Welcoming Remarks

Secretary Suzie Jaworowski

Introductions

Order of Presentations

- Representative Soliday, 21st Century Task Force & 5 Pillars
- Luke Wilson, IURC, Indiana's Energy Landscape
- Sunil Maheshwari, Purdue, Indiana's Energy Demand Forecast
- Henry Wilhelmus, DOE National Energy Forecast
- Luke Wilson, IURC, NERC Long Term Reliability Assessment Report
- Bob Kuzman, MISO, MISO Updates
- Jill Gates, PJM, PJM Updates

Strategic Energy Growth Task Force:

21st Century Energy Policy Task Force

October 6, 2025

21st Century Energy Policy Task Force

- Established by HEA 1278 – 2019, extended by HEA 1220 – 2021
  - Approaching energy supply/demand ”Duck Bill”
  - Business organizations requests for a statewide energy policy.
  - One major utility creative contracts allowing major customers pass-through access to energy markets.
- **Task Force Overall Goal: Create a Foundational Statewide Energy Policy**
- **Operating Biases:**
  - Keep Indiana competitive to attract and supply business and residential energy consumers with reliable, affordable energy
  - Ensure Indiana's energy policy is flexible enough to respond to the Federal political volatility.
  - Be Data Driven

Task Force Composition

- Voting Membership
  - Co-chaired by House and Senate Energy Chairs
  - Bi-Partisan legislative members from both Senate & House
  - Academia
  - Regulators
  - Industry
- Over 200 expert witnesses
- 20, 6-hour meetings over 4 years
- Complete record of meeting, testimony, submissions, findings and recommendations located at:
  - IGA Interim Study Committees website

21st Century Energy Policy TF Outcomes

- The TF Recommended 5 Foundational Pillars to **establish Indiana's STATUTORY energy policy.** (Codified by HEA 1007 – 2023.)
    - IC 8-1-2-0.6 specifically states Indiana energy policy requires all IURC energy actions regarding electricity generation, infrastructure, and ratemaking address **all** of the 5 pillars.
- Other key recommendations of the Task Force included:

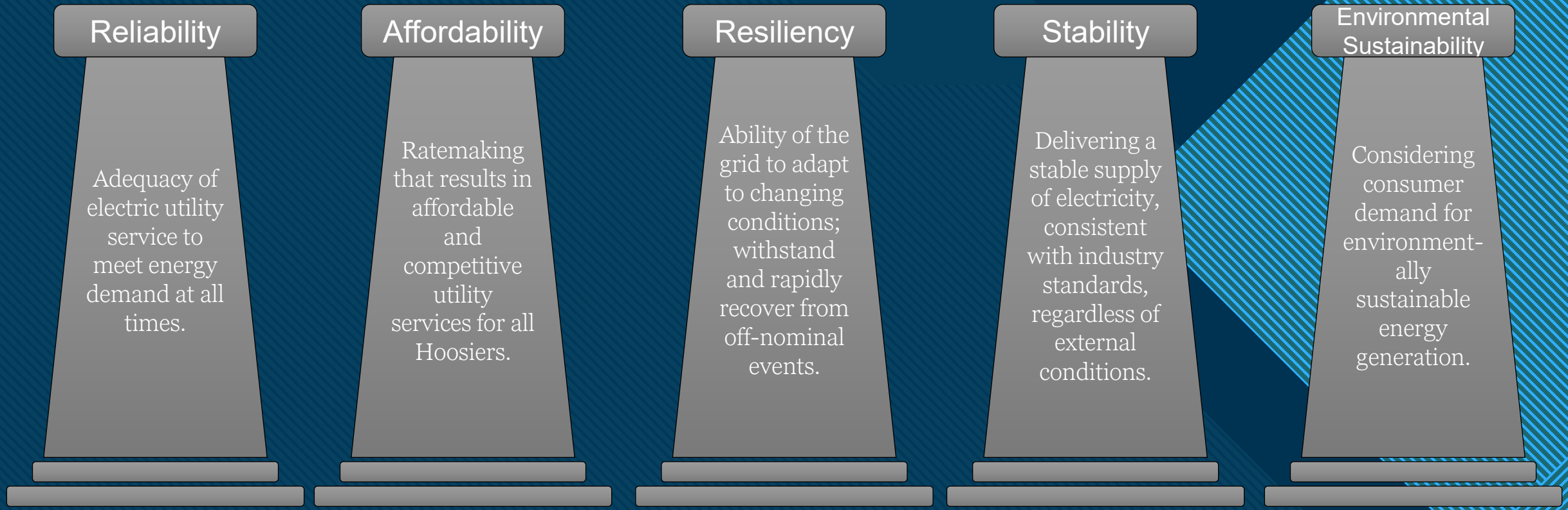
1. Recommmended statewide reliability standards. (Enacted by HEA 1520 – 2021, updated in 2023 with stricter standards HB1007-2023, HB1007 – 2025 Requirements for Generating Facility Retirements)
2. Recommended Independent study of Small Modular Reactor Potential (OED funded Purdue Study Completed 2024)
3. Recommended study of alternate rate designs. (Study required by HEA 1007 – 2023, Completed 2025)
4. Providing incentives/programs for redevelopment of land previously used for mining or energy generation. (Enacted by SEA 425 – 2025)

Relevant Legislation

Bill Number	Session Year	Author	Roll Calls		Significance	Citations Affected
			House	Senate		
HEA 1007	2025	Soliday	63 – 23	36 – 13	SMR manufacturing incentive, establishes EGR plans, generation retirement requirements.	6-3.1; 8-1
SEA 422	2025	Koch	96 – 0	49 – 0	Advanced transmission technologies deployment and report.	8-1
SEA 423	2025	Koch	67 – 29	34 – 12	SMR partnership pilot program.	8-1
SEA 424	2025	Koch	59 – 30	32 – 15	SMR project cost recovery.	8-1
SEA 425	2025	Koch	51 – 40	31 – 19	Energy production zones.	8-1; 14-11; 36-1; 36-7
SEA 431	2025	Koch	94 – 0	49 – 0	Foreign adversary data facilities	8-1
HEA 1007	2023	Soliday	93 – 2	48 – 0	Establishes the 5 Pillars, Adequacy Requirements, PBR study.	8-1
HEA 1417	2023	Soliday	68 – 28	33 – 15	Asset depreciation and retirement, deferred costs.	8-1
HEA 1420	2023	Soliday	55 – 39	32 – 17	Transmission ROFR	8-1
HEA 1421	2023	Soliday	65 – 29	31 – 10	CPCN issuance deadline reduction, clean energy project incentives.	8-1; 14-8
HEA 1520	2021	Soliday	93 – 0	50 – 0	Reliability adequacy metrics.	8-1
HEA 1470	2019	Soliday	74 – 19	33 – 14	Increases TDSIC flexibility.	8-1
SEA 560	2013	Hershman	75 – 21	42 – 7	Establishes TDSIC	6-1.1; 8-1; 8-23; noncode.

The 5 Pillars Energy Policy

IC 8-1-2-0.6



Recommended to the General Assembly by the 21st Century Energy Policy Task Force, enacted by HEA 1007 – 2023.

HB1520-2021 Key Provisions

- Each Year Utilities Must Report to the IURC Rolling 3 Year Inventory:
  - Capacity, Location and Fuel Source for Each Generating Facility
  - Capacity under Contract to be Provided to Consumers
  - Planned Reserve Margins
  - Adequacy Metrics as Forecast for Rolling Three Years
- If IURC Determines Resources Are Not Adequate to Meet 85% of Demand and Reserve Margins, They May:
  - Conduct an Investigation, if Results Indicate Inadequate Supply
  - IURC Must Order a Utility to Present a Plan within 90 Days to Acquire or Build Capacity to Meet Forecast Demand plus Margins

HB1007-2025 Key Provisions

- Provides SMR Manufacturer Incentives to Locate in Indiana
  - Credit Against State Tax Liability For SMR Manufacturing Expenses
- Provides for Expedited Generation Resource Plans
- Provides Requirements for Retiring or Repowering a Generation Facility
  - Utility May petition to retire or repower a facility up to three years in advance
  - IURC Must Conduct an Investigation and Issue an Order
  - Utility Must Show Equal Replacement Capacity
  - Utility Must Show Economic Benefit to the Consumer

TDSIC -SEA 560-2013 and HB1470-2019

- TDSIC (Transmission, Distribution, and Storage System Improvement Costs) SEA 560 to encourage utilities to replace aging infrastructure..
- Allows utilities to recover 80% of infrastructure improvement costs approved by the IURC, deferring 20% until the next rate case.
    - TDSIC Plan must be pre-approved by IURC
    - Ratepayers were given additional protection through a 2% cap on utilities' revenue earned through a TDSIC tracker.
- TDSIC gives ability to prioritize resources to address aging infrastructure issues that would result in more expensive costs for ratepayers in the long term.
- Investment in the Future

CWIP

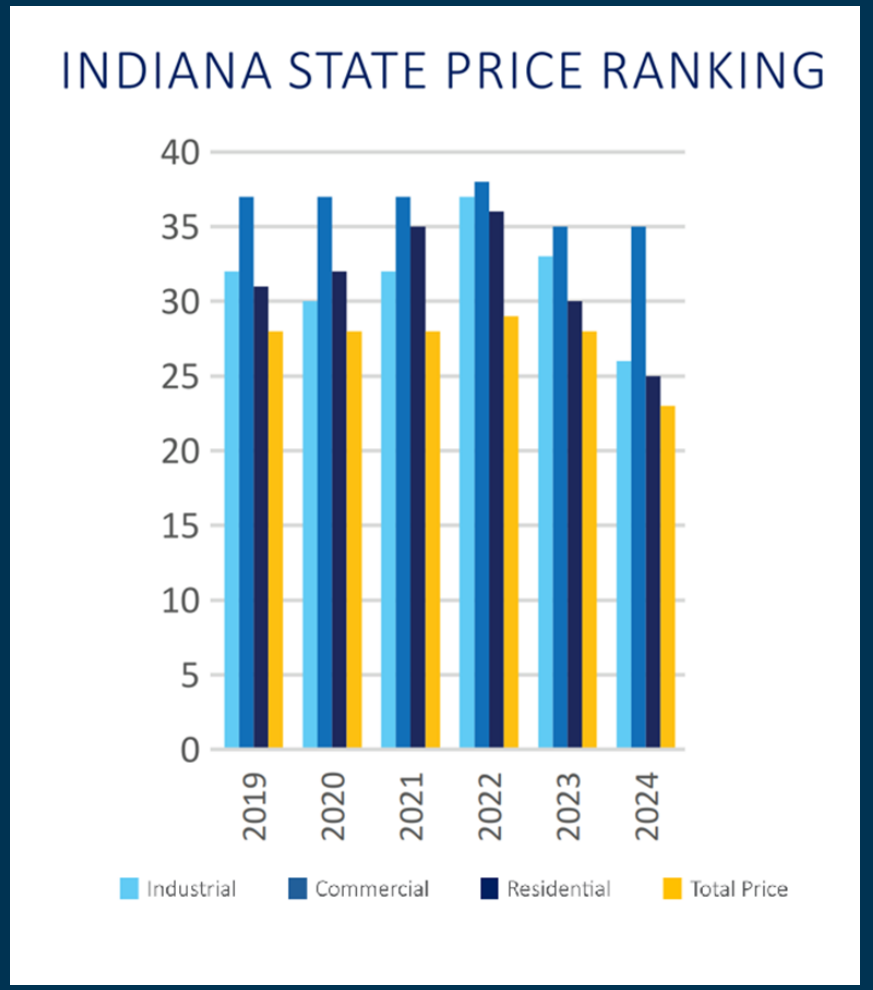
- Construction Work in Progress (CWIP) allows utilities to seek marginal rate increases for ongoing projects avioding significant rate increase upon completion of the project.
- CWIP prevents ratepayers from having to pay for higher interest on bonds utilities would have to acquire otherwise.
- Most notably, CWIP has been used to replace aging resources:
  - Utilized in replacing and rebuilding generation units .
  - Funding large transmission infrastructure projects.
  - Future Generation Projects

CPCNs

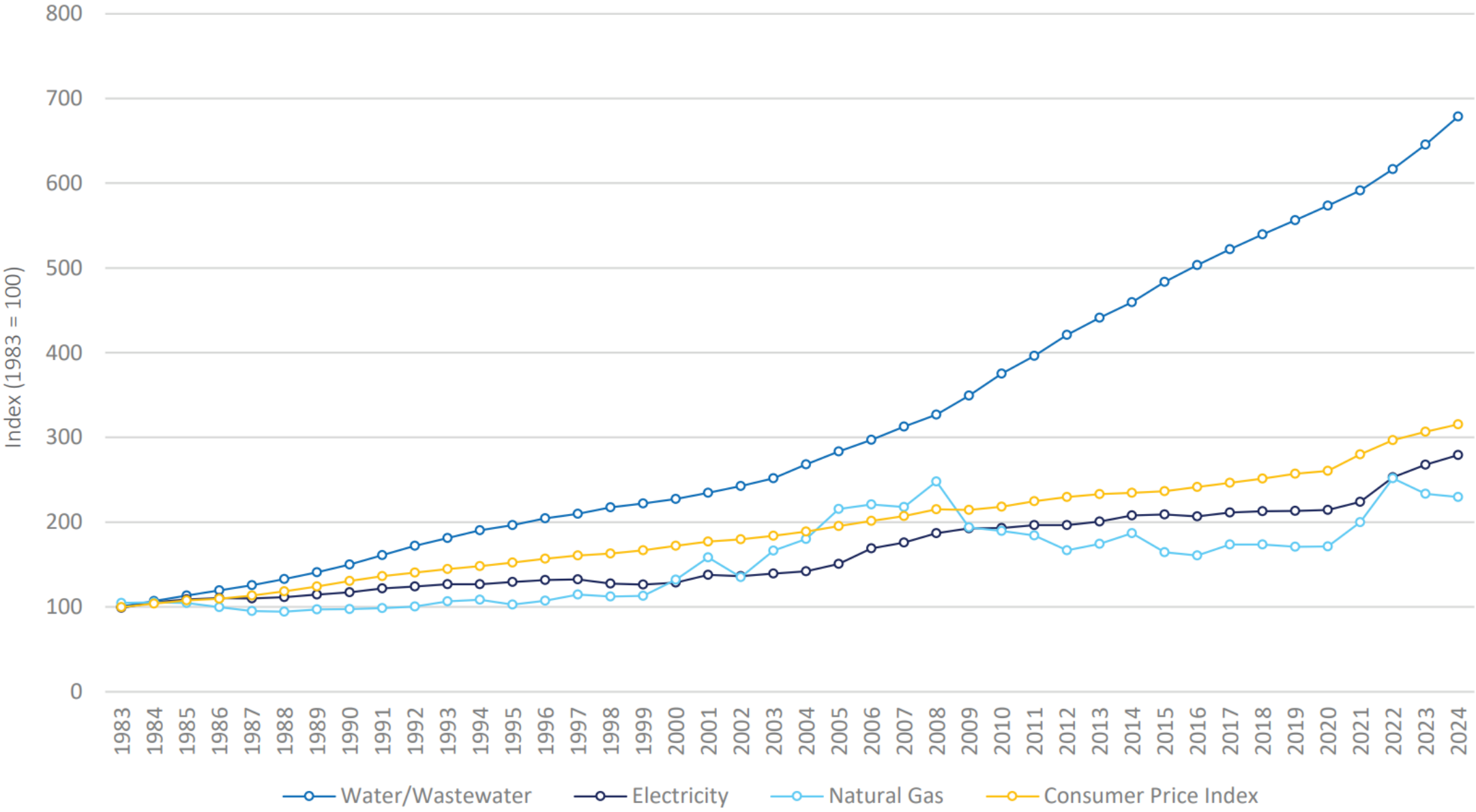
- A Certificate of Public Convenience and Necessity (CPCN) is required for a utility to build, lease, or purchase a facility for generating energy to furnish public service. (IC 8-1-8.5-2)
- CPCNs allow the IURC to comprehensively vet projects being undertaken by utilities that will have financial impact on Hoosier ratepayers.
- The current CPCN process allows for utilities to pursue a variety of projects to better serve Hoosiers, including developing SMRs.
    - Achieved through SEA 423 – 2025.
- Energy generation being brought online through a CPCN to replace other energy generation is subject to the same reporting and justification requirements as retiring energy generation. Time for Order issuance reduced from 300+ days to 220 days
    - Enacted through HEA 1007 – 2025.

Impact of the Task Force

- Legislation based on the recommendations of the 21st Century Energy Policy Task Force has made energy more affordable for Hoosiers.
- Indiana's national electricity affordability ranking has improved from 28th (2022) to 23rd (2024) least expensive.
    - This is a complete turnaround from the state total prices consistently becoming more expensive since 2015.
- Apart from Kentucky, Indiana has the most affordable electricity prices of all of its neighboring states.
- Renewable Tax Credit Expiration May Further impact Rankings?
- Electric and natural gas utility prices have consistently been kept lower than the Consumer Price Index.



COMPARISON OF UTILITY PRICES



Legislative Outlook

1. Performance-Based Ratemaking (PBR)
    1. Multi-Year Rate Plans
    2. Performance Incentive Mechanisms (PIMs)
2. Rate Relief for low-income customers
3. Operating Bias for Data Driven Legislation
    1. Avoid Hyperbole
    2. Avoid Click Bait

Indiana's Energy Landscape

INDIANA UTILITY REGULATORY COMMISSION
Luke Wilson, Executive Director of External Affairs

10/6/25

OUTLINE

- IURC & Other Regulatory Entities
- Generation Planning & Transition
- Resource Adequacy

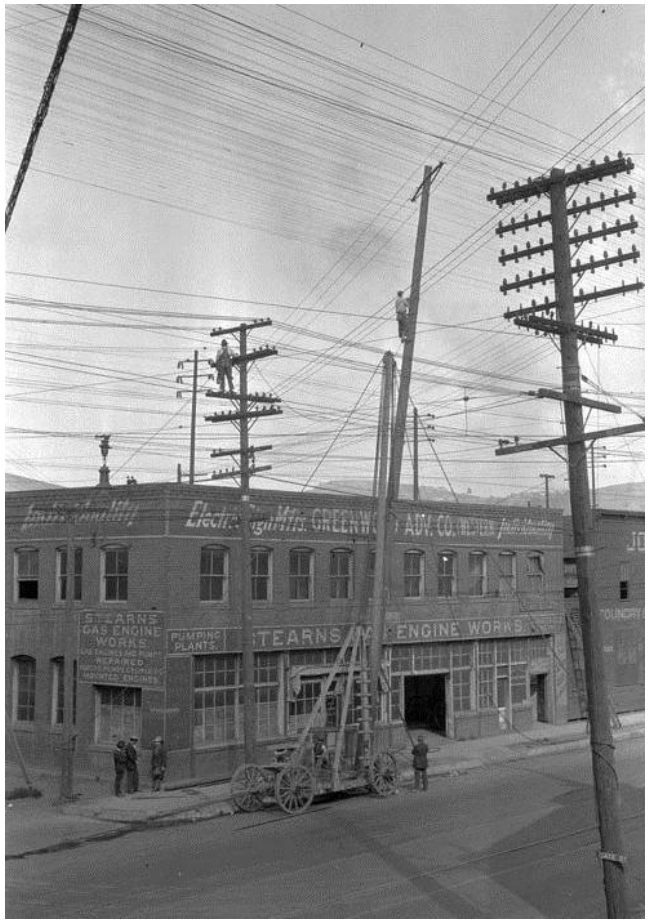
UTILITY REGULATION

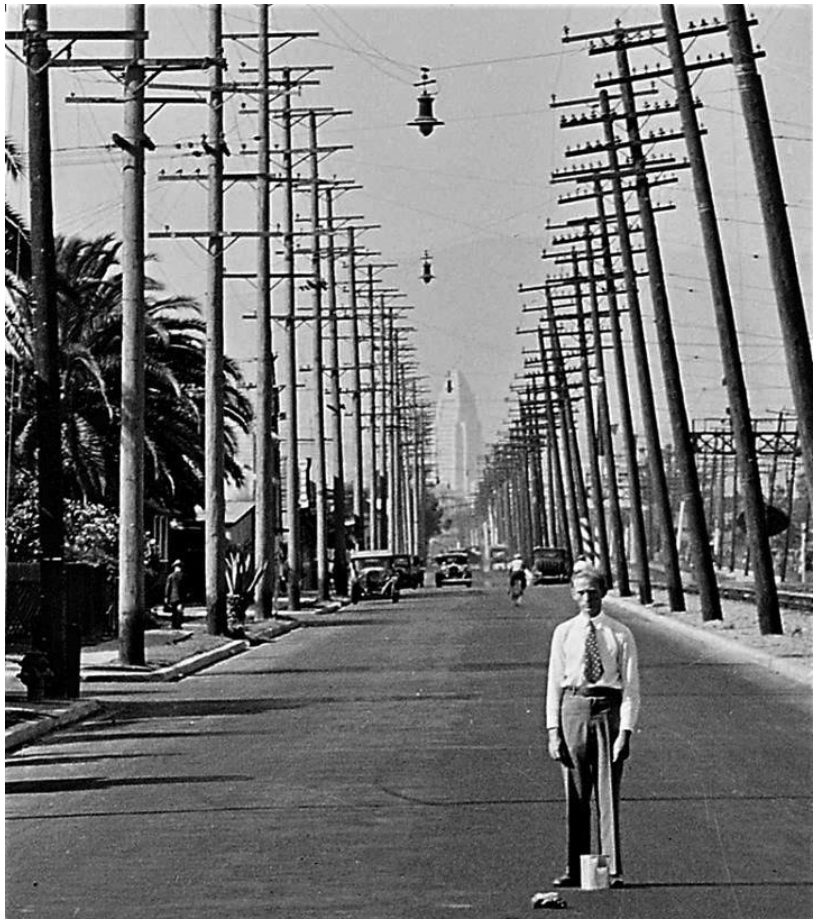
- Utilities have generally been considered a *natural monopoly* because of the significant capital investments necessary to build the infrastructure to serve customers.

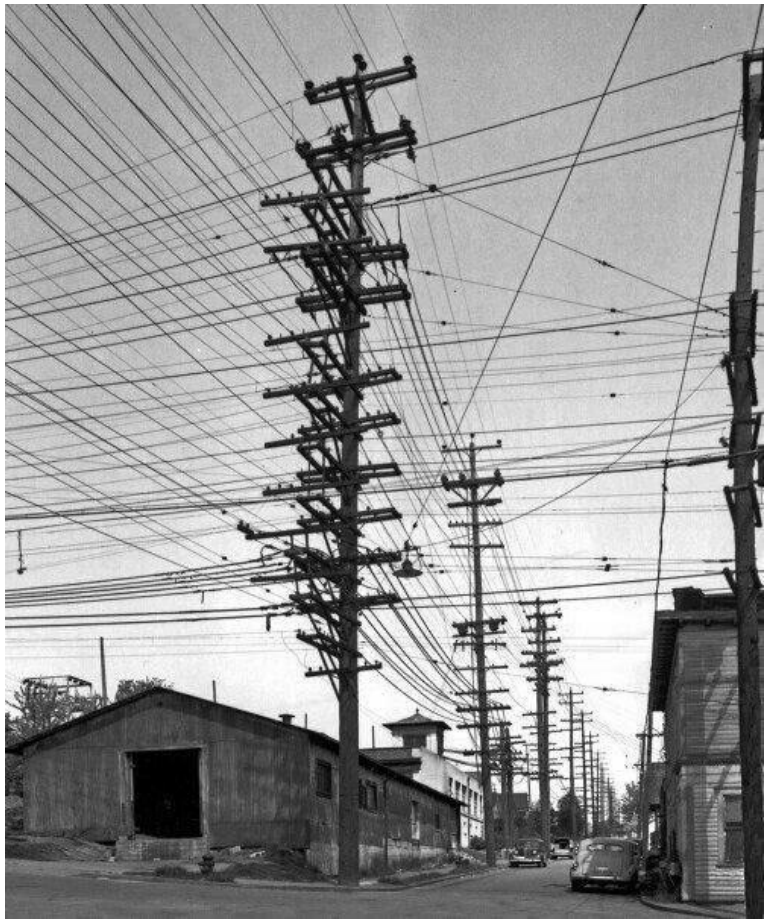
- To avoid the high costs of unnecessary duplication, utilities are generally granted a specific, or exclusive, retail service territory by the government.

- Utilities must serve the public safely and reliably without discrimination. The government then regulates and sets the rates and charges of the utilities.

UTILITY REGULATION







THE IURC's ROLE

- The IURC regulates the rates and charges of utilities under its jurisdiction.
- The IURC uses 'cost of service' ratemaking to determine the amount of revenues necessary for a utility to provide safe and reliable service while having an opportunity to earn a reasonable return on their investments.
- The IURC is required by law to be an impartial fact-finding body and hears evidence in cases filed before it and makes decisions based on the evidence presented in those cases.

THE IURC's ROLE

- The IURC ensures that *retail* utilities are meeting their **resource adequacy requirements** (i.e. providing safe and reliable service)

- Utilities submit **integrated resource plans (IRPs)**, every 3 years demonstrating how they plan to meet their forecasted demand with a generation portfolio over the next 20 years.
  - Want lowest cost reasonably possible while maintaining flexibility.

- The IURC approves utilities building new generation facilities and ensures cost recovery for investments made in generation, transmission, and distribution infrastructure that are found prudent.

