Recent Policy Objectives and the Impacts on Bulk Power Infrastructure

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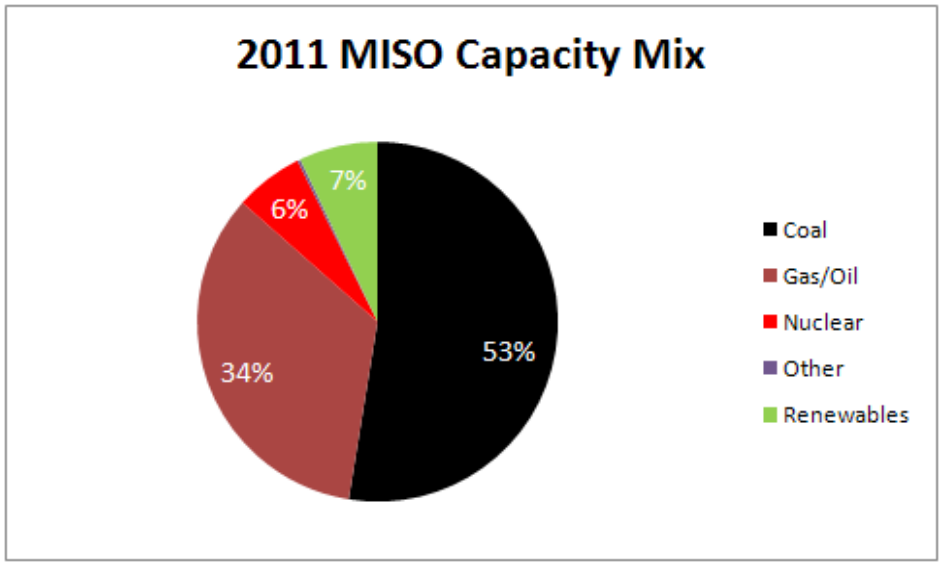
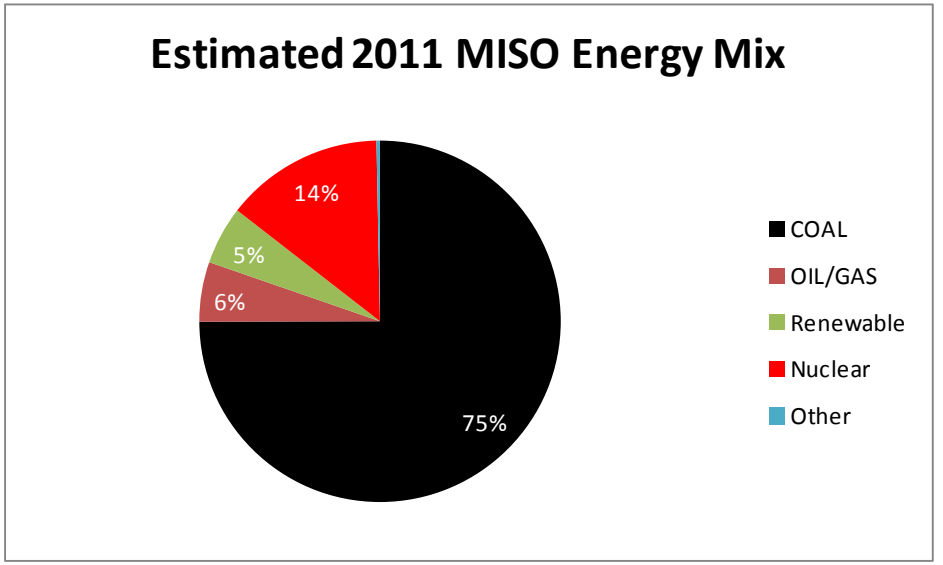
MISO System Summary

- **Generation Capacity - 135 GW**
- **Historic Peak Load (set July 20, 2011) – 104 GW**
- **53,203 miles of transmission**





