NERC

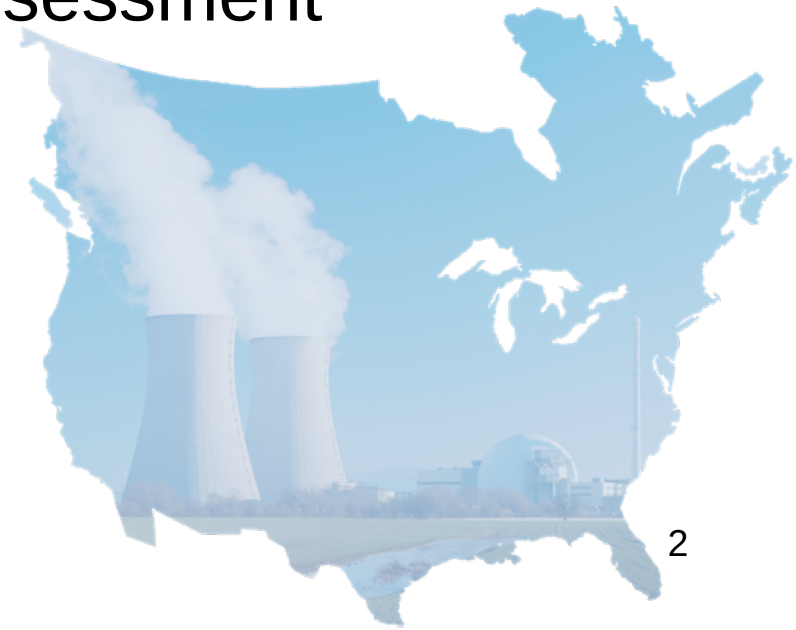
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

2009 Long-Term Reliability Assessment

to ensure the reliability of the bulk power system

Overview

- 2009 Report Enhancements
- Highlights for 2009
- Emerging Issues for 2009
- 2009 Scenario Reliability Assessment



Enhancements for 2009

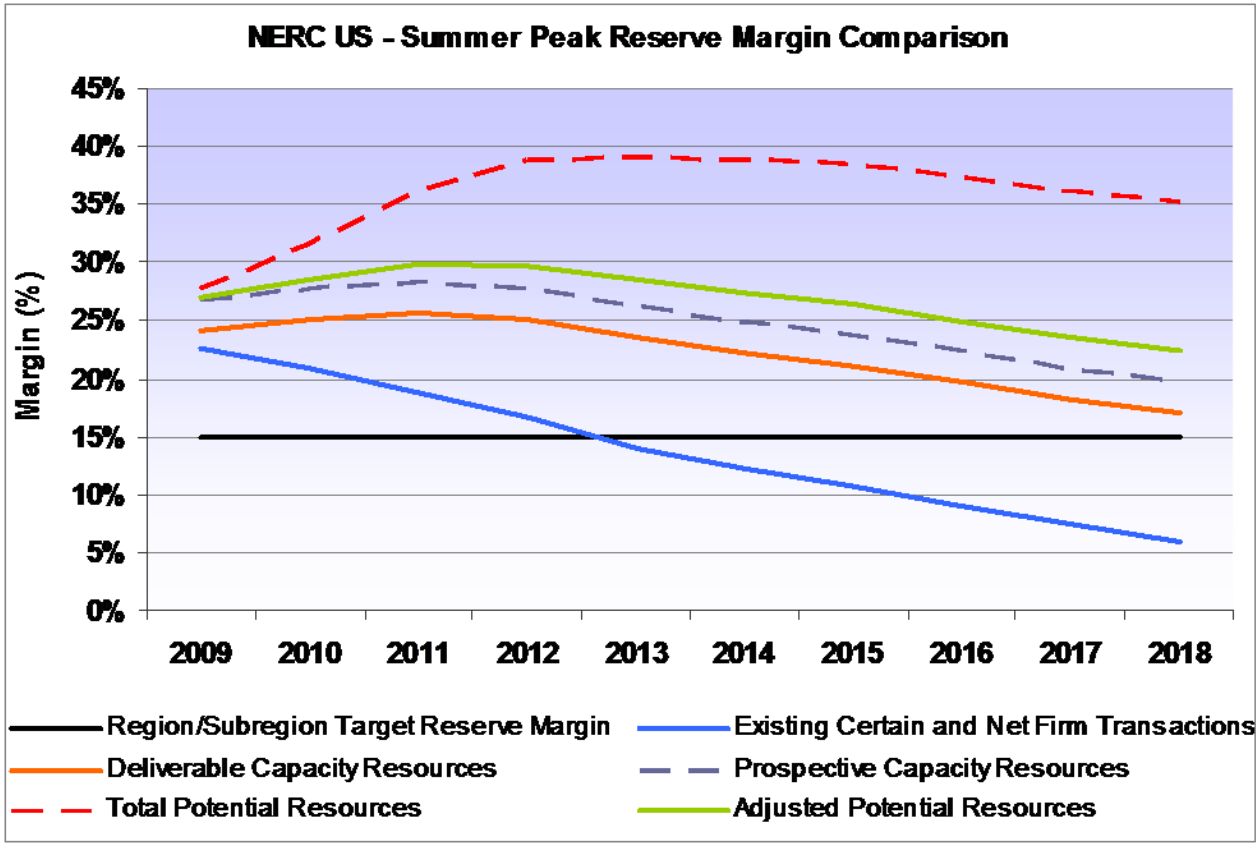
- Enhanced supply definitions and resource categories
- Increased granularity in transmission data
  - More visibility into the certainty of transmission projects
  - Expand definition to include 100 kV and above
- Performance metrics
- External data validation
- Planning reserve margin for adequacy assessment

Highlights

- Economic Recession, Demand-Side Management Leads to Decreased Demand, Higher Reserve Margins
- Significant New Renewable Resources Come Online
- Natural Gas Expected to Replace Coal as the Leading Fuel for Capacity by 2011
- Transmission Siting and Construction Must Accelerate to Meet Plans and Ensure Reliability
- Industry Faces Transformational Change: Transmission Siting, Pending Climate Legislation, Integration of Variable Generation, and Cyber Security Top List of Emerging Reliability Issues

Highlight

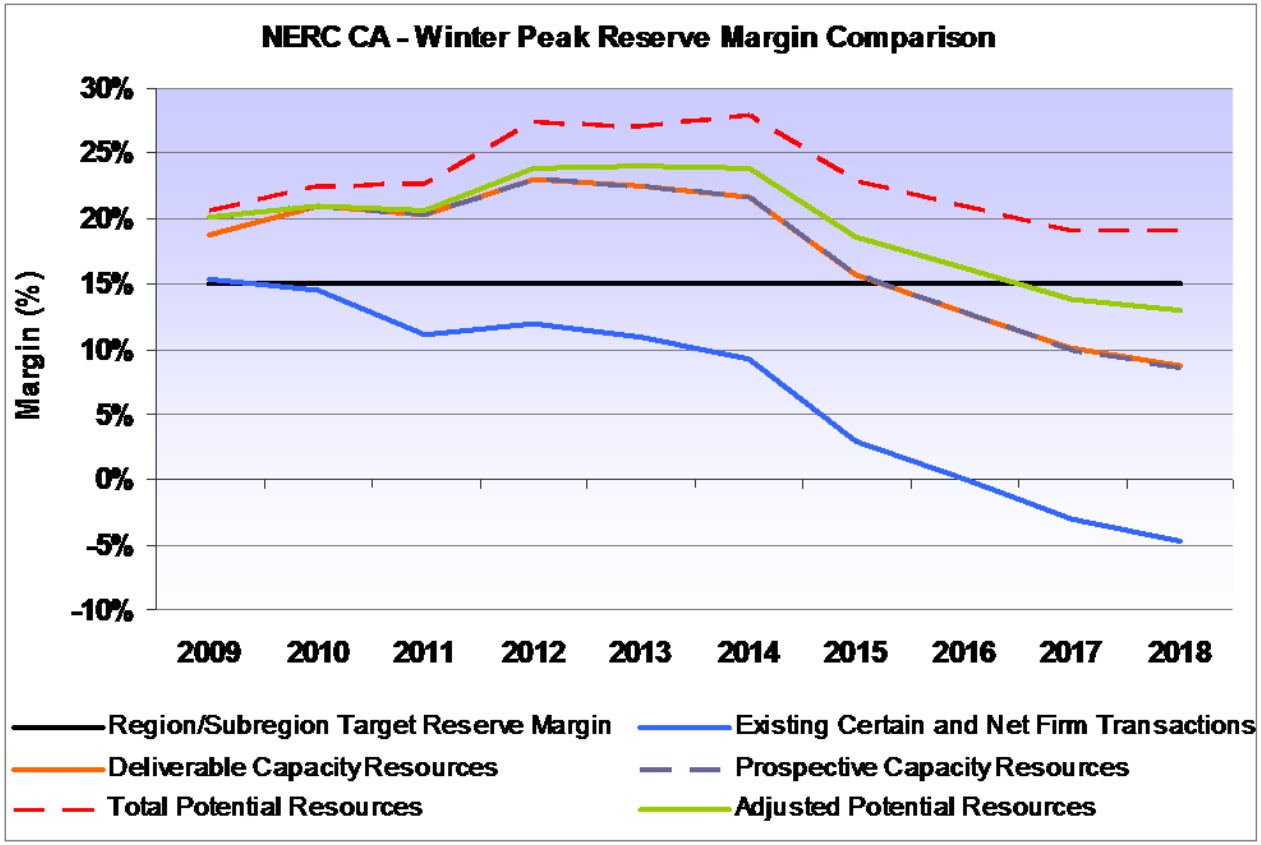
Higher Reserve Margins (U.S.)



