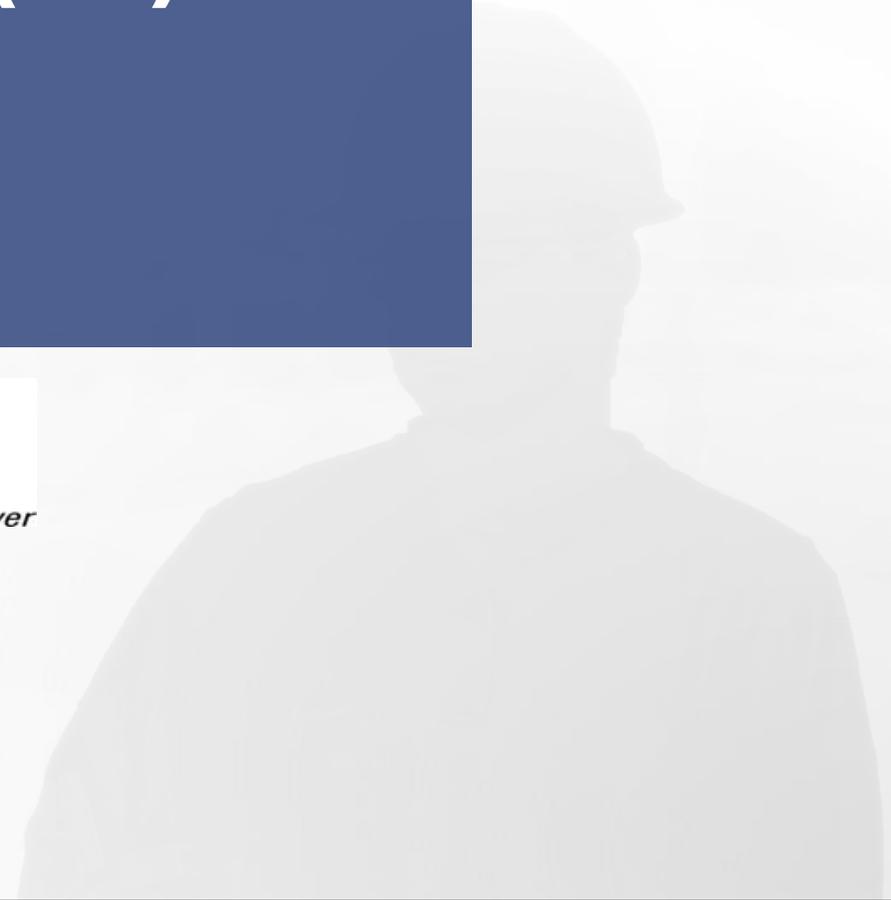


Joint Integrated Resource Plan (IRP) Stakeholder Presentation February 3, 2016





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REGIONAL TRANSMISSION OPERATORS (NIPSCO)

Agenda

- Overview of RTOs
 - What they are
 - Who participates
 - What they do
 - How they benefit Indiana's customers
- RTOs and the IRP
 - Relevancy to Indiana's IRP process
- RTOs and Utilities – Information Exchanged
- Questions





OVERVIEW OF REGIONAL TRANSMISSION ORGANIZATIONS

Overview of RTOs – What is an RTO?

- Regional Transmission Organizations (RTOs) or Independent System Operators (ISOs) are independent, non-profit organizations that optimize the operation and planning of the transmission systems of their region
 - Reliably operate their portion of the Bulk Electric System
 - Provide regional and interregional reliability planning for the system
 - Administer capacity, energy, financial transmission rights, and ancillary services markets
- RTOs are required to comply with Federal Energy Regulatory Commission (FERC) Orders and North American Electric Reliability Corporation (NERC) Standards



Overview of RTOs – How many RTOs are there?

- There are 7 RTOs across the US
- Indiana participates in two:
 - PJM
 - Indiana Michigan Power
 - MISO
 - Duke Indiana
 - Indianapolis Power & Light
 - NIPSCO
 - Vectren

