



Free markets. Real solutions.

# **Integrating Renewables and DERs Efficiently and Reliably in the Midwest**

## **Examining the role of state and regional institutions**

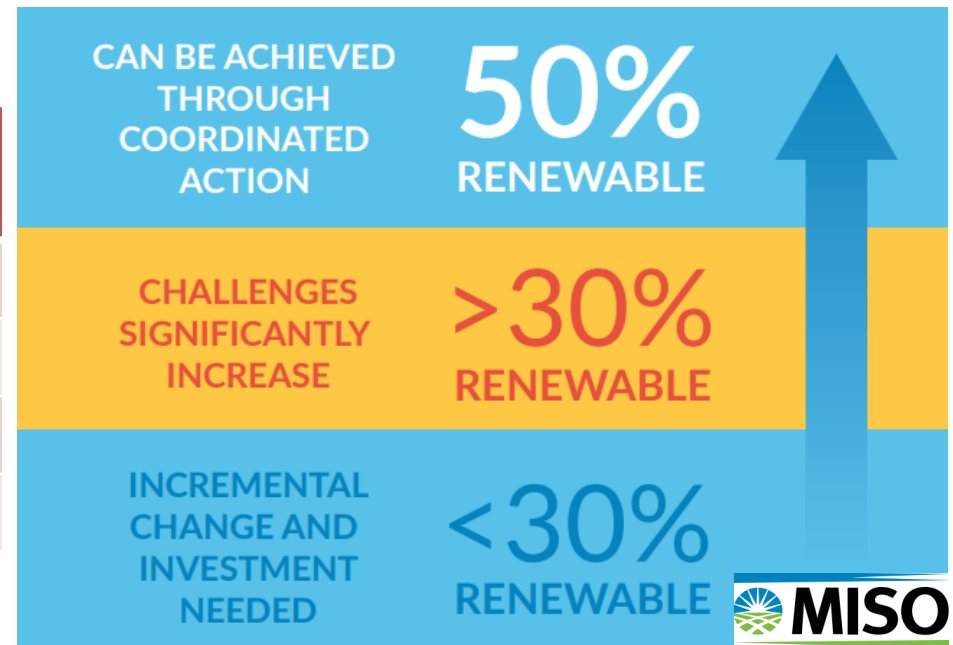
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January 27, 2021

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# Why this issue?

- Biggest challenge to renewables & DERs?
  - Regulatory framework!

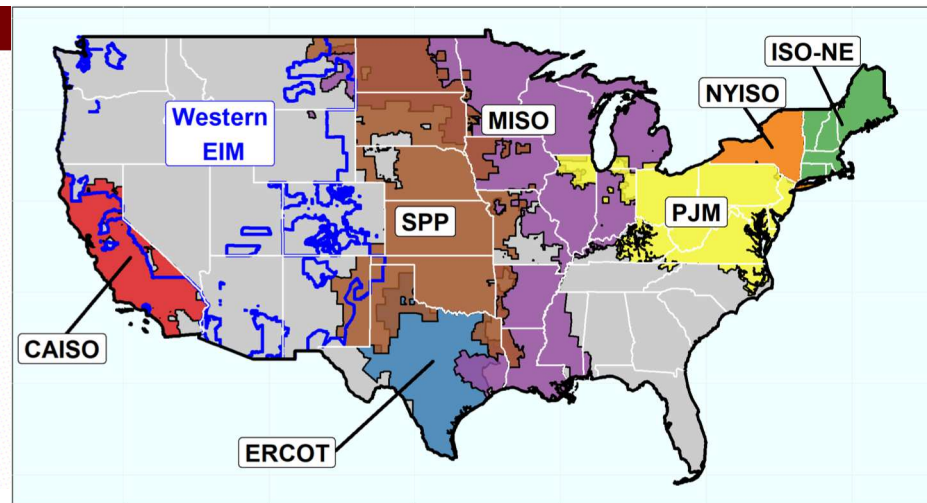
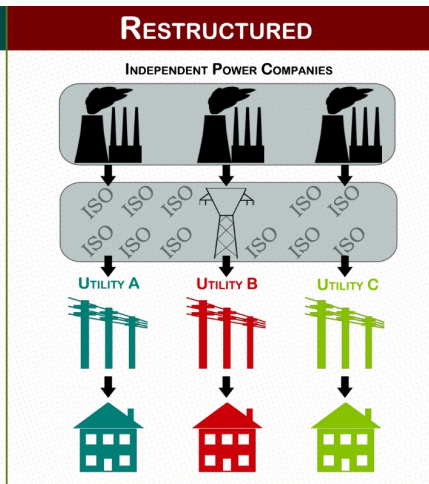
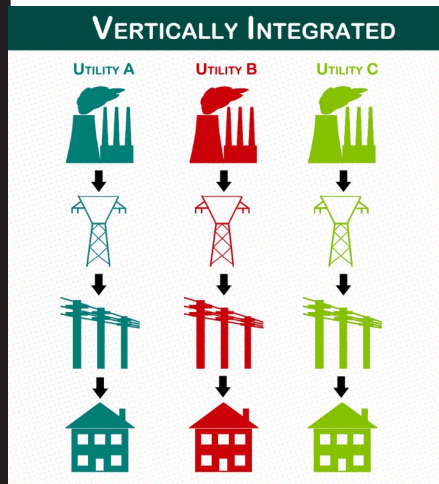
	MISO Generation Renewables Mix
2005	Minimal
2020	12%
2030 (Future 1)	20%
2030 (Future 2)	35%



