10. Reporting Information

Welcome to the *Reporting Information* section of CAISO *BPM for Market Instruments*. In this section you will find the following information:

- A description of the reports that are available to SCs

Technical interface documentation and report content details can be found in the Interface Specification for Market Results Services and Market Results Report Overview documentation at: http://www.caiso.com/2359/2359b9866b2c0.html

10.1 Scope of CMRI Reports available to SCs

Exhibit 10-1.1 summarizes the reports that are available to SCs through the CAISO Market Results Interface (CMRI). Details of the report contents are provided in subsequent sections.

Exhibit 10-1.1: Summary of CMRI Reports

Title	Contents
Day-Ahead Generation Market Results	Day-Ahead Energy Schedules, Ancillary Services Awards, Load Following and RUC Capacity for Generating Units
Day-Ahead Demand Market Results	Day-Ahead Energy Schedules and Ancillary Services Awards of Participating Loads and Day-Ahead Energy Schedules for Non-Participating Loads
Day-Ahead Residual Unit Commitment (RUC) Capacity	RUC Capacity and RUC Awards from the Residual Unit Commitment process
Day-Ahead Import/Export Schedules	Day-Ahead Energy Schedules and Ancillary Services Awards at Intertie Scheduling Points
Day-Ahead Start-Up Instructions	Start-Up instructions resulting from the RUC process
Day-Ahead Ancillary Service Market Results	Resource-specific Ancillary Service Awards resulting from the Integrated Forward Market run
Day-Ahead Market Power Mitigation (MPM) Results	Segments of the "new" or mitigated Bid as a result of the Day-Ahead Market Power Mitigation Process (MPM)
~~Real-Time~~HASP Market Power Mitigation (MPM) Results	Segments of the "new" or mitigated Bid as a result of the ~~Real-Time~~HASP Market Power Mitigation Process (MPM)
RTUC Market Power Mitigation (MPM) Results	Segments of the "new" or mitigated Bid as a result of the -RTUC Market Power Mitigation Process (MPM)
Default Energy Bid Curves	Independent Entity-supplied default Bid Curve data used in the Market Power Mitigation process
Day-Ahead Generation Commodity Prices	Day-Ahead resource-specific prices (for Energy Schedules, Ancillary Services Awards, RUC Awards) of Generating Units
Day-Ahead Demand Commodity Prices	Day-Ahead resource-specific prices for Energy Schedules and Ancillary Services Awards of Participating Loads; and resource-specific prices for Energy Schedules of Non-Participating Loads
Hour Ahead Scheduling Process (HASP) Schedules	Displays Hour-Ahead Scheduling Process results for the next Trading Hour. Posts the HASP Binding results relevant to Hourly Pre-

