

FERC Meeting on Gas-Electric Coordination

May 16, 2013

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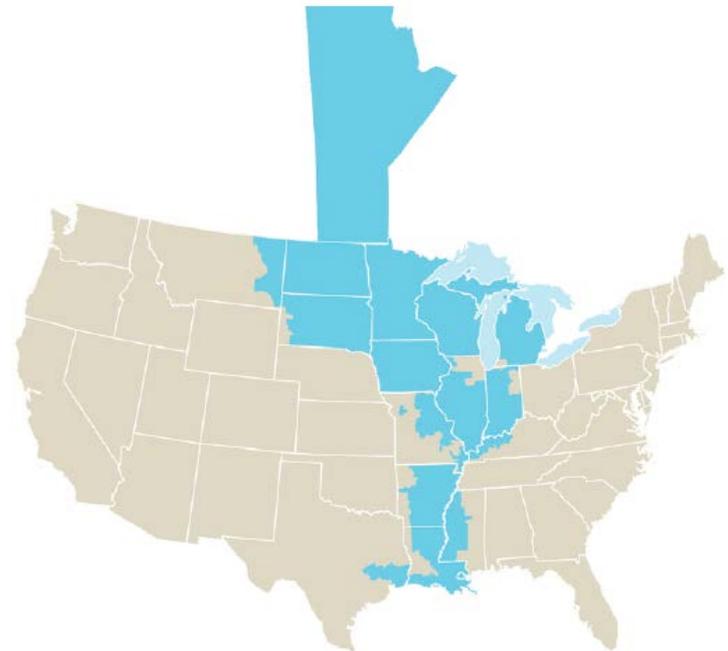
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MISO Footprint & Scope of Operations

- Generation Capacity
 - 132,296 MW (market)
 - 194,418 MW (reliability)
- Historic Peak Load (set 7/23/2012)
 - 98,576 MW (market)
 - 104,669 MW (reliability)
- 49,670 miles of transmission
- 11 states (Market Footprint)
- 15 states (Reliability Footprint)
- One Canadian province
- Control Centers
 - Carmel, IN
 - St. Paul, MN



