

**ELECTRICITY RESTRUCTURING:  
OPEN ACCESS FROM ORDER 888 TO  
SUCCESSFUL MARKET DESIGN (“SMD”)**

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**Frustration with electricity restructuring raises calls for reform of open access and efforts to develop competitive markets.**

At its core, the debate identifies persistent disagreement about what open access means, and what models are available to achieve the purported benefits.

Under the conceptual umbrella of revisiting the ideas of open access and Order 888, one appeal is to consider alternatives to the recent FERC policies regarding Regional Transmission Organizations (RTOs):

**“... it should not be assumed that RTOs are the only, or even the preferred, mechanism available to ensure competitive wholesale power markets.”<sup>1</sup>**

A competing formulation might be put as:

**“... it should not be assumed that RTOs are *not* the only, or even the preferred, mechanism available to ensure competitive wholesale power markets.”**

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<sup>1</sup>

American Public Power Association, Restructuring at the Crossroads: FERC Electricity Policy Reconsidered, Washington DC, December 2004, p. 14.

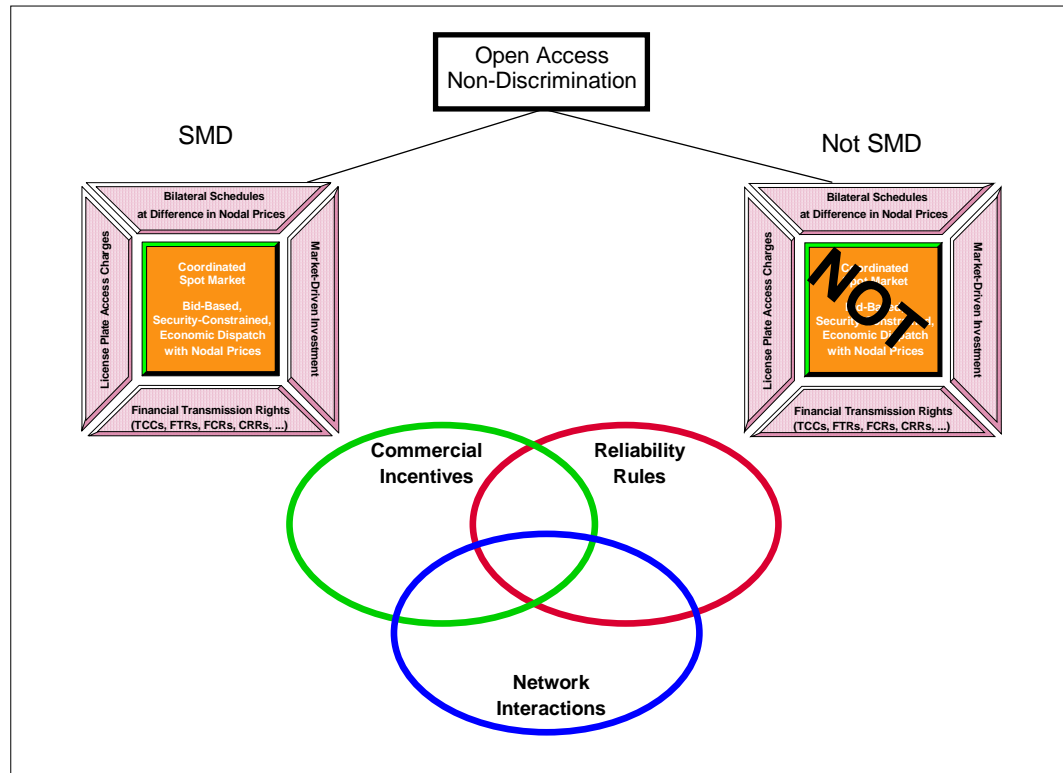
# ELECTRICITY MARKET

# Electricity Restructuring

The public policy debate over reshaping the electricity industry confronts major challenges in balancing public interests and reliance on markets.

“The need for additional attention to reliability is not necessarily at odds with increasing competition and the improved economic efficiency it brings to bulk power markets. Reliability and economic efficiency can be compatible, but this outcome requires more than reliance on the laws of physics and the principles of economics. It requires sustained, focused efforts by regulators, policy makers, and industry leaders to strengthen and maintain the institutions and rules needed to protect both of these important goals. Regulators must ensure that competition does not erode incentives to comply with reliability requirements, and that reliability requirements do not serve as a smokescreen for noncompetitive practices.”

(Blackout Task Force Report, April 2004, p. 140.)



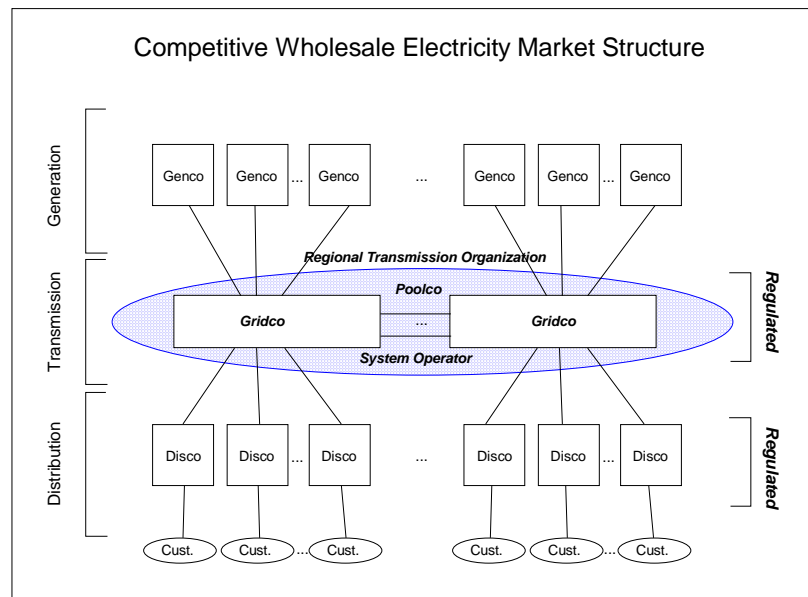
# ELECTRICITY MARKET

# Electricity Restructuring

The evolution of electricity restructuring contains a thread of issues related to counterintuitive market design requirements requiring coordination for competition.

**Markets for Power, 1983.** Joskow and Schmalensee.

"The practice of ignoring the critical functions played by the transmission system in many discussions of deregulation almost certainly leads to incorrect conclusions about the optimal structure of an electric power system."<sup>2</sup>



<sup>2</sup>

Paul L. Joskow and Richard Schmalensee, Markets for Power: An Analysis of Electric Utility Deregulation, MIT Press, 1983, p. 63.

