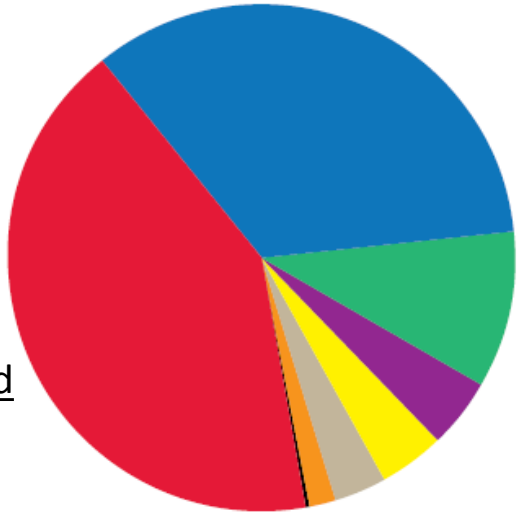
Helping our members work together to keep the lights on... today and in the future

SPP Southwest Power Pool

SPP's 2013 Energy Consumption and Capacity

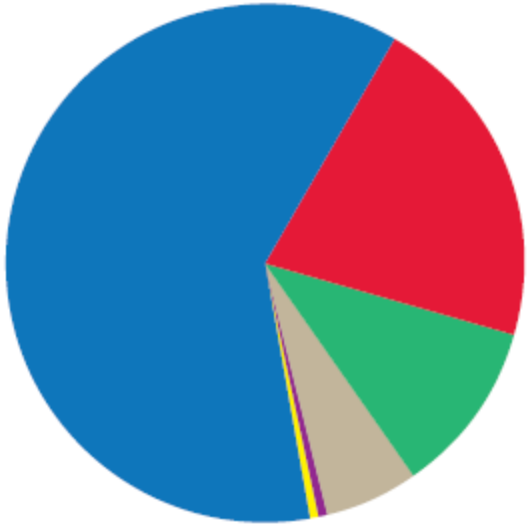
Total Capacity
66 GW
Total Peak Demand
49 GW

Capacity



Gas	42.04%
Coal	34.08%
Wind	10.01%
Hydro	4.55%
Dual Fuel	4.06%
Nuclear	3.34%
Fuel Oil	1.83%
Other	0.08%

Consumption



Coal	61.2%
Gas	21.2%
Wind	10.8%
Nuclear	6.0%
Hydro	0.6%
Diesel Fuel Oil (DFO)	0.3%

