

Session 5: Solutions

A Case Study in Planning and Guiding Principles for Policy Solutions

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Missouri Public Service Commission

Powering Missouri: An Evolving Landscape

Grid Demands
and Challenges

Generation
Resource Mix

Anticipated Load
Growth

Individual,
Community, and
Business
Demands

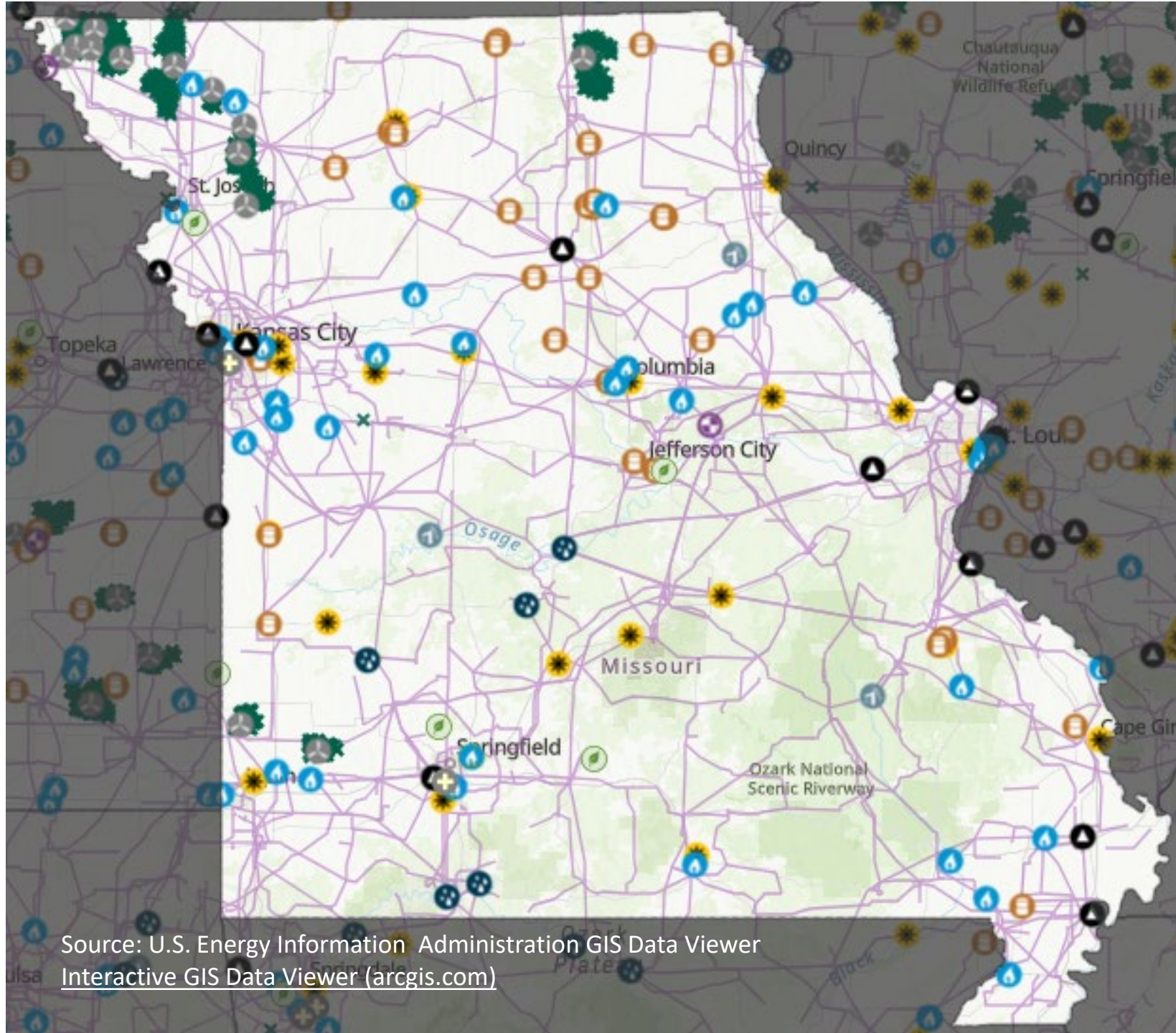
Market Forces
and Challenges

Federal
Regulatory
Changes and
Uncertainties

Incentive
Structure of
Ratemaking and
Subsidies

Seasonal
Impacts and
Extreme
Weather Events

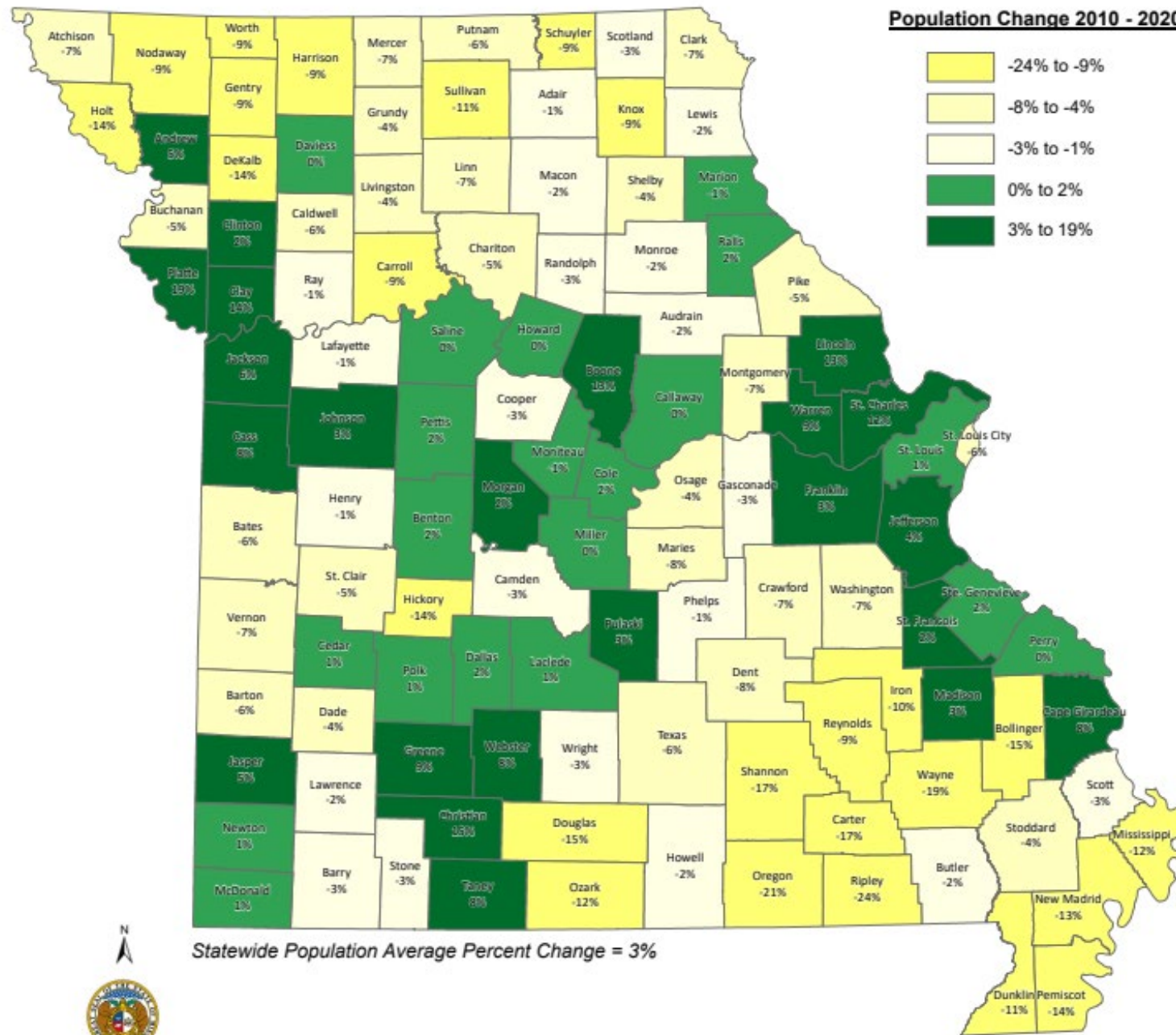
Reliability and
Resiliency



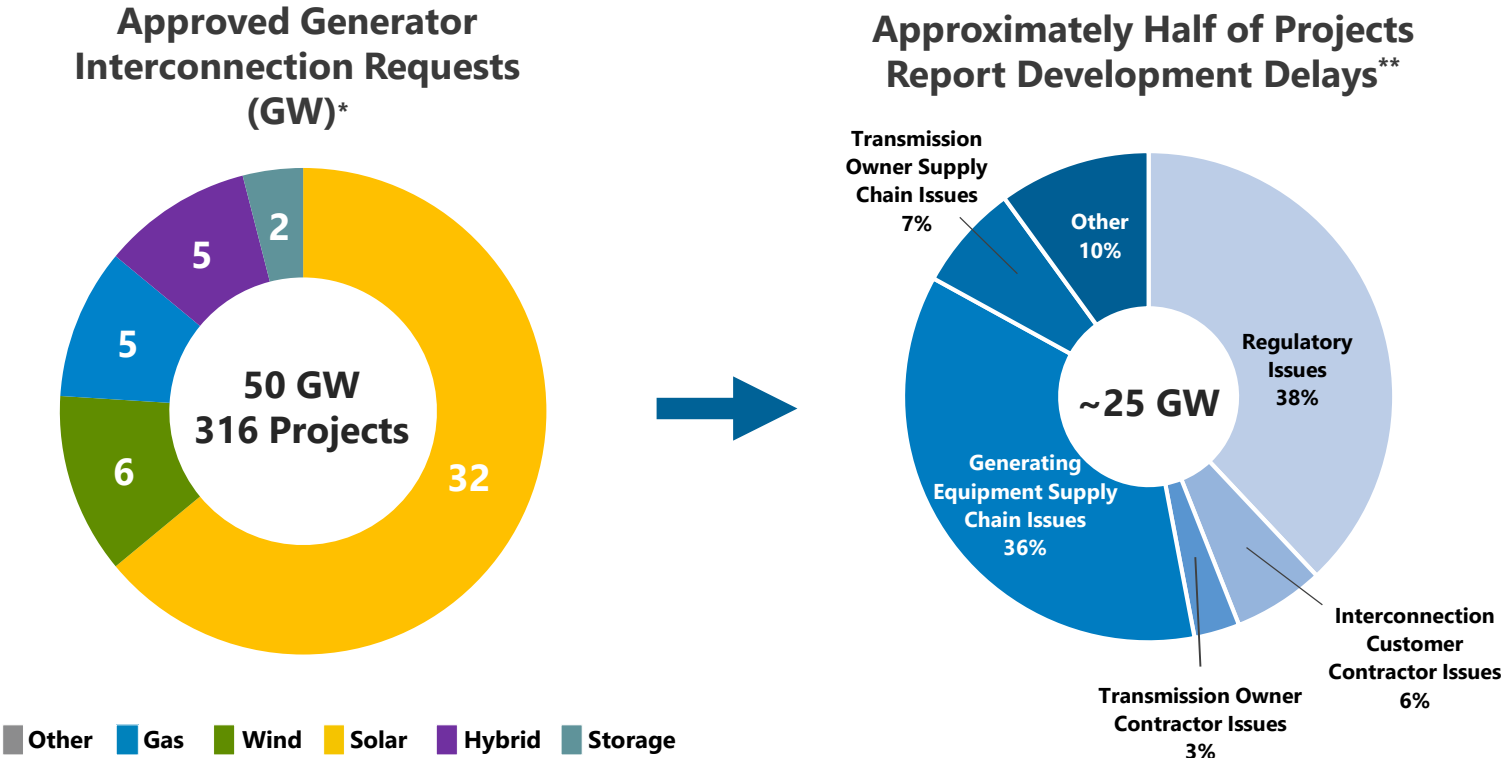
Legend

- Battery Storage Power Plants**
 - Battery Storage
- Biomass Power Plants**
 - Biomass
- Coal Power Plants**
 - Coal
- Geothermal Power Plants**
 - Geothermal
- Hydroelectric Power Plants**
 - Hydroelectric
- Natural Gas Power Plants**
 - Natural Gas
- Nuclear Power Plants**
 - Nuclear
- Petroleum Power Plants**
 - Petroleum
- Pumped Storage Power Plants**
 - Hydro - Pumped Storage
- Solar Power Plants**
 - Solar
- Wind Power Plants**
 - Wind
- Other Power Plants**
 - Other

Source: U.S. Energy Information Administration GIS Data Viewer
[Interactive GIS Data Viewer \(arcgis.com\)](https://interactivegis.eia.doe.gov/)



...and many of the already approved new resources are experiencing delays in getting online