**The Open Access Rule of Order 888 followed from a lengthy debate about the many details of electricity markets.**

“Today the Commission issues three final, interrelated rules designed to remove impediments to competition in the wholesale bulk power marketplace ... . The legal and policy cornerstone of these rules is to remedy undue discrimination in access to the monopoly owned transmission wires that control whether and to whom electricity can be transported in interstate commerce.” (FERC, Order 888, April 24, 1996, p. 1.)

- **What did Order 888 anticipate for the development of electricity market design?**
- **Did FERC jump too soon to an RTO model with a “standard market design” that forecloses other options?**
- **What other electricity market design options are available to achieve the objectives of open access and Order 888?**
- **Is it necessary to revisit Order 888 to develop a new approach to achieve the open access objective to remove impediments to competition?**

**Under Order 888 the FERC made a crucial choice regarding a central complication of the electricity system.**

“A contract path is simply a path that can be designated to form a single continuous electrical path between the parties to an agreement. Because of the laws of physics, it is unlikely that the actual power flow will follow that contract path. ... Flow-based pricing or contracting would be designed to account for the actual power flows on a transmission system. It would take into account the "unscheduled flows" that occur under a contract path regime.” (FERC, Order 888, April 24, 1996, footnotes 184-185, p. 93.)

“We will not, at this time, require that flow-based pricing and contracting be used in the electric industry. In reaching this conclusion, we recognize that there may be difficulties in using a traditional contract path approach in a non-discriminatory open access transmission environment, as described by Hogan and others. At the same time, however, contract path pricing and contracting is the longstanding approach used in the electric industry and it is the approach familiar to all participants in the industry. To require now a dramatic overhaul of the traditional approach such as a shift to some form of flow-based pricing and contracting could severely slow, if not derail for some time, the move to open access and more competitive wholesale bulk power markets. In addition, we believe it is premature for the Commission to impose generically a new pricing regime without the benefit of any experience with such pricing. We welcome new and innovative proposals, but we will not impose them in this Rule.” (FERC, Order 888, April 24, 1996, p. 96.)

**Hence, although the fictional contract path approach won't work in theory, maintaining the fiction would be less disruptive in moving quickly to open access and an expanded competitive market!**

Order 888 would not work in theory, but might it work in practice? The CRT provided striking evidence that FERC knew there was a serious problem.

## Capacity Reservation Tariff (CRT), 1996.

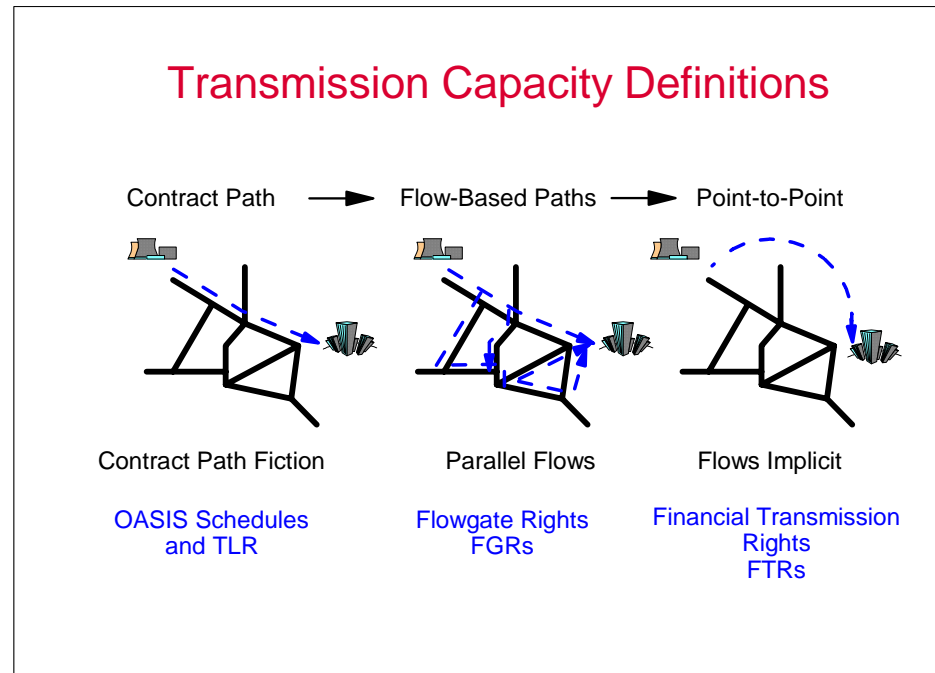
A new model, on the same day as Order 888 (April 24, 1996).

"The proposed capacity reservation open access transmission tariff, if adopted, would replace the open access transmission tariff required by the Commission ..."<sup>3</sup>

The new model outlined in the CRT moved away from the contract path to embrace point-to-point rights. The CRT was roundly rejected by industry, and received little support. But it was to reappear, again and again.