12% annual capacity margin requirement

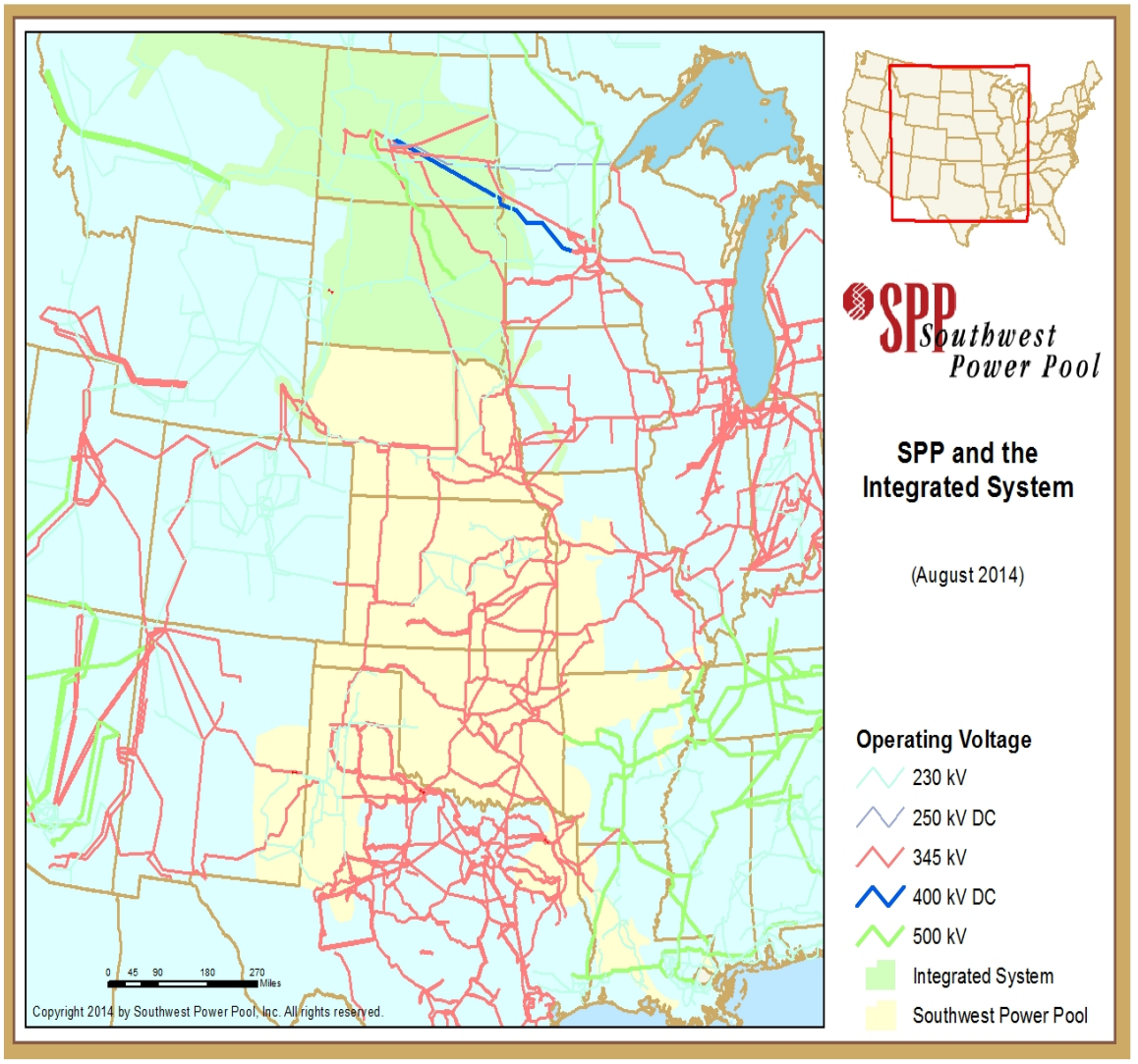
SPP's Operating Region

Current

- 77,366 MW of generating capacity
- 46,136 MW of peak demand
- 48,930 miles transmission:
  - 69 kV – 12,569 miles
  - 115 kV – 10,239 miles
  - 138 kV – 9,691 miles
  - 161 kV – 5,049 miles
  - 230 kV – 3,889 miles
  - 345 kV – 7,401 miles
  - 500 kV – 93 miles

Future (October 2015)

- Adding 3 new members (WAPA, BEPC, and HCPD)
- + 5,000 MW of peak demand
- + 7,600 MW of generating capacity
- 50% increase in SPP's current hydro capacity

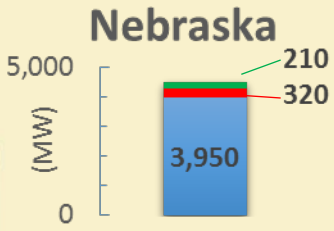


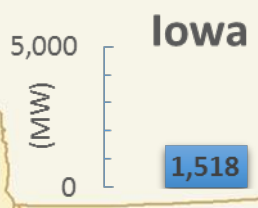
SPP's Current Coal Status for 2018

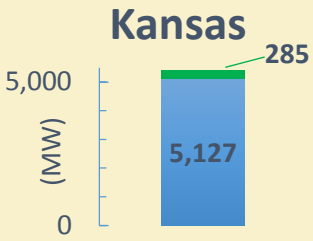
SPP Southwest Power Pool

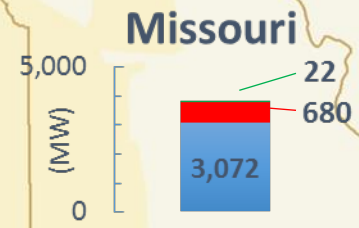
LEGEND

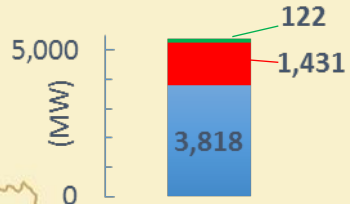
- Derated Capacity
- Retired Capacity
- Remaining Capacity

