



## 2016 Annual Meeting

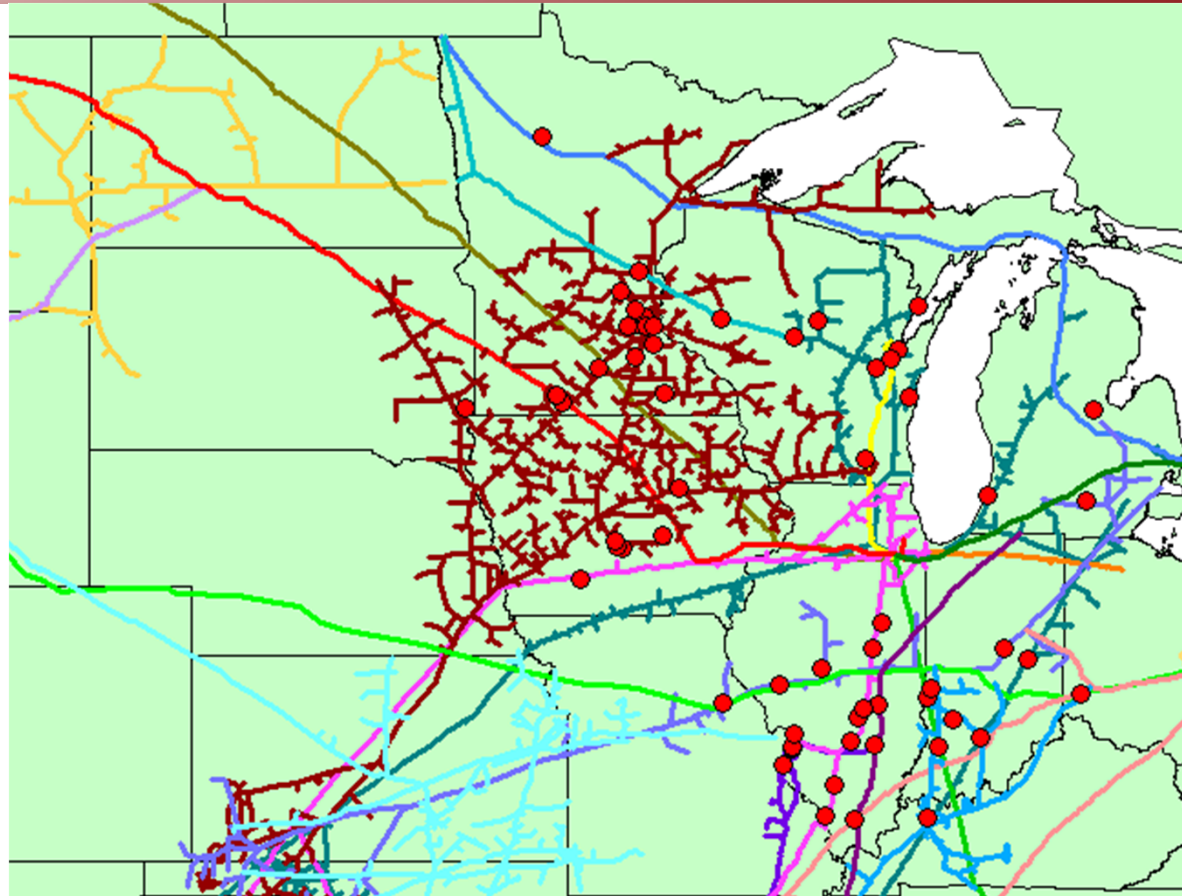
# Natural Gas – What you Need to Know

Richard Levitan