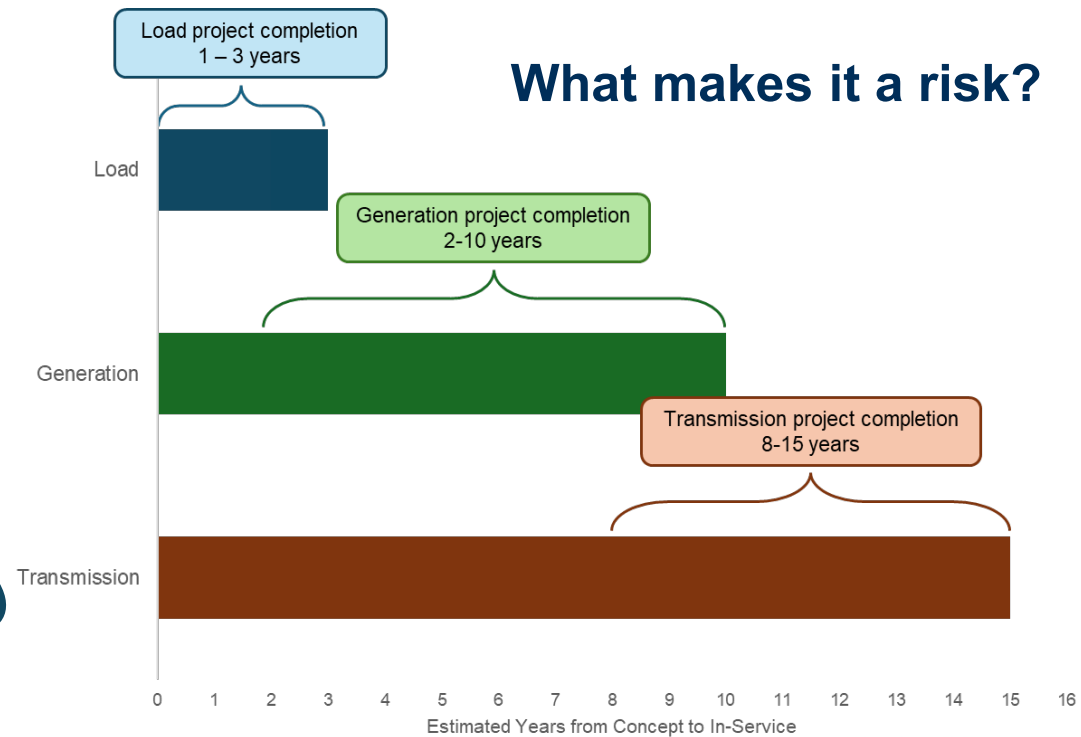
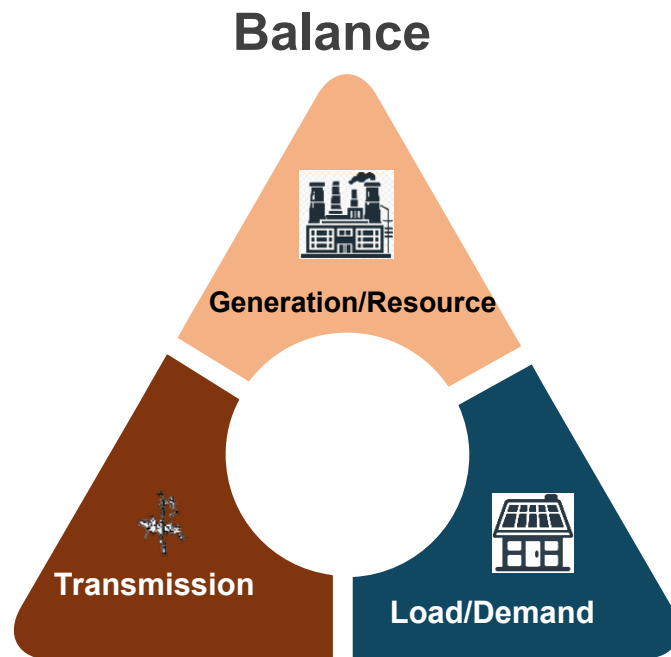
50 GW of resources approved through MISO's interconnection processes are in or awaiting construction with approximately 50% already signaling a delay with an average of 650 days to commercial operation

*Queue data as of June 1, 2024

** Reasons for delay based on responses from a subset of delayed projects

Resource Adequacy

Generally speaking, resource adequacy is the ability of the electric system to meet the energy needs of electricity consumers. This means having sufficient generation to meet projected electric demand - FERC



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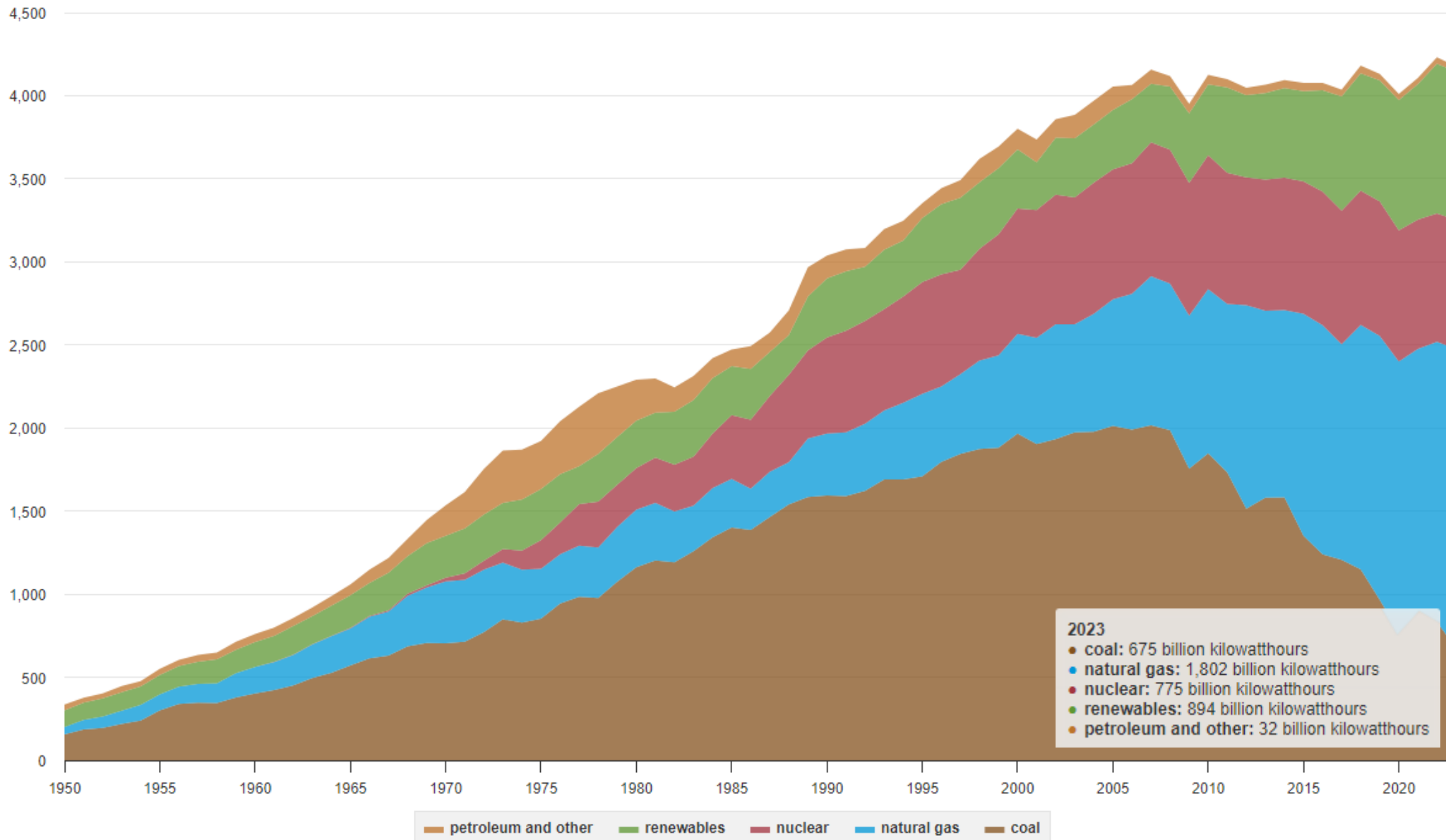
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U.S. electricity generation by major energy source, 1950-2023