ELECTRIC UTILITY REGULATORY PARTNERS

- Federal Energy Regulatory Commission (FERC)
- North American Electric Reliability Corporation (NERC)
- Regional Transmission Organizations (RTOs)
  - MISO & PJM
- ReliabilityFirst

FEDERAL ENERGY REGULATORY COMMISSION (FERC)

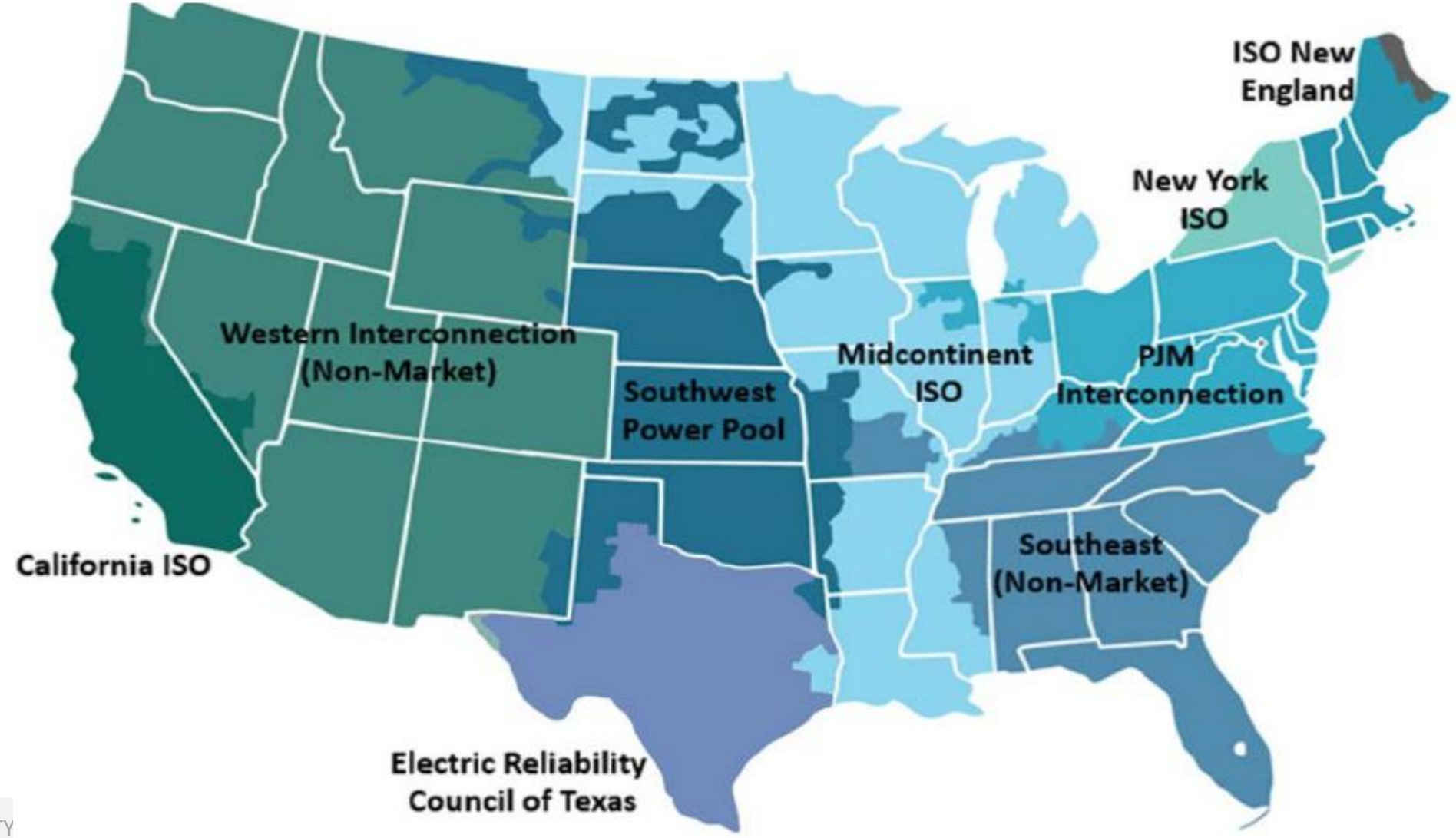
- The federal agency that oversees the nation's bulk power system.
- FERC regulates both the high-voltage transmission system and wholesale sales of electricity, among other things.
  - FERC oversees regional transmission organizations.
- Sets mandatory reliability standards
  - FERC oversees the North American Electric Reliability Corporation

REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)

- RTOs are independent organizations that plan and control the transmission grid to improve the economics and reliability of the wholesale electric markets.

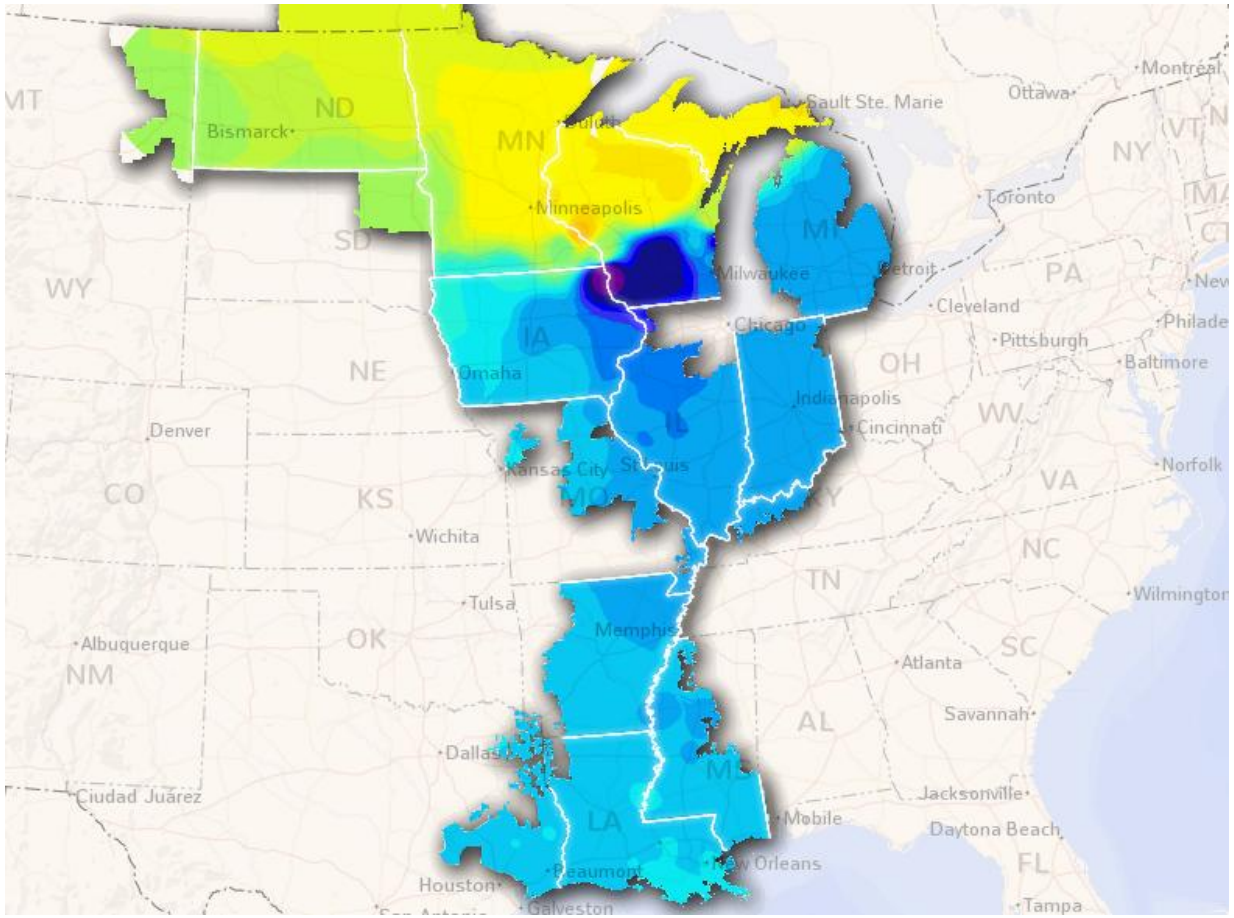
- They provide three main functions:
  - **Planning** - transmission system and regional resource needs.
  - **Operations** – matches supply with demand by coordinating generation output and transmission.
    - Think air traffic controller for electrons.
  - **Markets** – provides economic dispatch of resources to ensure the lowest cost combination of resources are used.
    - Think stock market for electrons.

REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)



REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)

October 6, 2025 around 6:50am



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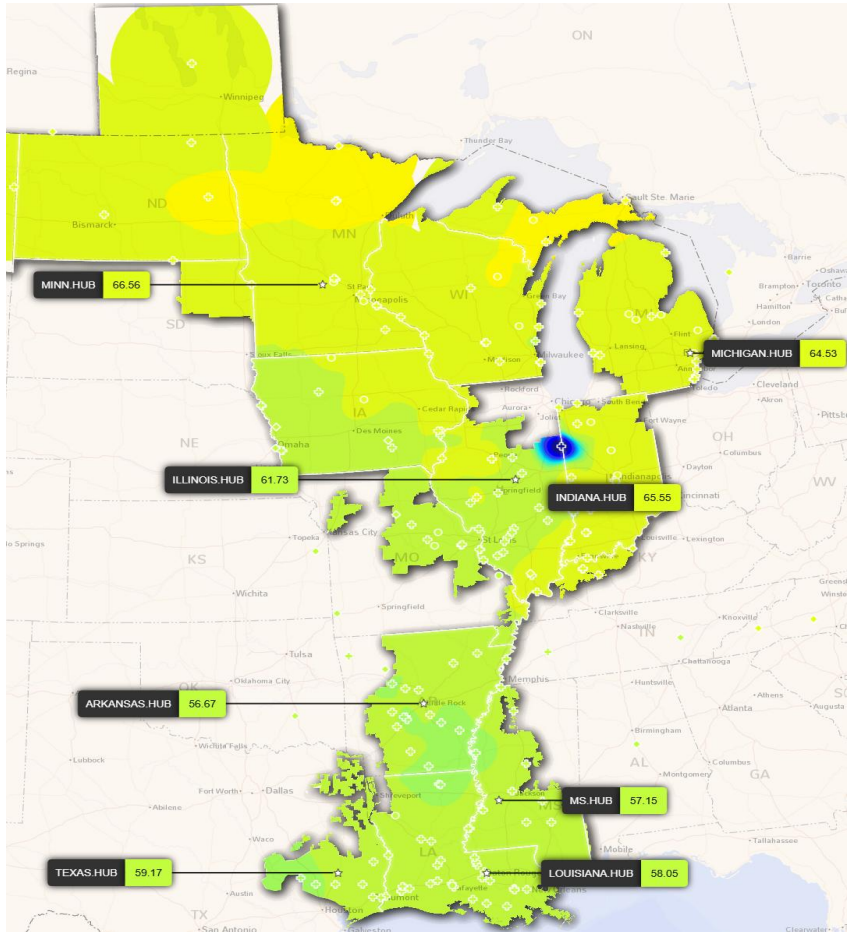
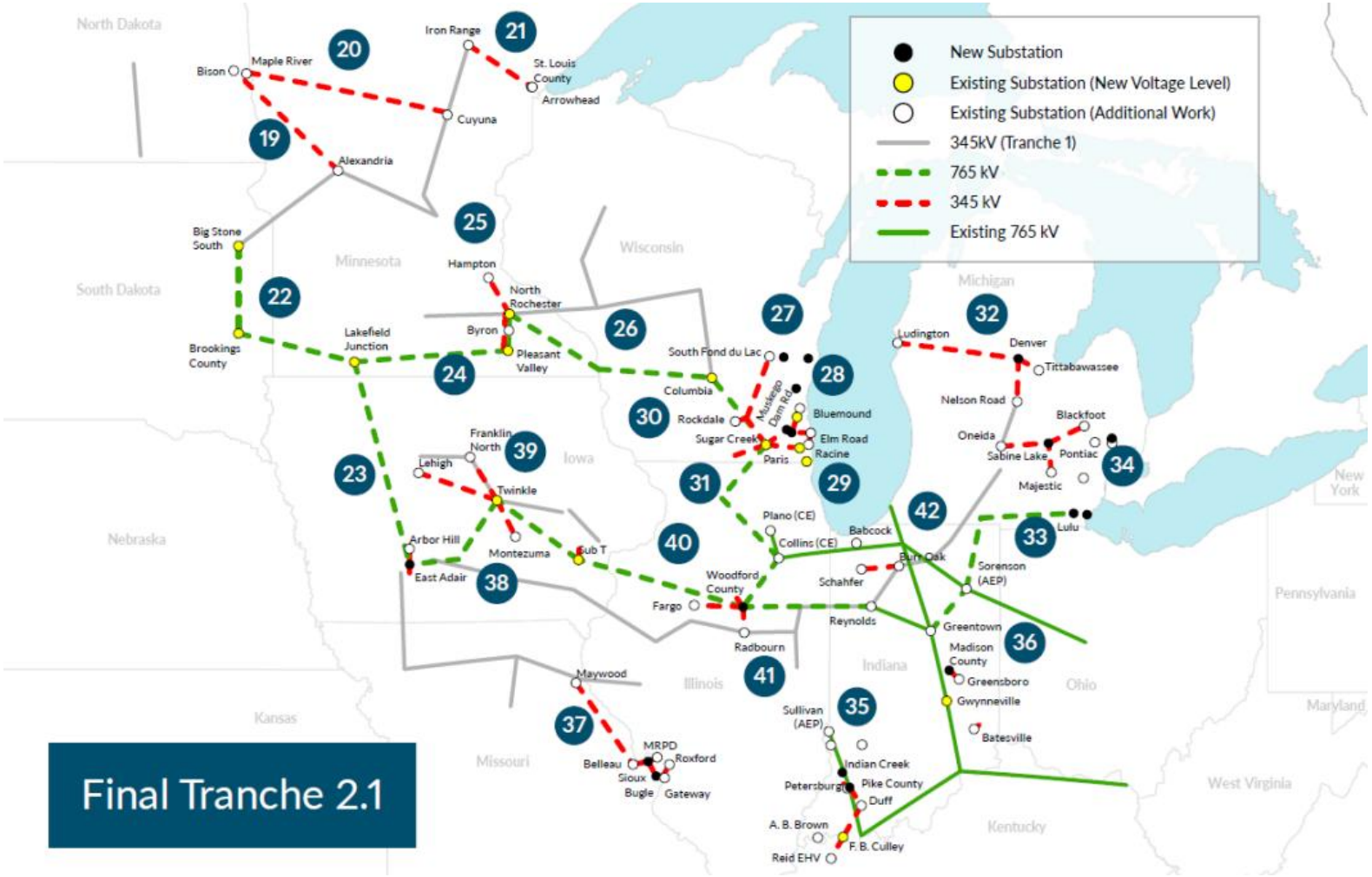


REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)

MISO
Control Room

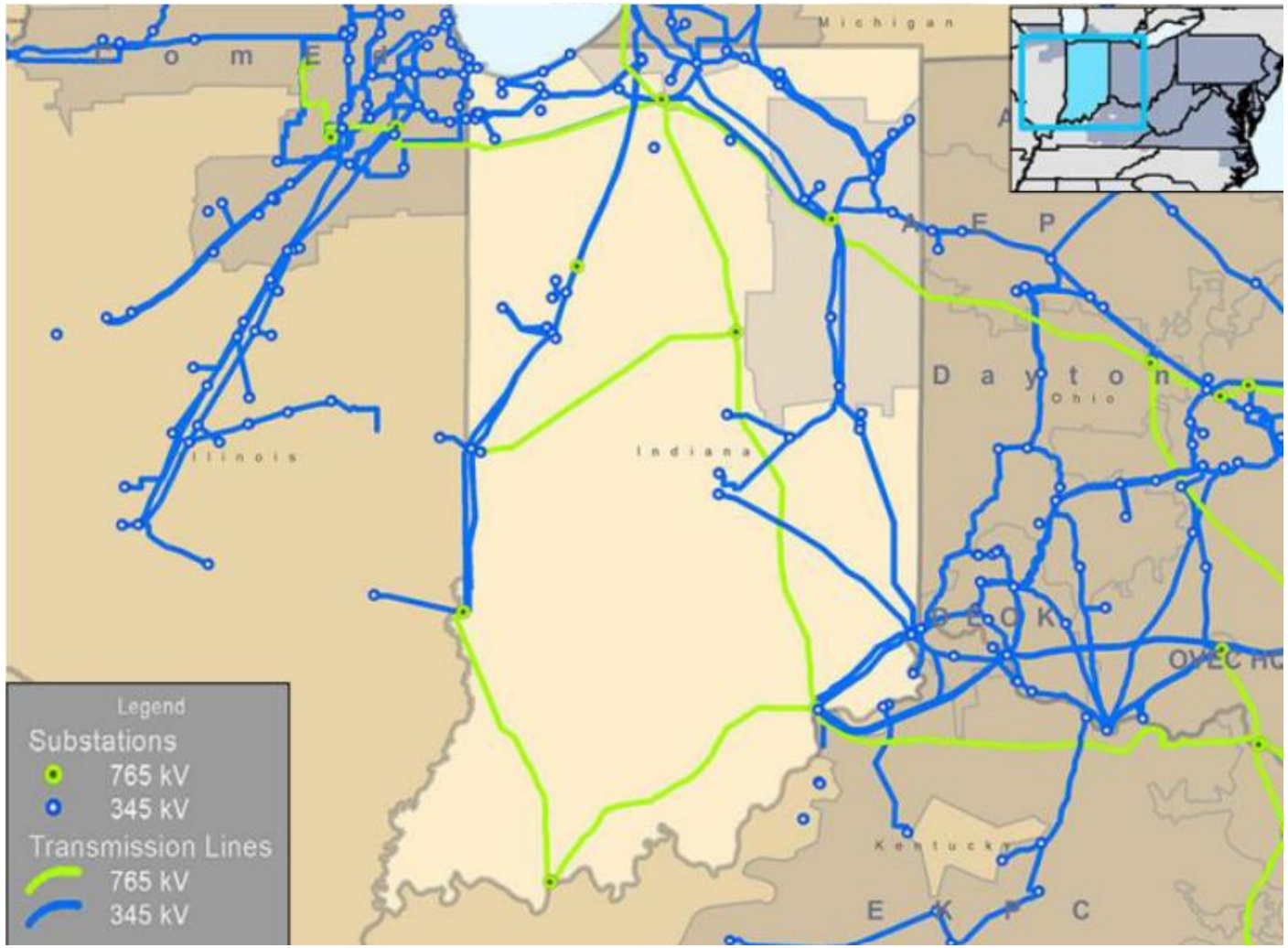
REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)

MISO Transmission Planning



REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)

PJM
Transmission
in Indiana



REGIONAL TRANSMISSION ORGANIZATIONS (RTOS)

- MISO includes Duke Energy, CenterPoint Energy, NIPSCO, AES Indiana, and Hoosier Energy.
- PJM encompasses Indiana Michigan Power.
- Indiana Municipal Power Agency & Wabash Valley Power Alliance participate in both RTOs.

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION (NERC)

- Established as the non-profit regulatory authority responsible for the reliability of the bulk power system in North America (USA & Canada).

- NERC accomplishes this by:
  - Developing and enforcing reliability standards
  - Providing seasonal and long-term reliability assessments annually
  - Offering education and training to industry personnel

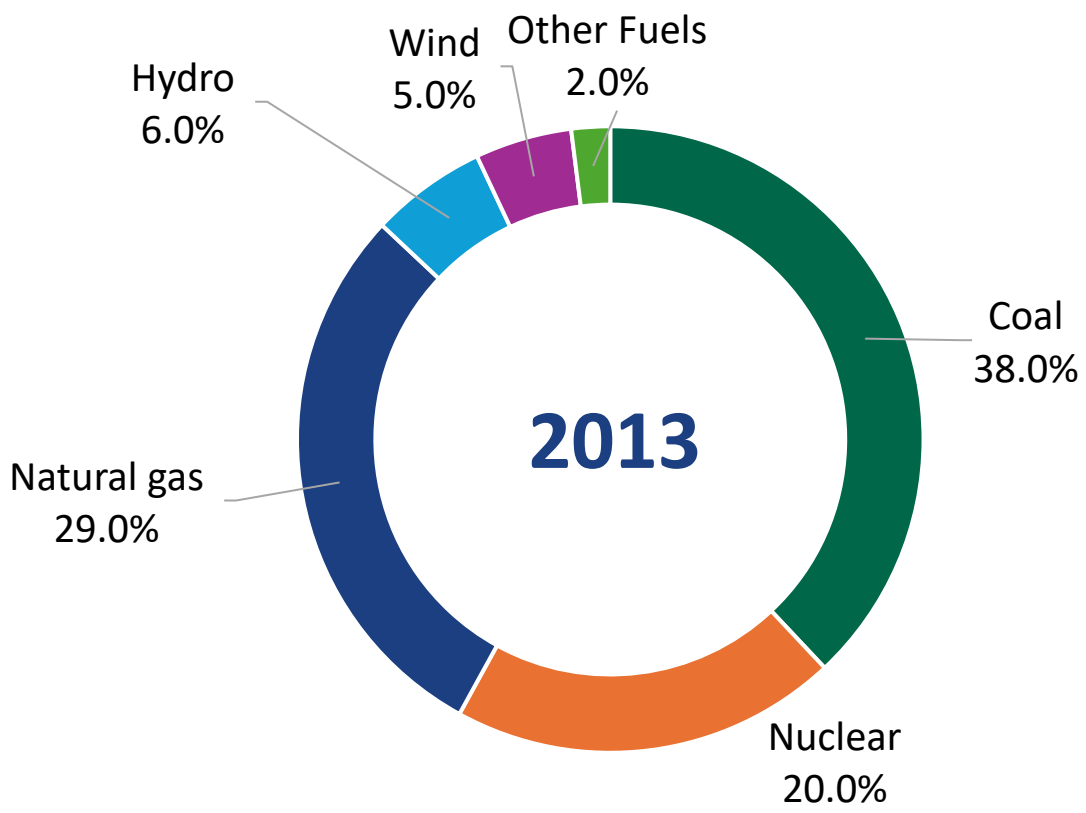
ReliabilityFirst

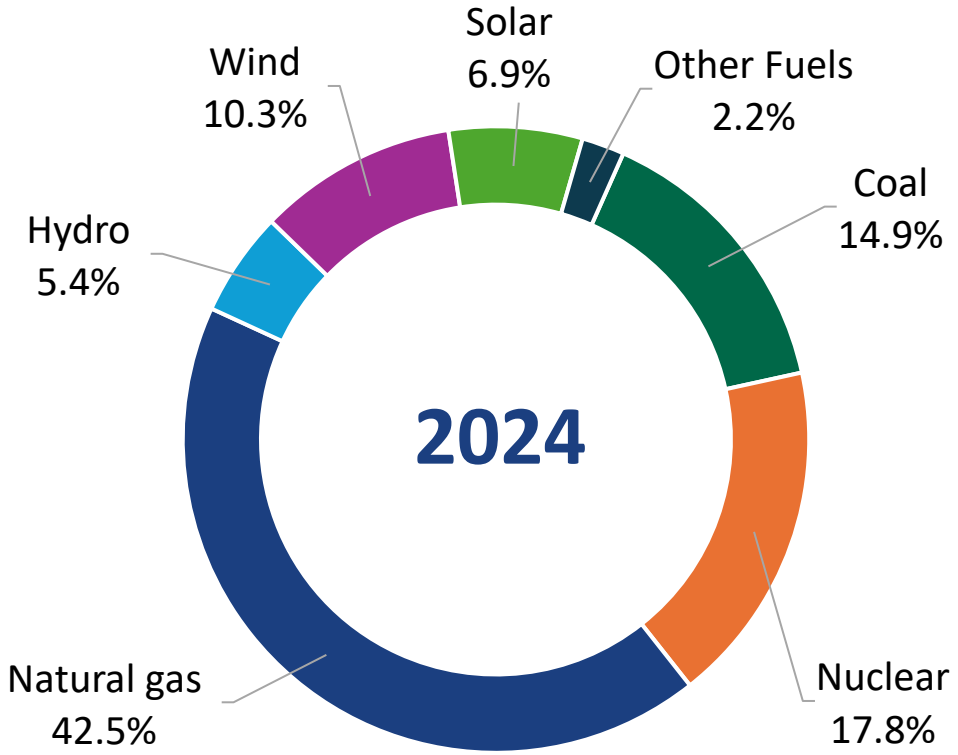
- Operates as the Electric Reliability Organization for the region Indiana is in.
  - Provides training and analysis to utilities on the reliability and security of their systems.
  - Audits compliance with mandated standards
  - Serves as an independent source for state bodies to utilize on energy policy decisions.
  - ReliabilityFirst is subject to FERC jurisdiction.

