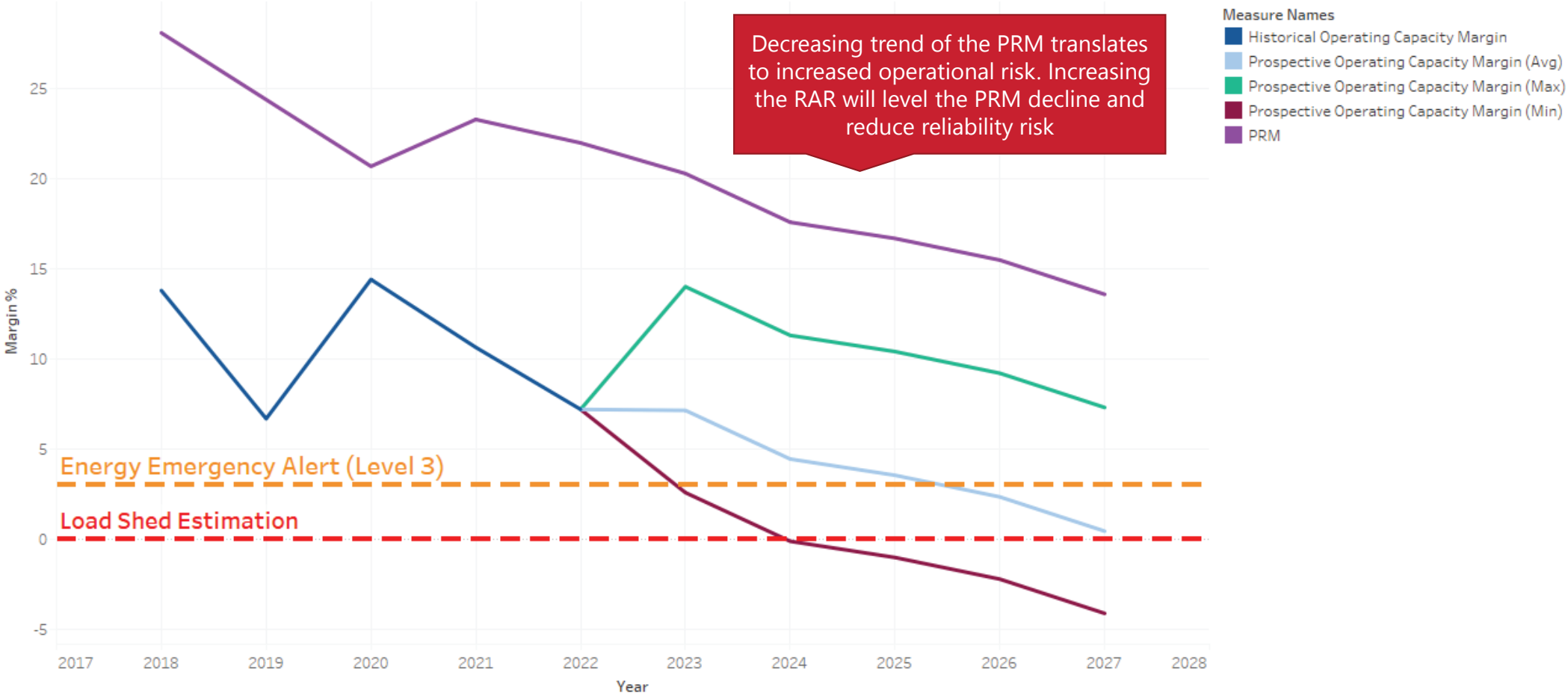
SPP tariff has winter season obligation without financial enforcement mechanism

- We do not enforce a resource adequacy requirement for winter

CURRENT PLANNING RESERVE MARGIN SUMMARY

Decreasing PRM is driven primarily by load growth and increasing resource retirements

PRM VS. OPERATING CAPACITY MARGIN



Operating Capacity Margin – Minimum value per year of total capacity MWs available minus load shown as a percentage of the load (Note the WWE has been excluded)

LOLE ANALYSIS AND RESULTS FOR SUMMER OF 2023

- Performed several studies that varied key assumptions;
  - Generation outages
  - Demand response
- PRM Requirement ranges from ~13% - 18%
- Considered current operations and industry trends
  - Increase in operational events associated with scarce capacity
  - Growing deployment of energy limited resources
  - Changing load shapes due to electrification
- General acceptance of 15% PRM Requirement as appropriate
  - Perspectives differ on timing of transition from 12-15% PRM