# Where to Start?

- Know your reg framework
  - RTO + cost-of-service utility regulation
- Know your institutions & their incentives
  - FERC, oversees RTOs (except ERCOT)
  - RTOs, especially MISO
  - PUCs, oversee utility cost-of-service regulation
  - Regulated utilities
  - Other market participants
- Know where to get good information
  - Know expertise & biases of your info sources!

# Regulatory Framework



State Status	RTO?	Power Generation	Examples
Restructured	Yes	Competitive, independent	Illinois, Ohio, Mid-Atlantic (PJM), Northeast (NYISO & ISO-NE)
Traditionally Regulated	No	Regulated Monopoly	Southeast, parts of West
Regulated + RTO	Yes	Regulated Monopoly	Most of Midwest (MISO), West (CAISO), Great Plains (SPP)

# Key Roles & Responsibilities

*(Cost of Service Regulation + RTO only)*

	PUC	MISO
<b>Generation</b>		
Planning	New: approves utility resource plans and certificates of need Existing: “used and useful” test	Operates capacity market Evaluates generator retirements (reliability must-run)
Operations	Utility rate cases and automatic rate adjustment mechanisms	Operates energy & ancillary service markets Dispatch and unit commitment
<b>Transmission</b>		
Planning	State/PUC input to regional planning and siting	MISO transmission expansion planning
Operations		FERC RoR, NERC reliability standards, no economic oversight of asset management
<b>DERs</b>		
Planning	Approves distribution plans	Aggregated DERs in capacity, energy and ancillary markets (Order 2222 compliance pending)
Operations	Retail distribution oversight	

# Incentive Context

	Primary Incentives	Secondary Incentives
MISO	Ensure reliability Satisfy transmission owners	Economic efficiency Satisfy states
States/PUCs	Autonomy, reliability	Cost/efficiency
Regulated utilities	Max “rate base” and regulated RoR Deter third party competition (e.g., DERs)	Indifferent to operating costs & market revenues Avoid regulatory and political scrutiny

**Regulatory Compact: Exclusive Franchise  $\leftrightarrow$  State Regulation**

**Revenue Requirement = (Rate base x RoR) + Operating Costs + Depreciation + Taxes**

# Information Context

- PUC regulation “substitutes” for competition
  - Regulator must be fully informed & motivated
  - Historically simple generation planning & operations
    - Operate as preset baseload, intermediate and peak resources
- DERs: MISO lacks visibility, dispatch control
- Rnwbls & DERs exacerbate PUC-utility info asymmetry
  - Diverse, complex, decentralized resource options
  - Dynamic supply-demand (e.g., coal no longer baseload!)
  - Better wholesale market info → informs PUC prudence
    - E.g., how much to invest to “firm”/backup for renewables?
    - E.g., are utilities operating plants to minimize costs?

