



Resource Availability and Need (RAN)

IRP Contemporary Issues

April 2019

Purpose & Key Takeaways



Purpose: Discuss trends impacting capacity and energy sufficiency; discuss the Resource Availability and Need (RAN) program

Key Takeaways:

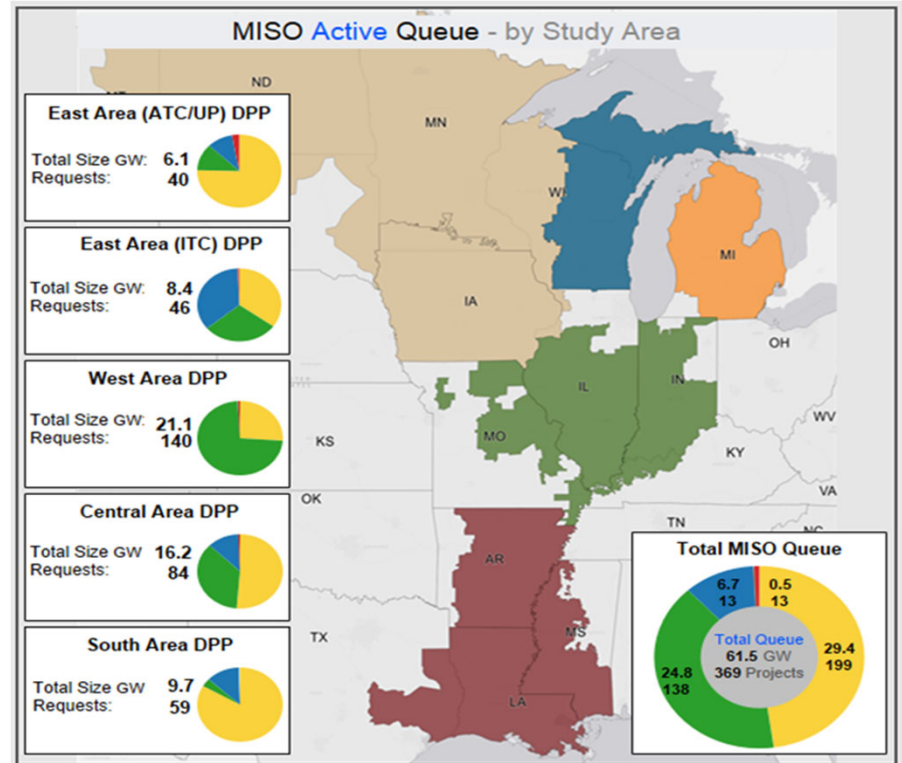
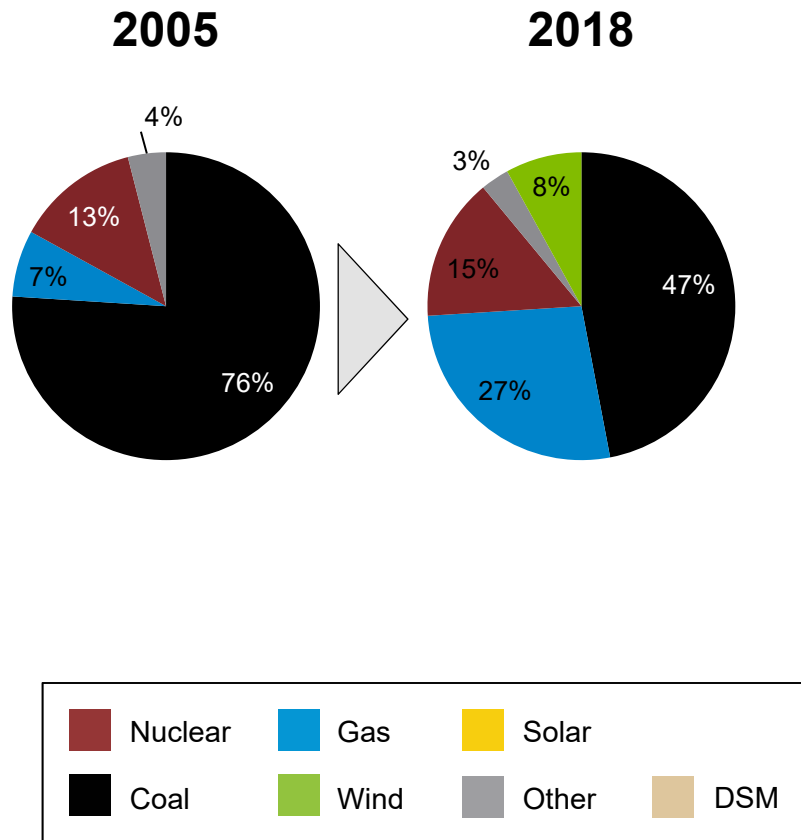
- Fleet changes and reduced reserve margins have caused the efficient conversion of expected capacity to energy to become a focus for maintaining reliability
- This has led to an increased focus on ensuring enough resources are available and have sufficient flexibility to meet reliability needs throughout the year
- RAN will provide a staged approach to investigate possible improvements and ensure resource availability and flexibility needs are met

