

THE FERC
STANDARD MARKET DESIGN
GIGANOPR: RESEARCH NEEDS

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OUTLINE

- The scope of the NOPR**
- The basic thrusts**
- Key issues**
- Major research needs**

STANDARD MARKET DESIGN OVERVIEW

- ❑ **A single set of rules proposed for all wholesale electric markets**
- ❑ **A fundamental industry restructuring proposal**
 - **structure of wholesale energy markets**
 - **transmission ownership and operations**
 - **transmission pricing**
 - **generation and transmission planning and expansion**
 - **market power monitoring and mitigation**
 - **corporate governance structure**

OBJECTIVES

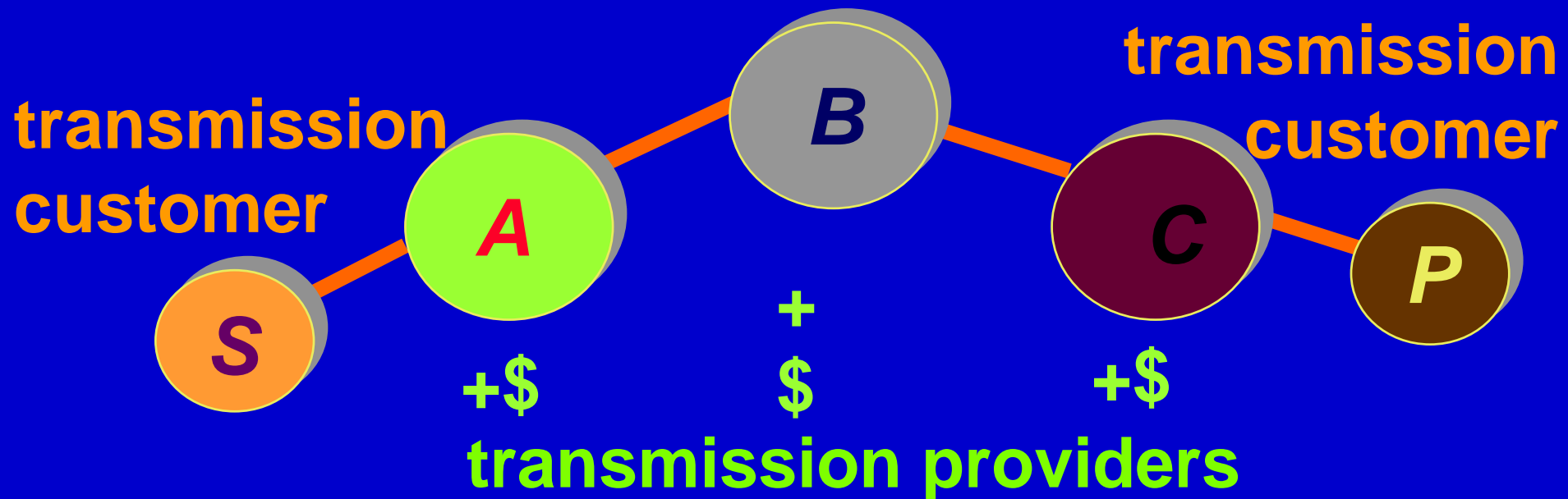
- ❑ **Prevent discriminatory practices in the provision of transmission services to ensure the smooth functioning of vibrant electricity markets**
- ❑ **Set up rules to facilitate economically efficient electricity trade by standardizing the design and operation of markets in wide geographic regions**
- ❑ **Facilitate the timely addition of new transmission *capability***
- ❑ **Establish a regulatory backstop to protect customers against the exercise of market power**

MARKETS, TRANSMISSION AND PLANNING

- ❑ Market approach based heavily on the functioning and design in PJM, NY ISO and ISO New England
- ❑ Day-ahead and real-time spot energy markets
- ❑ Network Access Service for transmission including bundled retail transmission
- ❑ Financially-based congestion management using locational marginal pricing (LMP) signals
- ❑ FERC extends its jurisdiction beyond markets and transmission to the areas of
 - resource adequacy
 - transmission planning

TRANSMISSION SERVICES / PRICING

- Single network access transmission service for all users to provide grid-wide access without rate “pancaking”



- Price consisting of two charges – an access charge and a congestion charge for usage

