

A nighttime photograph of a city skyline reflected in a body of water. The buildings are illuminated, and their lights are mirrored in the calm water. A bridge is visible on the left side of the frame.

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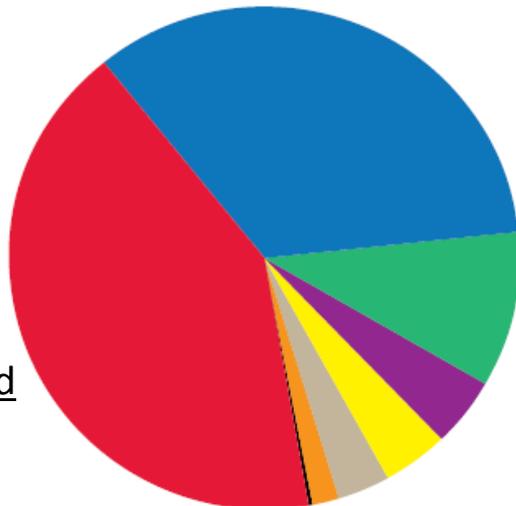
Helping our members work together to keep the lights on...  
today and in the future

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# SPP's 2013 Energy Consumption and Capacity

## Capacity



Total Capacity

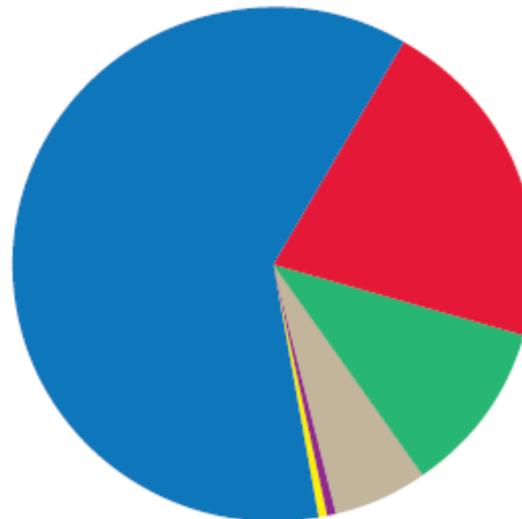
66 GW

Total Peak Demand

49 GW

<span style="color: red;">■</span> Gas	42.04%
<span style="color: blue;">■</span> Coal	34.08%
<span style="color: green;">■</span> Wind	10.01%
<span style="color: purple;">■</span> Hydro	4.55%
<span style="color: yellow;">■</span> Dual Fuel	4.06%
<span style="color: tan;">■</span> Nuclear	3.34%
<span style="color: orange;">■</span> Fuel Oil	1.83%
<span style="color: brown;">■</span> Other	0.08%

## Consumption



<span style="color: blue;">■</span> Coal	61.2%
<span style="color: red;">■</span> Gas	21.2%
<span style="color: green;">■</span> Wind	10.8%
<span style="color: tan;">■</span> Nuclear	6.0%
<span style="color: purple;">■</span> Hydro	0.6%
<span style="color: yellow;">■</span> Diesel Fuel Oil (DFO)	0.3%