GENERATION PLANNING & TRANSITION

Generation Mix Transition

United State's Generation Fuel Mix

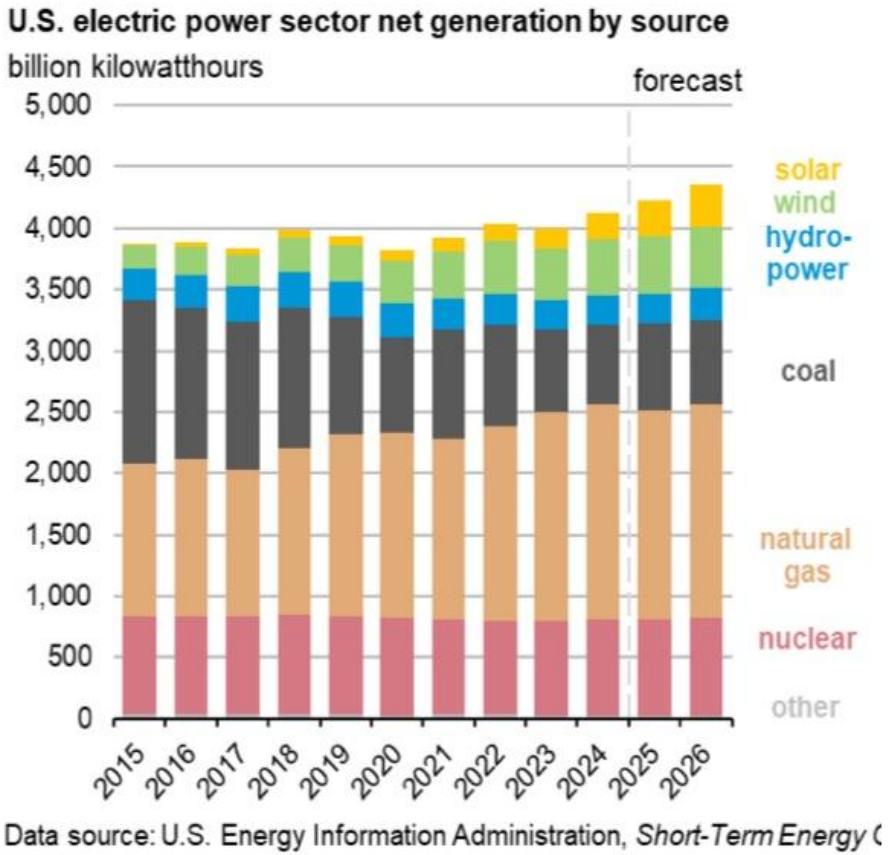




**Numbers are rounded from EIA data*

Generation Mix Transition

United State's Generation Fuel Mix



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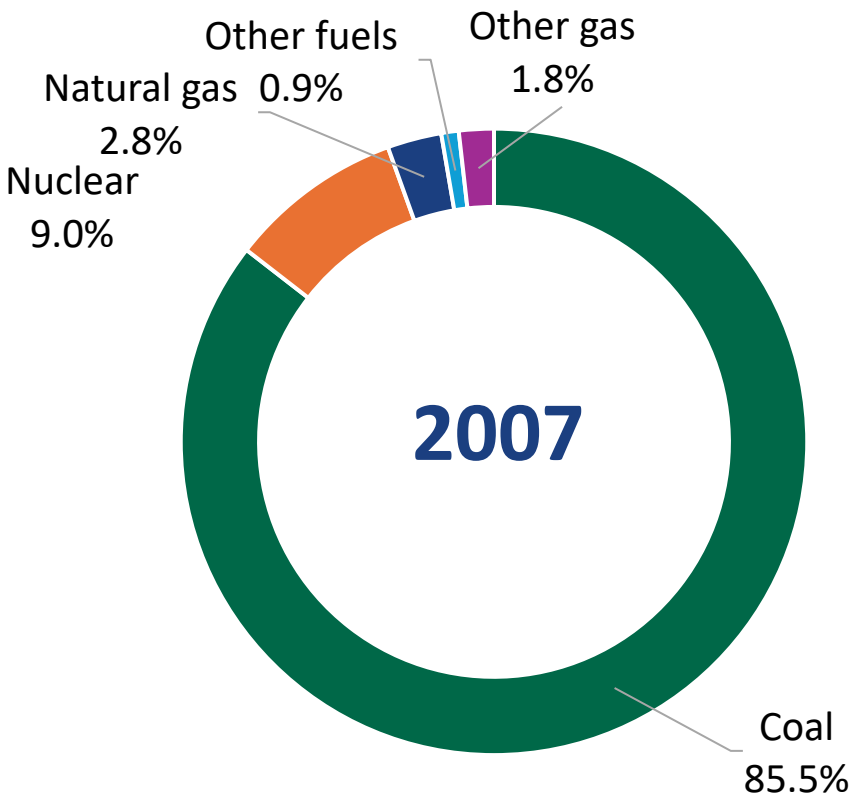
Generation Mix Transition

Indiana's Generation Fuel Mix



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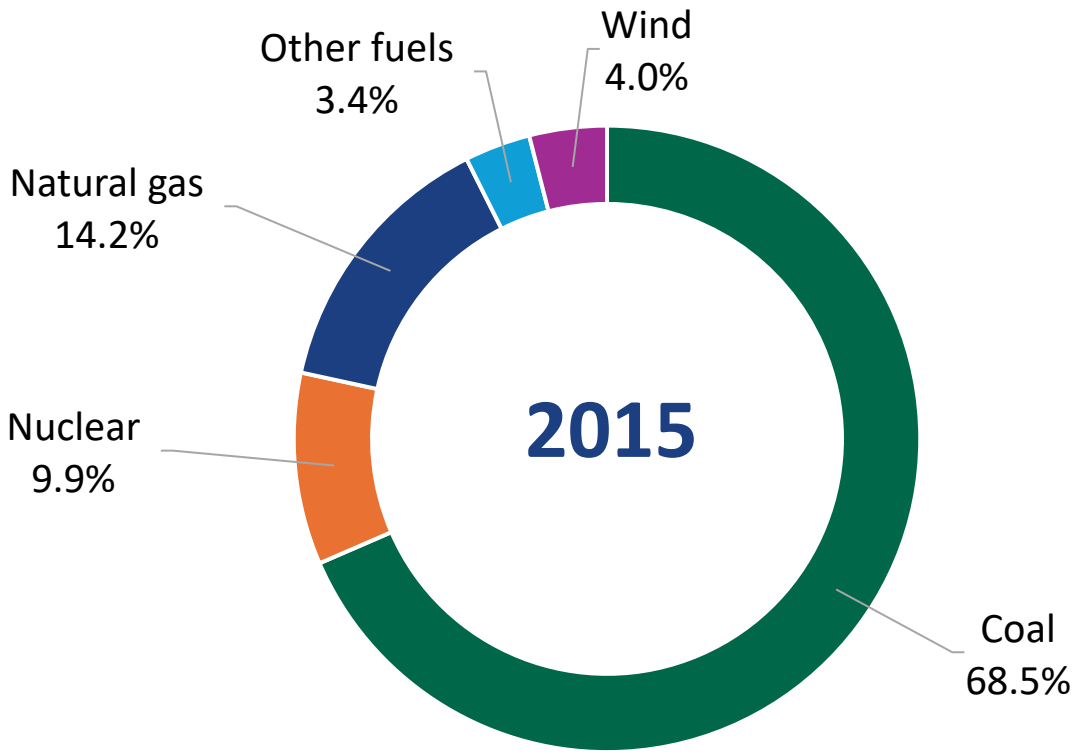
Generation Mix Transition

Indiana's Generation Fuel Mix



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Generation Mix Transition

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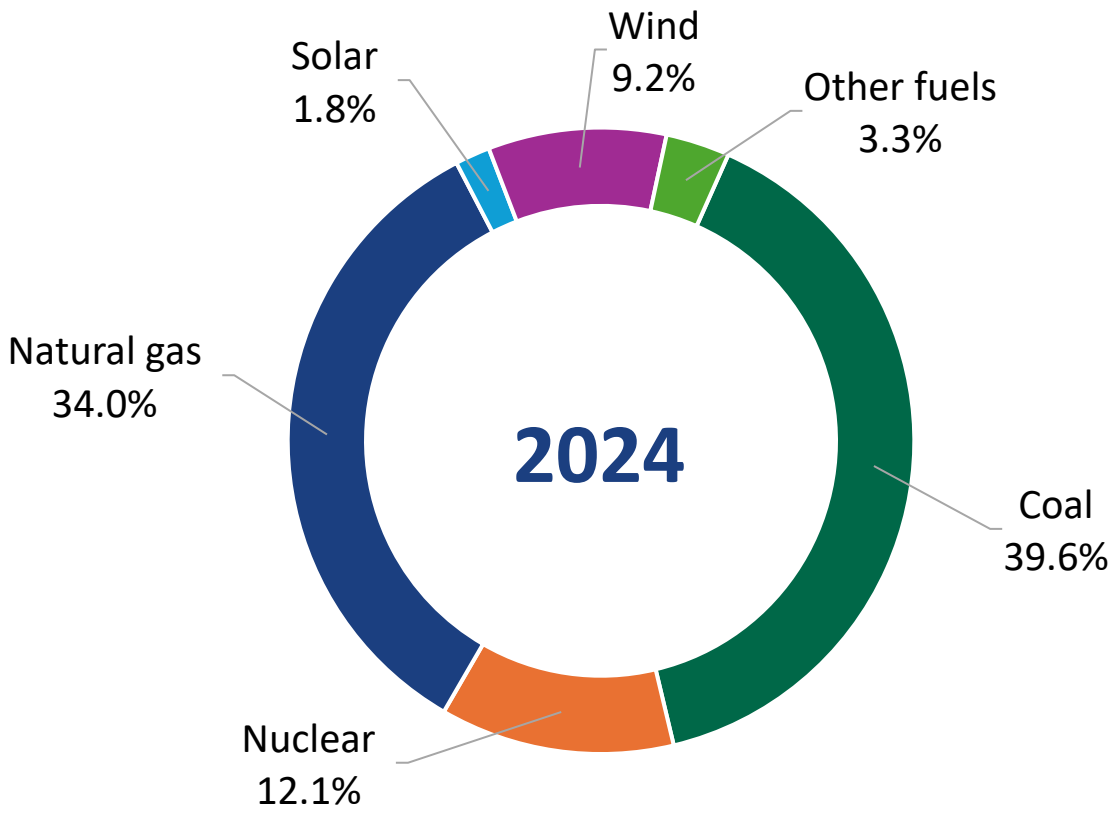


**Numbers are rounded from EIA data*

Generation Mix Transition

Indiana's Generation Fuel Mix

Resource	2007	2015	2024	Change
Coal	85.5%	68.5%	39.6%	-45.9%
Natural Gas	2.8%	14.2%	34.0%	31.2%
Nuclear	9.0%	9.9%	12.0%	3%
Wind	0%	4.0%	9.2%	9.2%
Solar	0%	0.1%	1.8%	1.8%
Other (e.g. hydro)	2.7%	3.3%	3.3%	0.6%

**Numbers are rounded from EIA data*

Generation Mix

In-State Generation Resources (Net Summer Capacity)

Resource	MW
Coal	12,721
Natural Gas	8,679
Hydro	72
Wind	3,652
Solar	3,754
Biogas	49
Other gas (e.g. CHP)	384
Petroleum	84
Total	**29,394**
Cook Nuclear Plant	1,460 (IN customers)

- This includes every generation resource in the state that reports data to EIA, including private generation resources, such as industrial combined heat and power (CHP) units .

Source: EIA 860-M (August 2025)

Generation Mix

Generation Resources Serving Hoosier Customers

Resource	MW
Coal	10,290
Natural Gas	7,083
Hydro	56
Wind	2,256
Solar	2,665
Biogas	17
Petroleum	48
Cook Nuclear Plant	1,460
Total	**23,875**

- Generation resources used by retail utilities to serve Hoosiers
- Does not include resources below 10MW
- Does not include short-term capacity contracts or power purchase agreements between utilities

Source: IURC 2025 Annual Report

What Do These Charts Show?

- Electric generation transition happening slowly but surely

- What has been the story over the last 20 years?
  - Retirements of thermal generation (coal, oil, and some natural gas)
  - The growth of renewable generation (wind and solar)
  - The growth of natural gas generation

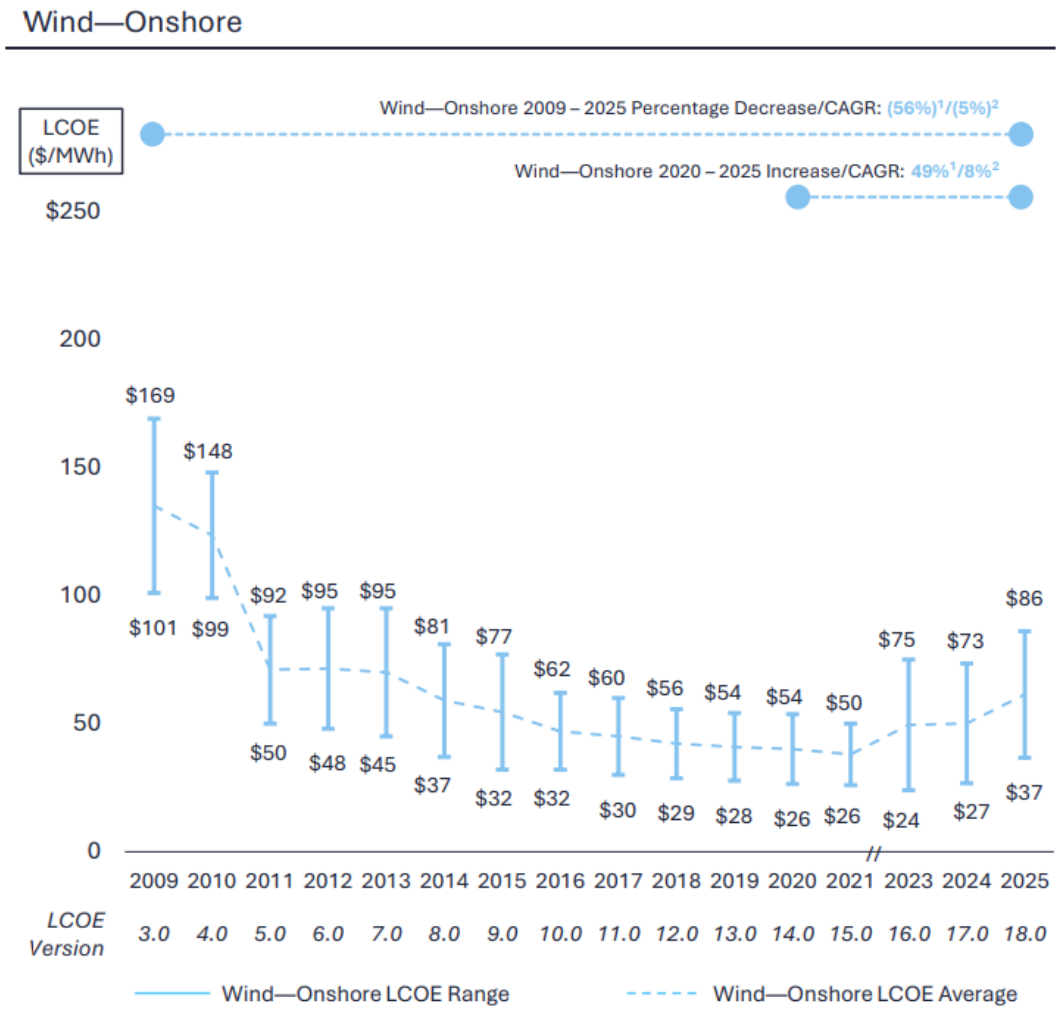
ELECTRIC GENERATION TRANSITION

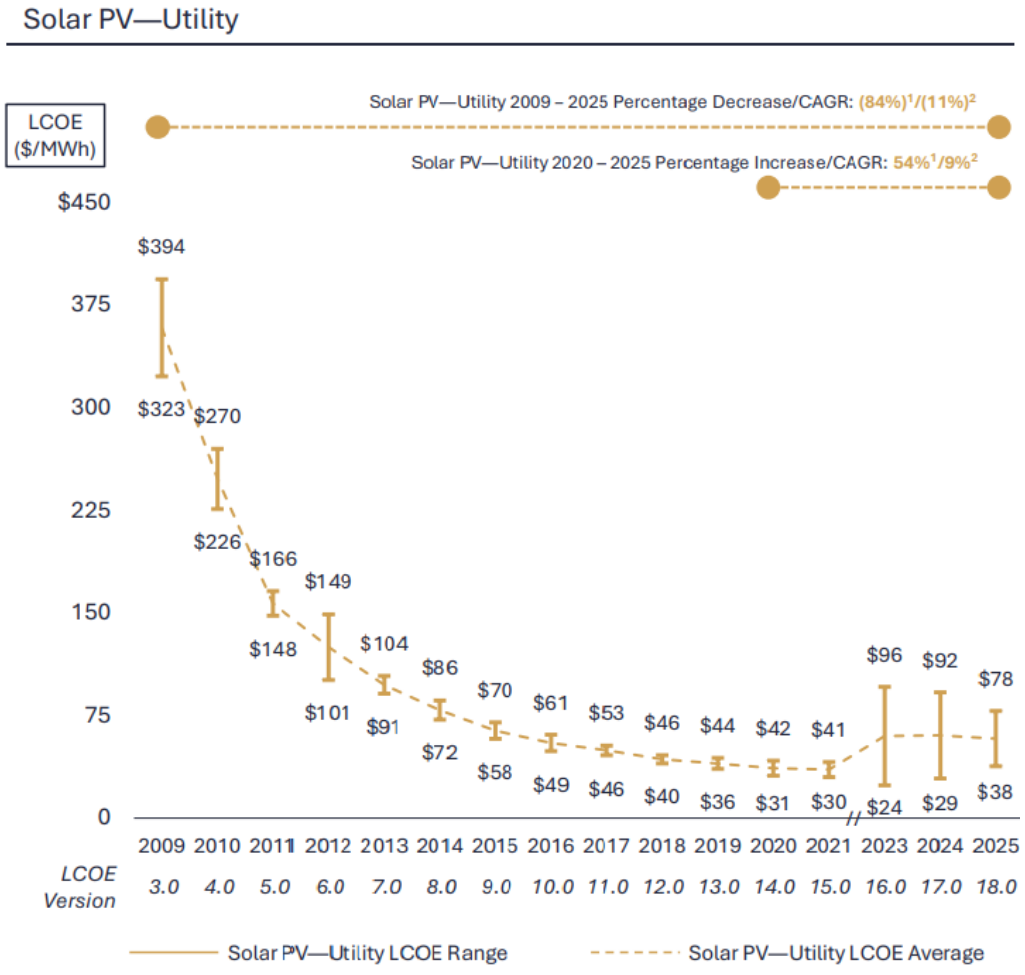
- What is behind the transition?
  - Energy market economics
  - Federal and state policies
  - Aging generation plants (natural build cycle)

What Has Driven Renewable Energy Growth?

- Relatively lower capital costs compared to traditional thermal generation.
  - Capital costs have decreased over time as renewable energy manufacturing and commercialization grew.
- No fuel costs to produce electricity & lower maintenance costs.
- Favorable tax treatment (production & investment tax credits)

What Has Driven Renewable Energy Growth?





What Has Driven Renewable Energy Growth?

- Increased outages and higher maintenance costs for aging plants.
  - NERC has said that “aging generation facilities present increased challenges to maintaining generator readiness and resource adequacy.”
  - A NERC analysis of increased outages confirm industry statements that there has been reduced maintenance investment in older generation units and increased cycling of baseload units.

Integrated Resource Planning

- Retail-serving electric utilities in the state are required to submit Integrated Resource Plans (IRPs) every 3 years.

- The five investor-owned electric utilities, the Indiana Municipal Power Agency (IMPA), Hoosier Energy, and Wabash Valley Power Alliance (WVPA) file IRPs.
  - IMPA has 61 municipal utility members
  - Hoosier Energy has 17 REMC members
  - WVPA has 21 REMC members

Integrated Resource Planning

- IRPs are 20-year power resource plans that help guide generation investments for the utility.
- The objective is to provide safe and reliable power at the lowest delivered cost reasonably possible.
- However, IRPs must be flexible to account for changing economics, public policy, and electric demand.

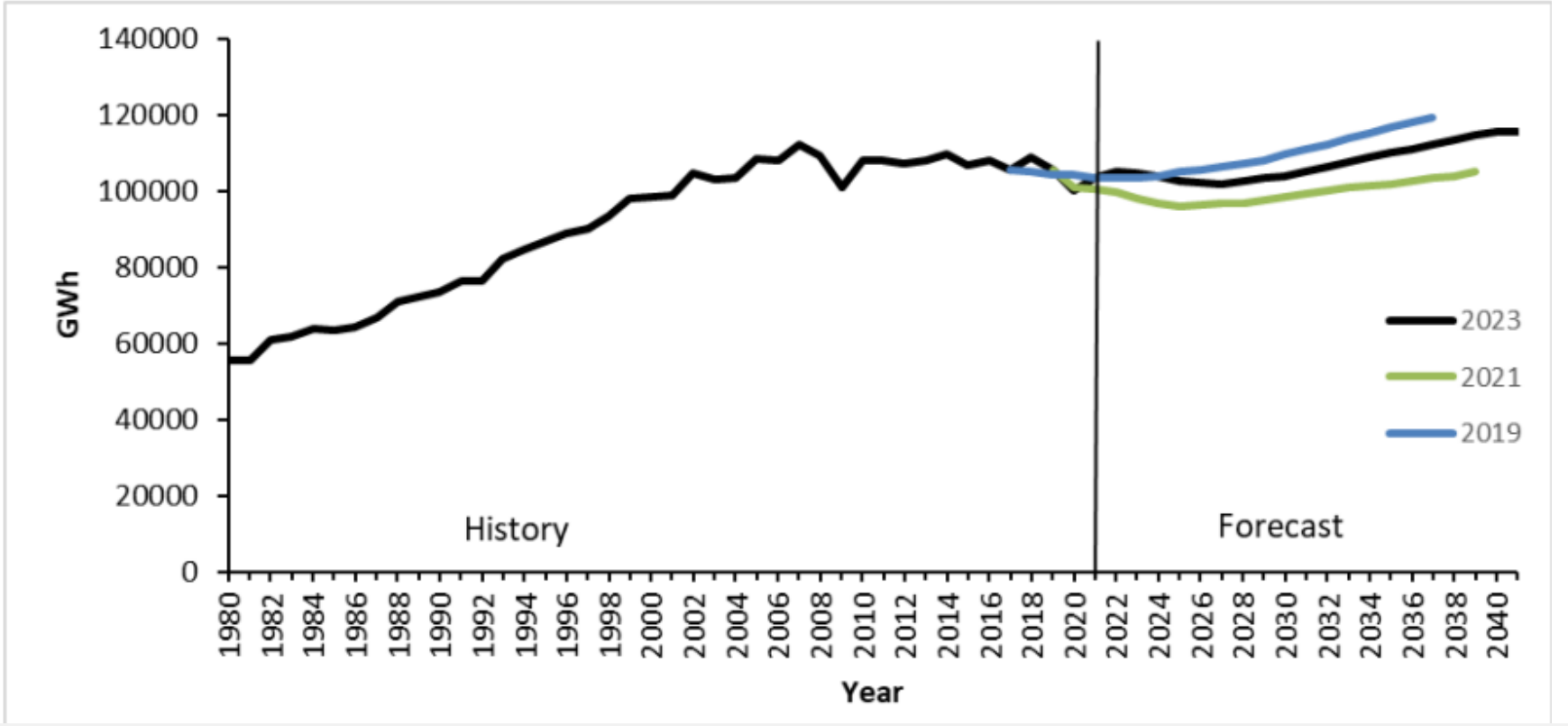
Integrated Resource Planning

- IRP in the recent past have generally shown that investments in natural gas and renewable energy resources will likely provide the best long-term value for ratepayers.
  - Fracking and improved technology reduced the cost of natural gas, especially compared to the cost of coal.
  - Environmental policies and aging coal plants hurt the economics of continuing to operate coal plants.
  - Renewable energy costs declined significantly.

Integrated Resource Planning

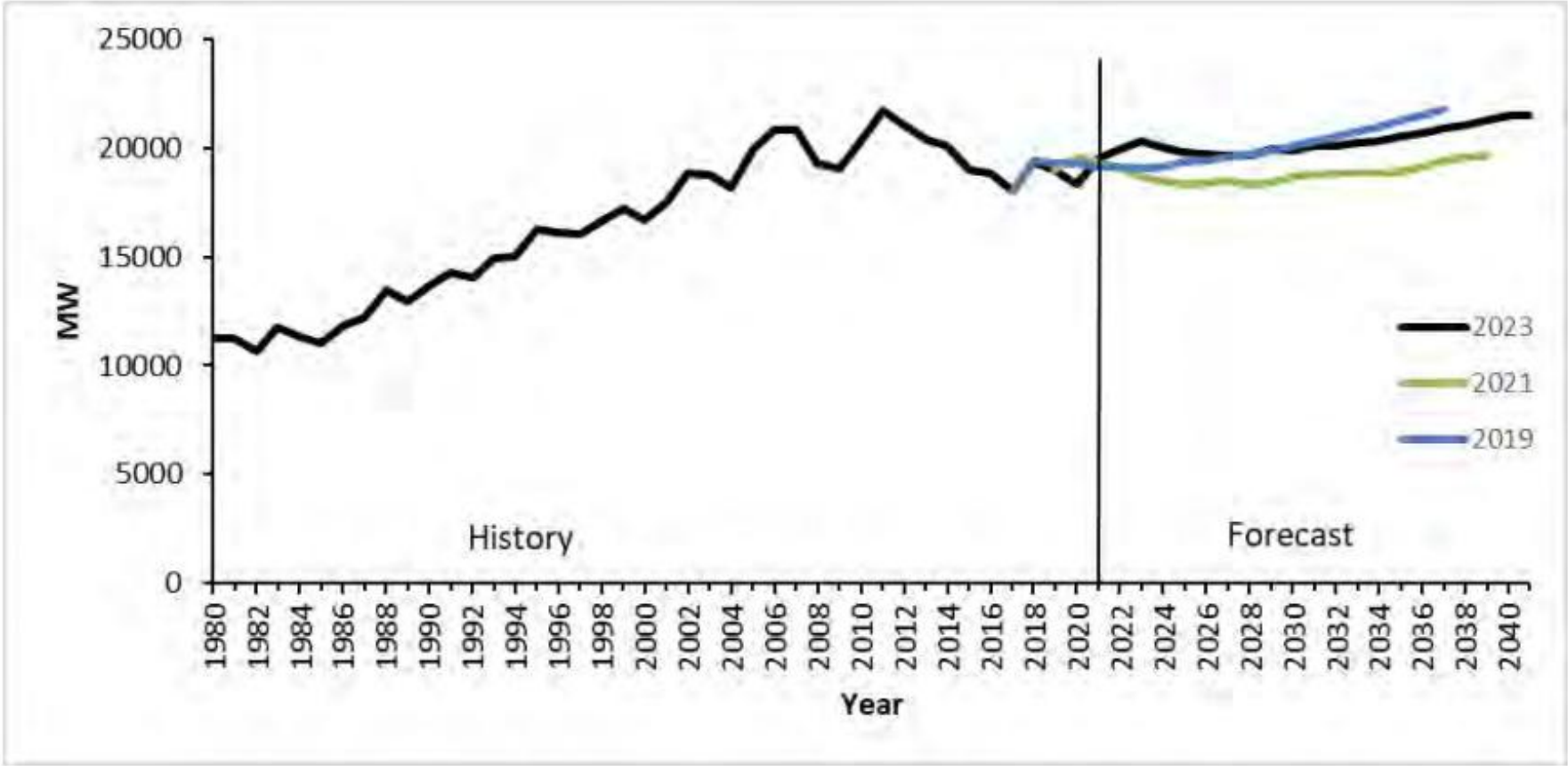
- New generation has been mainly to replace retiring units.

Figure 3-1. Indiana Electricity Requirements in GWh (Historical, Current, and Previous Forecasts)



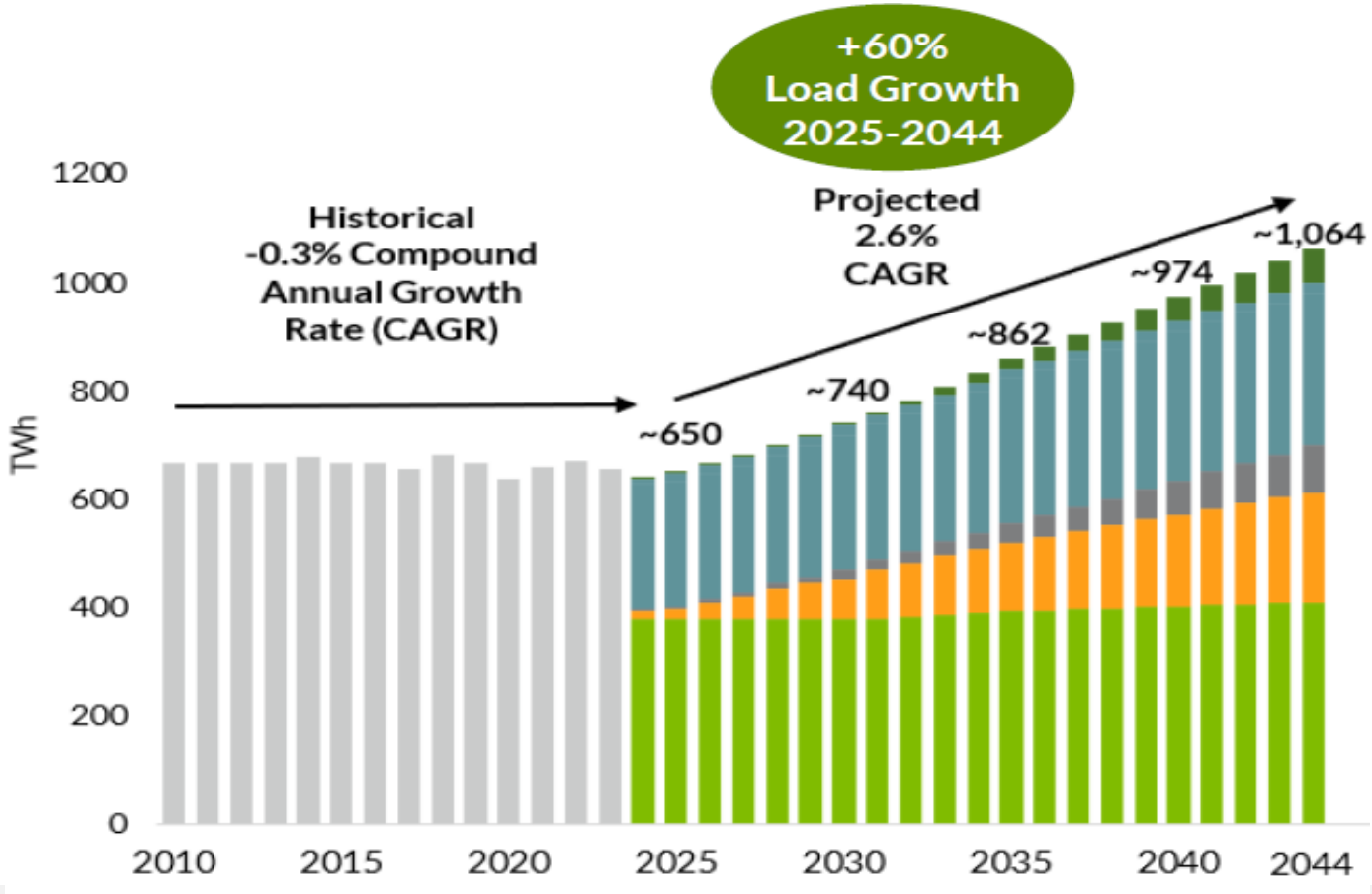
Integrated Resource Planning

Figure 3-2. Indiana Peak Demand Requirements in MW (Historical, Current, and Previous Forecasts)



Load Growth is Back!