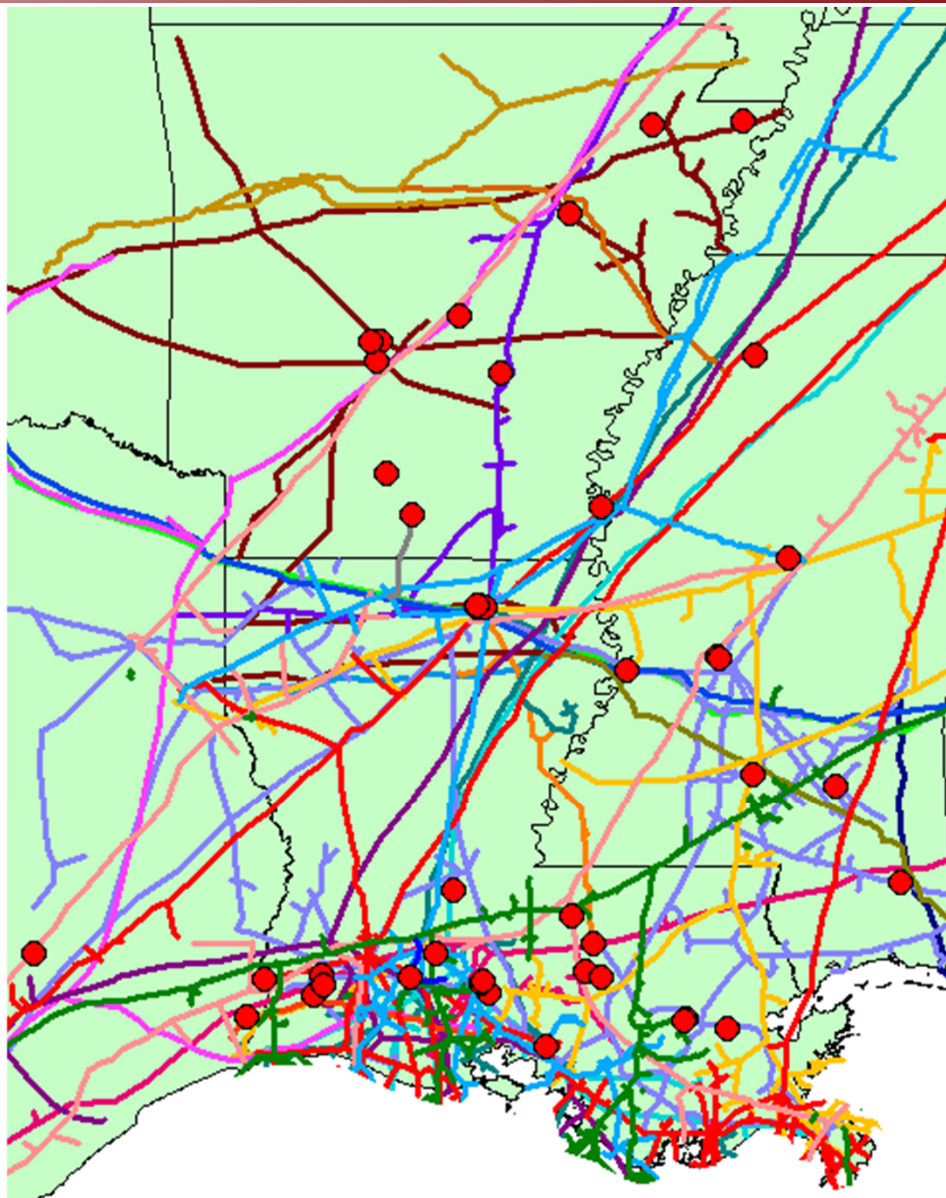
October 13, 2016

**LEVITAN & ASSOCIATES, INC.**  
MARKET DESIGN, ECONOMICS AND POWER SYSTEMS