**12% annual capacity margin requirement**

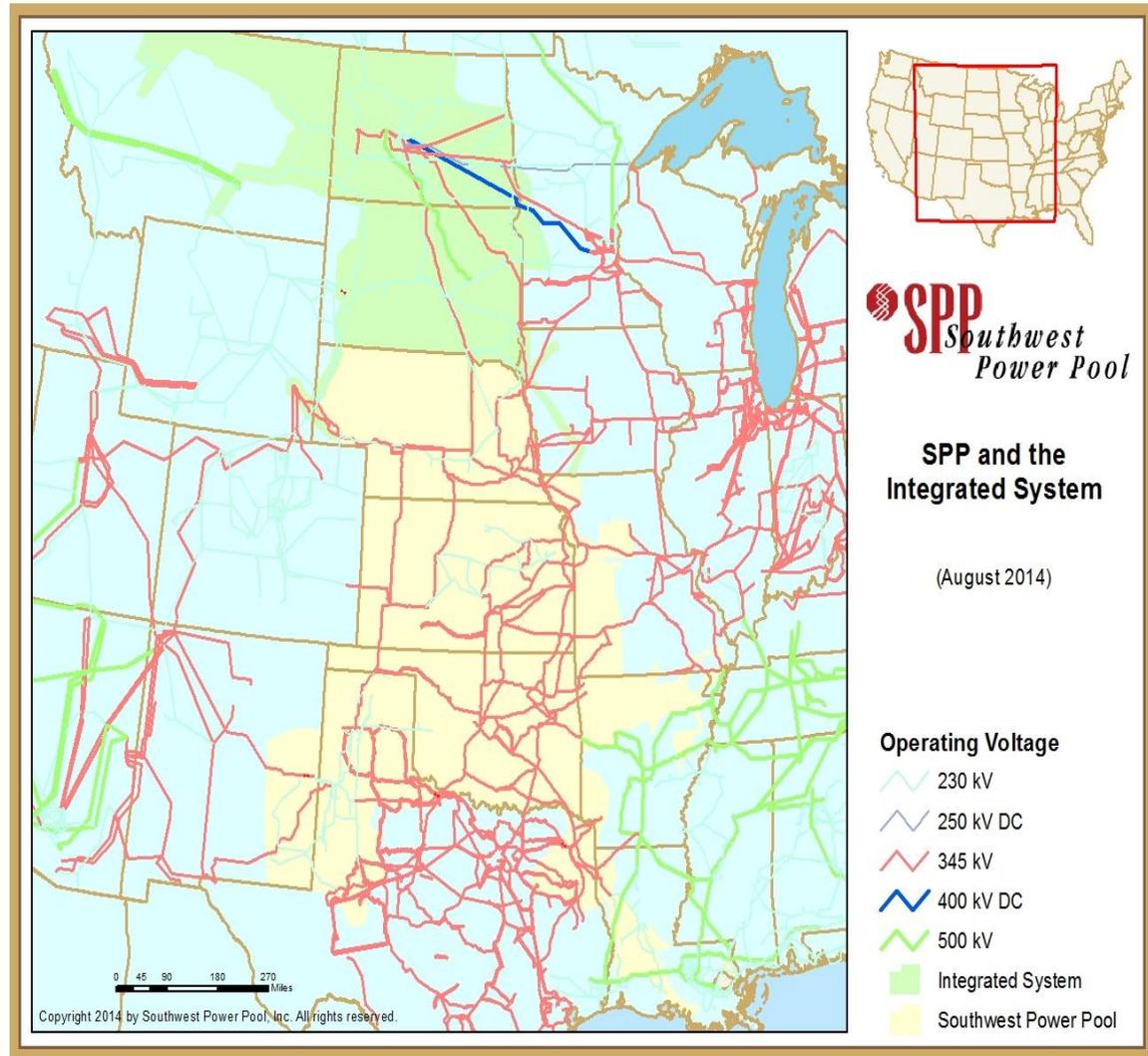
# SPP's Operating Region

## Current

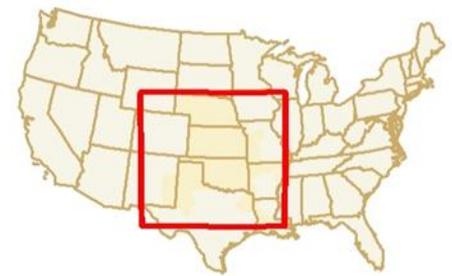
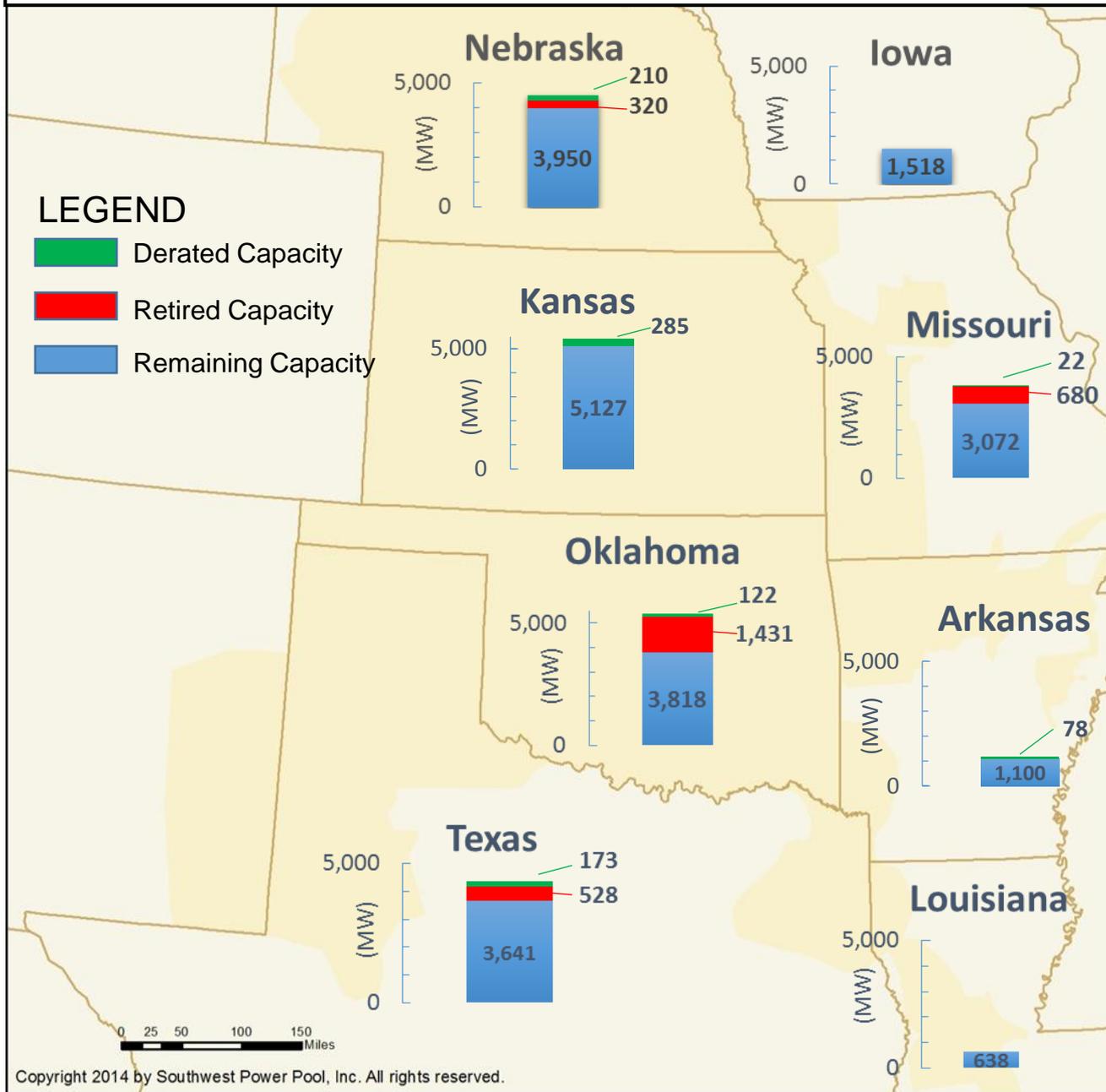
- 77,366 MW of generating capacity
- 46,136 MW of peak demand
- 48,930 miles transmission:
  - 69 kV – 12,569 miles
  - 115 kV – 10,239 miles
  - 138 kV – 9,691 miles
  - 161 kV – 5,049 miles
  - 230 kV – 3,889 miles
  - 345 kV – 7,401 miles
  - 500 kV – 93 miles