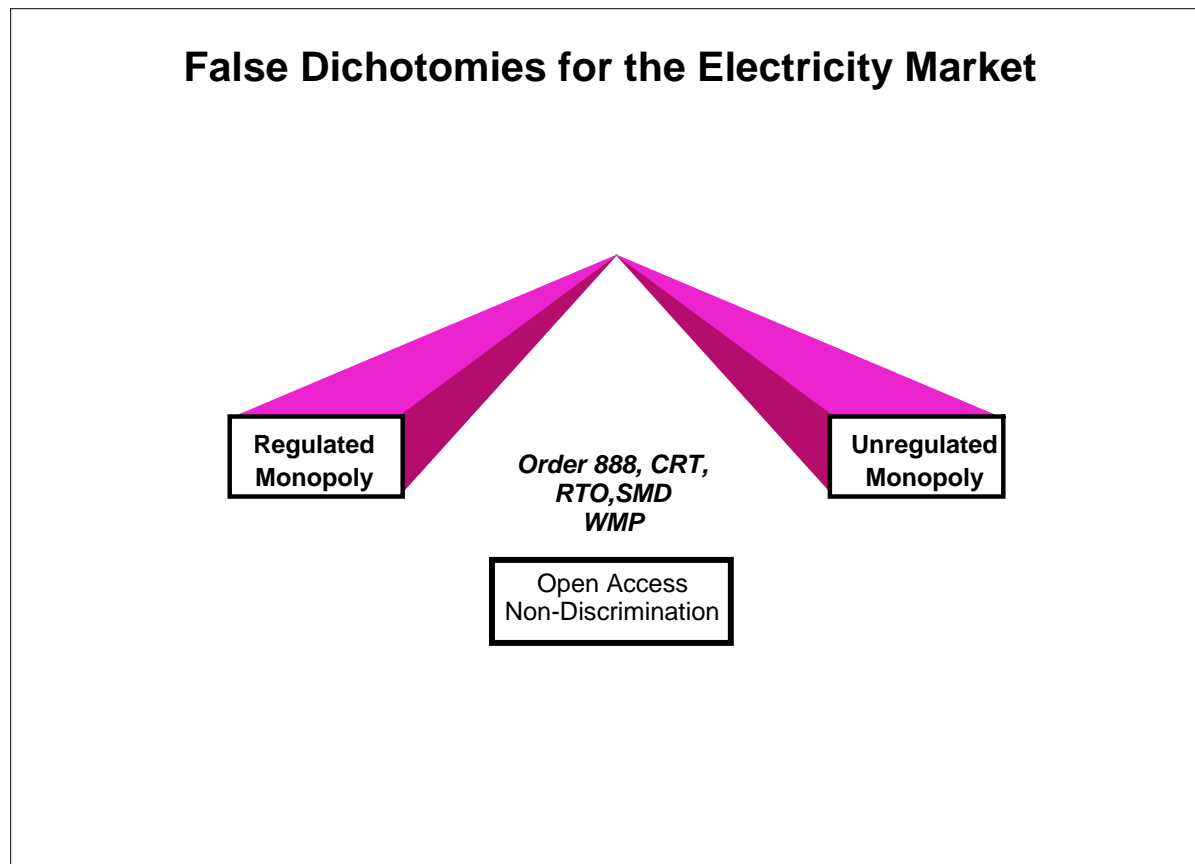
## NERC Transmission Loading Relief (TLR), 1997.

The reliability watchdogs saw the impending problem and soon created the unscheduling system to complement the contract path scheduling required under Order 888.



<sup>3</sup> Federal Energy Regulatory Commission, "Capacity Reservation Open Access Transmission Tariffs," Notice of Proposed Rulemaking, RM96-11-000, Washington DC, April 24, 1996, p. 1.

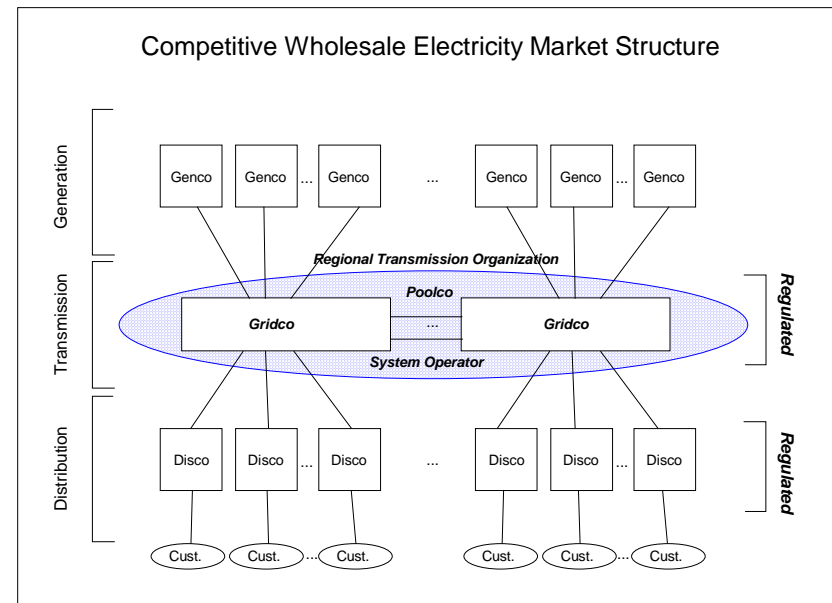
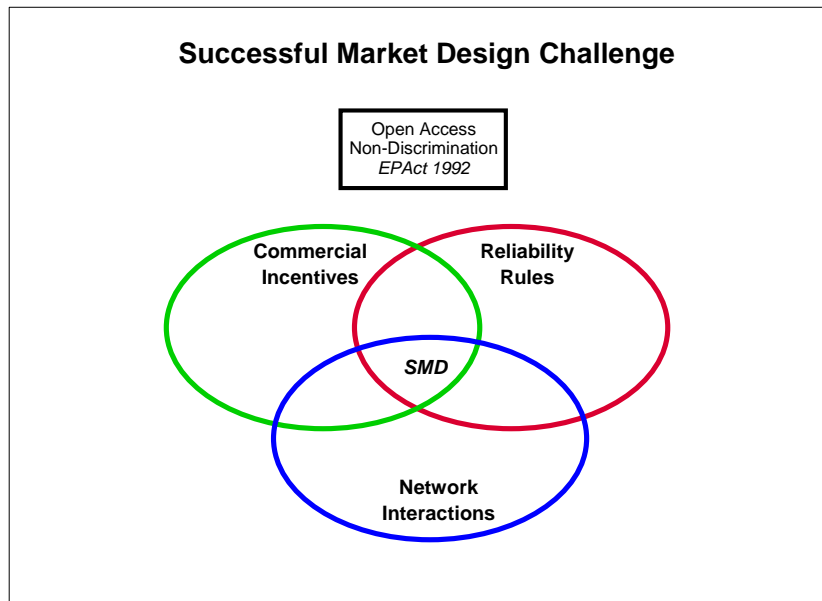
There is a middle ground for open access without going all the way to unregulated monopoly. But the middle ground requires careful attention to designing the rules to provide the oxymoron of “coordination for competition.” The electricity market cannot solve the problem of market design.