SPP STAFF RECOMMENDATION

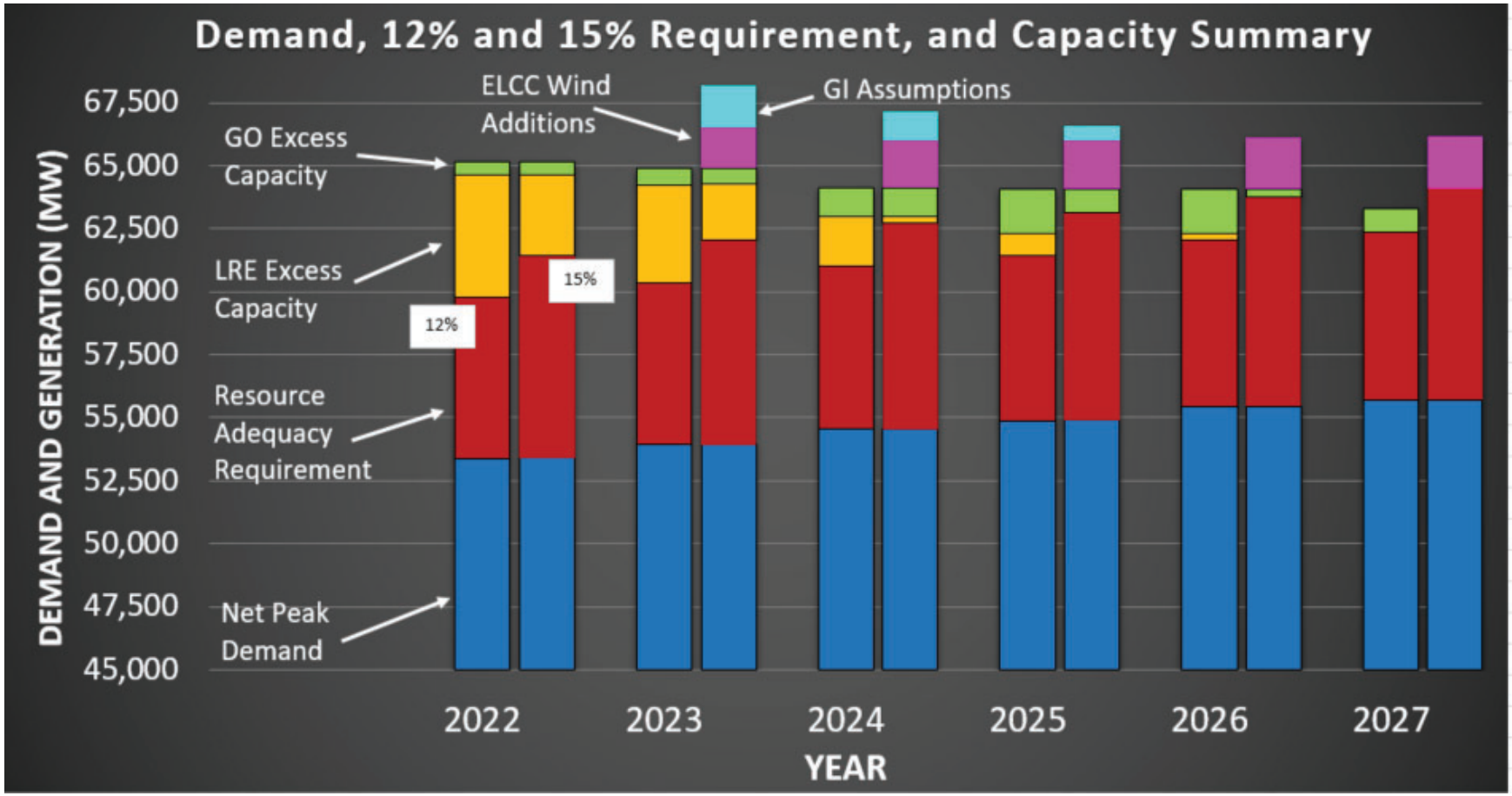
Staff recommends for Performance Based Accreditation the RSC:

Approve the performance-based accreditation methodologies described in the "Performance Based Accreditation Recommendations for Conventional Resources" policy paper

OPTIONS FOR MEETING NEW PRM REQUIREMENT

- Purchase existing excess capacity from others
- Defer currently planned retirements
- Reduce off-system sales
- Increase demand response and/or interruptible load
- Use interim service in GI process