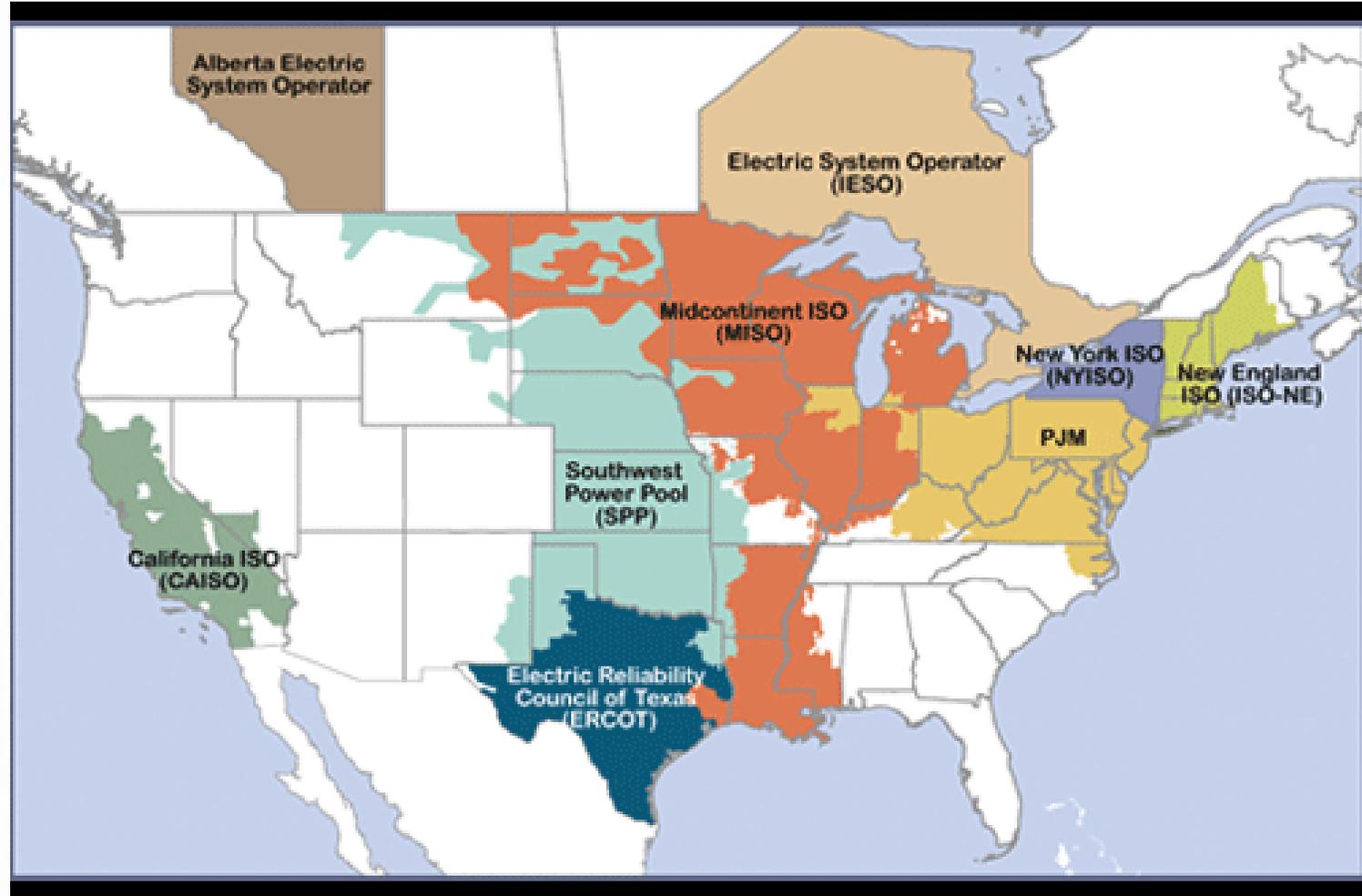


Image source: www.ferc.gov/industries/electric/indus-act/rto.asp

Overview of RTOs – Why are there RTOs?

- FERC envisioned RTOs as a way for existing US power pools to satisfy the requirement of providing non-discriminatory access to transmission for competitive generation
- Subsequently, FERC encouraged the voluntary formation of RTOs to administer the transmission grid on a regional basis throughout North America (including Canada)
- State participation in RTOs has slowly expanded since the mid-1990's and holdouts remain

Overview of RTOs – Who makes up an RTO?

- Participants - operationally and/or through stakeholder process
 - Transmission owners
 - Load serving entities
 - Transmission developers
 - Generators and independent power producers
 - Power marketers
 - End use customers
 - State regulators and consumer groups
 - Environmental organizations
 - Municipalities, Co-Ops and other transmission-dependent entities
 - Coordinating members



Overview of RTOs – What does an RTO do?