# ELECTRICITY MARKET

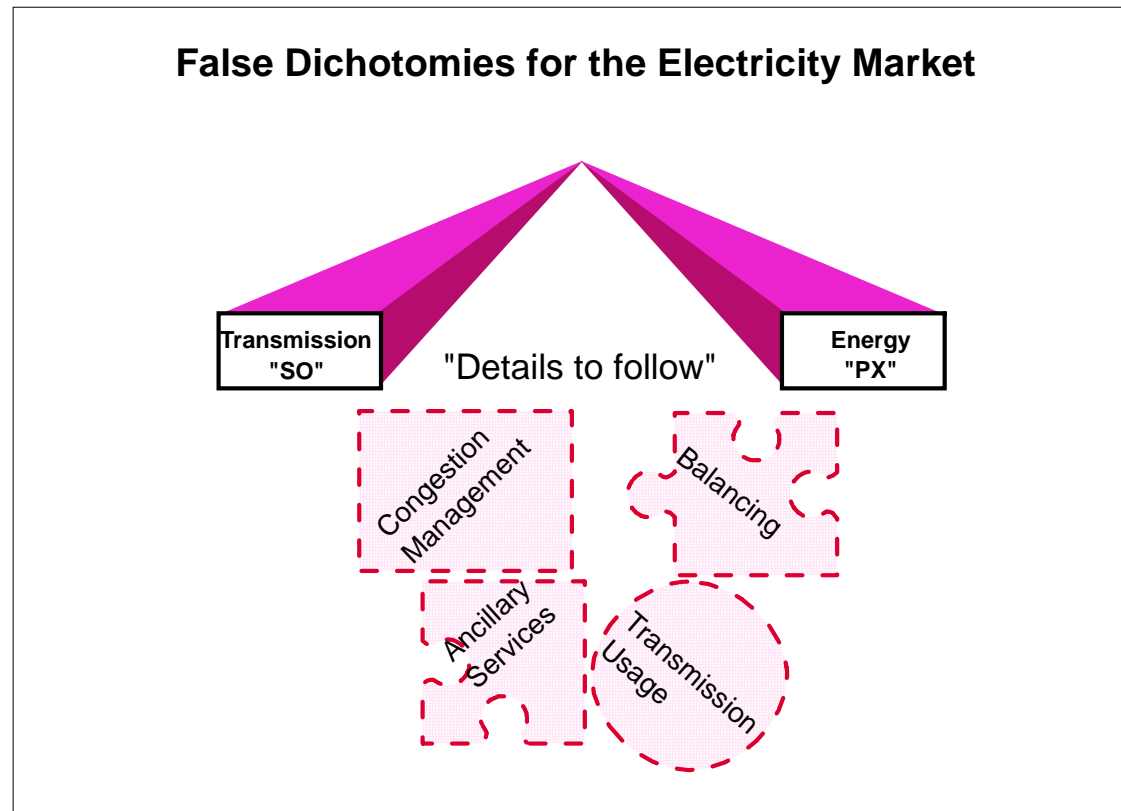
# Challenge of Electricity Market Design

In a regulated vertical monopoly, consistency of incentives is not required. The monopoly will resolve the inconsistencies. But in a market, the rules and resulting incentives determine the decentralized choices. A successful market requires consistency among incentives, consistency with reality. The market design must address the critical component monopoly activities.



A persistent challenge is found in designing rules and pricing for transmission operations that align commercial incentives with the requirements of reliability in the presence of complex network interactions.

The market for transmission and the market for energy are inherently intertwined. Separation into a transmission operator and a power exchange is based on a fallacy. The details reveal that the pieces cannot be constructed separately and still fit together.<sup>4</sup>

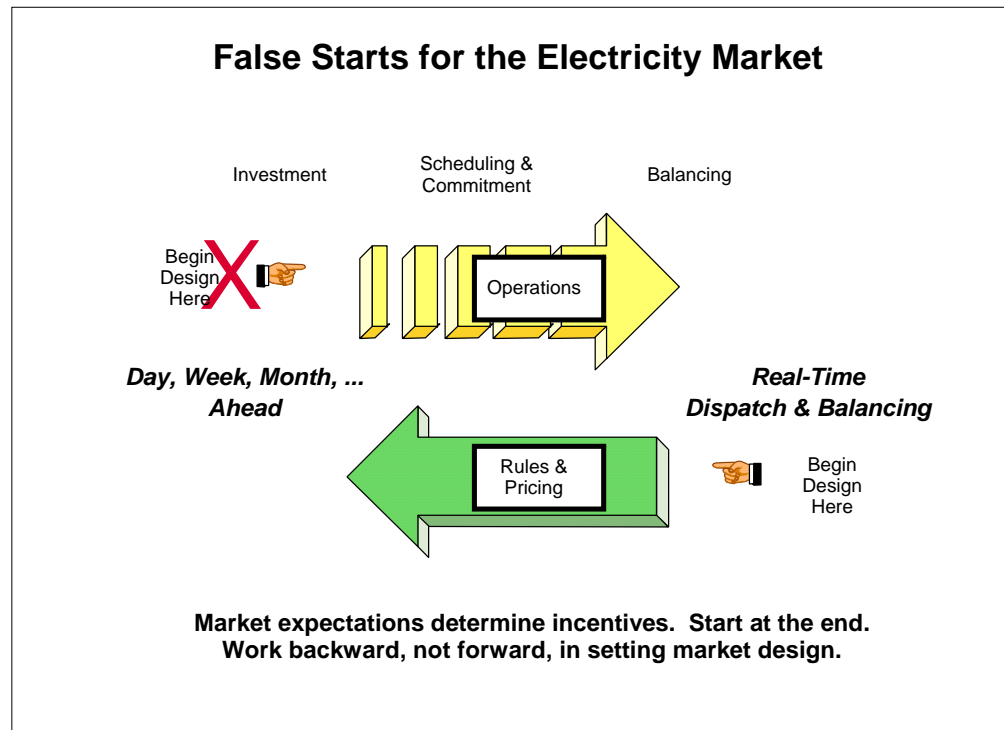


<sup>4</sup> W. Hogan, "A Wholesale Pool Spot Market Must Be Administered by the Independent System Operator: Avoiding the Separation Fallacy," The Electricity Journal, December 1995, pp. 26-37.

# ELECTRICITY MARKET

## Focus on Balancing Markets First

Good design begins with the real-time market, and works backward. A common failure mode starts with the forward market, without specifying the rules and prices that would apply in real time.



