Technical Bulletin

2011-04-01

Bid Cost Recovery and Accounting for Delivered Minimum Load Energy Market Revenues

Market Issue

April 5, 2011

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The ISO has determined that under certain market scenarios there exists an accounting deficiency arising out of its use of the day-ahead metered energy adjustment factor to account for market revenue in calculating bid cost recovery payments for resources. ISO Tariff Section 11.8.2.2 requires that in calculating integrated forward market (IFM) market revenues used to net IFM bid costs, the ISO must account for market revenue associated with delivered portions of the day-ahead schedule. The ISO uses the day-ahead metered energy adjustment factor to determine the delivered portions of the day-ahead schedule, which is configured to determine the portion of the resource's day-ahead schedule delivered based on the resource's meter. Because the day-ahead metered energy factor approaches or goes to zero when the resource performs at minimum load, the application of the day-ahead metered energy adjustment factor to the IFM market revenue associated with the day-ahead schedule results in the failure to account for market revenue for portions at or below the resource's minimum load that were actually delivered according to the resource's meter reading. The issue is aggravated by a bidding practice identified earlier this year that forces the ISO to schedule the resource at its maximum capacity in the day-ahead and then dispatch the resource down to its minimum load in the real-time.

The ISO will be resettling previously settled bid cost recovery payments to account for energy market revenue associated with all delivered energy associated with the day-ahead schedule as required by the tariff.[1] Because prior to August 2010, the identified bidding practice was not being employed, the deficiency in market revenue accounting did not pose a material difference in settled amounts. Prior to August 1, 2010, the difference in total bid cost recovery amounts to approximately $6 million from January through July 2010, and $17 million from April through December 2009. This amounts to approximately $23 million over a period of fifteen months. Whereas, after August 1, 2010, for a

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[1]   On March 21, 2011, the ISO filed with the Federal Energy Regulatory Commission a proposed rule change that eliminates the incentive for parties to engage in the identified bidding practice. The ISO proposed that for the specific case where a resource is dispatched to levels below its day-ahead schedule the IFM market accounting rule will be based on scheduled day-ahead energy as opposed to delivered day-ahead scheduled energy. This technical bulletin and the proposed resettlement herein only address the accounting deficiency in the use of the metered energy adjustment factor for market revenues at or below the resource's minimum load energy. This resettlement does not apply to the proposed rule change in the March 21, 2011 filing.

period covering only seven months, the difference in total bid cost recovery is approximately $32 million. To avoid unnecessary burden of resettlement to market participants the ISO will only resettle amounts from trading day August 1, 2010, through March 21, 2011, when the bulk of overpayments occurred.

Background:

The bid cost recovery mechanism is a series of market rules and calculations that together serve as the mechanism for ensuring resources are paid for their unrecovered start-up and minimum load bid costs if committed by the ISO. Bid cost recovery is also the mechanism through which scheduling coordinators are guaranteed recovery of their energy bid costs. The bid cost recovery mechanism performs four main functions: 1) calculates the applicable bid costs covered for the resource if dispatched or committed by the ISO; 2) determines the applicable market revenues earned by the resource; 3) offsets the calculated bid costs by the market revenue earned by the resource to determine bid cost recovery uplift paid to the resource; and 4) allocates out the total bid cost recovery uplift paid to all resources to ISO load and exports.[2]

The bid costs include both the start-up costs of a resource and the minimum load costs, as well as the energy or ancillary services bid costs. The unrecovered start-up and minimum load bid costs are paid to resources only for intervals in which the resource was committed by the ISO. The unrecovered energy or ancillary services bid costs are calculated and paid for a given interval the resource is dispatched or committed at prices below the bid price included in its bid for the relevant interval. This ensures that the resource is not paid lower than their submitted bid price.

The ISO guarantees recovery of the resource's unrecovered bid costs only to the extent its market revenues are not sufficient to cover these costs. Resources scheduled in the day-ahead market are settled at the locational marginal price (LMP) cleared in the IFM for all the energy scheduled, regardless of actual delivery of the energy scheduled in the day-ahead. Similarly, resources dispatched in the real-time are settled at the applicable LMP cleared in the real-time dispatch run of the real-time market. To the extent these market revenues meet or exceed the bid costs, there are no unrecovered bid costs and thus is no need to compensate the resource under the bid cost recovery mechanism above and beyond what the resource earned from the market. Therefore, the calculated bid costs for a given resource are offset by the market revenue costs first at the interval level and ultimately based on all market revenues earned by the resource across all of the ISO markets over the 24 hour period of a trade day.

