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## **Issue Paper**

# **Data Release & Accessibility**

### *Phase 2 Convergence Bidding Data Release*

**December 3, 2009**

# **Data Release & Accessibility**

## ***Phase 2: Convergence Bidding Data Release***

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## 1. Introduction

Convergence bidding is one of several market enhancements scheduled for implementation after start up of the California Independent System Operator Corporation's (the ISO) new Locational Marginal Pricing (LMP) market system on April 1 of this year. Stakeholders may require the release of additional information in order to effectively participate in ISO markets as convergence bidders. The ISO has already begun a stakeholder process to explore the issue of data release and accessibility in ISO markets. This initiative has been divided into three phases:

The Data Release & Accessibility Initiative will consist of three phases:

- Phase 1: Transmission Constraints (issue paper posted on 11/5/2009),
- Phase 2: Convergence Bidding Information Release (the topic of this issue paper), and
- Phase 3: Other types of market data to support well-functioning, competitive ISO spot markets, including Price Discovery and Outage Information.

Convergence bidding is currently scheduled for go-live implementation on February 1, 2011. The ISO Board of Governors approved the convergence bidding design proposal at its October 2009 meeting. Information on the stakeholder process is available on the Convergence Bidding Stakeholder Initiative, <http://www.caiso.com/1807/1807996f7020.html>. The ISO filed its convergence bidding design proposal in docket ER06-615 on November 20, 2009.

This issue paper focuses on information related to Convergence Bidding; specifically, it addresses the question of what information should be provided to market participants engaged in Convergence Bidding.

## 2. Process and Proposed Timetable

The convergence bidding phase of the Data Release & Accessibility initiative will generally share the same timeline as set forth in the beginning of this paper on Transmission Constraints. However, resolution of convergence bidding Data Release issues is expected in Q1-2010, possibly by the February 2010 Board meeting in the event Board action is required.

The following timetable is for the policy stakeholder and Board approval process for Phase 2. At this time the ISO anticipates completing the stakeholder processes for Phase 2 in the first quarter of 2010.

### Phase 2 Timetable

Date	Milestone
December 3, 2009	Phase 2 Issue Paper on Convergence Bidding
December 10, 2009	On-Site Meeting -- Jointly with Phase 1 & 2 at the ISO
December 17, 2009	Comments on Issue Paper are due
December 31, 2009	Phase 2 Straw Proposal
January 7, 2010	On-Site Meeting
January 14, 2010	Comments on the Phase 2 Straw Proposal
January 25, 2010	ISO Draft Final Proposal
January 29, 2010	Conference Call
February 1, 2010	Comments on Draft Final Proposal are due.
February 11-12, 2010	Board Meeting and Decision

## 3. Overview & Objectives

The ISO committed to take a broader look at the release of market information since the launch of the LMP market. In this effort, we will determine what information should be made available to the market to facilitate efficient market outcomes under of convergence bidding. The goal is to strike the right balance through the provision of information without compromising confidentiality or inviting tacit collusion. The ISO has already committed to release bid information on convergence bids on the same timeline as physical bids which are currently published on a 90 day lag.

Although the California ISO's proposed approach is on par with other ISOs, some Market Participants have argued for the release of more granular information about virtual transactions on a more frequent basis. The latter raises potential issues of comparability with the treatment of physical transactions. Our objective is to explore and resolve this, and related, issues and to

present a more specific convergence bidding data release proposal to the Board for its review and approval in February 2010, a year prior to implementation of convergence bidding.

## 4. Background

As described in more detail below, there are essentially four approaches that have emerged to date. The *Draft Final Proposal* recommended that the same information be released for both physical and virtual transactions on a 90-day lag. Southern California Edison (SCE) recommends posting the net quantities of cleared virtual bids by node. Market Surveillance Committee (MSC) supports “the day-ahead release of all virtual bids and offers and sales with or without explicitly identifying the market participant.” However, if the latter is not possible, the MSC recommends posting the net quantities of cleared virtual bids by node. DMM recommends posting aggregate virtual bid curves by node, which is at least total virtual supply and total virtual demand by node, respectively.

