



MISO Winter Readiness

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Oct. 19th, 2017

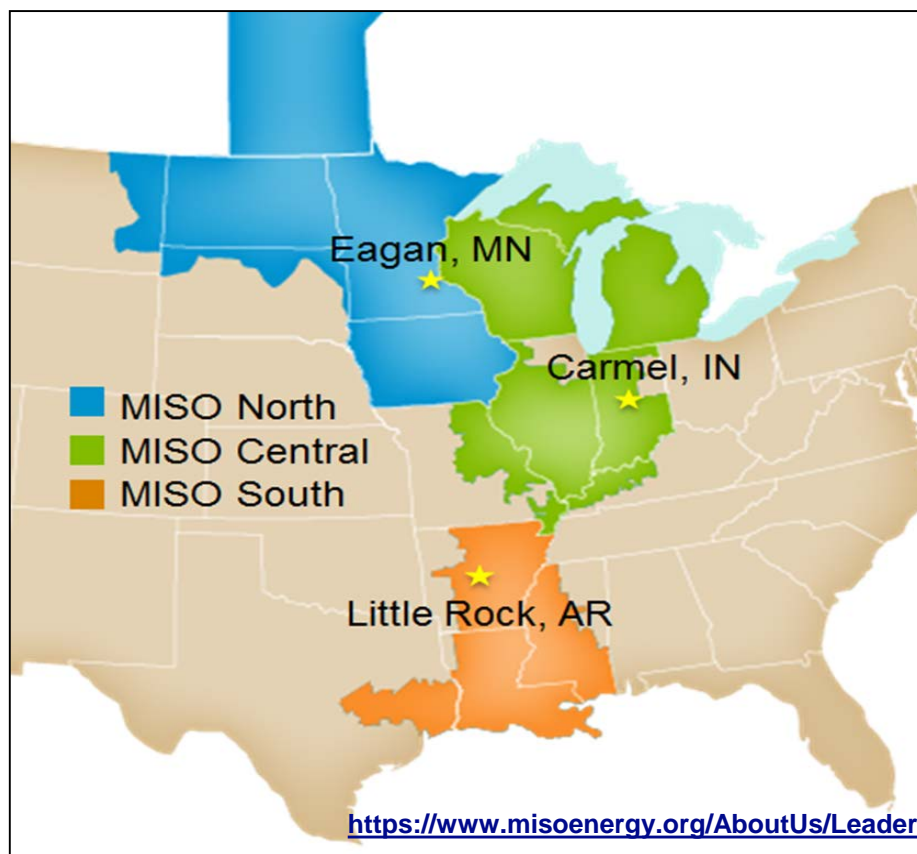
Executive Summary



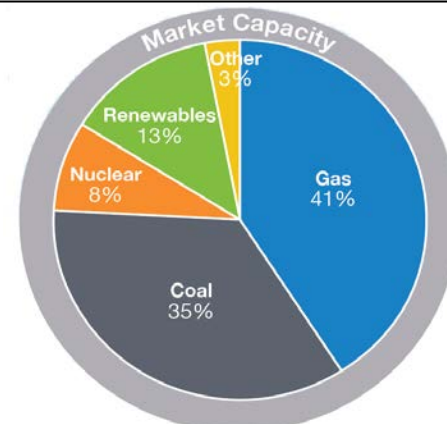
- MISO is well-prepared for the upcoming winter and forecasts sufficient reserve margins
- MISO's Gas/Electric coordination situational awareness continues to improve with industry changes
- MISO's emergency preparedness efforts bolster reliability during the winter months and year-round

MISO drives value creation through efficient and reliable markets, operations, planning, and innovation