Title	Contents
	Dispatched Resources. Posts HASP Advisory results relevant to the Non-Hourly Pre-Dispatch Resources.
Hour Ahead Scheduling Process (HASP) Schedule Prices	Displays Hour-Ahead Scheduling Process resource-specific prices for the next Trading Hour. Posts the HASP Binding results relevant to Hourly Pre-Dispatched Resources. Posts HASP Advisory results relevant to the Non-Hourly Pre-Dispatch Resources.
Day Ahead Finally Qualified Load Following Capacity	Day-Ahead Finally Qualified Load Following Up and Down Capacity for Metered Subsystems (MSS) resources
Day-Ahead Unit Commitments	Resources that are self-committed or CAISO committed by the IFM or RUC process in the Day-Ahead Market
Default RMR Minimum Load & Startup Cost Bid Curves	Displays the default minimum load and startup cost bid curves that will used for the Market Power Mitigation (MPM) Process. This information originates from an independent entity and applies to RMR units only.
Day-Ahead Import-Export Commodity Prices	Day-Ahead resource-specific prices (for Energy Schedules, Ancillary Services Awards, RUC Awards) of System Resources
Extremely Long Start Resource Startup Instructions	Startup instructions resulting from the Extremely Long Start Commitment (ELC) process. This report is not currently active.
Day-Ahead Reliability Must Run (RMR) Dispatches	RMR units that either have an Energy Schedule (from the IFM run)that is flagged as an RMR Dispatch and/or a Manual RMR Dispatch
Expected Energy Allocation Details	Displays the post-market Expected Energy results from the energy accounting process. Expected Energy is the sum total of all DA and RT market awards, Exceptional Dispatches and any other Dispatch Instructions, taking into account physical limitations (SLIC), disaggregated into their Settlement components.
Conformed Dispatch Notice (CDN)	Summary of the Day-Ahead and Real-Time Energy Schedules, Ancillary Service Awards, RMR Dispatches, Competitive Constraint Run results of RMR resources
Expected Energy	Post-market or after-the-fact energy accounting results for Settlement calculations. This report will contain the Total Expected Energy for Day Ahead, Real Time, Instructed and Total energy.
CAISO Commitment Cost Details	Includes Commitment Flags and Commitment Cost to validate the Bid Cost Recovery charge in Settlements
CRN	Reports the MW breakdown and CRN number market results for ETC/TOR Self-Schedules in the DAM and the RTM. These MWs breakdown are inputs used in the ETC/TOR balancing rights, and are not the final ETC/TOR balancing rights. RTM CRN reporting includes ETC/TOR schedule changes after the close of the RTM. Note: This report has limited functionality, and is only available in the GUI. The same results are posted to the CAISO SFTP site for downloading. Access to the CRN data through the SFTP site is managed through the AARF (Application Account Request Form) process.
Real-Time Pre-Dispatch (RTPD) Flexible Ramping	Reports the amount of upward ramping MW quantity of Flexible Ramping Constraint capacity awarded for each resource.

Title	Contents
Constraint Capacity	

Convergence Bidding Reports

The following four Convergence Bidding reports are available through the CAISO Market Results Interface (CMRI).
Reports 4.2, 4.3 and 4.4 are associated with the CRR Adjustment Settlement Rule.
For additional details on the CRR Adjustment Settlement Rule, please see the BPM for Market Operations, Appendix F.

Day Ahead Convergence Bidding Awards	Displays the market Virtual Bidding supply and demand awards that were cleared in the day-ahead market for energy
Hourly Prices due to Convergence Bidding for CRR Adjustment	Displays the hourly prices that CAISO uses to calculate Congestion Revenue Rights (CRR) adjustments due to Virtual Bidding.
Binding Transmission Constraints due to Convergence Bidding for CRR Adjustment Report	Displays supporting data for settlement charges imposed on scheduling coordinators, as a result of the application of the CRR settlement rule - specifically CRR flow impact on award locations for each scheduling coordinator.
Flow Impact due to Convergence Bidding for CRR Adjustment	Displays supporting data for settlement charges imposed on scheduling coordinators, as a result of the application of the CRR settlement rule – specifically CRR flow impact aggregated by Entity, where the Entity is a Convergence Bidding Entity name that coincides with a CRR Holder.

12. Public Market Information

Welcome to the *Public Market Information* section of CAISO *BPM for Market Instruments*. These reports are based on the requirements detailed in the CAISO Tariff Section 6.5, CAISO Communications.

In this section you will find the following information:

List of Report Tabs provided on the CAISO OASIS site. (http://oasis.caiso.com)

Content of the reports included under those Report Tabs

Interface Specifications regarding the downloading of the OASIS data through an API can be found at:

http://caiso.com/235f/235fcbd556310.html

CAISO provides the following reports groups through OASIS listed by the Tab name as they appear on the CAISO OASIS web site:

- Prices
- Transmission
- System Demand
- Energy
- Ancillary Services
- CRR
- Public Bids
- Atlas

12.1 Prices

CAISO provides information on prices to the public through the OASIS web page. The Price reports contain the following information:

Locational Marginal Prices (LMP) – Posts Hourly Locational Marginal Prices for all PNodes, APNodes and Scheduling Points in $/MWh, for the DAM and RUC market processes. Data fields are as follows:

LMP

- LMP Marginal Cost of Energy (MCE)
- LMP Marginal Cost of Congestion (MCC)
- LMP Marginal Cost of Losses (MCL)

Note: For the RUC prices, only the RUC price is posted. The three-component LMP breakdown is not applicable for RUC pricing.