Preliminary Results – NOT FOR CITIATION

Highlight

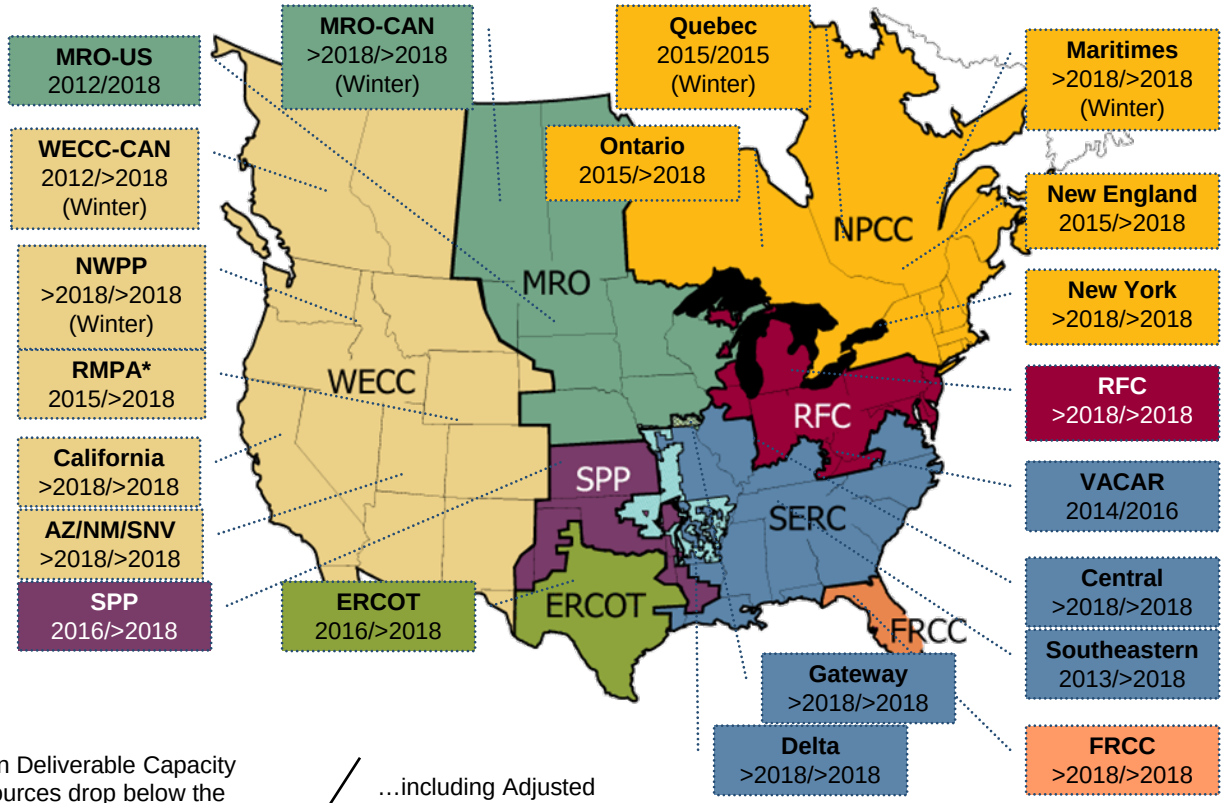
Higher Reserve Margins (Canada)



Preliminary Results – NOT FOR CITIATION

Highlight

Higher Reserve Margins



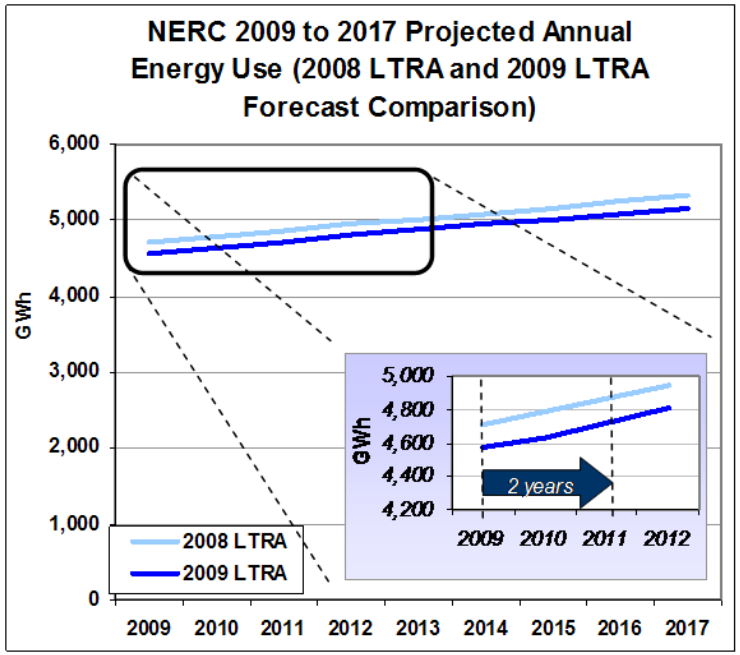
When Deliverable Capacity Resources drop below the NERC Reference Margin Level

…including Adjusted Potential Resources

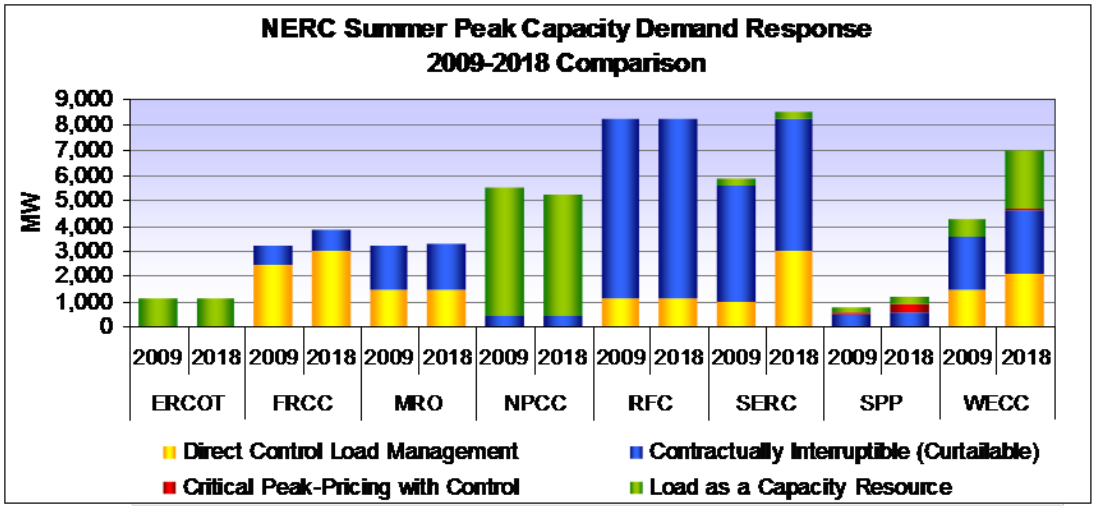
Preliminary Results – NOT FOR CITIATION

Highlight

Higher Reserve Margins



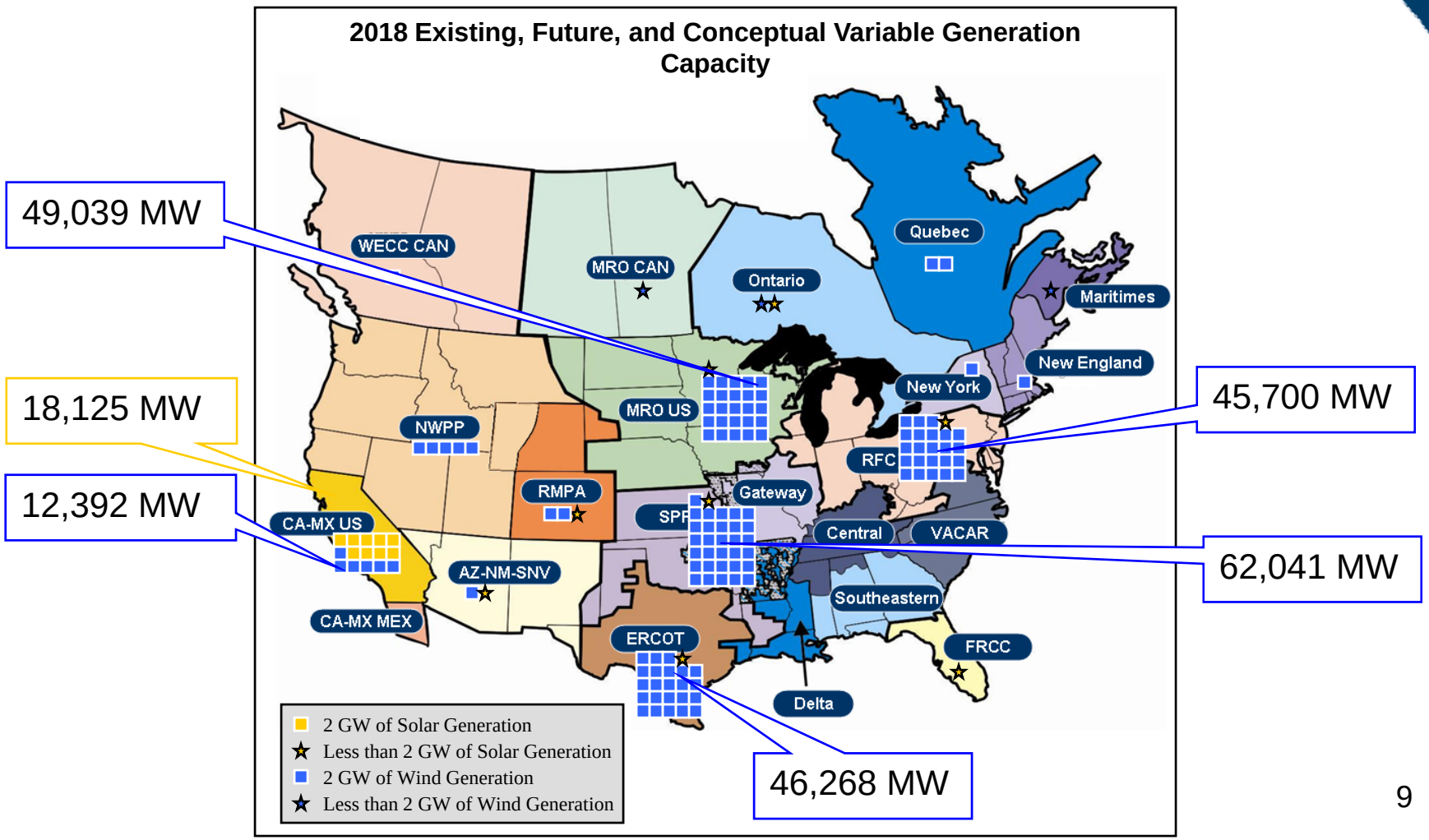
- Two years of growth deferred
- Energy Efficiency is projected to reduce summer peak demand by 20,000 MW
- By 2018, 38,000 MW of Demand Response to manage peak demand