## Future (October 2015)

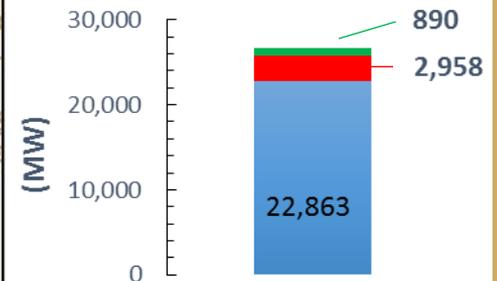
- Adding 3 new members (WAPA, BEPC, and HCPD)
- + 5,000 MW of peak demand
- + 7,600 MW of generating capacity
- 50% increase in SPP's current hydro capacity



# SPP's Current Coal Status for 2018

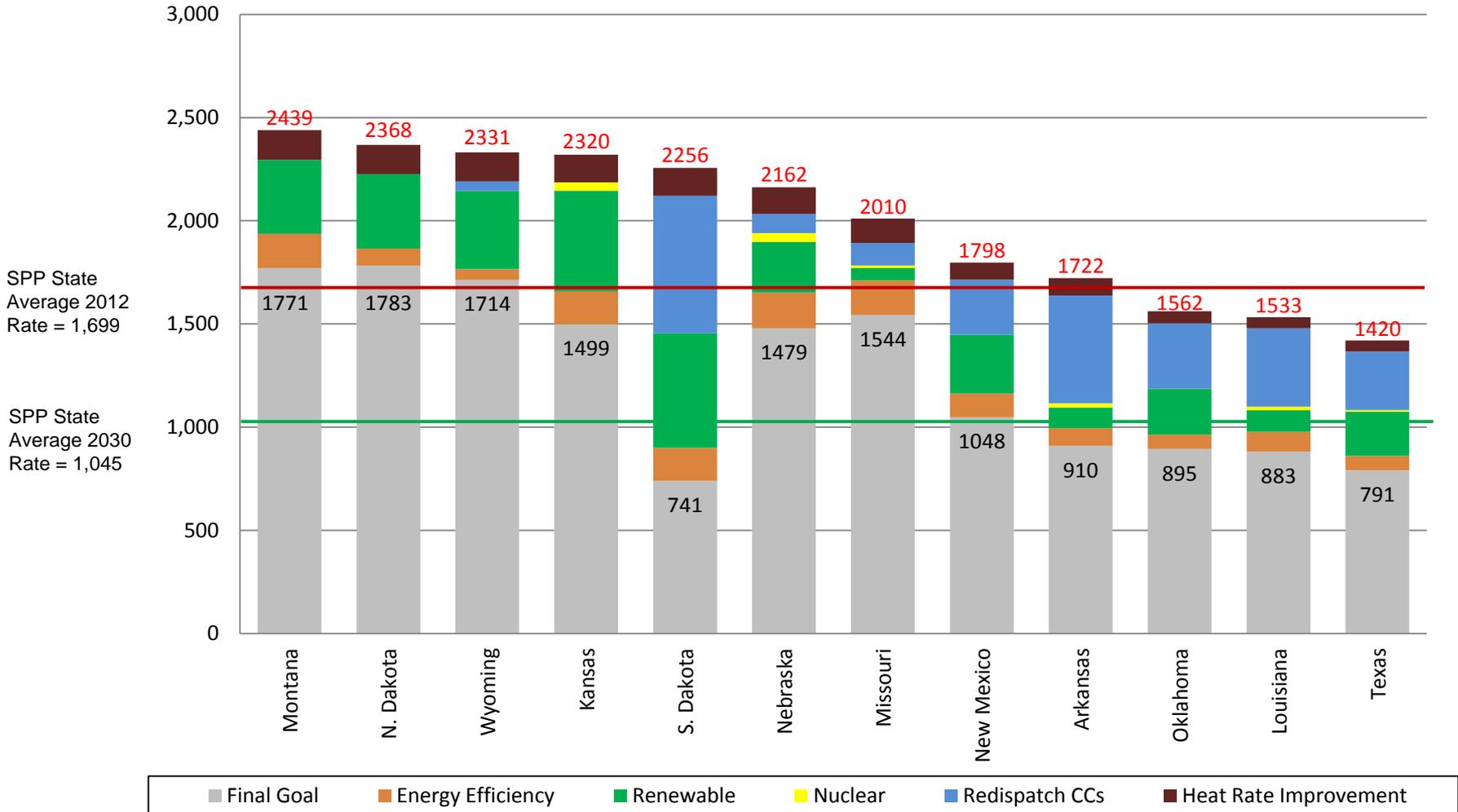


## Total Generation and Losses of Coal Units by 2018



# 2030 Goals for States in SPP

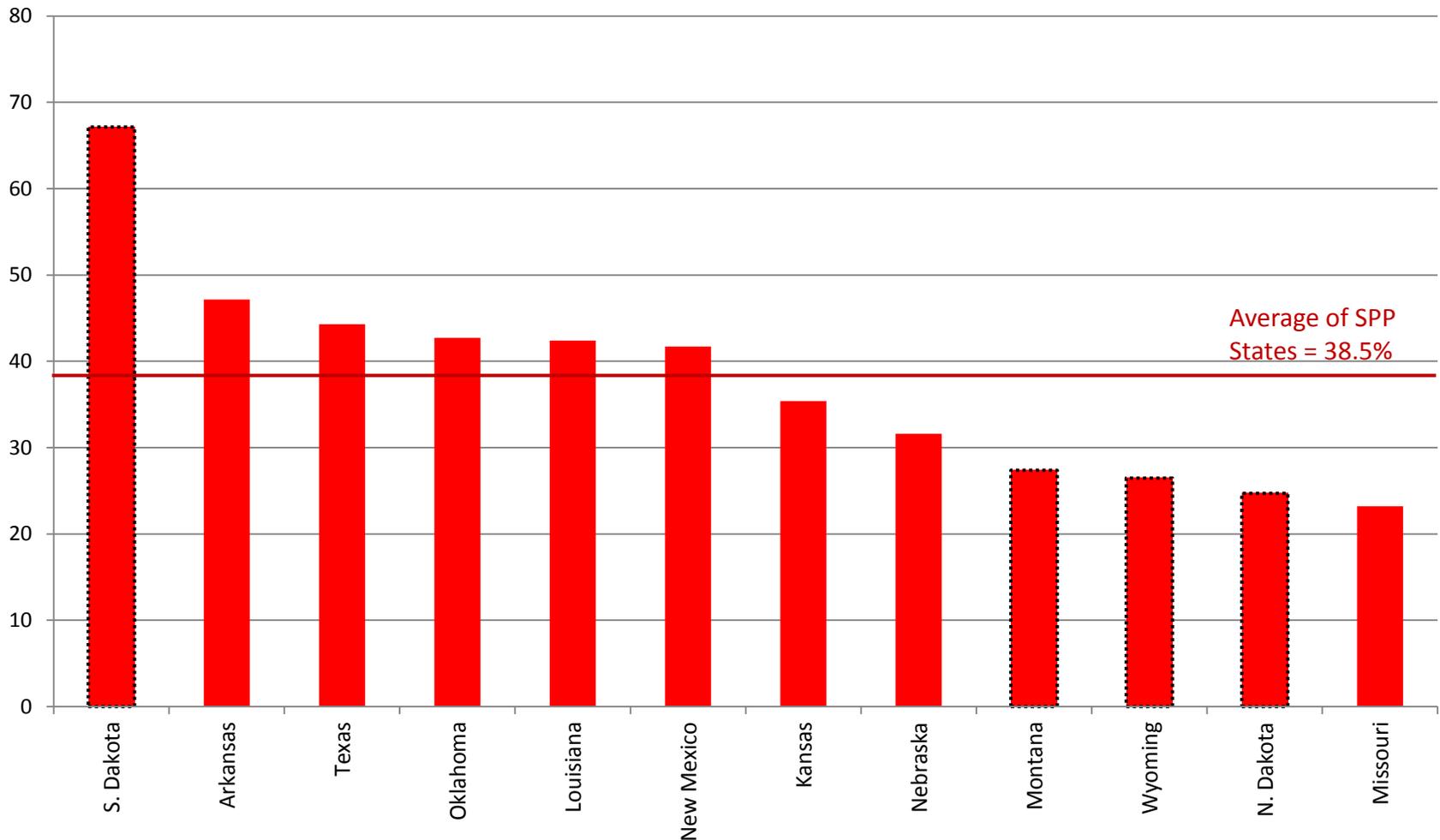
Fossil Unit CO2 Emission Rate Goals and Block Application (lbs/MWh)



