Energy Storage and Distributed Energy Resources

Customer Partnership Group

May 6, 2019

1 p.m.– 3 p.m. (PT)

Agenda

Item
Review of ESDER2/3A implementation scope
New data submittal requirements for ESDER2
Bidding option implementation overview for ESDER3
Single LSE implementation overview for ESDER3
Questions Received & ISO Answers

Review and Discussion of ESDER 2/3A – Implementation

- Phase 2 - priority item for 2019:
  - New data submittal requirements for approved CAISO baselines.
    - New measurement type: BASE
    - Additional use of current measurement type: TMNT
- Scope for Phase 3A – fall 2019:
  - Hourly and 15 Minute Bid/Dispatch Options
  - Removal of the single LSE and DLA / bid price criteria

Weekly communications via release user group meetings (RUG) and technical user group (TUG) calls

ESDER 2 – Changes to Implementation Data Submittal Requirements Due To Non-Compliance

Tariff 11.6.1:

*"For monitoring, compliance, and audit purposes, Scheduling Coordinators must submit in the Settlement Quality Meter Data Systems the **Customer Load Baseline**, as applicable, and the **actual underlying consumption** or Energy during all hourly intervals for the calendar days for which the Meter Data was collected to develop the Customer Load Baseline pursuant to Section 4.13.4."*

Issue:

- ESDER 2 business practices did not require SCs to submit the calculated Customer Load Baseline
- ESDER 2 requirement for submittal of actual underlying load data to measurement type "Baseline Load Data (.CBL)" was determined not to fulfill the requirement to provide Customer Load Baseline as defined in tariff

ESDER 2 – Assessment and Impact

- Participant Impact:
  - New data submittal requirements for each of the approved CAISO baselines
    - Technical implementation details identified in external BRS
- Data Submittal BRQs in External BRS for ESDER2 Compliance:
  - BRQs 001-007

Data Submittal BRQs – ESDER2 Compliance

6.5.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
CLB-BRQ001	MRI-S shall receive an additional measurement type of BASE to collect the resource/registration calculated Customer Load Baseline data for monitoring purposes only	Core	MRI-S, External DRP
CLB-BRQ002	Customer Load Baseline data submitted as measurement type of BASE shall be at hourly granularity	Core	MRI-S, External DRP
CLB-BRQ003	Customer Load Baseline data shall be submitted as measurement type of BASE for the following baseline methods: 1. Control Group 2. Day Matching 5/10 (Residential Only) 3. Day Matching 10/10 4. Day Matching Combined 5. Weather Matching	N/A	External DRP

Data Submittal BRQs – ESDER2 Compliance

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
CLB-BRQ004	For registration using Meter Generation Output with 10 in 10 method, the DRP shall submit two sets of data: • Customer Load Baseline data submitted as measurement type of BASE will be for the 10 in 10 element • MGO Customer Load Baseline data submitted as measurement type of TMNT will represent the generation device metered values used in the baseline calculation.	N/A	External DRP
CLB-BRQ005	Customer Load Baseline data submitted as measurement type of BASE shall be submitted only for those hours bids are submitted for trade dates when the resource/registration is being actively bid into the markets.	N/A	External DRP
CLB-BRQ006	Customer Load Baseline data submitted as measurement type of BASE shall be submitted beginning with the resource/registration effective start date and dates going forward until its effective end date.	N/A	External DRP
CLB-BRQ007	Data with measurement type of CBL, TMNT (load) and BASE (calculated) that are used for monitoring purposes shall be retained in MRI-S online for a minimum of 24 months and offline (archived) for a minimum of an additional 60 months	Core	MRI-S

Baseline Methods and Measurement Type mapping

Baseline Methods and Measurement Type mapping (under ESDER 3A highlighted in blue):

Measurement Type	Data Granularity	Baseline Method	Comments
LOAD	5 minute	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10[1]	AS Resource only This is the actual load for intervals the resource receives an Ancillary Service award. Both LOAD and MBMA data sets are required for no pay calculations, even though the LOAD data includes the same values submitted in the MBMA data set.
GEN	5 minute	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output[2] • Meter Generation Output with 10 in 10	Demand Response Energy Measurement (DREM) or performance data of the resource in response to an award or dispatch. Data required for intervals where TEE>0.
MBMA	5 minute	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10	AS Resource Only This is the actual load data for the interval preceding, during, and following the trading intervals for which they were awarded ancillary services.