### 4.1. Draft Final Proposal

On September 14, 2009, the California ISO published a *Draft Final Proposal for the Design of Convergence Bidding*<sup>1</sup> (DFP). Among other things, the draft final proposal outlined several proposed modifications to the Day-Ahead market process, including provisions for the release of certain information specific to convergence bidding. Under the *Draft Final Proposal*, the same information would be released for both physical transactions and for virtual transactions. Specifically, the MW quantities of clean bids would be released at each location 90 days following the trade date with the obvious identity of the Scheduling Coordinator masked. The DFP describes this approach here:

“The ISO proposes to post the clearing quantities of virtual bids on the same schedule and to the same level of specificity as the release of information on physical bids. In particular for physical bids, hourly Day Ahead LMPs identifying energy, congestion and losses at each Pnode and APnode are posted to OASIS at 1:00 pm PST. Megawatt-hour quantities of clean bids for physical load and generation cleared at each location are released 180 days following the trade date. Certain fields are omitted to mask the obvious identity of the Scheduling Coordinator. The ISO proposes that the same policy with regard to information release be applied to virtual transactions. Specifically, the ISO proposes that the MWh volume of convergence bids at each node be released 180 [now 90] days following the trade date. This is consistent with practices in other ISO markets.” (Draft Final Proposal, p.27)

According to the DFP, some market participants had argued for the release of additional and more granular information about virtual transactions on a more frequent basis than that for

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<sup>1</sup> *Draft Final Proposal for the Design of Convergence Bidding* (DFP).  
<http://www.caiso.com/2429/24291016c12990.pdf>

physical bids. Given that both virtual and physical transactions can affect the market outcome, the DFP concluded that it might be discriminatory toward certain market participants to report virtual bids in a manner different from physical bids (p.27). The DFP did not address additional information release issues and requests beyond the standard posting of bid data which is standard practice for the ISO even today in the absence of convergence bids.

SCE seeks clarification that the ISO will clearly distinguish both virtual supply and demand bids from physical bids in the public data release process (SCE Comments, 10/2/2009, p.11). To respond, the California ISO plans to distinguish both virtual supply and demand bids from physical bids in the public data release process. Such disclosure is standard practice with MISO, ISO-NE, and PJM, although NYISO does not seem to release any virtual bid information at all.<sup>2</sup>

In bid release data files, MISO, ISO-NE, and PJM flag bids as being either virtual supply or demand. These are flagged as either “INC” or “DEC” which are either an increase in virtual supply or a decrease in virtual supply (i.e., virtual demand). Tables 3 & 4 of show bids flagged in this manner for ISO-NE and PJM, respectively. For MISO, see the Market Report for cleared bids and associated Day Ahead Cleared Bids Reader’s Guide.<sup>3</sup>

## 4.2. Comments on the Draft Final Proposal

In the October 2009 comments on the *Draft Final Proposal*, a number of stakeholders submitted comments in support of the DFP on the issue of information release, while SCE’s comments opposed the ISO’s proposal.<sup>4</sup> Stakeholders in support of the DFP information release provisions include DC Energy, Mirant, NRG, RRI, Shell Energy, and WPTF. In contrast, SCE proposed that the ISO post net cleared virtual bids on a daily basis at each node at the close of the Day-Ahead market. Comments in support are shown here:

- DC Energy, NRG, RRI Energy, Shell Energy, and WPTF all support “CAISO’s position to release information on convergence bidding and physical bidding contemporaneously.” (DC Energy, 10/14/2009, p.2)
- Mirant supports the DFP’s determination to release the same amount of information at the same time for both virtual bids and physical bids. As the DFP notes, there is no basis to discriminate between virtual bids and physical bids. The concerns regarding potential market manipulation apply equally between virtual bids and physical bids, and the necessary oversight is already in place to address either form of manipulation. (Mirant, 10/14/2009, p.2)