billion kilowatthours

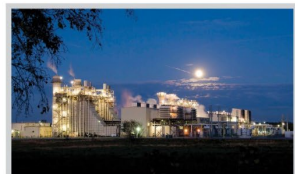


Associated's Evolving Resource Mix



2,353 MW

COAL



2,795 MW

GAS



478 MW

HYDROELECTRIC



1,240 MW

WIND

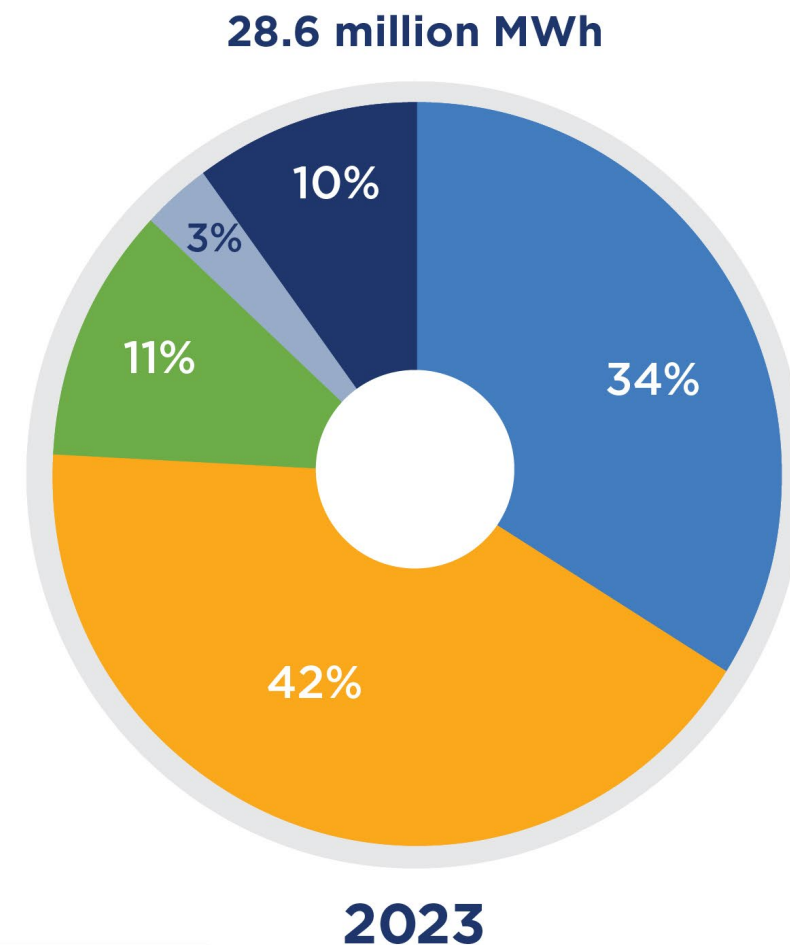
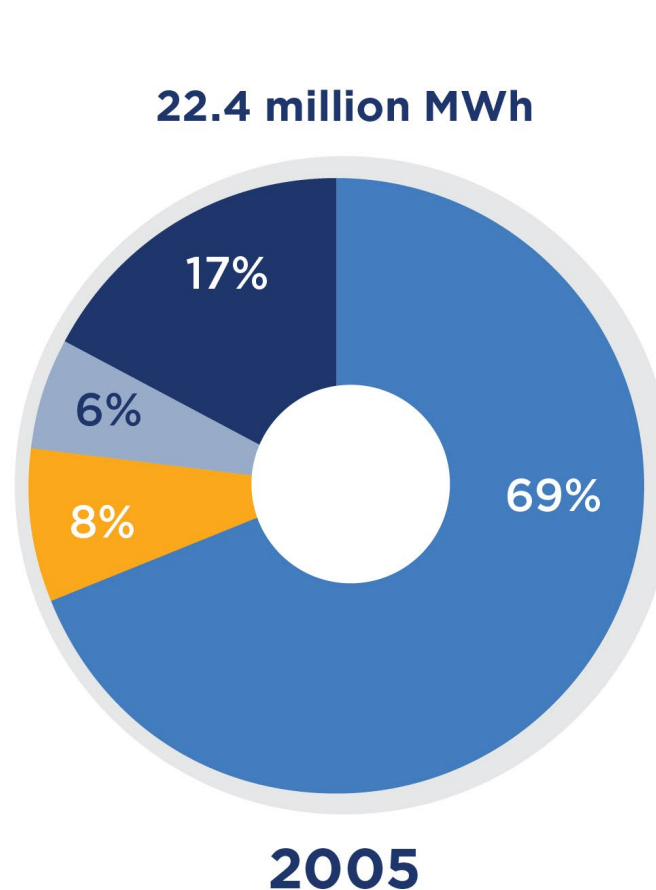


44 MW

LIQUID FUEL

TOTAL NAMEPLATE - 6,910 MW

TOTAL CAPACITY - 5,670 MW



COAL • GAS • WIND • HYDRO • PURCHASES

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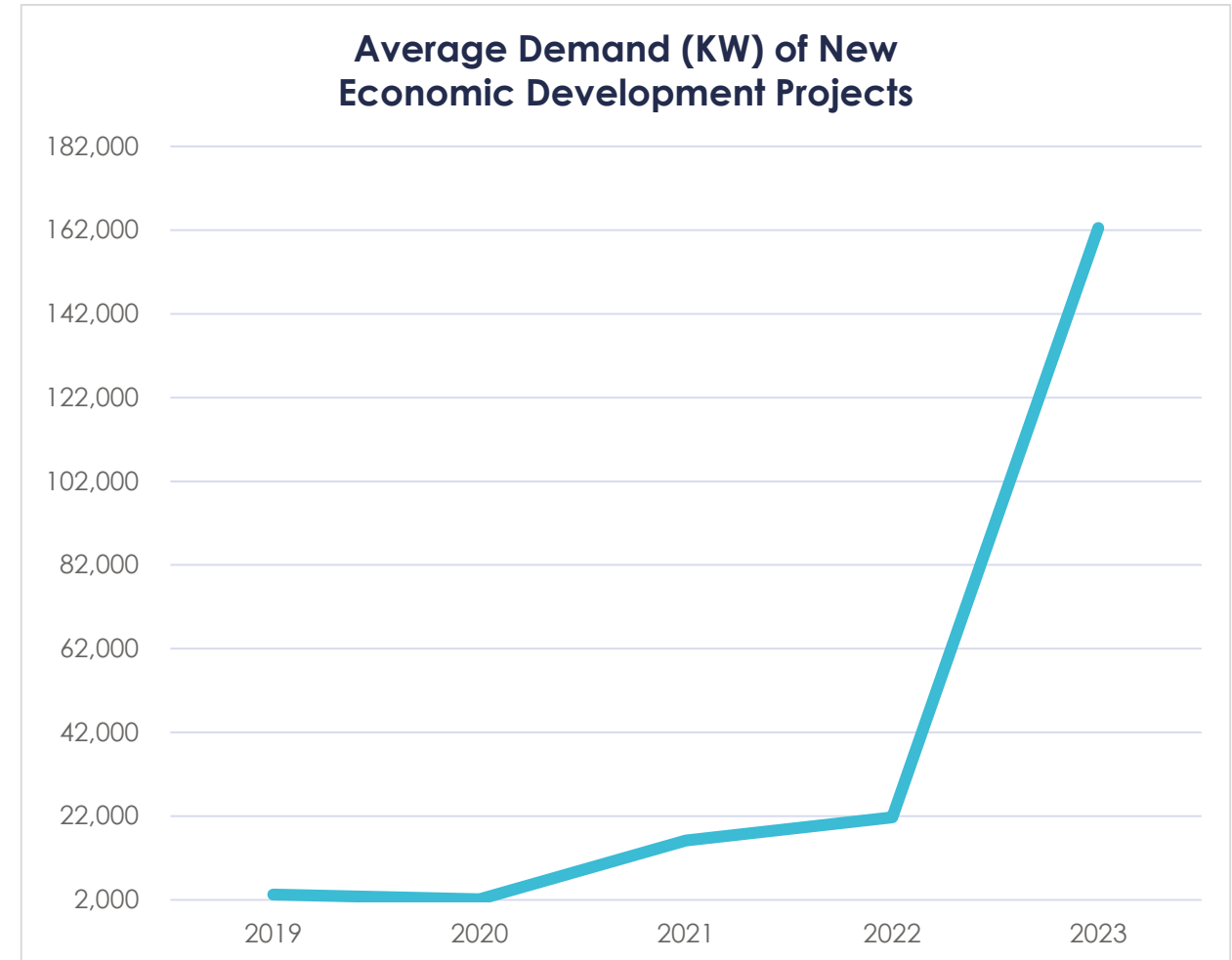
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Increased Demand from Economic Development Projects

