

**SUCCESSFUL MARKET DESIGN (“SMD”)
AND FAILURE DIAGNOSIS:
BLACKOUTS AND LAMPPOSTS IN REGULATING
ELECTRICITY MARKETS**

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ELECTRICITY MARKET

Electricity Restructuring

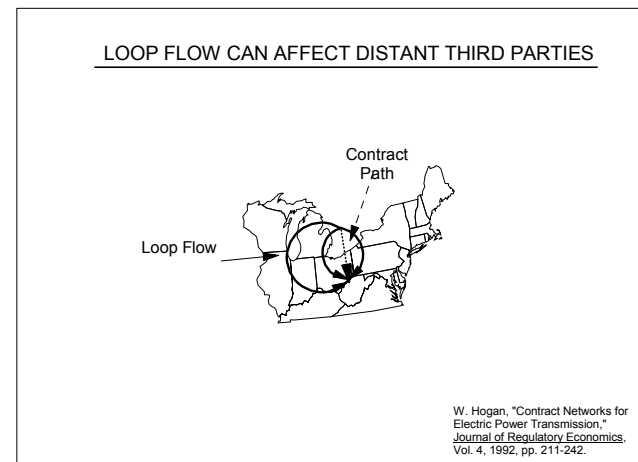
The Northeast Blackout of 2003 connects with an unresolved debate at the core of electricity restructuring.

“To take the strain off Cinergy's lines, the Midwest I.S.O. turned to another power company, Allegheny Energy, asking it to help by adjusting the electricity it was pumping out. But at 2:24 p.m., an Allegheny controller told the I.S.O. that the company's marketing staff wanted to do the opposite of what the I.S.O. was asking, so they could make money selling more power.” (Eric Lipton, Richard Perez-Pena and Matthew L. Wald , “Overseers Missed Big Picture as Failures Led to Blackout,” New York Times, September 13, 2003, Page 1.)

“As Governor, I will: ...Create a working wholesale power market based on the lessons learned from other states and the FERC standard market design. “ (Governor-Elect Arnold Schwarzenegger’s Campaign Web Page.)

“As conferees on the energy bill race to complete action on the legislation, they will be faced with a proposal from the Senate to prohibit the Federal Energy Regulatory Commission (FERC) from implementing its July 2002 Standard Market Design rulemaking proposal (SMD).” (Elizabeth Anne Moler, “Unintended Consequences of Delaying FERC's Standard Market Design,” Exelon Corporation, September 24, 2003.)

“The Italian government announced plans for a rapid and radical overhaul of its electricity sector after a weekend blackout left most of the country without power for many hours.” (“Italy Plans Swift Overhaul of Electricity Sector,” The Wall Street Journal On Line, September 23, 2003.)



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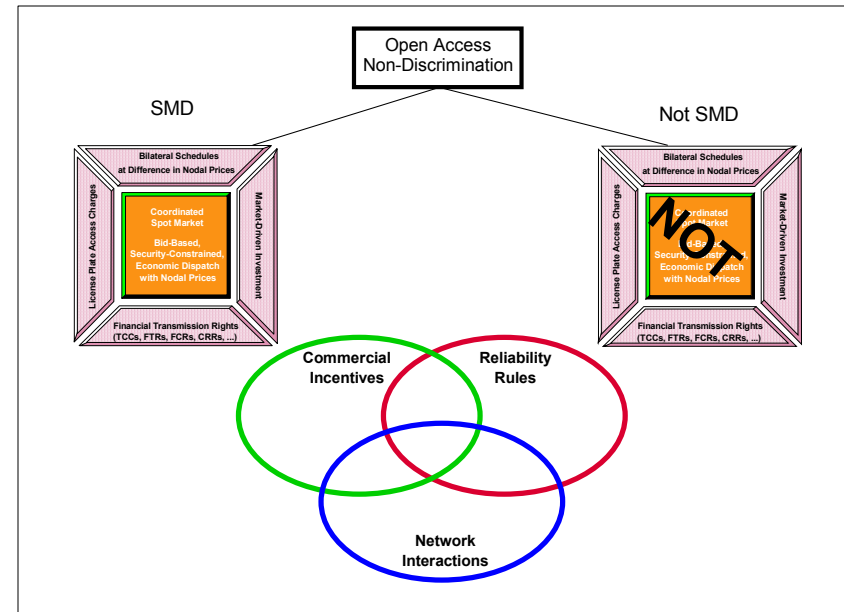
The public policy debate over reshaping the electricity industry confronts major challenges in balancing public interests and reliance on markets.

Enron memos and the California Meltdown. 'Ricocheting' off the 'Death Star'. The smoking gun or collateral damage?