HASP Locational Marginal Prices (LMP) – Posts hourly, the 4 15-minute Locational Marginal Prices in $/MWh, for the HASP hour. Posts the LMP, plus the Congestion, Loss and Energy Components that make up the LMP.

- Posts the HASP Binding LMP for PNodes and APNodes relevant to Hourly Pre-Dispatched Resources.
- Posts the HASP Advisory LMP for PNodes and APnodes relevant to the Non-Hourly Pre-Dispatch Resources.

Data fields are as follows:

LMP

- LMP Marginal Cost of Energy (MCE)

- LMP Marginal Cost of Congestion (MCC)
- LMP Marginal Cost of Losses (MCL)

Interval Locational Marginal Prices (LMP) – Posts the five-minute Locational Marginal Prices for PNodes and APNodes in $/MWh, for each five-minute interval Real-Time Economic Dispatch (RTED). Data fields are as follows:

LMP

- LMP Marginal Cost of Energy (MCE)
- LMP Marginal Cost of Congestion (MCC)
- LMP Marginal Cost of Losses (MCL)

Contingency Dispatch Locational Marginal Prices (LMP) – Similar to the Interval Locational Marginal Prices (LMP) report, but for Real Time Contingency Dispatch (RTCD) runs.

Posts the ten-minute Locational Marginal Prices for PNodes and APNodes in $/MWh, for each ten-minute interval RTCD. Data fields are as follows:

LMP

- LMP Marginal Cost of Energy (MCE)
- LMP Marginal Cost of Congestion (MCC)
- LMP Marginal Cost of Losses (MCL)

AS Clearing Prices – Posts the Ancillary Services Marginal Price (ASMP) for all Ancillary Service types for all binding AS Regions. Posted hourly in $/MW for the DAM.

DAM - Hourly ASMP ($/MW)

Interval AS Clearing Prices - Ancillary Services Marginal Price (ASMP) for all Ancillary Service types for all binding AS Regions. Posts 15-Minute price relevant to the next 15 minute binding interval for RTM on a fifteen minute basis.

RTM - 15Min Binding ASMP ($/MW)

Intertie Constraint Shadow Prices – Posts the hourly constraint pricing at each Intertie-based Transmission Interface And Intertie Constraint, for each Market
Process (DAM, HASP) in $/MWh, and the 15-Minute Shadow Price in $/MWh for the RTPD in RTM. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

Nomogram/Branch Shadow Prices – Posts the hourly constraint pricing at each binding Nomogram and Branch, for each Market Process (DAM, HASP) in $/MWh, and the 15-Minute Shadow Price in $/MWh for the RTPD in RTM. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

Fuel Prices – For each Gas Flow Day, lists the gas price in $/mmBTU by fuel region.

Current Locational Marginal Price – This report is available for download only. Five minute Locational Marginal Prices for all PNodes and APNodes for the current interval. (Returns the most recently posted interval only) This download is provided to allow Oasis users to quickly receive the most current LMP without any prior intervals included in the payload.