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<sup>2</sup> NYISO Bid Release Information, <http://mis.nyiso.com/public/postings/NYISO%206%20Month%20Bid%20Data%20Release%20Description.pdf> and NYISO Bid Data, [http://www.nyiso.com/public/market\\_data/reports/nyiso\\_capacity\\_report.jsp](http://www.nyiso.com/public/market_data/reports/nyiso_capacity_report.jsp)

<sup>3</sup> MISO Cleared Bids, [http://www.midwestiso.org/publish/Folder/3e2d0\\_106c60936d4\\_-76ba0a48324a?rev=1](http://www.midwestiso.org/publish/Folder/3e2d0_106c60936d4_-76ba0a48324a?rev=1)

<sup>4</sup> On or before October 2, 2009, seven stakeholders submitted initial comments on the draft proposal, and twenty-four stakeholders submitted final comments on or before October 15, 2009, <http://www.caiso.com/1807/1807996f7020.html>

In its October 2, 2009 comments, SCE proposes that the ISO release, concurrent with the daily release of market prices, the net cleared MW quantity of virtual transactions at each node within California:

“SCE is disappointed to see the CAISO has backtracked on previous proposals. An earlier CAISO [November 7, 2007] proposal would have released[,] concurrent with the daily release of market prices[,] the net cleared MW quantity of virtual transactions at each node within California. SCE continues to believe that the proposal should, at a minimum, release the cleared quantities of virtual bids, on a nodal level, shortly after the IFM posts results. Again, the CAISO proposes to give full nodal functionality to virtual participants. Equity and efficiency argue that the market should have information on what is going on in “virtual space” with like granular resolution. This information release was in an earlier CAISO proposal and we urge the CAISO to readopt it here. SCE further notes that release of cleared volumes of virtual bids was supported by the MSC members at the September 18th stakeholder meeting.” (SCE Comments, 10/2/2009, p.11)

As stated above, SCE expresses support for a previous ISO proposal, the November 7, 2007 *Update on the Design for Convergence Bidding*.<sup>5</sup> To be clear, SCE’s 2009 proposal is not necessarily the same as the 2007 ISO proposal. The latter did not explicitly propose net cleared quantities at the node. Rather, it proposed to release “the aggregated quantities of the cleared virtual bids (not physical bids) ... [at the node] by location (but not revealing the Scheduling Coordinator who submitted these virtual bids)” (2007 p.14). Although the two approaches are similar in concept, the information release outcomes can be significantly different. For example, suppose the following virtual supply and demand bids were submitted at Node A: Virtual Demand of 100 MW, 150 MW, and 200 MW, and Virtual Supply of 100 MW, 150 MW, and 250 MW. Under the 2007 proposal, the information reported at Node A would be: Virtual Demand 450 MW and Virtual Supply 400 MW. Under the 2009 SCE Proposal, the information would be Net Virtual Demand of 50 MW.

A number of parties, including but not limited to Constellation, Dynegy, Mirant and WPTF have, expressed their support for releasing virtual bidding information on the same schedule as physical bidding information.

“WPTF supports posting information on virtual bids, but that information should be released on the same schedule as physical bidding information. WPTF does not find any basis for releasing financial bidding information on a time frame that is different from the time frame for releasing physical bidding information, Moreover, establishing separate release time frames discriminates against market participants that engage in one activity (e.g., physical) more than another activity (financial).” (WPTF 11/14/2007 Comments on the 11/7/2007 *Update on the Design for Convergence Bidding*, p.4)

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<sup>5</sup> *Update on the Design for Convergence Bidding*, 11/7/2007, <http://www.aiso.com/1c8f/1c8ff39f65a70.pdf>

“Dynergy supports the CAISO’s position to release information on convergence bidding and physical bidding contemporaneously, and encourages the CAISO to make that position the rebuttable presumption in its upcoming stakeholder process on the CAISO’s information release policy.”