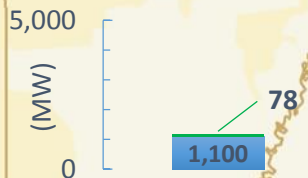


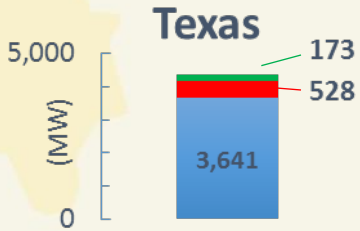


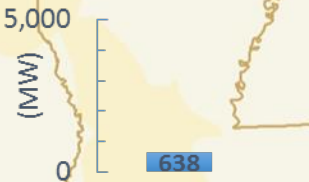


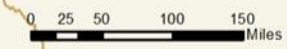












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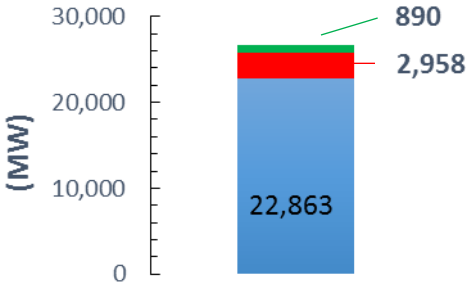
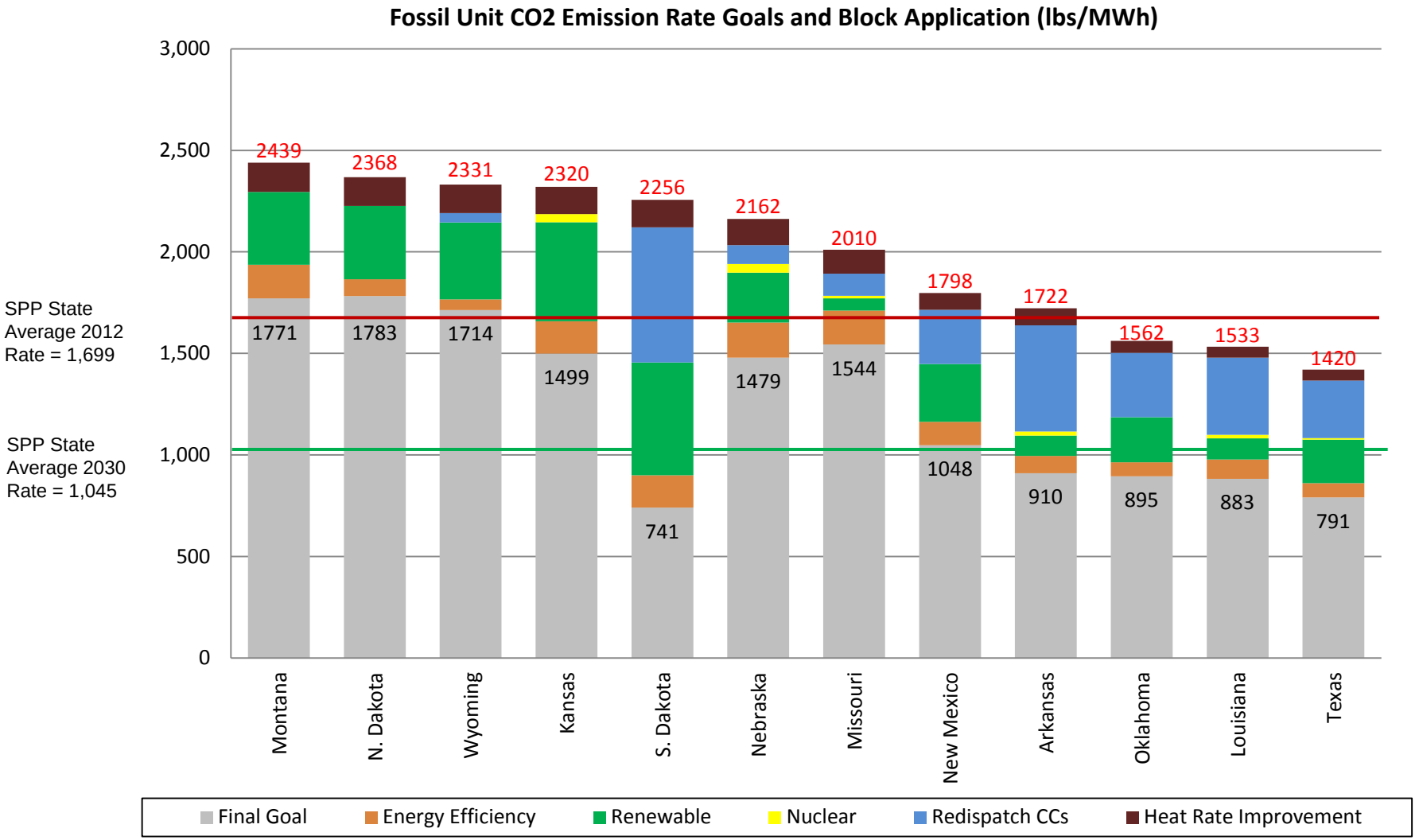
Total Generation and Losses of Coal Units by 2018