Preliminary Results – NOT FOR CITIATION

Highlight

New Renewable Capacity

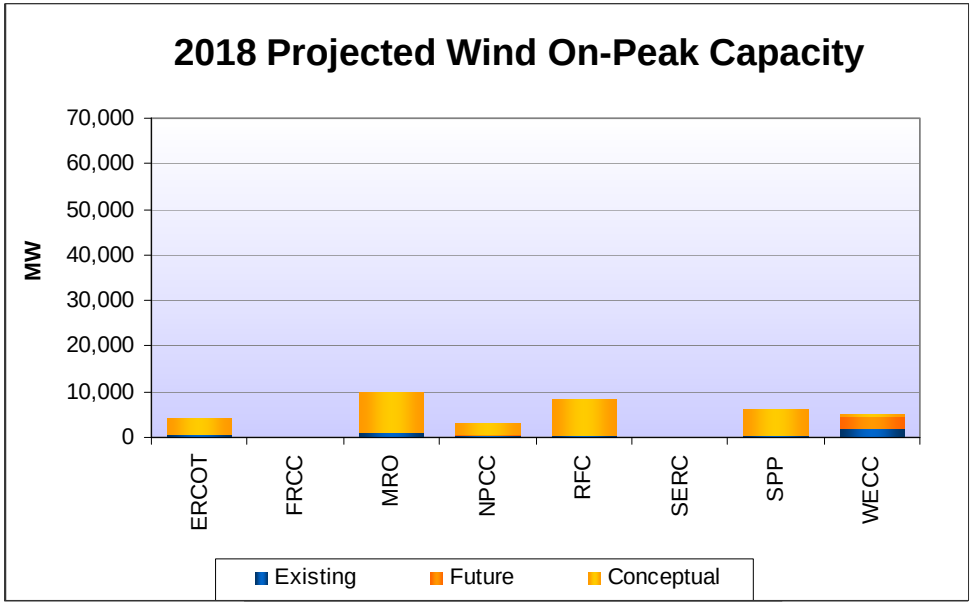


Preliminary Results – NOT FOR CITIATION

Highlight

New Renewable Capacity

- 220 GW of additional installed wind capacity
- 32 GW expected on-peak capacity

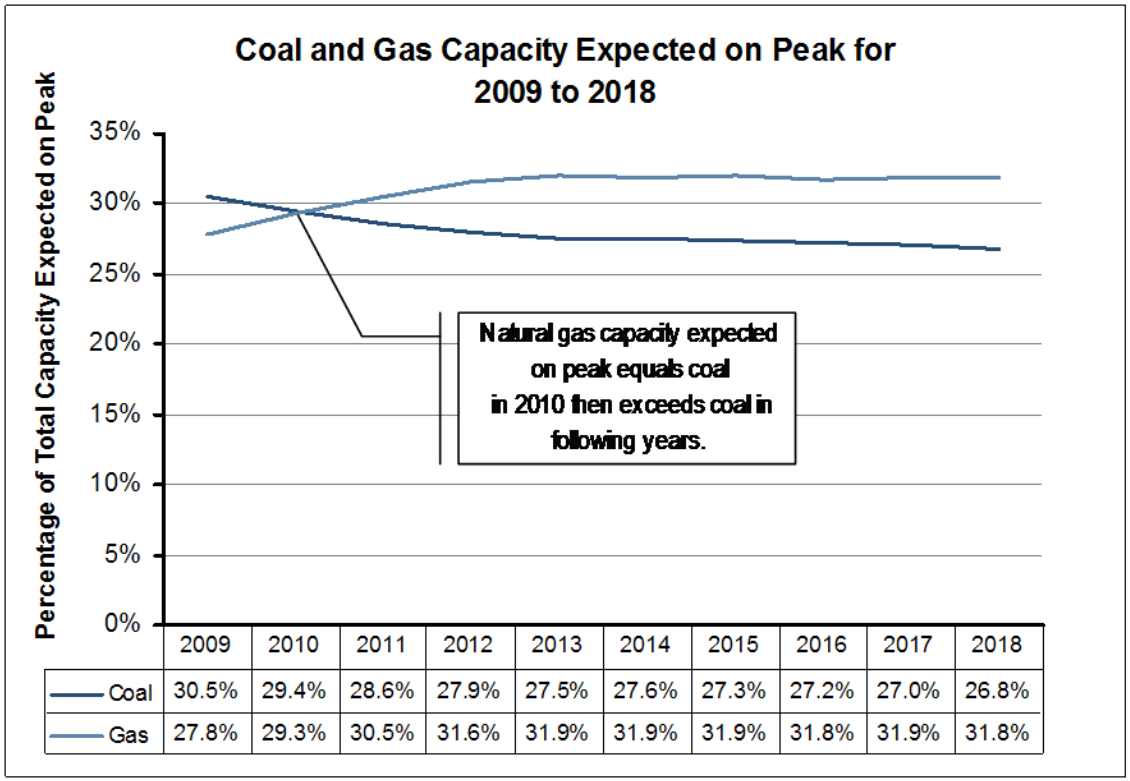


Preliminary Results – NOT FOR CITIATION

Highlight

Fuel Switching

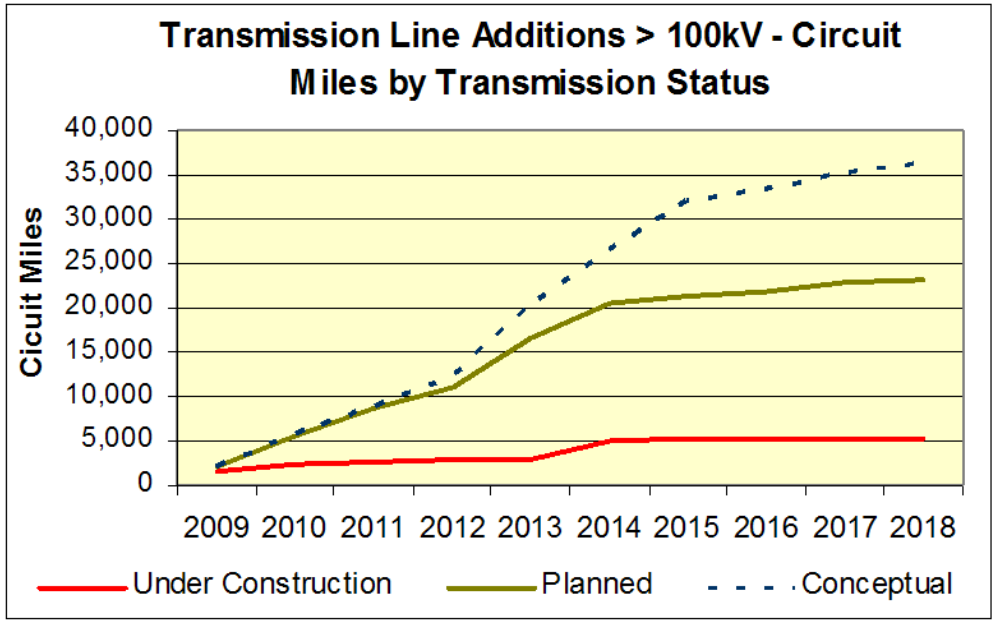
- Natural gas expected to replace coal as the leading fuel for capacity by 2011



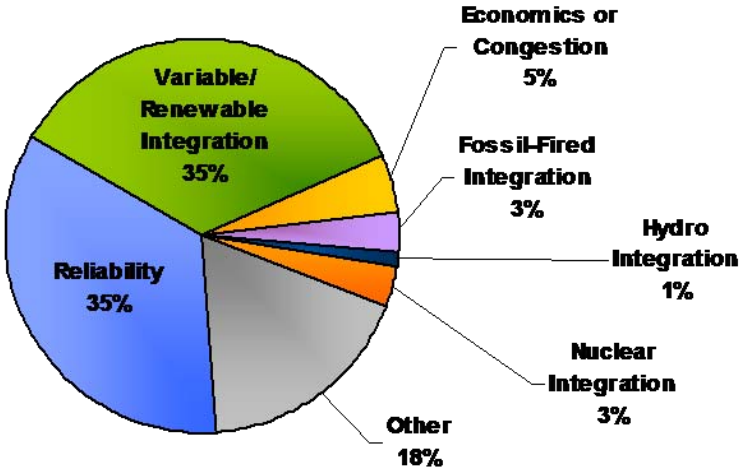
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Coal	30.5%	29.4%	28.6%	27.9%	27.5%	27.6%	27.3%	27.2%	27.0%	26.8%
Gas	27.8%	29.3%	30.5%	31.6%	31.9%	31.9%	31.9%	31.8%	31.9%	31.8%

Preliminary Results – NOT FOR CITIATION

Highlight
Transmission Siting & Construction Must Accelerate



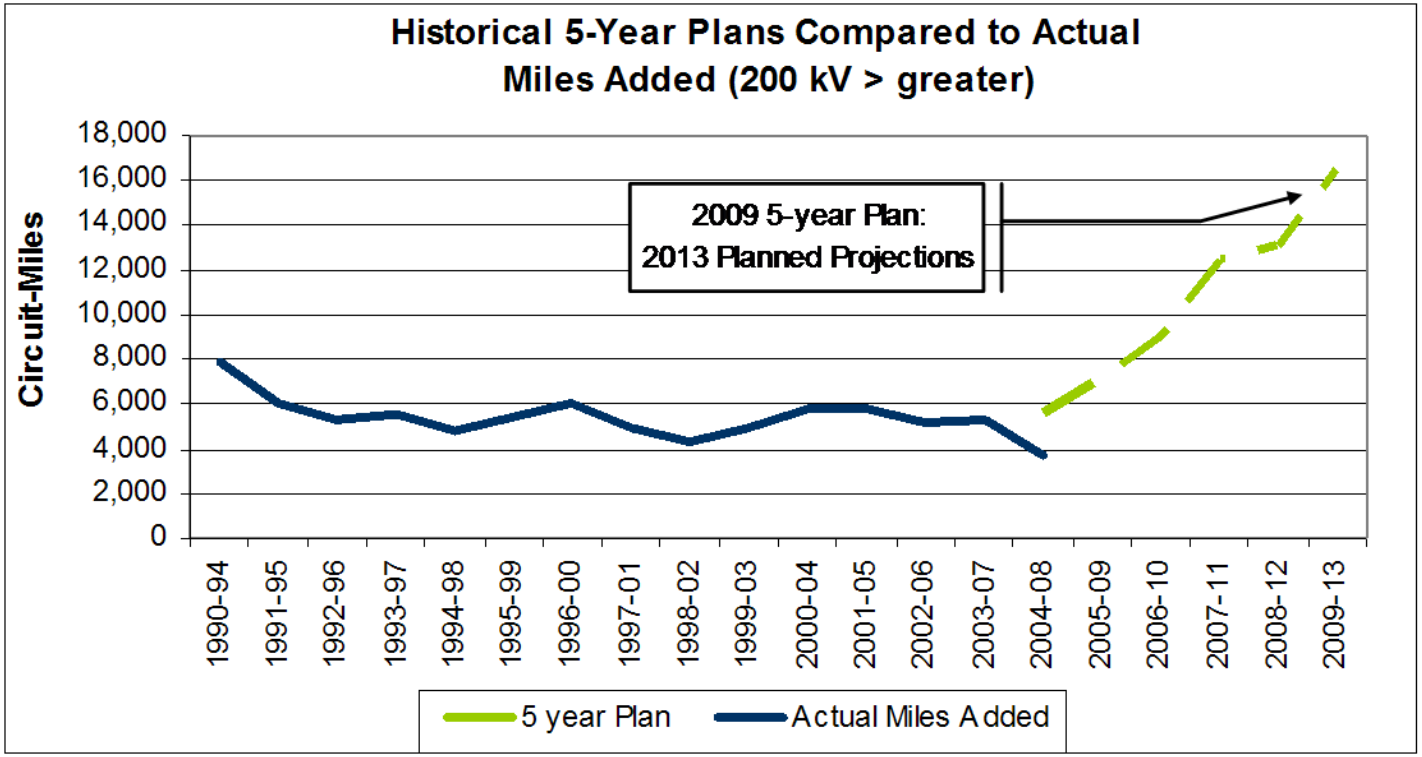
- 24,000 miles of Planned Transmission
- An additional 12,000 miles of Conceptual Transmission