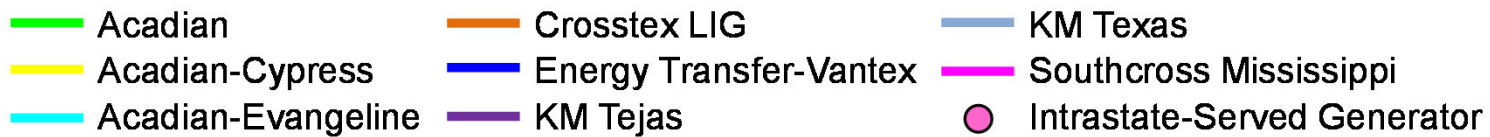
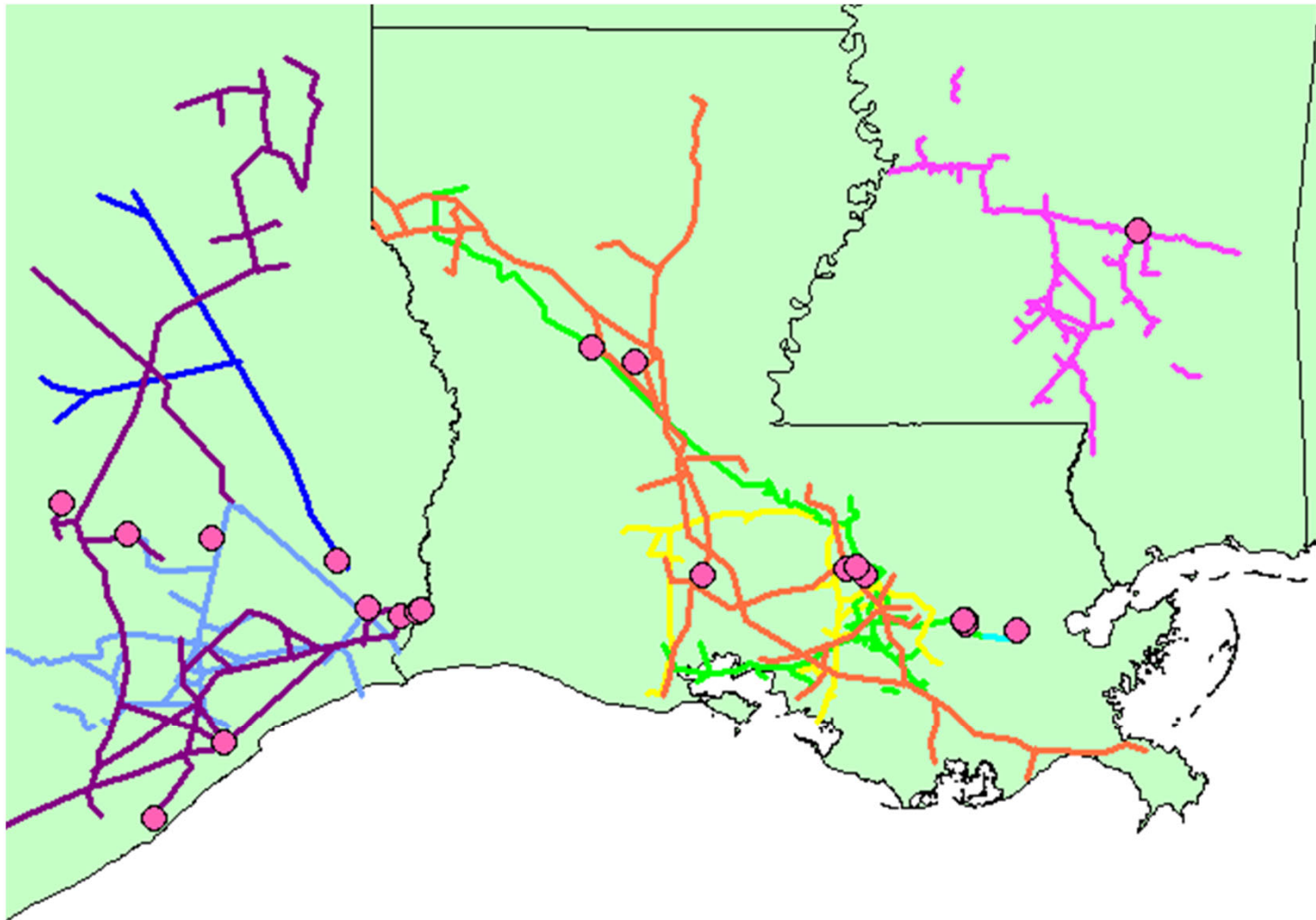
# Natural Gas Pipelines in MISO North/Central



