Bureau of
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National
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Workshop on Regional Electricity Trade and Market Development

Considerations in Developing a Framework for Competitive Regional Electricity Markets

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Paradigm Shift

In response to development of competitive framework in major electricity markets, the generation companies are obliged to develop bidding models to ensure dispatch and to maximize their profits.

Optimizing bidding policy (price, energy supply and capacity) in a competitive market has become one of the main issue in electricity regulation.

Concerns

- Supply security (shrinking reserve margins and lack of investments);
- Reliability;
- Resource adequacy (supply diversity); and
- Power sector reforms and regulatory institutional capacity.

Possible Solutions

- Improvements to spot wholesale energy markets (applicable mainly to highly developed competitive markets e.g. the USA and Europe); and
- The introduction of forward capacity markets (more appropriate for developing markets).

Electricity Supply/Demand Nature 1

- Large variations in demand and supply over the course of a year (un-predictable);
- Non-storability of electricity;
- Supply and demand are physically balanced at every point on the network based on constraints on voltage, frequency, and stability;
- Can not direct power flows to most consumers;

Electricity Supply/Demand Nature 2

- Limited use of real time pricing by retail consumers; and
- Even with effective real time pricing of energy and operating reserves, non-price mechanisms (black-outs) are relied from time to time to create supply/demand balance to meet physical operating criteria (fear of political backlash).

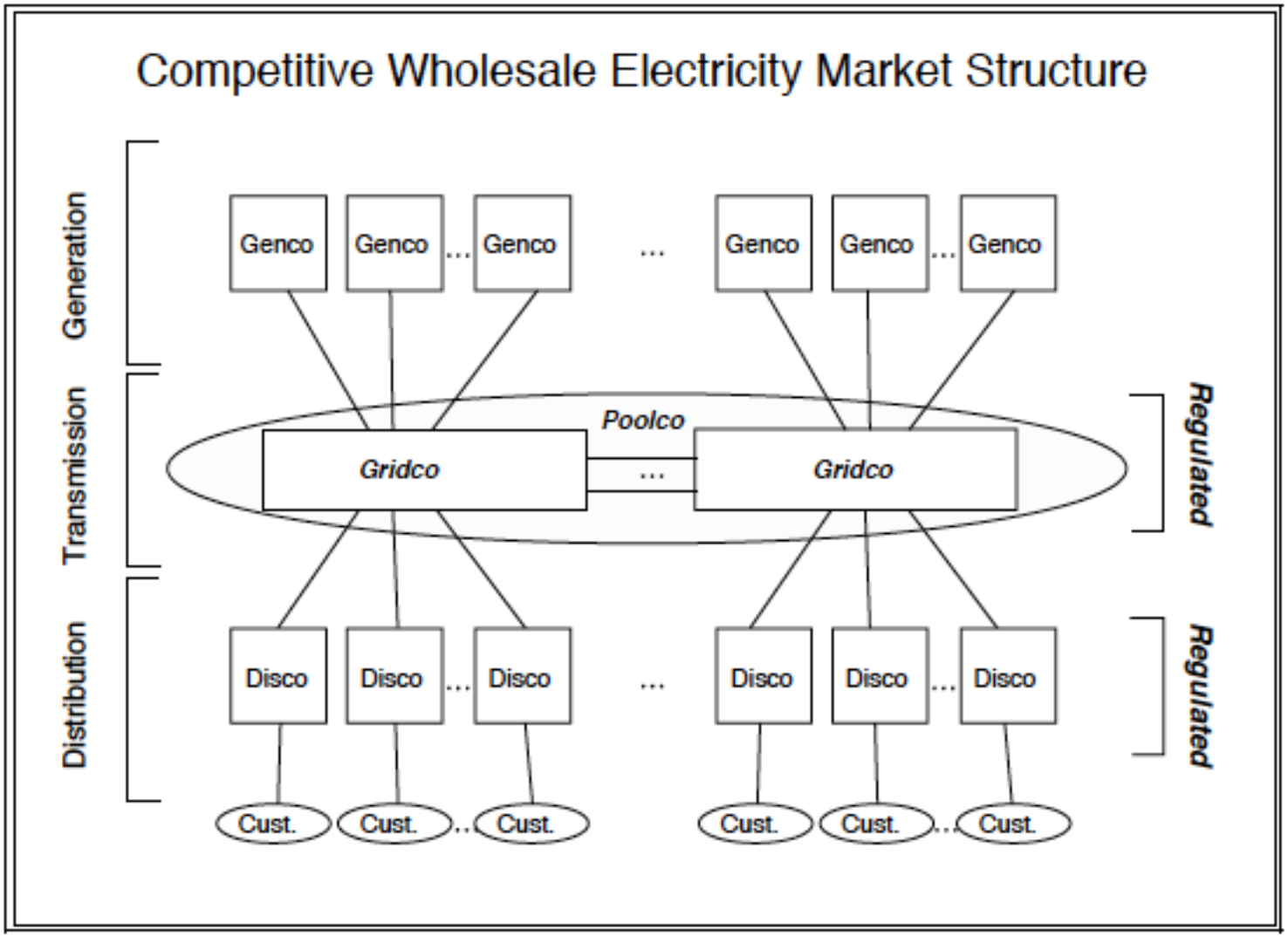
Source: Paul L. Joskow, COMPETITIVE ELECTRICITY MARKETS AND INVESTMENT IN NEW GENERATING CAPACITY, June, 2006.