Combined effect of five trends reveals potential gaps in resource availability & flexibility

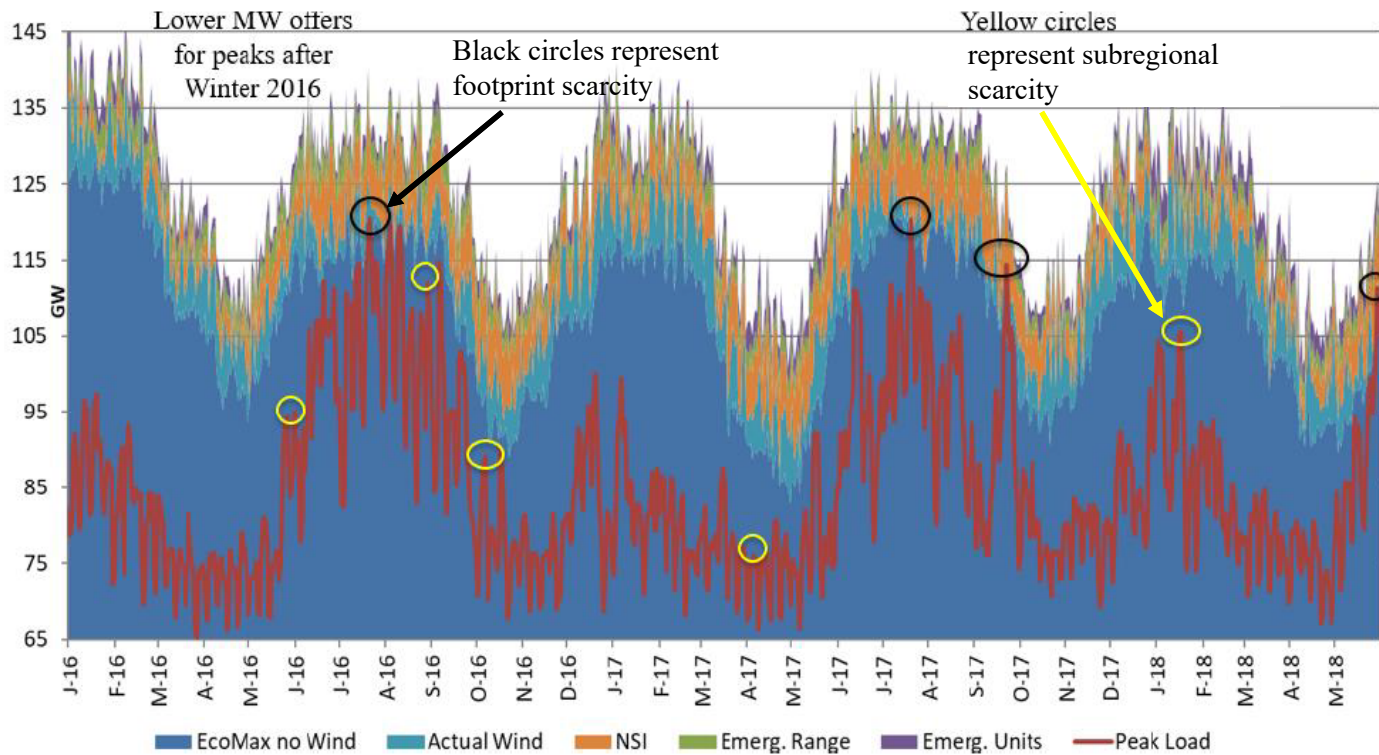
Key industry trends

- Increasing average age and retirement of non-viable generating units leading to increased forced outages and reduced annual reserve margins
- High correlation in timing of planned outage for scheduled resources leading to periods of very low available capacity margins
- Growth in demand side and other emergency-only capacity as a percent of the overall portfolio reduces non-emergency operating options
- Growing reliance on intermittent or unscheduled resources, including interchange increases uncertainty in meeting expected energy needs
- Growth of variable energy resources as a major element of the fleet increases need for flexibility of other resources