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

# % Emission Reduction Goals for States in SPP

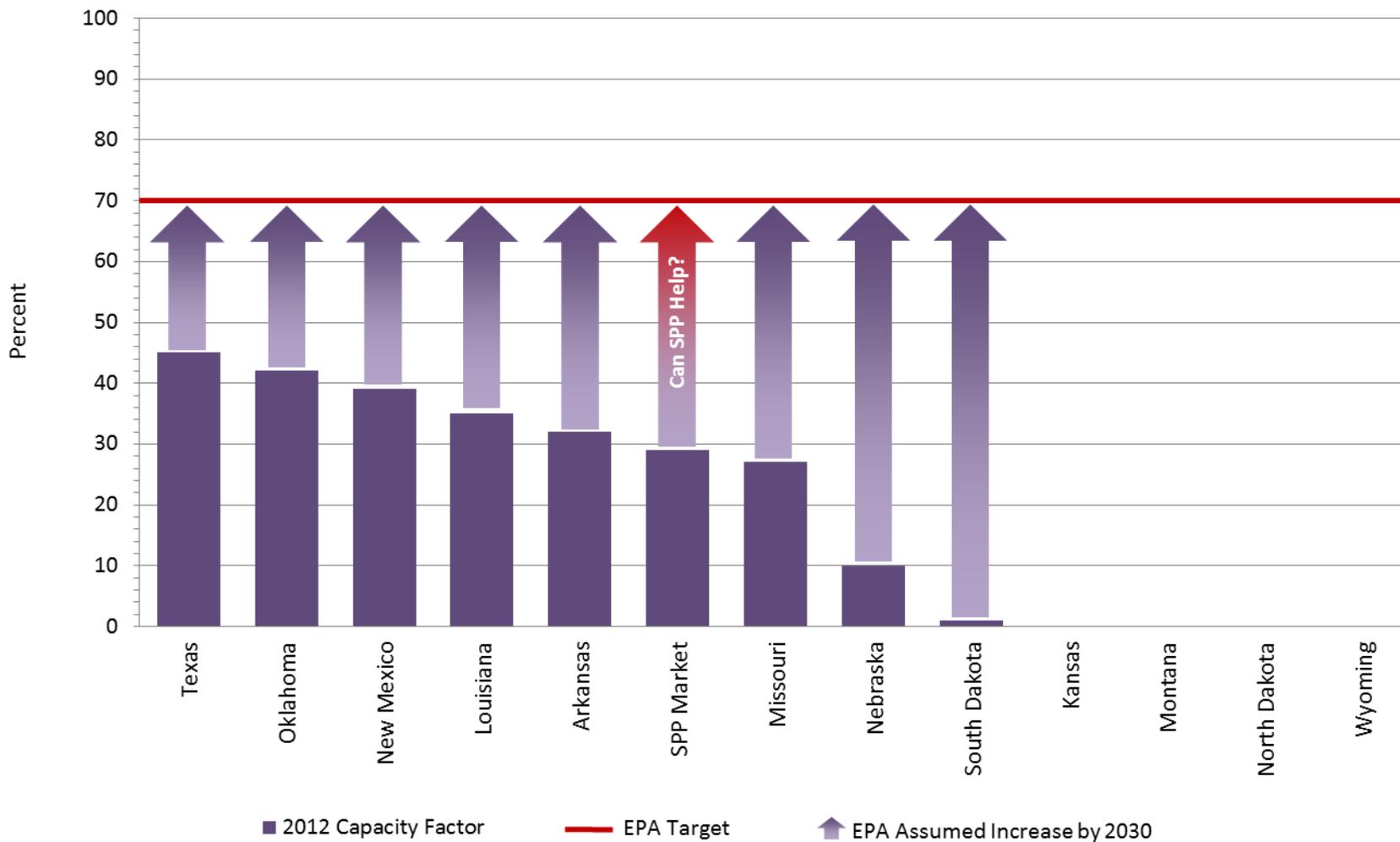
## Total CO<sub>2</sub> Emission Reduction Goals (%)



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

# NGCC Capacity Factors

(For SPP and Select Neighboring States)