- Both MISO & PJM are expecting large load growth rates



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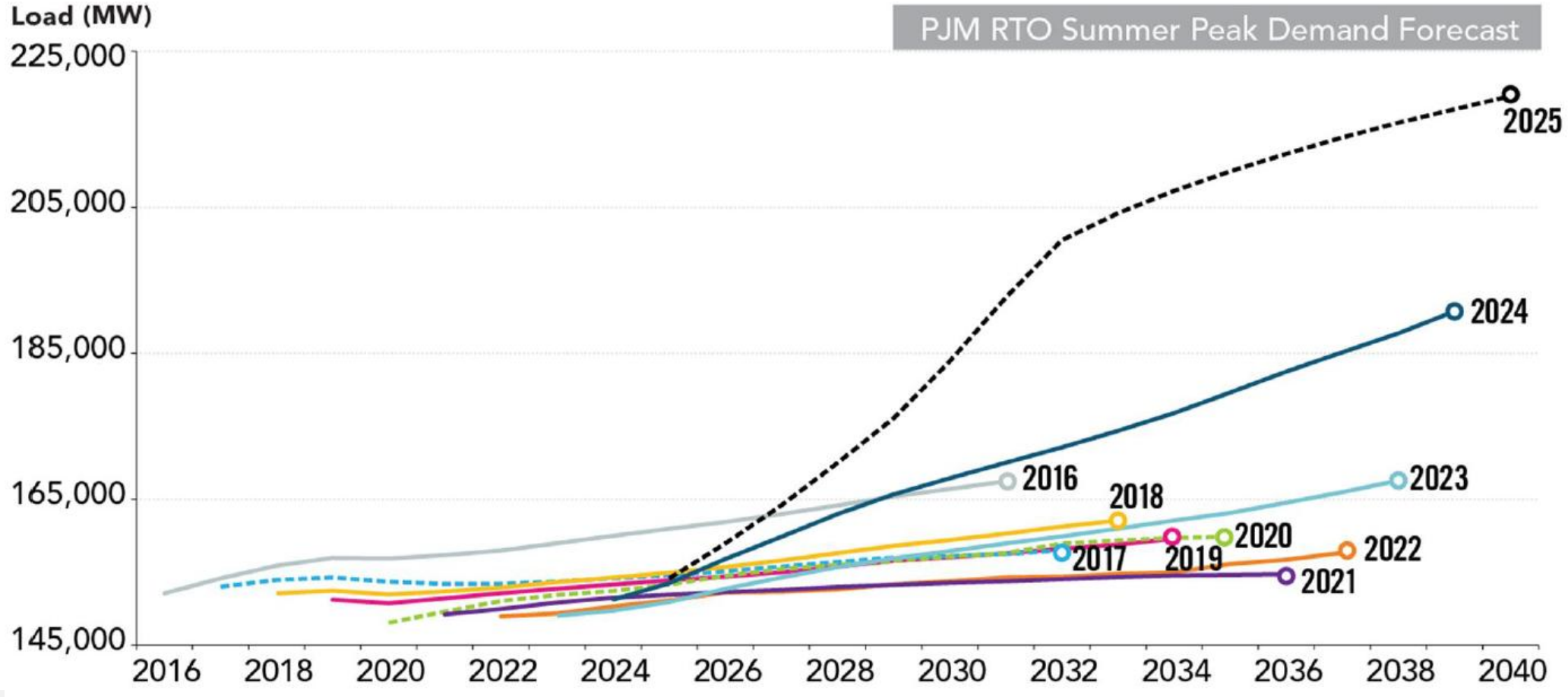


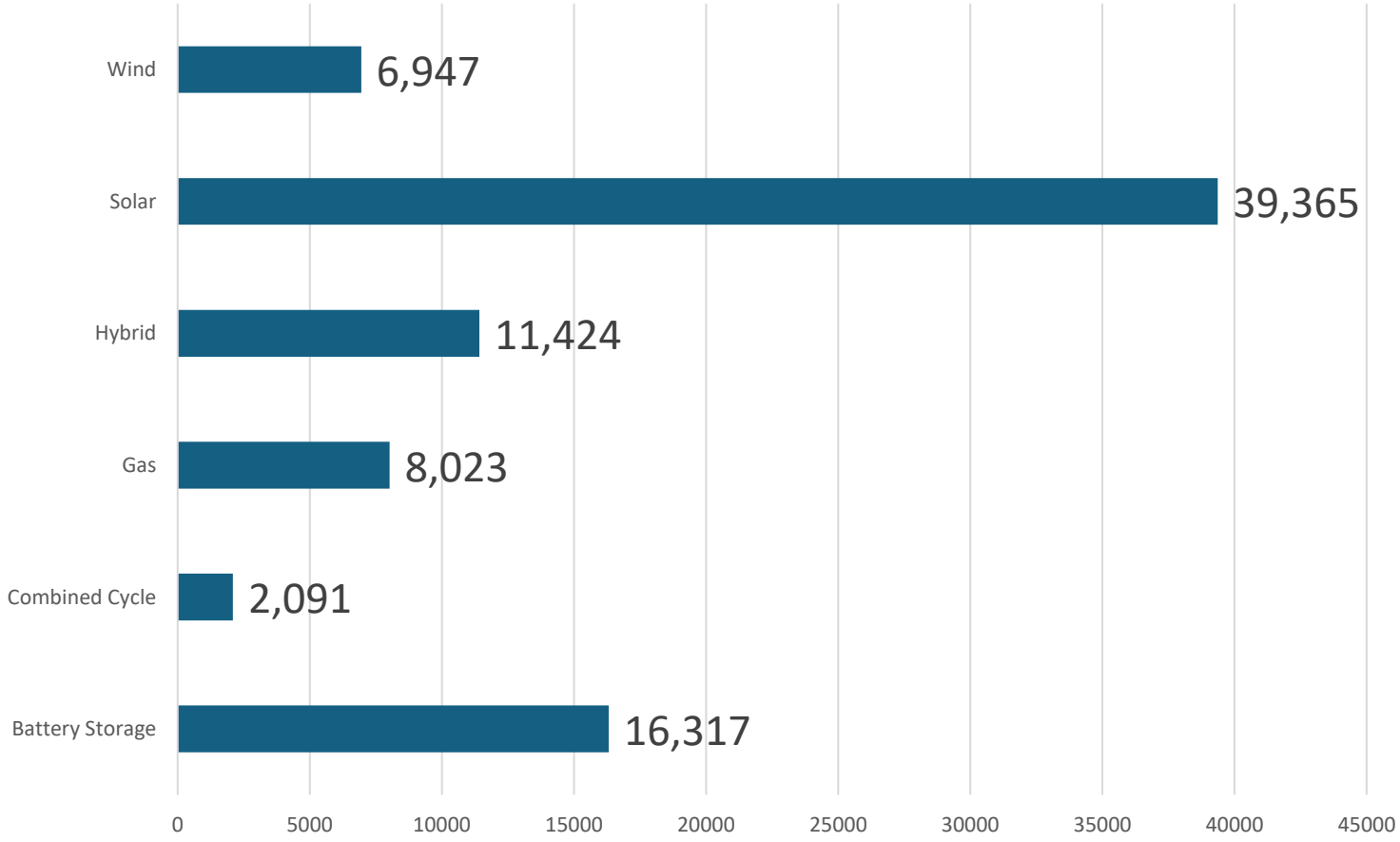
New Generation in Indiana

- New generation must receive technical approval from the RTO before being put onto the grid (called interconnection agreement).

- In MISO, there is 8,300 MW of generation that has received approval to interconnect to the grid but is still awaiting commercial operation.
  - Solar: 4,500MW
  - Hybrid: 1,700MW (usually solar with battery):
  - Gas: 1,000MW
  - Battery: 600MW
  - Wind: 200MW

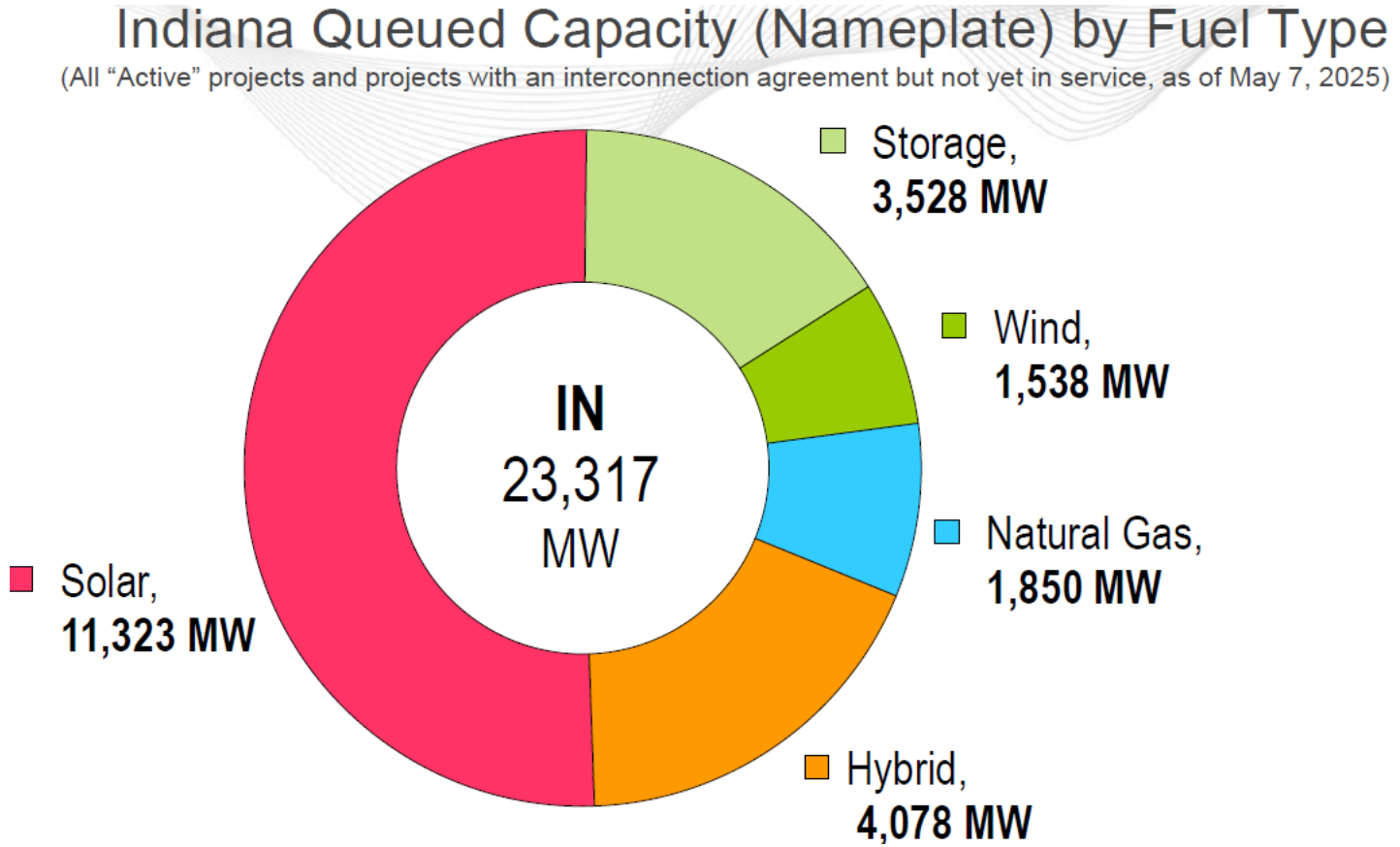
New Generation in Indiana

Total MISO Queue in Indiana



New Generation in Indiana

PJM Queue in Indiana



RESOURCE ADEQUACY

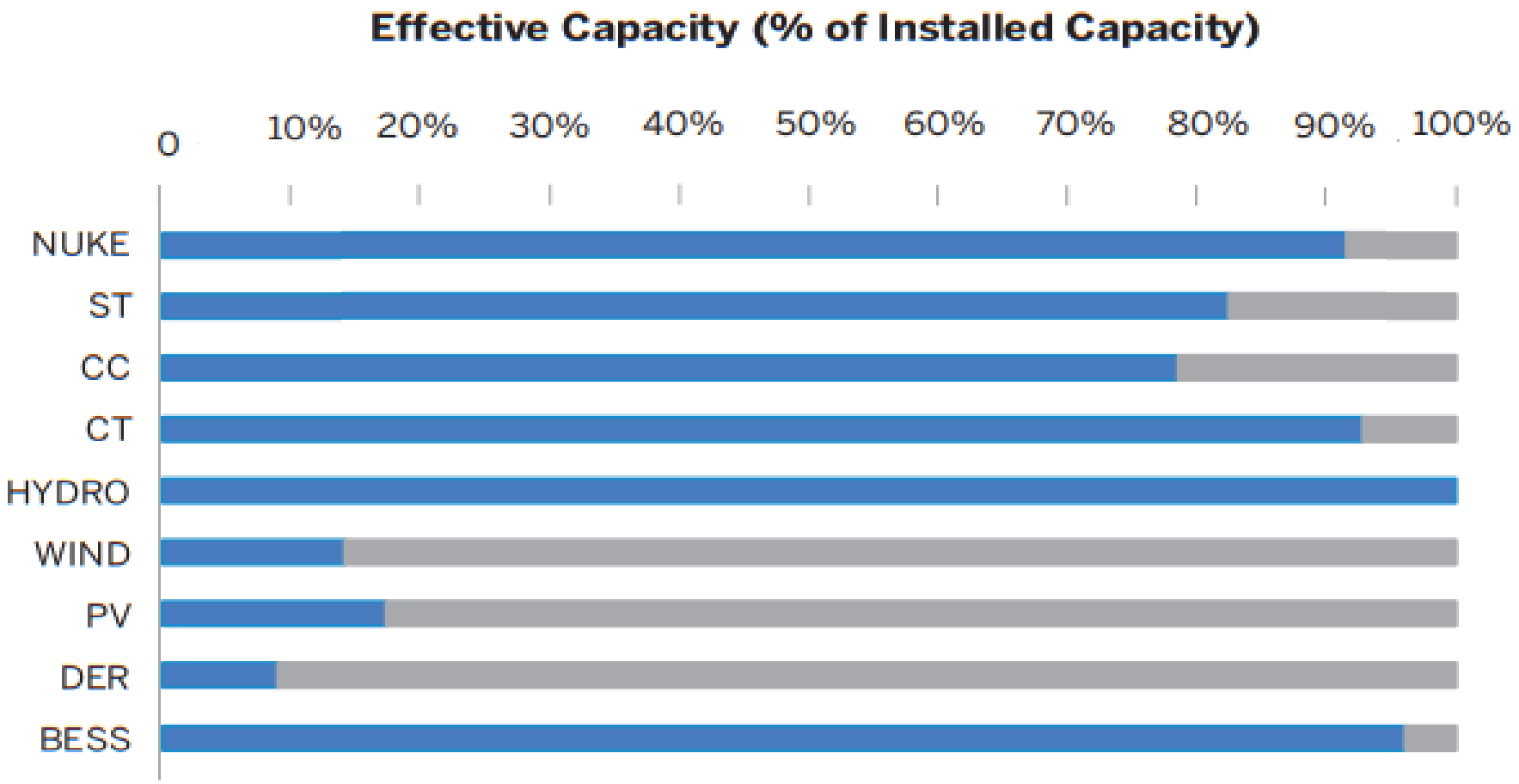
What is Resource Adequacy?

- Simply put, resource adequacy is the ability of an electric utility to serve all of its customers during highest moment of demand (peak demand) in the year.
- Utilities plan to meet this peak demand plus a reserve margin to account for unplanned outages or other issues that may happen.
  - Remember, retail electric utilities have an obligation to provide safe and reliable service
- Participating in an RTO improves system reliability and economics.

Why Are We Hearing About This Now?

- Installed capacity ≠ production at time of system need.
- RTOs use accredited capacity to determine value of generation resources.
- Renewable generation accredited capacity is much lower than thermal generation.
- IRPs rely on current accreditation capacity policy from RTOs.

ACCREDITED OR EFFECTIVE CAPACITY



ACCREDITED OR EFFECTIVE CAPACITY

- Morgan Stanley Annual Energy Paper (2023):
  - "…we computed the amount of natural gas that can be disconnected when adding solar and wind to meet another 10% of demand. The result: due to wind and solar intermittency and the need to meet demand and maintain system reliability, **only 10-30 MW of natural gas could be disconnected for every 100 MW of new wind and solar capacity.** These capacity credits decline as more wind and solar are added to the system..."

WHAT ARE THE GRID OPERATORS SAYING?

1

PJM

- Retirements are at risk of outpacing new resources, due to a combination of industry forces including siting and supply chain issues; 95% of the PJM generation queue is renewables with completion rates of just 5%.

2

MISO

- Studies conducted by MISO indicate it is possible to reliably operate an electric system that has far fewer conventional power plants and far more zero-carbon resources than we have today. However, the transition that is underway to get to a decarbonized end state is posing material, adverse challenges to electric reliability.

3

NERC

- In 2023, for the first time, NERC considered “energy policy” among the five significant evolving and interdependent risks to grid reliability.

RTO Warnings

- RTOs are concerned that projects are not moving to construction and completion.
- PJM has identified three main concerns:
  - Financing issues (related to costs and inflation)
  - Sluggish supply chain
  - Permitting issues (at the local, state, or federal level)
- In effect, each partner in the RTO is in some measure dependent on the other partners to accomplish the desired interconnected system reliability across the region.

THANK YOU

INDIANA UTILITY REGULATORY COMMISSION
Luke Wilson, Executive Director of External Affairs

Indiana Utility Regulatory Commission
101 W. Washington Street, Suite 1500 East, Indianapolis, IN 46204
www.in.gov/iurc

INTRODUCTION TO THE STATE UTILITY FORECASTING GROUP (SUFG)

Presented to the Energy Growth Task Force

Sunil Maheshwari, PhD, Director

October 6, 2025

PURDUE UNIVERSITY | State Utility Forecasting Group

SUFG – Who and Why

Purpose and Unique Strengths

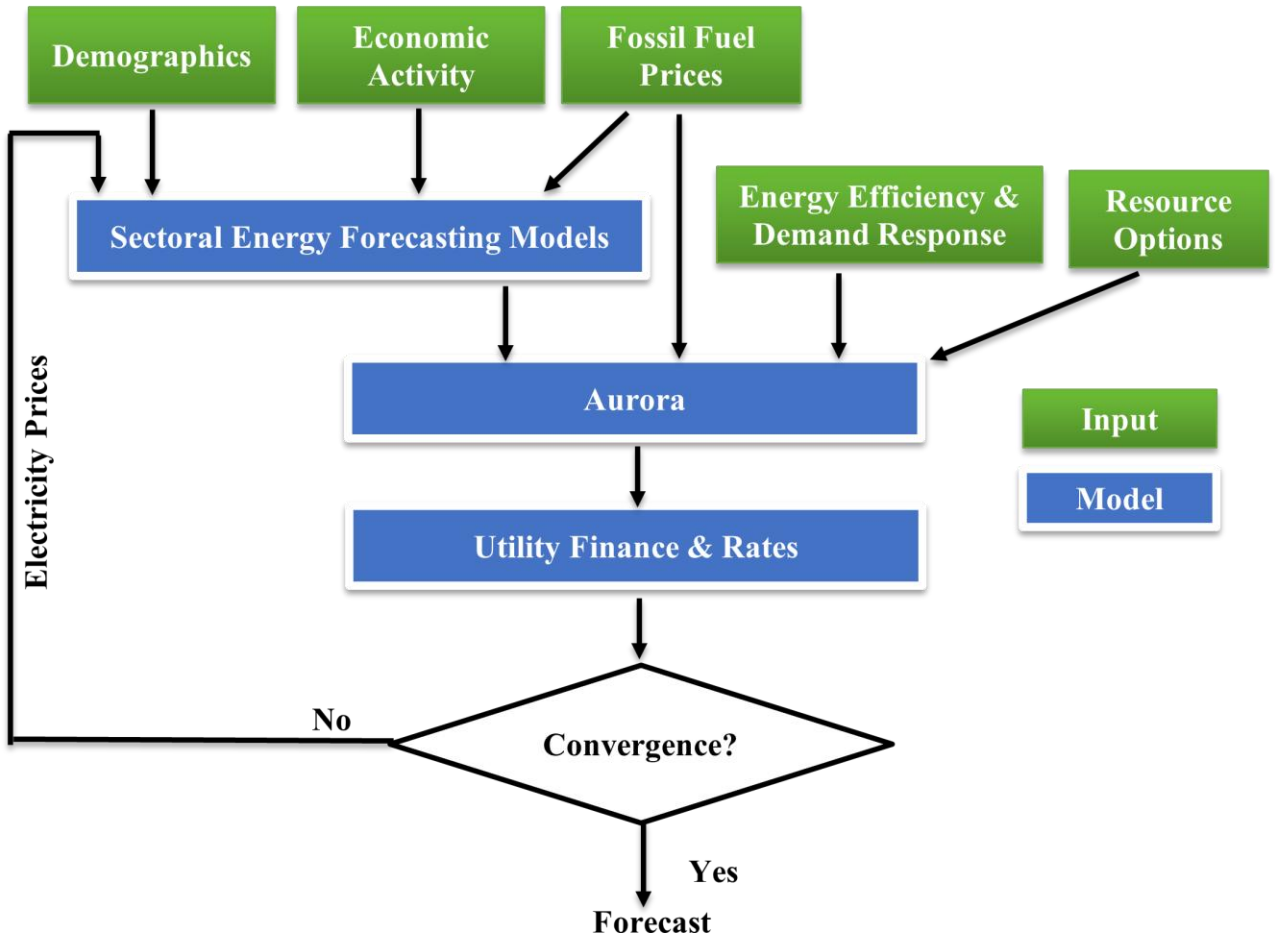
- **Established 1985**
  - The State Utility Forecasting Group (SUFG) was established in 1985 when the Indiana Utility Regulatory Commission (IURC) contracted with Purdue and Indiana Universities (Indiana Code 8-1-8.5).
- **Purpose**
  - Develop and maintain a methodology for forecasting electricity demand, prices, and capacity in Indiana.
  - Following the passage of Senate Enrolled Act 29 in 2002, SUFG was additionally tasked with conducting an annual study of renewable energy resources.
- **Strength**
  - Independent and unbiased analyses
- **Team composition**
  - A director and four economists

What does SUFG do?

Products and publications

- **Biennial Indiana Electricity Projections report**
  - 2023 Forecast is the latest published
  - 2025 Forecast currently in process
- **Annual Indiana Renewable Energy Resources study**
  - 2025 edition released earlier in September
- **Other analyses as requested by IURC**
- **Provided load forecast for the Midcontinent Independent System Operator system 2014-2024**
- **SUFG's website contains digital versions of most studies and reports**
  - https://www.purdue.edu/discoverypark/sufg/

SUFG Forecasting Modeling System



2025 Forecast Modeling System Enhancements

Improving the models is a continuing goal

- **Incorporating MISO's Direct Loss of Load (DLOL) methodology into reserve margin targets and capacity accreditation**
  - DLOL affects all resources but significantly lowers the capacity accreditation for solar and wind.
  - DLOL begins with the 2028-2029 MISO planning year.

- **Modeling the impacts of the One Big Beautiful Bill Act (OBBBA)**
  - Roll back of wind & solar credits expiration from 2032 to 2027
  - Projects with significant influence of foreign entities of concern are disqualified

2025 Forecast Modeling System Enhancements

Improving the models is a continuing goal

- **Known non-data center large load adjustments incorporated into the commercial and industrial forecasts**
  - Utilities provided information on known non-data center large load adjustments
  - Aerospace, Manufacturing, General Warehousing and Storage
  - These are included in all scenarios

- **Future large data center loads modeled in a separate scenario**
  - Indiana lacks substantial historical load data on large data centers, which makes creating econometric or end-use models impractical.
  - Uncertainty surrounding impacts on energy demand, infrastructure, and rates

APPENDIX

THANK YOU

Sunil Maheshwari
mahesh67@purdue.edu

https://www.purdue.edu/discoverypark/sufg/

PURDUE UNIVERSITY | State Utility Forecasting Group

Indiana Office of Energy Development

DOE National Energy Forecast – Summary of July 2025 Resource Adequacy Report

October 6, 2025

Department of Energy (DOE)

- Created this report in collaboration with Pacific Northwest National Laboratory (PNNL) and National Renewable Energy Laboratory (NREL).

- Summarized today by the Indiana Office of Energy Development (OED).

National Context of DOE Report

Executive Order 14262: Directed DOE to establish a uniform reliability methodology.

National Concerns: Retiring generation, surging demand, and rising reliability risks.

2030 scenarios modeled under new methodology to determine regional stability.

DOE used these models to determine readiness of the U.S. grid against future demand.

National Energy Outlook: The DOE's Take on the Grid

- U.S. has abundant resources (oil, gas, coal, nuclear).
- But: Retirements of dispatchable generation coupled with additions of large loads is creating stress on the system.
- DOE: Considers status quo unsustainable, stresses risk of **100x more** outages by 2030 without intervention.
- Forecast theme: Grid reliability now central to U.S. economic and national security.

Drivers of Demand Growth

- Data centers & AI: Projected 35 - 108 GW of new load by 2030.
- Manufacturing & Reindustrialization: Reshoring adds sustained industrial load.
- Electrification of transport and heating shifts additional load growth onto the grid.
- Peak load forecast: +15% (774 GW → 889 GW by 2030).

DOE's Updated Reliability Standards

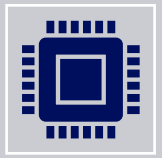
- Old Standard: 1-in-10 LOLE (loss of load expectation):
  - 1 day lost in 10 years
- New DOE approach: Factoring in Normalized Unserved Energy
  - Duration: ≤ 2.4 hours lost load per year.
  - Magnitude: ≤ 0.002% of energy unserved (NUSE)
- Why it matters: Accounts for outage severity and scale, not just frequency.

$$\frac{100\ MWh\ (of\ unserved\ energy)}{10{,}000{,}000\ MWh\ (of\ total\ energy\ delivered\ in\ a\ year)} x100 = 0.001\ percent$$

DOE's Methodology

Modeling Tool: Zonal PLEXOS used for load, generation, and transfer ability.