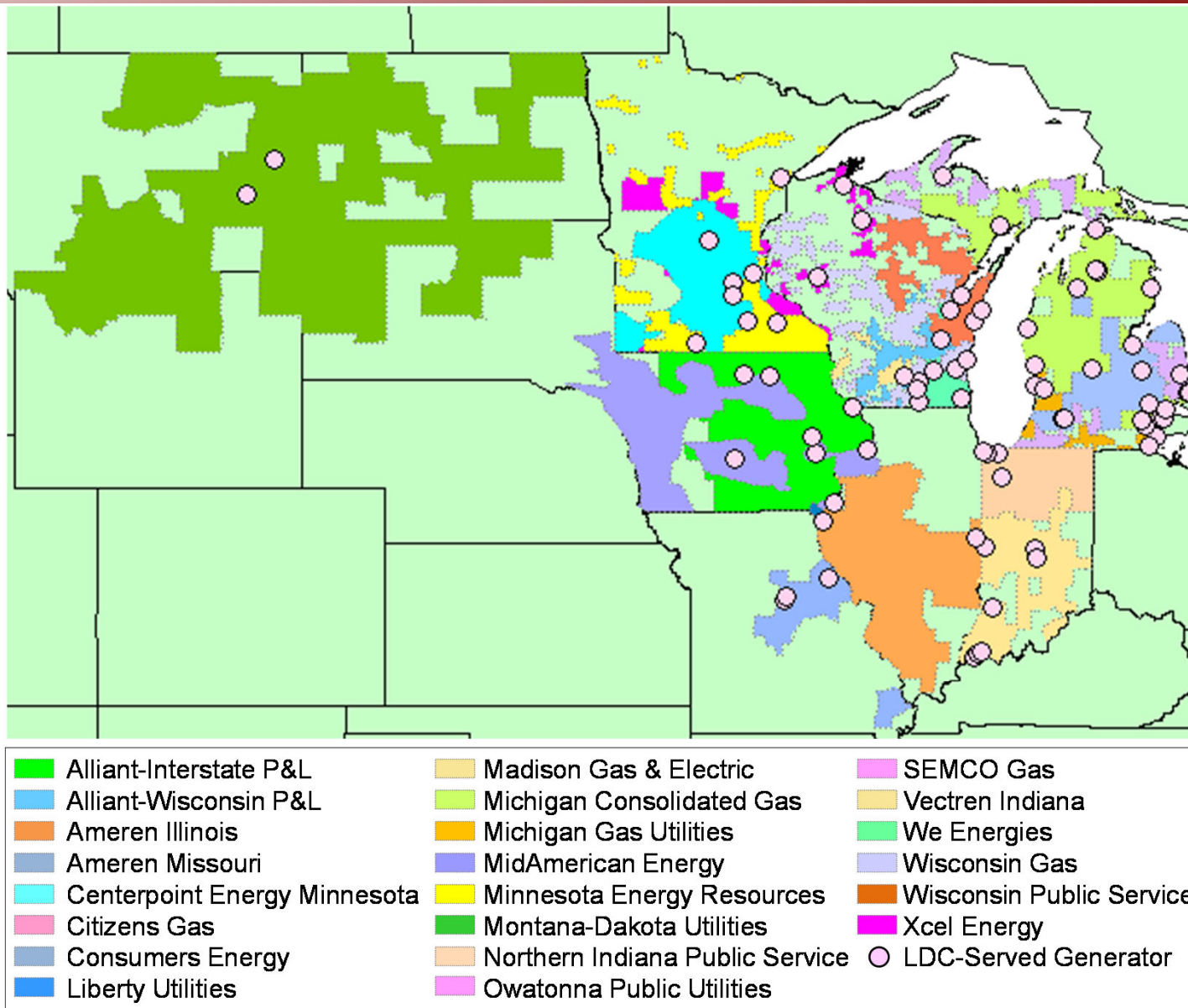
# Natural Gas Pipelines in MISO South



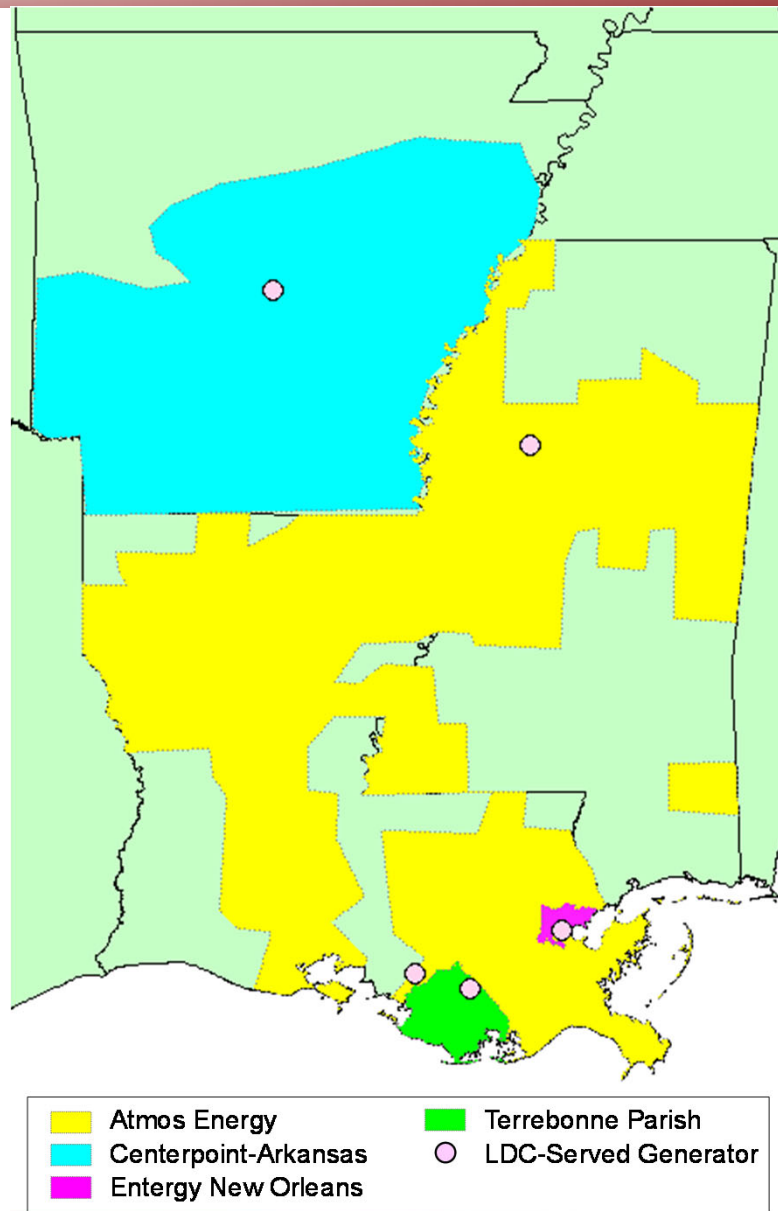
# Intrastate Pipelines Serving MISO South Generators