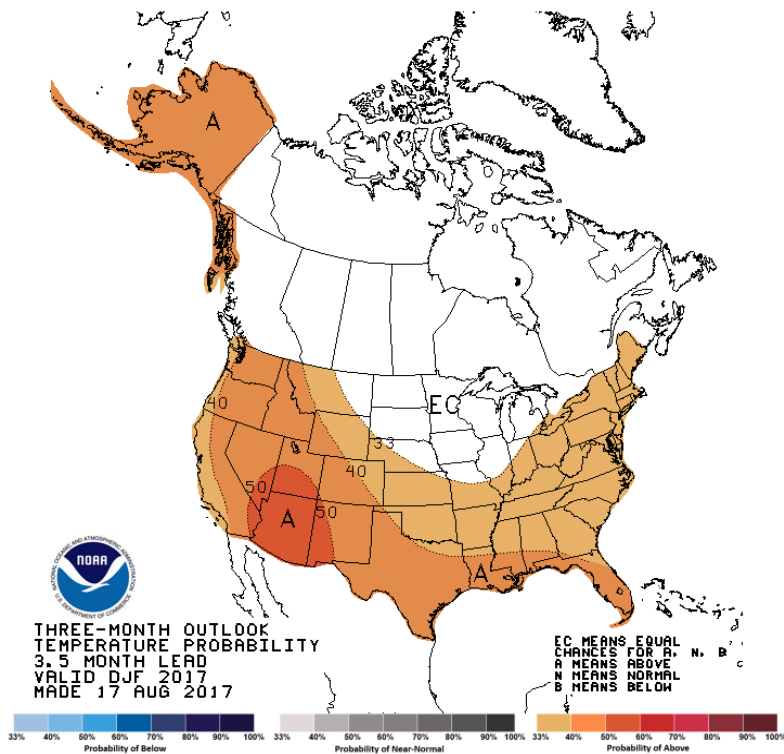
The most reliable, value-creating RTO



MISO by-the-numbers	
High Voltage Transmission	65,800 miles
Generation Capacity	174,000 MW
Peak Summer System Demand	127,125 MW
Customers Served	42 Million



MISO projects adequate resources to meet demand for Winter 2017-2018



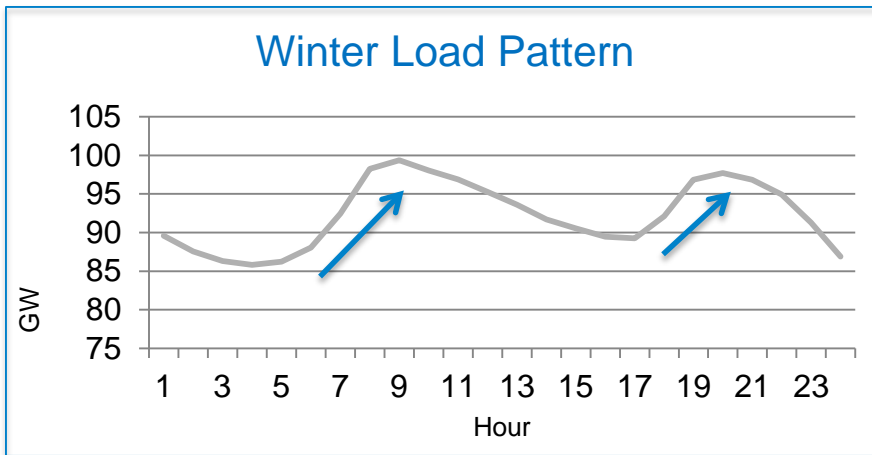
MISO Preliminary 2017 Winter Forecast

MISO Wide Reserve Margin Target	16%
Projected Reserve Margin	36%
Winter Peak Forecast	103 GW
Total Projected Available Capacity	142 GW