In its 10/2/2009 comments, SCE objects to arguments that such a release of data would be ‘discriminatory’ (p.11). SCE contends that virtual transactions are a completely separate product from physical load and generation and there is, therefore, simply no justification to argue that any different treatment in information release is ‘discriminatory’:

“... SCE objects to arguments that such release of data would be “discriminatory”.<sup>6</sup> Virtual transactions are a completely separate product from physical load and generation. Any party, at any time can submit any form of virtual bids at any price. This is completely unlike physical bids that are tied to specific locations, based on physical capability, and, in the case of supply, has market power mitigation that limits bids to specific prices. Given these fundamental differences, there is simply no justification to argue that any different treatment in information release is ‘discriminatory’.” (SCE Comments, 10/2/2009, p.11)

### 4.3. MSC Opinion

In its October 19, 2009 *Final Opinion on Convergence Bidding*,<sup>7</sup> the Market Surveillance Committee (MSC) wrote that it supports the major features of the ISO’s convergence bidding proposal. In particular, the MSC stated that overall market efficiency will be enhanced by allowing convergence bidding at the nodal level. More specifically, the MSC supports a progressive information release approach: “the day-ahead release of all virtual bids and offers and sales with or without explicitly identifying the market participant.” However, if this is not possible, the MSC recommended the release “of the net virtual position (total virtual supply bids accepted minus the total virtual demand bids accepted) at each location in the ISO control area and intertie point” at the close of the day-ahead market. Neither of these approaches are currently in practice at any of the other ISOs in the U.S. The MSC recommendation on information release is set forth in the following paragraph:

“We support the day-ahead release of all virtual bids and offers and sales with or without explicitly identifying the market participant. As we have emphasized in the past, with high levels of fixed-price forward contracting for energy and ancillary services, the bids by submitted by market participants convey little, if any, information about their underlying costs of production or any other company-specific confidential information. The release of bid information in a timely manner with the identity of the market participant would serve a very beneficial sunshine regulation function in enhancing

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<sup>6</sup> SCE citation to the CAISO *Update on the Design for Convergence Bidding*, dated November 7, 2007. <http://www.aiso.com/1c8f/1c8ff39f65a70.pdf>

<sup>7</sup> The MSC Opinion on Convergence bidding is posted on the ISO website at: <http://www.aiso.com/244c/244cd3c96d060.pdf>



overall market efficiency. Any market participant that wanted to bid in a manner that degrades system reliability and market efficiency would face the risk of having to explain this behavior to the press and general public. If it is not possible to release virtual bid information in a timely manner, then immediate release at the close of the day-ahead market of the net virtual position (total virtual supply bids accepts minus the total virtual demand bids accepted) at each location in the ISO control area and intertie point would help market participants become more informed participants in this financial market.” (p.8)

The MSC Opinion refers to the concept of ‘sunshine regulation’ also known as “smart sunshine regulation.” This is a regulatory approach that gathers and/or makes available “a comprehensive set of information about market outcomes, analyzes it, and makes it available to the public in a manner and form that ensures compliance with all market rules and allows the regulatory and political process to detect and correct market design flaws in a timely manner.”<sup>8</sup> With regard to the MSC’s broader recommendation on data release, the purpose for the sunshine or increased transparency is, at least in part, to put market participants at risk for explaining to the public that their actions are not violation of the intent of the wholesale market rules.

The secondary recommendation of the MSC is for the release of the net virtual position at each location in the ISO control area and intertie point at the close of the day-ahead market. In this case, only information about virtual trades would be released on a net basis; however, similar information regarding physical trades would not be released.

#### 4.4. DMM Recommendations

In its October 21, 2009 *Memo to the ISO Board of Governors*<sup>9</sup> on Convergence Bidding, the ISO Department of Market Monitoring (DMM) observed that the load-serving entities (LSEs) have identified several types of information that – if released on a relatively frequent basis – could alleviate some of their concerns about participating in convergence bidding at the nodal level. DMM states that “ISO should seek to make such additional market data available to market participants in a timely fashion, to the extent possible through the stakeholder process that is currently being initiated on the issue of information release” (p.8). DMM identified this additional market data as including the more frequent release of:

1. Aggregate virtual bid curves by node,
2. Nodal Load Distribution Factors (LDFs), and
3. Information on enforcement/unenforcement or biasing of constraints in the IFM and real-time markets. [Note: this is the subject of Phase 1 of the Data Release &