Preliminary Results – NOT FOR CITIATION

Highlight
Transmission Siting & Construction Must Accelerate

- 2013 Plans:16,000 Miles of New Transmission



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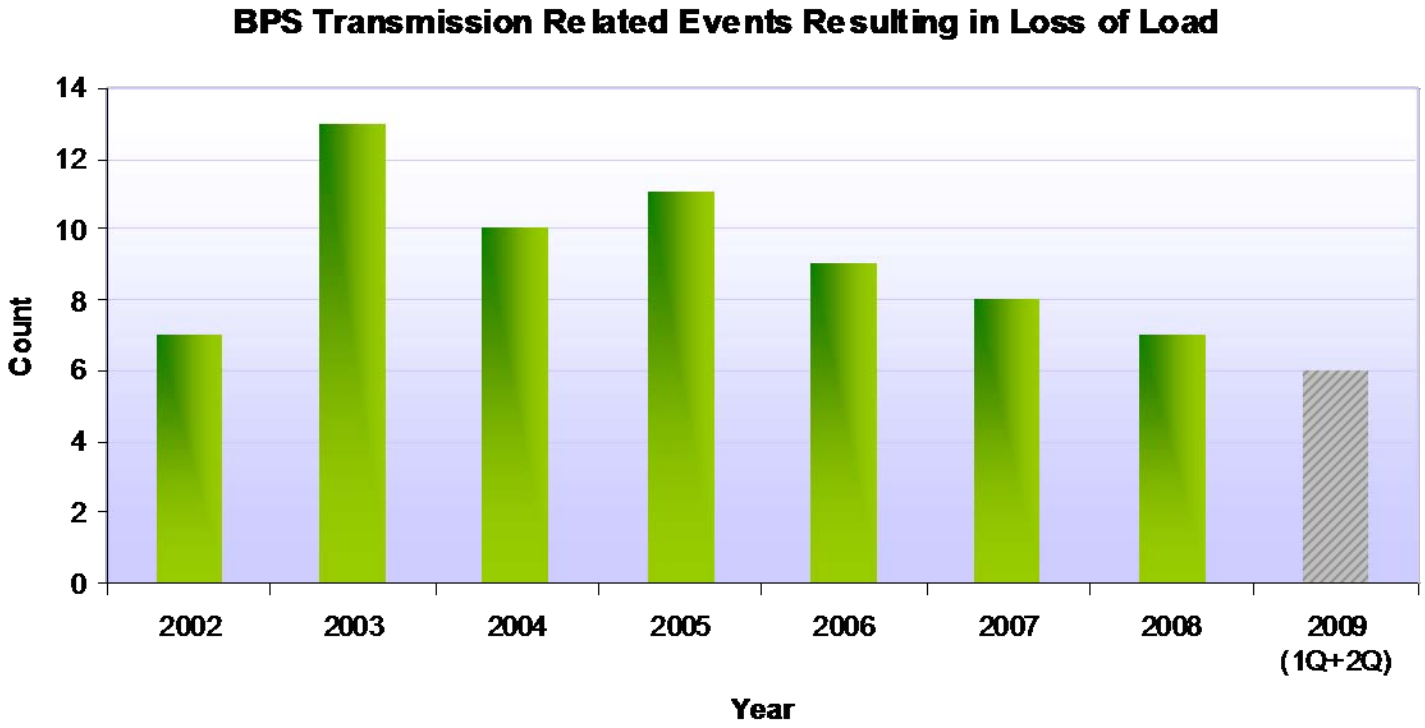
Highlight

Performance Metrics



Preliminary Results – NOT FOR CITIATION

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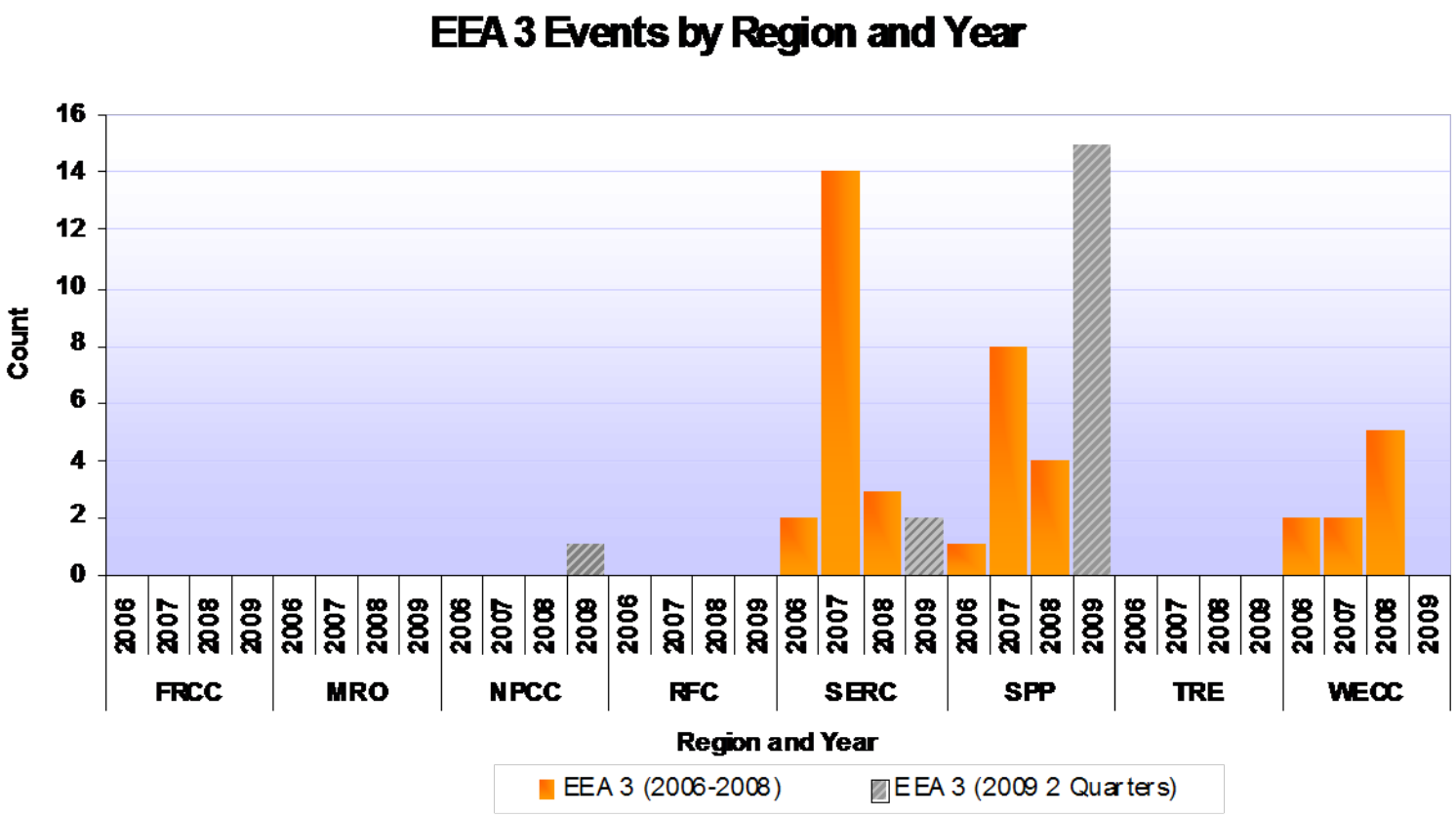
Performance Metrics



Preliminary Results – NOT FOR CITIATION

2009 Emerging & Standing Issues

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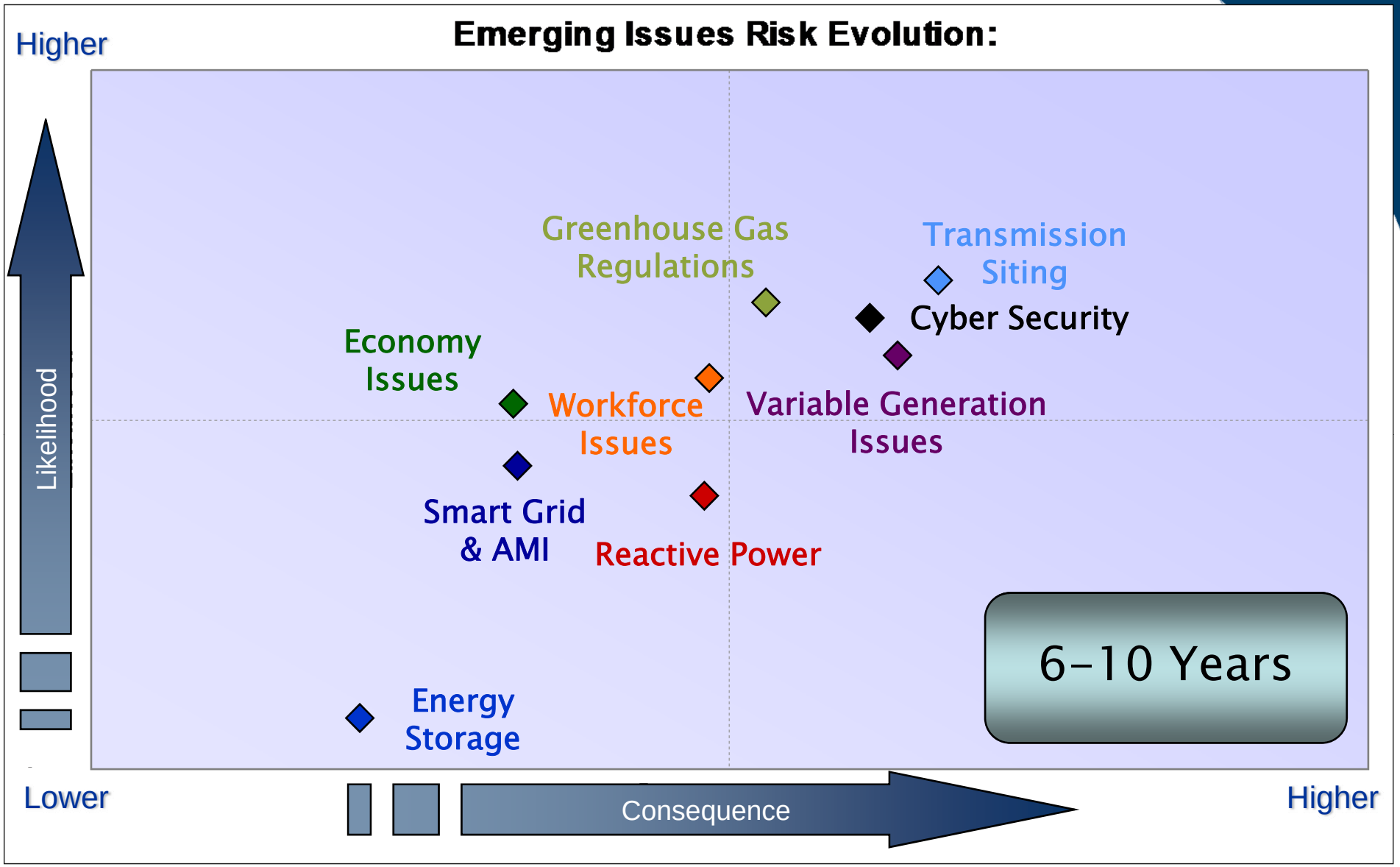