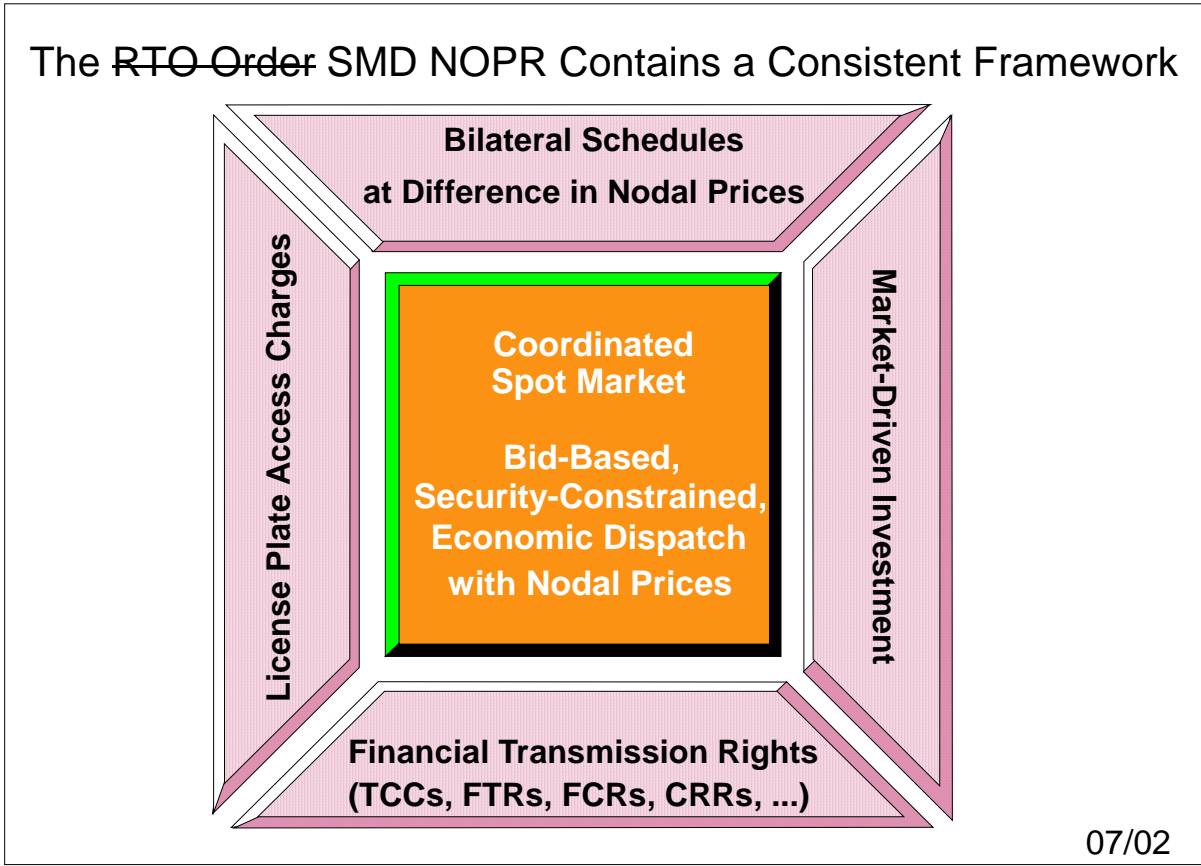
**Good design of the real-time market simplifies everything else. The basic principles stand at the center of successful market design (“SMD”), including the core elements of the FERC standard market design and subsequent wholesale market platform.**

- Efficient real-time operations conform to economic dispatch, and the prices or opportunity costs at the margin equal the much discussed locational marginal prices (LMP). This fact dictates the core elements of SMD. Any other outcome will create problematic incentives requiring intrusive mandates and rules to maintain reliability and achieve efficiency.
- Available Transmission Capacity (ATC) calculations required for the contract path model are not well defined. The problem is conceptual and not just a requirement for better information. Hence, ATC estimates are arbitrary and controversial. By contrast, the point-to-point financial transmission rights found in SMD provide an alternative, well-defined and workable set of rights to support forward markets.
- Security limits dictated by reliability standards are implemented as contingency constraints which inherently require coordinated and simultaneous evaluation. Evaluation of the (many) constraints requires calculation and not just observation.
- Bid-based dispatch or balancing systems can incorporate the elements needed for efficient operations to support coordination and competition.

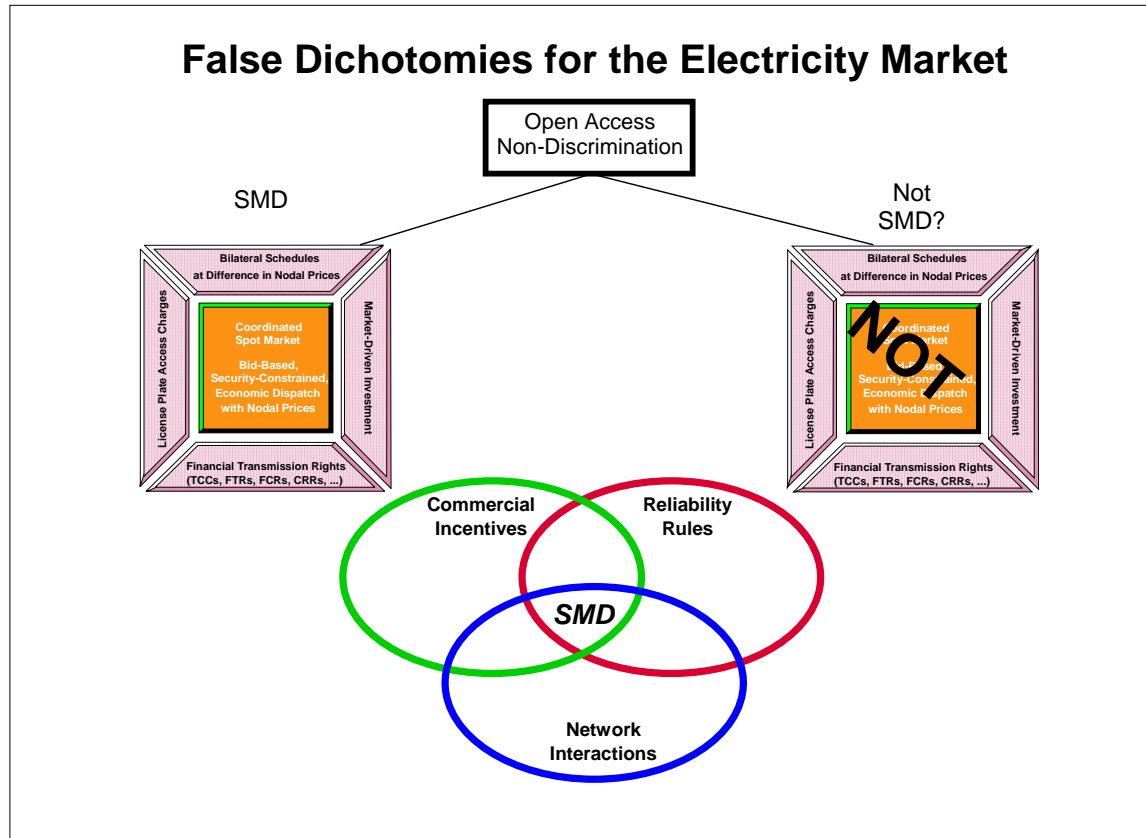
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# Successful Market Design (SMD)

The core elements of successful market design follow from the basic principles of ideal competitive markets.