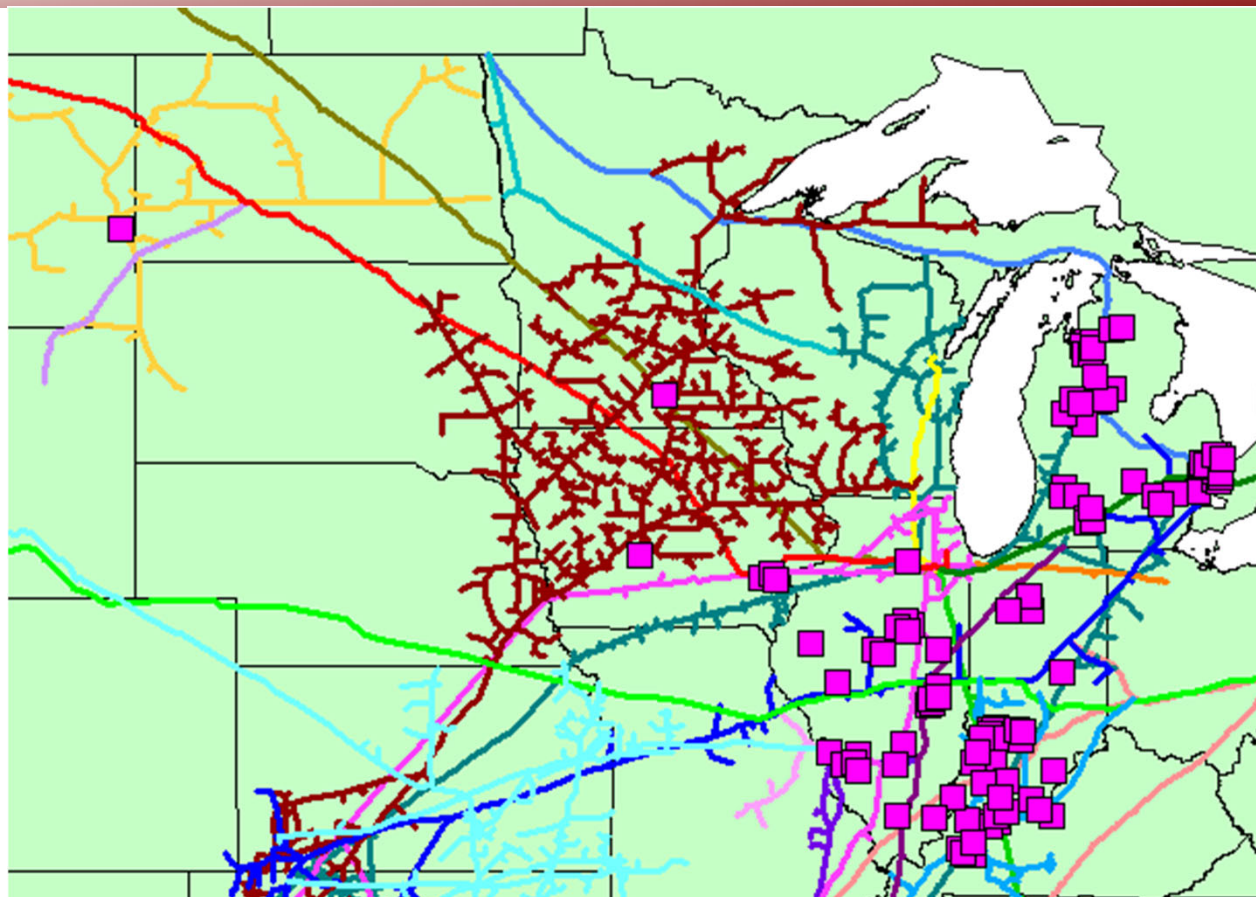
# LDCs Serving MISO North/Central Generators