- Reliably operates a portion of the Bulk Electric System
 - As transmission service provider, RTOs facilitate the scheduling of electric transmission
 - As transmission operator* and reliability coordinator, RTOs ensure the real time reliability of their region's transmission system
 - As balancing authority*, RTOs balance load and generation and maintain frequency for their region

* *Can be a shared function with local utility*



Overview of RTOs – What does an RTO do? (cont.)

- Provides reliability planning for the electric system
 - Transmission studies including impact of new generator interconnections
 - Generation assessments (not generation reliability planning)
 - Coordination for outage planning
 - Coordinated regional and interregional transmission planning
 - Performs open and transparent long-term system planning
 - Identifies reliability adequacy on a larger regional basis and ensures that the transmission plans of each member company are compatible with one another
 - Interregional planning studies evaluate transmission issues/solutions for the areas where RTOs adjoin one another (seams)



Overview of RTOs – What does an RTO do? (cont.)

- Administers the energy and ancillary services markets on a daily basis
 - Dispatches the system by matching generation resources to load to provide the needed electrical energy
 - Security constrained, economic dispatch
 - Lowest cost available resources are dispatched before higher cost resources unless reliability is jeopardized
 - Utilities can buy and sell electricity on behalf of their customers depending on how competitive and available their resources are both in the “day ahead” and real time
 - Price of electricity changes constantly during the day and is influenced by multiple factors including:
 - Weather, electrical load, system constraints, available generation, available fuel, environmental considerations, etc.



Overview of RTOs – What does an RTO do? (cont.)

Administers the annual capacity market/auction

- Capacity markets (or MISO's auction) provide a competitive structure for generation owners to sell their available capacity to load serving entities like Indiana utilities
 - Utilities can also purchase or sell capacity through bilateral agreements outside of the capacity construct.
- Utilities serving load are obligated to procure enough resources to satisfy their Planning Reserve Margin which is based on their contribution to the RTO's system peak
 - A utility can satisfy this obligation by showing it has enough Unforced Capacity resources available
 - Utilities have the option to self schedule or provide a fixed resource adequacy plan or participate in the auction/market to obtain the necessary capacity
 - Depending on its resource position, a utility can buy additional capacity in the market or sell any excess
- Once a generation resource is “cleared” in the capacity market, it must be offered into the daily energy market unless it is in outage
 - Resources are also obligated to perform when dispatched

Overview of RTOs – What does an RTO do? (cont.)

- MISO's Single Year Capacity Construct (Duke, IPL, NIPSCO, Vectren)
 - Auction for the next Planning Year running June 1 – May 31
 - Capacity obligation established to meet summer peak and carried for entire year
 - Footprint is separated into individual local resource zones which limits over-importing/exporting
 - MISO is planning to move to a two-season approach with Winter and Summer auction periods
- PJM's Three Year Forward Capacity Market (I&M)
 - Auction for the Planning Years running June 1 – May 31
 - Three-year forward market with multiple auctions
 - Base Residual auction, then yearly secondary auctions provide a longer-term price signal
 - Generation pay-for-performance recently implemented
 - Higher performing resources receive a higher capacity payment than underperformers

While capacity markets show the value of capacity in the future, these markets/auctions are relatively near term when compared to the 20-year timeline for Indiana's IRP process