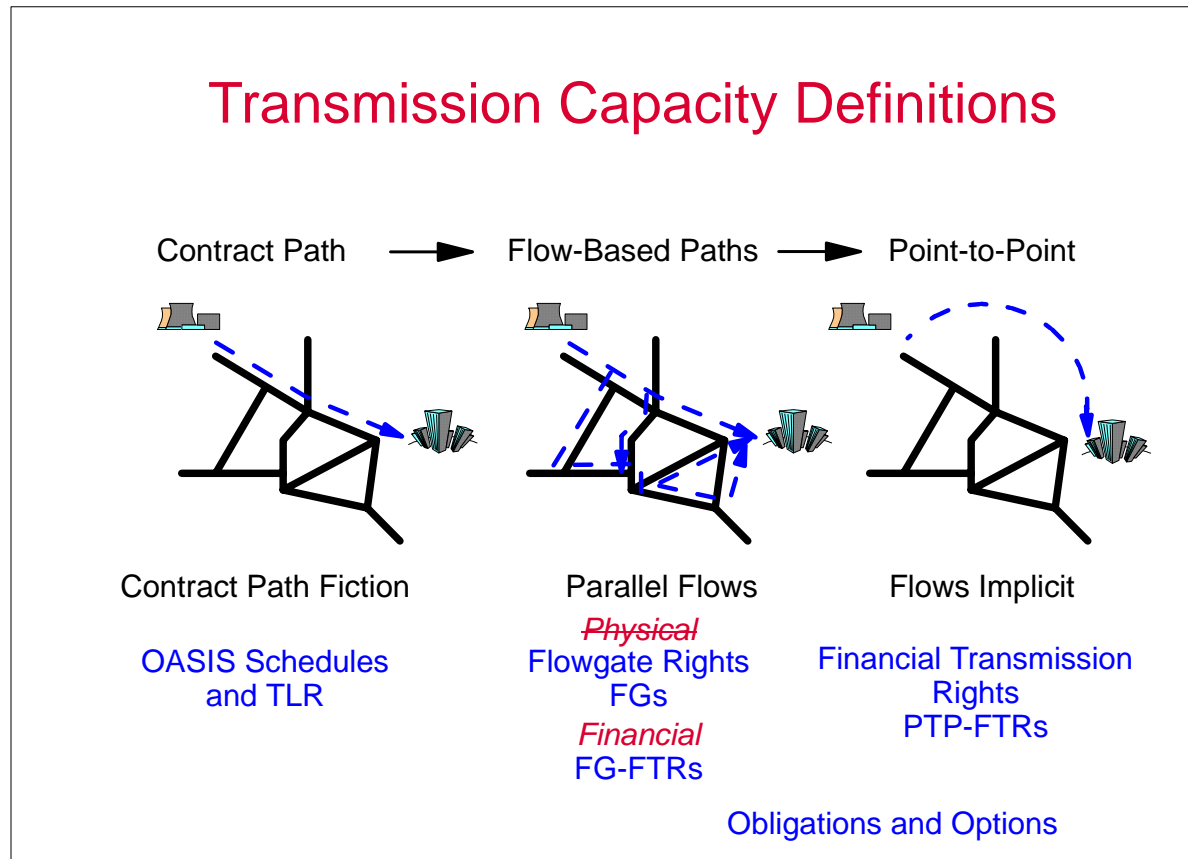


What are the open access alternatives to SMD?



Discussions of alternatives reject the well-specified SMD and offer failed ideas or vague generalities. At this stage of the process, the burden of proof should be born by the alternatives.

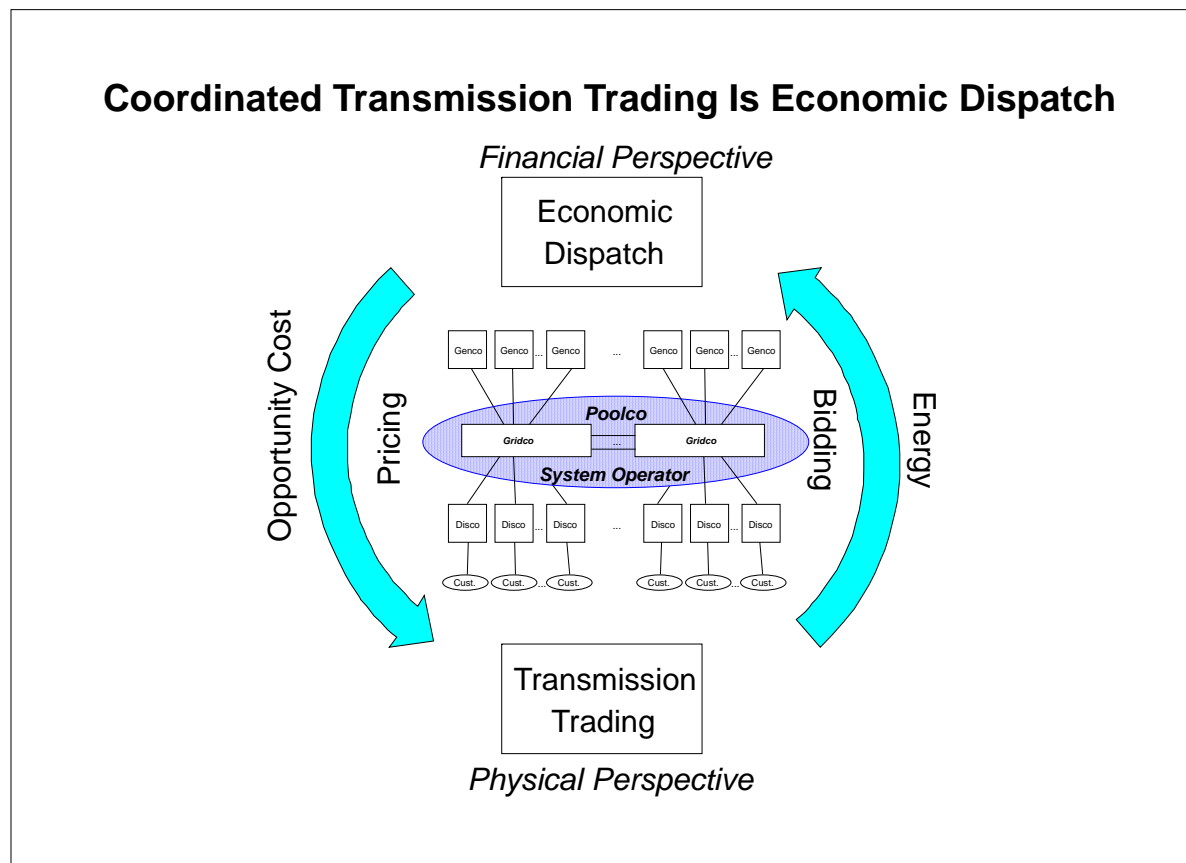
The path-based and flowgate models fail not in principle but in practice. There are too many paths and too many flowgates to operate the electricity system by trading physical rights.



