

MISO Resource Adequacy 2013 and Beyond

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Resource Adequacy Overview

- MISO expects to have sufficient resources to reliably serve the region's 2013 peak summer demand
- The region's resource portfolio is undergoing significant change which will result in reduced reserve margins
- Improved forward transparency of the supply picture would both reduce reliability risk and improve economic efficiency
- MISO is coordinating with adjacent parties on outages and improved seams operations
- MISO is also working with the gas industry to improve cross-industry coordination in both the planning and operational time horizons

Resource Adequacy – Basics

Responsibility

- **Ensure electric reliability in all time frames**
- **Facilitate economically efficient operations and planning**

Setting Planning Reserve Margins

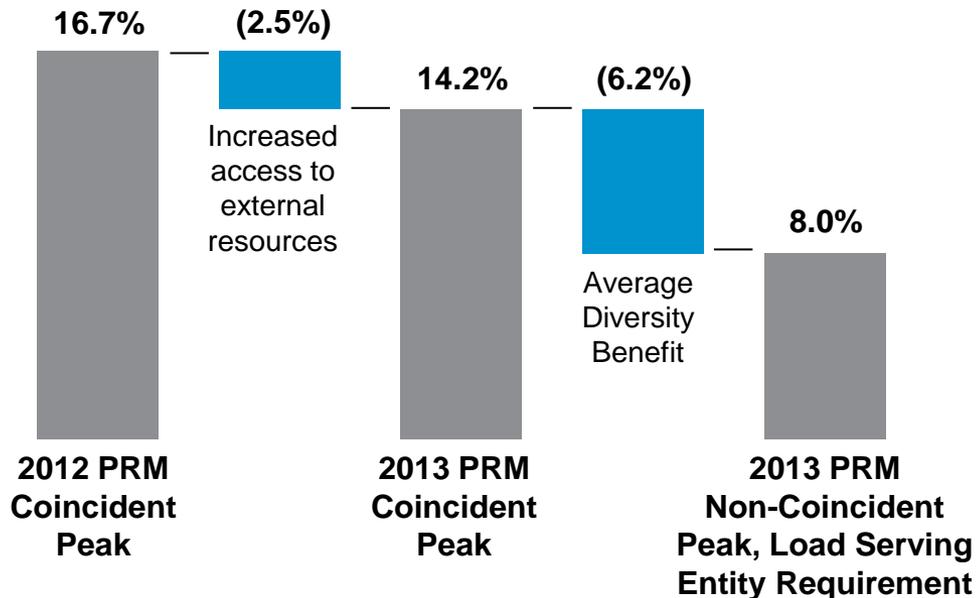
- Load Serving Entities (LSEs) establish load forecast
- MISO establishes/recommends planning reserve margin
- Local regulators have authority to modify for their jurisdiction

Meeting Planning Reserve Margins

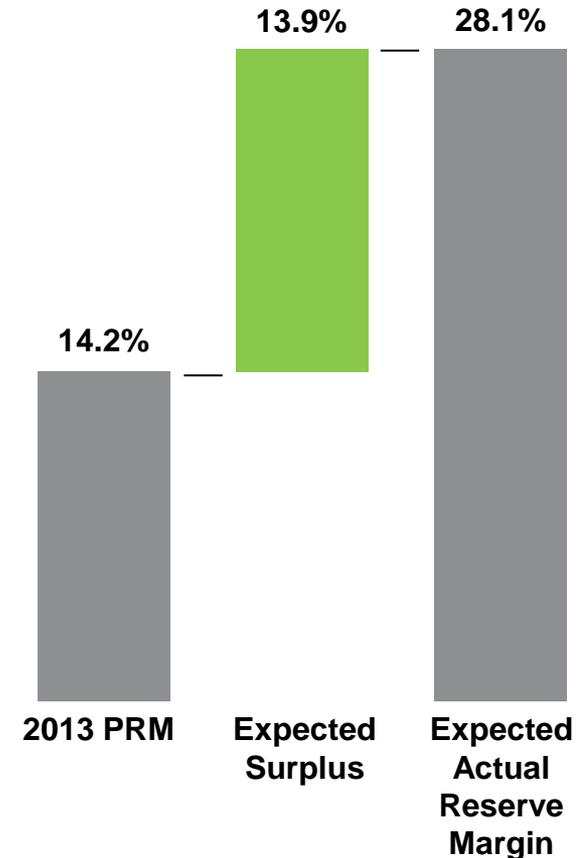
- LSEs must meet their load forecast plus their planning reserve margin – can be met through:
 - Owned resources
 - Controlled resources
 - Voluntary capacity auction