"The Enron memos reveal one an important fact about the behavior of electricity suppliers that was strongly disputed by many observers of competitive electricity markets but is a maintained assumption for economists studying these markets. That is, sellers intend to make as much money as possible and will use all available strategies to achieve this goal." (Frank A. Wolak, Statement before the Senate Committee on Commerce, Science and Transportation, Washington D.C., May 15, 2002. p. 3.)

Imperfect Regulation vs. Imperfect Markets.

- Shoreham Nuclear Plant $\approx \frac{\$6 \text{ Billion}}{0 \text{ MWH}}$.
- Wholesale electricity markets require special institutions
- Good markets are made, they don't just happen.



The failures of electricity restructuring have ranged from the embarrassing to the negligent. Public officials and market participants are at a crossroads. But the road to take depends on the diagnosis of the failures and the identification of the needed corrections.

- **Go Back.** Can markets work well in the case of electricity? If not, then the old model of monopoly and regulation may be the best choice. But has too much happened since EPAct of 1992? It would be both difficult and expensive to go back, and the delay would create even more crises.
- **Stand Still.** Can we simply stay where we are and fix a few leaks, letting the regulators go home early? The rules are in turmoil and market institutions are fragile. The ostrich strategy is an invitation to continued surprises, and this should be no surprise.
- **Go Forward.** Can we go forward, put good markets in place, and treat the costs of the mistakes as the sunk costs of an expensive education? This requires leadership by the regulators, in Washington and in the states. We know what we must do:
 - Regional Transmission Organizations.
 - Standard Market Design.
 - Significant Demand Participation.
 - Market Power Mitigation.

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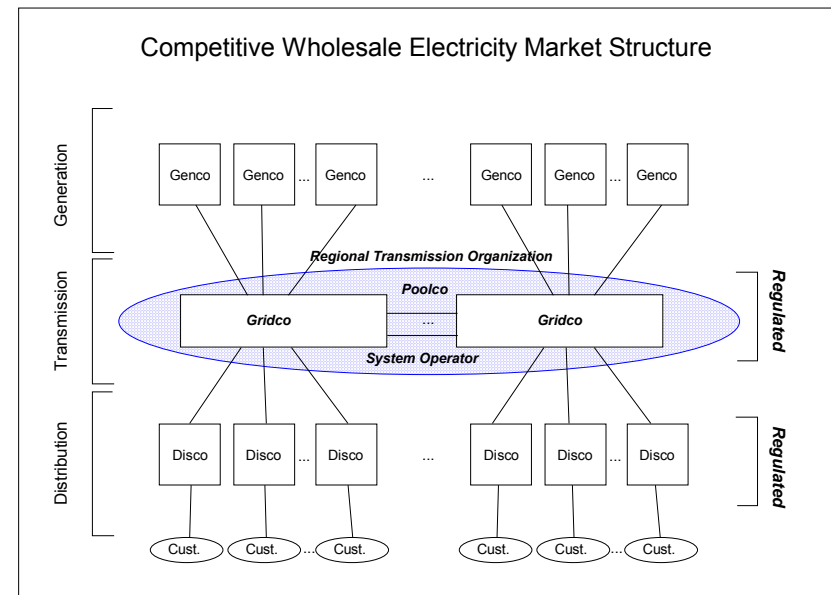
Electricity Restructuring

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

- **PURPA, 1978.** The rise of the new generators.
- **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."¹