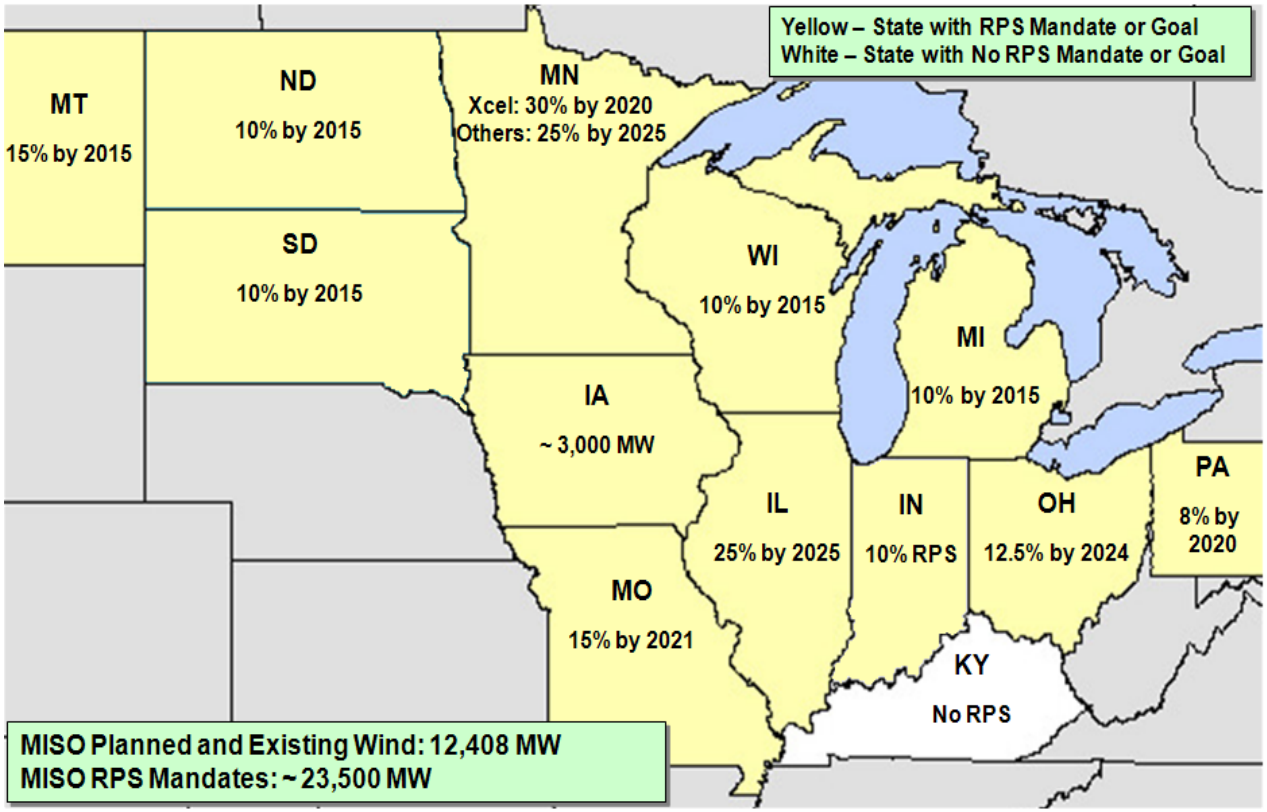
Policy Initiatives Impacting Bulk Power System Costs

- **Renewable Portfolio Standards**
  - Generally encourages a certain percentage of delivered energy to be produced from a specific set of resources; wind, solar, hydro, etc.
  - Some resources, such as wind do not have significant contribution to resource adequacy. Therefore, other resource must also be built to meet resource reliability requirements
- **Recent EPA proposed and finalized rules**
  - Primarily impacts the coal fleet on the MISO system
  - Costs to comply include generation retirement and replacement, addition of new control technology on in-service plants, and increases in the cost of energy
- **FERC Order Number 1000**
  - Impacts on transmission planning processes
  - Impacts on cost allocation of transmission investment