The ISO pays for the unrecovered bid costs associated with portions of the day-ahead scheduled energy that are actually delivered. For energy that is

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[2]   The bid cost recovery rules are contained in section 11.8 of the ISO tariff.
http://www.caiso.com/pubinfo/tariffs/index.html

not actually delivered as measured through the resource's meter, the ISO does not guarantee recovery of bids costs for the resource. Minimum load costs are paid only to the extent that the ISO can determine that the resource is actually on-line in the applicable trading hour. This determination is made on the basis of the resource actually reaching its minimum load within a given trading hour, subject to a tolerance band which establishes the resource to be on so long as the resource reaches within a tolerance band quantity its minimum load; where the tolerance band is defined as the higher of 5 MW or the product of 3% and the resources PMax. Similarly, start-up costs are only paid to the extent the resource actually starts up within the applicable commitment period.

The ISO compares the portion of metered energy above the greater of the resource's minimum load and self-schedule for a given resource relative to its portion of the day-ahead schedule above the greater of the resource's minimum load and self-schedule through a tool called the day-ahead metered energy adjustment factor (MEAF). The day-ahead MEAF formula is part of the settlements charge code calculations contained in the ISO Business Practice Manual (BPM) for Settlements and Billing.[3] As described in the BPMs, the day-ahead MEAF is bounded by 1 or 0, and is the ratio of the resource's (a) Metered Energy *minus* the Day-Ahead Self-Scheduled Energy *minus* the Day-Ahead Minimum Load Energy *minus* the Standard Ramping, and (b) the Day-Ahead Scheduled Energy *minus* the Day-Ahead Self-Scheduled Energy *minus* the Day-Ahead Minimum Load Energy. It reflects the portion of the scheduled energy above the greater of the resources self-schedule and it minimum load from the dispatched bid curve delivered based on the meter and can be applied to the energy bid cost calculations so that energy bid cost is paid for delivered portions and not paid for the undelivered portions of the day-ahead schedule.

The ISO calculates all the market revenues earned by the resource for a given trading hour by summing up the product of the resource's MWhs scheduled in the day-ahead schedule actually delivered multiplied by the applicable LMP. The ISO applies the day-ahead MEAF to this calculation to capture the IFM market revenue associated only with the delivered portions of the day-ahead schedule.

The ISO also developed a real-time MEAF that compares the metered generation to the dispatched amount above or below the amount scheduled in the day-ahead market. The real-time MEAF formula is also part of the settlements charge code calculations contained in the BPM for Settlements and Billing. The real-time MEAF is also bounded by 1 or 0, and is defined as the ratio of the resource's (a) metered energy minus day-ahead scheduled energy minus standard ramping minus real-time self-scheduled energy, and (b) total expected energy minus day-ahead scheduled energy minus standard ramping minus real-time self-scheduled energy.

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[3]   https://bpm.caiso.com/bpm/bpm/doc/000000000000536.

Description of the Market Issue:

Section 11.8.2.2 provides, in relevant part:

For any Settlement Interval in a CAISO IFM Commitment Period the IFM Market Revenue for a Bid Cost Recovery Eligible Resource is the algebraic sum of: (1) the product of the *delivered MWh, in the relevant Day-Ahead Schedule in that Trading Hour* where for Pumped-Storage Hydro Units and Participating Load operating in the pumping mode or serving Load, the MWh is negative, and the relevant IFM LMP, divided by the number of Settlement Intervals in a Trading Hour; and (2) the product of the IFM AS Award from each accepted IFM AS Bid and the relevant Resource-Specific ASMP, divided by the number of Settlement Intervals in a Trading Hour. In the case of a Multi-Stage Generating Resource, the CAISO will calculate the market revenue at the Generating Unit or Dynamic Resource-Specific System Resource level. *[emphasis added]*

Generally, the day-ahead MEAF is effective in determining the portions of the day-ahead schedule that are actually delivered based on the resource's meter. However, in cases where the resource is operating at a level below its day-ahead schedule in the real-time the application of the day-ahead MEAF results in the failure to account for the fully delivered portions of the day-ahead schedule below the minimum load.

The day-ahead MEAF is used to capture the delivered portions of the day-ahead schedule based on the resource's metered energy. For portions above the resource's minimum load, energy is delivered if the resource is operating at minimum load. If a resource reaches its minimum load, the resource has in essence delivered its minimum load energy, even though the resource may not have delivered energy above its minimum load. Using the day-ahead MEAF to determine what portion of the day-ahead schedule below the minimum load is delivered poses a problem because by design if the resource is at or near the resource's minimum load, the day-ahead MEAF approaches or reaches zero. Consequently, when the day-ahead MEAF is applied to the portion of the calculation of market revenues for portions of the day-ahead schedule below the minimum load, no revenue is accounted for when, in fact, the resource earned market revenue for portions at or below the minimum load.