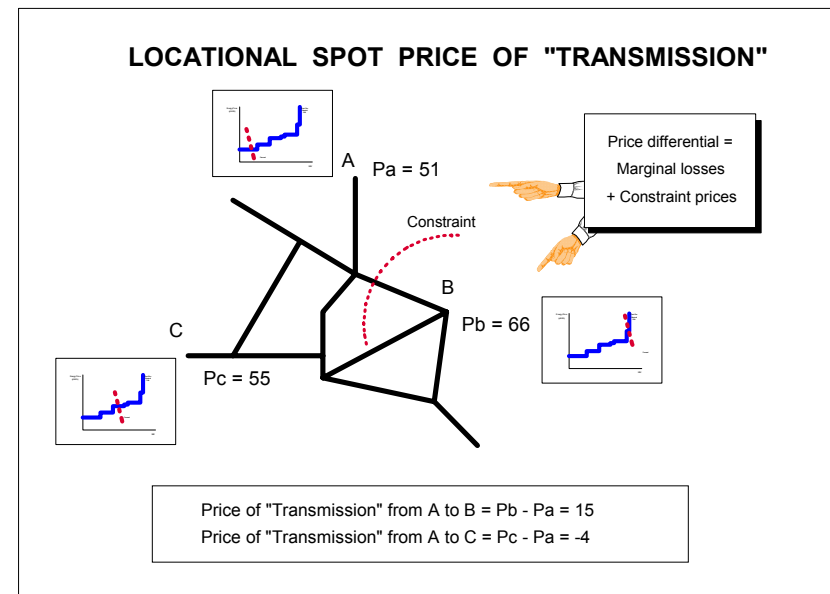
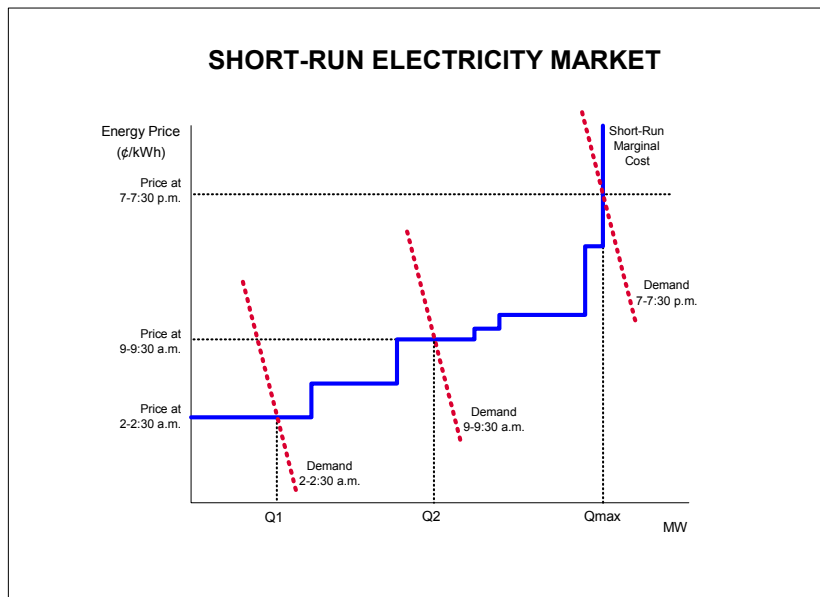
- **Schweppe et al., 1988.** Spot Pricing of Electricity, Kluwer. Using prices to direct the dispatch.
- **Hogan, 1992.** "Contract Networks for Electric Power Transmission," JRE. Spot market pricing and financial transmission rights.
- **EPAcT, 1992.** The 'camel's nose' of wholesale competition.



¹ Paul L. Joskow and Richard Schmalensee, Markets for Power: An Analysis of Electric Utility Deregulation, MIT Press, 1983, p. 63.

The evolution of electricity restructuring thread ...

- **California Blue Book, 1994.** "An Efficient Bilateral Market Needs a Pool."²



- **California MOU, 1995.** Separation of Power Exchange (PX) and System Operator (CAISO)³

² William W. Hogan, "An Efficient Bilateral Market Needs a Pool," testimony before California Public Utilities Commission, August 4, 1994.

³ William W. Hogan, "A Wholesale Pool Spot Market Must Be Administered by the Independent System Operator: Avoiding the Separation Fallacy," *Electricity Journal*, December 1995, pp. 26-37.

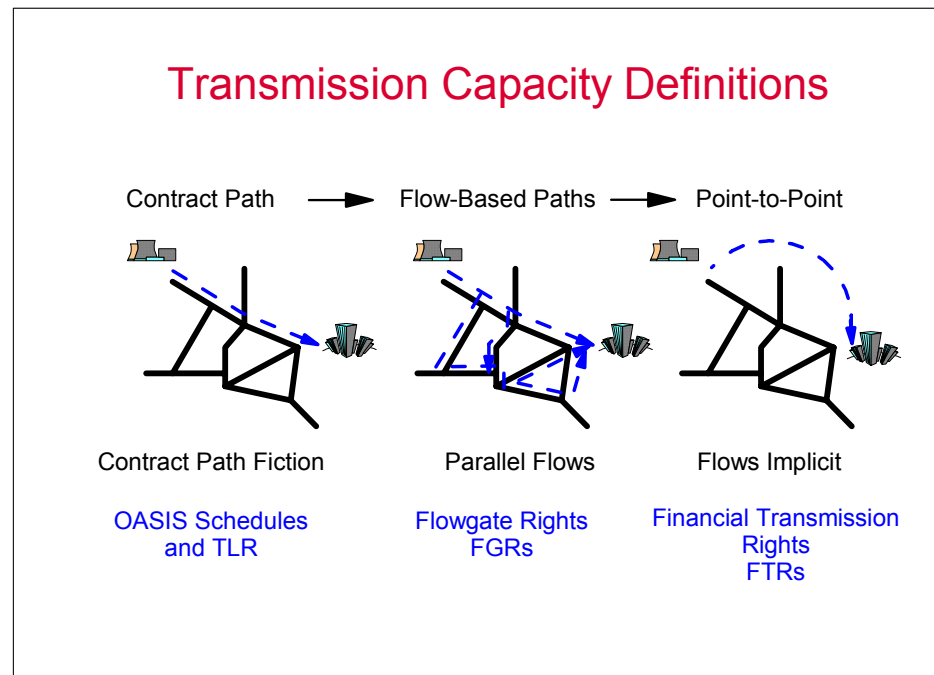
The evolution of electricity restructuring thread ...

