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# Standard Market Design in Wholesale Electricity Markets: Can FERC's Proposed Structure Adapt to the Unknown?

*The SMD proposal focuses on wholesale markets and transmission in isolation, not on ways to encourage a more market-based retail approach. As long as it remains so supply-focused, policy will be like one hand clapping, leading to potential overinvestment in transmission and costly future revisions of institutions.*

*Lynne Kiesling and Brian Mannix*

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## I. Introduction

Fifteen years ago Vernon Smith wrote of electricity markets:

Replacing the entrenched regulatory regime, after 80-odd years, with a competitive regime will require regulators to be forward looking, politically bold, and cognizant of the disciplinary value of competition.<sup>1</sup>

Today the Federal Energy Regulatory Commission, and many of the state regulatory commissions, can look back with considerable pride at what they

have accomplished. Deregulation of electric power generation has proceeded, perhaps not as quickly as in some other industries, and not without some missteps, but with a deliberate and sustained pace. Competition is now deeply entrenched in the nation's power generation system, and it has made that system more efficient, more adaptable, more resilient, and more reliable. Much of this progress has been driven by technological innovation and also by economic developments outside the industry, but to a

considerable extent it is the product of hard work and innovative thinking within the regulatory commissions themselves, at both the federal and state levels.

FERC's current Standard Market Design (SMD) proposal is an important—although not final—step in the evolution of electricity markets. It recognizes that, in power generation, competition is now the primary guarantor of “just and reasonable” rates. It seeks to protect and promote that competition by proscribing anticompetitive practices, especially those that take the form of “undue discrimination” by vertically integrated transmission operators. It seeks to expand the scope of competition by erasing the “seams” between different geographic jurisdictions, as well as smoothing some of the seams between wholesale and retail markets. And it seeks to unmask the price signals for transmission investment that will alleviate the troublesome bottlenecks in the existing infrastructure.

These goals are laudable, and many of the features of the proposed SMD are welcome. In our view, however, the current proposal also suffers from several serious flaws.

**A. The SMD is too prescriptive and too quick to impose uniformity for its own sake**

More uniform national, and even international, “ground rules” will provide a better

foundation to facilitate exchange and competition, and to encourage investment in new capacity where it is needed. On the other hand, flexibility and variability in market design provide the raw material for evolution and experimentation, both by regulators and by market participants. By locking in a single, detailed, and inflexible market design, the SMD may inadvertently choke off further progress.

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Regional variation in market design has created “seams,” transaction costs, and other anomalies that seem desirable to eliminate. But regional variation in market design may also have accommodated legitimate differences in local conditions. And while variation allowed California to walk off a cliff, it has allowed other states, and the Commission, to draw important lessons from that experience.

The proposed rule identifies numerous problems—some theoretical, some anecdotal—in existing markets and asserts that the SMD will fix them. A search

of the preamble for “eliminate(d)” and “(re)solve(d)” reveals dozens of problems that will be made, by rule, to vanish. The mixed record of recent experience with market design fails to dent the confidence with which the SMD is proffered:

In the years since the ISO [independent system operator] markets have been operating, dozens of market design flaws have been identified, . . . No region has been exempt from market design flaws of one type or another. . . . Only standardization of electricity market design will solve these problems. Our goal is . . . to raise the quality of all electricity markets simultaneously.<sup>2</sup>

Unfortunately, standardization also means that *unintended* consequences of the SMD will affect all electricity markets simultaneously. Good intentions do not prevent errors, unanticipated abuses, or assumptions that turn out later to be misplaced. For this reason, the Commission should proceed with caution. The proposed SMD may appear to be superior to all the others only because it is, so far, untried.

Detailed rules run the risk of regulatory path dependence and lock-in. The new institutional structure in the SMD should be simple, flexible, and *reversible*, with clear and credible phase-out provisions as technology evolves and market-based retail pricing expands. Robust institutions that will stand the test of time and create value for consumers must be able to adapt to the unknown.

