



# Long Range Transmission Planning

System Planning Committee of  
the Board of Directors

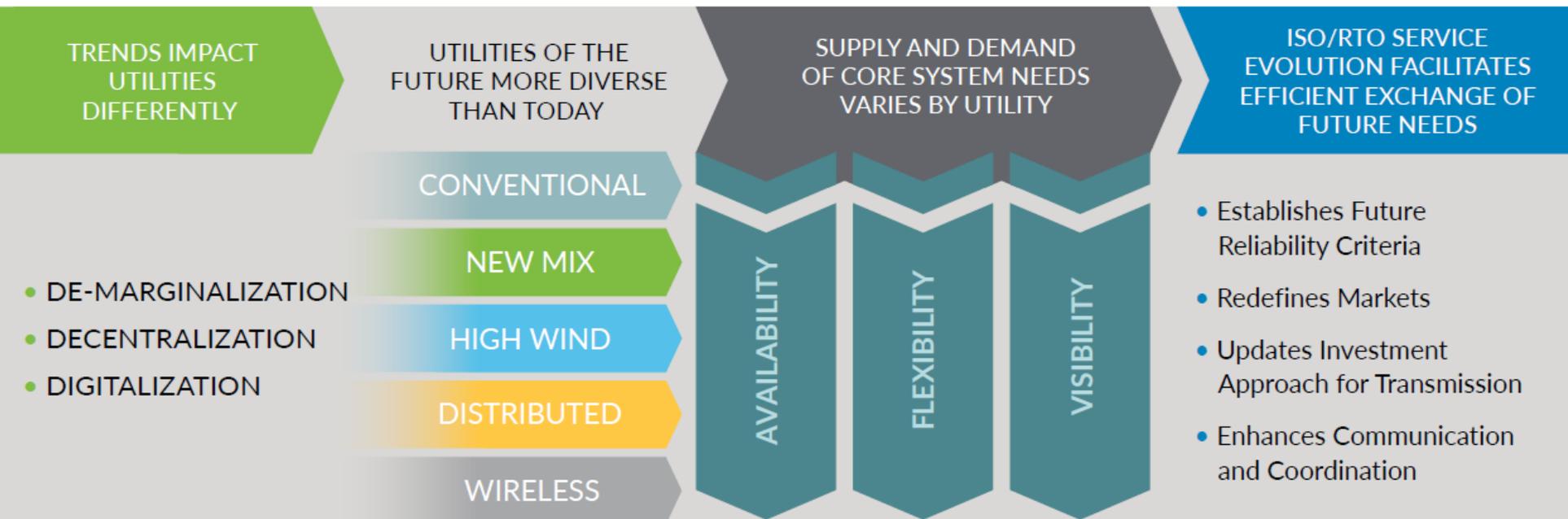
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# Executive Summary



- Industry trends are driving MISO to focus on solutions that anticipate and adapt to rapid changes in new and existing resources
- New Futures will help MISO hedge against future uncertainties
- Long Range Transmission Planning will guide investment decisions to address rapidly changing system needs

# As the industry rapidly changes, MISO is focusing on solutions that anticipate and adapt to the shifting resource mix



Insights inform strategic action plans focused on cultivating a reliable and efficient ecosystem of exchange for utility needs

Our goal is to cultivate an ecosystem that enables participants to achieve diverse goals through open access transmission and competitive wholesale markets

# Long Range Transmission Planning ensures the transmission system is optimized across the long-term as well as the short-term

## Long Range Transmission Plan

- Roadmap / guide to inform decisions about specific solutions
- Longer term planning horizon
- Big-picture with more focus on regional and interregional infrastructure
- Addresses regional differences



## Needs Addressed

Major baseload fleet retirements

Interregional reliability issues, enhancement and economic opportunities

Distributed energy resource fleets

Renewable portfolio standards driven by environmental policies

Increased uncertainty/risk with resource location and dispatch

Load growth from electrification

# MISO follows a value-based, phased approach to model, analyze and plan for solutions that increase long-term value

1

Develop  
Future Scenarios

5

Transmission Solution  
Evaluation

2

Develop Resource Plan  
and Site Future  
Resources

6

Project Justification

3

Identify Transmission  
Issues

7

Project Recommendation  
and Cost Allocation  
Analysis

4

Integrated Transmission  
Development

# We are updating Futures to better reflect potential changes 20+ years into the future

Future I	Future II	Future III
<ul style="list-style-type: none"><li>• The footprint develops in line with 85% of utility announcements / plans, along with State mandates, goals or preferences</li><li>• Carbon emissions decline as an outcome of utility plans</li><li>• Load growth is consistent with current trends</li></ul>	<ul style="list-style-type: none"><li>• Companies / states meet or exceed all their goals, mandates and announcements</li><li>• Changing federal and state policies reduce carbon emissions footprint-wide to 60% by 2040</li><li>• Electric vehicle adoption increases and electrification begins, driving approximately 1.3% Compound Annual Growth Rate in energy through 2040 footprint-wide</li></ul>	<ul style="list-style-type: none"><li>• Companies / states meet or exceed all their goals, mandates and announcements</li><li>• Changing federal and state policies support a reduction of carbon emissions footprint-wide to 80% by 2040</li><li>• Electric vehicle adoption increases and electrification begins, driving approximately 2.8% Compound Annual Growth Rate in energy through 2040 footprint-wide</li></ul>

\* Current Carbon Emissions are 22% lower than 2005 levels

## MISO's first step is to conduct transmission planning studies focusing on the most constrained interfaces



- North Region – stability limits new renewable integration development in upper Midwest
- Michigan import constraints limit access to regional generation
- MISO North to South transmission capacity limits market flows and results in higher market flow costs

## Next steps

- Get input on new Futures
- Continue planning based on transmission needs identified by the Renewable Integration Impact Assessment (RIIA)
  - Determine investments that can address most RIIA issues with a focus on getting to the 30 – 40% footprint-wide penetration
- Assess nearer term needs that provide a foundation for future phases of work and leverage existing cost allocation frameworks