# LDCs Serving MISO South Generators

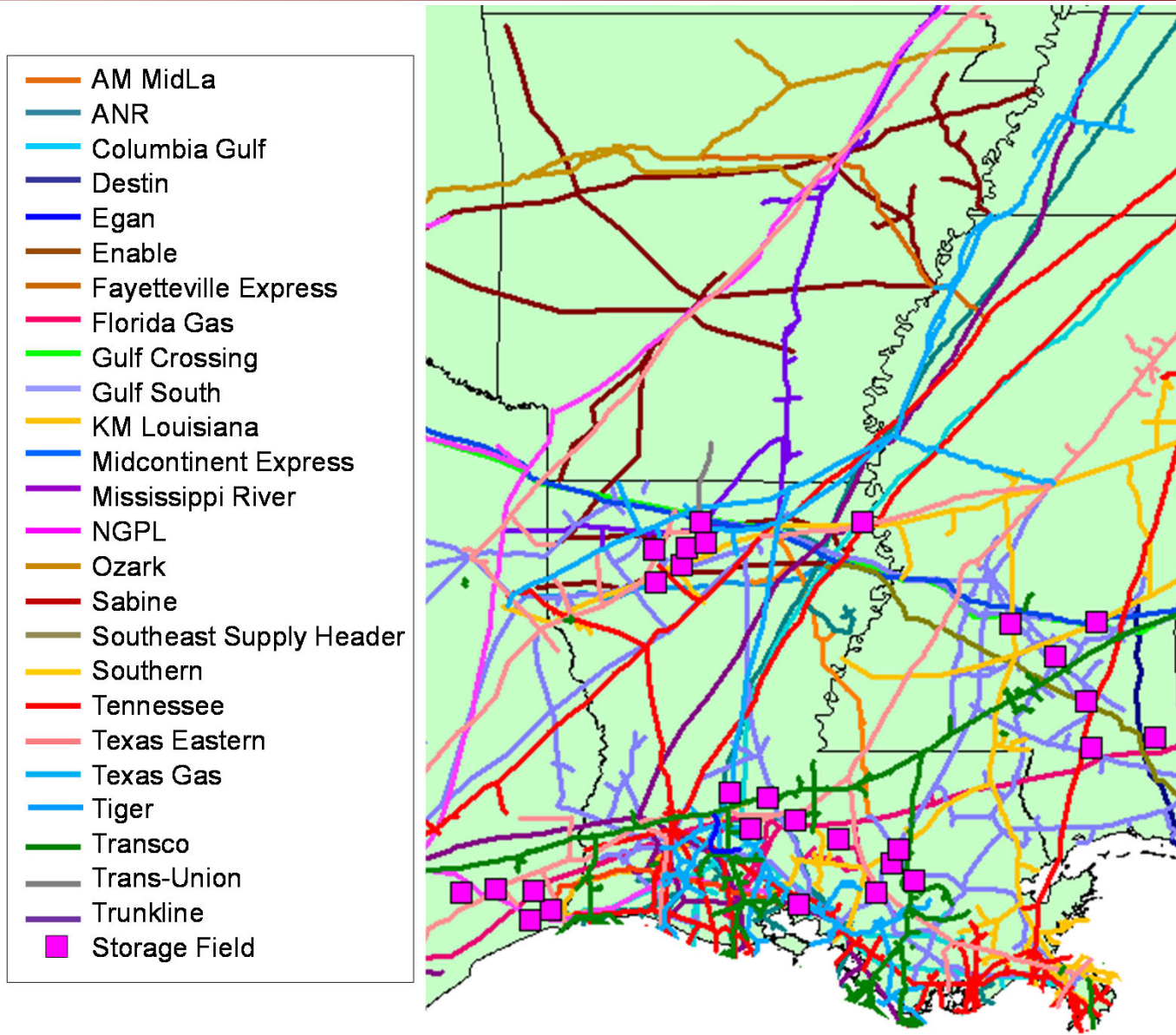


# Natural Gas Storage in MISO North/Central



— Alliance	— Mississippi River	— Texas Eastern
— ANR	— NGPL	— Texas Gas
— Bison	— Northern Border	— Trunkline
— Crossroads	— Northern Natural	— Vector
— Great Lakes	— Panhandle Eastern	— Viking
— Guardian	— Rockies Express	— WBI Energy
— Midwestern	— Southern Star Central	— Storage Field