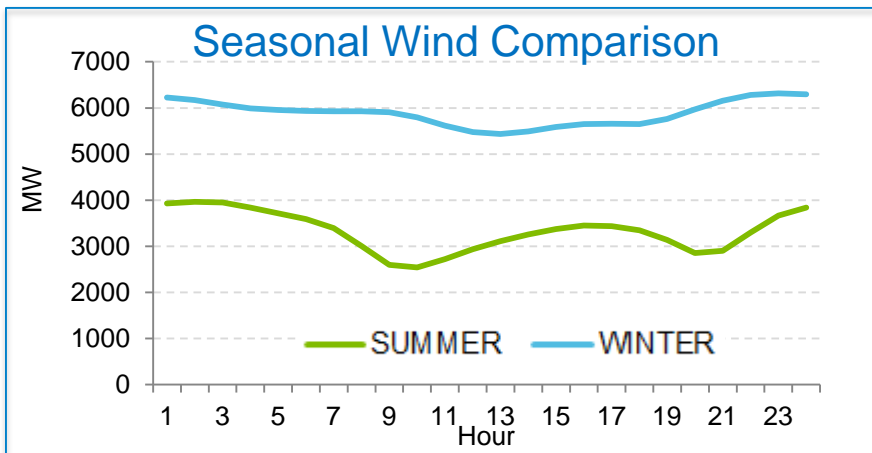
All-time Winter Peak:
109 GW January 6, 2014

Final assessment results will be presented at Winter Readiness Workshop on November 6

Winter operations are characterized by a steep morning peak, and higher levels of wind than summer months

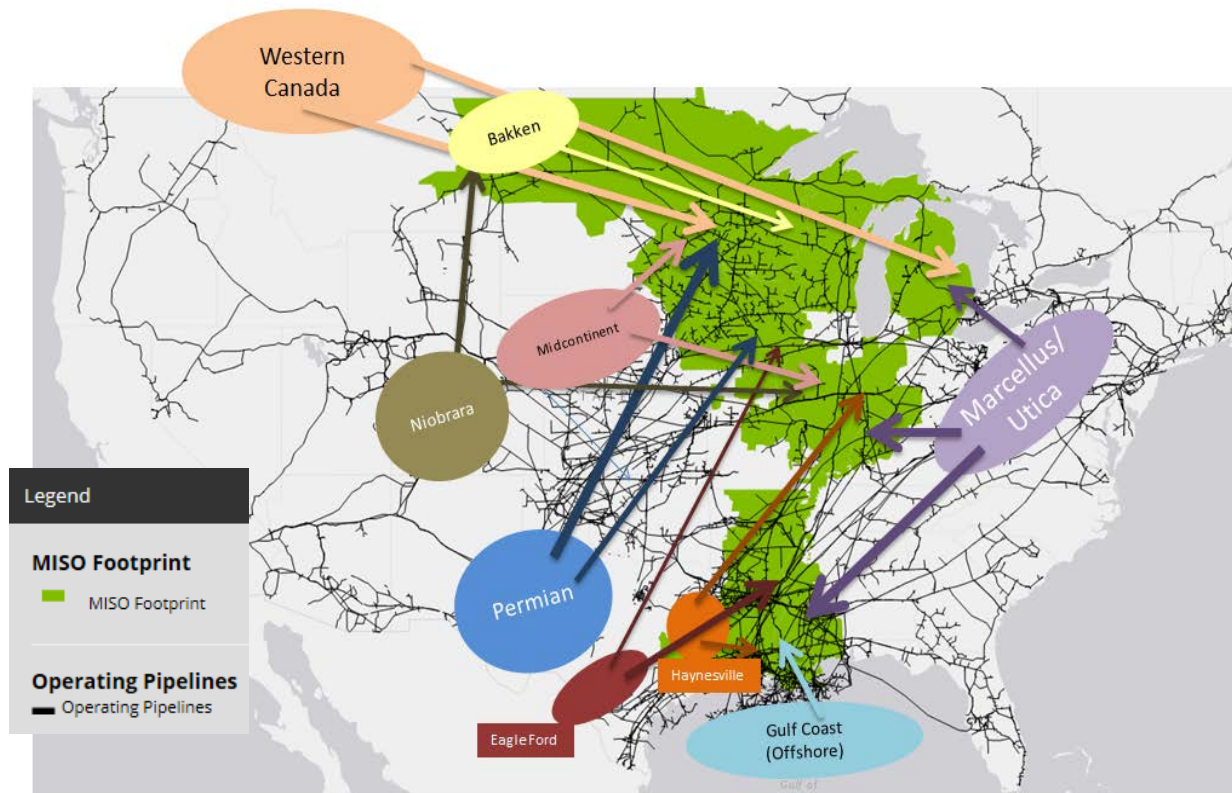


Operators use short lead generation to quickly keep pace with the steep increase in demand