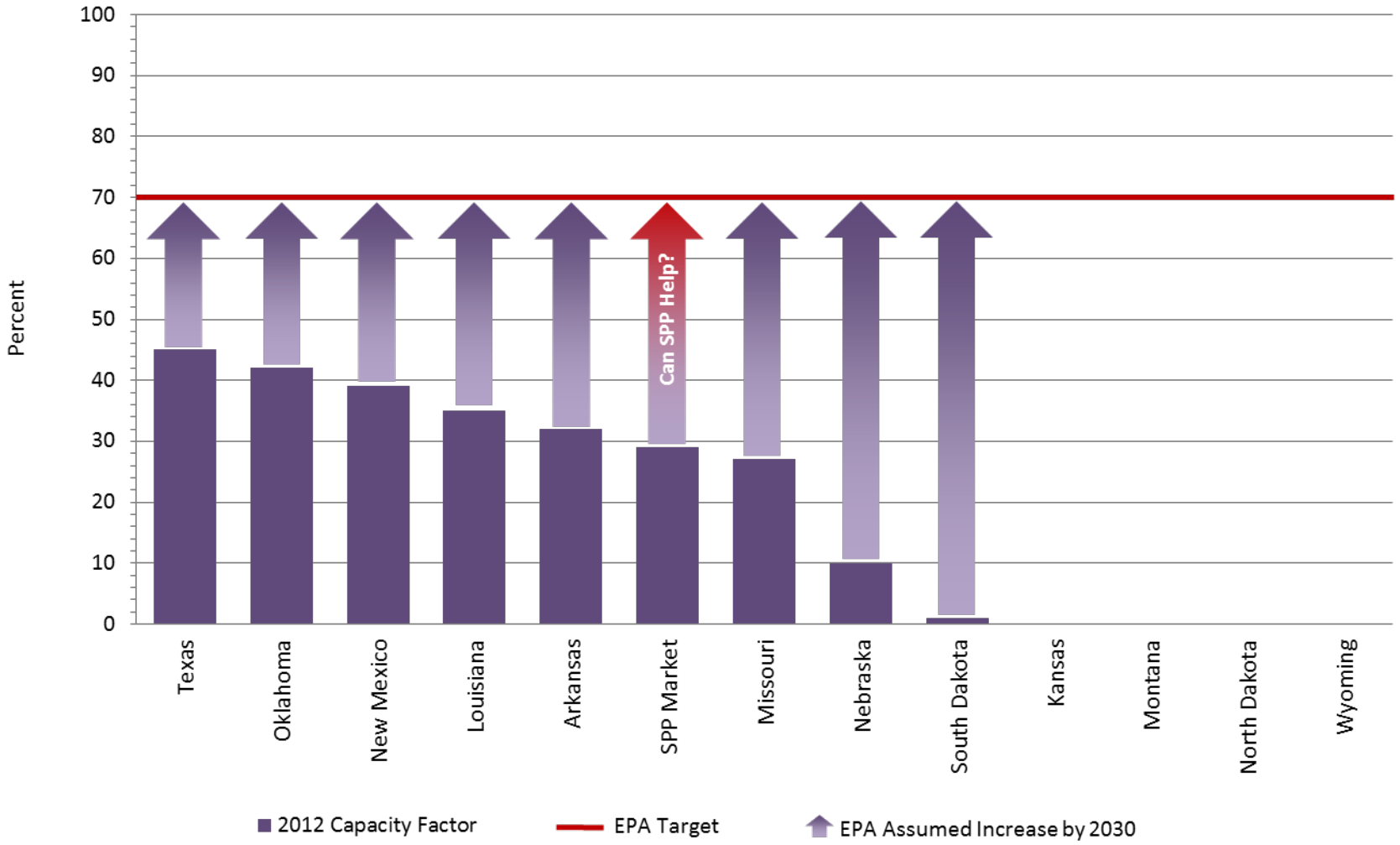
2030 Goals for States in SPP



*Includes Future States with IS Generation in SPP (N. Dakota, S. Dakota, Montana, and Wyoming)