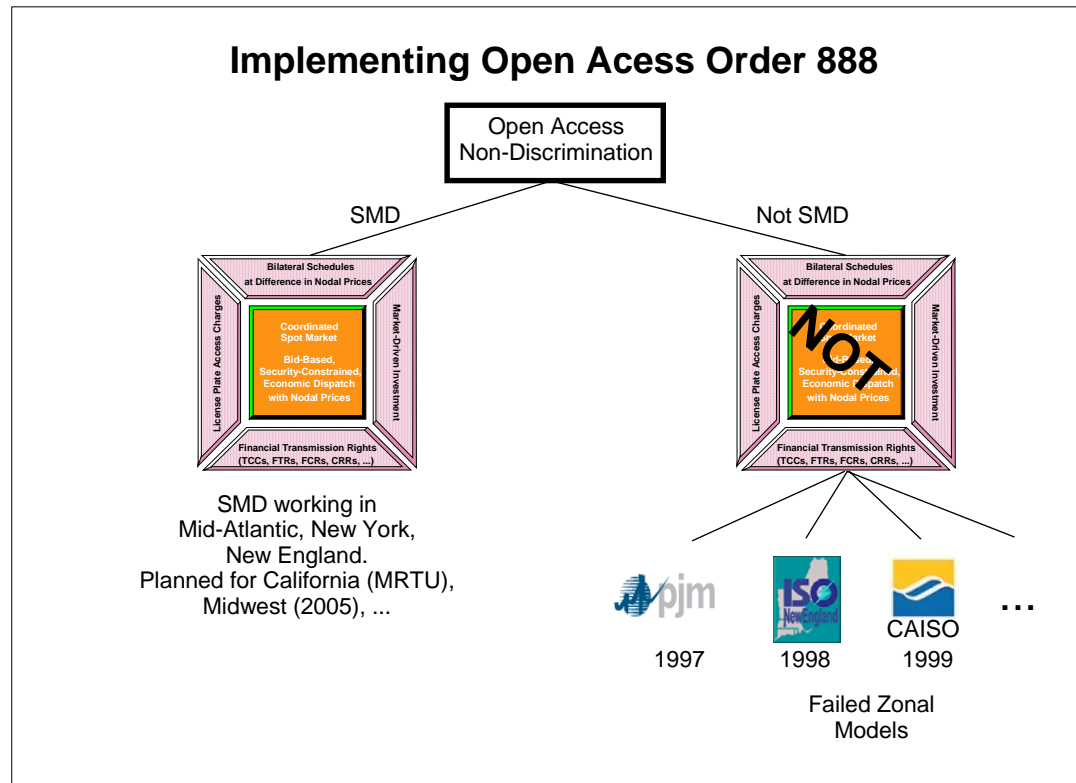
# ELECTRICITY MARKET

# Financial Perspective on Trading

A complete physical trading model would produce the same result as the financial perspective under SMD with economic dispatch (gross pool) or the equivalent economic balancing (net pool). The physical trading model is not feasible. But SMD works.



The LMP model appears complex with many locations and many different prices. A common mistake is to argue that aggregation to a few zones would make the market simpler.



If there are many different LMPs, pretending there are a few zones is more self-deception than simplification. Many attempts to create workable, highly aggregated zonal models have failed.

**The California experience with congestion management and a zonal model is instructive.**

**California CMR, 1999.** Congestion Management Reform to Comprehensive Market Redesign.

"The problem facing the [California] ISO is that the existing congestion management approach is fundamentally flawed and needs to be overhauled or replaced."<sup>5</sup>

**In January 2002, the CAISO addressed the contradictions of the “simplified” design.<sup>6</sup>**

“Upon reexamination of the [Congestion Management Reform] proposal ... we find that some of the crucial assumptions underlying the [Locational Pricing Areas] concept break down.”(CAISO, p. 13)

The assumptions were crucial and flawed. Trying to make the market simpler than is possible turned out not to be possible.

“...in reality, the ‘simplicity’ of the zonal system only appears so because the complexity is assumed away, allowing market participants to ignore it in scheduling while the CAISO must manage it through real time adjustments and periodic modifications to the rules to mitigate novel gaming strategies as they arrive. ... it will be far simpler, and more transparent, to design forward [congestion management] procedures to be as consistent as possible with the real-time operating needs of the grid.”(CAISO, p. 14)

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<sup>5</sup> Federal Energy Regulatory Commission, "Order Accepting for Filing in Part and Rejecting in Part Proposed Tariff Amendment and Directing Reevaluation of Approach to Addressing Intrazonal Congestion," Docket ER00-555-000, 90 FERC 61, 000, Washington DC, January 7, 2000, p. 9. See also Federal Energy Regulatory Commission, "Order Denying Requests for Clarifications and Rehearing," 91 FERC 61, 026, Docket ER00-555-001, Washington DC, April 12, 2000, p.