12% AND 15% RESOURCE ADEQUACY REQUIREMENT



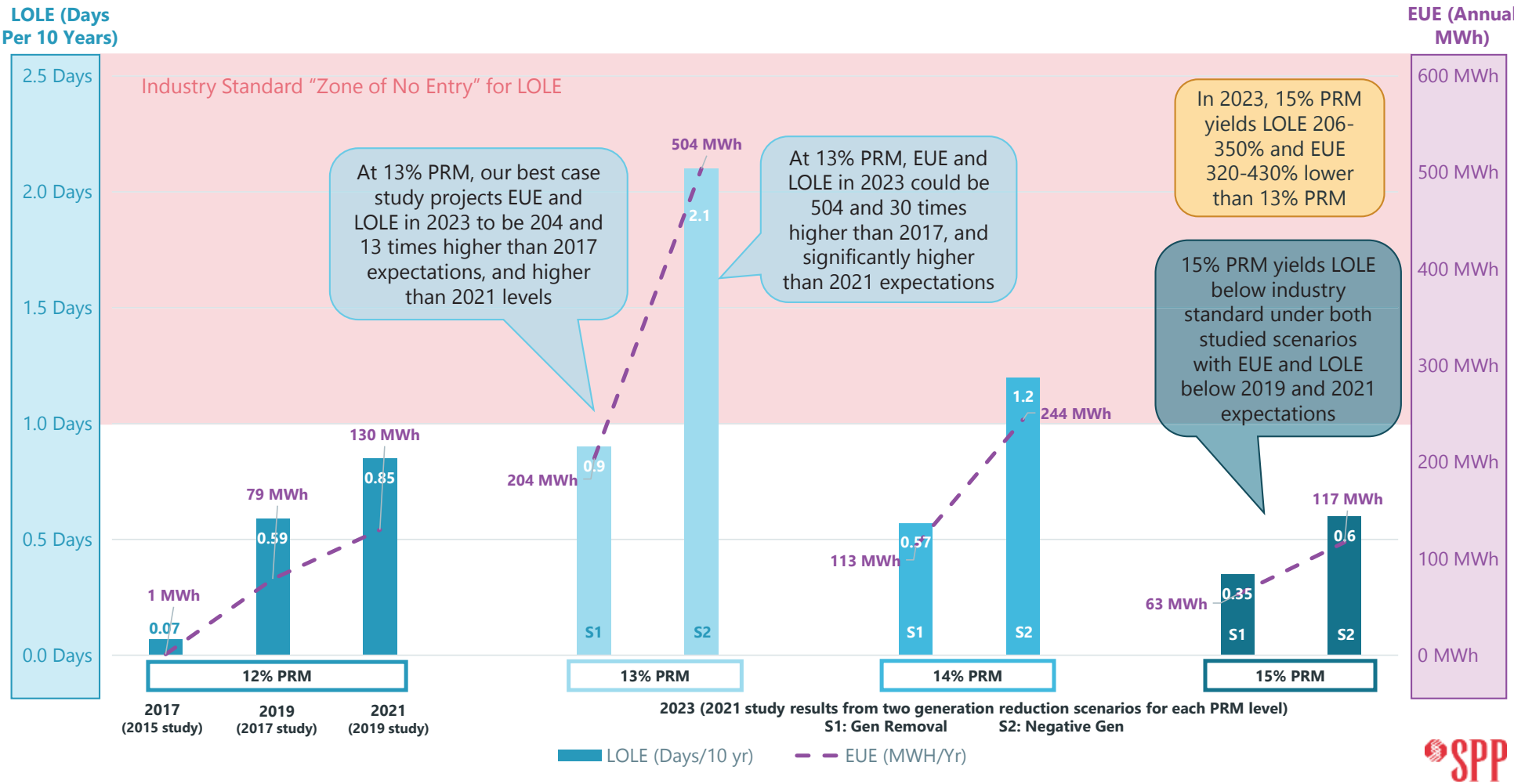
BENEFITS & VALUE OF INCREASED PRM REQUIREMENT

INCENTS	companies to keep their capacity in SPP
INCENTS	companies to build additional capacity
INCREASES	reliability
REDUCES	risks
REDUCES	costs associated with extreme events
IMPROVES	public's perception that SPP & stakeholders are working together to ensure reliability

EXPECTATIONS FOR YEARS STUDIED FROM PREVIOUS ANALYSES

LOSS OF LOAD EXPECTATION (LOLE)

EXPECTED UNSERVED ENERGY (EUE)



Staff recommends the RSC for Planning Reserve Margin Requirement:

Increase the SPP Balancing Authority's Planning Reserve Margin (PRM) Requirement from 12% to 15% effective for the 2023 summer season

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