2009 Scenario Assessment

Background

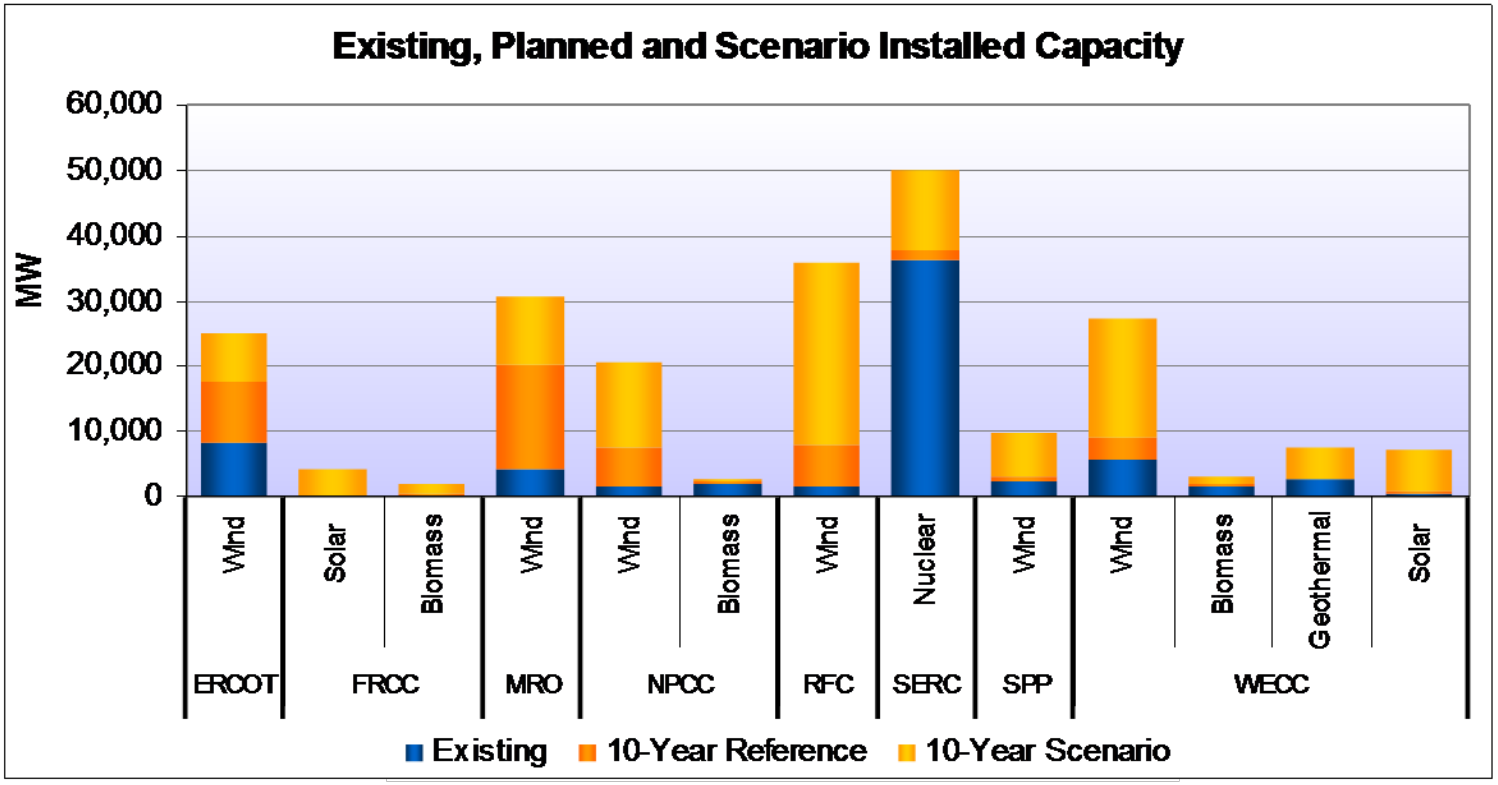
- Two Options
  - Scenario #1: Accelerated Integration of Renewable Resources
    - 15% energy from renewables
  - Scenario #2: Fuel-shift analysis
    - Integration of increased Nuclear generation
- Identify planning and operational challenges with respect to reliability
- Identify impacts to reserve margins, transmission needs, and generating capacity mix

Highlights

- Significant changes in resource mix needed to meet scenario targets
- More than double the amount of transmission needed to integrate new generating resources than the reference case
- Increased Reserve Margins may indicate a need for increased operating reserves to maintain Bulk Power System reliability

Highlight

Changes in Resource Mix



Highlight

Transmission Needed

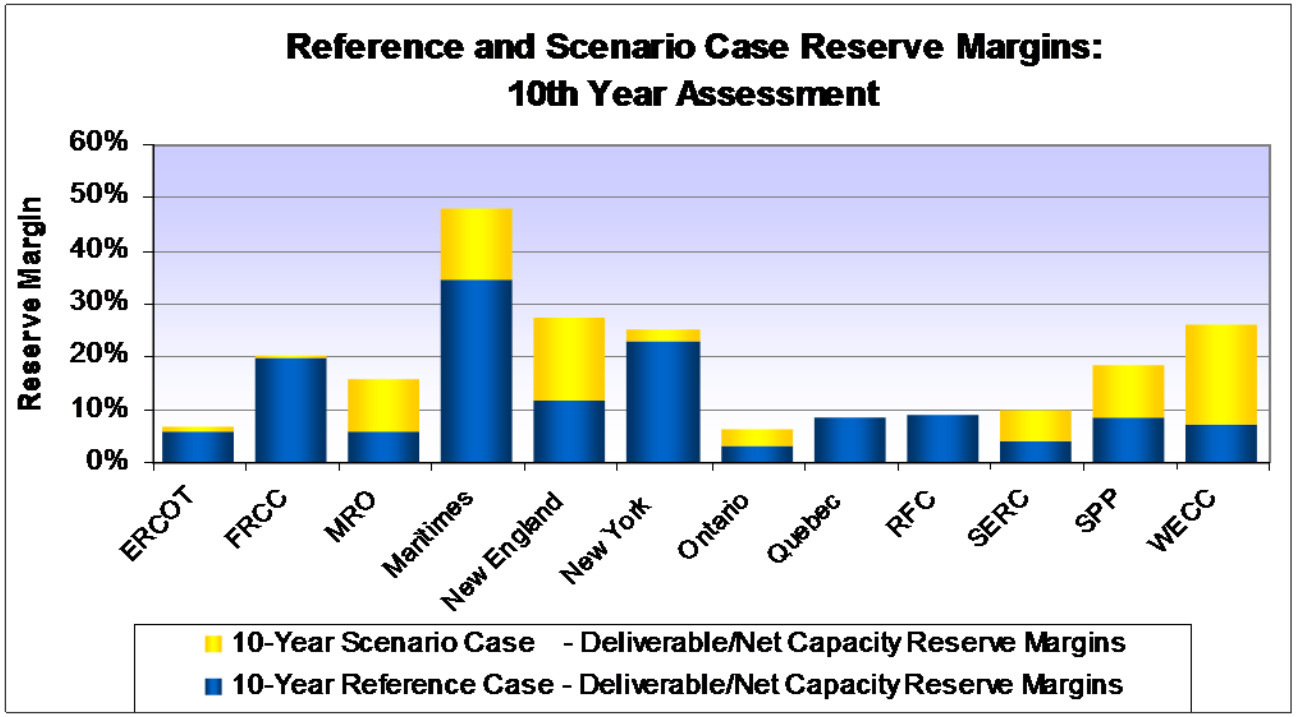
- *More than double the amount of transmission needed to integrate new generating resources than reference case*
  - 20,000 more miles of transmission across North America
  - This represents over 40,000 miles of needed transmission in a ten-year timeframe

Existing, Reference, and Scenario Case: Circuit Miles > 200kV				
	2008/2009 Reference Case	2017/2018 Reference Case Planned	2017/2018 Scenario Case	Percentage Increase from 2008/2009 Reference Case
ERCOT	8,917	13,032	14,020	57.2%
FRCC	7,201	7,789	7,803	8.4%
MRO	22,632	26,289	33,505	48.0%
NPCC	36,100	37,775	+39,571	9.6%
RFC	26,203	27,828	33,368	27.3%
SERC	32,295	34,724	35,440	9.7%
SPP	9,063	9,877	11,701	29.1%
WECC	70,435	78,527	+78,527	11.5%
TOTAL	**212,846**	**235,841**	**253,935**	**19.3%**

Highlight

Increased Reserve Margins Needed

- *Increased Reserve Margins may indicate a need for increased operating reserves to maintain Bulk Power System reliability*



Highlight

Operational Challenges

- *Considerable Operational Challenges Identified*
  - *Scenario #1*
    - Minimum generation limits during light load conditions
    - Increased ramp requirements and out-of-phase ramping
    - accurate day-ahead and hourly wind forecasting
    - access to additional operating reserves
  - *Scenario #2*
    - *Increased reserve requirements with larger units*
    - Common mode failures and multiple contingency losses exacerbate reliability impacts
    - *Load-following technology needed to increase operational flexibility*

Question & Answer

SPP Highlights

The SPP RTO Region is anticipating a steady and slow growth in demand with total system demand approaching 50,000 MW by 2018. Current SPP RTO demand is 44,500 MW.

The annual reserve margin for SPP is greater than the required 13.6 percent until the year 2016, where the margin drops to approximately 13 percent. For the remaining years (i.e., 2017 and 2018), SPP anticipates to meet reserve margin using potential capacity resources.