NGCC Capacity Factors

(For SPP and Select Neighboring States)

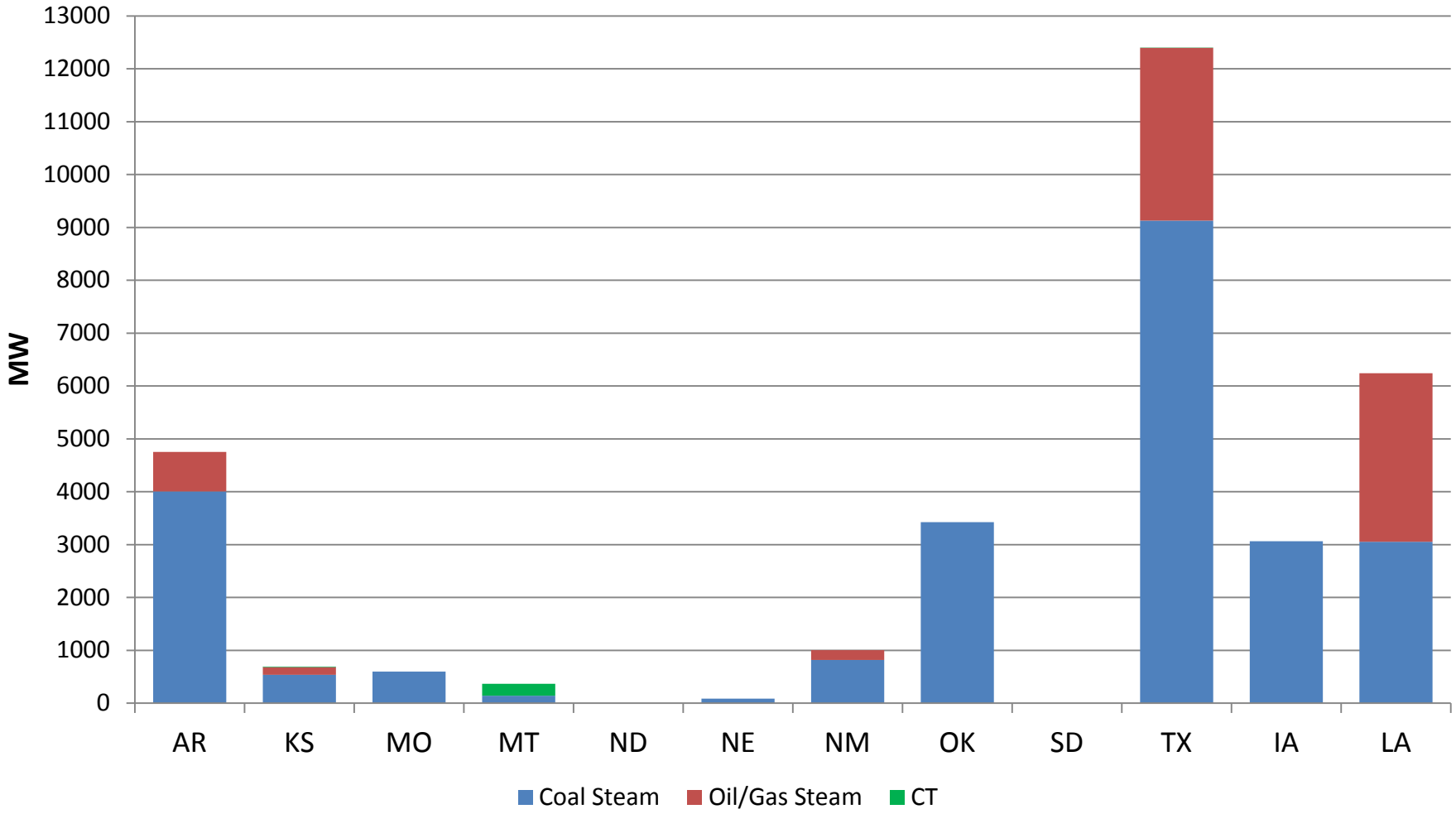


SPP's CPP Impact Assessments

- Initial analysis requested by SPP's Strategic Planning Committee
  - Reliability analysis
  - Use existing ITP 2024 models
  - Model EPA's projected EGU retirements
  - Replace retired EGUs with a combination of increased output from existing CCs, new CCs, Energy Efficiency, and increased renewables (with input from member utility experts)