Competitive Electricity Markets

- Markets that have been restructured to promote competition among market participants, while maintaining strict regulatory oversight; and
- Power suppliers who compete against each other to provide the best possible service at the lowest cost.

Restructuring Markets

- Unbundle vertically integrated industry;
- Promote competition in generation capacity and allow free entry/exit to generators;
- Create independent TSOs (ISOs);
- Develop power pools and power exchanges; and
- Promote consumer choice and regulate Cross-border interconnections.



Source: William W. Hogan, A competitive electricity market, Harvard University, 1993

Effective Regulatory Process

Is necessary to mitigate substantial local market power and to monitor overall market performance to detect and correct market design flaws. The regulator must be forward looking and fast acting.

Source: Inter American Development Bank, Designing Competitive Whole Electricity Market for Latin American Countries, 2003.

Market Interconnection

- Allow optimum and efficient use of infrastructure and resources by:
  - Deploying resources at regional level; and
  - Fostering competition among suppliers and producers.
- Helps lower the electricity prices.

Market Structure

- Energy markets;
- Capacity markets;
- Congestion management;
- Who conducts auctions (if applicable); and
- Who enforces the rules (in Europe ACER, in the USA FERC and State Commissions).

Market Design

- Establish independent regulator or body;
- Develop forward market for electricity;
- Use a real time market is necessary (locational marginal price – LMP);
- Divest capacity from incumbent;
- Real time cost based dispatch (imbalances); and
- Raise the cost-of-deficit parameter (full economic cost).

Source: Inter American Development Bank, Designing Competitive Whole Electricity Market for Latin American Countries, 2003.

Issues for Regulators

Regulators do not have information on:

- The extent to which Transmission Service Operators (TSOs) will coordinate with each other;
- The precision and reasons for the security margins kept by TSOs;
- To what extent the Cross-border capacities are maximized; and
- The cost of increasing available capacity or the implication of doing so on operational security.

Market Issues

- Market interconnection (harmonizing the rules of two or more markets);
- Congestion Management (when electricity is unable to flow due to physical constraints); and
- Isolation of the supply side of the market from the demand side.

Cooperation is Necessary Condition

- Between Transmission System Operators (TSOs), Distribution System Operators (DSOs) and Regulators;
- Between National Regulatory Agencies (NRAs);
- Between Power Exchanges. Regulators and NRAs;
- Between Governments and Regulators; and
- Utilities and Regulators.

Thank you!

mian_zia@hotmail.com

What is Market Coupling?

[Market Coupling European Model]