Interval Intertie Constraint Shadow Prices – Posts the 5-Minute constraint pricing at Transmission Interfaces and Intertie Constraints in $/MWh, for the RTD run in the RTM. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

Contingency Dispatch Intertie Constraint Shadow Prices – Similar to the Interval Intertie Constraint Shadow Prices report, but for Real Time Contingency Dispatch (RTCD) runs. Posts the 10-Minute constraint pricing at Transmission Interfaces and Intertie Constraints in $/MWh, for the RTCD run in the RTM. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

Interval Nomogram/Branch Shadow Prices - Posts the 5-Minute constraint pricing at each Nomogram and Branch in $/MWh, for the RTD run in the RTM. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

Contingency Dispatch Nomogram/Branch Shadow Prices - Similar to the Interval Nomogram/Branch Shadow Prices report, but for Real Time Contingency Dispatch (RTCD) runs. Posts the 10-Minute constraint pricing at each Nomogram and Branch in $/MWh, for the RTCD run in the RTM. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

Reference Prices – Posts Quarterly Reference prices associated with each Virtual Bidding PNode and APNode for supply and demand.

Nodal Group Constraints Shadow Prices - This report displays the upper and lower MW limits, cleared MW value and associated hourly shadow prices for any binding Nodal Group Constraint. This report is triggered with the publication of the Day-Ahead results.

Flexible Ramping Constraint Results – Posts the following values for RTPD and RTD market runs, for intervals when the Flexible Ramping Constraint is enforced.

- Ramp Up Capacity (MW) - The required amount of total un-loaded capacity below maximum operating limits (that can be dispatched up) of the ramp-limited resources that is retained

through the market optimization. The Flexible Ramping Constraint is enforced on a system level per market run and market interval.

- Ramp Up Shadow Price ($/MW) - Shadow price of the ramping up constraint when binding in the relevant market run and in the binding market interval. Binding interval shadow price is the Ramp Up Shadow Price when "Market Run DateTime" = "Market Interval StartDateTime" or when "MKT_RUN_START_TIME" = "INT_START_TIME".

Payment to resources providing the flexi-ramp capacity will be paid based on the following price: For each applicable fifteen-minute RTUC interval, the Flexible Ramping Constraint derived price will be equal to the lesser of: 1) $800/MWh; or 2) the greater of: (a) 0; (b) the Real-time Ancillary Services Marginal Price for Spinning Reserves for the applicable fifteen-minute RTUC interval; or (c) the Flexible Ramping Constraint Shadow Price minus seventy-five percent of the maximum of (i) zero (0); or (ii) the Real-Time System Marginal Energy Cost, calculated as the simple average of the three five-minute Dispatch Interval System Marginal Energy Costs in the applicable fifteen-minute RTUC interval.

The flexi-ramp cost for each binding RTPD interval can be estimated by the amount of procured RAMP Up Capacity multiplied by Ramp up Shadow Price in that binding interval. If the flexi-ramping constraint is binding and feasible, the procured Ramp Up Capacity is equal to the flexi-ramping capacity requirement (Ramp Up Capacity or RAMP_UP_CAP_REQ). However, if the flexi-ramping constraint is infeasible, meaning that the RTPD market run is unable to procure the full required flexi-ramping capacity, the procured Ramp Up Capacity would be less than the flexi-ramping capacity requirement. On OASIS, the flexi-ramping capacity requirement not the procured amount is posted.

MPM DA Locational Marginal Prices (LMP) – Hourly Locational Marginal Prices from the Day-Ahead MPM run for all PNodes and APNodes associated with market resources with physical bids in $/MWh. Posts the LMP, including the competitive congestion component, non-competitive congestion component, loss and energy components that make up the LMP.

MPM HASP and RT Locational Marginal Prices (LMP) – ~~Posts hourly, the 4~~ 15-minute Locational Marginal Prices from the HASP and RTUC MPM runs for all PNodes and APNodes associated with market resources with physical bids in $/MWh. Posts hourly for the 4 intervals of the HASP hour and every 15 minutes for RTUC. Posts the LMP, plus the competitive congestion component, non-competitive congestion component, loss and energy components that make up the LMP.