  - Assessment underway, results expected week of August 18th
- SPP's Regional State Committee requested analysis comparing both individual state and regional approaches
  - Will discuss approach during their August 25th conference call

EPA Projected 2016-2020 EGU Retirements

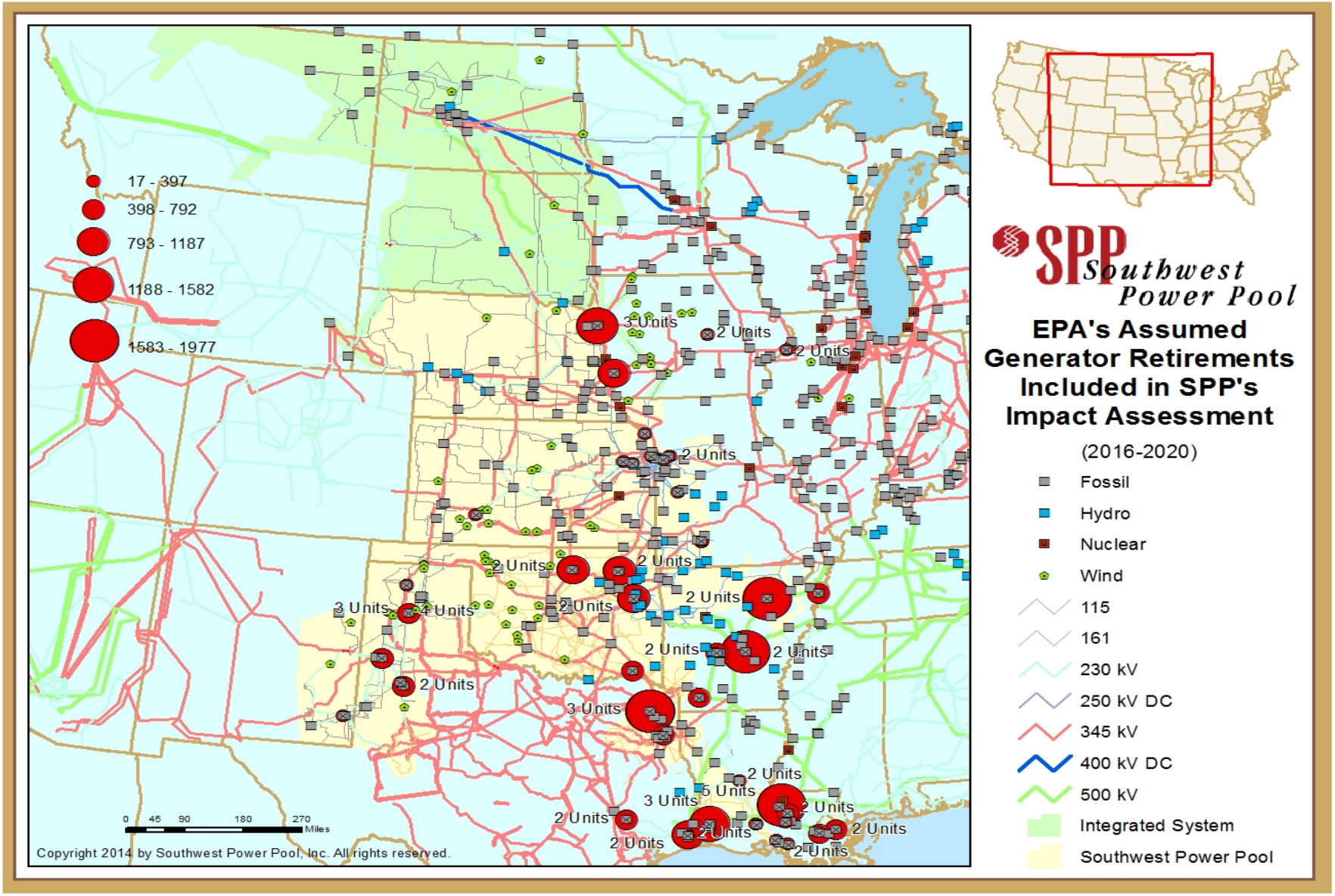
(For SPP and Select Neighboring States)