The SPP Transmission Expansion Plan 2009-2018 reported approximately 1,000 miles of bulk transmission lines and more than 10 transformers to address reliability needs. The SPP RC anticipates that the Acadiana Load Pocket will be a concern for the remainder of the 2009 summer. SPP is working with each entity in the area to resolve the issues and protect the load in the area. As a long-term solution, the SPP Independent Coordinator of Transmission (ICT) facilitated an agreement with members in the Acadiana pocket to expand and upgrade electric transmission in the area. In addition to the reliability needs, SPP RTO has implemented a Balanced Portfolio, which is a strategic initiative to develop a cohesive group of economic upgrades that benefit the SPP RTO Region, and for which costs will be allocated Regionally. Projects in the Balanced Portfolio are transmission upgrades of 345 kV or higher that will provide customers with potential savings that exceed the cost of the project. In April 2009, the SPP Regional State Committee and the Board of Directors/Members Committee approved Balance Portfolio projects totaling over $700 million, to be funded by the application of Federal Energy Regulatory Commission-approved “postage stamp” rates to SPP’s transmission-owning members across the Region.

The SPP Board of Directors recently approved the adoption of new planning principles and implementation of an Integrated Transmission Planning (ITP) Process. The ITP will consolidate SPP’s EHV Overlay, Balanced Portfolio, and ten-year reliability assessment into one consolidated process.

SPP as a Planning Authority conducts various reliability assessments to comply with NERC TPL Reliability Standards and coordinate the mitigation effort with its members. Based on the studies performed, SPP is not anticipating any near- or long-term reliability issues that have not addressed by any mitigation plan or local operating guides.

Since the implementation of the EIS market in 2007, SPP RTO continues an increase in the number of TLR events primarily due to the fact that SPP publishes congested facilities by issuing TLRs. SPP’s tariff and market protocols require the SPP RC to issue a TLR event in accordance with NERC TLR requirements each time congestion is experienced in the market footprint, even when it is only constraining economic use of transmission. SPP’s market protocols require issuing a TLR to announce that SPP is experiencing congestion.

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The penetration of wind generation in the western half of the SPP footprint is anticipated to have a significant impact on operations, due to wind's variable nature. SPP RTO currently has approximately 50,000 MW of wind in their Generation Interconnection queue. Additional data collection and situational awareness has been implemented to begin assessing regulation and spinning reserve needs. SPP formed a Wind Integration Task Force, which is responsible for conducting and reviewing studies to determine the impact of integrating wind generation into the SPP RTO transmission system and energy markets. These studies will include both planning and operational issues. The studies should lead to recommendations for developing new tools that may be required for the SPP RTO to properly evaluate requests for interconnecting wind generating resources to the transmission system.

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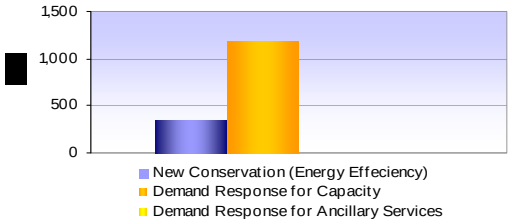
SPP

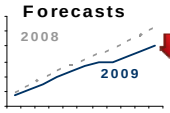
Regional Long-Term Assessment Summary

Summer Peak Demand	2009	2018
Total Internal Demand (MW)	44,463	49,696
Direct Control Load Management	33	30
Contractually Interruptible (Curtailable)	484	527
Critical Peak-Pricing with Control	35	324
Load as a Capacity Resource	215	315
Net Internal Demand (MW)	43,696	48,500

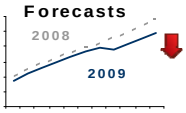
Demand-Side Management - 2018



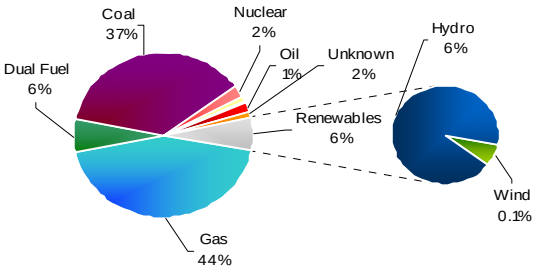
Energy Consumption	2009	2017
Net Energy to Load (GWh)	211,320	236,886
Percentage Change from 2008 Forecast	-0.7%	-3.9%



Peak Demand Comparison	2009	2017
2008 Demand Forecast	44,786	50,640
Percentage Change from 2008 Forecast	-0.7%	-3.2%



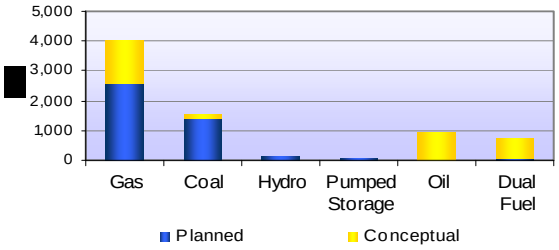
Relative Capacity Mix by Fuel Type - 2009



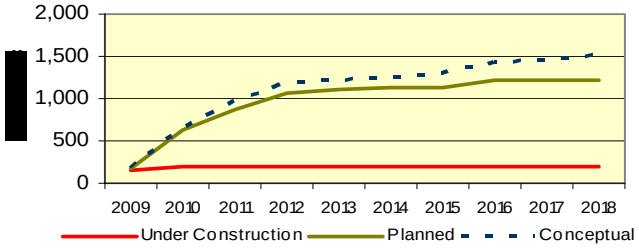
Capacity Resources On-Peak - 2009	MW	Margin
Existing Certain and Net Firm Transactions	49,706	13.8%

Capacity Resources On-Peak - 2018	MW	Margin
Deliverable Capacity Resources	53,319	9.9%
Prospective Capacity Resources	59,846	23.4%
Adjusted Potential Capacity Resources	60,141	24.0%
Total Potential Capacity Resources	65,880	35.8%
NERC Reference Margin Level	-	13.6%

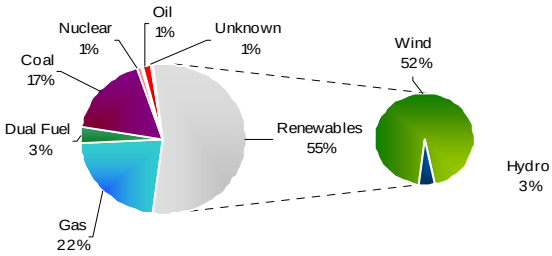
Projected On-Peak Fuel-Mix 10 Year Change



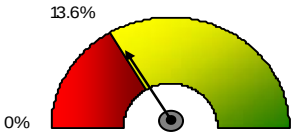
Projected Transmission Additions



Relative Capacity Mix by Fuel Type - 2018

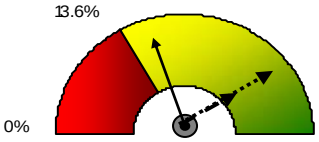


2009 Reserve Margin



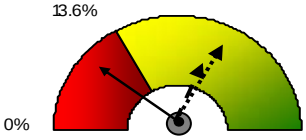
Existing-Certain & Net Firm Transactions

2013 Reserve Margins



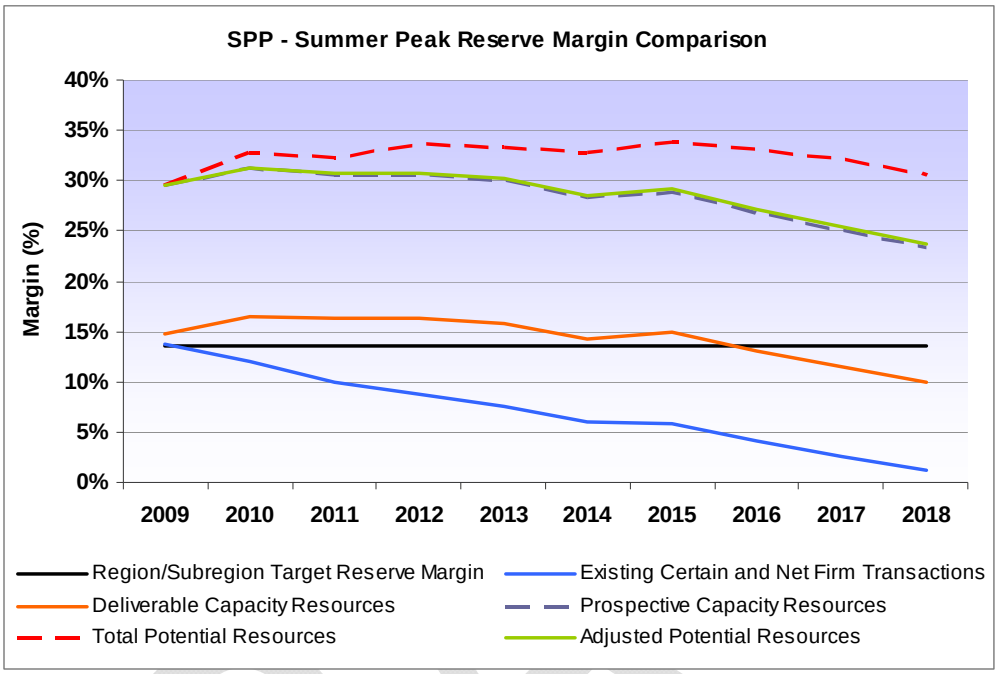
Deliverable
Prospective
Adjusted Potential

2018 Reserve Margins

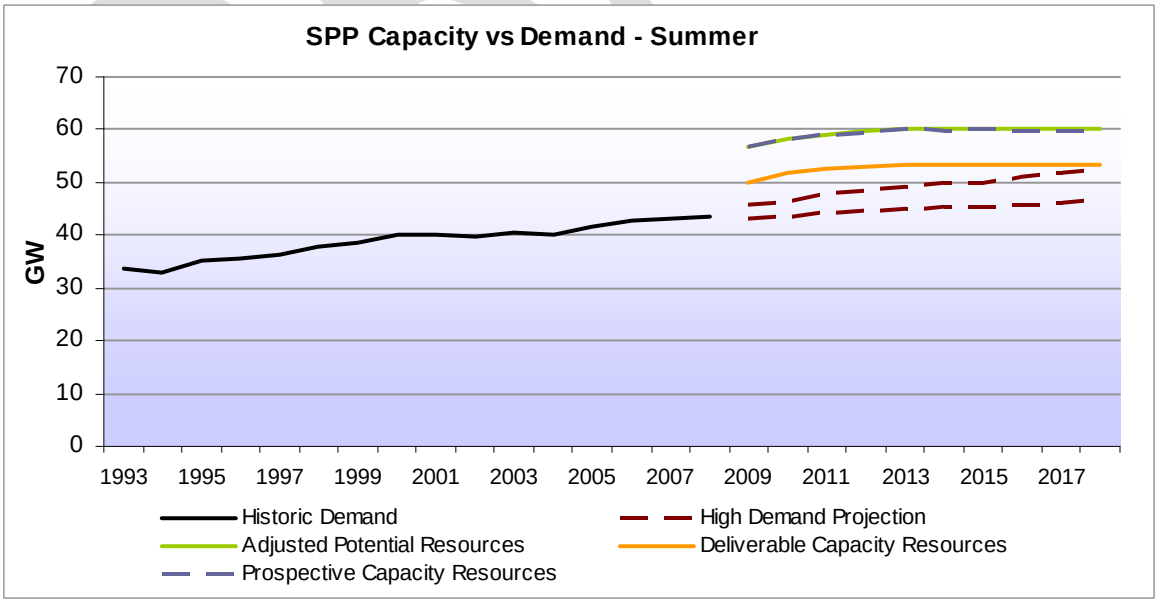


Deliverable
Prospective
Adjusted Potential

For the 2009 to 2018 assessment period, SPP Reserve Margins are projected below the NERC Reference Margin Level by 2010 if no new resources are added. Even with the addition of Future, Planned resources, Reserve Margins are below the NERC Reference Margin Level by 2016. SPP may need the additional resources to remain above the NERC Reference Margin Level through 2018.



