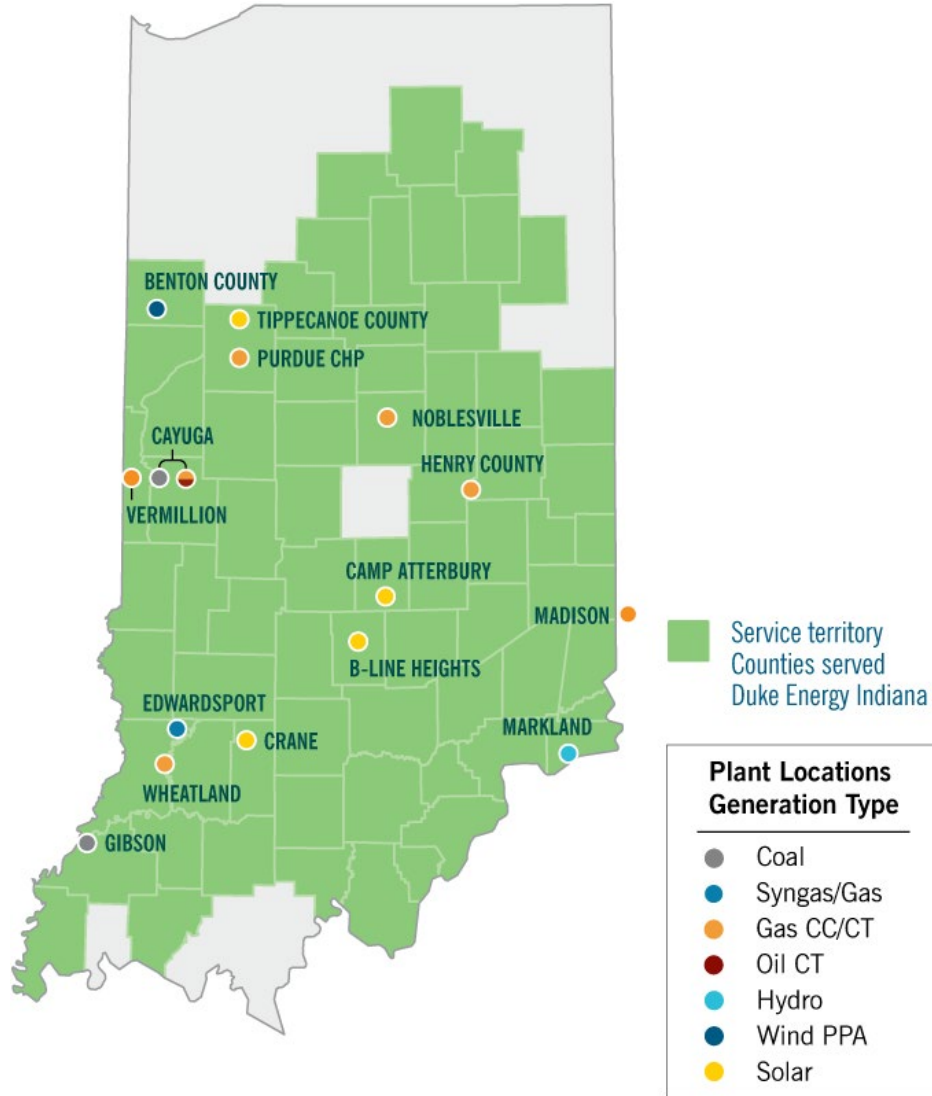




Bryan Garnett,
Duke Energy
RTO Policy and Compliance Manager



Duke Energy Indiana at a Glance



Largest electric utility in Indiana

23,000 square-mile service area,
covering 69 of 92 counties

900,000 customers

37,000 miles of transmission and
distribution lines

6,300 megawatts at 12 large
power generation sites

Approximately 2,500 Duke Energy
Employees in Indiana

MISO Resource Adequacy Changes | Impact on Integrated Resource Planning



Seasonal Accreditation Capacity (SAC) Construct (2024 – 2027)

- Included seasonal peak load requirements in updated IRP analysis starting in 2023
- Existing units:
 - Used the latest MISO Auction data (2023-24) for GVTC, XEFORd (UCAP) and SAC values for Duke Energy Indiana's fleet
 - To alleviate volatility in the SAC numbers, created a resource class-based grouping (Coal, Other) to arrive at a SAC/UCAP ratio
 - Applied this ratio to every unit to avoid extreme changes on a unit per unit basis based on planned outages, which units were available in tight hours
- New resources:
 - Used 2023/2024 LOLE study to calculate seasonal ELCC with the Feb 2021 RIIA Study for solar/wind shapes
- Encompass Model (Version 7.1.4) solves for the most constrained season
- Preliminary results show the constrained season can move from year to year (winter / summer)
- Winter season has potential to be the binding season going forward, due to lower accreditation values of renewables in winter

Planning Reserve Margin Requirement (2024 – 2027)



MISO Resource Adequacy Changes | Impact on Integrated Resource Planning



MISO Direct Loss of Load (DLOL) Methodology (2028+)

- Methodology on file with FERC and expected to be incorporated in 2028/2029 planning year
- Existing units:
 - Duke Energy Indiana followed similar methodology as SAC
 - DLOL values will be the Class Average adjusted for unit performance
- New resources:
 - DLOL accreditation values used 2028 and forward
 - *Thermal*: Use 2023-2024 data to calculate forward values DLOL
 - *Non-Thermal*: Used 2023-2024 Proposed DLOL values for Starting Point with the January 2023 Market Redefinition solar/wind ELCC shapes

Planning Reserve Margin Requirement (PRMR) (2028+):

 Summer
2.7%

 Fall
9.4%

 Winter
1.1%

 Spring
-0.5%

Reliability Verification: Motivation and Modeling



- DEI will add a new process called Enhanced Reliability in 2024 in response to both the changing MISO accreditation as well as the shifting risk landscape in the future.
- Enhanced Reliability will use the SERVM model to gauge how DEI's risk profile changes with the different DLOL resource and PRM values in the IRP window.
- The SERVM stochastic model is used to evaluate portfolio performance under real world certainties, focusing on the DEI portfolio and its effect on the MISO footprint. Real world certainties include:

Weather:
44 years of
weather history
(1980-2023)

**Weather Impact on Load
and Resources**
(weather-driven performance
of hydro, wind, solar, and
thermal resources)

**Economic Load
Forecast Error:**
distribution of long-term
load growth uncertainty
with varying probabilities
of occurrence

**Unit Outage
Modeling**
(frequency and
duration of thermal
unit forced outages)