# Natural Gas Storage in MISO South

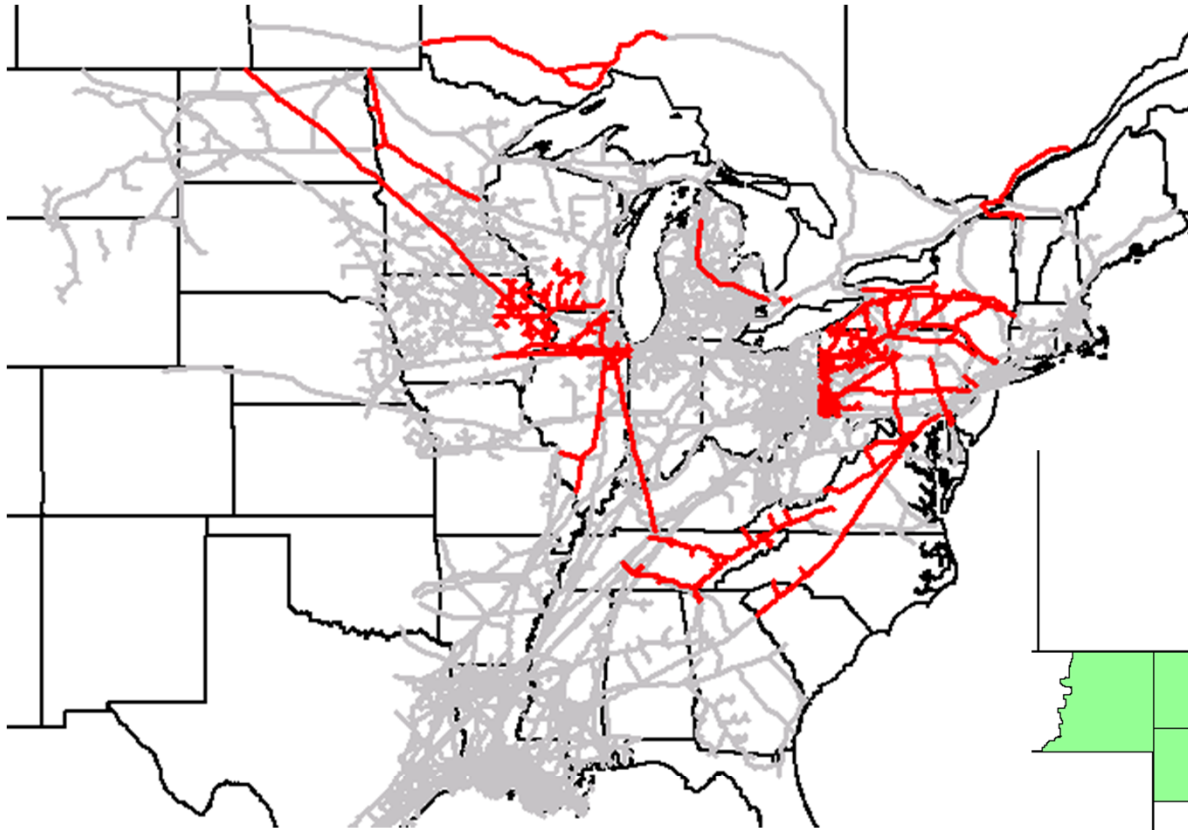




# Gas-Capable Generation in MISO

	<b>MISO North/Central</b>	<b>MISO South</b>	<b>Total</b>
Gas-Capable Generation	39 GW	30 GW	69 GW
Interstate-Served Gas-Capable Generation	22 GW	23 GW	45 GW
Intrastate/LDC-Served Gas-Capable Generation	18 GW	6 GW	24 GW

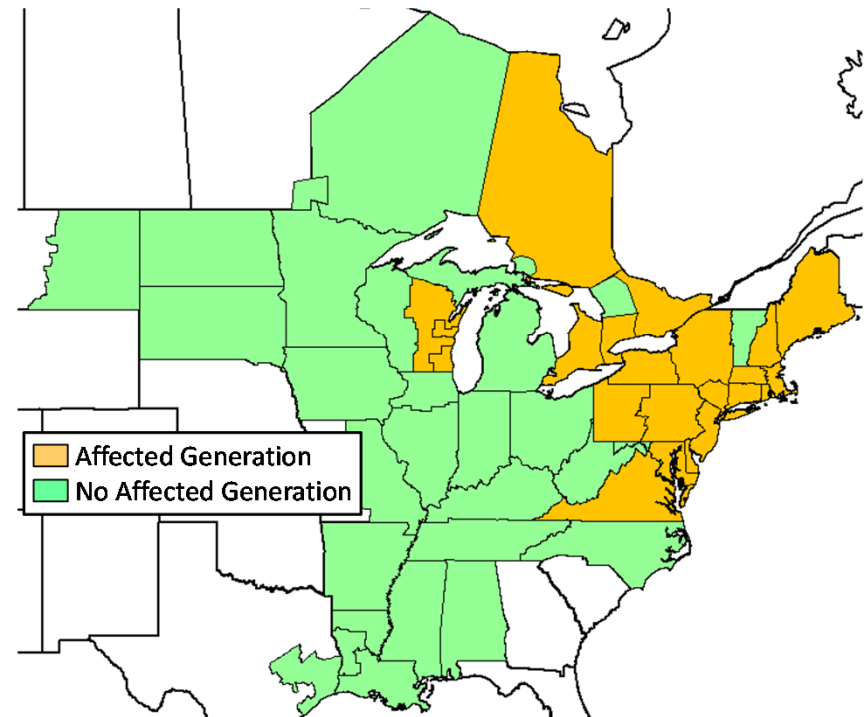
# EIPC Target 2: High Gas Demand Scenario