[1] "MGO with 10 in 10" under this performance methodology option, the demand response performance is a result of combining the demand response energy measurement (DREM) from pure load reduction calculated utilizing a customer load baseline (10 in 10, 5 in 10, weather matching) combined with the DREM from load reduction attributed to generation offset (MGO). Referred to as "load and generation"

[2] "MGO" is a performance evaluation methodology that can be used by a generation device located behind the revenue meter, to represent the load reduction attributed only to the output of that generation device excluding its typical use. Referred to as "generation offset only".

Baseline Methods and Measurement Type mapping (Continue)

CBL	Hourly	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10	For monitoring only. Underlying load data used in the customer load baseline calculation for all baseline methods. 90 days of historic data prior to the day of the event is required. This is applicable for the "MGO with 10 in 10"[3] only. It represents the net load data used to develop the customer load baseline of the facility only. 90 days of historic data prior to the day of the event is required.
TMNT	Hourly	• Control Group • Meter Generation Output • Meter Generation Output with 10 in 10	For monitoring Only For the Control Group baseline method, data represents the actual load data for those locations in the treatment group. For the MGO baseline method, TMNT data represents the generation device metered values.
BASE	Hourly	• Control Group • Day Matching 5/10 (Residential Only) • Day Matching 10/10 • Day Matching Combined • Weather Matching • Meter Generation Output with 10 in 10	For monitoring Only Calculated customer load baseline values used to derive DREM. For the "MGO with 10 in 10": **BASE** data represents the customer load baseline used to calculate the DREM attributed to the pure load reduction only. BASE data is submitted for trade dates when the resource/registration is being actively **bid into the market** for the hours in which it is bid.

[3] "MGO with 10 in 10" provides for the use of 10 in 10, 5 in 10 (residential customers only) and weather matching performance evaluation methods in the calculation of the DREM portion attributed to customer load response only.

New Data submittal of Customer Load Baseline

DRPs will submit a **BASE measurement** for each hour a DR resource is bid into the day-ahead or real time market

- Hourly granularity
- Applies to all baseline methodology types

Example: When to apply and not apply baseline adjustment

Resource A, Market day 4/30/2019:																							
Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Bid in day-ahead														Y	Y	Y	Y	Y	Y	Y	Y			
Bid in real-time																	Y	Y	Y	Y	Y	Y		
TEE > 0																		Y	Y					
BASE submission required														Y	Y	Y	Y	Y	Y	Y	Y	Y		
Adjusted (A) or Unadjusted (U)														U	U	U	U	A	A	U	U	U		