*Extracted from EPA IPM data

**THESE RETIREMENTS ARE ASSUMED BY EPA – NOT SPP!

EPA Projected 2016-2020 EGU Retirements



SPP Reserve Margin Assessment

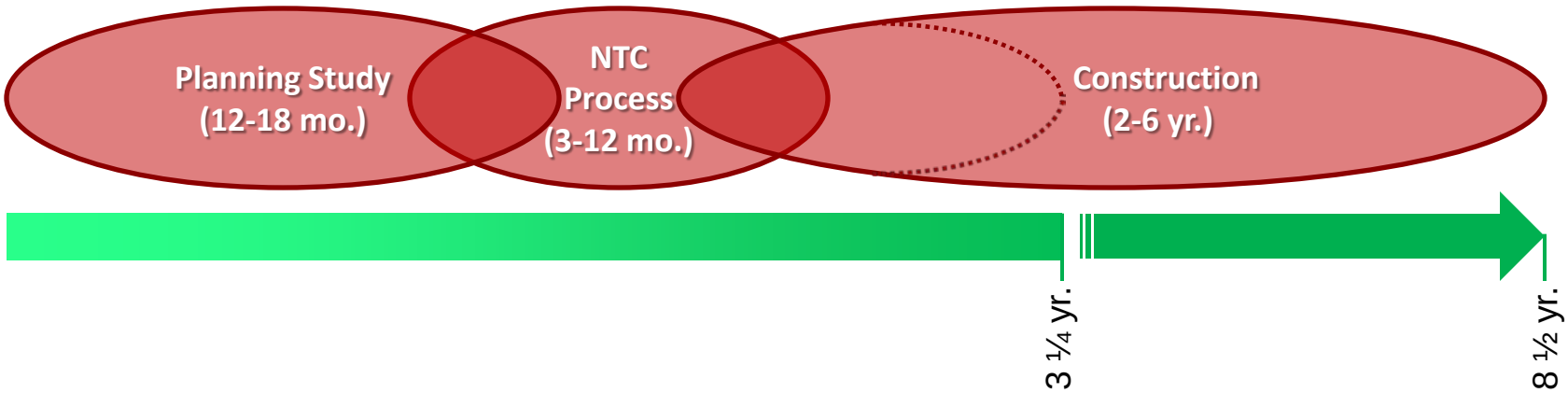
- Used current load forecasts supplied by SPP members, currently planned generator retirements, currently planned new generator capacity with GIAs, and EPA's assumed retirements
- SPP's minimum required reserve margin is 13.6%
- By 2020, SPP's anticipated reserve margin would be 5.0%, representing a capacity margin deficiency of approximately 4,500 MW
- By 2024, SPP's anticipated reserve margin would be -3.8%, representing a capacity margin deficiency of approximately 10,000 MW
- Out of 14 load serving members assessed, 9 would be deficient by 2020 and 10 by 2024