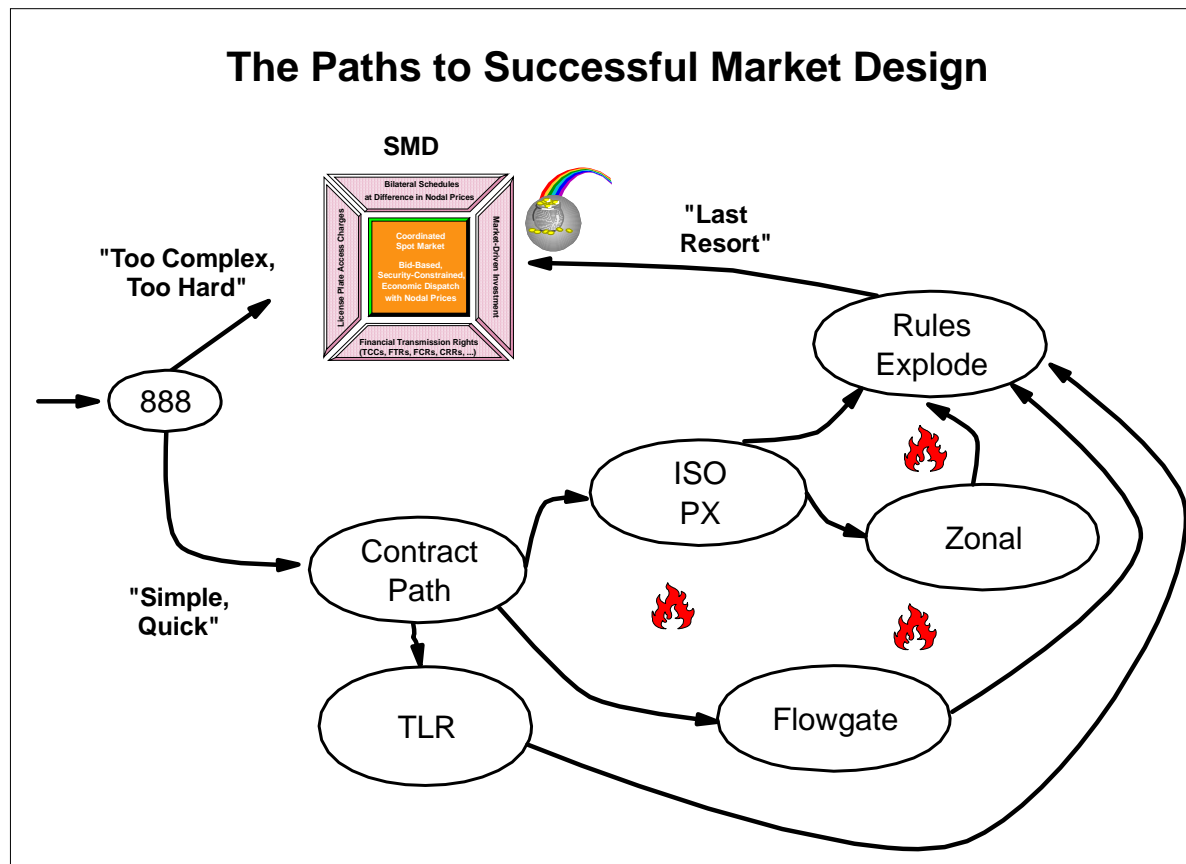
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<sup>6</sup> CAISO proposal, "Market Design 2002 Project: Preliminary Draft Comprehensive Design Proposal," January 8, 2002.

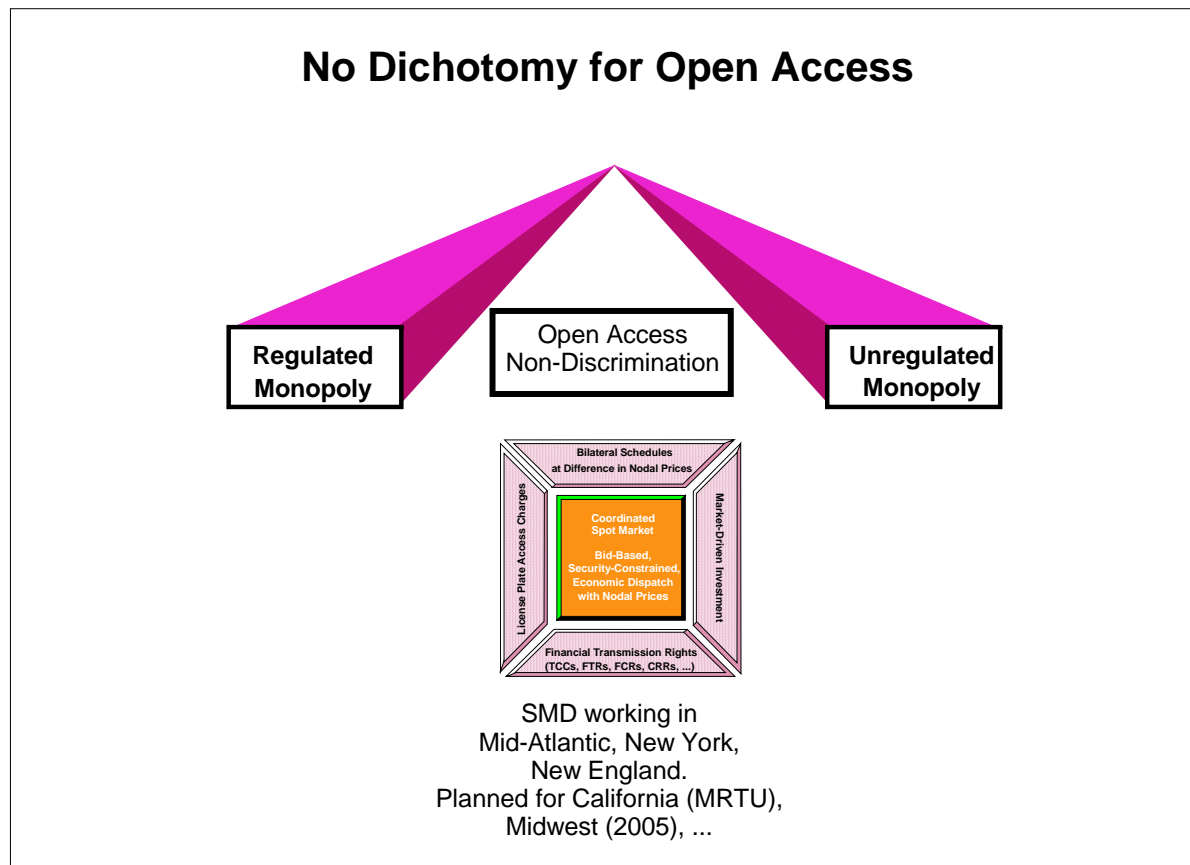
# ELECTRICITY MARKET

# Too Many Paths

Turning away from SMD is either turning away from open access, or embarking on a painful and circuitous route. With its core elements, SMD is the only design that works both in theory and in practice.



There is no dichotomy for an open access model. There is no theory and no experience that identifies any viable alternative. There is no need to *assume* that SMD is the only model that works, the evidence makes the case. There is no evidence available to support the assumption that there is a viable alternative. The burden of proof should be born by the alternatives.



The core SMD elements provide the necessary foundation for open access and wholesale electricity markets. However, the core elements by themselves are not yet sufficient. The challenge is to build on the foundation. There remain many challenges:

- Better demand response.
- Scarcity pricing in practice as well as in theory.
- Energy limited facilities.
- Seams across the integrated grid.
- Long-term financial transmission rights.
- Transmission investment.
- Make power mitigation.
- Resource adequacy.
- Long-term incentives for RTOs.
- ...

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