Adjusted baseline data for hours when TEE >0

ESDER 3 – Scope of Implementation Phases

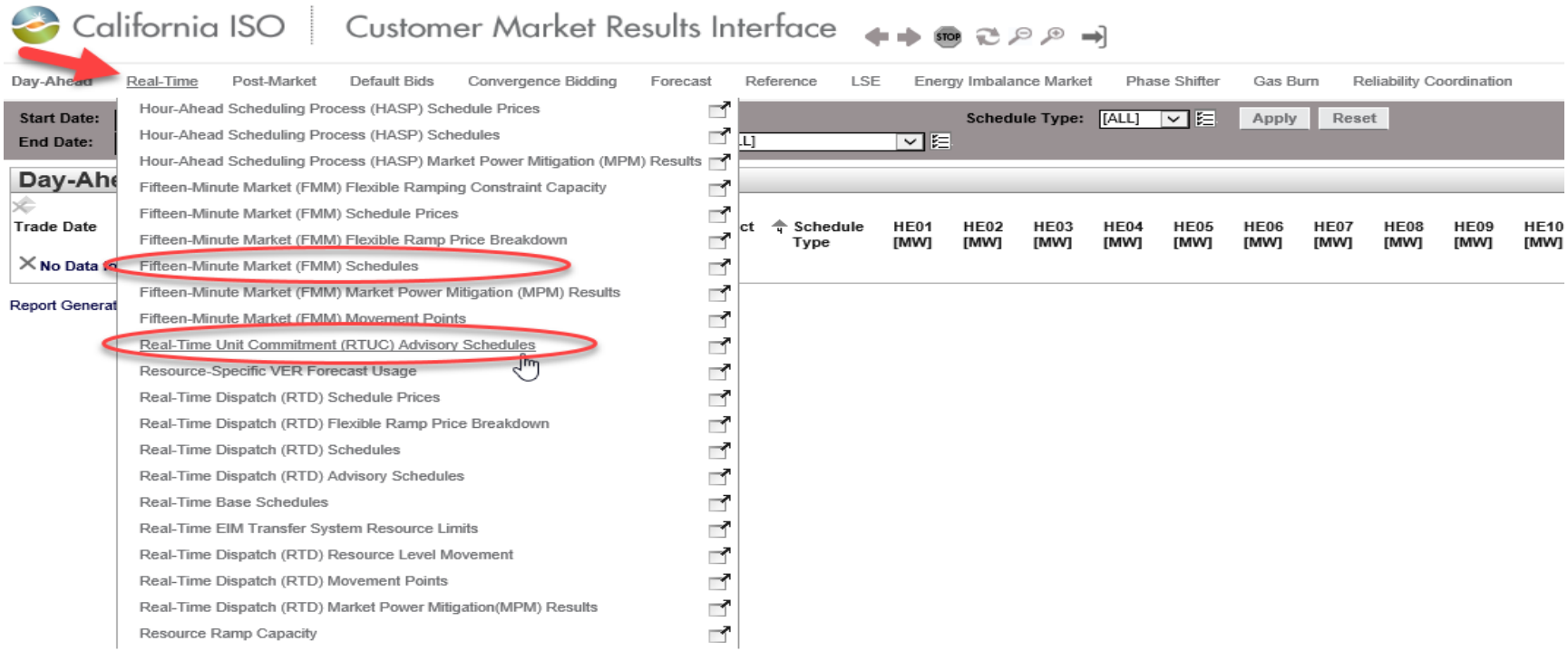
- Scope for Phase 3A (Fall 2019)
  - Hourly and 15 Minute Bid/Dispatch Options
  - PDR energy schedules/awards and instructions provided by Customer Market Results Interface (CMRI)
  - ADS dispatches will not be included in this phase of implementation
  - Removal of the single LSE and DLA / bid price criteria

- Scope for Phase 3B (Fall 2020)
  - Load shift resource
  - EVSE baseline measurement

View Energy Schedules and Awards – CMRI

ESDER 3A - Hourly and 15 Minute Bid/Dispatch Options

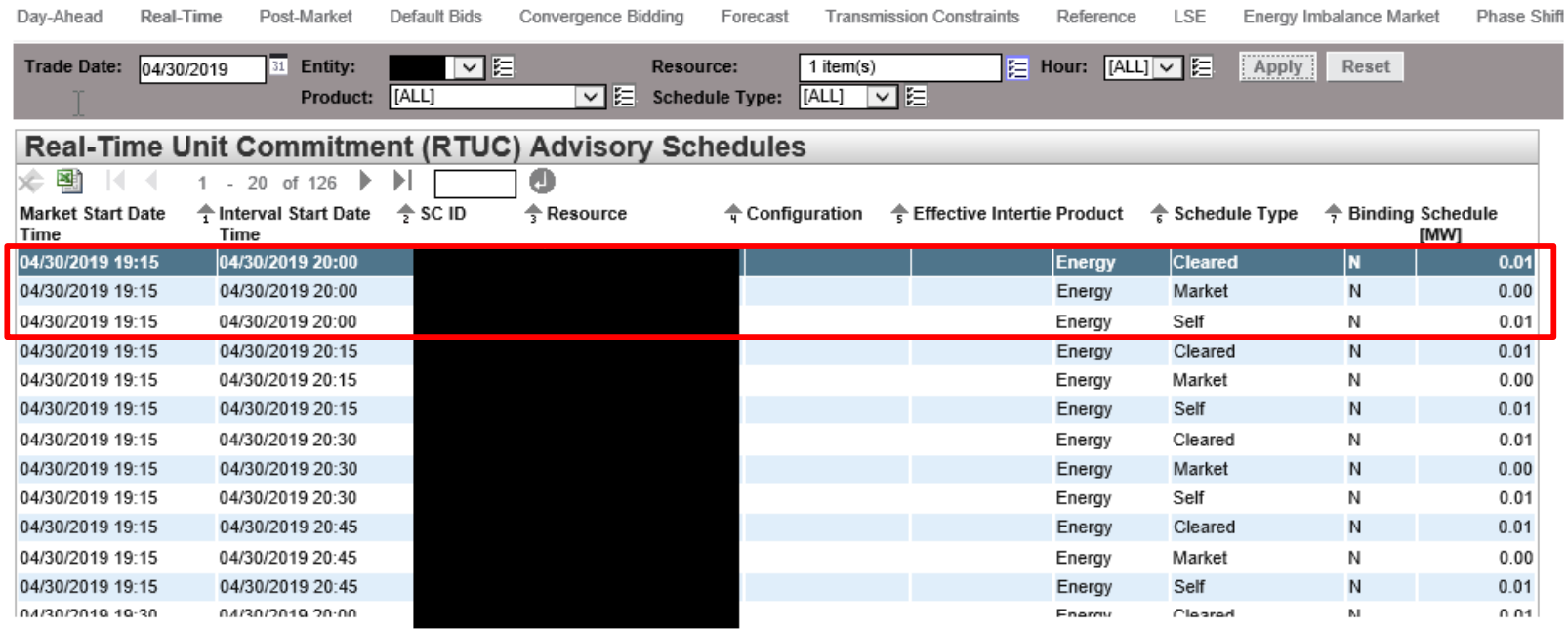
- Utilize CMRI to obtain binding schedules and awards (not through ADS)
  - Fifteen-Minute Market (FMM) Schedules (15 Minute)
  - Real-Time Unit Commitment (RTUC) Advisory Schedules (Hourly)