Time Horizon: 12 historic weather years, (2007 - 2013, 2019 - 2023), modeled through 2030.



Deterministic Approach: Creates hour-by-hour simulation

DOE's Methodology Assumptions

- AI/Data Centers: 50 GW nationally by 2030.
- Storage: Based on NERC IRCS:
  - Pumped hydro assumed to be 12 hours.
  - Battery at 4 hours.
- Imports and Demand Response were modeled only after local resources were exhausted.
- Solar/Wind/Thermal: Availability is assumed based on historical EIA output data, and NERC assessments.

Generation Outlook

- Retirements: 104 GW by 2030 (71 GW of coal, 25 GW of gas).
- Additions 209 GW of planned, but mostly solar/wind, only 22 GW firm.
- Net effect: Growing mismatch between firm capacity and peak demand.
- Forecast: If plant closures occur, outages will rise

DOE's 2030 Test Scenarios

Plant Closures: All announced retirements + Tier 1 additions

No Plant Closures: Retirements deferred past 2030 + Tier 1 additions proceed

Required Build: Perfect capacity added until reliability restored

DOE stress-tested all with 12 historic weather years

Tier 1 additions refer to Tier 1 of the 2024 NERC LTRA Additions Report

National Case Review: Plant Closures

- Annual outages hours (LOLH): increase from **8** hrs. to as high as **817** hrs.
- Worst year: 1,316 hours lost (≈55 days)
- NUSE: 0.046% vs the 0.002% threshold
- Widespread reliability shortfalls, only ISO-NE and NYISO remain within limits

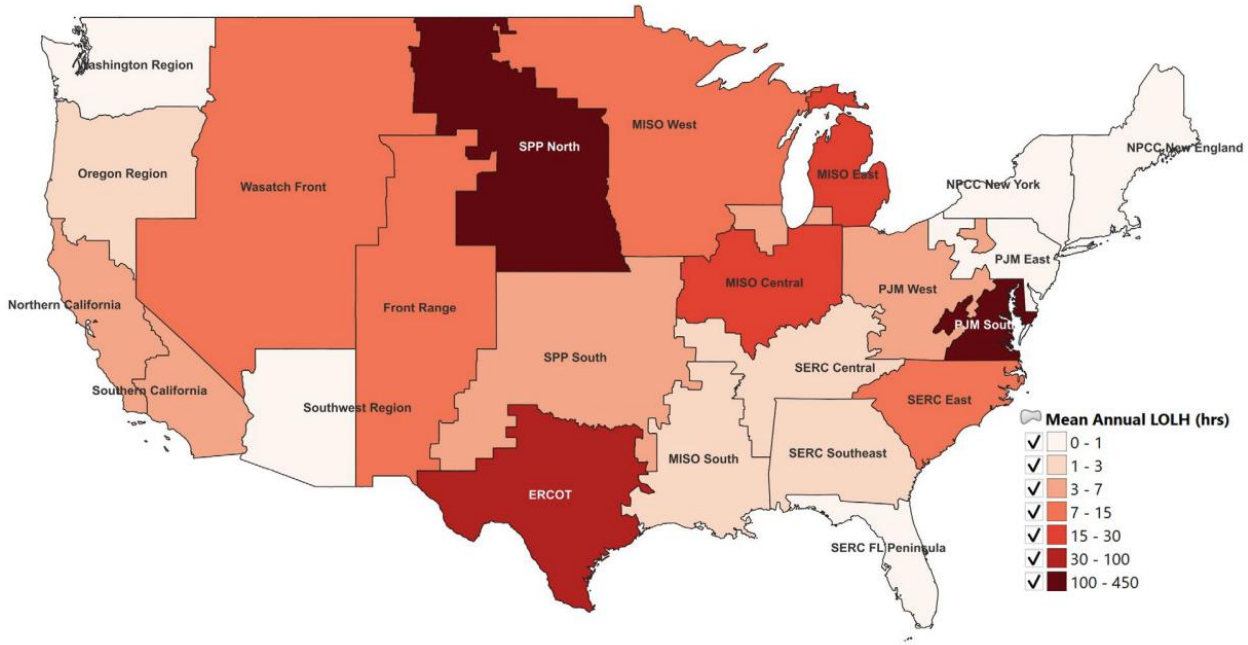


Figure 1. Mean Annual LOLH by Region (2030) – Plant Closures

National Case Review: No Plant Closures

Improves reliability, but not enough:

- PJM: 214 hours/year lost, 0.066% NUSE
- SPP & ERCOT: still facing outages despite improvements

Deferring retirements helps, but can't close the reliability gap nationwide

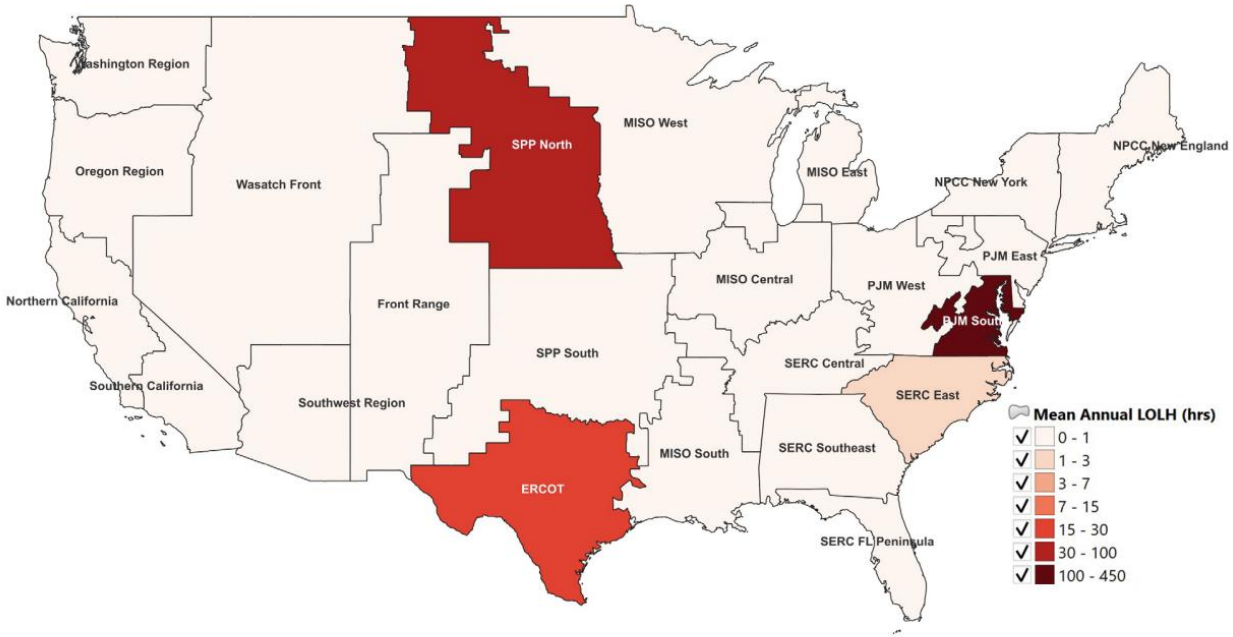


Figure 2. Mean Annual LOLH by Region (2030) – No Plant Closures

Required Build Analysis

Needed by 2030:			
PJM → 10.5 GW	ERCOT → 10.5 GW	SERC-East → 0.5 GW	SPP → 1.5 GW

≈23 GW of firm capacity needed beyond current plans assuming no plant closures.

Regional Forecast: MISO

+10 GW load by 2030 (6 GW from data centers)

Mostly stable in No Closures case, but import-dependent

Closures Case forecasts 124 outage hours in worst year, 0.07% NUSE

Overall: Rising import reliance noted as increasing exposure

Table 2. Summary of MISO Reliability Metrics

Reliability Metric	Current System	2030 Projection		
		Plant Closures	No Plant Closures	Required Build
AVERAGE OVER 12 WEATHER YEARS				
Average Loss of Load Hours	-	37.8	-	-
Normalized Unserved Energy (%)	-	0.0211	-	-
Unserved Load (MWh)	-	157,599	-	-
WORST WEATHER YEAR				
Max Loss of Load Hours in Single Year	-	124	-	-
Normalized Unserved Load (%)	-	0.0702	-	-
Unserved Load (MWh)	-	524,180	-	-

Regional Forecast: PJM

+25 GW load by 2030 (15 GW from data centers)

Modeled at weakest nationwide reliability outlook.

430 outage hours/yr in Closures Case, 1052 in worst year.

Overall: 70x above new DOE threshold assuming planned retirements.

Table 8. Summary of PJM Reliability Metrics

Reliability Metric	Current System	2030 Projection		
		Plant Closures	No Plant Closures	Required Build
AVERAGE OVER 12 WEATHER YEARS				
Average Loss of Load Hours	2.4	430.3	213.7	1.4
Normalized Unserved Energy (%)	0.0008	0.1473	0.0657	0.0003
Unserved Load (MWh)	6,891	1,453,513	647,893	2,536
WORST WEATHER YEAR				
Max Loss of Load Hours in Single Year	29	1,052	644	17
Normalized Unserved Load (%)	0.0100	0.4580	0.2703	0.0031
Unserved Load (MWh)	82,687	1,453,513	647,893	2,536
Max Unserved Load (MW)	4,975	21,335	17,620	4,162

Policy Forecast (DOE Suggestions)

Avoid	Premature retirements of firm generation
Accelerate	Firm capacity additions to the grid
Strengthen	Interregional transfer ability

The DOE Energy Forecast for 2030

Current 2030 forecast shows:

- Demand growth will outpace firm supply
- Reliability shortfalls across most regions with planned retirements.
- National security and International AI/data center race at stake

Key Takeaways:

- Status quo is unsustainable
- Grid growth must match pace of AI innovation
- Retirements plus load growth increase risk of lost load by 100x in 2030
- Planned supply falls short, reliability is at risk

Closing

- DOE frames this report as a national call to action.
  - Defer retirements
  - Increase capacity
  - Realize that a simple acceleration of current plans is insufficient.
- States and stakeholders are urged to act now, ensure reliability, and to continue to support economic growth.

Thank you

Henry K. Wilhelmus

NERC's Long-Term Reliability Assessments

INDIANA UTILITY REGULATORY COMMISSION
Luke Wilson, Executive Director of External Affairs

10/6/25

OUTLINE

- NERC’s History & Mission
- 2024 Long-Term Reliability Report
- Report Recommendations

North American Electric Reliability Corporation (NERC)

- NERC started as voluntary organization for interconnected utilities to coordinate the transmission system following the 1965 Northeast Blackout.
- NERC set voluntary protocols and standards for reliable grid operation.
- Regional outages continued to happen in 1977, 1982, 1996 (twice), 1998, 1999, and 2003.

North American Electric Reliability Corporation

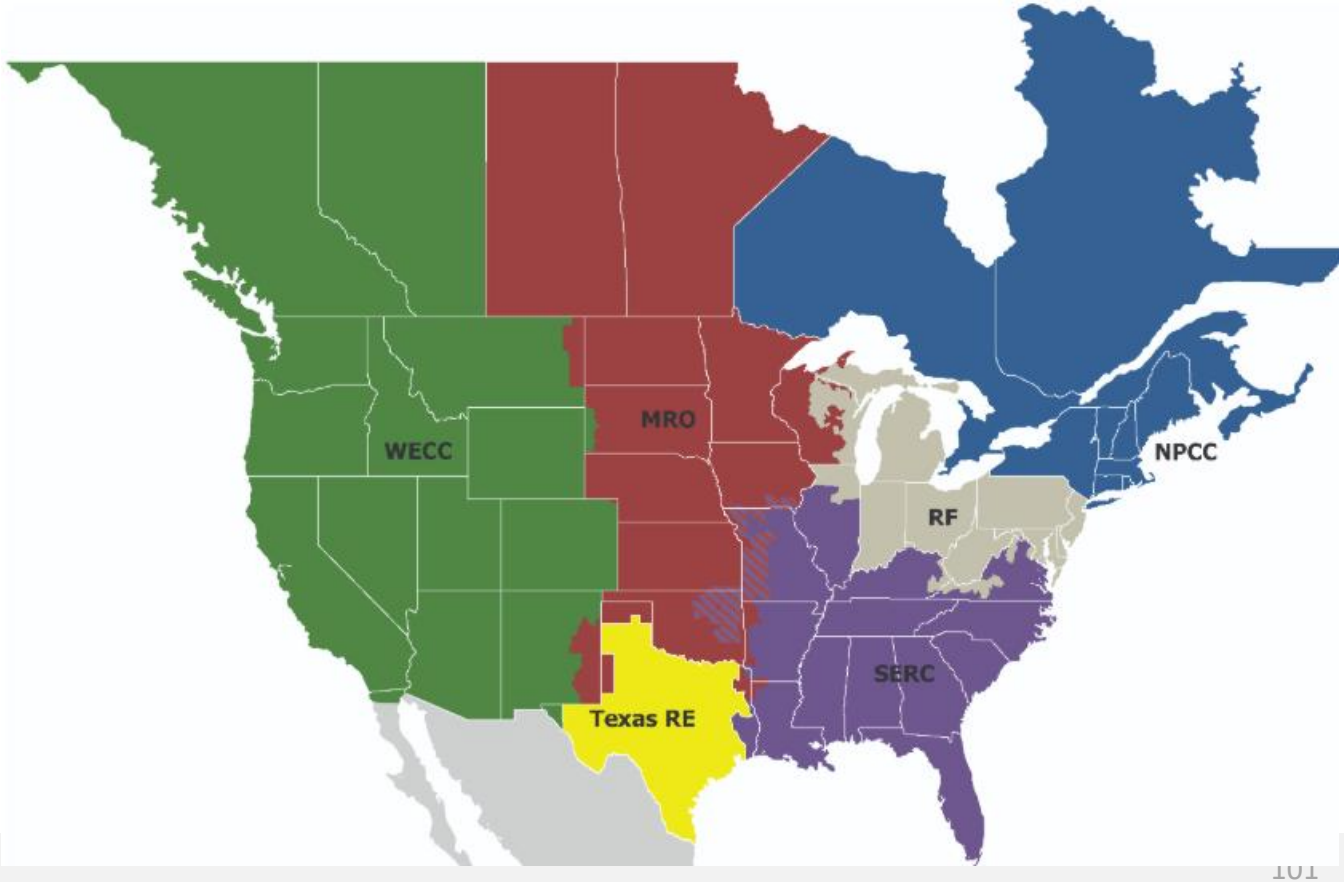
- Following the 2003 blackout, Congress gave FERC power to certify an organization to develop and enforce mandatory reliability standards for the bulk power system.
- NERC was certified as that authority in 2006.
- NERC's duties:
  - Develop and enforce reliability standards
  - Annually access long-term and seasonal reliability
  - Educate, train, and certify industry personnel

North American Electric Reliability Corporation

- NERC delegates its authority to 8 regional entities that it oversees.

- ReliabilityFirst (RF) is the Regional Entity overseeing Indiana.

- RF audits compliance, provides training, and serves as a policy source to states.



Reliability Assessments

- NERC publishes both long-term and seasonal reliability assessments.
  - Long-Term Reliability Assessment
  - Summer Assessment
  - Winter Assessment

- NERC also publishes occasional special assessments, such as studying the impacts from battery energy storage, natural gas system disruptions, and generation retirement scenarios.

Long-Term Reliability Assessments (LTRA)

- NERC's Long-Term Reliability Assessment looks at anticipated load demand and sets a targeted reserve margin level.
  - Based on information submitted by RTO and reviewed by RF & NERC.

- The targeted reserve margin level is set to identify the least amount of generation needed to achieve a "loss of load expectation" (or LOLE) for one day every 10 years.
  - Put another way, the resource adequacy benchmark is set to experience a system outage for a day once every 10 years.

2024 LTRA

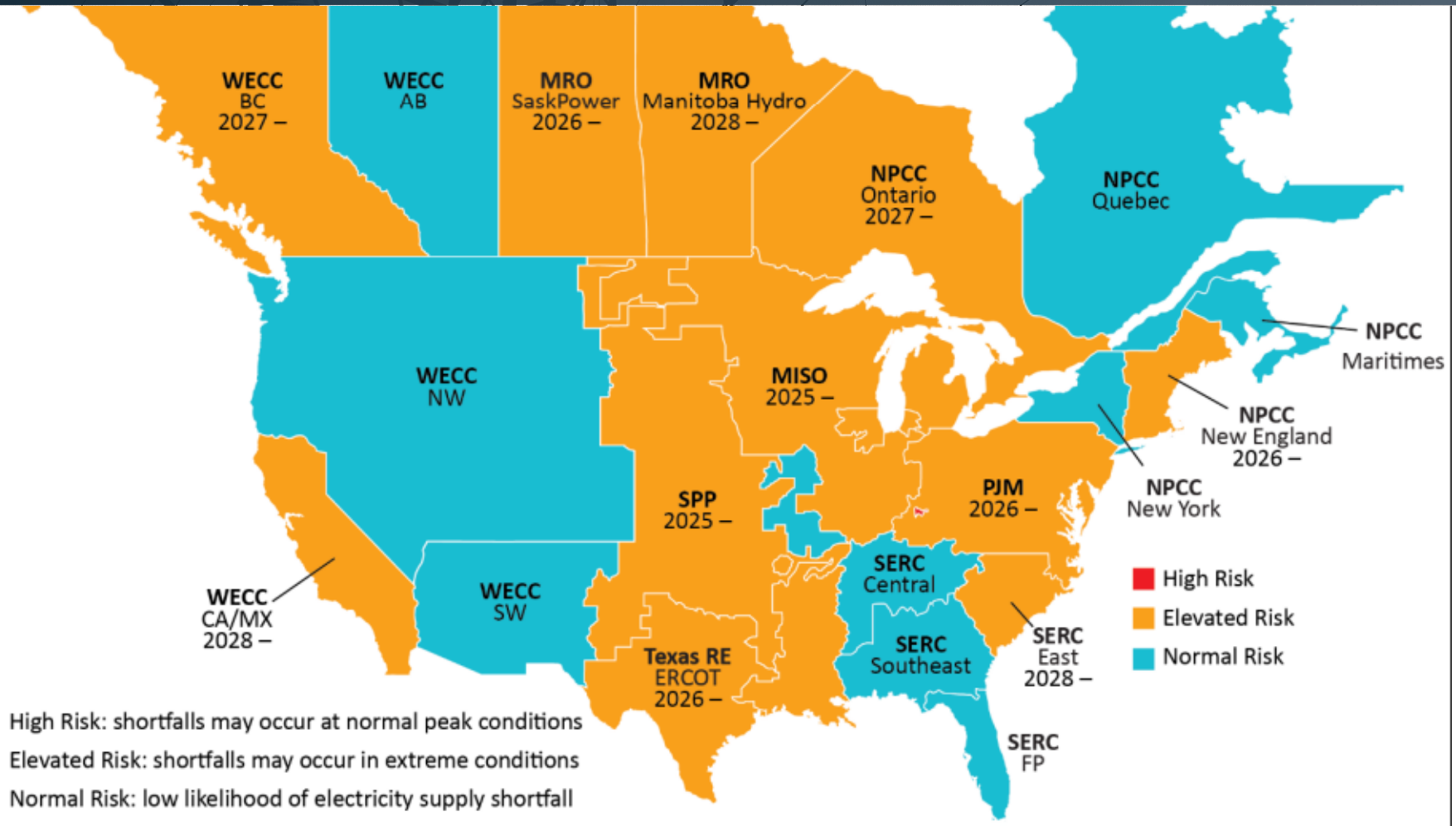


Figure 1: Risk Area Summary 2025–2029 (Corrected July 2025)

2024 LTRA

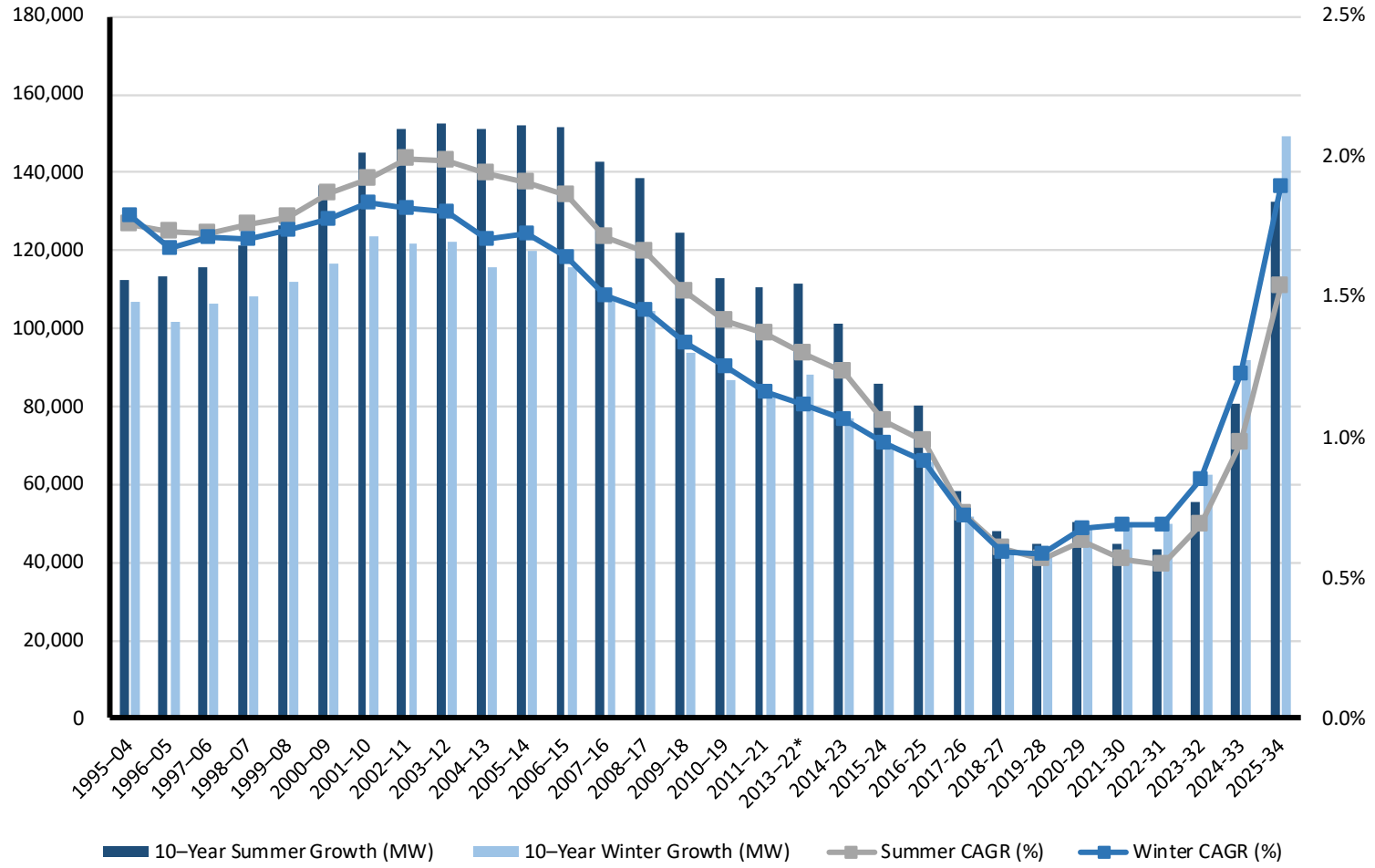
- High risk means that the assessment area annual loss of load expectation exceeds the 1 day in 10 years benchmark (2.4 hours per year).
- Elevated risk means that the resource adequacy benchmarks are met but, under extreme scenarios could cause shortfalls in reserves. An elevated risk assessment area has a projected loss of load between 0.1 and 2.4 hours per year.
- Low risk means that the assessment area is projected to have enough reserves during extreme scenarios and has a projected loss of load below 0.1 hours per year.

2024 LTRA

- NERC sees three main challenges to maintaining resource adequacy over the next 10 years:

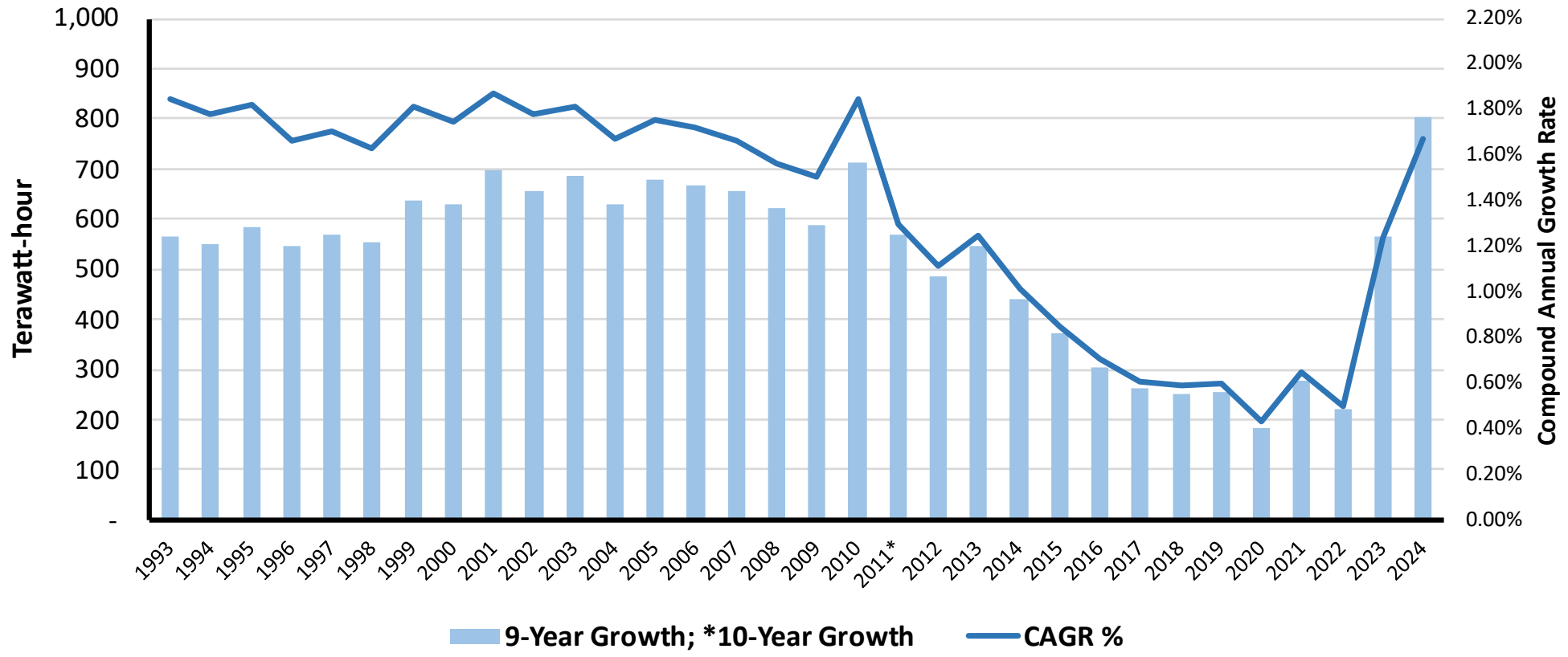
1. Accelerating resource & transmission development.
2. Managing generator retirements.
3. Meeting escalating energy growth demands.