State Plans Need to Consider the Following

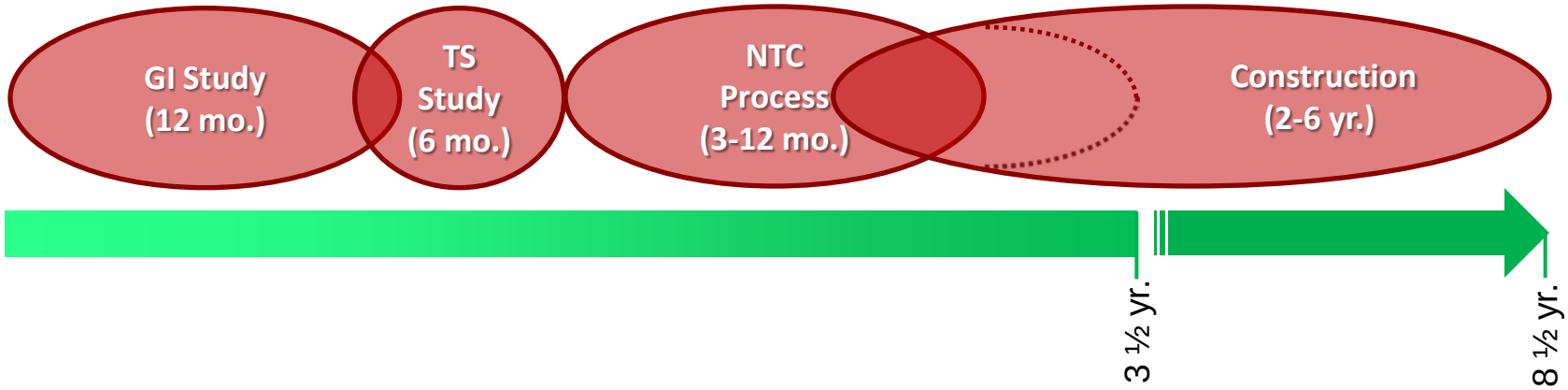
- SPP is responsible to FERC and NERC
  - Required to ensure reliability and perform in accordance with tariff
  - Rules, behavior, pricing, and revenue distribution are subject to FERC approval
  - Penalties may be levied by FERC/NERC for failure to comply (up to $1 MM/day/violation)
- SPP operates regional security-constrained, economically dispatched markets
  - Considers both reliability and economics
  - Generation dispatch provides reliable and economic solutions to needs over a multi-state area
- SPP plans and directs regional transmission construction
  - Addresses expected reliability, economic, and public policy needs
  - Generator interconnection and transmission service must be requested of SPP and processed by SPP
  - Takes up to 8.5 years to perform applicable planning processes and construct transmission upgrades

Transmission Build Cycle

Transmission Planning Process



GI and Transmission Service Process



MoPSC Questions of Interest to SPP

Q. II, b) Are there transmission constraints (either gas in or electricity out) or operational or market constraints that make the EPA's target of 12.78 Million MWhs for NGCC problematic? Explain. If there are any constraints, what steps would be necessary to relieve them? What are the costs of those steps?

A. SPP believes its impact assessment can be useful to answer this question but does not have results yet. If electric transmission upgrades are required to facilitate increased production of NGCC, it can take up to 8.5 years to construct. 345 kV construction typically costs approximately $2 MM per mile and 138 kV construction typically cost approximately $1 MM per mile, excluding substation costs.

MoPSC Questions of Interest to SPP

Q. V, h) Please explain whether an Independent Operator's control over the dispatch of the generation will affect the utility's ability to control emissions and comply with EPA's proposed 111(d) requirements.

A. SPP's market dispatch designed to reliably dispatch the most economic resources could affect compliance with EPA's requirements unless well-designed market system changes are made. Close coordination between SPP, members, regulators, and the applicable state agencies will be needed to ensure that SPP's Security-Constrained Economic Dispatch system appropriately accounts for emission goals. This will not be a trivial matter and will take considerable time to develop the appropriate protocols and potential market system changes.

MoPSC Questions of Interest to SPP

Q. V, i) Does EPA's proposal give rise to any concerns about reliability? If so, what are those concerns?

A. Yes. SPP expects equipment overloads, low voltages, and dynamic stability issues will result from EPA-assumed fossil fuel generator retirements. Further, EPA's assumed retirements will result in approximately 4.5 GW and 10 GW of new generation being needed by 2020 and 2024, respectively, to comply with SPP's minimum reserve margin requirements. Transmission infrastructure needed to mitigate reliability issues and to support interconnection and delivery of new generation will likely not be available by the time it is needed to facilitate compliance with the EPA's regulations.

MoPSC Questions of Interest to SPP

Q. V, l. Describe in as much detail as possible the comments you intend to submit to EPA. If you have already submitted comments, please provide them.

A. SPP intends to submit comments reflecting the 1) nature and possible significance of reliability concerns, 2) need to recognize transmission upgrade evaluation and construction time, 3) current misalignment of SPP's market system with emission goals and affect of uncoordinated compliance on dispatch costs and real-time reliability, 4) potential value of a coordinated, RTO-wide regional approach, and 5) need for more time to fully evaluate the impacts of the Clean Power Plan.

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