Energy Schedules and Awards – CMRI (continue)

RTUC Schedules

- Published as an Advisory, but binding for PDR selecting hourly bid option.
- RTUC runs and the report is published in CMRI 52.5 minutes before the hour.

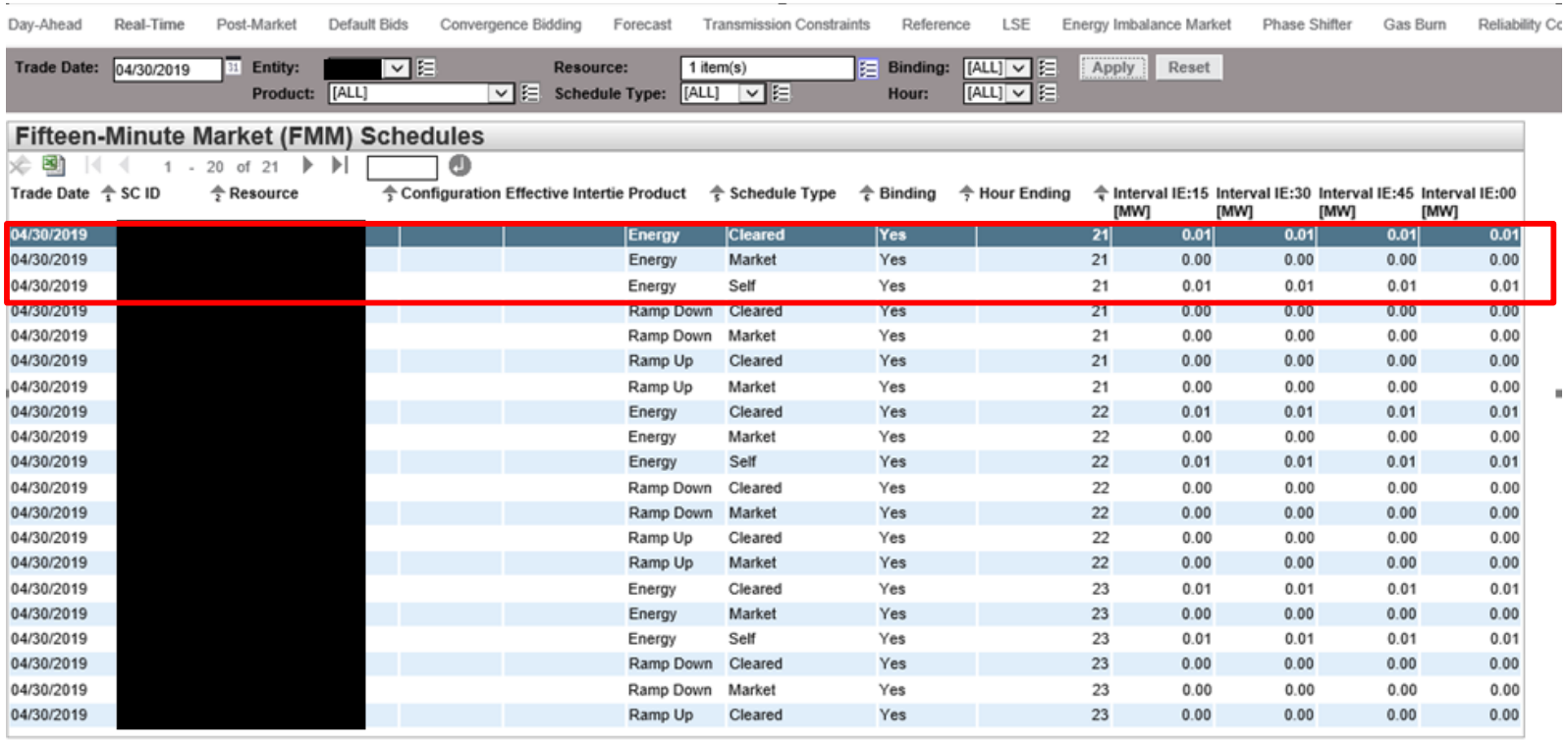


Market Start Date Time	Interval Start Date Time	SC ID	Resource	Configuration	Effective Intertie	Product	Schedule Type	Binding	Schedule [MW]
04/30/2019 19:15	04/30/2019 20:00	[redacted]				Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:00					Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:00					Energy	Self	N	0.01
04/30/2019 19:15	04/30/2019 20:15					Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:15					Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:15					Energy	Self	N	0.01
04/30/2019 19:15	04/30/2019 20:30					Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:30					Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:30					Energy	Self	N	0.01
04/30/2019 19:15	04/30/2019 20:45					Energy	Cleared	N	0.01
04/30/2019 19:15	04/30/2019 20:45					Energy	Market	N	0.00
04/30/2019 19:15	04/30/2019 20:45					Energy	Self	N	0.01

Energy Schedules and Awards – CMRI(continue)`

15-Minute Market (FMM) Schedules

- Published as binding for PDR selecting 15-minute bid option
  - Hourly bid option will also see FMM awards consistent with the hourly schedule.
- FMM runs 37.50 minutes before the start of the binding interval.
- Report is published 22.50 minutes before the start of the binding interval.



Day-Ahead | Real-Time | Post-Market | Default Bids | Convergence Bidding | Forecast | Transmission Constraints | Reference | LSE | Energy Imbalance Market | Phase Shifter | Gas Burn | Reliability Cc

Trade Date: 04/30/2019 Entity: [redacted] Resource: 1 item(s) Binding: [ALL] Apply Reset
Product: [ALL] Schedule Type: [ALL] Hour: [ALL]

Fifteen-Minute Market (FMM) Schedules

1 - 20 of 21