For summer 2013, there are sufficient resources to manage weather, load, and outage uncertainty

Planning Reserve Margin (PRM) Requirement 2012 to 2013



Anticipated Actual Reserve Margin 2013



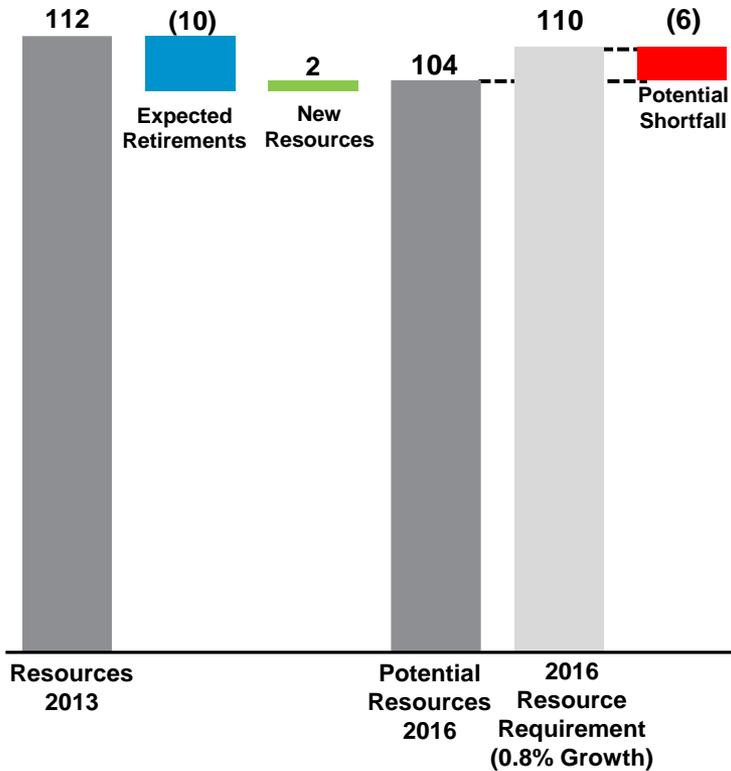
However, the resource adequacy resources are about to undergo rapid change

- Tightening reserve margins - driven by:
 - Retirements
 - Coal units (environmental regulations / age)
 - Uneconomic units (e.g., Kewaunee Power Station)
 - Demand growth
 - Fuel supply uncertainty
- Increased reliance on natural gas
 - 39 GW of gas generation in the region
 - 12 GW of combined cycle units with firm supply and transportation
 - 8 GW of combustion turbines with oil backup
 - 19 GW of combustion turbines without backup or firm gas

Resources are very tight under a bottom-up load forecast – manageable, but tighter than the grid has ever operated