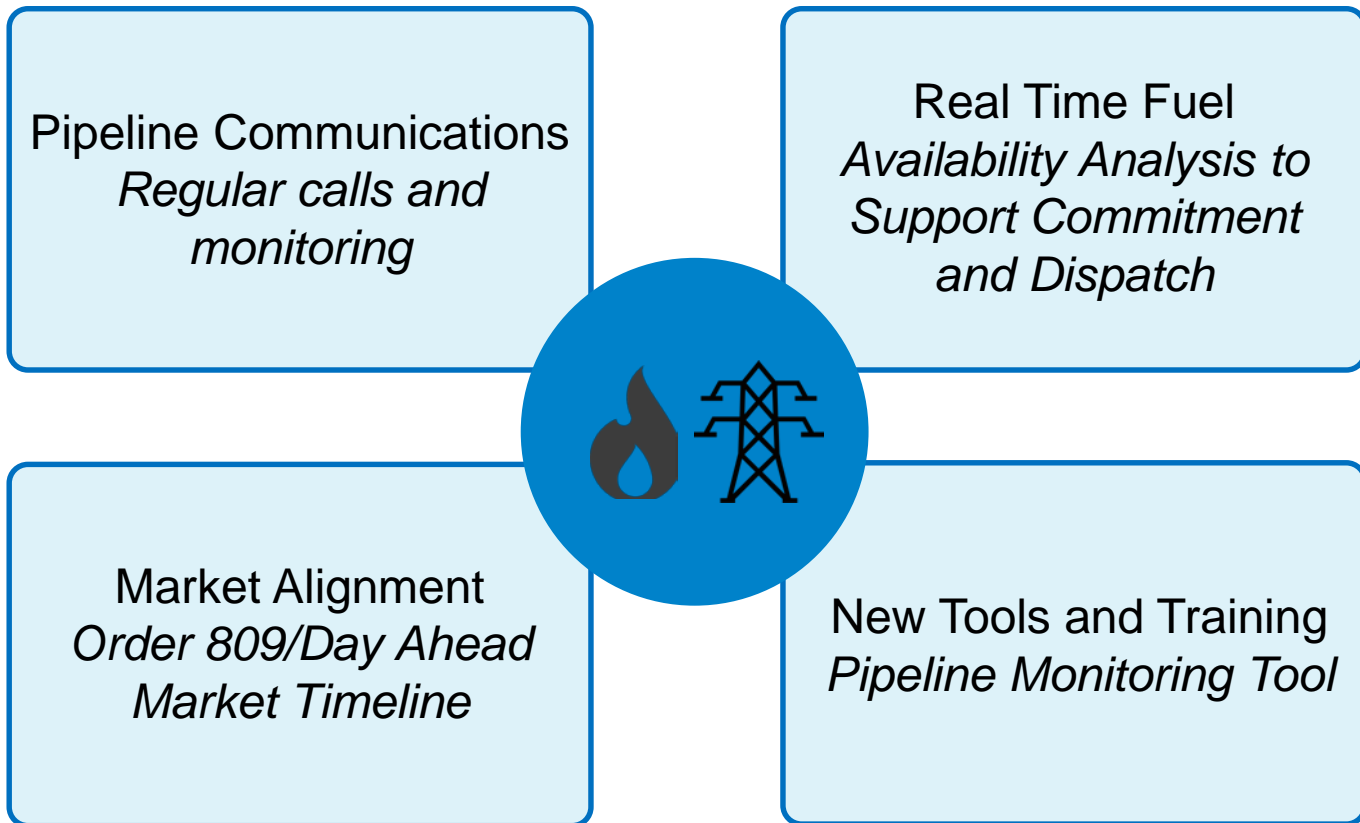
Wind is more steady and available in winter months