MPM Nomogram/Branch Group Shadow Prices – Posts the ~~hourly~~ constraint pricing at each binding nomogram and branch group, for each market process of the MPM run (DAM, HASP~~/RTM~~, RTUC) in $/MWh. Posts hourly data for DAM and 15 minute data for HASP and RTUC. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

MPM Nomogram/Branch Group Competitive Paths – Posts the ~~hourly~~ results of the dynamic competitive path determination~~ for the Day-Ahead MPM run,~~ for binding nomogram~~s~~ and branch~~es~~ constraints for each market process of the MPM run (DAM, HASP, RTUC). Posts hourly data for DAM and 15 minute data for HASP and RTUC. Posts a flag indicating whether

each binding constraint was competitive or not. ~~For the time being this report covers the Day-Ahead market only. HASP/Real-time MPM uses static competitiveness values which are updated quarterly. See the CAISO.COM website for the latest static competitive path assessment.~~

MPM Intertie Constraint Shadow Prices – Posts the ~~hourly~~ constraint pricing at Transmission Interfaces and Intertie Constraints, for each market process of the MPM run (DAM, HASP~~/RTM~~, RTUC) in $/MWh. Posts hourly data for DAM and 15 minute data for HASP and RTUC. Report will also include an indication of whether the Constraints were binding because of the base operating conditions or contingencies, and if caused by a Contingency, the identity of the specific Contingency.

MPM Intertie Constraint Competitive Paths – Posts the ~~hourly~~ results of the dynamic competitiveness constraint ~~for the Day-Ahead MPM run,~~ for binding interchange~~s~~, market scheduling limit~~s~~, and branch group~~s~~ constraints for each market process of the MPM run (DAM, HASP, RTUC). Posts hourly data for DAM and 15 minute data for HASP and RTUC. Posts a flag indicating whether each binding constraint was competitive or not. ~~For the time being this report covers the Day-Ahead market only. Real-time MPM uses static competitiveness values which are updated quarterly. See the CAISO.COM website for the latest static competitive path assessment.~~

MPM Reference Bus – Posts the reference bus used in the MPM run for each market process of the MPM run (DAM, HASP, RTUC). ~~Posted~~ Contains hourly data for the Day-Ahead ~~and HASP~~ market~~s~~ and 15-minute data for HASP and RTUC. Note, the IFM, RUC, and regular HASP and RTUC runs use a distributed reference bus.

12.4 Energy

The Energy reports contain the following information:

System Load and Resource Schedules

DAM Load, Generation, Import and Export Schedules per TAC Area and CAISO total for each Operating Hour, in MW.

RUC Capacity from Generation and Imports for each TAC Area, plus CAISO total for each Operating Hour, in MW.

Hourly Real-Time Market (HASP) Generation, Import and Export per TAC Area and CAISO total, in MW.

5 minute RTM Generation, Import and Export per TAC Area and CAISO total, in MW.

Contingency Dispatch Resource Schedules – Similar to the System Load and Resource Schedules report, but for Real Time Contingency Dispatch (RTCD) runs.

RTM Generation, Import and Export per TAC Area and CAISO total, in MW for all 10-minute RTCD runs.

Expected Energy – Lists after-the-fact Energy accounting, per Energy type. Posted daily at T+1, in MWh for ISO total.

Please refer to the table in the BPM for Market Operations, Appendix C.4 for the complete list of valid Expected Energy Types.

Exceptional Dispatch– Summary of Exceptional Dispatch Energy for each Operating Hour, expressed in MWh, and Exceptional Dispatch weighted price, in $/MWh. Posted daily at T+1. Values are summed by Exceptional Dispatch Type, by TAC Area.

Please refer to the BPM for Market Operations, Appendix C.4 for the complete list of valid Exceptional Dispatch Types.

~~Local~~ **Market Power Mitigation Status** - Mitigation indicator showing whether any Bids were replaced by Reference Curves, for the following: DAM Hourly Market Mitigation (Yes/No), ~~RTM~~ HASP and RTUC 15Min Market Mitigation (Yes/No)