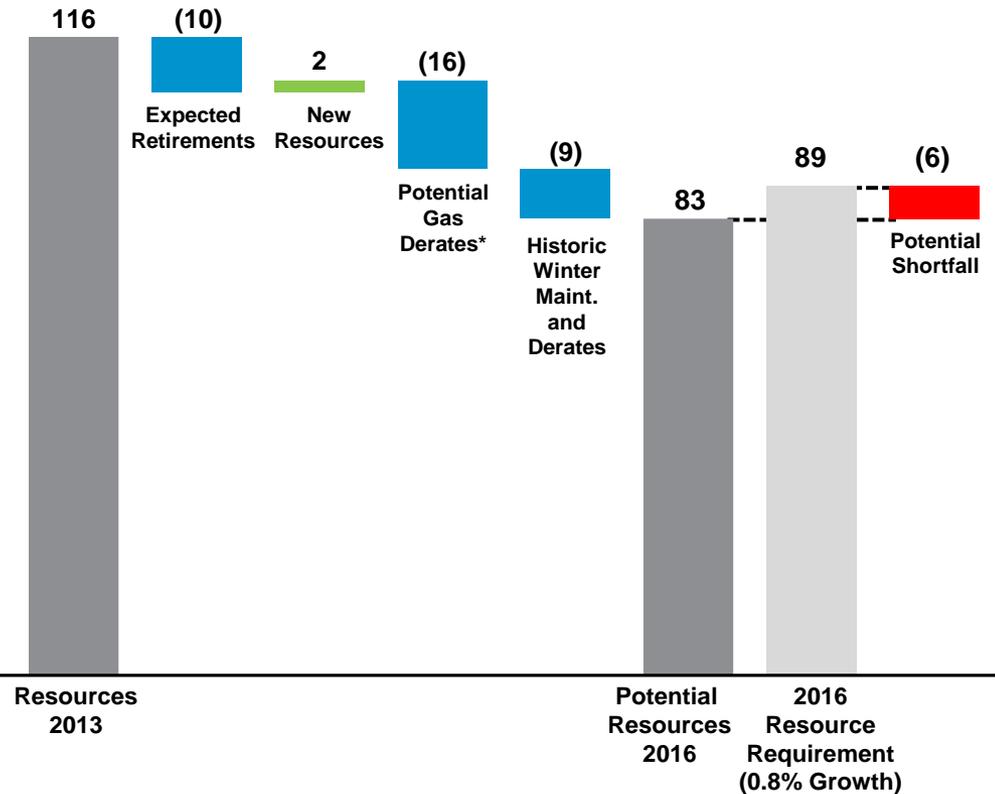
Summer Resource Adequacy Moderate Load Forecast

2016
(GW)



Winter Resource Adequacy Moderate Load Forecast

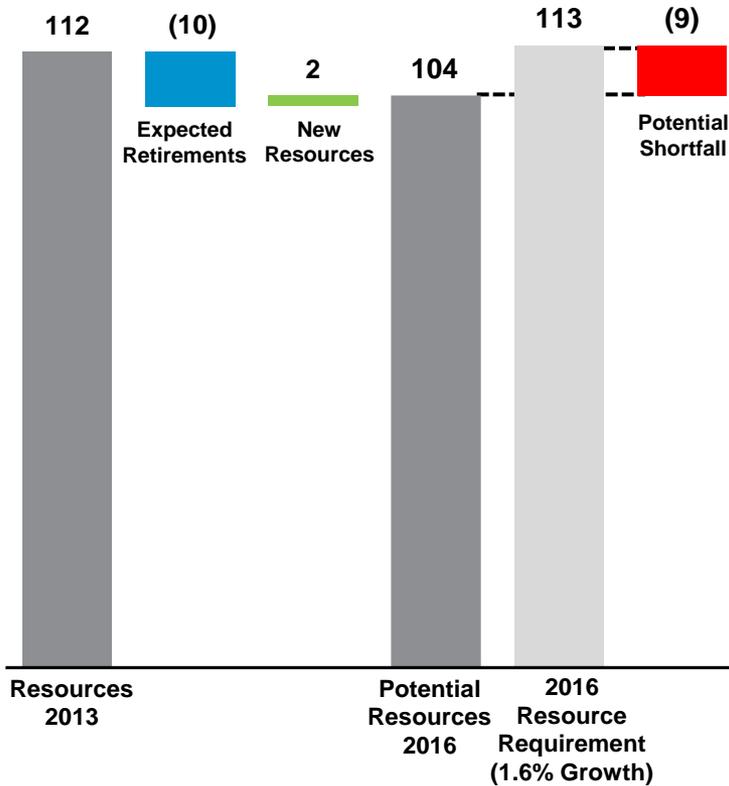
2016
(GW)