Some benefits of the RTO/ISO approach

Optimized Transmission System

- Real Time Operations
- System Planning
- Overall Enhanced Reliability

Economies of Scale

- Centralized operating activities v. locally duplicated activities

Available Capacity Reserves

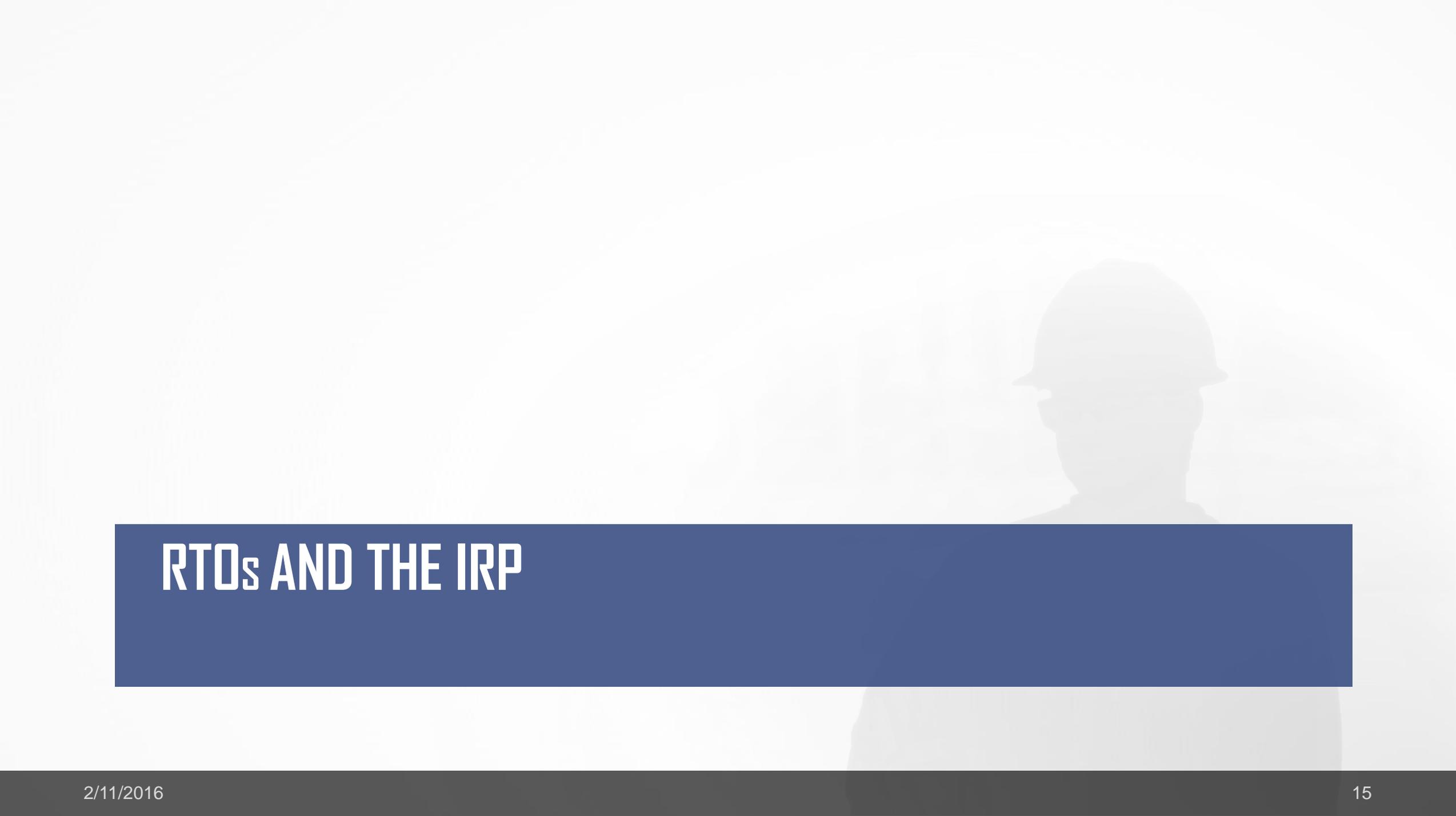
- Available at competitive prices

Potential Long Term Price Signal

- Bringing more certainty to capacity price in distant years

Evolving Markets

- Capacity, Energy & Ancillary Services
- Can match products to address customer needs or solve operational / reliability issues



RTOs AND THE IRP

RTOs and the IRP – How do they interact?