For the high demand projection,[1] SPP capacity resources, with all categories considered, remain higher than these forecasts through 2018.



[1] Demand uncertainty bandwidths represent a 10% chance of falling above and 10% chance of falling below confidence bands.

SPP

Introduction

Southwest Power Pool (SPP) operates and oversees the electric grid in the southwestern quadrant of the Eastern Interconnection. SPP's Regional Transmission Organization (RTO) footprint includes all or part of nine states in the U.S. On April 1, 2009, the SPP RTO acquired three new members for which SPP will perform Reliability Coordination and Tariff Administration services: Nebraska Public Power District, Omaha Public Power District, and Lincoln Electric System. Midwest Reliability Organization (MRO) will continue to perform Reliability Assessments for these entities until a NERC Delegation Agreement is revised in 2010.

The SPP RTO anticipates consistent but slow growth in demand and energy use over the next ten years. Significant generation capacity using uncertain resources is forecasted to be available in SPP throughout the planning horizon to meet native network load needs, with certain generation resources meeting minimum Reserve Margins until 2016.

Demand

According to the most recent data, the projected annual rate of growth for peak demand in the SPP Region over the next ten years is 1.1 percent, from 44,463 MW in 2009 to 49,695 MW in 2018. In the *2008 Long-Term Reliability Assessment* report, the projected annual growth rate for the SPP Region over the 10 year period was 1.4 percent. This decrease results from some SPP members reporting reduced load forecast due to economic recessions in their respective areas.

For 2009 to 2018 the projected annual rate of growth for energy use in the SPP Region is 1.3 percent, from 211,320 GWh in 2009 to 240,513 GWh in 2018. This is slightly less than the 2008 report's forecasted growth rate of 1.5 percent.

The SPP RTO has 21 reporting members who annually provide a 10 year forecast of peak demand and net energy requirements. These forecasts are used to develop an overall non-coincident SPP RTO forecast. The forecasts are developed in accordance with generally recognized methodologies and in accordance with the following principles:

- Each member selects its own demand forecasting method and establishes its own forecast.
- Each member forecasts demand based on expected weather conditions. In the case of extreme weather, peak demand would be increased by approximately 2.9 percent.

Methods used, factors considered, and assumptions made are submitted to SPP, along with the annual forecast. Economic, technological, sociological, demographic, and any other significant factors are considered when producing the forecast.

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The resultant SPP RTO forecast is a total of the member forecasts. High and low growth rates and unusual weather scenario bands are then produced for the SPP RTO Regional demand and energy forecasts. To ensure against negative impacts due to forecast error, SPP requires each member to maintain a 12 percent Capacity Margin or 13.6 percent Reserve Margin.

Although actual demand is very dependent upon weather conditions and typically includes interruptible loads, forecasted net internal demands used for assessing net capacity or Reserve Margins are based on normal weather conditions and do not include interruptible loads.

These capacity or Reserve Margin projections include the effects of demand-side response programs, such as direct-control load management and interruptible demand. Currently, the SPP RTO does not have a specific Demand Response program. However, according to SPP's Strategic Plan[2], the SPP staff along with its members plan on establishing collective knowledge to eventually include conservation and efficiency programs Intergrated Resource Planning, Demand Side Management. In the meantime, over the next 10 years, interruptible demand relief is expected to increase from 484 MW to 527 MW. These Demand Response values are based on predictions using historical data and trends; these projections do not reflect increased Demand Response as directed by FERC in the evolution of SPP's market design. Also, these projections are net values and do not indicate the increase in Demand Response to offset significant amounts of interruptible loads.

To quantify peak demand uncertainty and variability due to extreme weather, economic conditions, and other variables, SPP formed a Bandwidth Working Group. This group produced the Demand and Energy Bandwidth Report[3], which supports the current predicted growth rates and allows for up to a 1.2 percent variation in current and future predictions through the year 2012. SPP anticipates this trend will continue for the remaining study period, and is continuing this analysis process for future predictions beyond 2012.

Generation

For the 2009 to 2018 assessment period, the SPP RTO projects to have 49,362 MW Existing Certain Capacity; 8,617 MW Existing Other Capacity; 597 MW Existing Inoperable; 4,397 MW Future Capacity; and 3,305 MW Conceptual resources that are either in-service or are expected to be in-service. The Existing Certain Capacity amount from renewable plants is 217 MW (wind), 2,995 MW (hydro), and 365 MW (biomass). Existing Uncertain Capacity from renewable plants (mostly wind) is 2,040 MW. Planned Capacity for 2018 from renewable plants is 22 MW. These reported renewable resource additions in the SPP RTO do not reflect merchant wind farm development in process within SPP, incremental needs which may result from Renewable Electricity Standard (RES) mandates within the SPP Region, or public pronouncements for additional renewable expansion by SPP RTO members. Currently, the SPP RTO has requests to connect approximately 56,000 MW of generation (mostly wind) to the SPP RTO grid via the Generation Interconnection queue.

For future and conceptual capacity resources, the SPP RTO uses the Generation Interconnection (GI) and Transmission Service Request (TSR) study processes as defined in the SPP Open

[2] http://www.spp.org/section.asp?pageID=83
[3] The Demand and Energy Bandwidth Report is located: http://www.spp.org/publications/BWG_Report_2003.pdf.

Access Transmission Tariff (OATT). According to the OATT[4], at the time the Interconnection Request is submitted, the Interconnection Customer must request either Energy Resource Interconnection Service or Network Resource Interconnection Service. Any Interconnection Customer requesting Network Resource Interconnection Service may also request that it be concurrently studied for Energy Resource Interconnection Service, up to the point when an Interconnection Facility Study Agreement is executed. Interconnection Customers may then elect to proceed with Network Resource Interconnection Service or proceed under a lower level of interconnection service to the extent that only certain upgrades will be completed.

Purchases and Sales on Peak

A small portion of SPP's capacity or Reserve Margin depends on purchases from other Regions. Transactions purchased from other Regions for the 2009 to 2018 assessment period are 964 MW (this is a ten-year average). Based on a ten-year average (2009 to 2018), 875 MW of these purchases are firm, and 150 MW is firm delivery service from WECC administered under Xcel Energy's OATT.

SPP has 798 MW of firm sales to Regions external to SPP based on a ten-year average, including firm generation and transmission.

Transmission

The SPP Transmission Expansion Plan (STEP) establishes transmission system needs for the next ten years to meet forecasted load and all firm long term transmission service. The STEP includes a reliability assessment with different scenarios of firm transmission being sold in various directions. In addition, the SPP RTO has been performing various analyses to comply with NERC Transmission Planning (TPL) standards. SPP also developed a Balanced Portfolio study to evaluate economic transmission projects that would benefit the entire Region.

There are no known concerns about meeting the target in-service dates for the projects that are approved by the SPP Board of Directors. Assuming these projects come on-line as scheduled, there are no known transmission constraints that could impact the reliability of the SPP transmission grid. The SPP RTO has identified and issued Notifications to Construct (NTCs) for over 1,000 miles of bulk transmission lines and more than 10 transformers to address reliability and economic needs. A summary of these projects is listed in *Transmission and Transformers Tables* section of this report.

For details on Level 3 Energy Emergency Alerts (EEA-3s) in the Acadiana load pocket area, see the Transmission section of SPP's Regional Reliability Self-Assessment.

Operational Issues

The penetration of wind generation in the western half of the SPP footprint could have a significant impact on operations, due to wind's variable nature. Several avenues are being explored to provide transmission outlets for this wind energy during the next ten years, including SPP's EHV Overlay Study, the Balanced Portfolio, and the Joint Coordinated System Plan (JCSP). However, the operational impacts of wind generation to regulation and control

[4] http://www.spp.org/publications/SPP_Tariff.pdf

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performance are still unknown. As the penetration rate of variable generation grows, further study will be required to mitigate any issues that arise.

Additional data collection and situational awareness has been implemented to begin assessing regulation and spinning reserve needs. SPP formed the Wind Integration Task Force in January 2009. This Task Force is responsible for conducting and reviewing studies to determine the impact of integrating wind generation into the SPP RTO transmission system and energy markets. These studies will include both planning and operational issues, and should lead to recommendations for developing new tools that may be required for the SPP RTO to properly evaluate requests for interconnecting wind generating resources to the transmission system.

The SPP RTO has been working with AMEC and Southwestern Public Service/Xcel Energy staff to investigate the operational impacts of increased wind penetration to secure reliable operations within the Southwestern Public Service (SPS) area. Due to significant existing, approved, and requested wind farm development, existing constraints in the near-term must be resolved before major transmission capability can be installed to improve internal and interface capabilities. This AMEC study of spring 2010 conditions focused on operations and reliability, and did not investigate economics associated with planned and potential wind development within and surrounding the SPS balancing authority. The study leveraged the National Renewable Energy Lab's wind data for 2004 to 2006 to simulate future scenarios for 2010. Without considering proactive wind curtailments as an option, the study concluded that operating margins within SPS would be jeopardized as wind farm development approached 1,100–1,200 MW within SPS. This is only slightly above existing wind farm levels, with more being built and another 2,000 MW of approved wind Interconnection Agreements. SPS is working with SPP to finalize operating procedures and communicate them to wind developers as a near-term solution. Consolidating the SPP RTO's balancing authorities will help facilitate wind integration in the Region, but additional changes to the SPP OATT, interconnection agreements, operating procedures, and market design may be required to maintain adequate operating margins within SPS and other portions of SPP as wind development continues.