Many unknowns exist in electricity, particularly in the regulatory, financial, and technological future. Market design that focuses too heavily on explicit details and not enough on flexible and adaptable rules will be useless at best, and counterproductive at worst.

**B. The SMD classifies practices as “undue discrimination” without sufficient examination of economic efficiency**

In policing electricity markets, the Commission faces the same problem faced by antitrust agencies: How can it be sure that its power to intervene is used to protect competition rather than suppress it? In a complex market it can be difficult to distinguish cost-based (and therefore economically efficient) discrimination from “undue” discrimination, and competitive practices from anticompetitive practices. Certainly, it will not suffice to rely uncritically on complaints from market participants. Companies will file anticompetitive-discrimination complaints if it is rewarding to do so, regardless of whether the alleged discrimination has an economic basis. And aggressive competition elicits complaints from competitors just as surely as anticompetitive behavior does.

**I**t is the duty of the Commission to ensure that its oversight of markets is not employed to favor one or another participant

in the market, but to provide the greatest benefit to consumers as a whole. It should use as its guideposts the notions of economic efficiency and consumer harm that are used to guide antitrust interventions.

The SMD seeks to eliminate discrimination and, in particular, to ensure that a vertically integrated transmission provider will never have competitive advantage over independent

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generators. In its zeal to eliminate competitive advantage, however, the Commission needs to be careful not to throw the baby out with the bathwater: i.e., not to eliminate real economic efficiencies from the system.

For example, in its discussion of scheduling advantages (paragraphs 45–47) and in its discussion of imbalance resolutions (paragraphs 48–49), the SMD proposal appears to proceed directly from the observation that a practice confers competitive advantage to the conclusion that it should be banned. We do not have enough information to say

whether these particular practices are anticompetitive, but surely there are some cases where competitive advantage flows from real economic efficiencies; the Commission needs to make more of an effort to examine this possibility before it bans a practice.

**C. The SMD does not recognize the value of competition, or potential competition, in transmission services**

While the SMD recognizes the disciplinary value of competition in power generation, it appears to embrace—and to codify—the status of transmission as a “regulated natural monopoly.” But FERC could accomplish many of the proposal’s objectives regarding transmission investment and congestion pricing by reducing entry barriers in transmission. The SMD structure as currently envisioned does not address the fundamental supply-side problem that makes transmission a bottleneck—the combination of fragmented ownership and the persistence of artificial barriers to entry facing the grid’s potential competitors. The proposed SMD acknowledges that improved transmission coordination and investment can make wholesale generation markets more competitive, but does not incorporate the insight that the reverse is also true. Changes in generation regulation and technology can make

transmission more competitive, so that transmission need no longer be treated as a natural monopoly.

The proposed SMD does not reduce the regulatory barriers to entry that prevent us from putting transmission to a market test. In the absence of these barriers, transmission faces potential competition, or is *contestable*. Reducing artificial barriers to entry in transmission, and observing the extent to which and the timeframe over which transmission really can be contestable, would create real benefits from dynamic efficiency and optimized investment. Furthermore, reduced entry barriers would enable investors to create redundancy and increased grid security when and where it makes economic sense. Such beneficial redundancy does not exist with transmission regulated as a natural monopoly, as natural monopoly theory is premised on removing redundant infrastructure.

**D. The SMD does not recognize that market pricing for retail customers can exert considerable competitive discipline on transmission as well as generation**

Market-based retail pricing is another simple concept that would reduce the need for FERC and ISO market monitoring functions and associated bureaucracies. Market-based retail pricing connects demand

and supply, maximizing information transmission in markets and disciplining supplier exercise of market power better than any other known institution. Clearly, retail pricing is beyond the scope of this rulemaking and beyond the scope of the Commission's jurisdiction. However, states are slowly moving toward market-based retail pricing and retail choice. It is important

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for FERC to recognize that retail pricing reforms will make loads responsive to scarcity at peak times, and will thereby alleviate many of the transmission bottlenecks and rigidities that the SMD is designed to address.