MISO is favorably positioned as the gas pipeline “crossroads” of the U.S. and well-situated to support future generation growth



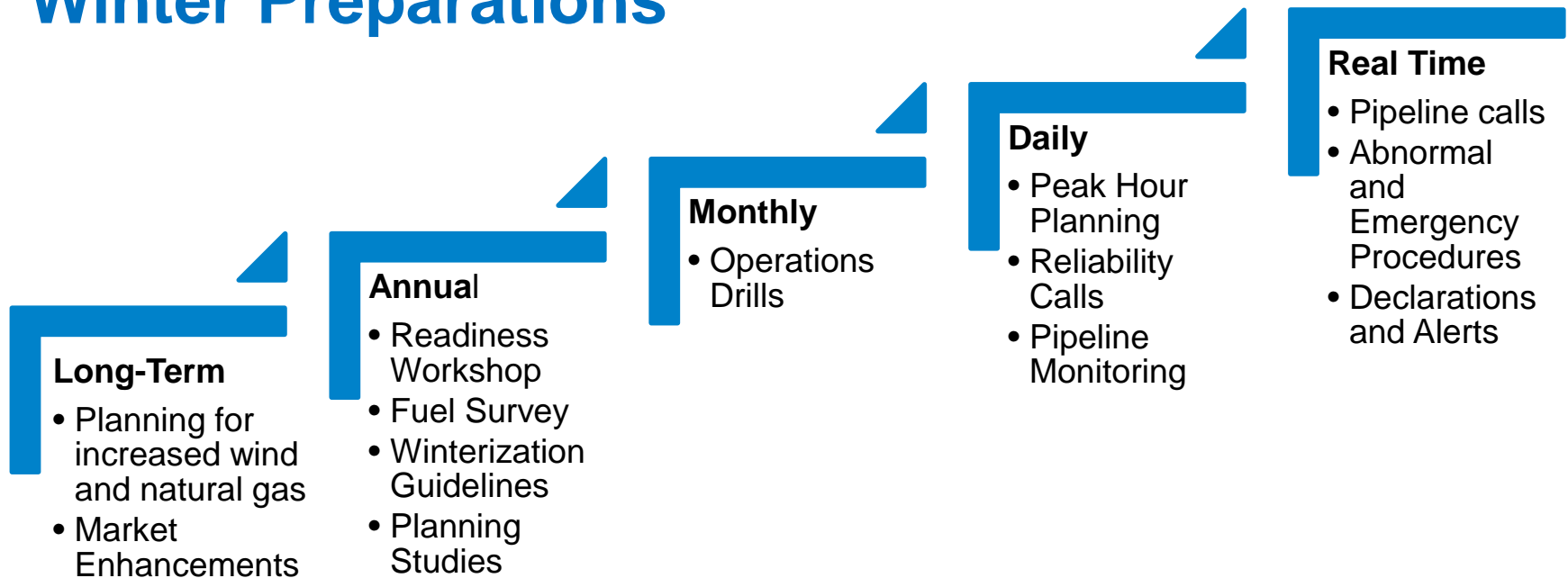
- Access to all major U.S. gas basins
- 55% of U.S. gas storage capacity is located in MISO
- 200+ gas-fired generators contribute 70,000 MW of capacity

MISO is prepared to handle potential winter operational challenges that can develop, such as forced generation outages and fuel limitations



Lessons learned from the 2014 Polar Vortex are a standard part of planning and real-time operations

Winter Preparations



Operational and market enhancements improve MISO's preparedness for winter 2017

Pricing Enhancements

- Emergency Pricing
- Ramp Product
- ELMP Phase 2
- Offer Cap Flexibility

Market/Seams Alignment

- Coordinated Transaction Scheduling
- Gas/ Electric Market Timeline Changes

Unit Performance

- Gas Usage Profiles (Nov. 2017)
- MISO Winterization Guidelines (Oct. 2017)



Questions?