SPP operations staff does not anticipate any environmental or regulatory restrictions that could potentially impact reliability. SPP has a substantially diverse mix of generation capacity and a sufficient expected Capacity Margin such that no reliability impacts are foreseen.

Reliability Assessment Analysis

For the 2009 to 2018 assessment period, the net capacity margin reflected by current EIA-411 data, based on Deliverable Capacity Resources, indicates SPP members should maintain a 12.8 percent capacity margin in 2009, reducing to 9.0 percent in 2018. The forecasted Reserve Margin for 2009 is 14.7 percent, reducing to 9.9 percent in 2018. These margins are expected to cover a 90/10 weather scenario.

The annual net capacity margin for SPP is greater than the required 12 percent until the year 2016, when the capacity margin will drop to 11.5 percent and the Reserve Margin to 13.0 percent. For 2017 and 2018, SPP anticipates more resources will be qualified as certain and can be counted against capacity margin.

SPP defines firm deliverability as electric power intended to be continuously available to buyers even under adverse conditions; i.e., power for which the seller assumes the obligation to provide capacity (including SPP defined capacity margin) and energy. Such power must meet the same standards of reliability and availability as that delivered to native load customers. Power purchased can be considered firm only if firm transmission service is in place to deliver the power to the load serving member. SPP does not include financial firm contracts in this category. Existing long-term firm delivery is ensured by provisions in the SPP Transmission Expansion Plan, while new long-term firm delivery is ensured by Aggregate Transmission Service Studies. These procedures are included in attachments O and Z1 in the SPP OATT[5].

SPP monitors potential fuel supply limitations by consulting with its generation-owning and generation-controlling members at the beginning of each year. There are no known infrastructure issues, which could impact deliverability, as SPP is blanketed by major pipelines and railroads to provide an adequate fuel supply. Coal-fired and natural gas power plants, which make up approximately 48 and 44 percent of total generation respectively, are required by SPP criteria to keep sufficient quantities of standby fuel in case of deliverability issues. As previously stated, because hydro capacity is a small fraction of capacity for the Region, run-of-river hydro issues brought about by extreme weather are also not expected to be critical.

Significant deliverability problems due to transmission limitation are not expected, assuming all projected projects are completed on time. SPP will continue to closely monitor the issue of deliverability through the flowgate assessment analysis, and will address any reliability constraints. This analysis validates the list of flowgates that SPP monitors on a short-term basis, using various scenario models developed by SPP staff. These scenario models reflect all the potential transactions in various directions being requested on the SPP system. The results of this study are reviewed and approved by SPP's Transmission Working Group prior to summer and winter of each study year.

According to the NERC Functional Model, the Planning Coordinator ensures a long-term (generally one year and beyond) plan is available for adequate resources and transmission within its Planning Coordinator Area. That area, which encompasses the customer demands therein, will not necessarily coincide with a Reliability Coordinator Area. A Loss of Load Expectation (LOLE) study was performed by SPP RTO staff in 2008 to meet these requirements and verify whether a 12 percent capacity margin (13.6 percent Reserve Margin) is adequate. In 2009, the SPP RTO finalized the sensitivity analysis for this study. This sensitivity addresses the impact of wind penetration in the western part of the grid. The results of this sensitivity study indicate the LOLE in the western part of the SPP system should be improved by a combination of additional generation resources (wind and fossil fuels) as well as an additional transmission line (345 kV line from Woodward District EHV to Tuco) into the Texas Panhandle. Historically, SPP has adhered to a 12 percent capacity margin/13.6 percent Reserve Margin to ensure the minimum LOLE of one occurrence in 10 years is met. Presently, the 12 percent capacity margin/13.6 percent Reserve Margin requirement (both short-term and long-term) is checked annually in the EIA-411 reporting, as well as through Regional members' supply adequacy audits. The last supply adequacy audit was conducted in 2007, and the subsequent audit is scheduled for 2012.

[5] http://www.spp.org/publications/SPP_Tariff.pdf

The SPP RTO develops an annual SPP Transmission Expansion Plan (STEP) that includes a group of projects to address Regional reliability needs for the next 10 years (2009–2018). The latest STEP was approved by the SPP Board of Directors in January 2009 and is available on the SPP.org *Engineering and Planning* section.[6] In addition to the STEP and as a part of compliance assessment process, the SPP RTO also performs a dynamic stability analysis. The latest dynamic study completed for 2009 operating conditions did not indicate any dynamic stability issues for the SPP RTO Region. The SPP Regional Entity (RE) performs an annual review of reactive reserve requirements for load pockets within the Region. Currently, the SPP RE and RTO do not have specific criteria for maintaining minimum dynamic reactive requirement or transient voltage dip criteria. However, according to the reactive requirement study scope, which was completed as a STEP process in 2008, each load pocket or constrained area was studied to verify that sufficient reactive reserves are available to cover the loss of the largest unit. The annual STEP process conducted by the SPP RTO did not indicate limited dynamic and static reactive power areas on the BPS.

As a part of the interregional transmission transfer capability study, the SPP RE participates in the Eastern Interconnection Reliability Assessment Group seasonal study group (comprised of MRO, RFC, SERC West, and SPP), which produces an upcoming summer and winter operating condition transfer limitation forecast. Simultaneous transfers are also performed as part of this study. The results of this study do not indicate any reliability issues for the SPP area.

SPP RTO members, along with neighboring members like Entergy from the SERC Region, have formed a Reserve Sharing Group. Members of this group receive contingency reserve assistance from other SPP Reserve Sharing Group members. SPP's Operating Reliability Working Group sets the Minimum Daily Contingency Reserve Requirement for the SPP Reserve Sharing Group. The SPP Reserve Sharing Group maintains a minimum first Contingency Reserve equal to the generating capacity of the largest unit scheduled to be online.

The SPP RTO has an UVLS program in the western Arkansas area within the AEP-West footprint. This program targets about 180 MW of load shed during the peak summer conditions to protect the BPS against under-voltage events.

The SPP RTO anticipates a significant amount of wind capacity to be added in the SPP footprint in the western part of the footprint. Although these are predominantly energy-only resources and only a small portion of this capacity (according to SPP Criteria 12.3.5.g) will be counted as certain based on the historical trend, it would be sufficient to meet SPP's capacity or Reserve Margin requirement. No major unit retirements are planned within the next ten years.

Due to the SPP RTO's diverse generation portfolio, there is no concern about the fuel supply being impacted by the extremes of summer weather during peak conditions. If a fuel shortage is expected, SPP members are expected to communicate with SPP operations staff in advance so they can take the appropriate measures. The SPP RTO would assess if capacity or reserves would become insufficient due to the unavailable generation. If so, the SPP RTO would declare

[6] http://www.spp.org/publications/2007_percent20SPP_percent20Transmission_percent20Expansion_percent20Plan_percent2020080131_BOD_Public.pdf

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either an Energy Emergency Alert or Other Extreme Contingency and post as needed on the Reliability Coordinator Information System. SPP does not conduct operations planning studies to evaluate the extreme hot weather conditions. Capacity margin criteria are intended to address load forecast uncertainty.

Energy-only resources, uncommitted resources, and transmission-limited resources are not used in calculating net capacity margin. The EIA-411 data does not include the 8,597 MW of uncommitted resources located within the SPP RTO footprint. These are reflected in the total potential resources capacity or Reserve Margin, which is considerably greater than the net capacity margin. SPP has not assessed the highest short circuit levels that have been forecasted on its 230 kV and above transmission system during the assessment period. No reliability impacts have been addressed due to aging infrastructure or economic conditions, and at this time SPP does not have any guideline for on-site, spare-generator step-up (GSU), and auto transformers.

As a Planning Authority, the SPP RE conducts reliability assessments to comply with NERC TPL standards:

- TPL-001 — The SPP Model Development Working Group (MDWG) ensures that all base case violations are addressed during Base Case development.
- TPL-002 — Using the SPP MDWG Models, Near and Long Term Analysis for N-1 contingencies are performed by SPP staff.
- TPL-003 — SPP staff performs automatic N-2 contingencies along with selected N-2 contingencies submitted by SPP members.
- TPL-004 — SPP periodically conducts reactive reserve and stability studies that address the key requirement in this standard. This standard covers the requirements of the SPP Region's planning process concerning selected catastrophic events.

Based on these studies, the SPP RE does not anticipate any near-term or long-term reliability issues that have not been addressed by mitigation plans or with local operating guides.

The Balanced Portfolio is an SPP RTO strategic initiative to develop a cohesive group of economic upgrades that benefit the SPP RTO Region, and for which costs will be allocated Regionally. Projects in the Balanced Portfolio are transmission upgrades of 345 kV or higher that will provide customers with potential savings that exceed the cost of the project. These economic upgrades will reduce congestion on the SPP RTO transmission system, resulting in savings in generation production costs. The economic upgrades may provide other benefits to the power grid, including increased reliability, lower Reserve Margins, deferred reliability upgrades, and environmental benefits due to more efficient operation of thermal assets and greater utilization of renewables[7].

The SPP Board of Directors recently approved the adoption of new planning principles and implementation of an Integrated Transmission Planning (ITP) Process. The ITP will consolidate SPP's EHV Overlay, Balanced Portfolio, and 10-year reliability assessment into one consolidated process.

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[7] http://www.spp.org/publications/Item2 percent20- percent202009 percent20SPP percent20Balanced percent20Portfolio percent20Report percent20- percent20DRAFT_20090515-update.doc

Principles of the ITP include:

- Focus on Regional needs, while integrating local needs
- Plan will be updated every three years
- Goal is to build a robust grid to meet near- and long-term needs
- Will result in comprehensive list of needed projects for SPP Region over next 20 years
- Plan the transmission backbone to connect known load centers to known or expected larger generation sites
- EHV transmission backbone should connect transmission between SPP's west and east Regions and strengthen existing ties to the Eastern Interconnection, with options for interconnecting to the Western grid
- Planning horizons will be 5, 10, and 20 years
- Will position SPP to proactively prepare and quickly respond to national priorities that may require additional consideration

There are no other Region-specific issues other than the one described above for SPP at this time.

Region Description

The Southwest Power Pool (SPP) Regional Transmission Organization (RTO) Region covers a geographic area of 370,000 square miles and has members in nine states: Arkansas, Kansas, Louisiana, Missouri, Mississippi, Nebraska, New Mexico, Oklahoma, and Texas. The SPP RTO manages transmission in eight of those states. SPP's footprint includes 26 balancing authorities and 47,000 miles of transmission lines. The SPP RTO has 54 members that serve over 5 million customers. SPP's RTO membership consists of 12 investor–owned utilities, 11 generation and transmission cooperatives, 11 power marketers, 9 municipal systems, 5 independent power producers, 4 state authorities, and 2 independent transmission companies. Additional information can be found on SPP.org.

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