Trade Date	SC ID	Resource	Configuration Effective Intertie	Product	Schedule Type	Binding	Hour Ending	Interval IE:15 [MW]	Interval IE:30 [MW]	Interval IE:45 [MW]	Interval IE:00 [MW]
04/30/2019	[redacted]			Energy	Cleared	Yes	21	0.01	0.01	0.01	0.01
04/30/2019				Energy	Market	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Energy	Self	Yes	21	0.01	0.01	0.01	0.01
04/30/2019				Ramp Down	Cleared	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Ramp Down	Market	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Cleared	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Market	Yes	21	0.00	0.00	0.00	0.00
04/30/2019				Energy	Cleared	Yes	22	0.01	0.01	0.01	0.01
04/30/2019				Energy	Market	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Energy	Self	Yes	22	0.01	0.01	0.01	0.01
04/30/2019				Ramp Down	Cleared	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Ramp Down	Market	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Cleared	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Market	Yes	22	0.00	0.00	0.00	0.00
04/30/2019				Energy	Cleared	Yes	23	0.01	0.01	0.01	0.01
04/30/2019				Energy	Market	Yes	23	0.00	0.00	0.00	0.00
04/30/2019				Energy	Self	Yes	23	0.01	0.01	0.01	0.01
04/30/2019				Ramp Down	Cleared	Yes	23	0.00	0.00	0.00	0.00
04/30/2019				Ramp Down	Market	Yes	23	0.00	0.00	0.00	0.00
04/30/2019				Ramp Up	Cleared	Yes	23	0.00	0.00	0.00	0.00

Report Generated: 05/01/2019 12:01:00

Questions Received On BRQ004 – ESDER2

CLB- BRQ004: "For registration using Meter Generation Output with 10 in 10 method, the DRP shall submit two sets of data:

- **Customer Load Baseline data submitted as measurement type of BASE will be for the 10 in 10 element**
- **MGO Customer Load Baseline data submitted as measurement type of TMNT will represent the generation device metered used in the baseline calculation."**

Q: CLB-BRQ004 mentions that the Meter Generator Output (MGO) with 10-in-10 method requires a BASE submittal. Does the requirement apply to all MGO baseline options or just the MGO with 10-in-10?