The generation fleet in the MISO region is evolving, with the pace accelerating towards more renewables



Stress on current real time operations near term impacts of these longer term trends



MISO increasingly reliant on interchange (NSI) and wind to meet load

The Resource Availability and Need (RAN) program focuses on four areas to address these challenges

1. Ensure outage process matches resource expectations with commitments
2. Align accreditation and expected operating parameters, with an initial focus on Load Modifying Resource (LMR)s
3. Evaluate Planning Resource Auction (PRA) reforms, with a focus on needs throughout the year and link to availability
4. Ensure flexible resource availability to address changing fleet character

RAN's goal is to deliver short and long term solutions promoting reliable and efficient results

PHASE 1: Improve Resource Transparency and Performance for Spring 2019 and subsequent Planning Year

LMRs

- Create transparency and better align LMR obligations to other resources

Outage Coordination

- Improve forward-looking transparency for stakeholders and MISO
- Increase early outage notification and flexibility during emergencies

Filed Dec 2018 / Jan 2019
IMPLEMENT 2019

PHASE 2: Continued refinements for 2020 PRA, movement toward holistic solution(s)

Expected focus on

Improved Planning Resource Auction (PRA) inputs, include resource accreditation

File Q2-3 2019
IMPLEMENT 2020

PHASE 3: Holistic solution(s)

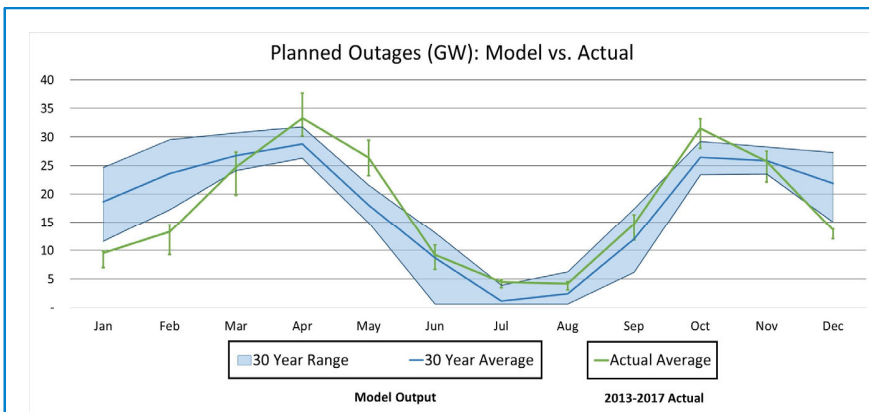
Expected focus on

Improved market incentives for resource availability and flexibility to meet daily and variable energy needs
Seasonal resource adequacy

File as early as Q2 2020
IMPLEMENT TBD

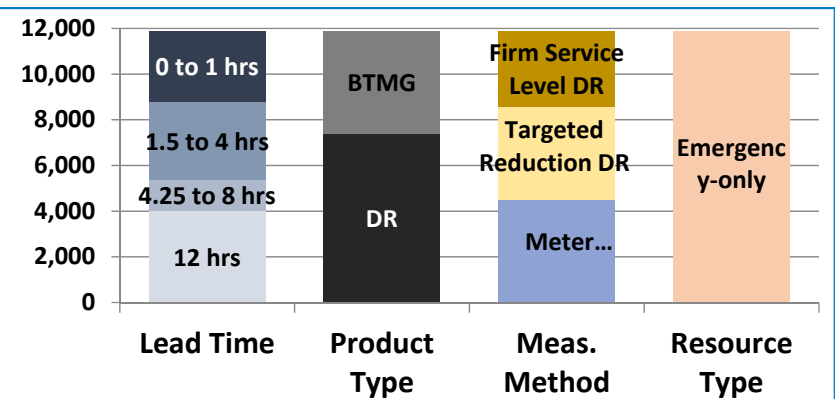
Initial improvements will help avoid or reduce the severity of emergency conditions

Outage Coordination



- Goal is to reduce the number of emergency conditions through avoiding correlated planned outages during high risk times
- Proposal will incent forward scheduling and near term avoidance of planned outages in high risk times

Load Modifying Resources



- Goal is to increase the efficient use of LMRs during emergency conditions, reducing the severity of such events
- Proposal will provide this transparency through increased transparency, testing requirements, and calling resources in advance of emergency conditions

Longer term focus will target availability and flexibility needs

