AN ENERGY-ONLY MARKET FOR RESOURCE ADEQUACY IN THE MIDWEST ISO REGION

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In the Midwest ISO Region
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INTRODUCTION

This paper continues the discussion of resource adequacy issues initiated in the Midwest through working groups organized by the Midwest Independent System Operator ("ISO") and the Organization of MISO States (OMS).[1] It follows a White Paper prepared by the Midwest ISO and issued on August 3 and September 9 (revised) of this year and comments submitted by stakeholders.[2] In its earlier White Paper, the Midwest ISO expressed a desire to examine the feasibility and merits of using what is commonly called an "energy-only market" approach to ensure resource adequacy. Comments by stakeholders, including important questions asked by the OMS,[3] seek additional information about how an energy-only market would function. In this paper, we attempt to address those questions that can be answered at this time, while providing a framework for thinking about other questions that should be answered as this discussion moves forward.

The principal reason for considering an energy-only market approach to achieving resource adequacy is the expectation that it would allow market incentives, rather than centralized administrative direction, to drive investment decisions. The rationale is consistent with the principal reasons for developing markets and departing from the traditional regulatory structure in the first place. In the words of William Hogan:

> A main feature of the [energy-only] market would be prices determined without either administrative price caps or other interventions that would depress prices below high opportunity costs and leave money missing. The real-time prices of electric energy, and participant actions, including contracting and other hedging strategies in anticipation of these prices, would be the primary drivers of decisions in the market. The principal investment decisions would be made by market participants, and this decentralized process would improve innovation and efficiency. A goal would be to avoid repeating the problem of leaving customers with stranded costs arising from decisions in which the customers had no choice. This change in the investment decision process and the associated reallocation of risk would arguably be the most important benefit that could justify greater reliance on markets and the costs of electricity restructuring. If this were not true, and if it would be easy for planners and regulators to lay out the trajectory of

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[1] This paper was prepared by and at the direction of Midwest ISO staff, with significant assistance from John Chandley and Robert Borlick. Helpful comments were provided by William Hogan and Mike Cadwalader.

[2] Midwest ISO, "Discussion Paper on Resource Adequacy for the Midwest ISO Energy Markets," posted August 3, 2005; revised, September 9, 2005. http://www.midwestmarket.org/publish/Document/25228f_10631e11216_-7fac0a48324a. Hereafter referred to as "White Paper."

[3] http://www.midwestmarket.org/publish/Document/2b8a32_103ef711180_-77cd0a48324a.

needed investment for the best portfolio of generation, transmission and demand alternatives, then electricity restructuring would not be needed.[4]

From this perspective, the goals of an energy-only market are to improve innovation and efficiency, avoid the problems of stranded costs, and shift the risks and rewards of prudent investment from consumers to investors.[5] This would be achieved by moving the primary responsibility for investment decision-making from regulated planning and centralized administrative processes to the decentralized, voluntary decisions made by market participants responding to prices set by the market. But these are not the only reasons for considering an energy-only market.

One need not be convinced of the innate superiority of competitive markets to recognize other, very practical considerations that favor an energy-only approach to delivering an essential service to consumers without compromising reliability. The structure of an energy-only market directly defines the incentives that induce resources and loads to take actions consistent with reliable operations in the short run. Hence a further justification for giving serious consideration to an energy-only market approach is that it offers a consistent set of incentives that directly support both real-time reliability and resource adequacy. In contrast, current installed capacity (ICAP) structures and reform efforts make clear that achieving equally consistent and effective incentives in a capacity construct is extremely difficult and getting agreement on these administrative mechanisms is even harder, generally resulting in less than adequate incentives in both the short-run and long-run. These are not trivial concerns; they go to the heart of a very difficult problem we are trying to solve.

This paper expands the energy-only discussion by providing a more detailed description of how an energy-only market would work and what the ISO and others would need to do to implement such a market. The paper describes and discusses each element of that market and how it serves in promoting resource adequacy as well as ensuring operational reliability.