Renewable Portfolio Standards

Current State Renewable Portfolio Standards

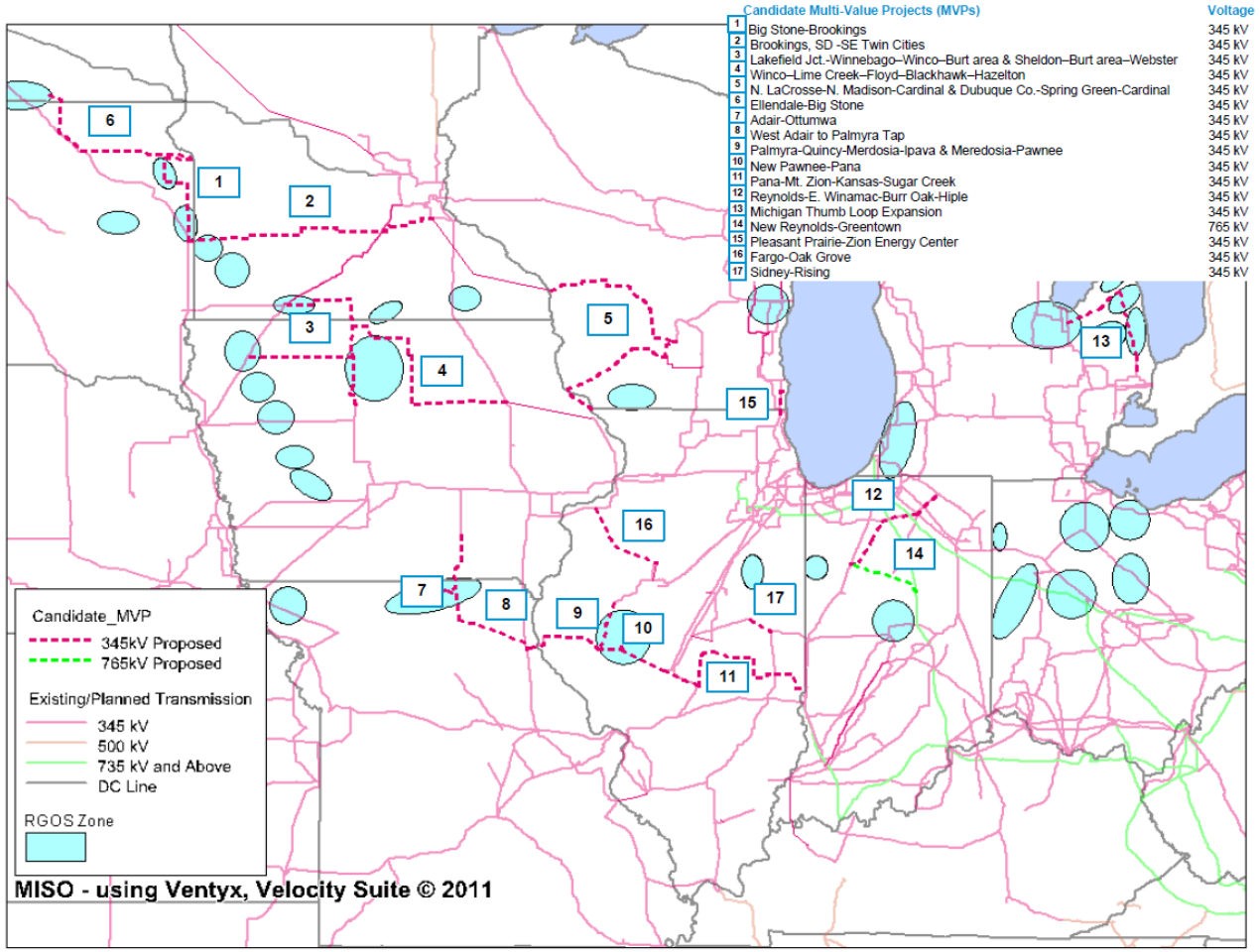
As of 07/27/2011



Planned and Existing Wind as of 3/28/3011

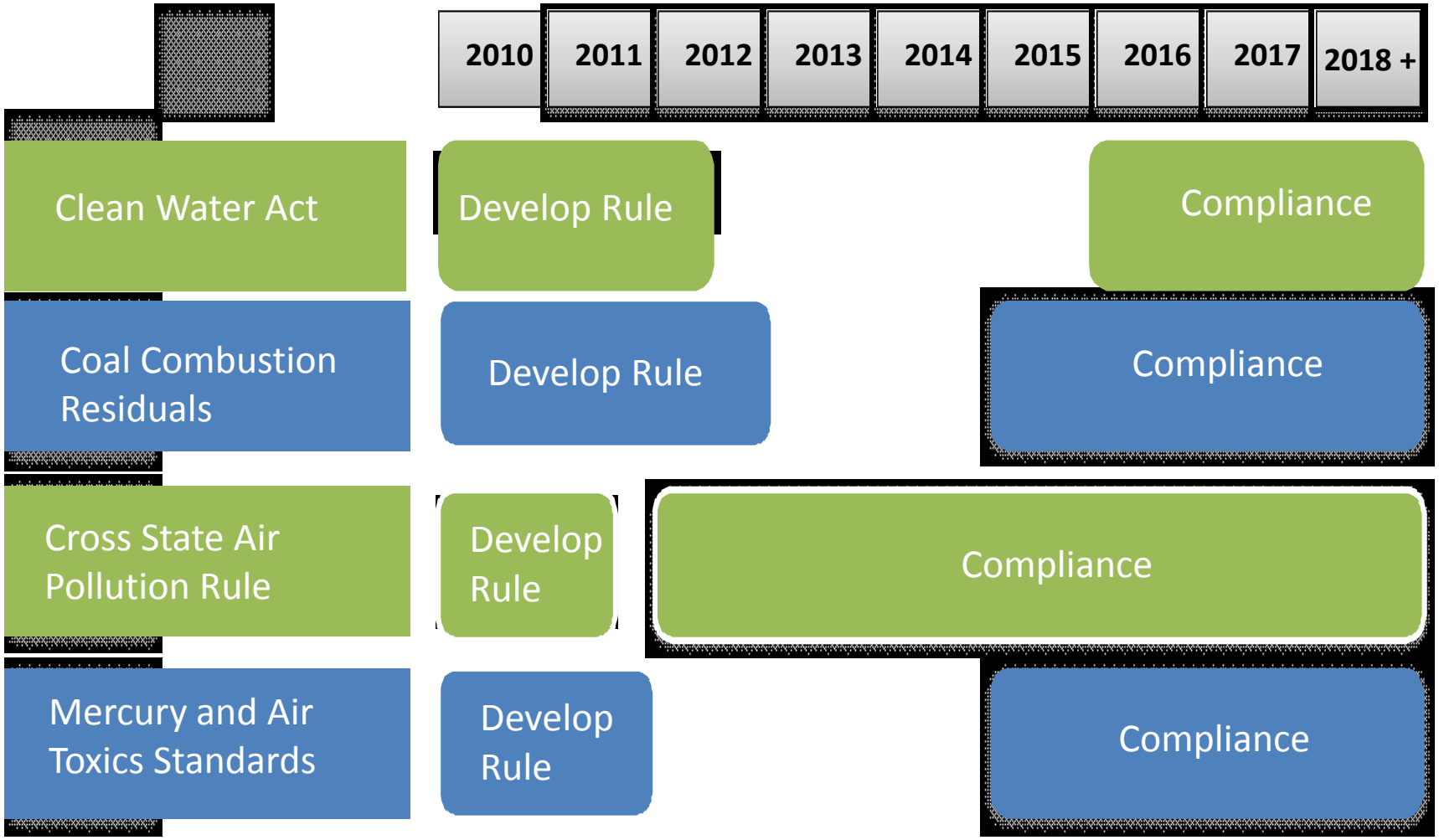
- MISO footprint expected to receive approximately 12-13% of its energy from renewable resources
- Current new investment trends focused on wind and solar resources
- Additional resource investment needed to meet resource adequacy needs
- Renewable generation locations often limited in locations and requiring the need for new transmission development