There has been a **significant increase** in expected demand load since the pandemic.

- ◈ Project size is increasing rapidly
 - ◈ In 2019, average size was 3.2 MW
 - ◈ In 2023, average size was 162.5 MW



Data courtesy of  **Ameren**



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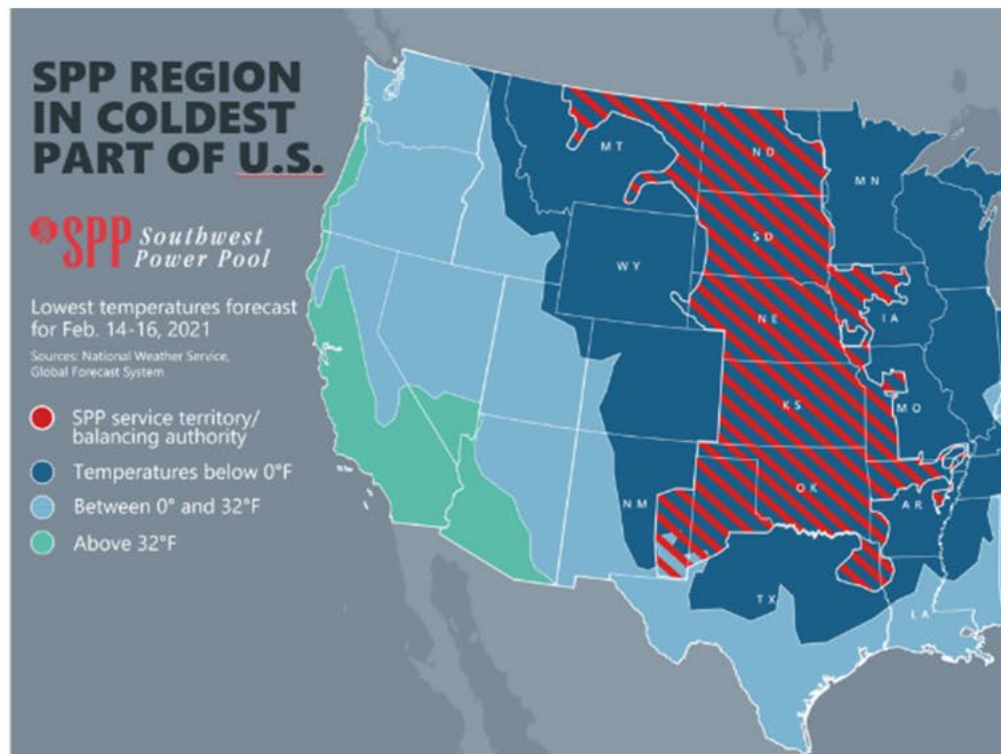
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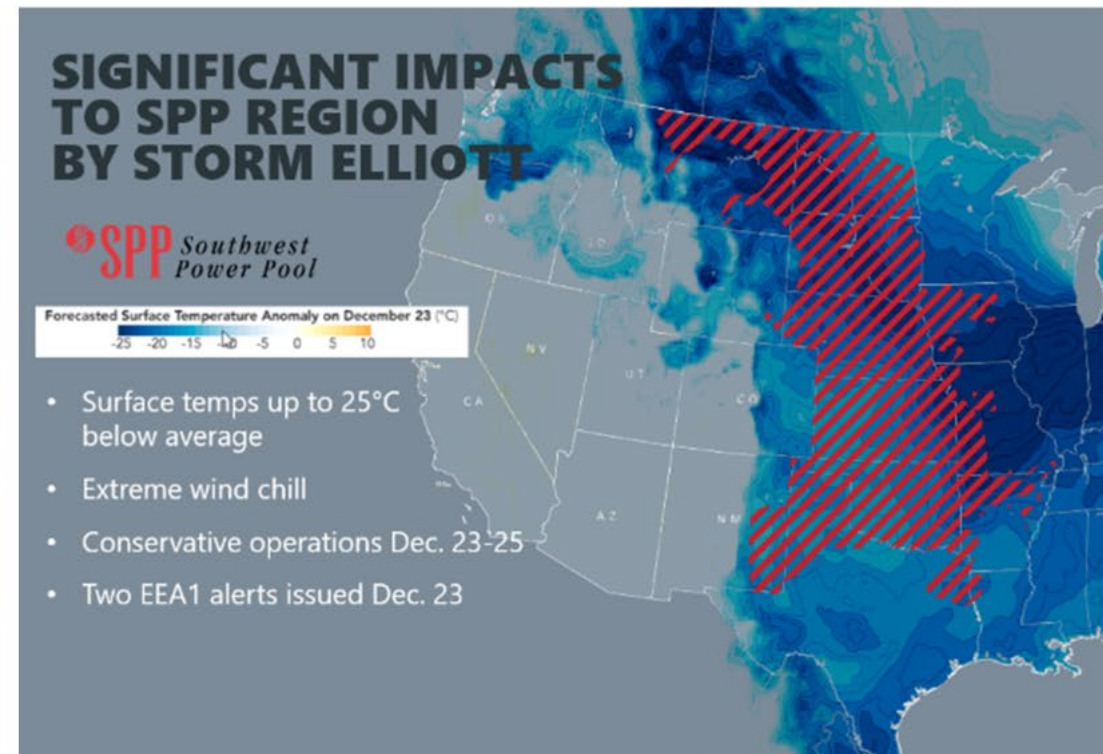


Seasonal Resource Constraints

TWO “100 YEAR STORMS” IN TWO YEARS



Winter Storm Uri
Feb. 2021



Winter Storm Elliott
Dec. 2022

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Missouri is not Alone

- States around the country are grappling with similar challenges
- In a recent Regulatory Assistance Project Peer-to-Peer workshop at the Mid-America Regulatory Conference there was consensus that all states are facing the same general challenges and there is a need to do things different
- Hard conversations about approaches to Integrated Resource Planning and Resource Adequacy are happening throughout the country
- Who can we learn from?