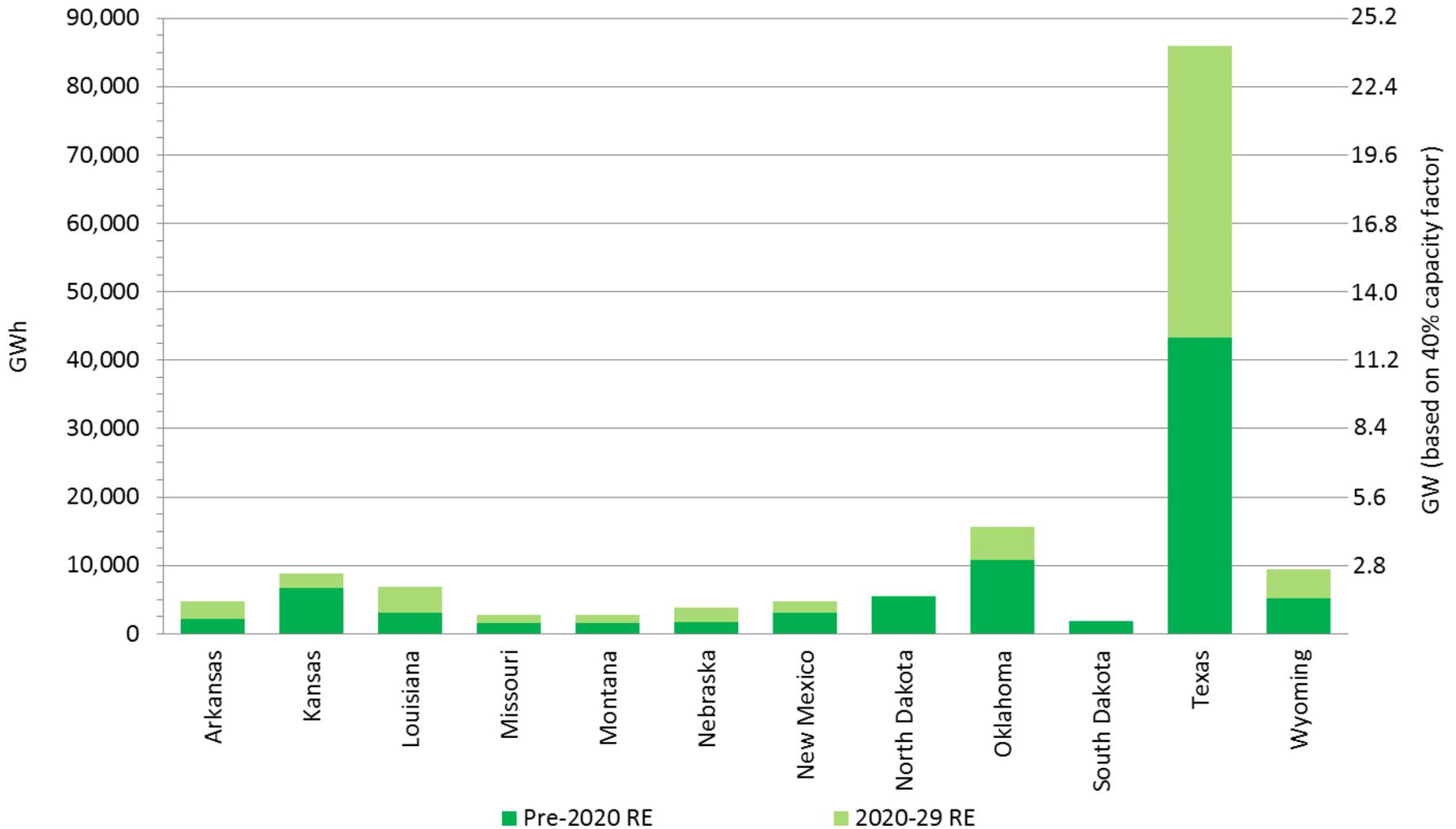
■ 2012 Capacity Factor

— EPA Target

▲ EPA Assumed Increase by 2030

# EPA's Renewable Energy Assumptions

(For SPP and Select Neighboring States)