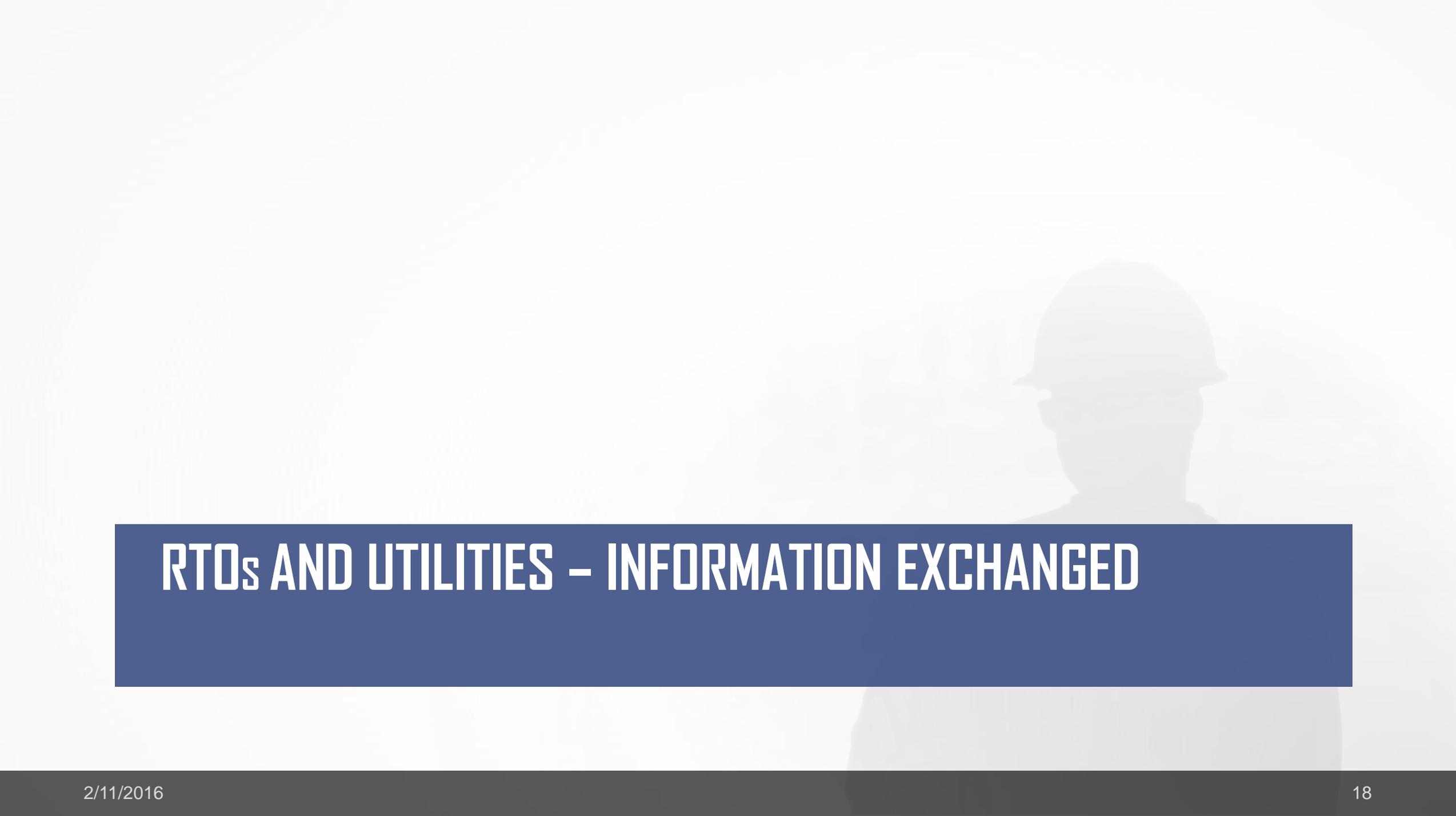
- The Indiana Utility Regulatory Commission (IURC) is the regulator of Indiana's resource adequacy
 - The IURC regulates the resource requirement for each utility
 - Through the IRP, utilities demonstrate that they have enough resources to meet the forecasted system peak in future years plus an additional reserve margin
 - Many of the concepts between the IRP and the way MISO and PJM conduct their capacity auction/market are similar, but differences exist
 - Some examples:
 - A utility's system peak may not peak at the same time as the RTO's system peak
 - Unforced capacity in the IRP may not equal the utility's Unforced Capacity (UCAP) in the RTO
 - In the IRP, utilities include RTO energy and capacity cost forecasts in order to model market dispatch and select the preferred resource plan in multiple scenarios



RTOs and the IRP – How do they interact? (cont.)

- RTOs perform an analysis role for the region's resource adequacy
 - RTOs also evaluate the ability of smaller areas in the region to meet their Planning Reserve Margin requirements
 - These areas do not break cleanly on state boundaries and are even more complicated for states like Indiana that are separated between two RTOs
 - While obligated by FERC to perform this verification function, the authority and obligation to ensure Indiana's resource adequacy lies with Indiana





RTOs AND UTILITIES – INFORMATION EXCHANGED

RTOs and Utilities – What Information is exchanged?

- Information exchanged includes
 - Load and Resource forecasts
 - Maintenance outage plans
 - Plans for generation retrofits, retirements and additions
 - Environmental compliance plans
 - Demand side resources
 - Generation fuel assumptions
 - Transmission investments and upgrades
 - Historical performance of generation resources (NERC-GADS)
 - Historical performance of demand response resources (NERC-DADS)
 - Scenario planning and risk assessment
 - Emergency recovery planning