Resource Adequacy in Michigan

State Reliability Mechanism
& Integrated Resource
Planning

Roger Doherty

Manager Resource Adequacy &
Forecasting Section

August 13, 2024

Michigan Public Act 341 of 2016

- Sect. 6t – Integrated Resource Planning (IRP)
 - Requires Michigan electric utilities whose rates are regulated by the MPSC to submit an IRP to the MPSC for review and approval. It also requires the MPSC to determine modeling scenarios and sensitivities as well as filing requirements for IRPs.
- Sect. 6w – State Reliability Mechanism (SRM)
 - Requires all electric providers to annually demonstrate to the MPSC, in a format determined by the MPSC, that they own or have contractual rights to sufficient capacity resources to serve their retail electric load in Michigan four years into the future.



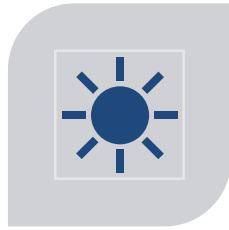
Michigan's IRP

- Collaborative process with interested parties to develop modeling scenarios and sensitivities. Updated every 5 years.
- IRP planning period is a minimum of 20 years with specific reporting of 5-year, 10-year, and 15-year projections.
- MPSC must consider whether the proposed IRP represents the most reasonable and prudent means of meeting the energy and capacity needs.
- Multi-state utilities may file IRP consistent with other state's IRP filing requirements, Small utilities may request waivers.
- File updated IRP at least once every five years.
- Approved IRP allows utility to obtain pre-approval for the recovery of costs of near-term projects proposed in IRP.

IRP Process



Michigan's IRP Application Requirements



RENEWABLE
ENERGY



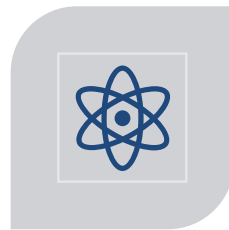
SALES FORECAST



ENERGY WASTE
REDUCTION



ENVIRONMENTAL
REGULATIONS



TRANSMISSION



AFFORDABILITY & RATE
IMPACT



EXISTING
GENERATION



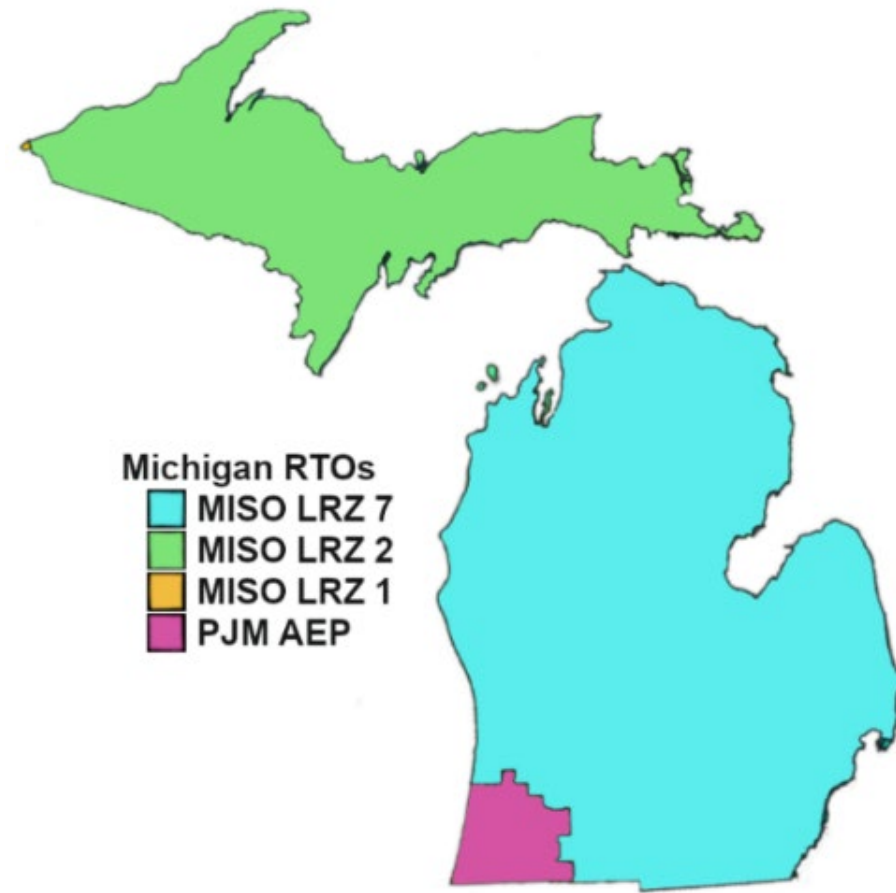
DEMAND
RESPONSE

Michigan State Reliability Mechanism (SRM)

- Annual filing required of all electric providers (rate regulated, cooperative, municipal, and alternative electric suppliers).
- Each Load Serving Entity (LSE) must demonstrate sufficient capacity resources to meet requirements 4-years forward.
- MPSC reviews/audits filings and prepares a report for the Commission.
- Consequences of failing to demonstrate enough capacity vary depending on LSE type.
- Aligns with Michigan IRP process as well as Regional Transmission Organization's Resource Adequacy Constructs.

Into the Weeds of the SRM

- Development of Process and Requirements.
- PJM vs. MISO.
- Load switching.
- Resource location.
- Legal challenges.
- SRM Charge.
- Evolution.



MISO LRZ 7

Figure 4: U-21393 Results – PY 2027/28 LRZ 7 Capacity Position (ZRCs)

Line #		Summer	Autumn	Winter	Spring
1	Planning Reserve Margin Requirements (PRMR)	21,565	19,893	17,366	19,670
2	Local Reliability Requirement (LRR)	23,771	23,843	22,253	21,255
3	Capacity Import Limit (CIL)	4,500	4,400	4,656	4,883
4	Zonal Import Ability (ZIA)	4,490	4,390	4,656	4,883
5	Local Clearing Requirement (LCR) (L1-L4)	19,271	19,443	17,597	16,372
6	Total Owned	17,880	17,703	17,490	17,869
7	Total PPA Contracts	4,329	4,218	3,404	4,758
8	Total ZRC Contracts	423	399	332	396
9	Total Qualified Demand Response	1,871	635	774	767
10	Total Resources (sum of L6 through L9)	24,502	22,954	22,000	23,790
11	LCR Demonstrated Position (L10-L5)	5,231	3,511	4,403	7,418
12	PRMR Demonstrated Position (L10-L1)	2,937	3,061	4,634	4,120
13	Net Undemonstrated Capacity	436	485	587	478
14	Anticipated LCR Position (L11+L13)	5,667	3,997	4,990	7,896
15	Anticipated PRMR Position (L12+L13)	3,373	3,547	5,221	4,598

Guaranteed?