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<sup>8</sup> Wolak, Frank A., “Regulating Competition in Wholesale Electricity Supply,” Revised November 12, 2007, p.57 [http://zia.stanford.edu/pub/papers/nber\\_regulation\\_wolak.pdf](http://zia.stanford.edu/pub/papers/nber_regulation_wolak.pdf)

<sup>9</sup> *Memo to the ISO Board of Governors*, Convergence Bidding, October 21, 2009, <http://www.caiso.com/244f/244f99f1605d0.pdf>

Accessibility Initiative on Transmission Constraints,  
<http://www.caiso.com/244c/244cae3b46bb0.html> ]

Consider the following example of the recommendation above regarding the more frequent release of aggregate virtual bid curves by node, as compared to the MSC and SCE approach. Data release under the MSC/SCE approach would result in one MW number published for each node on a daily basis. For example, suppose the following virtual supply and demand bids were submitted at Node A: Virtual Demand of 100 MW, 150 MW, and 200 MW, and Virtual Supply of 100 MW, 150 MW, and 250 MW. The totals are: Virtual Demand 450 MW and Virtual Supply 400 MW. Under the MSC/SCE proposal, the information would be posted as Net Virtual Demand of 50 MW. Under the DMM approach, the posting at Node A would be: Virtual Demand 450 MW and Virtual Supply 400 MW.

#### **4.5. Issues to be Resolved**

The ISO must determine what specific information should be made available to the market the purpose of convergence bidding. The right balance must be struck without compromising confidentiality or inviting tactic collusion. Although the California ISO's proposed approach is on par with other ISOs, a request has been made for the release of more granular information about virtual transactions on a more frequent basis. As market participants have previously been divided on this topic more discussion is needed to fully vet this important issue. Through this stakeholder process the ISO will resolve the following questions through discussion with stakeholders:

##### **Questions to Stakeholders:**

1. What information should the ISO post on convergence bids and why?
2. The MSC supports the ISO posting the net cleared virtual bids at each node at the close of the Day-Ahead market. Is this information important for the ISO to post and how is it beneficial to the market? Could this information be harmful to the market or to specific market participants? Of the other ISO approaches described in Section 4 of this paper, what are advantages and disadvantages of each ISO's approach?
3. Should the California ISO adopt the MISO approach? Explain.
4. Response Template: a response template will be posted for the stakeholder comments due on December 17, 2009.

## 5. Other ISOs and Information Release

In other ISOs, convergence bidding is known as virtual bidding, virtual transactions, and virtual trading. The terms virtual supply and virtual demand are also used. The term convergence bidding is specific to California. Virtual bidding has been in operation in other ISO markets for a number of years: PJM since June 1, 2000, NYISO since November 8, 2001, ISO-NE since March 1, 2003, and MISO since April 1, 2005. PJM, ISO-NE, and MISO have nodal virtual bidding, whereas NYISO has virtual bidding only at the zonal level, although NYISO has committed to move to the nodal level.

Each ISO posts slightly different information about virtual trading activity. For virtual supply and demand, MISO provides aggregate energy (MWh) and dollars cleared in a Day-Ahead Pricing Report. For virtual load and supply, NYISO provides aggregate energy Offered (MWh) and Scheduled (MWh). ISO-NE does not appear to provide daily aggregate energy and/or price information. Instead, ISO-NE provides lagged bid data that includes physicals and virtuals. PJM provides hourly Day-Ahead “Inc” (Virtual Offer or Virtual Supply) and “Dec” (Virtual Bid or Virtual Demand) bid data on a 6-month delay or lag. PJM bids are aggregated by pricing point, by bid type, by hour, and by day. None of the other ISOs post virtual bid information at a nodal level.

### 5.1. MISO

The MISO Day-Ahead Pricing Report<sup>10</sup> contains Energy Cleared in MWh and Dollars Cleared for both Virtual Supply and Virtual Demand. Reports are posted in XLS and PDF formats. A partial screenshot of the Day-Ahead Pricing Report for 10/22/2009 is shown below.