Example:

PMax = 400 MWs
Pmin = 100 MWs
Day-Ahead Schedule = 400 MWs
Day-Ahead market cleared LMP = $35/MWh
Day-Ahead Market Revenue for total Scheduled Energy = $14,000

Day-Ahead Market Revenue above Minimum Load Energy = $10,500
Day-Ahead Market Revenue at or below Minimum Load = $3500
Day-Ahead Minimum Load Cost (Based on Registered Cost) = $4000

Real-time Meter = 100 MWs

(1)   Use of Day-Ahead MEAF in Accounting for IFM Market Revenues

Apply Tolerance Band to Determine whether Resource is On = Resources Passes and is Eligible to Receive Minimum Load costs = $4000

Assume no Self-Scheduled Energy and no Standard Ramp, therefore, day-ahead MEAF = (metered energy *minus* minimum load energy) *divided by* (day-ahead schedule energy *minus* minimum load energy) = (100 – 100)/400 – 100) = 0

IFM Market Revenue for netting IFM Bid Cost Recovery = $14,000 * 0 = 0
IFM Minimum Load Cost Payment = $4000 – 0 = $4000
Day-Ahead Scheduled Energy Revenue actually earned for Minimum Load Energy Portions = $3500

Total Payments for Associated with Reaching Minimum Load = $3500 + $4000 = $7500

(2)   Determining Delivered Minimum Load Energy Based on Resource Coming Online

Apply Tolerance Band to Determine whether Resource is On = Resources Passes and is Eligible to Receive Minimum Load costs = $4000

Resource Determined to be On, capture IFM Market Revenue associated with Minimum Load Energy = $3500

Result:
IFM Market Revenue for netting IFM Bid Cost Recovery above Minimum load = $10,500 * 0 = 0
IFM Market Revenue for netting IFM Bid Cost Recovery above Minimum load = $3,500

IFM Minimum Load Cost Payment = $4000 – $3500 = $500

Total Payments for Associated with Reaching Minimum Load = $3500 + $500 = $4000

The ISO intended to use the day-ahead MEAF for the purposes of calculating the delivered portions of the day-ahead schedule. When a resource

delivers at least its minimum load energy, the ISO pays the LMP for that scheduled minimum load energy through the settlement of the day-ahead schedule. Applying the day-ahead MEAF which was determined from the energy delivered and scheduled above minimum load to the delivered minimum load energy (day-ahead MEAF<1) results in the under accounting of those revenues associated with the delivered portions of the day-ahead schedule.

Section 11.8.2.2 of the tariff does not specify the use of the day-ahead MEAF and only specifies that the ISO calculate IFM market revenues based on the delivered portions. Section 11.8.2.1.2, of the ISO tariff specifies that the ISO provides IFM Minimum Load Cost payment in a given interval if the resource is determined to be "On." To determine whether the resource is "On," the ISO applies the tolerance band to the resource's metered energy and if the resource is at or near their minimum load at any time during the applicable time interval, the resource is determined to be "On" and the ISO qualifies the resource for payment of its IFM Minimum Load cost. The tolerance band is defined as: the higher of 5 MW or the product of 3% and the resources PMax.

The ISO believes the application of the tolerance band to determine the delivered portions as opposed to the day-ahead MEAF would better capture the delivered portions of the day-ahead schedule for portions below the minimum load.

Impact of Market Issue:

Figure 1 and table 1 below provide an estimate of the impact of this deficiency in bid cost recovery payments.

The data in Figure 1 and table 1 only estimates resettlement based on the change in accounting for minimum load energy market revenues in the IFM. The ISO will be adopting the same practice of using the tolerance band to determine delivered portions of minimum load energy in the real-time market as well. Therefore, the actual resettlement may vary from these illustrative data. However, given that the real-time metered energy adjustment factor does not pose the same issue described above, the ISO does not anticipate the actual resettlement amounts will differ substantially from the illustrative data. Moreover, this impact analysis was conducted outside of the settlement systems. Consequently, when the actual settlement statements are recalculated, the actual settlement amounts may vary.