New Transmission Investment to Support RPS Requirements

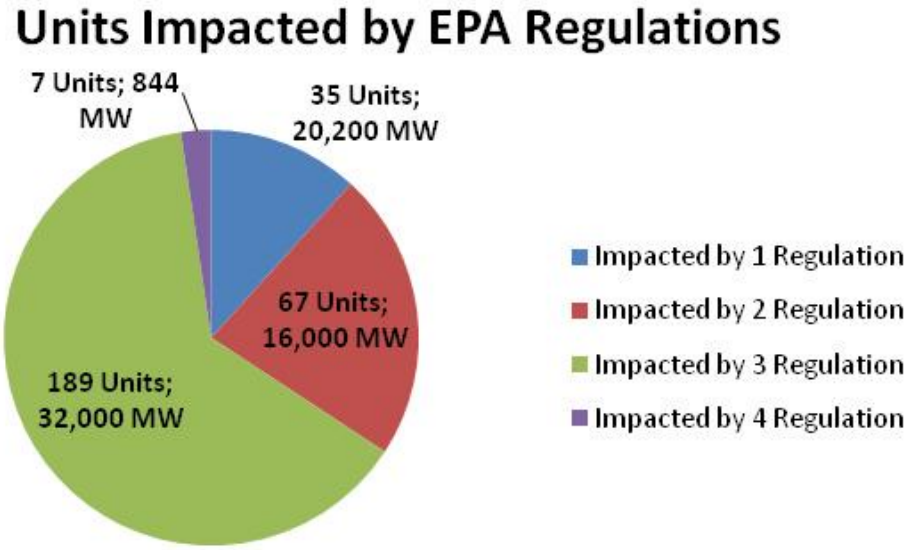


- The 2011 MVP Portfolio Analysis is the culmination of MISO's planning efforts to meet the public policy mandates of the MISO states, while simultaneously minimizing the total cost of delivered power to consumers
- This analysis serves to justify and demonstrate the value of a regional portfolio of projects, which brings multiple benefits to stakeholders throughout the MISO footprint.
- B/C of 1.7/1 to 2.7/1 with sensitivity cases as high as 5.4/1

Environmental Protection Agency Proposed and Finalized Rules



EPA Regulations Will Impact MISO Coal Fleet



- 100% of the MISO coal fleet will be impacted by one or more of the proposed regulations
- Impacts will range from installation of control equipment and redispatch to retirement

Technology	MW	Average Cost ($/KW)
No Action Required	9,569	0
Require Fabric Filters (Baghouse)	27,921	150
Require DSI and ACI or FGD	20,427	478
Replacement Capacity for Retirement	12,652	663

MISO Evaluated Overview of Impacts

- **12.6 GW of Coal Capacity Identified as at-risk, with approximately 2.9 GW identified with more certainty**
  - Recent evaluation of MISO Attachment Y process has revealed 3,000 MW of capacity already requested for retirement since the beginning of the MISO EPA analysis
- **Capital Investment of $31.6 to $33.0 Billion will be required to retrofit and/or replace units**
  - 12.6 GW of retirement will require replacement of 10 GW to maintain reserve margins through year 2016
- **Energy Prices will increase from $1/MWh to as high as $5/MWh**

MISO

Impacts on Resource Adequacy

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
No retirements	Reserve Margin (MW)	23,930	22,438	22,064	21,368	20,760	20,065	19,287	19,950	19,031	18,032
	Reserve Margin (percent)	27.0%	24.8%	24.2%	23.3%	22.5%	21.5%	20.5%	21.0%	19.9%	18.6%
2.9 GW Retirements (impacts adjusted for expected derates)	Reserve Margin (MW)	21,603	20,111	19,737	19,041	18,433	17,738	16,960	17,623	16,704	15,705
	Reserve Margin (percent)	24.3%	22.2%	21.7%	20.8%	19.9%	19.0%	18.1%	18.6%	17.5%	16.2%
12.6 GW Retirements (impacts adjusted for expected derates)	Reserve Margin (MW)	12,544	11,052	10,678	9,982	9,374	8,679	7,901	8,564	7,645	6,646
	Reserve Margin (percent)	14.1%	12.2%	11.7%	10.9%	10.1%	9.3%	8.4%	9.0%	8.0%	6.6%

Continuing Planning Evolution: FERC Order 1000 - Transmission Planning and Cost Allocation

- **Encouragement of Regional and Interregional Planning**
  - Regional Planning can help provide alternatives solutions to local reliability issues and potentially maximize the value of investments with coordinated planning efforts
  - Interregional planning encourages coordination along organizational seems with the intention of finding more cost effective solutions than planning in isolated silos
  - Economic and policy planning provide for additional considerations regarding benefits of transmission beyond reliability
- **Cost allocation**
  - Encourages for cooperation between regions
  - Encourages the identification of who pays with who benefits