Defining An Energy-Only Market

As broadly defined in the earlier White Paper, an energy-only market explicitly pays resources only for the energy and ancillary services they deliver. It does not pay for installed capacity (ICAP). There is no requirement for utilities or load-serving entities to acquire or contract for "capacity" *per se*, or would anyone need to administer markets for

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[4] William W. Hogan, *On an "Energy-Only" Electricity Market Design for Resource Adequacy*, paper prepared for the California ISO, September 23, 2005. See http://ksghome.harvard.edu/~whogan/.

[5] The term, energy-only market, is a misnomer and actually refers to a series of closely linked sub-markets for spot energy, operating reserve, other related ancillary services and bilateral contracts. The common bond is that all depend on cost-reflective, transparent spot energy prices in order to function efficiently and effectively.

such "capacity" because they wouldn't exist.[6] This does not mean that energy-only markets do not compensate generators for their "capacity" costs (i.e., their fixed operating costs, start-up and no-load costs, plus the recovery of, and return on invested capital). However, generators recover these costs through the enhanced profit margins (scarcity rents) they earn from selling energy and ancillary services, rather than through direct payments earmarked to recover those costs.

That said, it is worth emphasizing that an energy-only market deals with more than just energy; rather it is a convenient label for a set of market rules that govern the ISO's day-ahead scheduling and real-time dispatch for energy *and* operating reserve.[7] The mandatory capacity rules of ICAP markets presume that these spot prices will not reflect the true system conditions, thus turn to alternative regulatory requirements to provide adequate investment incentives. By contrast, the energy-only market approach presumes that spot prices can be made to reflect operating conditions and provide the right incentives. The expected stream of hourly spot prices for energy and operating reserve provide a foundation for contracts and investment decisions occurring in a series of interdependent markets (*e.g.,* bilateral contracts, derivative markets, *etc.*) complementary to the ISO run spot markets, that will yield the desired level of resource adequacy.

It may seem strange that the real-time spot market should be the key to talking about long-run resource adequacy. Typically, in discussions of resource adequacy or "capacity" constructs these topics are separated from discussion of the real time spot markets. But they are *not* separate and unrelated and it is a serious mistake to separate them. A coherent discussion of resource adequacy must consider how the ISO conducts real-time dispatch and prices energy.

When these topics become separated, the result will likely fall well short of solving the resource adequacy problem and may also undermine short-run system reliability. Indeed, virtually every problem that the Eastern power markets are having with their current ICAP mechanisms can ultimately be traced to the mistake of ignoring or deemphasizing this critical linkage.[8] The hourly spot prices that signal the need for investments to keep existing plants operational and to build new capacity also induce generators to make their existing units available to the dispatch to ensure safe and reliable operations in real time.

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[6] The ISO leaves open the question of whether it should administer a voluntary forward market for energy, where market participants that are long or short could adjust their positions.

[7] Of the various ancillary services needed to support power system operation, operating reserve is the service most intimately linked with energy production. To maximize economic efficiency the markets for these two products must be closely coordinated.

[8] Scott M. Harvey, "ICAP Systems in the Northeast: Trends and Lessons," September 19, 2005, available at www.caiso.com. The New England LICAP filing (FERC Docket No. ER03-563-030) and the PJM RPM filing (FERC Docket Number EL05-148 *et al.*) both include substantial and remarkably candid critiques of the problems each ISO has experienced with current ICAP approaches, thus necessitating their reform efforts.

Getting the spot price signals right, and making sure that those who make operational and investment decisions are exposed to those prices, is essential. Even if the ISO ultimately adopts a capacity-based construct, that mechanism is unlikely to work very well if the designers lose sight of this basic truth.

The central question raised by the ISO in this paper, and in its original White Paper, is whether an energy-only market would be better than one that includes an explicit capacity mechanism. Would it be easier to implement? Could it do a better job of stimulating investment and ensuring resource adequacy? Would it be easier to design? This paper discusses why the central question is so important and explains why consideration of an energy-only market framework is both necessary and worthwhile no matter which path the Midwest region pursues.

