

Are ISOs and RTOs Really All They Claim To Be?

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The ISO/RTO Council (IRC) recently issued a report claiming that centrally organized wholesale electricity auctions in the U.S. provide substantial benefits to consumers “relative to the level of costs that would otherwise have been incurred”.¹ The IRC report claims that these benefits result from (1) security-constrained economic dispatch, (2) incentives for generators to be available to produce electricity, (3) optimized reserves, (4) investment in new and more efficient generation, (5) retirement of uneconomic generators, (6) implementation of demand response measures, (7) integration of new renewable resources, (8) investment in transmission capacity, and (9) an increase in market participants. Unfortunately (for the IRC), there is little or no direct connection between each of these potential sources of value to consumers and the existence or behavior of ISOs or RTOs, the evidence presented by the IRC is not convincing, and recent research has shown that these markets are not likely to be universally competitive, at least as economists understand that term. Most tellingly, the IRC presents *no* evidence on what consumers *would have paid* absent the ISOs and RTOs.

- 1) **Security constrained economic dispatch** is hardly a new concept. This is basically an updated and more sophisticated description of how utilities have long operated: serve all load at lowest cost from available generation while meeting reliability criteria. As Joskow and Schmalensee noted over twenty years ago, vertically integrated utilities joined into “power pools” all over the country to accomplish this same result. The pools coordinated dispatch, subject to reliability criteria.² In some cases, perhaps most notably PJM and New York, ISOs and RTOs succeeded pools, which presumably would have evolved absent federal mandates. Thus, this putative

¹ “2009 State of the Markets Report”, n.d. [September 2009], available at www.isorto.org.

² *Markets for Power*, MIT Press, 1983, 66-77.

benefit of ISOs and RTOs “compared to what otherwise might have happened” is unproven. The IRC also claims that security constrained economic dispatch leads to “consistent pricing” at the borders of RTOs and ISOs, which is not possible, according to the IRC, without centrally organized markets (page 8). However, market hubs exist at the California/Oregon border (COB), in central Washington State (Mid-Columbia, or Mid-C) and in Arizona (Palo Verde, or PV), without an RTO or ISO in the Northwest or Arizona, and Dow Jones posts electricity price indexes at COB, Mid-C, and PV. Are those price indexes “inconsistent”? If so, with what, and with what economic consequences? What, exactly, is a “consistent price”?³ How would we know a “consistent price” if we stumbled across one in the street?

- 2) The claim that ISO/RTO markets increase the **incentive to make generators available** ignores the evidence that individual participants in these markets also have an incentive to withhold generation at critical times in order to drive prices up, and to practice market power through bidding strategies, even without colluding. Lab experiments have shown that individual market participants do not need to collude to achieve effective physical or economic withholding, because they interact so frequently that such bidding strategies emerge naturally.⁴ Also, we do not need to rely on experiments: bids consistent with physical and economic withholding have been observed in the New York ISO, and bids consistent with the full exercise of market power have been observed in ERCOT.⁵ It is difficult to understand how physical withholding of capacity increases generator availability or enhances reliability, or why the IRC chose to ignore evidence of the exercise of market power. It may be accurate that average plant availability factors have increased, as the Report

³ This is not a common economic concept.

⁴ For example, see HyungSeon Oh, Robert J. Thomas, Bernard C. Leiseutre, and Timothy D. Mount, “A method for classifying offer strategies observed in an electricity market”, *Decision Support Systems*, 40, 2005, 449-460, which demonstrates that experimental withholding strategies are consistent with actual bidding strategies in PJM.

⁵ See Vladlena Sabodash and John Kwoka, “Price Spikes in Electricity Markets: ‘Business by Usual Methods’ or Strategic Withholding?” Presented at the Seventh Annual International Industrial Organization Conference, Northeastern University, March 2009; available at https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=IIOC2009&paper_id=384. See also the reported occurrences of withholding reviewed in “Is Market Monitoring a Substitute for Regulation in Restructured Wholesale Electricity Markets? An Evaluation of the First Five Years”, available at <http://www.nw-econ.com/workingpapers.html>. For ERCOT, see Steven L. Puller and Ross Baldick, “Tools for Assessment of Bidding into Electricity Auctions”, PSERC Publication 8-24, October 2008, and at <http://mediasite.engr.wisc.edu/Mediasite/Viewer/?peid=2ff9627858cb4329a0077a35b280275c>.

claims (page 21), but owners of generation may increase availability factors *on average*, while simultaneously withholding capacity *during critical or peak periods* in order to increase profits. Consumers may be worse off as a result, and are obviously worse off if bidding strategies cause prices to be higher than absolutely necessary to elicit production.