A: The requirement to submit BASE measurement does not apply to all MGO baseline, it only applies to MGO with 10-in-10.

Q: CLBBRQ004 adds a requirement to submit MGO device "generation" data as type TMNT for resources using baseline methodology 10/10 with MGO. We suggest this requirement be extended to all MGO resources. If CAISO is to be fully consistent with the tariff, there should also be submission of the MGO baseline data as applicable for all MGO configurations.

A: "MGO with 10 in 10" under this performance methodology option, the demand response performance is a result of combining the demand response energy measurement (DREM) from pure load reduction calculated utilizing a customer load baseline (10-in-10, 5-in-10, weather matching) combined with the DREM from load reduction attributed to generation offset (MGO). Referred to as "load and generation"

For the MGO baseline method, TMNT data represents the generation meter data from the behind the meter device ONLY. In addition to the TMNT for the behind the meter generation device, BASE is required for those utilizing the "MGO with 10 in 10" option which combines the BTM generation offset with load reduction. See "Baseline Methods and Measurement Type mapping-updated for ESDER3A".

Questions Received On BRQ005,006 – ESDER2

CLB-BRQ005: "Customer Load Baseline data submitted as measurement type of BASE shall be submitted only for those hours bids are submitted for trade dates when the resource/registration is being actively bid into the markets."

Q: What is the reasoning behind submitting the BASE only during hours actively bidding instead of the awarded hours? Would this be the adjusted calculation? There could potentially be multiple types of calculations and would further complicate the baseline? Especially if resources are not dispatched at a certain time every trade date? Also resources can be made available 24/7.

A: The CAISO would like to see the baseline of resource bidding as it provides transparency as to availability of load available to respond to a bid in quantity of that resource. Also provides historical reference of baseline for those trade dates/hours in which the resource receives and award/dispatch. The data submitted for hours in which the resource is bidding ONLY will be unadjusted baseline. **The data submitted for hours in which the resource TEE > 0, will be adjusted baseline.**

CLB-BRQ006: "Customer Load Baseline data submitted as measurement type of BASE shall be submitted beginning with the resource/registration effective start date and dates going forward until its effective end date. "

Q: Will we receive an error if we try to bid outside of the resource start/end date?

A: The CAISO would like to capture the trade dates in which the resource is effective and bidding into the market. There would be no ability for resource to bid outside of the start/end date, however, there may be a resource effective start data that begins before the resource is bidding into the market, therefore, BASE would not be required until that resource is bidding.

Questions Received on BRQ007 – ESDER2

CLB-BRQ007: "Data with measurement type of CBL, TMNT (load) and BASE (calculated) that are used for monitoring purposes shall be retained in MRI-S online for a minimum of 24 months and offline (archived) for a minimum of an additional 60 months"

Q: Data that are used for monitoring purposes are currently not available to participants. Will this be accessible to participants in the future?

A: No changes. Data that are used for monitoring, and auditing purposes will not be viewable to participants. The ISO recommend the SC keep records of the data submitted into MRI-S.

General Questions Received – Customer Load Baseline ESDER2

Q: Is there any documentation to address why implement the BASE requirement will improve compliance?

A: The implementation of the Base measurement type is to be in compliance with the ISO tariff section 11.6.1. requiring the submittal of customer load baseline data. It also provides data needed to allow for visibility, review and analysis of derived data used in the SC calculated demand response performance submitted as SQMD. In addition, the data provides the ability for the CAISO to utilize sets of information to assess reasonableness of baseline calculations, including any same day adjustments applied. Historical string of BASE data will allow for the monitoring of consistency with approved methodologies, especially for resources that are infrequently dispatched.

General Questions Received - Customer Load Baseline (continue)

Q: Has CAISO considered the Performance/storage implications for SC for additional calculations and storage of multiple versions of baselines?