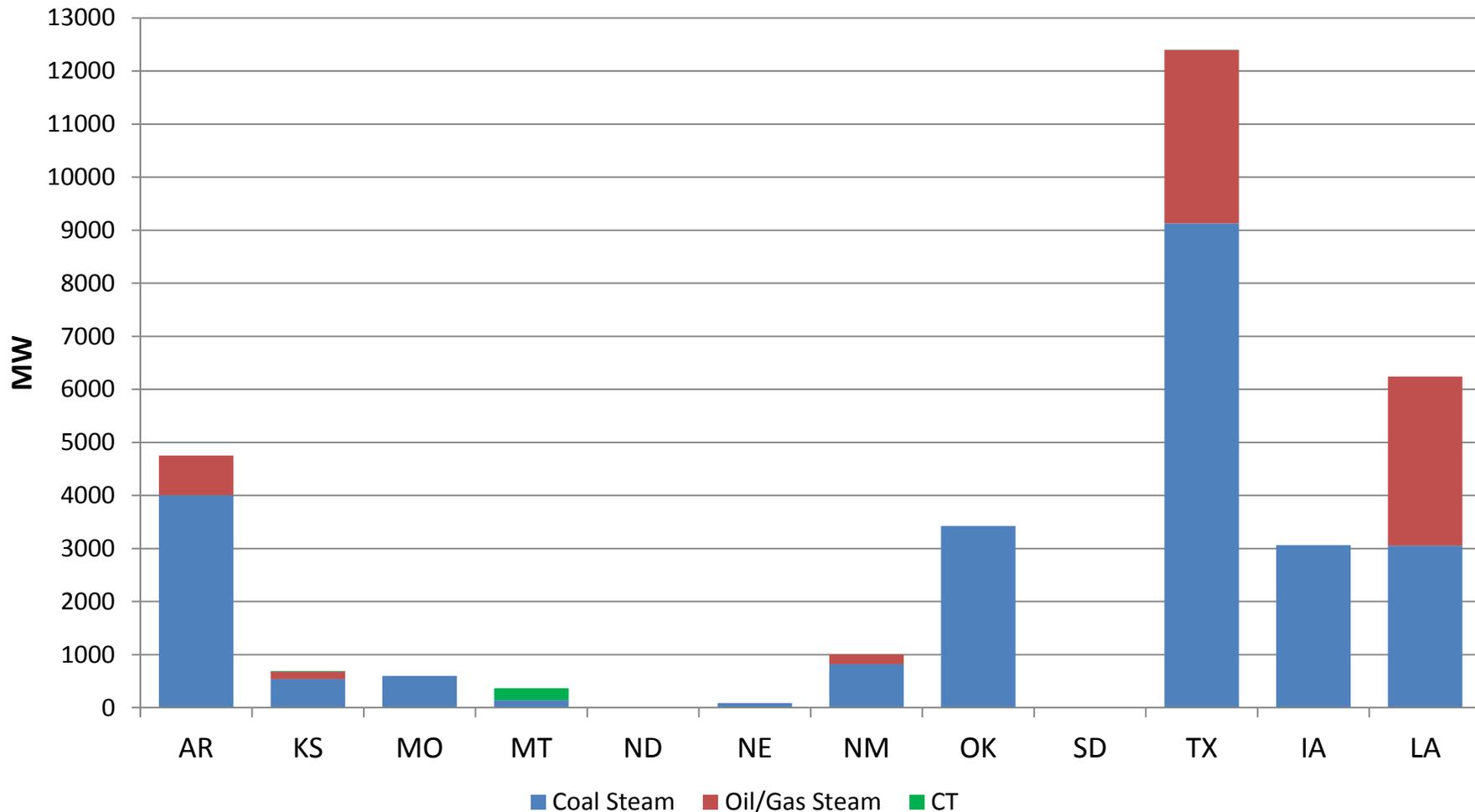


# SPP's CPP Impact Assessments

- 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, initial results expected week of August 18<sup>th</sup>
- SPP's Regional State Committee requested analysis comparing both individual state and regional approaches
  - Will discuss approach during their August 25<sup>th</sup> conference call

# EPA Projected 2016-2020 EGU Retirements

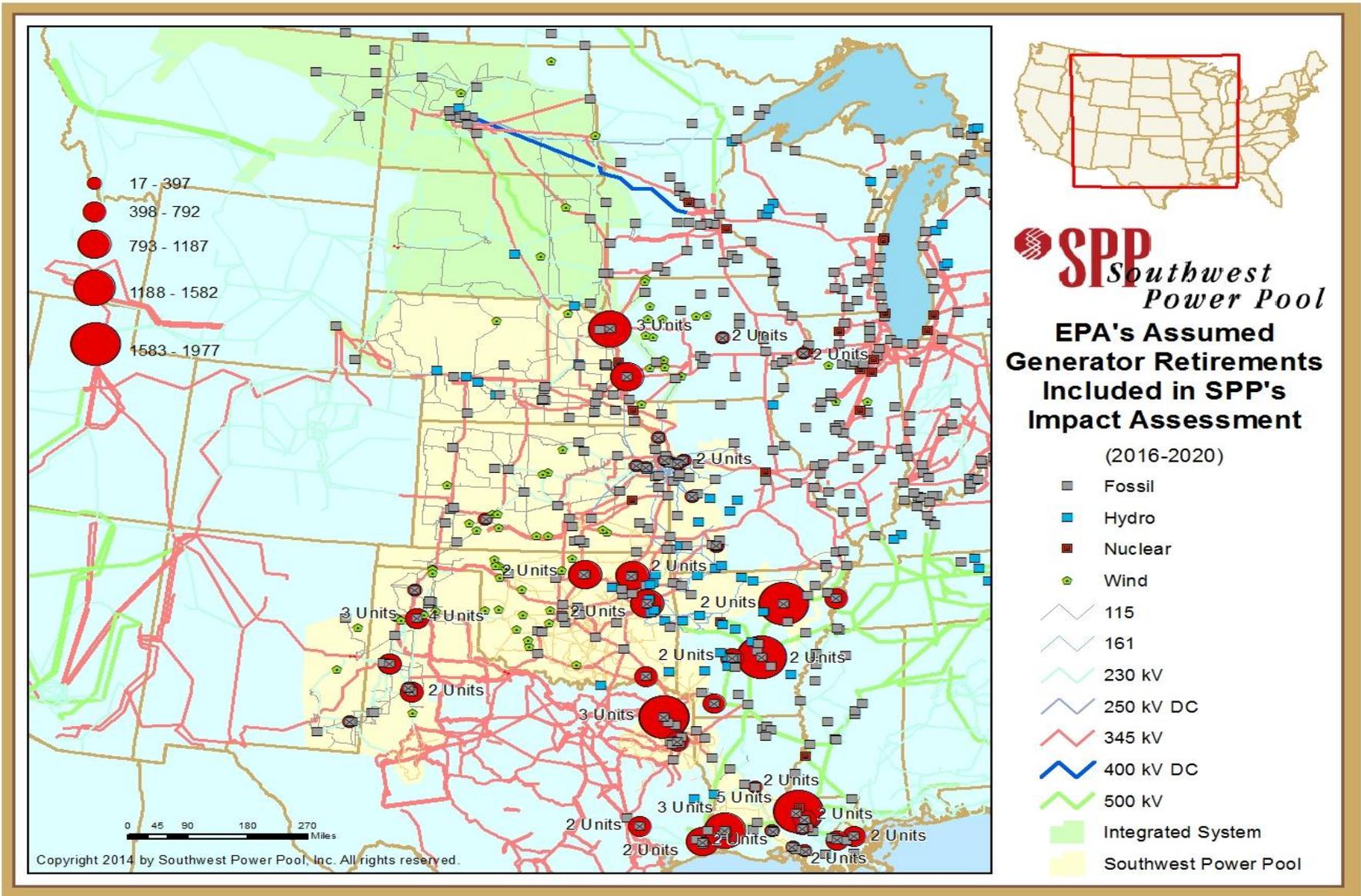
(For SPP and Select Neighboring States)