- **Order 888, 1996.** Non-discrimination, Open Access to Transmission.

- **Capacity Reservation Tariff (CRT), 1996.** A new model.

"The proposed capacity reservation open access transmission tariff, if adopted, would replace the open access transmission tariff required by the Commission ..."⁴

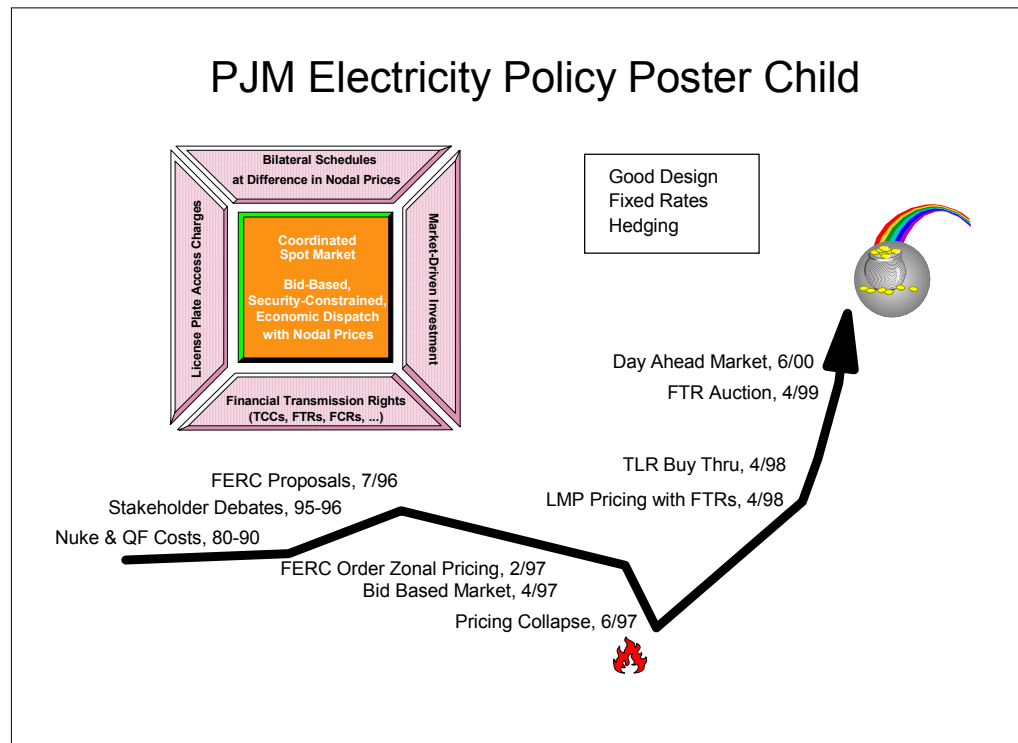
- **NERC Transmission Loading Relief (TLR), 1997.** The unscheduling system to complement Order 888.



⁴ Federal Energy Regulatory Commission, "Capacity Reservation Open Access Transmission Tariffs," Notice of Proposed Rulemaking, RM96-11-000, Washington DC, April 24, 1996, p. 1.

The evolution of electricity restructuring thread ...

- **PJM, 1997 & 1998.** Demonstration of the importance of congestion management.



- **Order 2000, 1999.** Regional Transmission Organizations, the 'Millennium Order.'

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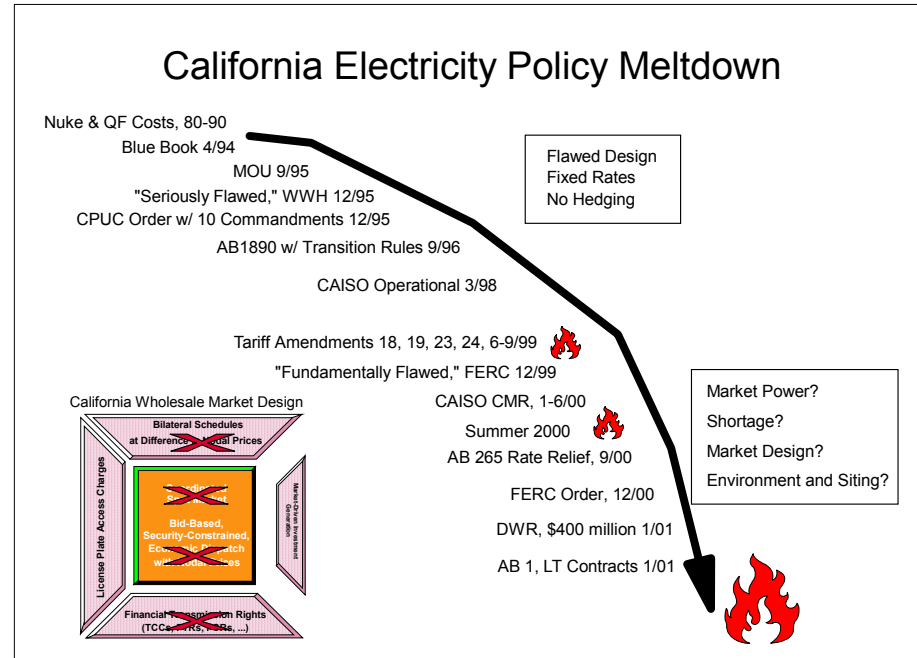
The evolution of electricity restructuring thread ...