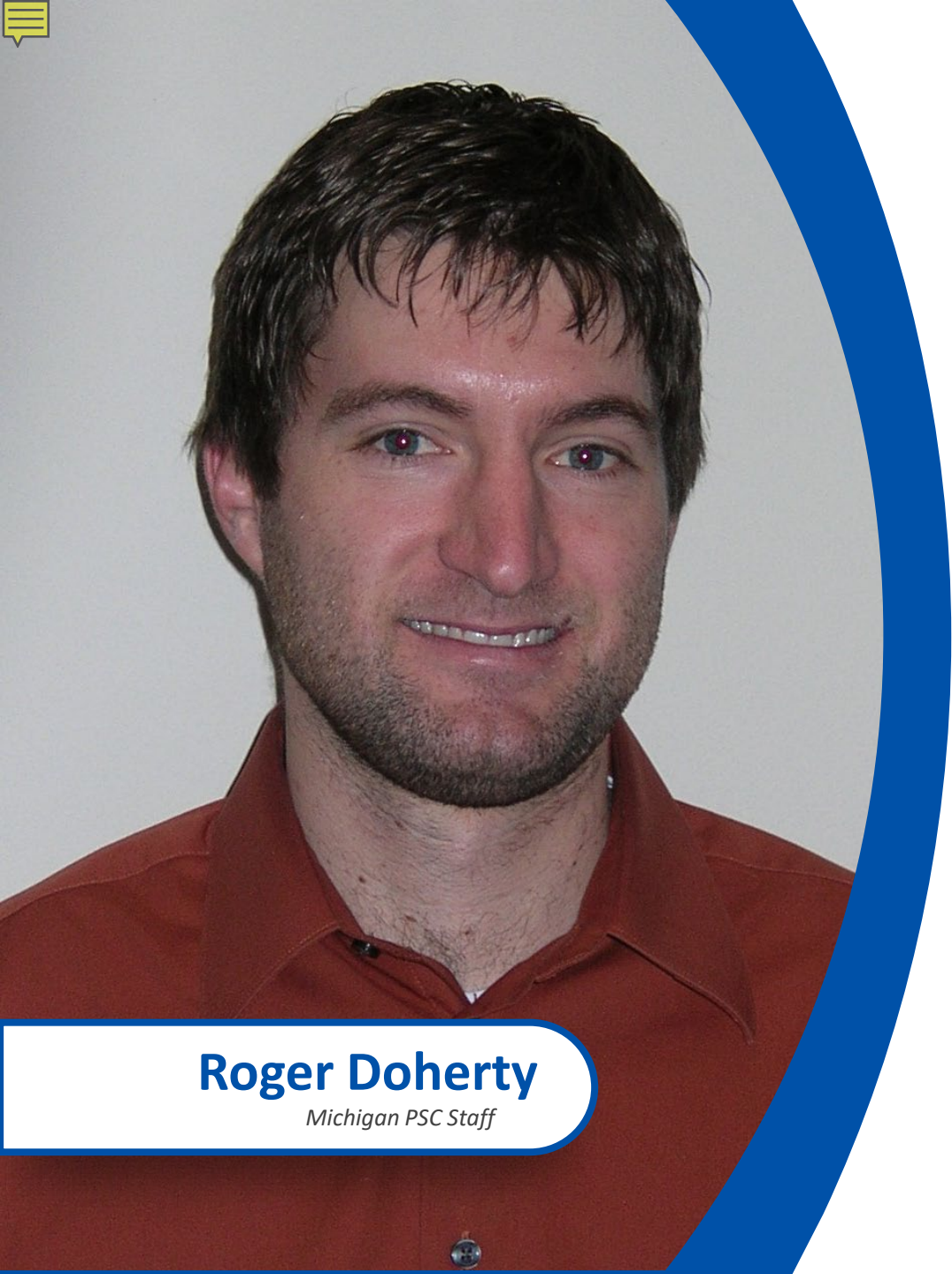
- Do Michigan's IRP and SRM requirements **guarantee**...
 - that Michigan will have enough resource to avoid the planning resource auction clearing at the Cost of New Entry? No.
 - that Michigan customers will not experience firm load shed due to a lack of resources? Also no.
- If they don't do either of those, what benefit do they provide for Michigan customers?

Figure 6: Resource Breakdown (%) by Supplier Type Planning Year 2027/28 - Summer

Supplier Type	Owned	DR	Contract – PPA	Contract - ZRC	Auction
Muni/Co-Op Aggregate	58.6%	0.1%	36.8%	1.7%	2.7%
AES Aggregate	0.2%	0.2%	4.8%	93.2%	1.6%
Utility Aggregate	76.7%	6.4%	16.6%	0.2%	0.0%

Q & A





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GET IN TOUCH

— . .




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Michigan.gov/mpsc



How does Missouri move forward?

Strategic and Resource Planning Principles to Improve Resource Adequacy in Missouri

Update Missouri's Integrated Resource Planning Process and Framework

- Move from Static to Dynamic Approach
- Embrace Forward Looking Perspective

Incent Action to Align with Outcomes

- “Steel in the Ground” and Optimize Existing Resources and Infrastructure
- Accounting, Ratemaking, Incentives