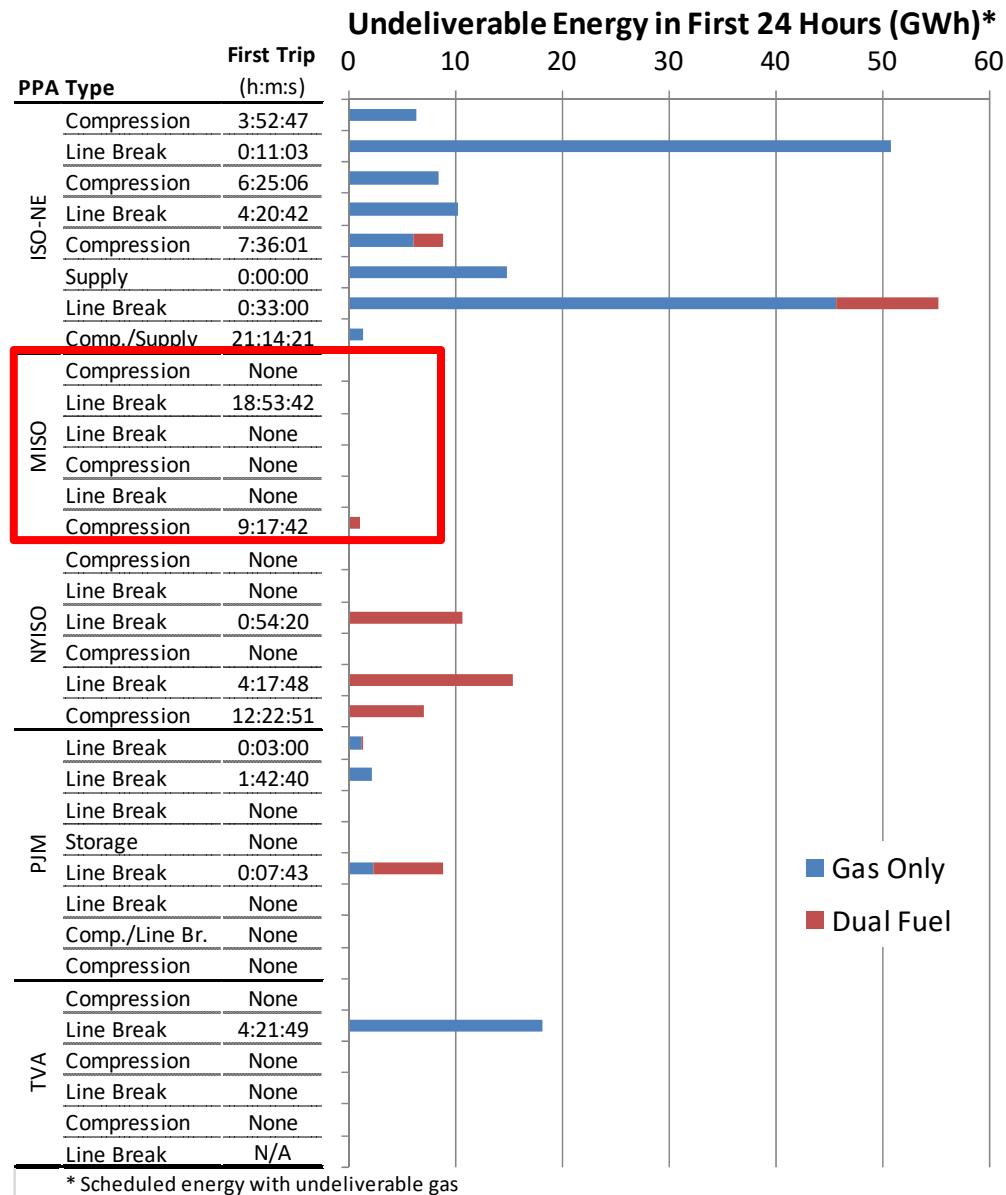
Study Region Peak Hour Affected Generation: 45,269 MWh (29.3%)

MISO Peak Hour Affected Generation: 2,652 MWh (5.0%)

“Affected Generation” does not imply a risk to electric reliability



# EIPC Target 3: Gas-Side Contingencies



\* Scheduled energy with undeliverable gas

## Market Dynamics in Flux relative to EIPC Study

- ◆ Higher coal attrition relative to MTEP – '13
- ◆ Lower delivered gas prices causing increased pressure on “dark spread”
- ◆ Nuclear retirements in IL, other
- ◆ Substantial gas-fired new entry -- both combined cycle and quick start peakers
- ◆ Accelerated entry of variable energy resources