Energy-Only Market And The Need For Intermediate Or Backstop Mechanisms

The energy only market has been characterized by some as an "end state" – a position that the market should eventually evolve into, but one that is not immediately feasible. This raises two issues that must be addressed. First, if an energy only market is the desired end state, then the short and long term impediments need to be identified and either overcome or mitigated. Second, it must be recognized that there is a fundamental difference between a "backstop" mechanism, *i.e.* one that is hopefully never used and is triggered only when a set of pre-defined criteria are met, and an "interim" mechanism which is a step along the way to an energy-only market. In either case it will be necessary to design structures that are incentive compatible with the development of an energy only market. That is, both the "backstop" or "interim" mechanisms cannot provide disincentives for either reaching the end state or ensuring the potential failure of the end state once implemented.

This paper explores the critical issues that need to be addressed to determine the need for an interim capacity mechanism. The paper also summarizes and provides references to recent papers that describe alternative capacity mechanisms.

The Role Of State Regulators

A purely market-based energy-only wholesale market can work without changes in the way electricity is consumed and paid for by end-users but the task becomes much more difficult to achieve. In particular, markets – for any service or commodity – function best when the costs and benefits of specific actions are either implicitly or explicitly transparent. When actions are linked to costs and benefits then parties have the incentive to manage risk in ways that allow for socially optimal outcomes. Under current rules ensuring that adequate capacity is installed is the responsibility of the States. Therefore, to assure both short-run reliability and long-term resource adequacy, wholesale market rules and retail regulation need to work in mutually supportive ways. As a result, state regulators play a critical role in a well functioning energy-only market.

In today's MISO energy markets, market participants are credited or charged based on the locational marginal price (LMP) at their injection or offtake node. Market participants that serve load (LSEs) with sufficient contract cover can insulate themselves

from the potential for real-time LMP price volatility. LSEs without sufficient cover through contracts with generation may be able to make up the shortfall through contracts with their customers having price responsive demand. Without either, these LSEs can be exposed to significant real time price volatility. As discussed later, state regulators will have access to LMP data for LSEs under their jurisdiction and will have knowledge of their contract cover, including demand-side contracts. The state regulators can use this information to guide LSE procurement strategies.

Over time retail rate designs can be changed and real-time, interval metering and billing can be implemented. However, decisions need to be made regarding how fast this should be done and for which customers. Because these decisions reside with the state utility commissions an energy-only market cannot be designed and implemented exclusively by the ISO. Important elements, particularly with respect to retail rate design, demand-side response and forward contracting would benefit from significant attention from state regulators. [9]

Regardless of the approach taken to resource adequacy, the energy charge component of any retail rate design should reflect, as closely as practicable, the real-time spot price where the load is located. Any retail rate designs that reflect this locational energy charge, coupled with appropriate metering and billing systems, would charge customers on the basis of cost causality and would facilitate economically efficient demand-side response, which in turn would help define and mitigate prices, discourage market power, and significantly reduce the need for involuntary curtailments (rolling or tailored blackouts). We expand on these concepts in later chapters.

An important issue is whether contracting should be promoted or mandated by state regulators to complement an EOM. In addition to self-supply by utility-owned generation, power contracts of varying terms could play a dominant role in the prices retail customers would face. Such contracts could protect most consumers from the spot price volatility that is essential for an energy-only market to assure operational reliability and long-run resource adequacy. This contracting would not diminish the importance of spot prices in providing the right incentives but it would redistribute the risks of volatile spot prices.

In states where utilities are regulated and have an obligation to serve their franchised customers, such price hedges are a natural consequence of utility plant ownership and power supply contracting. In states that allow retail choice, or where utilities have divested their generation, state regulators would want to consider how best to structure "default service."

The degree of support the ISO receives from state regulators, as well as the degree of cooperation among them (such as by acting collectively through the OMS) would largely determine how successful an energy-only market would be. It is unlikely that the

[9] These structural flaws also interfere with the efficient functioning of capacity-based resource adequacy mechanisms so correcting them is important regardless of what the ISO decides to do.