10 Year Peak Demand Growth Projection



Source: NERC 2024 LTRA Supplemental Charts

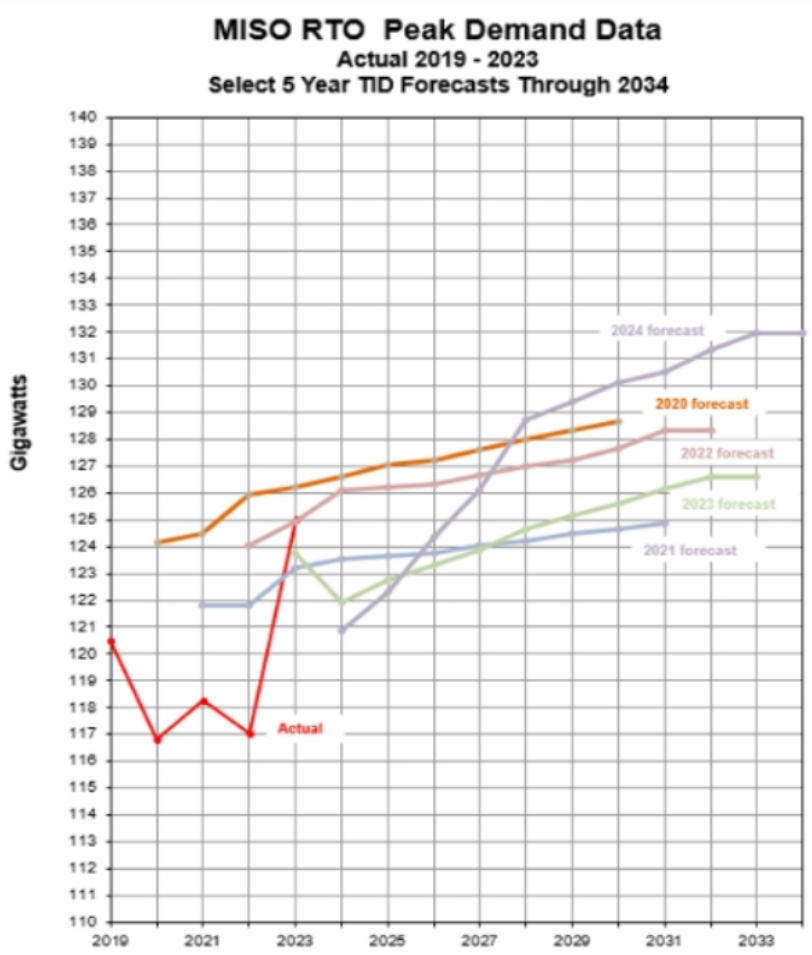
10 Years Net Energy Growth Projection

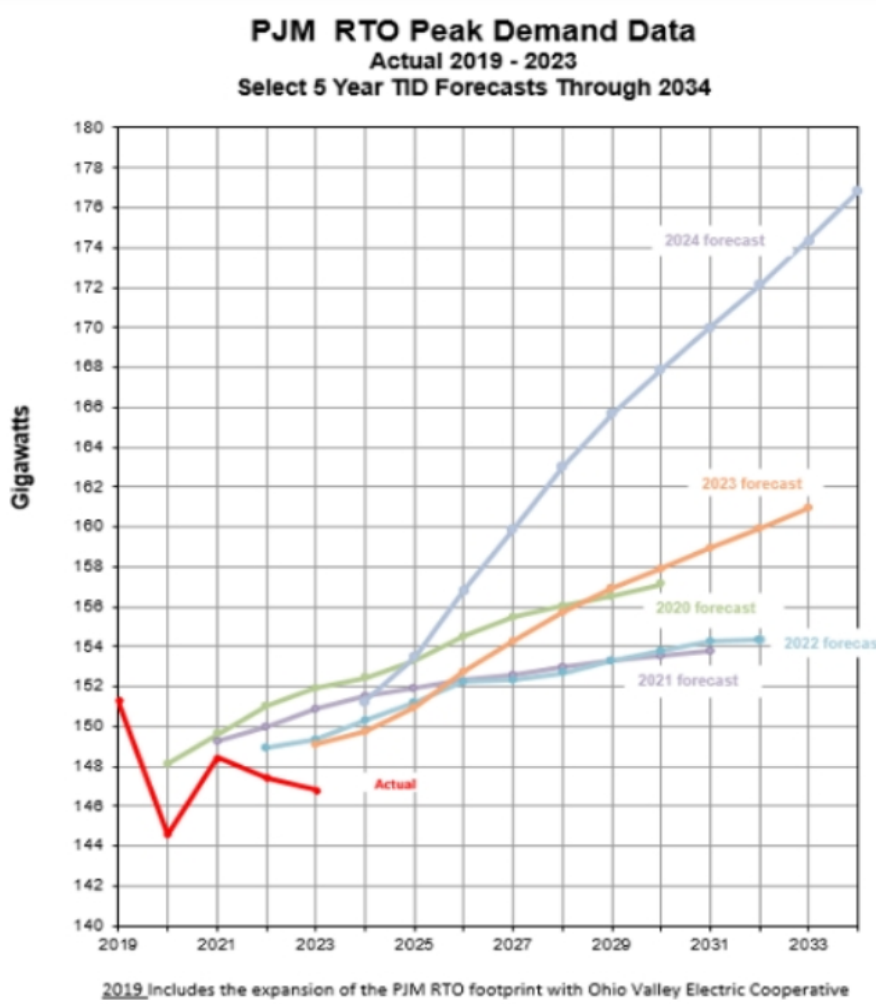


Source: NERC 2024 LTRA Supplemental Charts

2024 LTRA

- Load growth continues to accelerate





2024 LTRA

- Capacity loss due to projected retirements will grow in the coming years.

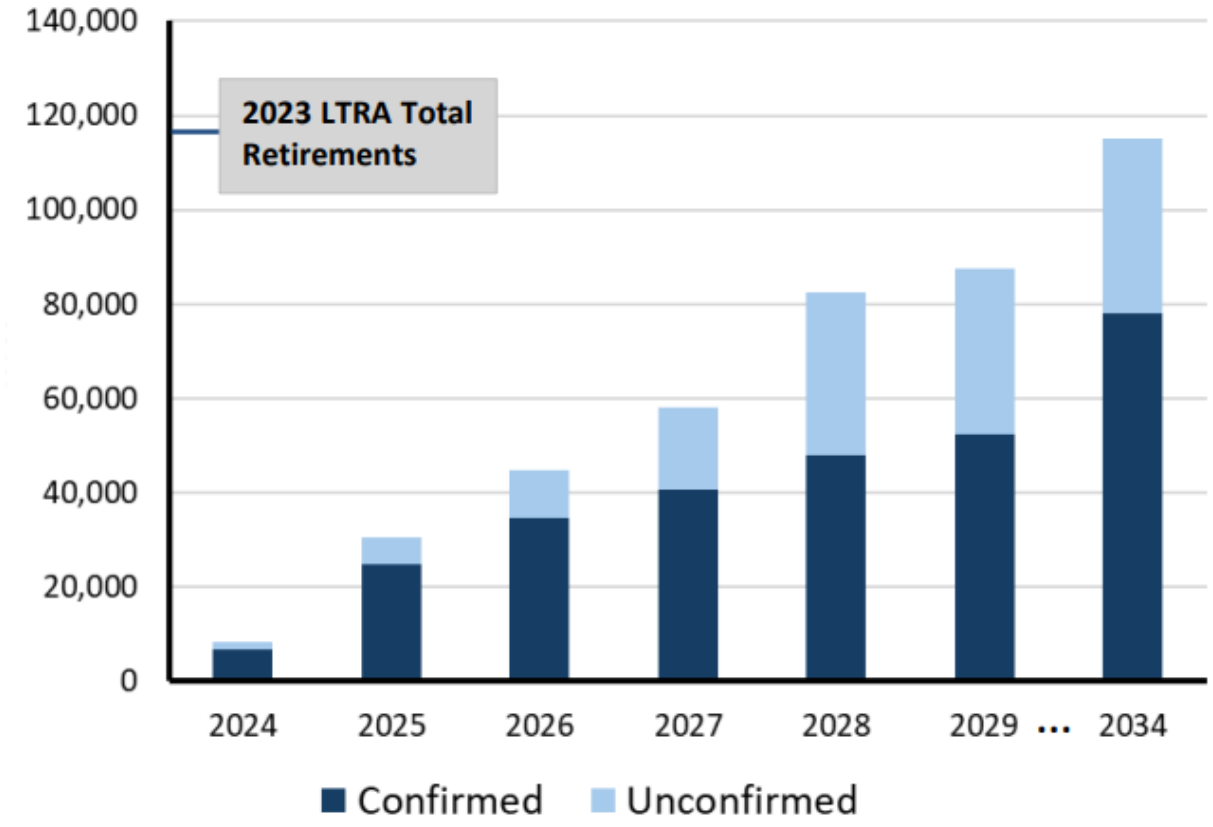


Figure 14: Projected Generation Retirement Capacity through 2034

2024 LTRA

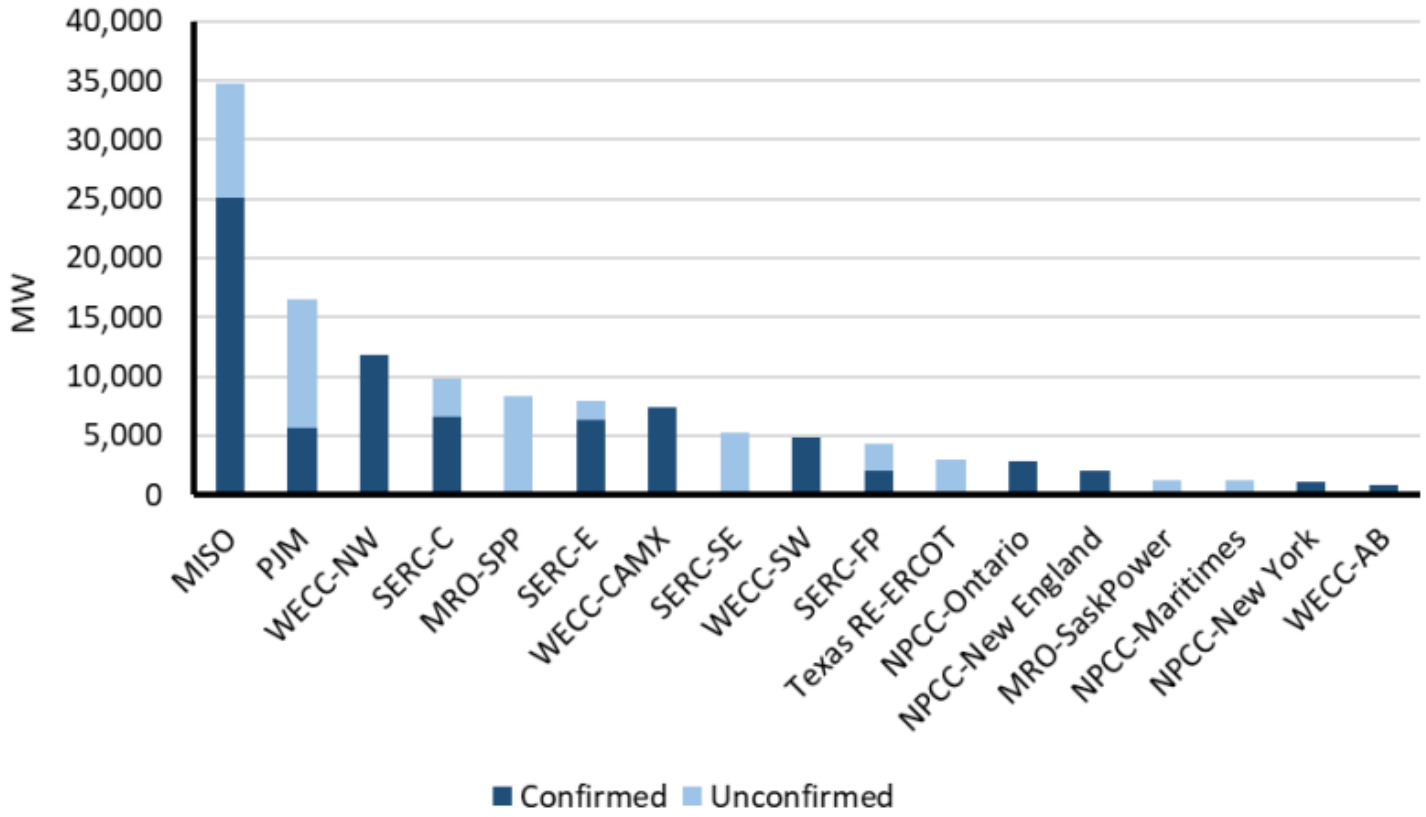


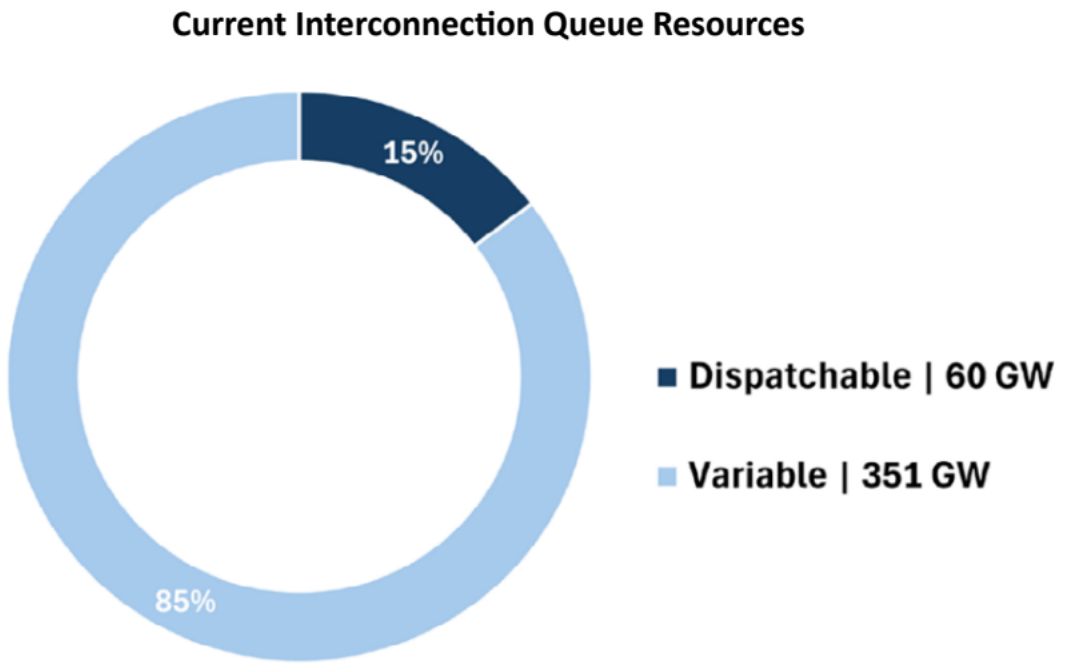
Figure 15: Projected Capacity Retirements of Nuclear and Fossil Generation 2024–2034

2024 LTRA

Table 13: Existing BPS Resource On-Peak Capacity			
	2023 Capacity (MW)	2024 Capacity (MW)	Difference (MW)
Coal	188,856	180,402	-8,454
Petroleum	32,107	30,987	-1,120
Natural Gas	483,391	484,148	757
Biomass	7,273	7,381	108
Solar[14]	52,998	66,293	13,295
Wind[15]	32,320	31,370	-950
Geothermal	4,319	3,881	-438
Conventional Hydro	103,368	105,792	2,424
Run of River Hydro	1,565	2,047	482
Pumped Storage	19,463	19,422	-41
Nuclear	106,173	105,385	-788
Hybrid & Battery	5,593	9,909	4,316
Other	2,217	774	-1,443
Total	1,039,643	1,047,791	8,348

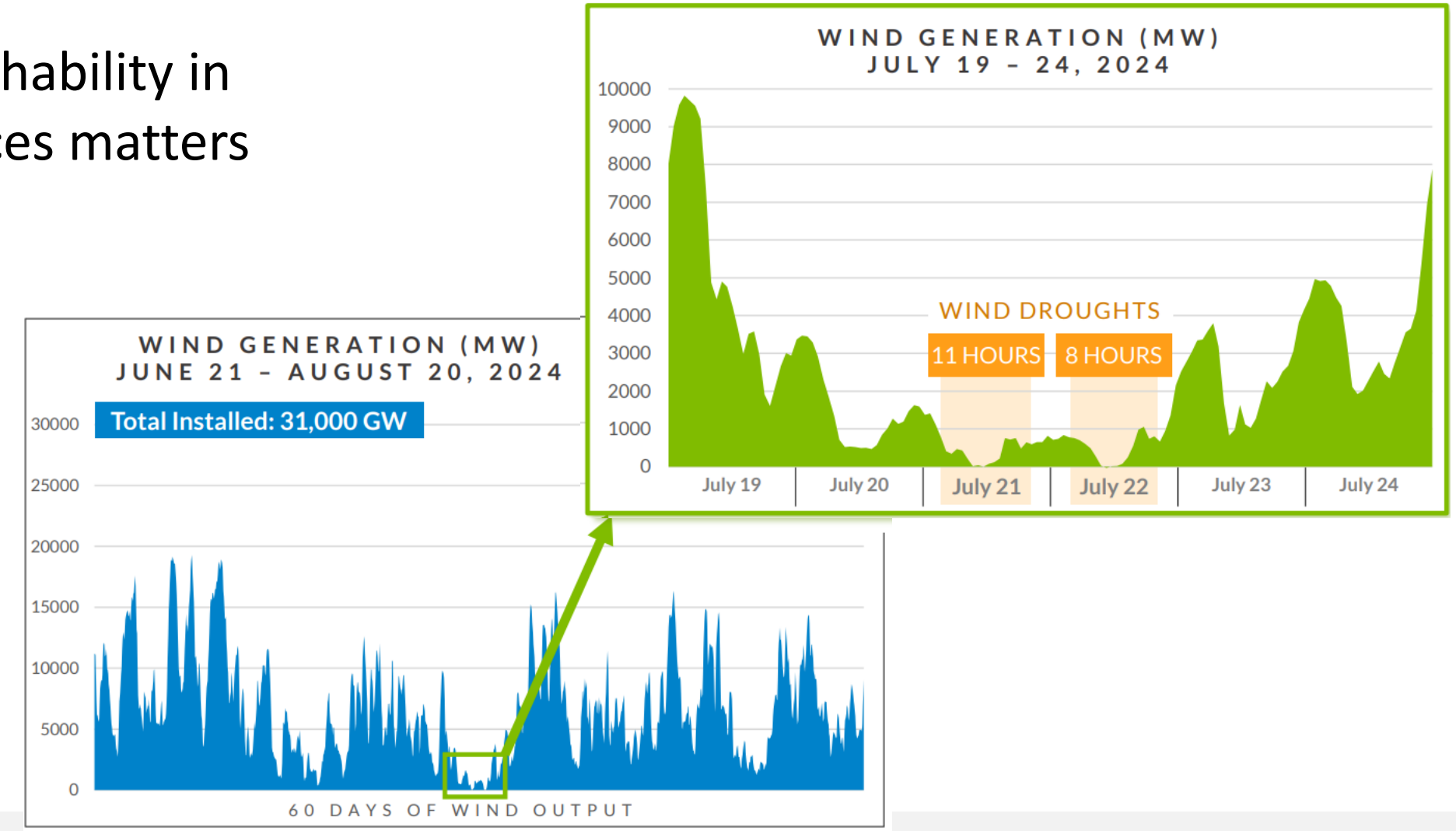
2024 LTRA

- New generation is predominately variable generation, like wind and solar.



2024 LTRA

- Dispatchability in resources matters



2024 LTRA

- MISO accreditation for different resource types as a percentage of nameplate capacity

PY 2025-2026	Summer	Fall	Winter	Spring
Biomass	50%	46%	50%	49%
Coal	89%	84%	76%	73%
Dual Fuel Oil/Gas	87%	83%	79%	78%
Gas	88%	84%	65%	69%
Combined Cycle	95%	91%	77%	79%
Nuclear	94%	90%	90%	82%
Oil	77%	74%	74%	72%
Pumped Storage	98%	89%	76%	67%
Reservoir Hydro	89%	80%	76%	70%
Run-of-River Hydro	62%	52%	58%	63%
Solar	38%	21%	24%	32%
Wind	8%	15%	22%	14%
Storage*				
Status Quo**	39%	46%	66%	25%
Blended	50%	55%	70%	25%
Even Loss	62%	57%	71%	25%

2024 LTRA

- MISO summary:
  - Uncertainty surrounds new resource additions and existing generation retirements. If above-normal generator outages occur during extreme weather, there may be issues.

- PJM summary:
  - New resource additions are not keeping up with retirements. Winter season becoming more of a concern compared to summer due to fuel supply issues and generator performance.

2024 LTRA

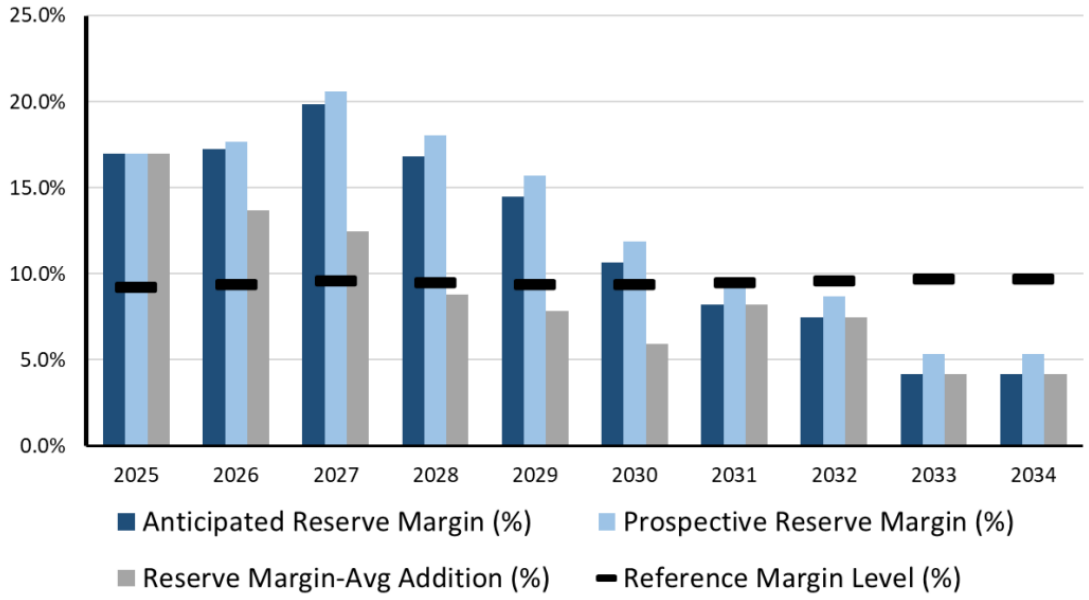


Figure 3: MISO Planning Reserve Margin–Summer

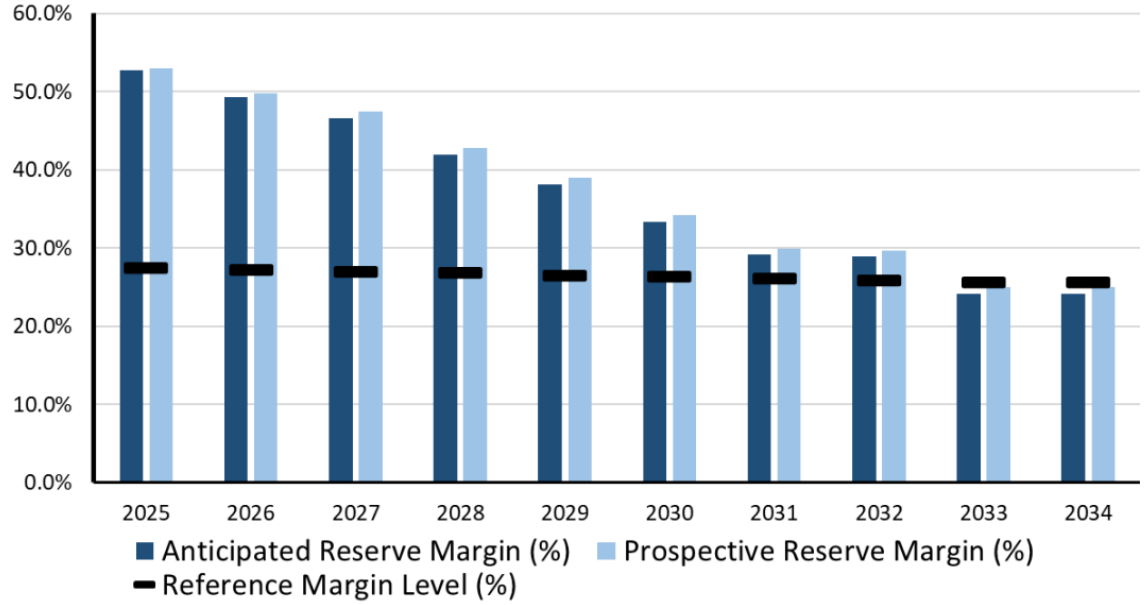
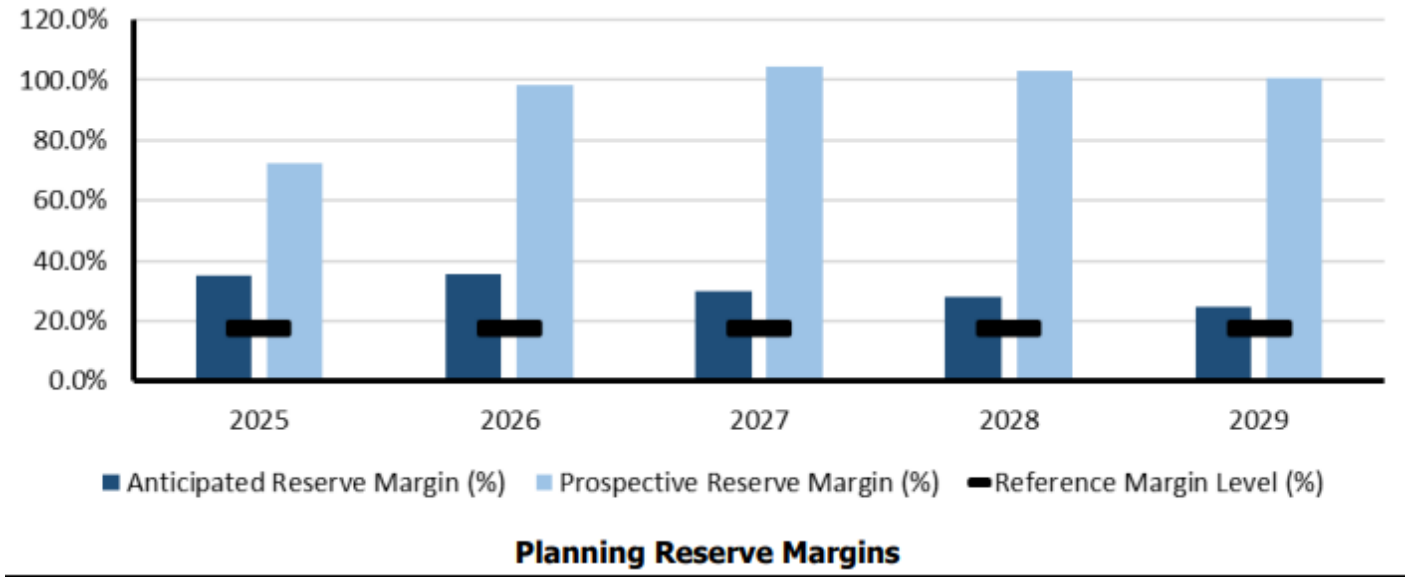


Figure 4: MISO Planning Reserve Margin–Winter

PJM Planning Reserve Margins



2024 LTRA Recommendations

- Recommendations for Regulators & Policymakers:
  - Carefully manage generator deactivations.
  - Streamline siting and permitting processes to remove barriers to resource and transmission development.
  - Implement a framework for addressing the operating and planning needs of the interconnected natural gas-electric energy system.

