

Resource Adequacy in Competitive Wholesale Markets: The U.S. Experience

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U.S. Electricity Regulation: Who is Responsible for What?

Federal Regulation (FERC)

- Wholesale sales of capacity and energy for resale in interstate commerce
- Transmission of electricity in interstate commerce
- (Very) Limited transmission siting authority
- Permitting of hydro plants
 - Otherwise, no generation planning or facility siting control
- Reliability of transmission grid

State Regulation (PUCs)

- Retail sales to end users
- Low-voltage distribution
- Siting of power plants and transmission lines
- Resource planning; *i.e.* the generation types (coal, natural gas, renewable) used by a utility to serve customers

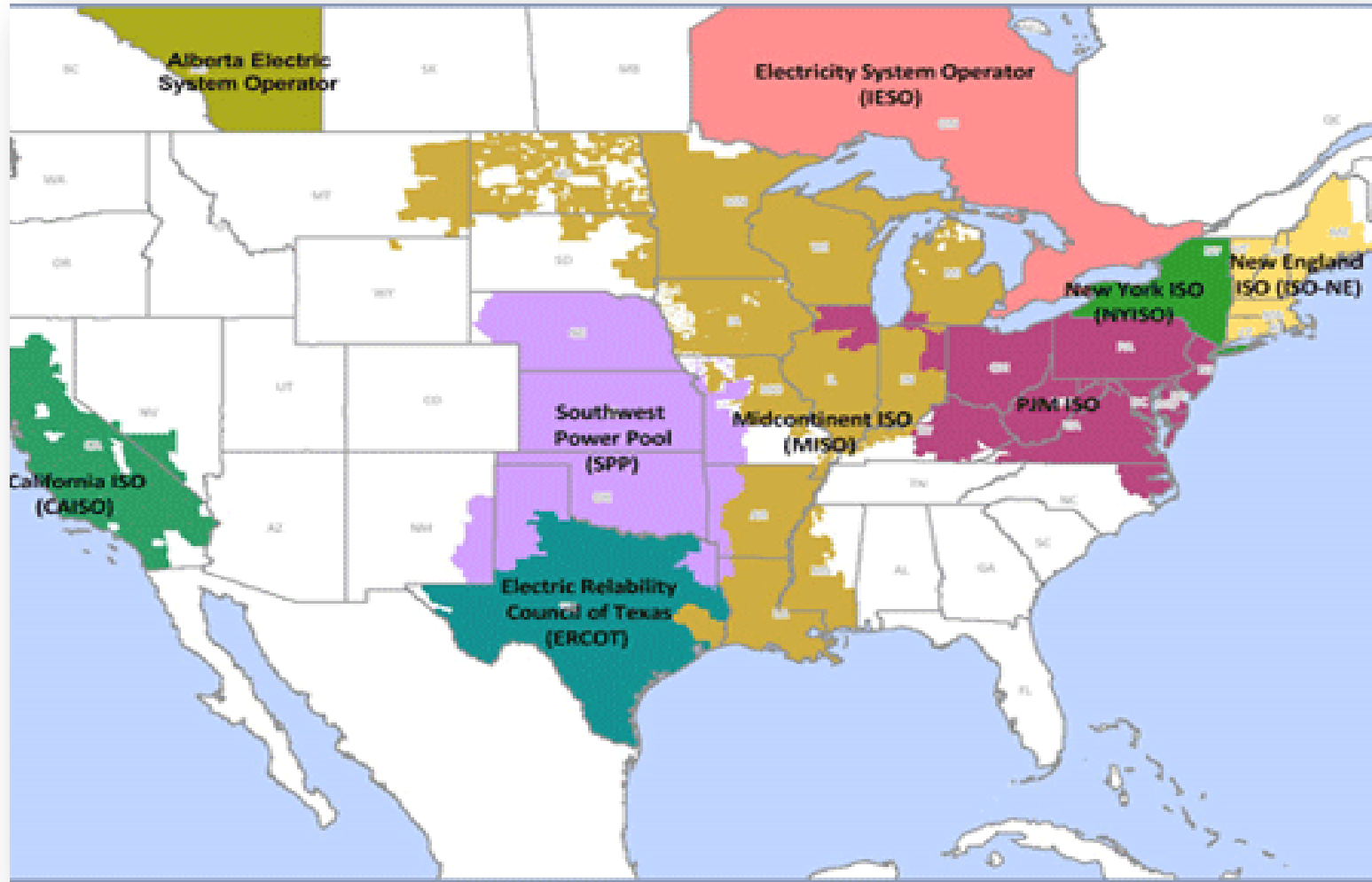


Historic Industry Structure

- ❑ Vertically-integrated monopolies with “bundled” cost-based rates
- ❑ Individual utilities plan and build generation, transmission and distribution to meet own load growth
- ❑ Some power pooling and wholesale sales between entities, but resource sharing not prevalent early on
- ❑ Almost no resources owned by non-utilities

Evolution to Competitive Markets

- Federal and state policy changes encourage greater electricity competition and development of “merchant” (non-utility) generation
 - Many states required utilities to unbundle and divest assets
- Regional Transmission Organizations and Independent System Operators (RTOs/ISOs) created
 - Organized wholesale energy markets with price caps
 - Originally required member utilities to provide sufficient capacity or pay a deficiency charge; operated voluntary balancing markets for capacity





U.S. Resource Adequacy Constructs

- RTO/ISO-run centralized capacity markets with a single market clearing price
 - ISO New England, New York ISO, PJM Interconnection
- State regulators set requirements for utilities; RTO operates residual market(s)
 - California ISO, Midcontinent Independent System Operator
- Non-RTO/ISO regions: state regulated integrated resource planning



Why Centralized Capacity Markets?

- Resolve “missing money” problem and provide opportunity for fixed cost recovery
 - Energy market mitigation limits revenue opportunity
- Give RTO/ISO an administrative tool to assure resource adequacy/reliability needs are met with least cost mix of resources
- Establish transparent market signals for future investment

Challenge: Interaction with State and Local Policy Goals

- States concerned that market power mitigation conflicts with renewable energy goals
 - Offer floors (“Minimum Offer Price Rule”) prevent certain resources from bidding below cost to assure clearing; ensures out-of-market subsidies do not distort market outcomes
 - May prevent higher-cost renewables from clearing market and satisfying RA requirements
- RTOs/ISOs have taken a variety of approaches to addressing this potential conflict
 - Exemptions
 - Defining who is subject to offer floors
 - Resource-specific offer floors and unit-specific review

Challenge: Are we getting the “right” capacity resources?

- Originally procured a single product – MWs
 - No consideration of resource type; little consideration of transmission deliverability or location
- Evolved to include locational features to account for transmission limits and send location-specific price signals
- Today’s challenges: resource performance, fuel assurance, and resource characteristics
 - Poor performance of capacity resources, especially during tight system conditions
 - Risks of interruptible fuel supplies
 - Need for specific resource characteristics (e.g., fast ramping)
- All RA constructs face these challenges to some degree



Interregional Resource Adequacy

- ❑ Little resource planning across RTO/ISO regions or utility systems in non-RTO/ISO regions
- ❑ Each capacity construct has rules to allow external resources to participate
- ❑ Goal is to balance greater competition/economic efficiency against potential reliability impacts
- ❑ Considerations include:
 - Transmission availability and potential for curtailment by neighboring systems
 - Operator visibility and ability to dispatch
 - Impact of redispatch scenarios on deliverability
 - Application of market rules applied to internal resources (must-offer, etc.)

Thanks!

Questions?

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