**Table 1**

Pricing Results		Demand				
		Fixed	Price Sensitive	Virtual	Total	
Energy Cleared (MWh)		1,381,032.8	32,715.3	94,900.9	1,508,649.0	
Dollars Cleared		\$40,951,562.98	\$1,031,803.31	\$2,927,159.57	\$44,910,525.87	
		Supply				
		Physical	Virtual	Total		
Energy Cleared (MWh)		1,399,728.8	53,323.7	1,453,052.5		
Dollars Cleared		\$38,672,105.30	\$1,571,559.41	\$40,243,664.71		
LMP Prices (\$ per MW)						
	MISO System	Illinois Hub	Cnergy Hub	Michigan Hub	Minnesota Hub	First Energy Hub
Hour 01	18.31	15.55	20.17	22.17	14.26	20.95
Hour 02	17.05	14.66	19.62	21.70	13.47	20.27
Hour 03	16.89	14.91	19.42	21.31	12.93	20.11
Hour 04	16.72	15.01	19.82	21.68	12.35	20.53

An overview, *Virtual Transactions in the Midwest ISO Markets*, was provided to California ISO stakeholders in July 2008, <http://www.caiso.com/200c/200c8a5c1f8d0.pdf> See the California ISO Convergence Bidding website for other documents presented at July 2008 stakeholders meeting, <http://www.caiso.com/1807/1807996f7020.html>

<sup>10</sup> MISO Day-Ahead Pricing Report, [http://www.midwestmarket.org/home/Market%20Reports/index.php?type=da\\_pr&theMonth=200910](http://www.midwestmarket.org/home/Market%20Reports/index.php?type=da_pr&theMonth=200910)

## 5.2. NYISO

The NYISO Daily Energy Report<sup>11</sup> contains Virtual MWh Offered and MWh Scheduled information for both Virtual Load Bids and Virtual Supply Bids. Total volume information is provided for the trading day and for each hour. Reports are posted in CSV and PDF formats. A Daily Energy Report for 10/21/2009 is shown below.

**Table 2**

<b>Daily Energy Report - Day Ahead Market (DAM)</b>			
<b>Date: 10/23/2009</b>			
		<b>MWh</b>	<b>Percent</b>
NYISO Load Forecast		398482	
Customer Load Forecast		406592	2.0%
	<b>Offered MWh</b>	<b>Scheduled MWh</b>	<b>Percent</b>
Load Bids	185527	185527	100.0%
Bilateral Bids	183501	183501	100.0%
Price Capped Load Bids	14235	7944	55.8%
Virtual Load Bids	45977	32081	69.8%
<b>Total Load</b>	439944	419757	95.4%
<b>Total Peak Load</b>	315846	299951	95.0%
<b>Total Non Peak Load</b>	124098	119807	96.5%
Generation Bids	728776	331124	45.4%
Virtual Supply Bids	61022	46385	76.0%
<b>Total Generation</b>	789798	377509	47.8%
<b>Total Peak Generation</b>	524546	269875	51.4%
<b>Total Non Peak Generation</b>	265252	107634	40.6%
Imports	194656	72601	37.3%
Exports	74673	9722	13.0%
Net Imports/(Exports)	119983	62879	52.4%
Gross Imports/Exports Summary			
Wheel Throughs	6300	2290	36.3%

<sup>11</sup> NYISO Daily Energy Report, [http://www.nyiso.com/public/market\\_data/reports/daily\\_energy\\_report.jsp](http://www.nyiso.com/public/market_data/reports/daily_energy_report.jsp)

### 5.3. ISO-NE

In ISO-NE, virtual demand and supply are considered virtual transactions. More specifically, Incremental Offers are virtual supply and Decremental Bids are virtual demand. Virtual transactions are part of the DAM which includes cleared Generation Offers, cleared Load Bids, cleared Virtual transactions, cleared Imports and Exports, and Bilateral Transactions.<sup>12</sup>

Unlike MISO and NYISO, the ISO-NE does not post aggregated virtual trading activity, but only offers lagged bid information. Bid data received by ISO-NE from participants for the Day-Ahead Energy market is published monthly with the appropriate FERC-ordered lag (first day of the fourth month following the operating month). Thus, bid data for the entire month of June would be published on October 1, as shown in Table 3.