# MISO-State Nexus

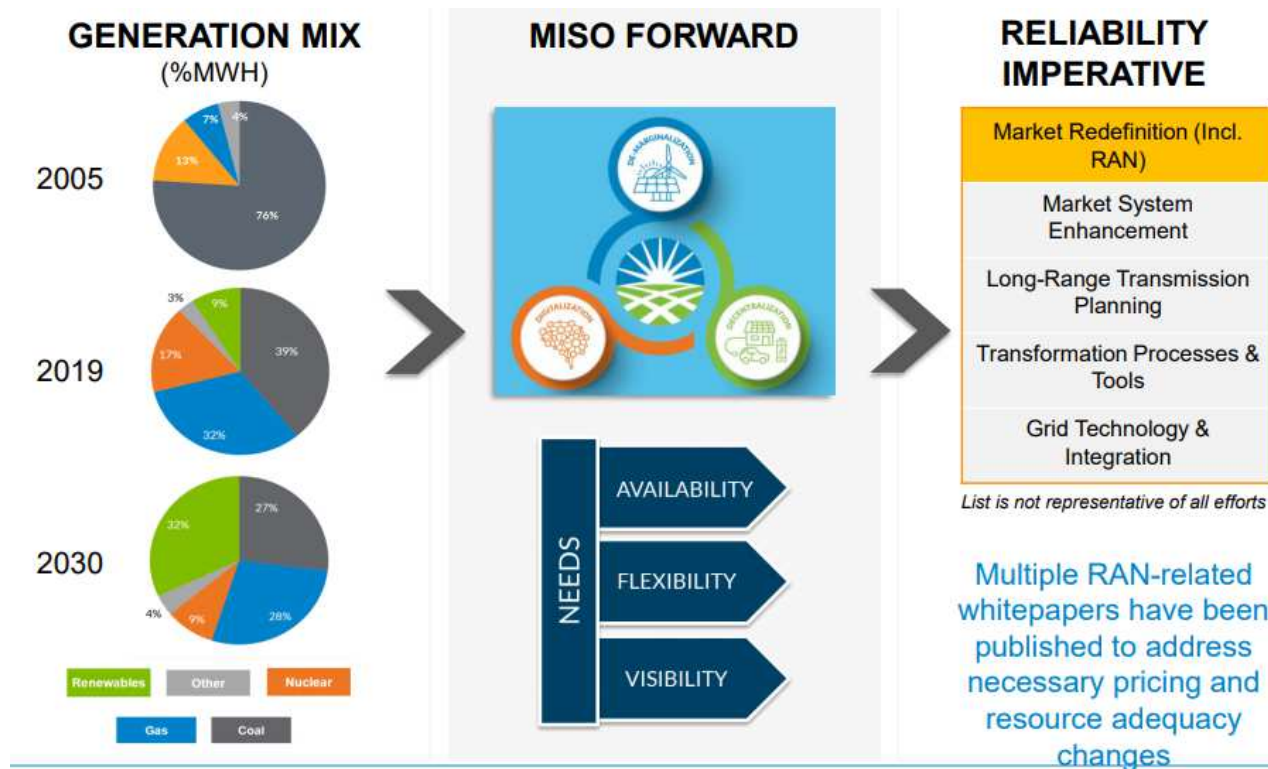
- Market design premised on “incentive compatibility”
  - Align market participants’ net revenues w/ efficient and reliable system operation
- Cost-of-service regulation removes net revenue maximization incentive
  - Capacity markets
    - Dominated by state-approved resources
  - Energy and ancillary service markets
    - Dominated by participants indifferent to market revenues/costs
  - Some issues:
    - How to design MISO markets given cost-of-service prevalence?
    - Should MISO rules reflect just technical system elements or align with areas of state authority?
    - How to let third parties aggregate DERs for wholesale when retail is regulated monopoly?



# MISO-State Nexus Cnt'd

## Information Sharing & Coordination

— E.g., MISO Resource Availability and Need



# Next Steps

- Understand core concepts
  - Think: how to address incentive and info problems to coordinate resource investment and management prudently?
  - What happens if current institutional framework plays out?
    - E.g., aggregating as-is IRPs, same operations practices under more dynamic system, DER potential under different Order 2222 compliance pathways
  - What analysis are parties lacking to inform policy decisions?
- Deeper dives into planning, operations & DERs
  - In a few weeks....

Have fun learning!!!