- **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."⁵

- **California Meltdown, 2000.** Bad policy, bad luck, and bad news.
- **Bankruptcy, 2001.** PG&E and Enron, bankruptcy bookends for the "annus horribilis."

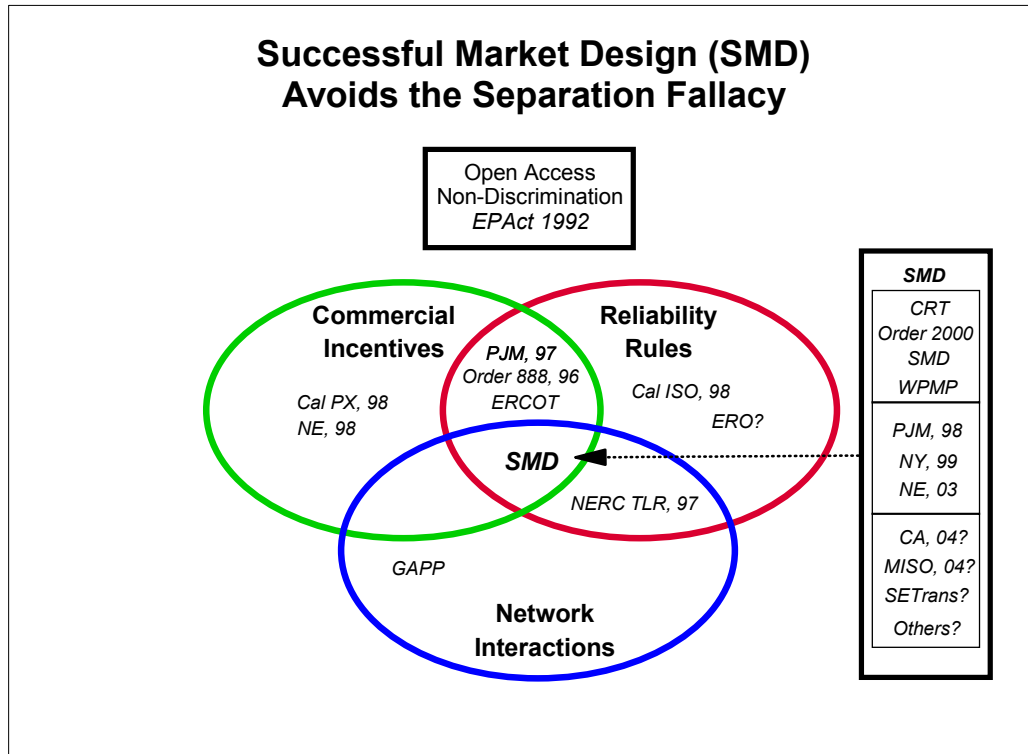
- **Standard Market Design (SMD), 2002.** A good design is necessary, but not sufficient.



⁵ 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. 4.

The evolution of electricity restructuring thread ...

- **Regional Revolt Opposing SMD, 2003.** Changing paradigms and defending turf.
- **Northeast Blackout, 2003.** An isolated incident with an engineering fix, or part of the continuing thread?



There is an underlying premise in many market design proposals that the functions of the independent system operator (ISO, aka ITP) can be largely separated from the operation of a wholesale spot market. This is a mistake.⁶

A False Goal

Minimize the role of the ISO: In an attempt to have a small footprint for the ISO, there is a common argument that the ISO functions should be restricted to reliability and separated from the operation of the spot market. In practice, the lack of an efficient spot market and efficient pricing drives the ISO to intervene ever more, but without the tools of the market. The ISO ends up large and intrusive, and the market works badly or not at all.

Better to

Recognize the minimum requirements of an ISO: There are certain functions that only the ISO can perform, and these should be done both efficiently and to support a competitive market. Done right, the result is healthy bilateral trading, liquidity, and ease of entry.