Thus, the proposed FERC and ISO market monitoring should have sunset provisions as the percentage of retail load on competitive contracts increases. Market-based retail pricing is more likely than market monitoring to create value for consumers, and one reason for that advantage is that market monitoring is almost certain to sup-

press dynamic investment incentives.

## **II. Simple Market Design Rules: Transmission Entry and Demand Response**

Although full of important and well-crafted recommendations, the SMD proposal is awash in excessively detailed rules. In many of the dimensions of the SMD proposal, the objective is sound, but then the question arises: How necessary are such detailed specifications to competitive wholesale markets? Excessive details can make the SMD proposal unable to adapt to changing technology and market conditions. Furthermore, such detailed specifications would make changing these new institutions very costly and time-consuming. This is particularly true when a subset of market participants has a stake in preserving the status quo: anticompetitive or discriminatory practices in a contestable marketplace tend to be eroded, but anticompetitive or discriminatory regulations tend to get locked in place.

Perform the following thought experiment: What would be the minimum set of rules necessary to support a competitive wholesale market?<sup>3</sup> How different is the SMD proposal from that minimum set of rules, and what are the costs and benefits associated with the differences? That

minimum set of rules would have at least two features: reduced entry barriers in transmission, and increased demand response and market-based retail pricing.

### **A. Transmission entry barriers send faulty investment signals**

While slowly evolving away from its traditional "command and control" approach, electric industry regulation retains the government-granted monopoly franchise in the transmission (and distribution) portion of the value chain. Mandating a particular institutional structure, especially one based on natural monopoly theory, will forestall the discovery of possibly superior alternatives. As technological change and other changes occur, revising the SMD structure could be quite costly and time-consuming. In so doing we overlook the potential contestability of transmission, and stifle potential beneficial technical and institutional change and innovation.

**T**echnological change has helped create the environment and the incentives for the deregulation and restructuring efforts that we have seen thus far. As the technology of generation has changed, the economics of generation have also changed, and large power plants are no longer the only way to lower the long-run average cost of producing electricity. Technological change has made distributed

generation (DG) possible and more cost-effective over time. It has also improved transmission's ability to carry electricity over longer distances with less line loss. More importantly, though, technological change in generation has changed the economics of transmission, making it more contestable. However, the idea that redundant



electricity transmission would be unnecessarily costly continues to permeate public policy regarding transmission, including the SMD proposal. This perspective does not incorporate due consideration of other alternatives to the existing transmission grid, such as distributed generation, nor does it acknowledge the security benefits of redundant systems.

Technical change and contestability hold the keys to a dynamic electricity industry. Contestability is an important feature of competitive markets because it promotes dynamic efficiency. Often, the threat of potential competition can deter a company from raising its prices, because it knows that by

doing so it may attract competitors. Electricity transmission faces some possible competition from entrepreneurs who may be willing to lay parallel lines (as with natural gas and telecommunications, redundant systems could be profitable and cost-effective), but the more pressing competition could come from transmission of fuel to distributed generation sites instead of transmission of electricity.<sup>4</sup>

An institutional structure that removes barriers to entry would also be more flexible than traditional regulatory institutions. Efficiency over time depends on institutions that are economically and politically flexible enough to adapt to opportunities and encourage innovation and risk taking.<sup>5</sup> Institutions that do not adapt to discovery will wind up increasing transaction costs as the wedge grows between efficient practices and behavior accommodated by the static institutions. Increasing transaction costs in turn obscure or even eliminate opportunities for beneficial discovery and for direct market evolution. Contestability, for example, can be stifled by high transaction costs caused by static regulatory schemes that limit contract flexibility. Thus the point of flexible transmission policy should be to allow institutional arrangements that lower transaction costs (along with regular costs) according to unique, local, and dynamic conditions.