Figure 1: Impact of Under Accounting for Delivered Minimum Load Revenue The below graph is from April 2009 through Feb 2011.
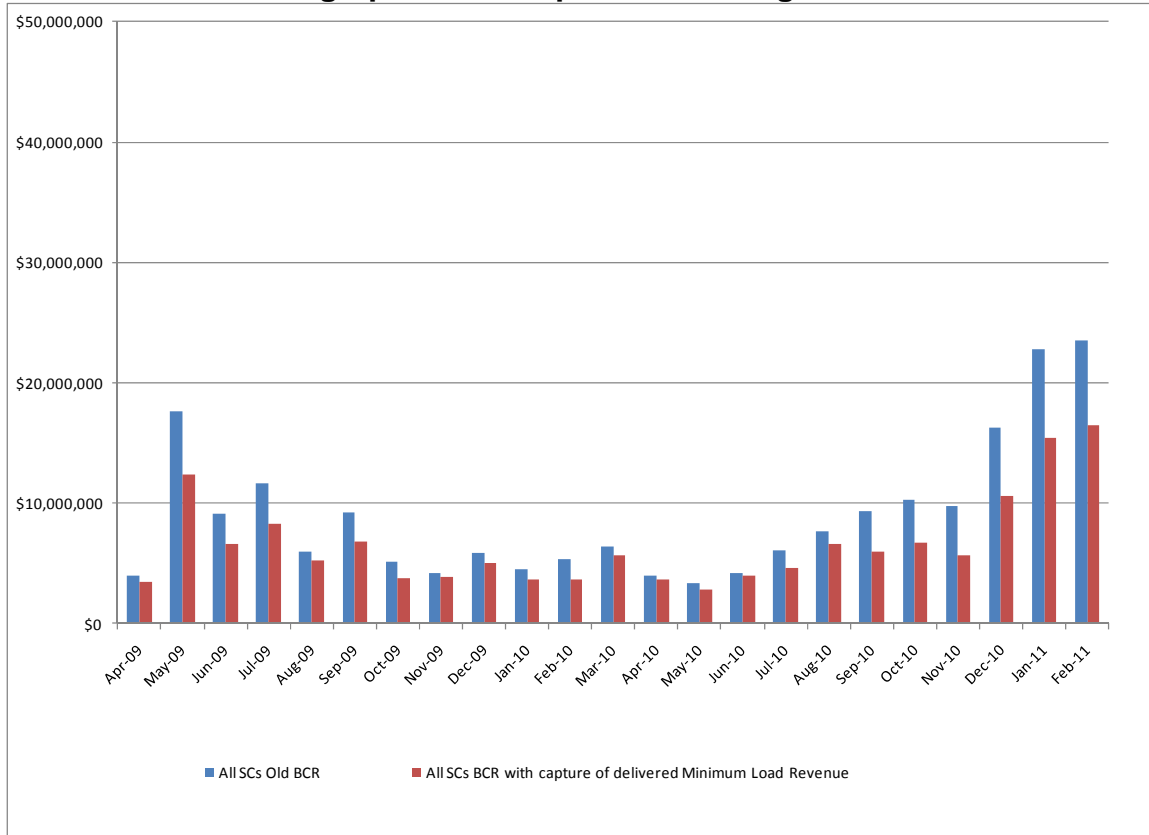

Table 1: The estimated bid cost recovery differences related to the above graph for April 2009 through February 2011.

Month - Year	Using DA MEAF	Using Tolerance Band	Difference
Apr 2009 through Dec 2009	$73,057,073	$55,614,811	$17,442,262
Jan 2010 through Jul 2010	$33,815,457	$28,132,357	$5,683,100
Aug 2010 through Dec 2010	$53,298,509	$35,628,911	$17,669,598
Jan 2011 through Feb 2011	$46,406,415	$31,951,362	$14,455,053

In its March 21, 2011, filing, the ISO explained in greater detail that a bidding practice has been identified as having exaggerated bid cost recovery payments since August 2010. *See* http://www.caiso.com/2b4c/2b4cb97236f80.pdf. The bidding practice led to the ISO committing the resource at full capacity in the IFM daily, and then forcing the ISO to dispatch the resource down to the resource's minimum load in the real-time. As a result the day-ahead MEAF was frequently at 0 for the affected

resources, thereby failing to capture any of the day-ahead market revenue associated with portions below the minimum load energy, even though such resources performed at their minimum load. Prior to August 2010, while in certain cases the day-ahead MEAF at times also resulted in the under-recovery of IFM market revenues, the magnitude was much smaller given the lack of a strategy forcing the ISO to keep resources on at minimum load each day.[4]

Next Steps:

January, February and part of March 2011 – Resettlement will commence in T+76 business day statements, starting mid-April 2011.

August – December 2010 – Resettlement will commence in the T+18 months statements, starting in February of 2012.

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[4]   In the early months after the start of the ISO's LMP-based market, in gaining experience with its new market, resources were committed in greater amounts than was the case later on. This accounts for the greater volume of bid cost recovery in the earlier months of the 2009 time period.