- 3) The need for RTOs and ISOs to achieve “**optimized reserves**” (itself undefined) ignores the evidence that some market participants have managed to develop contractually based reserve-sharing mechanisms *without* ISOs or RTOs. Whether these alternatives are economically more efficient than organized markets is not known, but there is no reason to believe that willing counterparties cannot work outside ISOs and RTOs to share reserve obligations, and thus at least avoid the transactions costs imposed by these institutions.⁶
- 4) Although the IRC takes some critics of ISOs and RTOs to task, appropriately, for not recognizing that wholesale prices result from a multitude of factors, the Council makes the very same mistake when claiming that the **investment in new generation** is a result of ISO/RTO markets (pages 21-22). Surely new generation is the result of many factors, including the desire to earn profits in ISO/RTO markets. Are consumers better off as a result? We do not know. Furthermore, the Report provides no evidence on whether markets have actually become more competitive as new generation has been built. If the additional capacity belongs to incumbents, then markets may become *more* concentrated as capacity increases, making higher prices more likely. The IRC offers no evidence on this point.
- 5) The IRC Report points to a February 2006 Texas PUC staff report that concluded that competition had forced the **closure of older, less efficient generators**. Unfortunately, the IRC does not provide a citation for this report, and several attempts to find the report on the Internet proved fruitless. In any event, plants are closed for a variety of reasons, including simply the fact that the going-forward costs of refurbishment and operations are greater than the expected costs of building a new plant, for a given expected price level. Because both the “brownfield” and

⁶ See “Control Area Operations: The Debate over Consolidation”, available at <http://www.nw-econ.com/workingpapers.html>.

“greenfield” costs are themselves the result of many factors, it is oversimplistic, and perhaps disingenuous, to point to the operation of ERCOT’s markets (or anything else) as the sole determinant of plant closures. Furthermore, Baldick and Puller have demonstrated that ERCOT’s markets are likely inefficient, due to both the exercise of market power by large sellers and the unsophisticated nature of bidding by small sellers in complex auctions, and Puller and Hortacsu showed over two years ago that bidding behavior in ERCOT leads to inefficient production decisions.⁷ The IRC report does not address this evidence.

- 6) As the IRC admits (on p. 4), traditional vertically integrated utilities have “long employed” **demand response programs**, but the IRC claims that ISOs and RTOs can encourage the development of demand response in ways that individual utilities could not. However, the IRC Report provides no evidence that ISO/RTO markets somehow have elicited or enabled greater demand response *than would otherwise have occurred*. One might just as well argue that price volatility in these markets, now experienced by retail consumers on a more widespread basis than before because of forced divestiture of generation, has encouraged more action by consumers to avoid price spikes. This should hardly be a claim that ISO/RTO markets provide benefits, if consumers incur costs to avoid the price volatility that such markets produce.
- 7) In the Pacific Northwest, which does not have an ISO or an RTO, **renewable resources** have blossomed. For example, in 1998 there was no wind generation within the BPA control area. By 2006 there was about 750 MW of wind capacity installed, and by May of this year wind capacity had exceeded 2,000 MW. The largest wind farm *in the world* is about to be built in Oregon.⁸ All of this was, or will be, accomplished without an ISO or RTO, and without centrally organized markets.⁹ The ratio of installed wind capacity to peak load is actually much higher within BPA’s control area than either CAISO or ERCOT.¹⁰ Again, the decision to build renewable resources is hardly a function of one factor. In large part, the growth of

⁷ Ali Hortacsu and Steven L. Puller, “Understanding Strategic Bidding in Multi-Unit Auctions: A Case Study of the Texas Electricity Spot Market”, June 2007.

⁸ See http://www.gpower.com/about/press/en/2009_press/121009.htm.

⁹ See http://www.bpa.gov/corporate/WindPower/docs/Wind-WIT_generic_slide_set_Sep_2009_customer.pdf, slide 3.

¹⁰ *Ibid.*, slide 4.

renewable resources may well be traced to state renewable resource standards, in which case RTOs and ISO have made little or no difference.