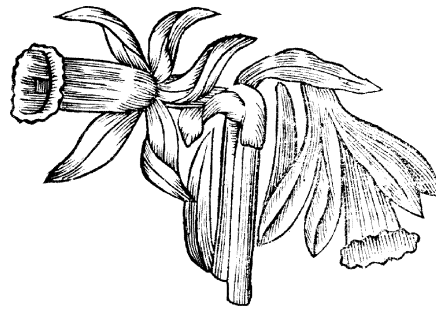
A regulatory system based on the natural monopoly assumption

about industry and market characteristics can raise substantial barriers to the emergence of superior alternatives. It can lock in the transaction costs of a regulated monopoly transmission grid with no mechanism for the evolution of contracts to seek institutional arrangements with lower transaction costs. It can also eliminate mechanisms by which refined use of local knowledge can lead to discovery of beneficial institutional arrangements that cannot be discovered by even the most thoughtful regulatory bodies. The contention that regional independent transmission providers form the best institutional structure falls prey to this criticism, if this structure is implemented as a static and inflexible institution. The combined federal and state regulation of the industry complicates the entry barrier story even further, as does the disincentive to transmission ownership consolidation posed by the combination of capital gains taxes and antitrust legislation.

**I**nstitutional change in the electricity industry should incorporate the effects of technological change in one segment on the competitive dynamics of the whole industry. A regulatory approach that treats the segments of the industry (generation, transmission, distribution) separately undermines the potential benefits that changes in one segment can create in another. Such a "silo" regulatory system overlooks and fails to either incorporate or encourage possible

competition from other parts of the value chain in the industry, and locks in inefficient investment choices.

FERC-imposed institutional change via the SMD proposal may lead to more costly and inefficient electricity provision compared to institutional change that could evolve out of the flexibility to opt out of RTOs and build distributed



generation, develop new contract paths, or some other unknowable future change that path dependence could forestall. That path dependence could also lead to the construction of more transmission grid assets than under a more flexible transmission policy, leading to excess and inefficient investment. Only through removing regulatory obstacles will we be able to discover and achieve optimal transmission investment.

#### **B. Market-based retail pricing is necessary for efficient investment**

Since state regulation of the electricity industry commenced in

1907, retail customers have faced average rates that change infrequently. Retail electric service is provided on a guaranteed-price basis, under the regulatory "obligation to serve" remit. In terms of consumer expression of their demand, these regulated rates have meant that consumer demand signals are metered, aggregated, and transmitted to suppliers on a *monthly* basis. With such unchanging rates, the demand or typical aggregate load profile fluctuates greatly across the day.

**R**etail customers still overwhelmingly face guaranteed average prices in the form of rate caps, even in states that have implemented some measure of deregulation. The states that have retained their regulated, vertically integrated industry structure still have guaranteed average wholesale prices, in addition to fixed retail rates for customers. In states that have implemented restructuring, the political compromises that have been required to move restructuring forward have led to a regulatory environment in which wholesale electricity markets and retail rates are still largely disconnected. Such price caps reduce the incentives of customers to participate in demand response programs that send informative price signals into the wholesale market. Many studies have shown that the demand for electricity is definitely downward-sloping, indicating that consumers do have some price responsiveness, and that

responsiveness can change as frequently as hourly. Fixed retail prices remove the price signals that would enable consumers to respond and act on those price sensitivities, and ignore the diversity among customers in their demand. Taking advantage of that diversity would lead to improved investment incentives, lower costs, and well-served customers. It would also be likely to reduce the required investment in transmission assets that a purely wholesale market focus would produce. This possible overinvestment in transmission is one of the main problems in the SMD proposal.

The benefits from implementing market-based pricing are varied and extensive. Market-based pricing emphasizes the information content of prices, an aspect of prices that frequently gets overlooked in political debates like the ones that occurred in California in 2000 and 2001. The most important features of market-based pricing and demand response arise when consumers can choose how much of the real cost of power they see over which time period, and when they have the corresponding choice of prices to face. An important policy distinction arises between customers being *required* to see hourly prices, and customers having the *opportunity* to see hourly prices. We recommend eliminating regulatory barriers to customers having the opportunity to see hourly prices. Eliminating this barrier

would allow retail consumer information to flow into wholesale markets, improving the efficiency of wholesale markets and optimizing the required investment in infrastructure such as transmission.