\*Extracted from EPA IPM data

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

# EPA's Projected 2016-2020 EGU Retirements



# SPP Reliability Impact Assessment Results

- Before considering the impacts of contingencies, preliminary results indicate increased thermal overloads and low voltages due to EPA's assumed retirements
- Summer peak cases are not solving under single contingency
  - Indicative of significant low voltages due to lack of reactive support
- Remaining steps to be taken
  - Continue to take steps to get all cases to solve and note what steps were required
  - Determine the amount of reactive support required to maintain reliable voltages
  - Identify the number and significance of overloads and low voltages that would have to be solved to comply with NERC Standards

# SPP Reserve Margin Assessment

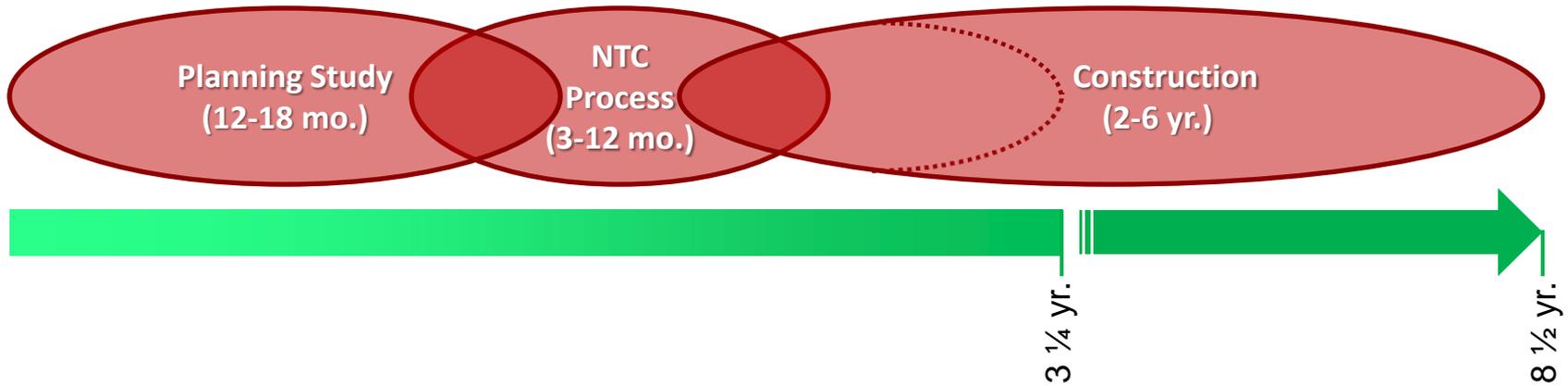
- Used current load forecasts supplied by SPP members, currently planned generator retirements, currently planned new generator capacity with GIAs, and EPA's assumed retirements
- SPP's minimum required reserve margin is 13.6%
- By 2020, SPP's anticipated reserve margin would be 5.0%, representing a 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

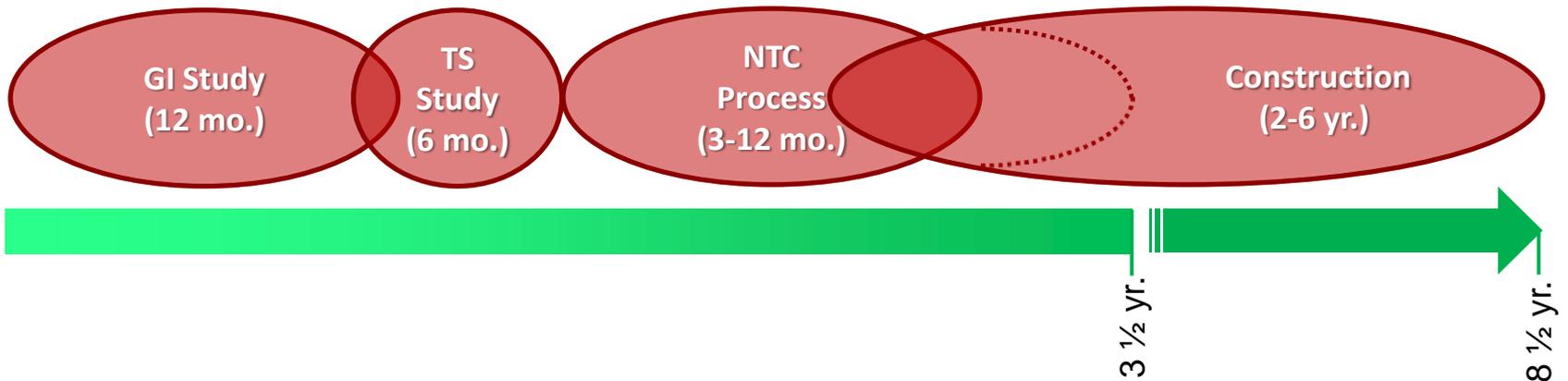
- SPP is responsible to FERC and NERC
  - Required to ensure reliability and perform in accordance with tariff
  - Rules, behavior, pricing, and revenue distribution are subject to FERC approval
  - Penalties may be levied by FERC/NERC for failure to comply (up to \$1 MM/day/violation)
- SPP operates 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





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