Considerations for the Design of Restructured Electricity Markets and Institutions 1st Annual OOCUR Conference "The Challenge for Utility Regulators in the Caribbean" 16-19 September, 2003 Port of Spain, Trinidad & Tobago

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Overview

- Introduction
 - Based upon experience and observation
 - The need to understand industry operation in the context of more general legal and regulatory concepts

System Operation

- Puts the ideas of cost, pricing, and "markets" into context.
- Legal and Regulatory Concepts
 - So many ideas to consider and to implement either in the context of a regulated industry or a industry opened to competition.
- Power Market Concepts and Questions
 - So many things to consider if there will be competitive markets for generation



System Operation

Security Constrained Unit Commitment (SCUC)

- Protocol by which the utility/system operator commits units to run in advance of the real-time dispatch
- Is this being done in a true least-cost manner?
- How are contingencies handled for reliability?
- Is it pre-programmed or is there an operator heuristic?
- How is system lambda (market clearing price) determined?
- Security Constrained Dispatch (SCD)
 - How often are dispatch signals sent?
 - How is system lambda determined?
 - Are the system contingencies different than in the SCUC?



System Operation

Contingency Constraints

- Can these be relaxed to improve cost-effective operation? Or do they need to be tightened to improve reliability?
- Cost impacts
- Pricing/Management Protocols for Transmission Constraints
 - Do transmission bottlenecks get explicitly priced or are these costs "socialized" across the system.
 - If bottlenecks are priced, how is this done?



System Operation

Ancillary services

- These include services such as reserves, voltage support, and frequency response.
- Are these being included in the SCUC and SCD in a least cost manner?
- How are ancillary service costs determined
- Must Run Units
 - How are these accounted for in the dispatch?
 - How are they compensated?
 - Do they set the system lambda?
 - How do consumers pay for these? If these units are run for reliability in a region, are the costs "socialized"?



Independence of operating institutions

In a market environment, the market and system operator functions must be independent from market participants.

Creditworthiness

- See Enron. Enough said!
- Licensing Requirements
 - Credit, ability to deliver, quality, reliability, and market conduct.

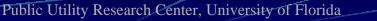
Facility Siting

- Both generation and transmission
- Can sites be chosen that will promote the least-cost expansion of the system?



Interconnection

- Needs to address reliability and cost issues
- Reliability
 - Addresses both operational security and generation adequacy.
 - Does the regulator enforce these standards?
 - What are the cost impacts to consumers?
- Integrated Resource Planning
 - Really a forecasting and advisory tool at best.
 - Can help the regulator enforce and revise reliability standards as needed.
- Demand-side resources
 - Allows consumers to respond to price or for the utility to move load to preserve reliability and reduce costs.



Generator Rate Regulation

- This is a way of managing competition through the rates generators can set.
- Used to protect consumers from market power.
- Transmission Access, Terms, and Conditions
 - Cost Separation and Cost Reflectivity
 - Rebalancing tariffs to eliminate subsidies where desired and can be used as a baseline to implement cross-subsidies where socially desirable.
- Obligation to Serve
 - While this is fundamental, there should be encouragement of both utilities and regulators to find new rate designs that will not make this financially burdensome.



- Market Power and Market Monitoring
- Consumer Protection and Codes of Conduct
- Existing Contracts in a Market Environment
 - Contracts for transmission service, power, and contracts associated with facility sales.
 - Metering and Telemetry
 - This is important to have data on load and generation along with costs to see how efficient the system is being operated.
 - Can help in implementing new rate designs
- Information Requirements and Disclosure
 - The regulator needs information on costs and operations to do its job properly.
 - What information shall be required and how will it be used?



- Treatment of Distributed, Co-Generation, or Renewable/Intermittent Resources
 - How to include these resources in a non-discriminatory and cost-effective way.
- Regulator Resources
 - Staffing and training.
 - Inter-agency Coordination
 - With ministries and other agencies that may hold some jurisdiction over the industry
- Governance Structures of Regulated Utilities and Institutions Where Competition is Introduced
 - Structure of governing boards
 - Voting rules
 - Authority of the board

Market Concepts and Questions

- What services should be opened to competition?
- Who can participate in the markets?
 What is the design of the market in general?
 How many markets over time?
 Week-ahead, day-ahead, hour-ahead, real-time?
- Bidding rules and information requirements to be in the market?
- Price determination?
- Financial settlement procedures?



Market Concepts and Questions

Separation of market and system operations? Procedures for handling other resources... Must run units Renewable and intermittent resources Transmission Management • Access • Pricing After-the-fact market information disclosure



Concluding Thoughts

There is a lot for regulators to contemplate in undertaking industry reform.

If competition in generation is being considered, the complexities become even greater.

If one lesson can be taken from experience it is to move deliberately and methodically and avoid rushed decisions and implementation.