- 8) Just because **new transmission** is built does not mean that it should have been built. Furthermore, the IRC ignores news reports that a lack of transmission capacity is interfering with the development of renewable resources.¹¹ One result of organized markets is that incumbents have an incentive, and an opportunity, to erect barriers to entry. For example, if I own (and have paid for) financial transmission rights (FTRs, a hedge against congestion costs) that are valuable only *if* there is congestion, then I have an incentive to block the construction of new transmission, because that would reduce congestion and thus the value of my FTRs. The IRC cannot simultaneously claim that ISOs and RTOs encourage renewable generation if at the same time they create property rights that could discourage investment in new transmission that would allow renewable resources to get to buyers.
- 9) Even though the **number of market participants** appears to have increased (page 23), this is hardly evidence of competition. The IRC Report does not identify whether these new market participants were large enough to dilute any market power held by incumbents or to reduce significantly the risks of tacit collusion (discussed above). Furthermore, the Report states that there were “over 400” market participants in NYISO in 2008. Yet, a search of the NYISO web site yields fewer than 400 “customers” in September 2009.¹² Of these, almost 40 were “guests”, including the New York State Department of Public Service, who can register simply to obtain information, and almost 30 were “limited” customers, who participate in only one of NYISO’s markets. The NYISO rules may state that I personally can become a guest of the ISO, but I am hardly in a position to influence the structure and behavior of ISO markets.

The IRC is correct to point out that the actual determinants of wholesale prices should *all* be taken into account, and that simple comparisons of regions with and without ISOs or

¹¹ See “Wind Energy Bumps Into Power Grid’s Limits”, *The New York Times*, August 28, 2008; available at <http://www.nytimes.com/2008/08/27/business/27grid.html?pagewanted=1>.

¹² See http://www.nyiso.com/public/webdocs/services/customer_relations/customers/NYISO_Approved_Customers_September_25_2009.pdf.

RTOs overlook this reality (page 15). However, the IRC both ignores its own advice, and then misses the point entirely. The evaluation of ISO/RTO markets should ask whether these markets are truly *as competitive as they can be*. The opportunities for tacit collusion and physical withholding, and the evidence cited above from ERCOT, would suggest that the answer to this question is “no”. However the IRC conveniently avoids this question first by hiding behind the wrong alternative, the prices we would have experienced without ISO/RTO markets, and then by not actually telling us what those prices would have (or might have) been.

The benchmark that the IRC finally articulates is “price declines” (page 16). However, this is as oversimplified as arguments that “all ISO/RTO markets fail (or succeed)”, and falls into the same trap that the IRC lays for the critics of ISO/RTO markets: it ignores the fact that fuel-adjusted wholesale price changes over time are the result of multiple factors. Falling prices tells us, in fact, nothing about the competitive state of markets. Even a monopolist might reduce price from time to time, for example, to foreclose entry by potential competitors, or to enhance sales (and profits) of a new product. Strikingly, the IRC Report concludes that falling fuel-adjusted prices are somehow evidence of a difference from what otherwise would have occurred (page 18), *but the IRC Report does not provide any estimates of fuel-adjusted prices in these regions assuming that ISO or RTO markets did not exist.*

Finally, another benchmark offered by the Report is a comparison of the simple *direction of change* of prices, costs, and demand levels. The Report concludes that if these three indicators all move in the same direction, then markets are competitive (page 20). However, any undergraduate student who has successfully mastered microeconomic theory could tell you that the same result could occur in markets that are monopolistic or just imperfectly competitive. It is not the *direction* of price changes that is important, but the *level* of prices compared to those that a truly competitive market would produce. The IRC Report does not offer any evidence on what “truly competitive” prices would be.

This brings us to the fatal flaw in the IRC Report: notwithstanding its use of basic economic terms, the IRC Report is not grounded in simple economics. The term “competitive” can be found over 25 times in the Report, but the IRC never actually defines what it means by “competitive markets”. Simple economic theory points to several conditions that must be met before markets can be declared “competitive”, including freedom of entry and exit, lots of buyers and sellers, a homogeneous product, and perfect information. However, all of these conditions would have to be met *during all hours and at all nodes* for these markets to be declared “competitive”. However, we know both that market monitors at ISOs and RTOs have bid mitigation rules that trigger price caps in non-competitive conditions, and that transmission constraints can create non-competitive conditions at some nodes and in some zones of RTO systems. If some sellers can withhold generation and drive up their profits, it is reasonable to assume that they will do so. Furthermore, if sellers know they are operating in an infinitely repeated game, then profit-maximizing strategies based on tacit collusion should emerge that will drive up prices.

By claiming sole ownership of any putative benefits of restructuring, the IRC commits the same error it accuses its detractors of committing. ISOs and RTOs are neither all bad nor all good. The hard part is figuring out the difference, and whether they are worth the investment of real money and real people.¹³

¹³ FERC will have a good opportunity to consider this fundamental question as it responds to the letter of late 2009 from Pennsylvania Senators Casey and Specter, asking for an investigation of PJM’s markets.