MARKET AREA



RELIABILITY COORDINATION AREA

Winter 2013 Operations Review

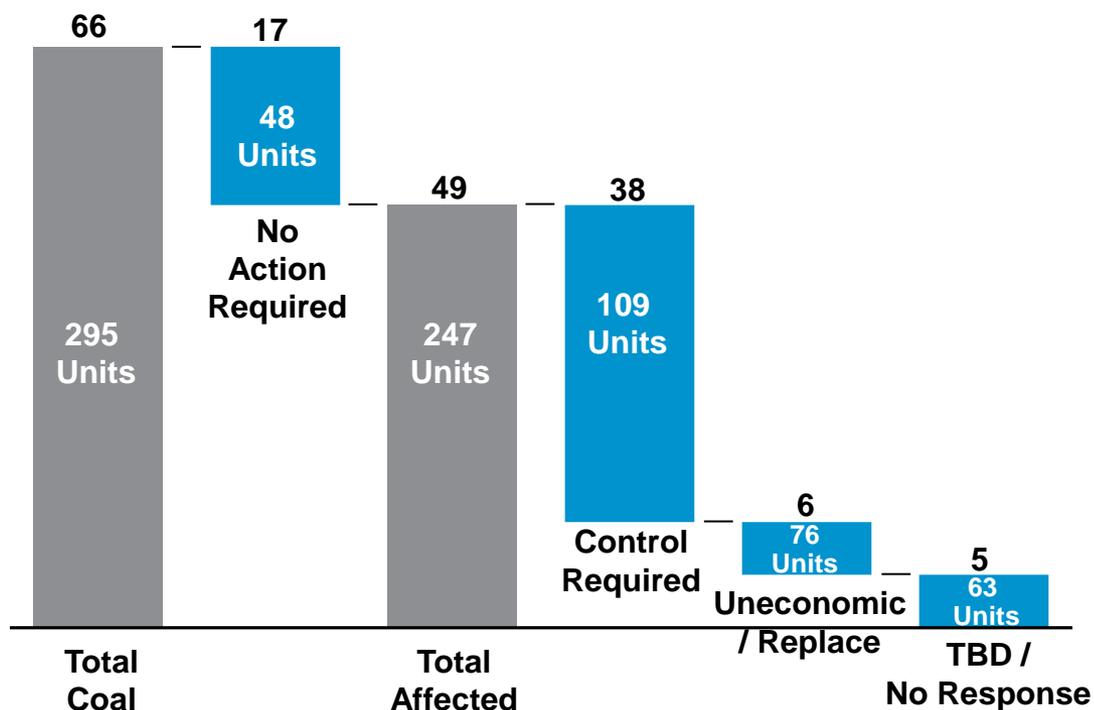
- Currently, operational and market constructs for both the gas and electric industries allow for successful management and coordination of system events.
- No significant operating events occurred in MISO during winter 2013.
 - MISO is primarily served by coal and nuclear during winter season, utilizing gas largely to meet marginal requirements
- MISO's winter peak occurred on January 22, 2013.
 - Tuesday following 3-day Martin Luther King Holiday
 - Large Day Ahead under-scheduling created significant need for Real Time unit commitments (approximately 4 GW)
 - A few units switched from gas to oil
 - A few units were limited to Day Ahead schedules and/or purchased gas hour to hour
 - A few units experienced mechanical failure associated with fuel switching
- MISO wants to ensure the ability to manage extreme system events in the future.
- MISO continues to coordinate with Stakeholders and the gas industry, resulting in
 - Improved communications
 - Understanding of Gas Operations

MISO's Survey of Stakeholder Compliance Strategies

In the MISO Midwest Region...

- Almost 10 GW of coal capacity will need a 1-year extension period for compliance with the Mercury and Air Toxics Standards or MATS (includes those that will apply, have applied, or have been approved).
- Another 9 GW may need an extension – currently unknown.
- Of the 34 coal units (11.6 GW) that need air permits, over half are in progress, with application pending or have been approved.