Improve Data Collection and Modelling

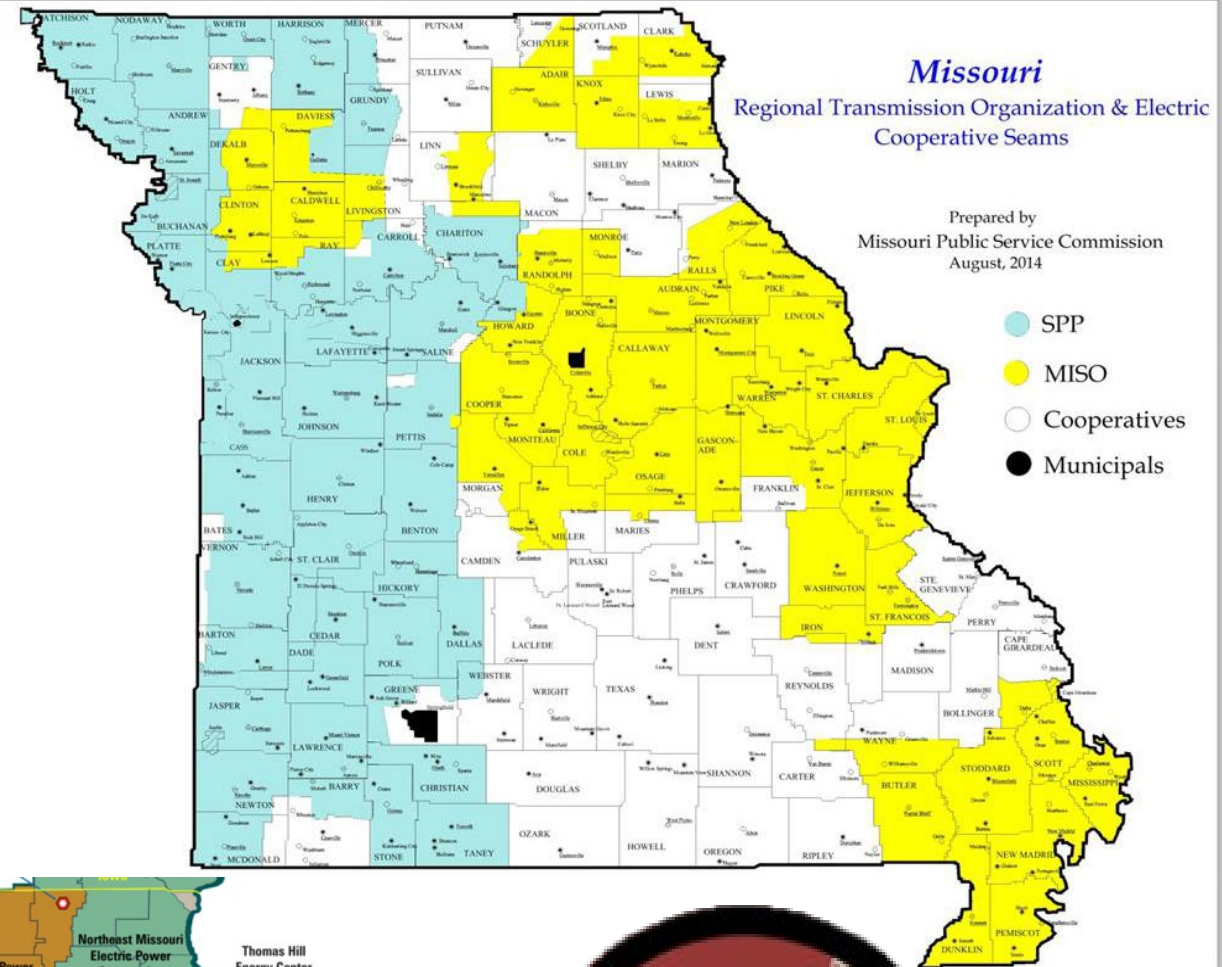
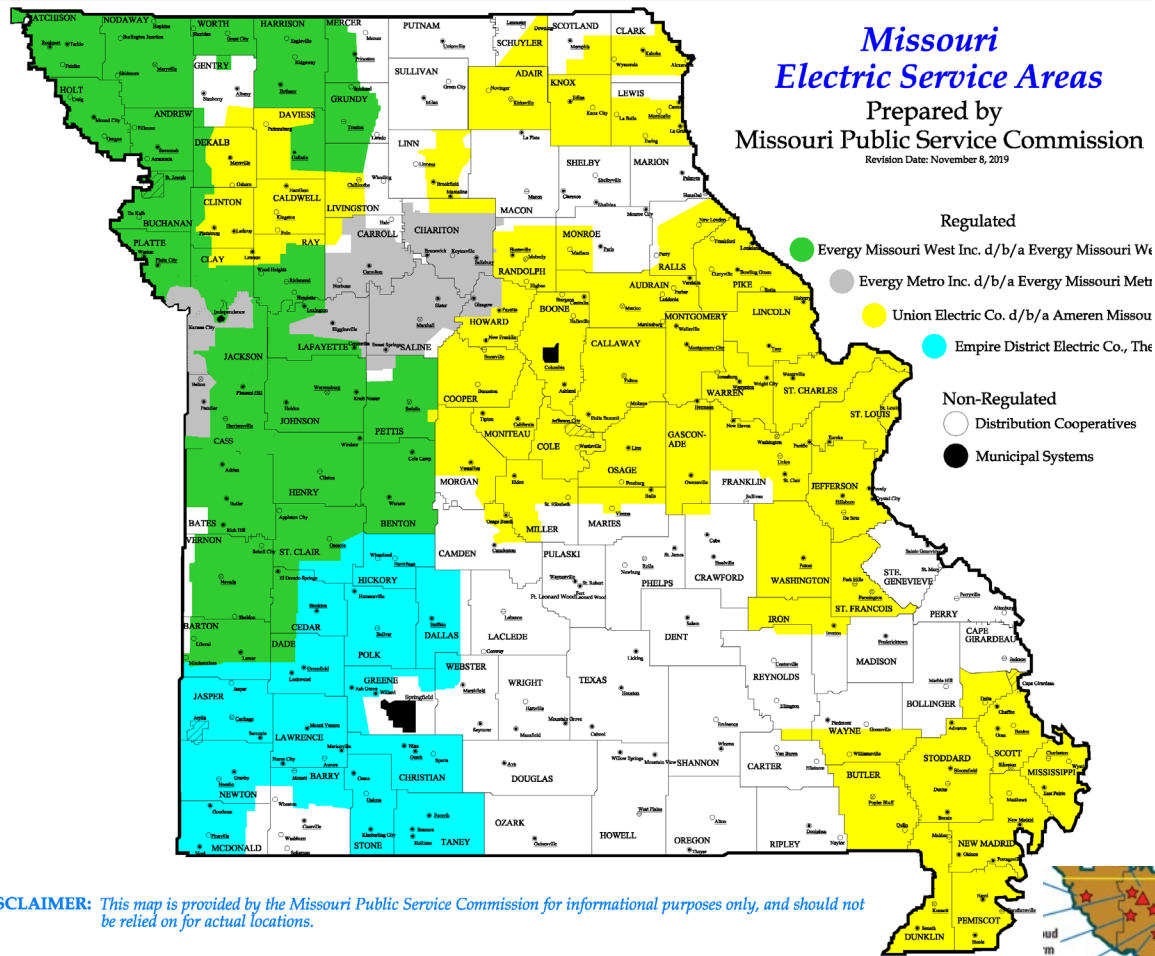
- Establish Foundational Understanding – Consistent and Standardized Approach
- Existing Nameplate and Accredited Capacity and Load Growth

Improve Line of Sight and Coordination

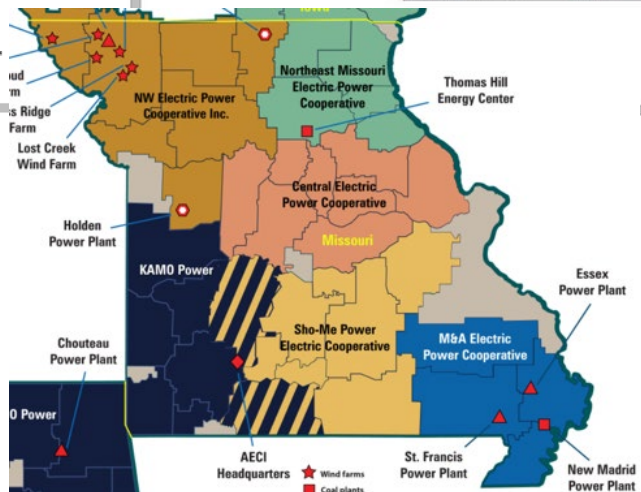
- Cooperation and Collaboration from All Missouri Electric Utilities
- Regional Transmission Organizations and other Stakeholders

Maintain Balance of Reliability and Affordability

- Customers Expect and Demand Safe and Reliable Electric Service
- Impact of Costs on All Customers



DISCLAIMER: This map is provided by the Missouri Public Service Commission for informational purposes only, and should not be relied on for actual locations.





“Plans are worthless, but
planning is everything.”

Dwight D. Eisenhower

POWER

MO

MO