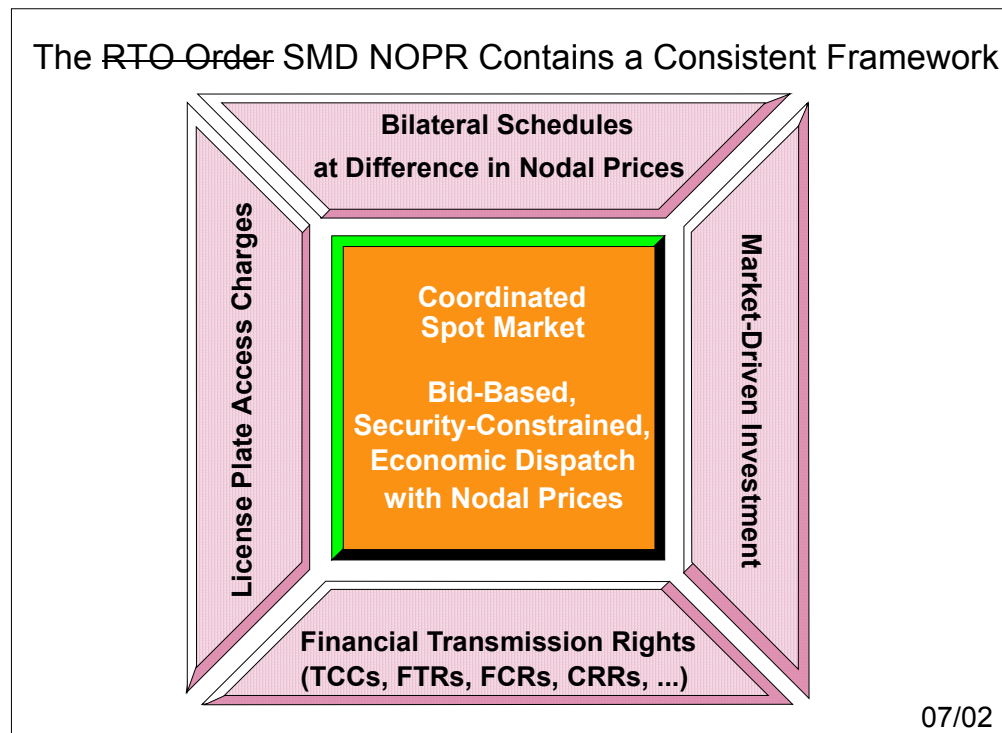
It is not good public policy to intentionally design the ISO functions to be inefficient. If we do so, we will succeed, and the ISO will not be able to provide the services that the market needs to handle the complexity of the electricity system. A well designed ISO, operating a spot market, providing price signals, and supporting transmission hedges, results in the smallest footprint possible.

⁶ 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.

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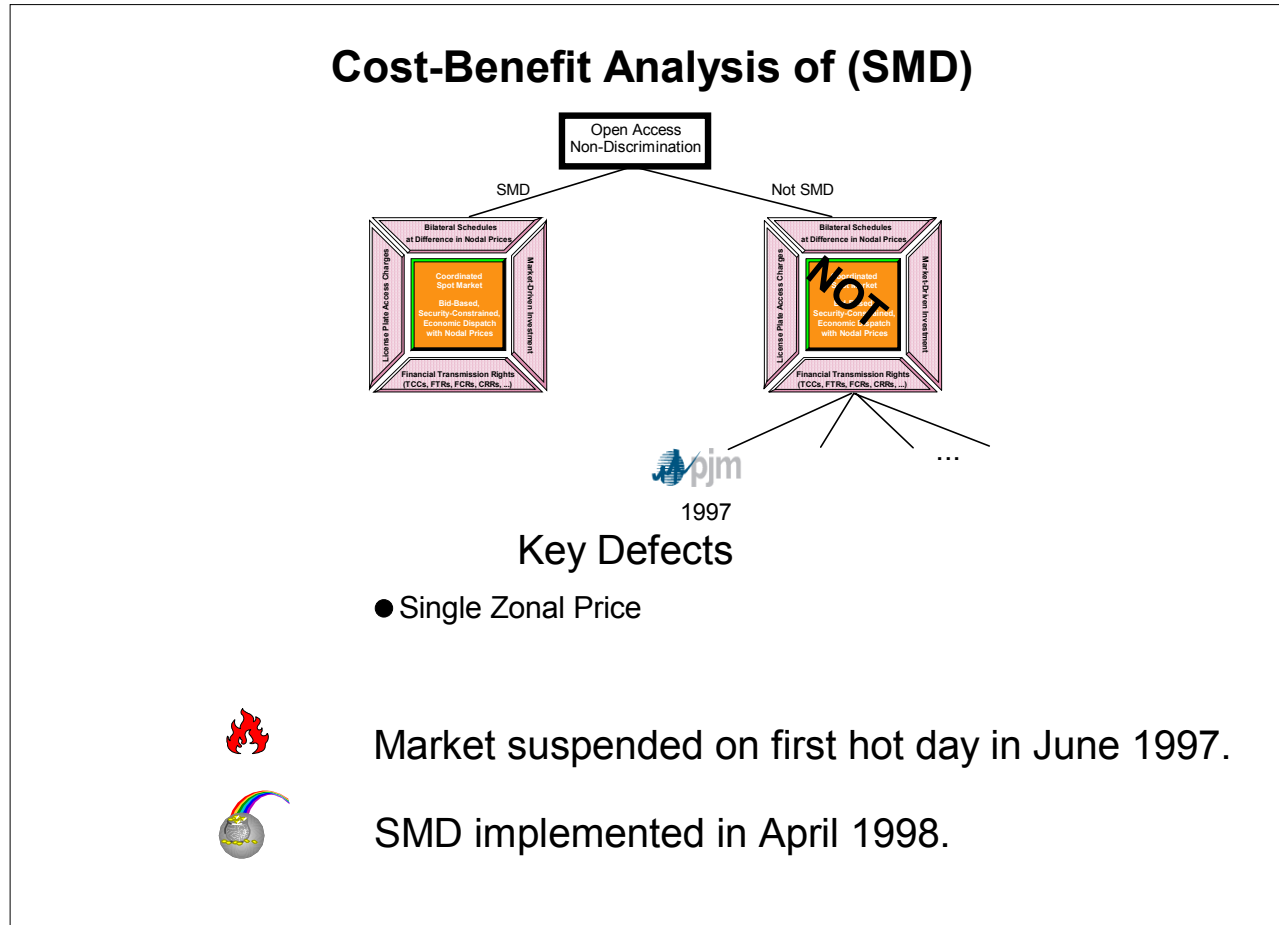
A Market Framework