TRANSMISSION SERVICES / PRICING

- ❑ **Load serving entities get congestion revenue rights (CRRs) for four years for their native load and existing wholesale contracts**
- ❑ **Options for pricing new transmission:**
 - **participant funding (direct assignment)**
 - **rolled in embedded cost**

INDEPENDENT TRANSMISSION PROVIDER (ITP)

- ❑ ITP is the new RTO
 - participation no longer voluntary
 - shareholder-owned utilities **must** turn over control and operations of transmission to ITP
- ❑ NOPR contains very specific ITP corporate governance rules ; in effect the ITP cannot be *for-profit* because rules do not allow for shareholder elected board
- ❑ In addition to running the wholesale market and providing transmission service, ITP has broad role in two additional areas:
 - regional resource adequacy
 - regional transmission planning

INDEPENDENT TRANSMISSION PROVIDER (ITP)

- ITP Board selected by a stakeholder committee from the following six classes:
 - generators and marketers
 - transmission owners
 - transmission dependent utilities
 - public interest groups
 - alternative energy suppliers
 - end users and retail providers that do not own T or D assets
- ITP receives non-binding advice from:
 - Stakeholder Advisory Committee
 - Regional State Advisory Committee (RSAC)

RESOURCE ADEQUACY REQUIREMENTS

- ITP forecasts the demand, helps determine adequate levels of resources, and assigns each LSE a share of the resource requirements
- ITP administers tariff and curtailment penalties if LSEs fail to meet their resource requirements
- In the past, the states made decisions on planning, reliability, and adequacy of service
- Under SMD, states establish overall reserve margin that has to be at least 12%
- FERC non-jurisdictional entities are not required to meet resource requirements

TRANSMISSION PLANNING AND EXPANSION

- ❑ Establishment of a market-driven regional planning process allowing competition among generation, transmission and demand response
- ❑ Transmission owner is the “builder of last resort” if market does not respond
- ❑ ITP is ultimate resource decision maker
- ❑ States provide non-binding input into ITP planning process
- ❑ States’ role on siting and retail cost recovery continues

MARKET MONITORING

- ❑ Set up of a market monitor **independent** of all the market participants
- ❑ Market monitor reports to the ITP Board and to **FERC**
- ❑ Market monitor responsibilities include
 - identification of market power
 - design of mitigation plans
 - investigation of market manipulations/abuses
 - enforcement of penalties

PROPOSED IMPLEMENTATION SCHEDULE

- November 15, 2002** : initial comments
- December 20, 2002** : reply comments
- January 10, 2003** : second stage of comments
- February 17, 2003** : second stage of reply comments
- March 2003 (projected)** : Final Rule issuance
- September 2003 (6 months):** planning process initiation
- March 2004 (1 year)** : initial regional transmission plan issuance
- September 2004** : full ITP/SMD implementation

SOME KEY ISSUES

- ❑ **Lack of uniformity on the application of SMD with exemption for non-jurisdictional entities opens the door to leaning on the grid: reciprocity provision may not be adequate**
- ❑ **Comprehensiveness/completeness of the market structure is necessary: SMD provides for short-term energy market, but no capacity market and no appropriate economic signals for transmission investment; significant increase in uncertainty**
- ❑ **The need for flexibility in corporate structures should allow for-profit models such as ITCs**

SOME KEY ISSUES

- ❑ The process for transmission expansion and investment is unclear and inequitable by not giving the current transmission owner the first right of refusal to build
- ❑ The shift from the current state and local planning to ITP regional planning is a significant jump
 - transition needs to be clearly specified
 - breaks the historical regulatory compact between the state and the utility on generation and transmission service and the state-based cost recovery is jeopardized
 - state support and involvement not specified

MAJOR RESEARCH NEEDS

- Data issues
- ITP organizational structures
- Market design and implementations
- Validation of market design
- Congestion revenue rights
- Market monitoring
- Transmission planning
- Resource adequacy
- Inter-ITP *seams* issues

THREE CLEAR THEMATIC NEEDS

- ❑ **Integration of economics and power engineering to develop efficient competitive electricity markets**
- ❑ **Collection and deployment of data to ensure adequate information in competitive markets**
- ❑ **Development of incentives in all relevant aspects of electricity market operations and planning**