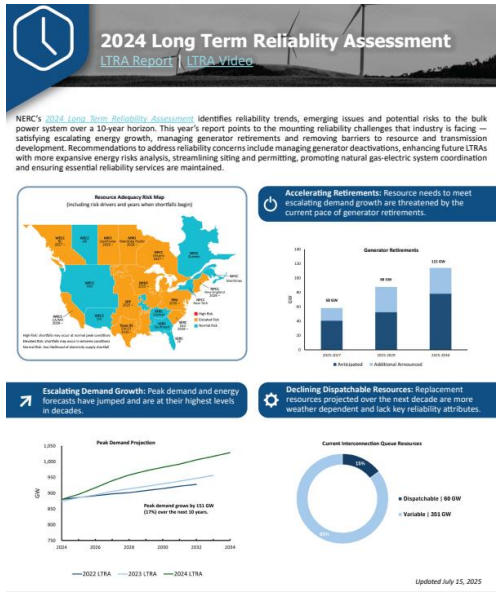
- Previous recommendations to stakeholders:
  - Address performance deficiencies with existing and future inverter-based resources (e.g. wind and solar).
  - Expand the transmission network.

NERC Reliability Risk Priorities Report

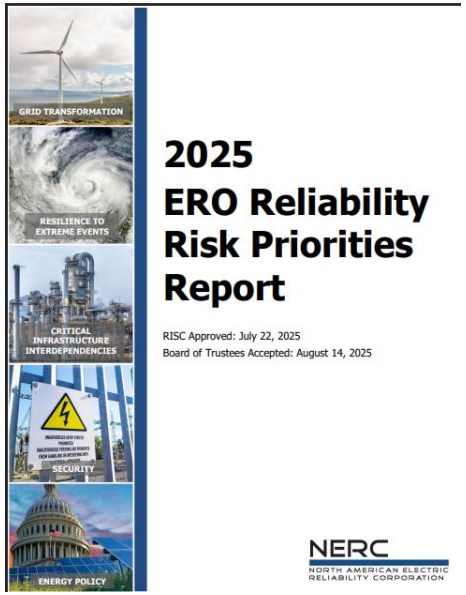
- **Grid Transformation:** New large loads and changing resource mix.
- **Resilience to Extreme Events:** Larger weather events impact multiple regions and can last longer.
- **Critical Infrastructure Interdependencies:** Natural gas pipeline infrastructure must expand to meet growing needs.
- **Security:** Cybersecurity and physical security are highly complex now and infrastructure is an attractive target.
- **Energy Policy:** Volatile and disconnected policy landscapes introduce risk and complicate ability to limit risk.
- **Supply Chain Challenges:** Persistent supply chain and workforce issues impact risk mitigation and response capabilities.

Reports

[NERC 2024 LTRA Report]



[NERC LTRA Infographic]



[NERC Risk Priorities Report]

THANK YOU

INDIANA UTILITY REGULATORY COMMISSION
Luke Wilson, Executive Director of External Affairs

Indiana Utility Regulatory Commission
101 W. Washington Street, Suite 1500 East, Indianapolis, IN 46204
www.in.gov/iurc

MISO Update

Energy Growth Task Force

October 6, 2025

Bob Kuzman - Executive Director, External Affairs – Central Region

Key Messages

- Reduced reserve margins and increased reliability risk have become the "new normal" as demand growth continues and dispatchable generators announce plans for retirement
- MISO and our members are responding with reforms and updated plans to help address the evolving challenges, but more work remains to be done
- Continued progress toward ensuring reliability and supporting policy goals requires a timely, collaborative approach between MISO, the States, and utilities

MISO Overview

MISO is an independent, not-for-profit, member-based organization responsible for keeping the power flowing across 15 U.S. states and Manitoba reliably and cost-effectively.

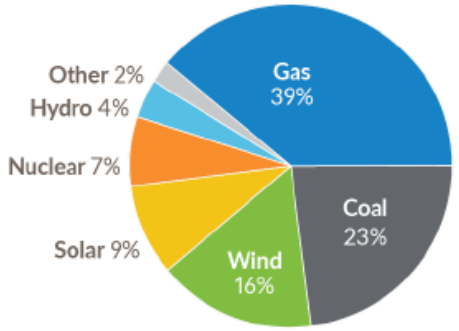
MISO's reliability footprint and regional control center locations

MISO STATISTICS

Population Served	45 Million
Transmission Line	77,000 Miles
Generating Units	1,460
Members	56 Transmission Owners
	173 Non-transmission Owners
Market Participants	> 550
Market Transactions	> $33 billion in 2024
Carbon Reduction	Approximately 32% since 2014

INSTALLED CAPACITY

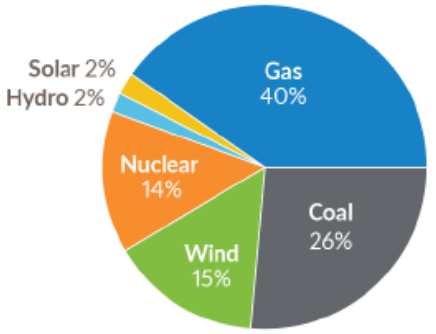
June 2025



203 GW

ENERGY PRODUCTION

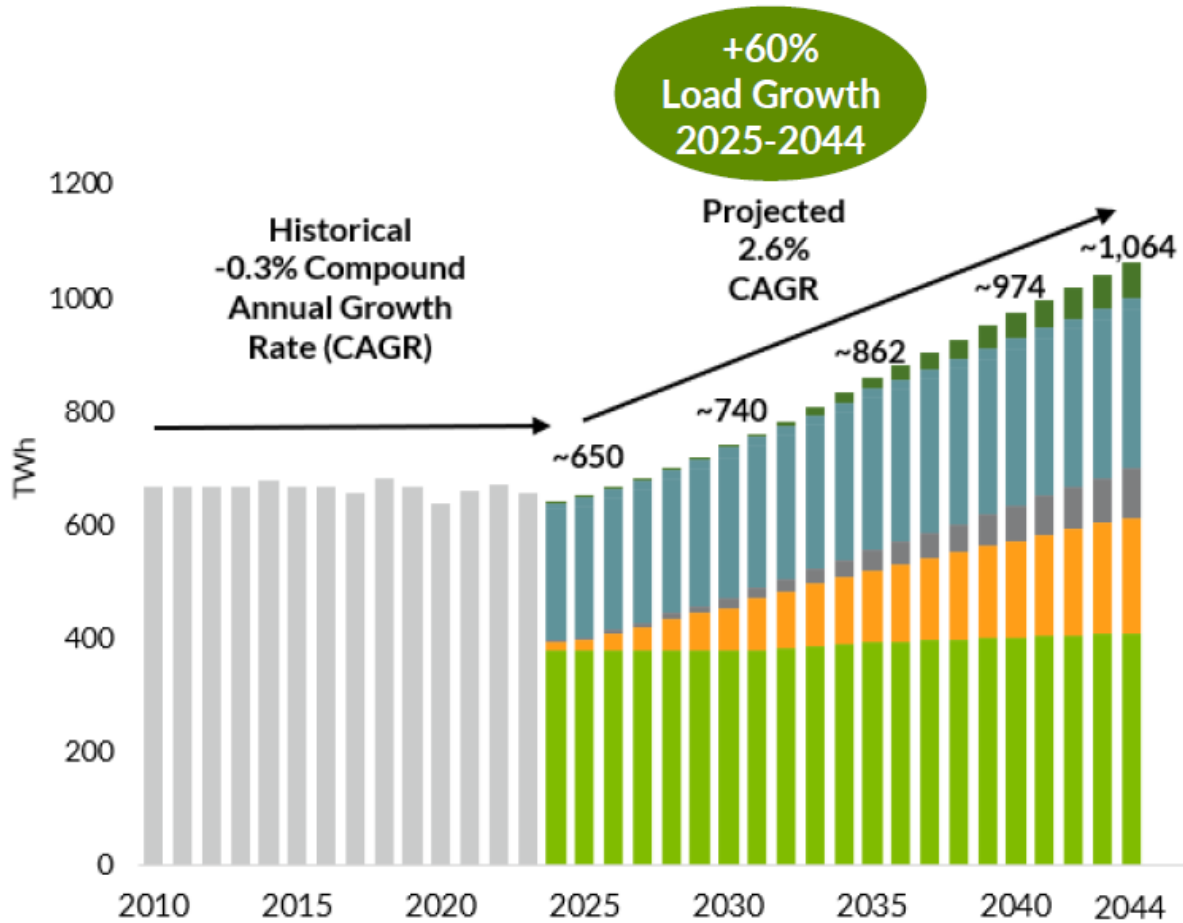
January-December 2024



638 Million MWh

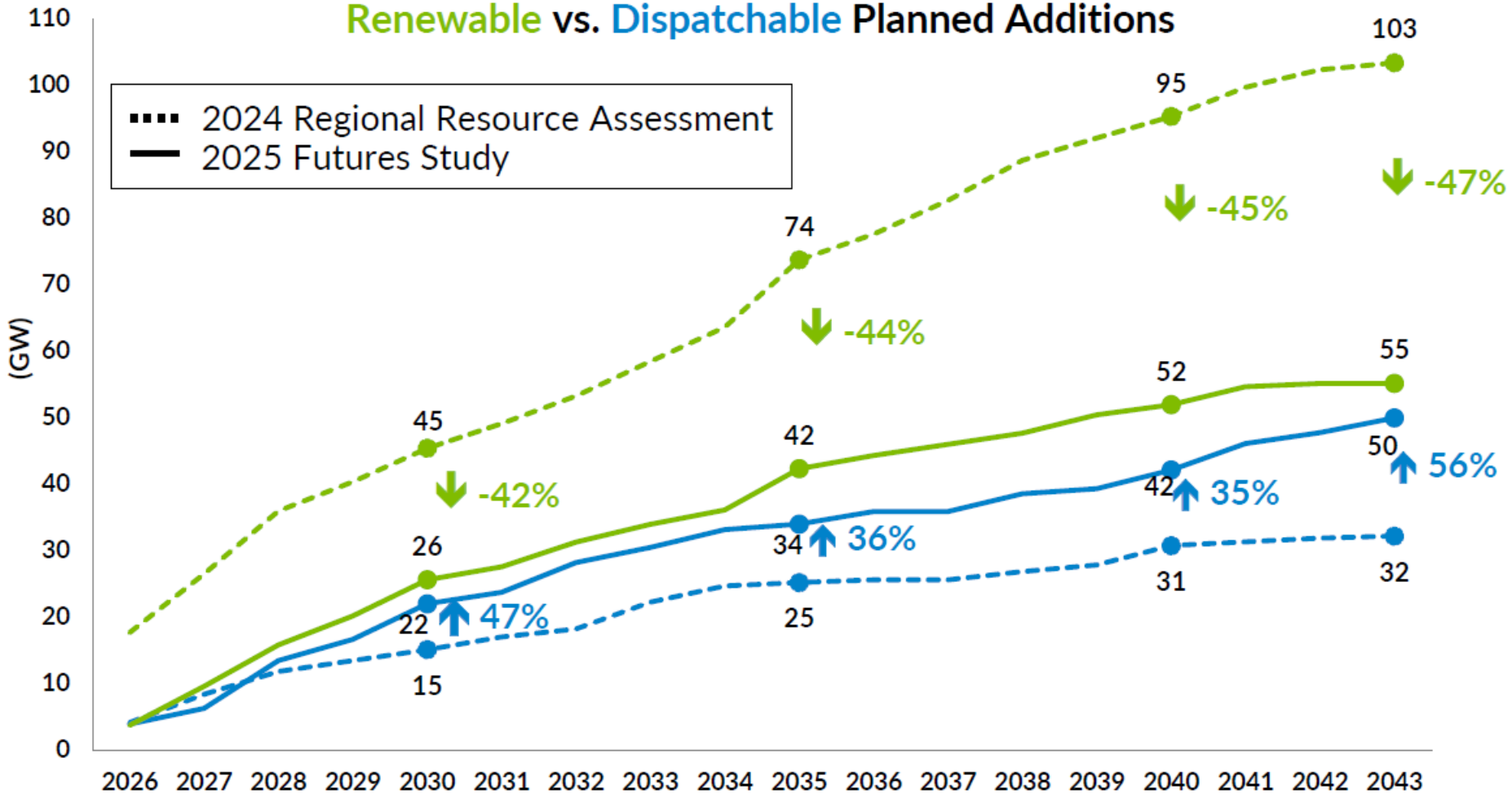
As of July 1, 2025

The MISO region expects load growth rates that have not been seen for decades, requiring additional firm, controllable resources



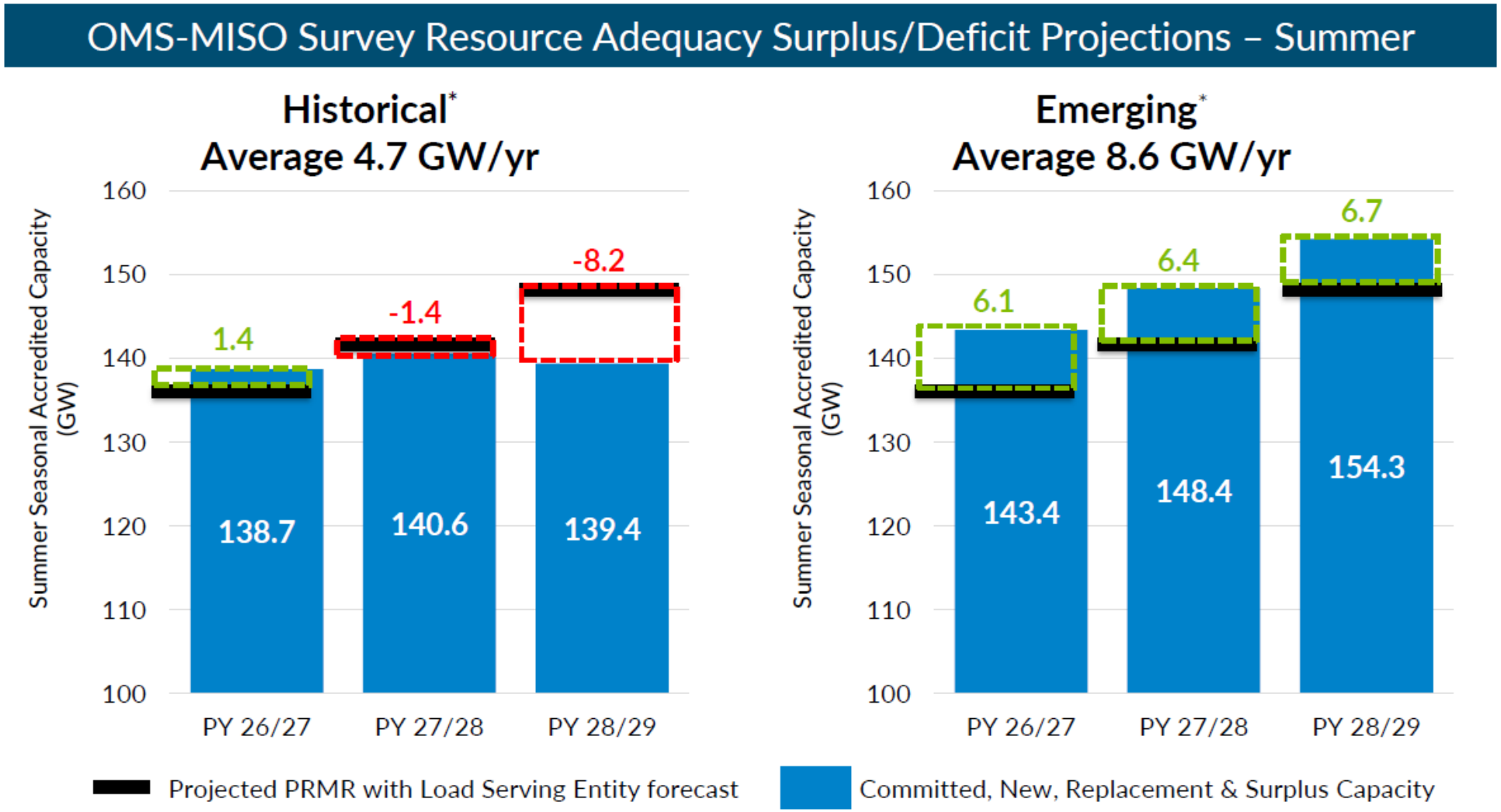
Projected Growth (Low-High)	CAGR % (2024-44)	TWh (2024-44)
Hydrogen	27 – 32	26 – 95
Industry Development & Reshoring	3 – 7	21 – 105
EVs	14 – 17	54 – 91
Data Centers	12 – 15	149 – 241
Building Electrification	0.45 - 0.54	36 – 43

MISO member plans have shifted over the last year, with an increasing focus on essential reliability attributes that are critical during the transition to renewables and will be needed as "insurance" in the future



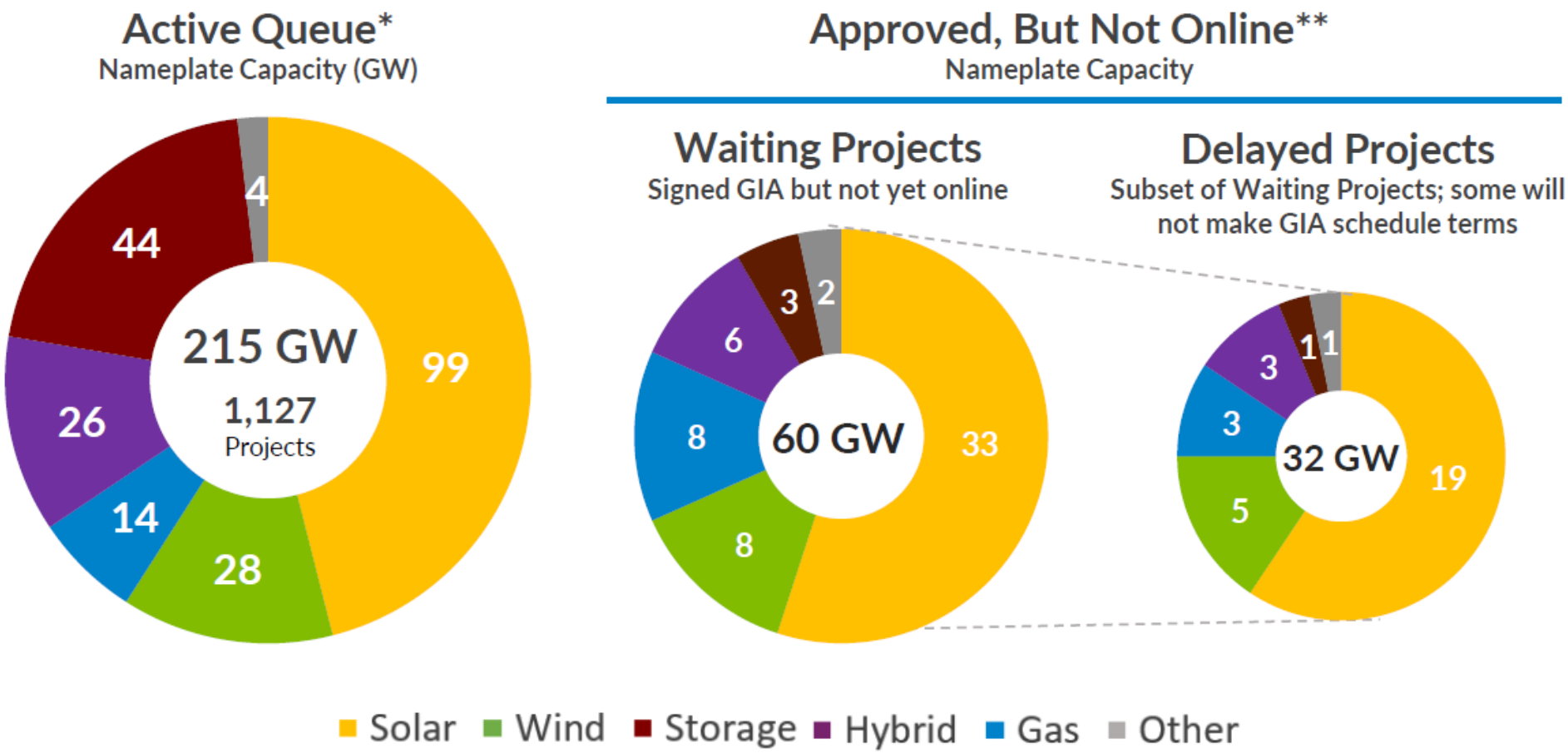
Renewable includes solar and wind; Dispatchable incudes gas and storage

The latest OMS-MISO survey shows that the pace of resource additions must accelerate beyond historical levels to maintain resource adequacy



*Historical assumes 50% and Emerging assumes 100% replacement/surplus.
Data and methods are available in the OMS-MISO Survey workshop presentation

While we are approving more new resources, over half have acknowledged delays in getting online; more are likely delayed



*Queue data as of 8/15/2025. Data does not reflect additional nameplate capacity from repowering existing generating facilities.
**As of 9/5/2025
GIA = Generator Interconnection Agreement

Generator Interconnection Queue - Indiana

MISO Generator Interconnection

COD Report: Waiting Generation

This is an overall view of "waiting generation", often referred to as "signed GIAs not yet online." This data encompasses generation that MISO is currently tracking after having an interconnection agreement but that has not reached commercial operation.

Data is representative as of 9/5/2025.

58 *CP Nodes Found*

8,504 *Nameplate MW Found*

Fuel: All

Company: All

TO: All

Cycle: All

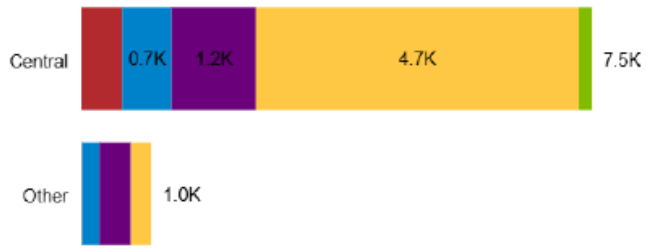
Region: All

County: All

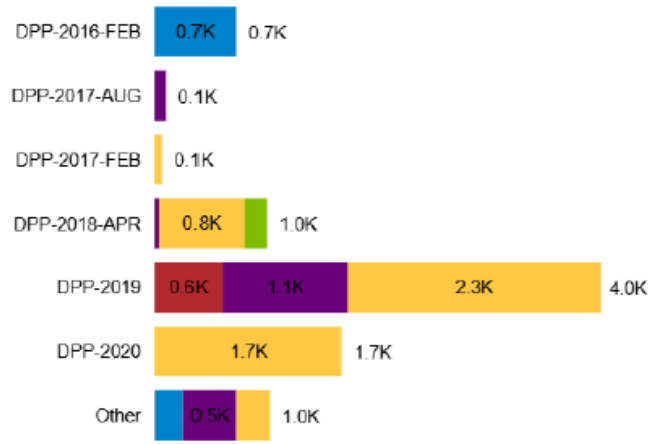
State: IN

BATTERY GAS HYBRID SOLAR WIND

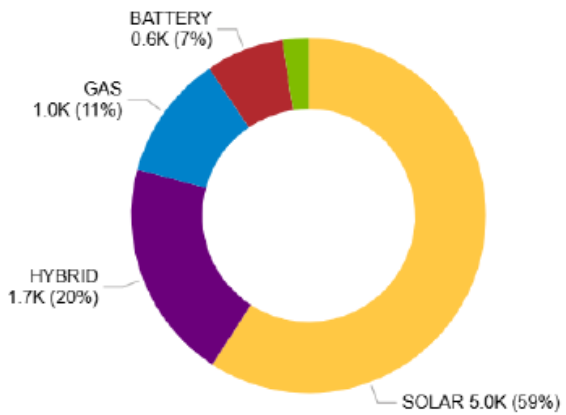
Regions



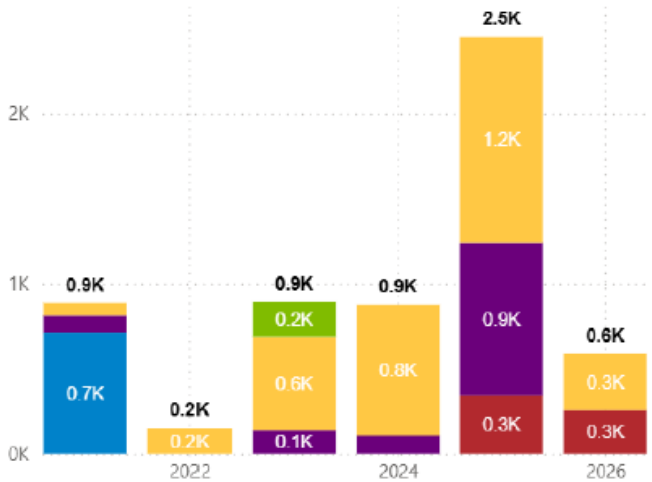
Cycles



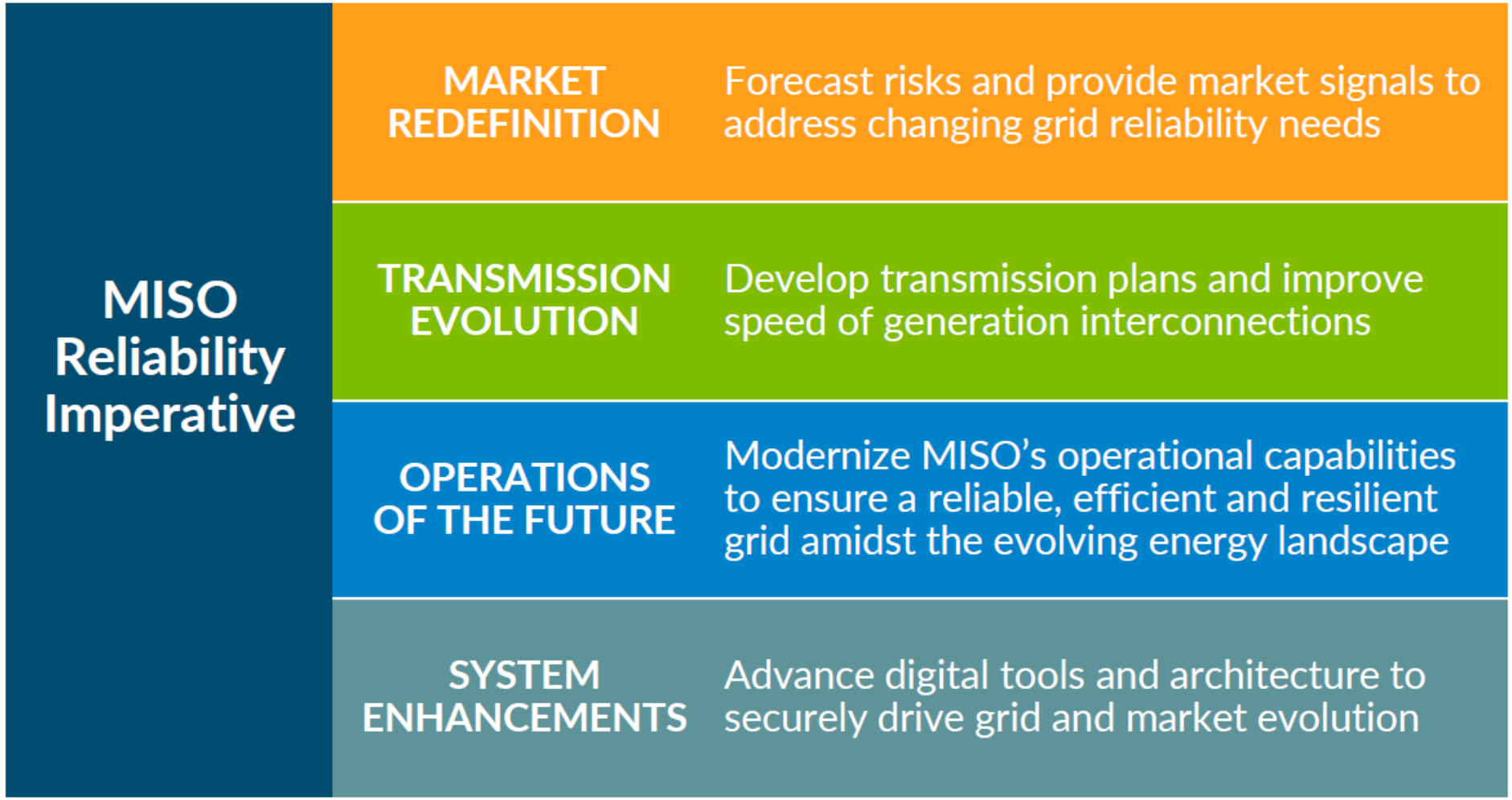
Fuel Breakdown



GIA COD by Year (MW)