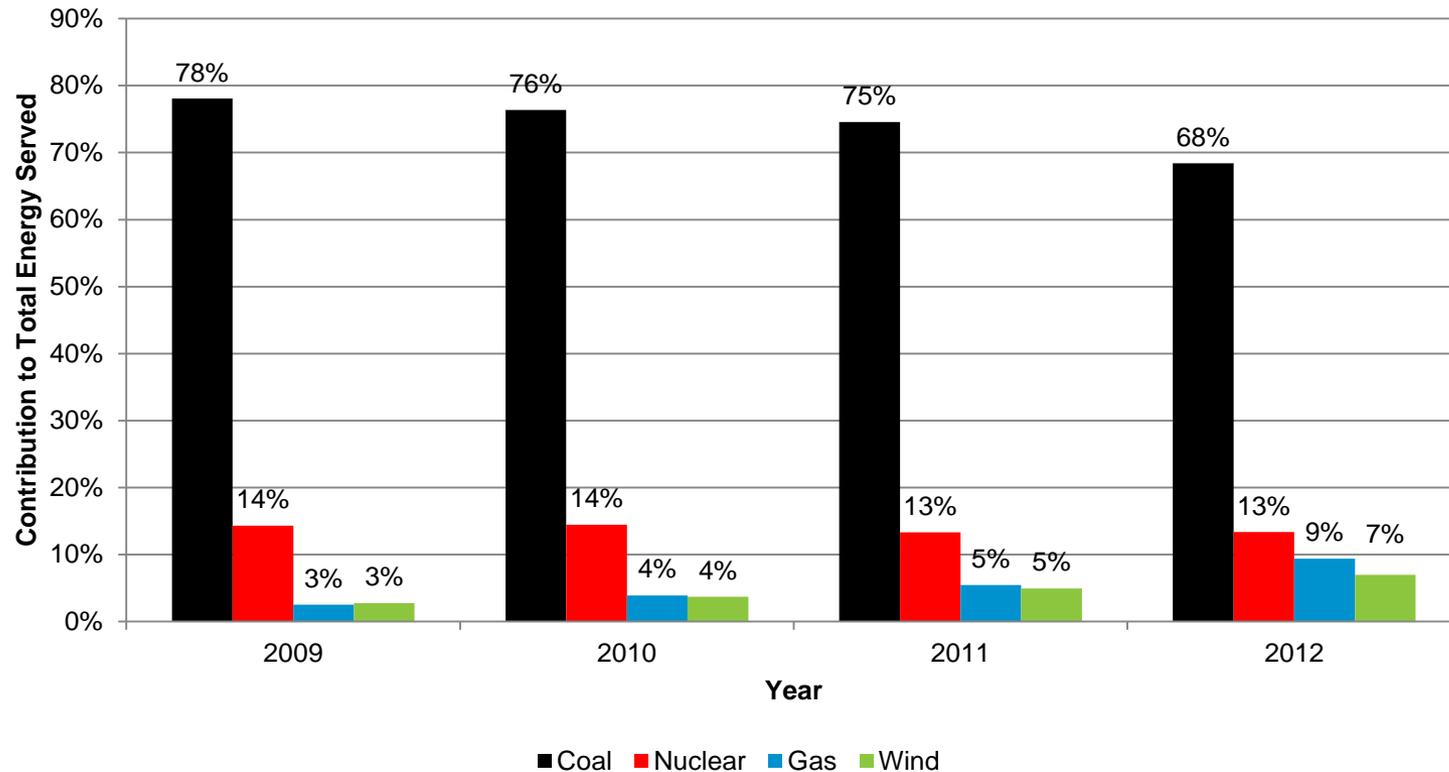
Coal Resources Impacted by EPA Regulations Capacity (GW) Results from 1st Quarter 2013



Revised 3/1/13

Growing dependence upon natural gas-fired generation resources in the MISO footprint

Energy Contribution by Fuel Source



To date, 2013 shows a trend closer to that of 2011, given an increase in gas price from 2012 levels.

MISO's Electric and Natural Gas Coordination Task Force (ENGCTF)

- The ENGCTF is a MISO Stakeholder group established in Oct. 2012.
 - Forum for electric and natural gas industry experts and interested MISO stakeholders to identify challenges and develop recommendations on:
 - Managing the impacts of compliance with regulatory deadlines
 - Investigating changes to market and planning constructs in the context of a changing resource portfolio
 - The Task Force meets monthly and continues to have active participation from both the gas and electric industries.
- The ENGCTF facilitates cross-industry education.
 - Recent meetings have featured presentations from pipeline companies, the American Gas Association (AGA), and America's Natural Gas Alliance (ANGA), as well as from MISO subject matter experts.

MISO's Electric and Natural Gas Coordination Task Force (ENGCTF): Current Initiatives

- MISO will begin studying the probability of loss of load as related to increased reliance on natural gas-fired generation resources
- Drafting teams are developing issue papers on:
 - Resource Adequacy
 - Gas Day and Electric Day Scheduling
 - Coordinated Operations

Phase III Gas Study

- The objective of the Phase III Study is to examine the capability of the natural gas infrastructure in the MISO footprint to serve increasing demand from electric generation for 2013-2032, while accounting for transitioning pipeline flow patterns and changing industrial gas demand.
- The study will include a localized forward-look at infrastructure and gas demand in the MISO Midwest footprint and a corridor flow analysis of the MISO South footprint.
- Study assumptions include known and forecasted coal unit retirements, forecasted industrial gas demand, and bounded gas prices.
- Study timeline of May - August 2013
- Study results will inform MISO's gas-electric conversation going forward