Market-based pricing also increases competitiveness of electricity markets and reduces the severity of price spikes.



Customers who adjust their use in the face of price volatility help reduce the magnitude of price spikes. Shifting demand from an expensive hour to a cheaper hour lowers equilibrium price in the expensive hour and may increase it in the cheaper hour.<sup>6</sup>

Market-based pricing gives consumers an explicit way to hold generators accountable for their wholesale pricing decisions. Market-based pricing integrates wholesale and retail markets; that integration means that customers may face wholesale electricity prices more directly, and therefore will be able to shift their demand away from hours with high wholesale prices. Thus removing the artificial regulatory

barriers from the demand-side disciplines firms that could otherwise exercise market power in a one-sided, supply-driven market.

In presenting the economics underlying the power of consumer demand in electricity markets, Rassenti, Smith and Wilson<sup>7</sup> analogize between the electricity industry and other industries, particularly the airline and hotel industries. All three are service industries, facing peak demand that fluctuates and that determines capacity, with substantial capital investment requirements to satisfy demand. In competitive markets for airline travel and hotel rooms, where both consumers and producers can provide and respond to price signals, rates typically go up in peak demand periods and plummet in off-peak periods. The high rates in peak demand periods, rates that certainly exceed marginal cost, pay for the capital that is necessary to satisfy the peak, and the interaction of these price signals lead to optimal capacity investment.

Facing uncertain, peaking demand does not mean, though, that all customers who want a seat or a room at peak will get it at a price they are willing to pay. Hotels and airlines do not operate under a regulatory obligation to serve, yet consumers deal with the fact that they might not be able to consume the flight or the hotel room they want when they want at the price they want. They shift their demand to different times,

trading off convenience for cost depending on their individual preferences. Thus the comparison with the airline and hotel industries reveals exactly the extent to which the “electricity cannot be stored” rationale for regulation is a canard—airline travel and hotel service cannot be stored either, yet no one is arguing that these industries should operate under “must serve” obligations like those in the electricity industry.

**T**he mismatch between real-time wholesale supply signals and fixed, average demand signals will continue to send the wrong transmission investment message to capital markets. Nonexistent price signals lead to poor investment choices, and thus run counter to the primary objective of the SMD proposal.

### III. Political and Jurisdictional Barriers to Simple Rules

Achieving integrated, competitive wholesale and retail electricity markets is made more difficult by the bifurcated regulatory jurisdiction between federal and state that keeps wholesale supply and retail demand from sharing information through market exchange. The most parsimonious, simple, unmanipulable approach to institutional change in electricity involves bridging state and federal jurisdictions to enact bene-

ficial institutional change. The SMD proposal focuses on wholesale markets and transmission in isolation, not on ways to encourage a more market-based retail approach. As long as the SMD proposal and electricity policy in general remain so supply-focused, electricity policy will be like one hand clapping, leading to potential



overinvestment in transmission and costly future revisions of institutions.

Absent the ability to implement the simplest set of rules because of jurisdictional constraints, the SMD proposal runs the risk of compounding regulatory intervention with further regulatory intervention. Market monitoring and market power mitigation are potentially the most costly of these band-aids; “... because market power mitigation may tend to suppress scarcity prices that signal the need for investment, a companion mechanism besides spot prices is needed.”<sup>8</sup> In other words, FERC argues that the inability to unleash the disciplining power of retail demand

response requires market power mitigation, which reduces investment incentives by not producing scarcity rents. They, therefore, must build in some other investment incentives. In the case of market power mitigation, the jurisdictional constraint away from retail demand response leads to the layering of regulation upon regulation, all in the name of competition.