The lagged bid data is posted in zip file format which contains a CSV file of the Historical Day-Ahead Demand Bid Data Report. Column F in the file contains “Bid Type” information for each bid. Bid Types “INC” and “DEC” are virtual transactions.

**Table 3**

ISO-NE Historical Day-Ahead Demand Bid Data Report							
C WW_DAHBDEMAND_ISO_2009063000_20091001200501.CSV							
C Date: 06/30/2009 and Version: 10/01/2009 20:05:01 GMT							
H	Trading Interval	Masked Participant ID	Masked Location ID	Location Type	Bid Type	Bid Block Price 1	Bid Block Energy 1
H	Hour End	Number	Number	String	String	\$	MW
D	1	110487	41756	LOAD ZONE	PRICE	300	5.3
D	1	124004	37894	LOAD ZONE	PRICE	85	74.1
D	1	164415	78747	NETWORK NODE	INC	2.2	50
D	1	167346	97805	NETWORK NODE	DEC	32	50
D	1	172669	39271	LOAD ZONE	DEC	500	1.8
D	1	172669	41756	LOAD ZONE	DEC	500	0.5
D	1	172669	67184	LOAD ZONE	DEC	500	0.9
D	1	172669	74580	NETWORK NODE	INC	30	0.4
D	1	172669	80396	LOAD ZONE	DEC	500	37.3

Source: [http://www.iso-ne.com/markets/hstdata/mkt\\_offer\\_bid/da\\_energy/2009/jun/index.html](http://www.iso-ne.com/markets/hstdata/mkt_offer_bid/da_energy/2009/jun/index.html)

<sup>12</sup> ISO-NE [http://www.iso-ne.com/support/training/courses/wem101/09\\_energy\\_market\\_settlements.pdf](http://www.iso-ne.com/support/training/courses/wem101/09_energy_market_settlements.pdf)

An overview, *California ISO Presentation Convergence Bidding - New England Experience*, was provided to CAISO stakeholders in May 2008, <http://www.caiso.com/1fb9/1fb9eb329740.pdf> See the California ISO Convergence Bidding website for other documents presented at this stakeholders meeting, <http://www.caiso.com/1807/1807996f7020.html>

#### 5.4. PJM

PJM provides hourly Day-Ahead “Inc” (Virtual Offer or Virtual Supply) and “Dec” (Virtual Bid or Virtual Demand) bid data on a 6-month delay or lag. PJM bids are aggregated by pricing point, by bid type, by hour, and by day.

**Table 4**

<b>PJM Hourly Day-Ahead Inc &amp; Dec Bid Data</b> <b>Virtual Bids -- 6 Month Delay</b> Posted on 9/1/2009 12:22:16 PM Bids on 2/28/2009 (Excerpt from Data File)					
BID DATE	BID HOUR	PRICE POINT	INC (MW)	DEC (MW)	MODIFIED DATE
20090228	1	-999	0.4	0	9/1/2009 12:19
20090228	1	-200	248	0	9/1/2009 12:19
20090228	1	-125	0	8	9/1/2009 12:19
20090228	1	-100	200	0	9/1/2009 12:19
20090228	1	-75	0	10	9/1/2009 12:19
20090228	1	-72	0	6	9/1/2009 12:19
20090228	1	-68	200	0	9/1/2009 12:19
20090228	1	-65	0	60	9/1/2009 12:19
20090228	1	-60	0	10	9/1/2009 12:19
20090228	1	-55	0	9	9/1/2009 12:19
20090228	1	-52	0	60	9/1/2009 12:19
20090228	1	-50	0	30.4	9/1/2009 12:19
20090228	1	-45	0	4	9/1/2009 12:19
20090228	1	-40	100	7	9/1/2009 12:19
20090228	1	-38	200	10.2	9/1/2009 12:19
20090228	1	-36	200	0	9/1/2009 12:19