DATA ISSUES

- ❑ **The gathering, dissemination and wide availability of data for smoothly functioning markets is a well-recognized need**
- ❑ **Guidelines are required for data**
 - **acquisition**
 - **release and dissemination**
 - **availability****for all participant and various stakeholders**
- ❑ **Development of incentives/penalties is required to ensure data availability, timeliness and accuracy**
- ❑ **Implementation of secure computing systems and tools to protect data sensitivity and integrity are a must for markets**

ITP STRUCTURES

- **Formulation of effective incentives schemes for the efficient operation of the system by an ITP**
 - **overcoming the constraint of a not-for-profit organization**
 - **investigation of the feasibility of a for-profit independent transmission company (ITC) to transition to an ITC**
- **The integration of additional interdependent markets under the ITP structure**

MARKET DESIGN

- ❑ **Development of transparent rules and procedures that effectively integrate and coordinate system operations with market administrative functions**

- ❑ **Development of**
 - **day-ahead and real-time energy markets**
 - **financial transmission rights markets****to operate side-by-side with bilateral contracts**

VALIDATION OF MARKET DESIGN

- ❑ The validation of different market designs is a critically important missing part of SMD
- ❑ Verification necessary to ensure the proper behavior of any new design under various conditions
- ❑ Major areas of need encompass development of
 - tools to perform market validation
 - test systems to validate a market design
 - experimental economic testing

CONGESTION REVENUE RIGHTS

- ❑ **Liquidity of CRRs:** in principle, CRRs are point-to-point rights so secondary markets for them may be limited
- ❑ **Revenue adequacy:** it is necessary to develop mechanisms to deal with the differences between the congestion charges collected and the targeted value of the CRRs

MARKET MONITORING

□ The smooth functioning of markets and the need for continuous improvements create a clear necessity to monitor the

- structure

- performance

- behavior

of markets, as well as, of each market player, including the demand response participants

MARKET MONITORING

- A primary need is the development of effective metrics to monitor market performance
 - formulation of appropriate measures
 - computational aspects
 - tool implementation
 - sanity checks to detect fraud or manipulation
 - measures for the assessment of market power
 - load pockets
 - robustness of demand response
 - metrics for inter- and intra- ITP performance assessment
 - tools to perform inter-market assessments

MARKET MONITORING

- ❑ **Long-term competitive benchmark analysis**
 - **trend identification and reference price determination**
 - **development of mitigation measures**
 - **formulation of criteria for market access**
 - **development of guidelines for the implementation of maintenance schedules to ensure that market power is not exercised**
- ❑ **Short-term competitive benchmark analysis**
 - **hourly and daily activity monitoring**
 - **transaction monitoring**
 - **identification of players causing anomalies**

TRANSMISSION PLANNING

- Development of long-term economic signals that can serve as effective incentives for transmission investments**
- Development of methodology to identify the beneficiaries of a given expansion and an equitable criterion to decide how project costs should be allocated to them**
- Investigation of the viability of the participant funding for new transmission expansion projects concept through analytical studies and tool and software development**

RESOURCE ADEQUACY

- ❑ **The reliability evaluation needs to establish a strong linkage between reliability and economics**
 - **outage costs**
 - **reliability criteria**
 - **willingness to pay by customers**
- ❑ **Definition of the allocation of the reserve margin requirements among all the LSEs**
- ❑ **Formulation of incentives to provide new capacity**
- ❑ **Definition of penalties in cases of failure to provide the required level of reliability**
- ❑ **Definition of the curtailments process in case of system outages**

INTER - ITC *SEAMS* ISSUES

- ❑ The creation of the geographically extensive ITPs requires the careful study and management of the *seams* problems between the ITPs
- ❑ These problems encompass all aspects of market and system operations and planning
 - interchange metering
 - data availability
 - impacts on LMP calculations
 - coordinated reliability/planning among ITPs
- ❑ Schemes and tools for the management of *seams* issues are needed

CONCLUDING REMARKS

- ❑ **The FERC GigaNOPR gives rise to a wide range of challenges and exciting new opportunities for power system engineers**
- ❑ **The solution of the various problems will require the effective marriage of economics and power system engineering**
- ❑ **The SMD area provides an unparalleled opportunity to contribute to the effective design of the future electricity industry**