MISO's Reliability Imperative was developed to guide ongoing work to address growing reliability risks while enabling state and member goals



Many initiatives underway and in process are expected to address near-term needs and improve long-term processes

- **Reliability-Based Demand Curve** *(FERC Approved)*
- **Non-Emergency Resource Accreditation** *(FERC Approved)*
- **Shortage Pricing** *(FERC Approved)*
- **Expedited Resource Additions Study (ERAS) Process** *(FERC Approved)*
- **Demand Response and Emergency Resource (DRER) Reforms*** *(Awaiting FERC Decision)*
- **Generator Interconnection Software (SUGAR) Implementation** *(In-Progress)*
- **Long-Range Transmission Planning (LRTP)** *(Ongoing)*
- **Futures Planning Scenarios** *(In-Progress)*

* *Previously referred to as Load Modifying Resource (LMR) Reforms*

FERC recently approved MISO's Expedited Resource Addition Study (ERAS) process, a temporary process to support the timely approval of needed new resources

- ☑ Addresses resource additions or adequacy needs that must be resolved within the next five years
- ☑ Respects the jurisdiction of the State or Relevant Electric Retail Regulatory Authority
- ☑ Evaluates projects individually instead of in clusters, allowing Generator Interconnection Agreement (GIA) execution within months versus years
- ☑ Provides a temporary solution, sunsetting no later than August 31, 2027
- ☑ Available for a limited number of both new projects and some existing projects already in the Queue

KEY DATES

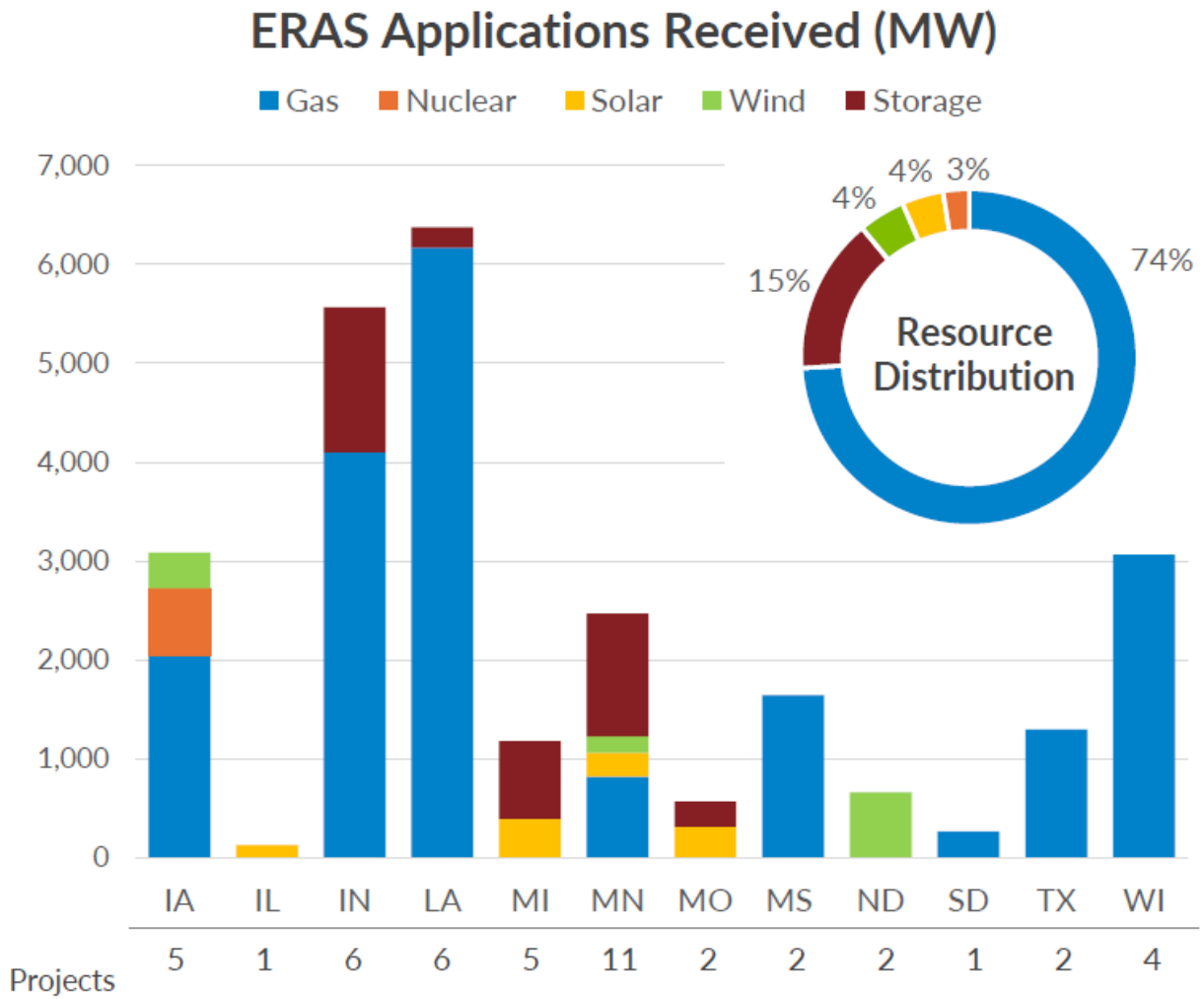
Aug. 6 - 11
ERAS Interconnection requests accepted

Sep. 2
First study cycle kickoff date

GIA = Generator Interconnection Agreement
https://www.misoenergy.org/planning/resource-utilization/generator-interconnection/

The Expedited Resource Additions Study (ERAS) process is being maximized to accelerate approval of critically needed resources

- 68 projects allowed; 10 processed per quarter
- 47 applications received in first period
- First 10 projects include 5 natural gas, 3 solar, 1 wind and 1 battery totaling 5.3 GW of installed capacity, covering all 3 MISO regions, from Minnesota to Louisiana

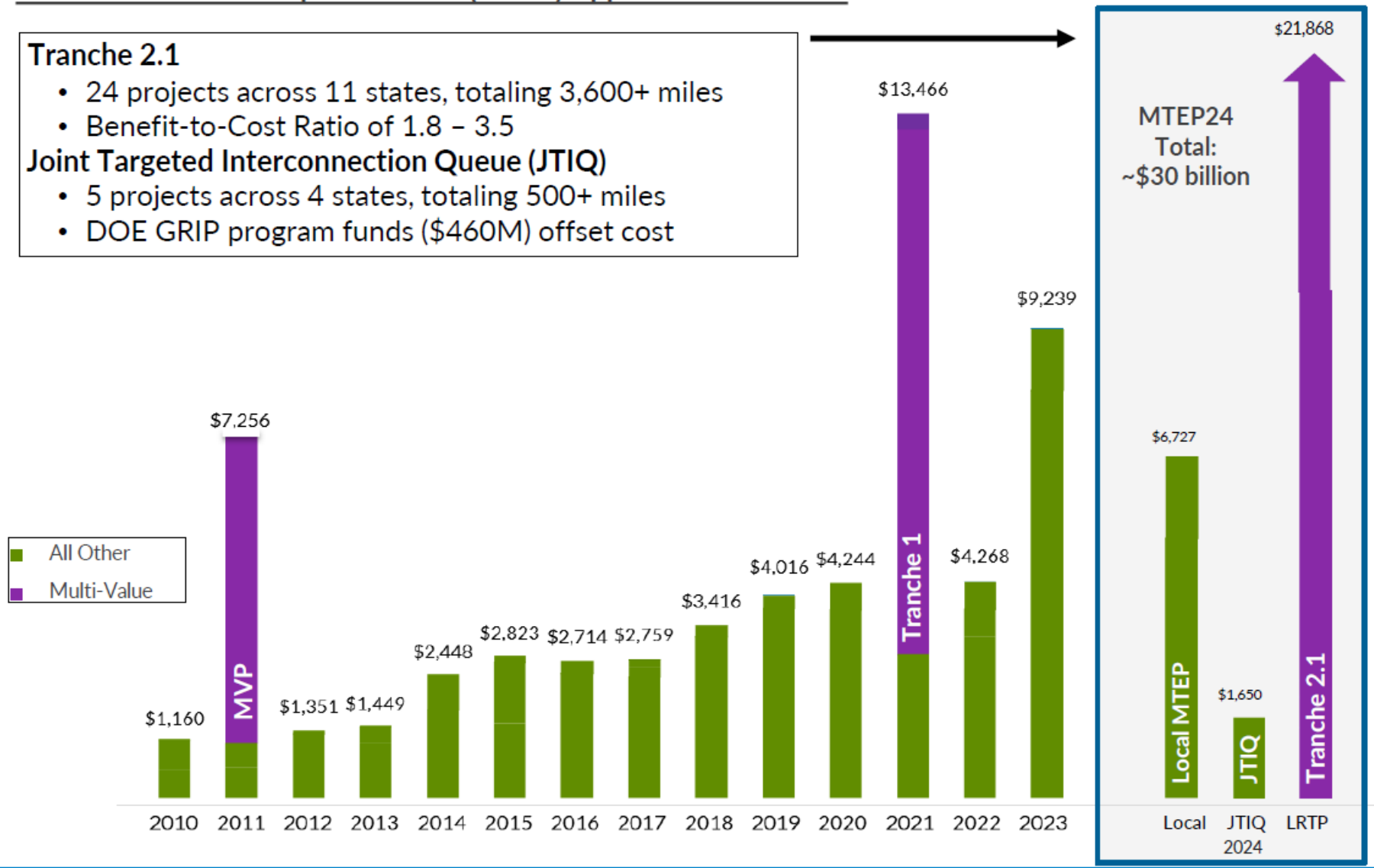


Transmission investment continues to facilitate the resource transition

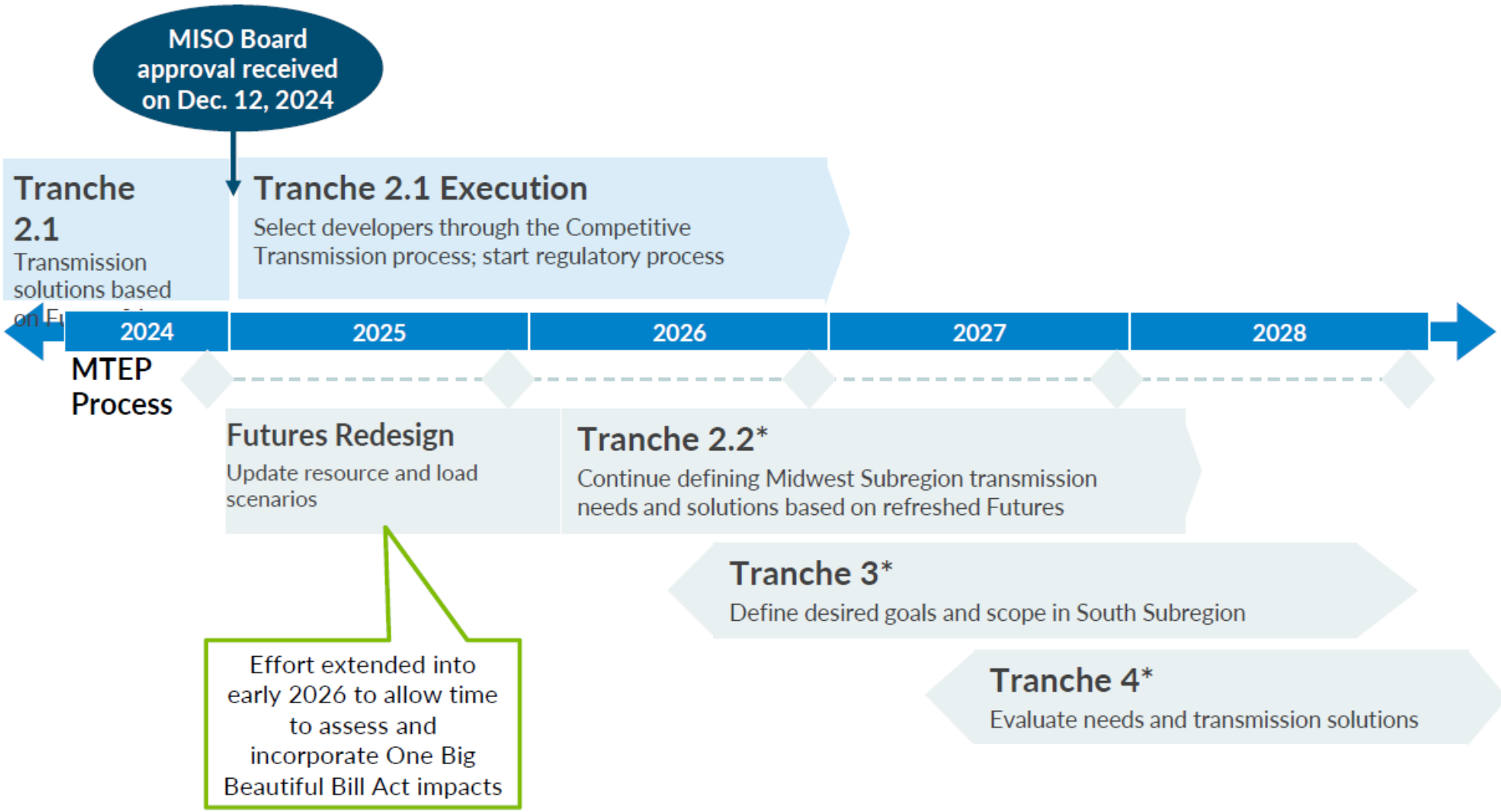
MISO Transmission Expansion Plan (MTEP) Approved Investment

Tranche 2.1
- 24 projects across 11 states, totaling 3,600+ miles
- Benefit-to-Cost Ratio of 1.8 – 3.5

Joint Targeted Interconnection Queue (JTIQ)
- 5 projects across 4 states, totaling 500+ miles
- DOE GRIP program funds ($460M) offset cost



Our Long Range Transmission Planning initiative will resume following a redesign of our Futures



Ongoing Reliability Imperative activities are helping ensure the continued reliability across the MISO region

MARKET REDEFINITION

- Provide Accreditation Data and Risk Metrics
- Illustrate Energy Adequacy Risks Across Time Horizons and Locations
- Implement Dynamic Locational Reserve Products

TRANSMISSION EVOLUTION

- Revise MISO Futures
- Develop Probabilistic Load Forecasts
- Reform Queue to Achieve 365 Day Cycle
- Implement Expedited Resource Additions Study Process

SYSTEM ENHANCEMENTS

- Implement Real-Time Market Clearing Engine
- Enhance Systems to Accommodate New Rules (e.g., Order 881)
- Expand Data & Analytics Modeling Capabilities

OPERATIONS OF THE FUTURE

- Advance Platform to Improve Risk Assessment & Evaluation
- Evolve Operator Training and Development
- Enhanced Scenario Manager for Operations Simulator

As MISO, the states, and utilities work together toward a common goal of reliability and value, the 2024 Value Proposition study highlights the growing benefit of a regional approach

2024 Analysis

Annual benefits grew from $4.9 billion in 2023 to: **$5.1 billion**

Cumulative benefits since 2007 are over: **$50 billion**

Benefit-to-cost ratio steady with 2023: **15:1**

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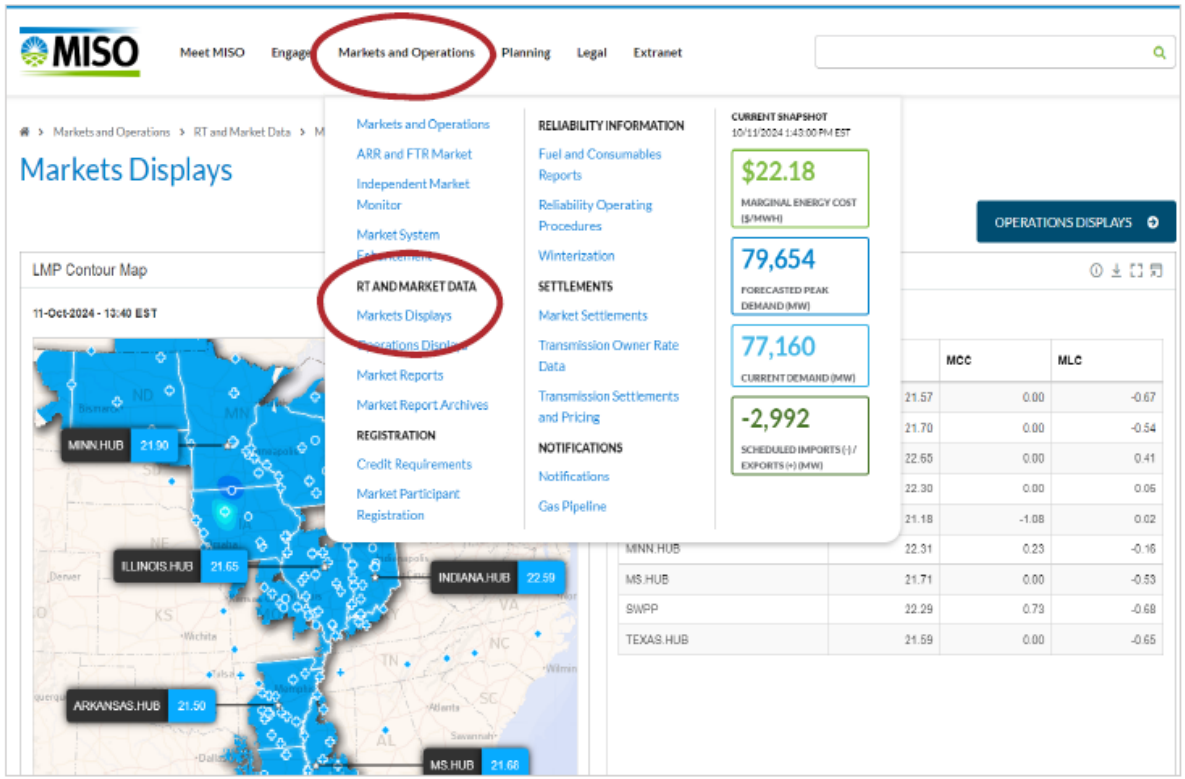
Real-Time Market and Operations Display is available via the MISO website and the Mobile App

www.misoenergy.org



MISO App

PJM Introduction
and
Supply/Demand Challenges

Jill Gates

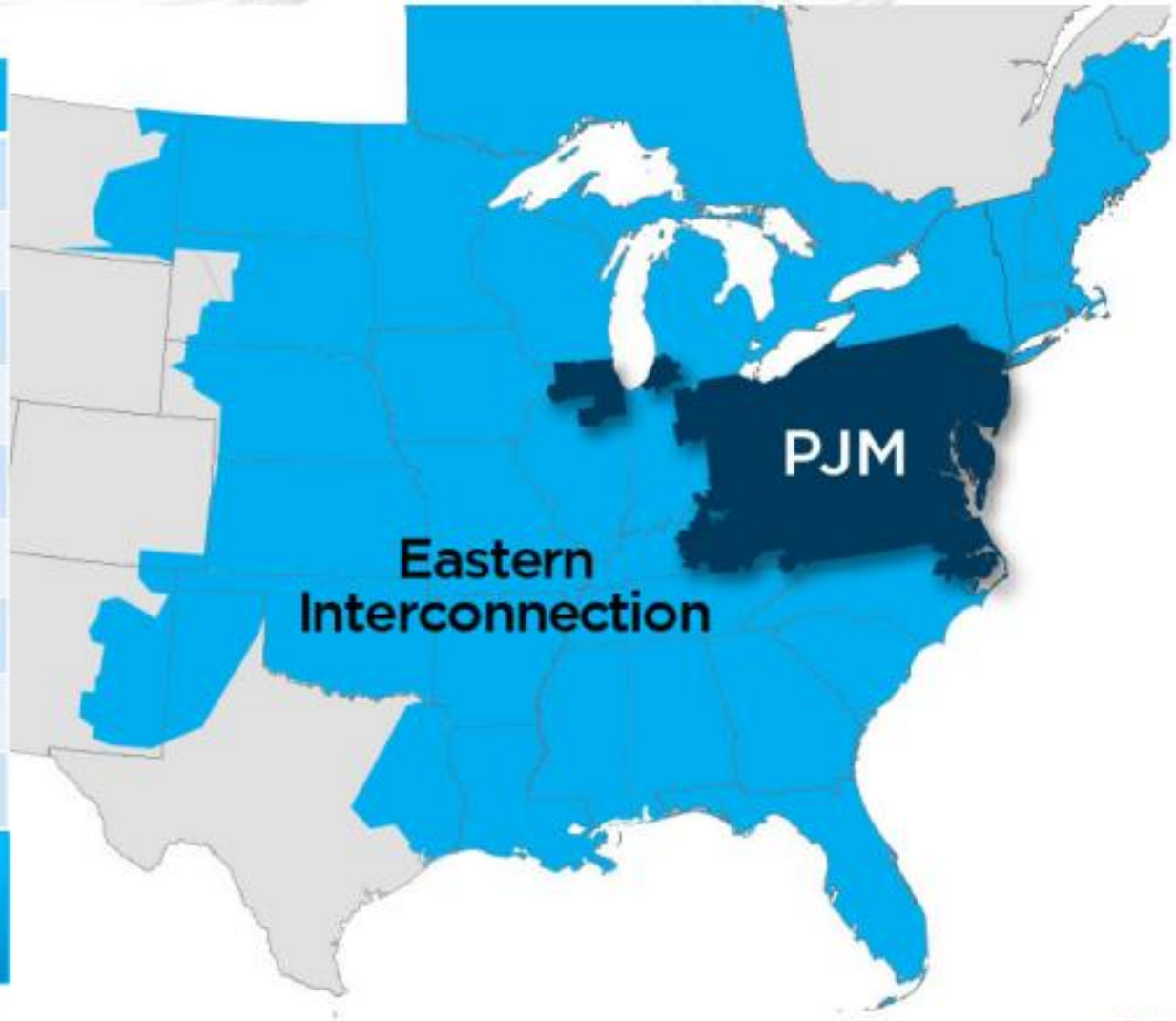
Principal Policy Advisor, Government and Legislative Affairs

October 6, 2025

PJM as Part of the Eastern Interconnection

Key Statistics	
Member companies	1,110
Millions of people served	67+
Peak load in megawatts	165,563
Megawatts of generating capacity	182,036
Miles of transmission lines (BES)	88,333
Gigawatt hours of annual energy	800,004
Generation sources	1,486
Square miles of territory	369,054
States served	13 + DC

- 27% of generation in Eastern Interconnection
- 24% of load in Eastern Interconnection



As of 2/2025

PJM Projects Energy Deficit by 2030

	2026 Projected Surplus	Minus Load Growth	Plus New Generation	Minus Deactivations	Plus DR and Load Flexibility	2030 Projected Surplus/Deficit
Scenario 1	0.3 GW	(22.9 GW)	6.6 GW	(8.1 GW)	0.0 GW	**(24.1 GW)**
Scenario 2	0.3 GW	(29.2 GW)	12.2 GW	(8.1 GW)	0.0 GW	**(24.7 GW)**
Scenario 3	0.3 GW	(22.9 GW)	12.2 GW	0.0 GW	0.0 GW	**(10.4 GW)**
Scenario 4	0.3 GW	(22.9 GW)	12.2 GW	0.0 GW	3.3 GW	**(7.1 GW)**
Scenario 5	0.3 GW	(22.9 GW)	12.2 GW	0.0 GW	10.4 GW	**0.0 GW**

Policy Takeaways

- **States should avoid policies intended to push *existing generation resources* off of the system until an adequate quantity of replacement generation is online and has been shown to be operating**
- **States should help to bring *new generation resources* onto the system as soon as possible**
- **States should address state and local challenges in the siting & permitting of all electricity infrastructure including *transmission infrastructure.***
- **Consider consumer *cost increases* as a natural byproduct of policies that exacerbate the supply/demand imbalance.**

Contact

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General Discussion

Share Thoughts
Ideas Moving Forward

Public Comment

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