The ~~Regional Transmission Organization (RTO) Millennium Order (Order 2000)~~ Standard Market Design (SMD) Notice of Proposed Rulemaking (NOPR), provides a workable market framework that is working in places like New York, PJM in the Mid-Atlantic Region, and New England.

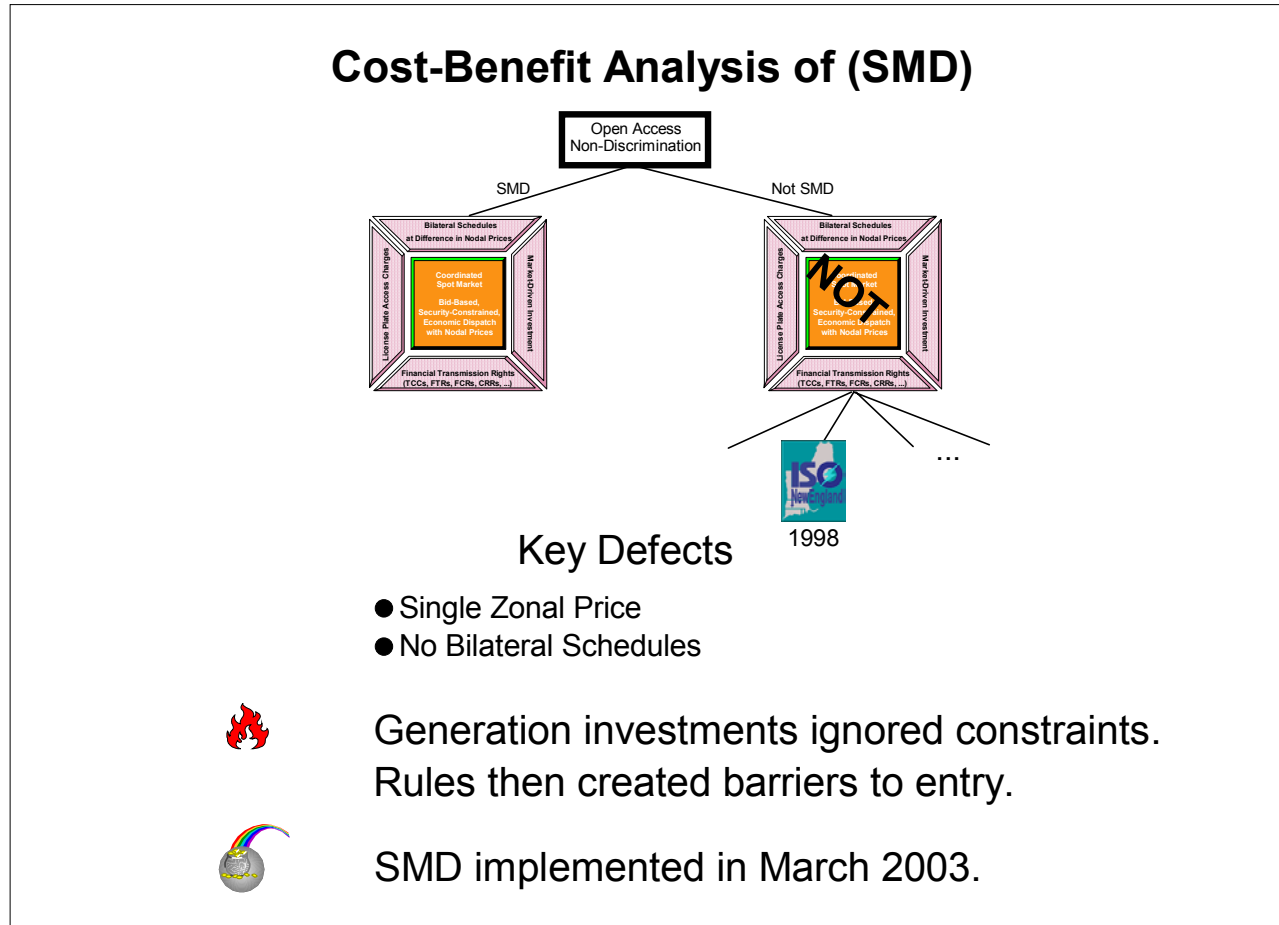


Poolco...OPCO...ISO...IMO...Transco...RTO... ITP...WMP...: "A rose by any other name ..."

The first market design in PJM was not SMD, and failed abruptly.



The first market design in New England rejected SMD, and failed more slowly.



Cost-benefit analysis is important, but the usual problem is in identifying the costs and the benefits. Asking the wrong question to focus on what can be done may ignore what is most important.

- Assume that many designs can support open access and non-discrimination.
- Assume that approximately the same investments will develop under any design.
- Focus on operating efficiency benefits that are likely to be small and may not be worth the effort.

Given these assumptions, the benefits of SMD may not be worth the costs. But these assumptions dispose of the principal arguments for SMD, and for electricity restructuring.

The evidence is clear, albeit difficult to quantify with big model precision. The assumptions are not correct, and market failures experienced under these assumptions have first order consequences.

The SMD is the “successful market design” and the only way known to work. There are many ways to get it wrong, but the alternatives impose large and avoidable costs.

Will Congress and the states support the SMD?

Pressure on the FERC has been building

- Opposition from states in the Southeast and Northwest.
- FERC “White Paper” on the Wholesale Market Platform on April 28, 2003.
- Two days after the White Paper, Senate Energy Committee votes 13-10 to impose a two year moratorium on the Standard Market Design.
- Department of Energy simultaneously produces a cost-benefit study generally supportive of the SMD. The House energy bill contains no SMD prohibition.
- FERC then announces it will wait until it sees the outcome of the energy bill, but continues with regional hearings on the wholesale market platform.
- To obtain unanimous consent and go to conference, Senator Shelby received a commitment to delay SMD for years. This would “cripple” FERC. (FERC Chair Pat Wood, September 15, 2003)