**E**ven if these jurisdictional constraints mean not achieving that integrated wholesale–retail simultaneous deregulation in this SMD proposal, what gets implemented in the SMD should be flexible and *reversible*, with phase-out provisions as demand response and market-based pricing expands.

### IV. Conclusion

The SMD proposal addresses supply-side issues, particularly transmission ownership, investment, and congestion pricing. The spirit is right and the effort is thorough and admirable. But a supply-side-focused institutional change is still only one hand clapping. The SMD should be couched more in the long-run benefits and objectives of creating a collaborative regulatory environment that enables demand-side and supply-side incentives and knowledge to interact, which is the best way to perform market monitoring, discipline suppliers, and provide optimal dynamic investment incentives. Furthermore, the unwillingness to

encourage competitive transmission by removing regulatory barriers to entry in the transmission sector of the value chain creates a market design proposal that compounds market interventions with further market interventions, instead of unleashing the benefits of integrated supply and demand in markets.

**R**etaining transmission entry barriers and retail average cost pricing ensures that transmission investment arising from the SMD proposal will be inefficient (except by chance). Entry barriers and the lack of demand response silence the most powerful information transmission mechanisms available—price signals that tell investors how much to build, and that also discipline supplier market power.

Transmission's degree of contestability depends heavily on barriers to entry into ventures that could compete with transmission. The higher the entry barriers, the lower the contestability and the more able a transmission owner is to exercise market power and raise prices. FERC's current effort to coordinate DG interconnection standards across states will reduce technical entry barriers, in keeping with the technological change that has made DG scale small enough to provide a real threat of competition to transmission. DG is but an example of the technological possibilities for competition with the grid.

The largest remaining barriers are regulatory. The traditional,

service-territory-defined government monopoly franchise and the ongoing natural monopoly regulation of transmission are the greatest barriers to potential competition against transmission. They are also the worst impediments to the application of technological change in ways that will create choice and benefits for consumers. Until artificial entry



barriers facing transmission's competitors change, transmission's contestability, and the delivery of efficiency gains and choice to consumers, remain off limits by legal construct.

FERC is also coming at the problem from the wrong side—the supply side—because that is where they have jurisdiction. Addressing the demand side, making it more responsive and enabling customers to convey price signals into the market, would result in more efficient infrastructure investment than the detailed set of rules laid out in the SMD proposal. While FERC does not have demand-side jurisdiction, it should ensure that the supply-side standard market

rules it implements do not interfere with (or perhaps even encourage) the development of demand responsiveness at the state level. Only by implementing rules that will adapt to the unknown can FERC create a forward-looking, enabling institutional foundation for integrated, competitive wholesale and retail electricity markets. ■

#### Endnotes:

1. Vernon L. Smith, *Currents of Competition in Electricity Markets*, REGULATION, Summer 1987, at 29.
2. Federal Energy Regulatory Commission, *Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design*, Notice of Proposed Rulemaking, Docket No. RM01-12-000, July 2002, Web version (pdf), paragraphs 88–89.
3. We are grateful to Tom Lenard of the Progress & Freedom Foundation for posing this thought experiment.
4. Liles provides a compelling argument for why transmission is contestable, and why, therefore, for-profit transmission companies are viable, in James Liles, *Merchant Transmission: Building a Grid That Wall Street Can Understand*, PUB. UTIL. FORTNIGHTLY, Sept. 15, 2001, at 24–36.
5. Douglass C. North, *Transaction Costs, Institutions, and Economic Performance*, International Center for Economic Growth, Occasional Paper No. 30 (San Francisco: International Center for Economic Growth, 1992).
6. Price might not rise in the less expensive hour because generators are often willing to accept lower prices to avoid having to shut off generators in that hour.
7. Stephen J. Rassenti, Vernon L. Smith, and Bart J. Wilson, *Turning Off the Lights*, REGULATION, Fall 2001.
8. Federal Energy Regulatory Commission, *supra* note 2, at 8–9.