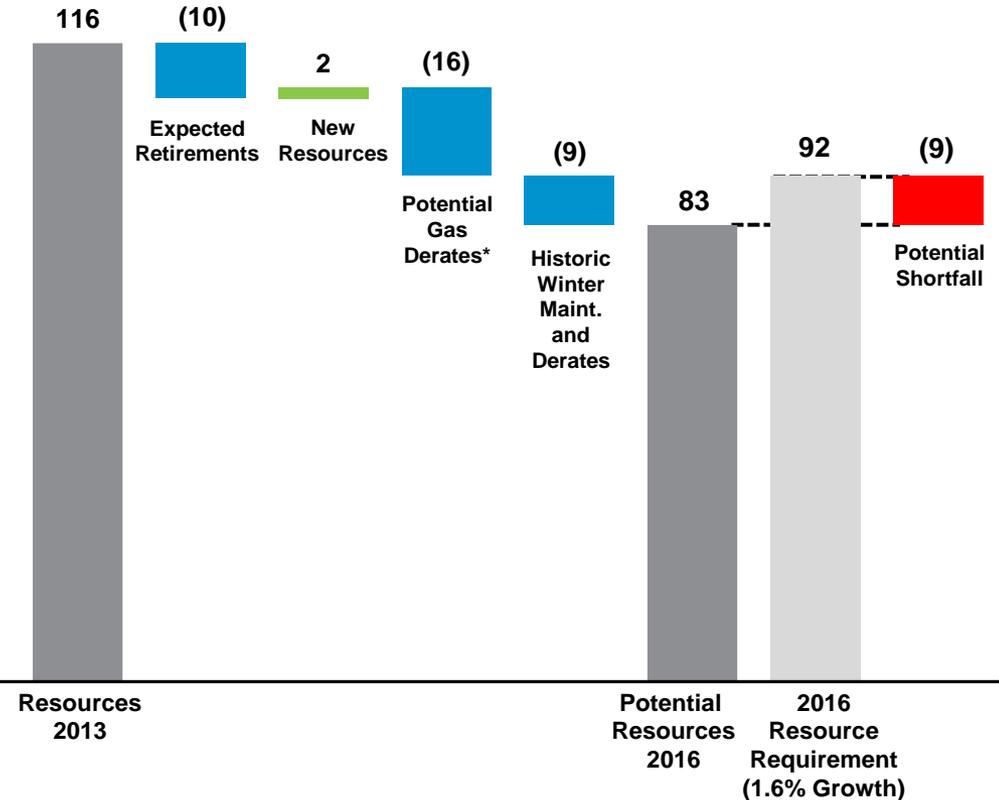
*Units without firm gas transport or distillate backup

Increased load forecast reveals significant shortfall risk. Winter concerns could be addressed by improving confidence in gas transport and Southern Region interchange

Summer Resource Adequacy
High Load Forecast
2016
(GW)



Winter Resource Adequacy
High Load Forecast
2016
(GW)



*Units without firm gas transport or distillate backup

Unique MISO context

- MISO has a unique mix of traditionally regulated and restructured states
 - Traditional utilities use MISO's resource adequacy mechanism to increase the efficiency and effectiveness of planning
 - Deregulated load use MISO's voluntary auction to hedge forward obligations
- The MISO regional supply and demand balance is in transition
 - Quickly approaching supply and demand balance
 - Region's fuel mix is shifting
- Region's interdependence has increased for both reliability and efficiency
- Load serving entities would benefit from increased forward visibility and transparency
 - Long-term forward transparency improves resource planning outputs
 - Transparency in the cost and value of resource additions would increase regional supply expansion efficiency

Path forward to improved forward transparency



Next Steps:

- Engage stakeholders to define MISO and market participant needs for resource assurance and enhanced planning and forward transparency
- Evaluate options for addressing those needs in such a way that:
 - Allows market participants greater information and opportunities for making efficient investment decisions for resource adequacy
 - Assures that MISO has sufficient information to conduct cost-effective, reliable transmission planning
 - Accommodates the differing states' and LSEs' preference to rely more heavily on self-supply vs. market procurement
- Identify incremental changes to improve reliability and efficiency

Summary

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