- Will the failure analysis of Blackout 2003 focus on the right questions? Make things better or worse?

Will Congress avoid the “separation fallacy”? Will FERC be able to follow through? Or will the country endure a further long period of expensive experimentation with accidents waiting to happen?

Supporting papers and additional detail can be obtained from the author. William W. Hogan is the Lucius N. Littauer Professor of Public Policy and Administration, John F. Kennedy School of Government, Harvard University and a Director of LECG, LLC. This paper draws on work for the Harvard Electricity Policy Group and the Harvard-Japan Project on Energy and the Environment. The author is or has been a consultant on electric market reform and transmission issues for Allegheny Electric Global Market, American Electric Power, American National Power, Australian Gas Light Company, Avista Energy, Brazil Power Exchange Administrator (ASMAE), British National Grid Company, California Independent Energy Producers Association, Calpine Corporation, Central Maine Power Company, Comision Reguladora De Energia (CRE, Mexico), Commonwealth Edison Company, Conectiv, Detroit Edison Company, Duquesne Light Company, Dynegy, Edison Electric Institute, Edison Mission Energy, Electricity Corporation of New Zealand, Electric Power Supply Association, El Paso Electric, GPU Inc. (and the Supporting Companies of PJM), GPU PowerNet Pty Ltd., ISO New England, Maine Public Advocate, Maine Public Utilities Commission, Mirant Corporation, Morgan Stanley Capital Group, National Independent Energy Producers, New England Power Company, New York Independent System Operator, New York Power Pool, New York Utilities Collaborative, Niagara Mohawk Corporation, NRG Energy, Inc., Pepco, Pinpoint Power, PJM Office of Interconnection, Public Service Electric & Gas Company, Reliant Energy, Rhode Island Public Utilities Commission, San Diego Gas & Electric Corporation, Sempra Energy, TransÉnergie, Transpower of New Zealand, Westbrook Power, Williams Energy Group, and Wisconsin Electric Power Company. The views presented here are not necessarily attributable to any of those mentioned, and any remaining errors are solely the responsibility of the author. (Related papers can be found on the web at www.whogan.com).