A: Because the CAISO will be collecting this data ONLY for intervals in which the resource is bidding and is not requesting historical data (as is being required of LOAD data) the performance impact is not an issue. As for the requirement for storage, it is the same as other measurement types.

CLB- BRQ007 Data with measurement type of CBL, TMNT (load) and BASE (calculated) that are used for monitoring purposes shall be retained in MRI-S online for a minimum of 24 months and offline (archived) for a minimum of an additional 60 months Core MRI-S

Versions also the same, we keep only the last two versions of the data.

Q: If we submit unadjusted baseline on non-bid hours, will the CAISO system reject or simply accept these values?

A: Currently, there is no system requirement to restrict its submittal, just a business practice requirement. If it becomes a problem with too much data we may need to restrict in the future.

Questions Received On BRQ001 – ESDER3a

ESDER3-BRQ001: "Bid Dispatchable Option Type
System to have ability to allow a Proxy Demand Resource (PDR) to register a Bid Dispatchable Option Type.
Bid Dispatchable Options to include:

- **60-Minute**
- **15-Minute**
- **5-Minute"**

Q: In ESDER 3A BRQ 001, Bid Option Type, the BRQ stated that the impacted system is Master File when register a bid option type. Do you also mean RDT since that is MPs use. Also, when mentioned registration, is that also should be in DRSS system? Please help clarify.

A: There will be a new field on the GRDT for Bid Dispatchable Option Type for PDR (BRQ002). SC will be able to modify the bid dispatchable option through the Master File UI for PDR only (this does not apply to RDRR. RDRR will be set to 5 minutes). There is no impact to DRRS.

New flags are for new Hourly and Fifteen minute bidding options.

Q. We were wondering from the 5 minute bid dispatchable option, is the data derived from a calculation or actual telemetry? Clarification of 5 minute dispatchable PDR's? How long of a notification would be noted to the MP's?

A: There is no change to the currently available 5 minute bidding option. This is how PDRs have been bidding and getting dispatched in real time. There are no changes in how that is currently done. RTD notification is 2.5 minutes.

Questions Received On BRQ005,220,230 – ESDER3a

ESDER3-BRQ005: "Bid Dispatchable Option Type Effective Period

System to require Proxy Demand Resource ID to have a single effective Bid Dispatchable Option Type registered with a Start Date and End Date"

Q: How often can PDRs change their bidding options?

A: Can change any time within the Master File timeline.

ESDER3-BRQ220: "Service Accounts - DLAP

For PDR registrations, DLAP data will not be required:

Implementation Note: Implementation Plan to manage existing PDR and RDRR registrations should be considered."

Q: Is it optional if we continue to submit DLAP? Will the system accept this data?

A: DRRS will ignore the DLAP, even though MP includes it in the API.

ESDER3-BRQ230: "Eliminate DLAP Mapping

DLAP mapping for PDRs and RDRRs is not required in the Master File

Implementation Note: A transition plan for DLAP mapping truncation must be developed. Items to include:

Existing DLAP mapping to be retained for historical data purposes

New resource IDs will not need any DLAP mapping"

Q: Will existing DLAP mapping be retained for historical data purposes? Could you please clarify on the historical data purposes? Will it be a requirement to remove it from the Master File later on?

A: Yes, existing DLAP mapping will be retained for historical data purposes in DRRS and Master File. There is no requirement to remove it from Master File at this time.

Questions Received On BRQ240,230 – ESDER3a

ESDER3-BRQ240: "NBT Price Threshold – DA Market. System to verify all RDRR, PDR and PDR-LSR-Curtailment bids submitted in DA Market are at or above monthly NBT price thresholds "

ESDER3-BRQ245: "NBT Price Threshold – RT Market. System to verify all PDR and PDR-LSR-Curtailment bids submitted in RT Market are at or above monthly NBT price thresholds"

Q: BRQ240 listed RDRR, PDR, and PDR-LSR, yet in BRQ245, RDRR is not listed.

A: There is an existing bid floor of $950 for RDRRs in real-time. ESDER 3 does not propose to change that rule.

ESDER3-BRQ255: "Bid Rejections

If Bids identified in BRQ240, BRQ245 and BRQ250 do not meet the applicable bid criteria noted in the respective BRQ, system shall:

- **Reject the bid and provide indication of rejection on system's User Interface**
- **Provide an Error Message appropriate for the rejection**
- **Allow rejected bids to be corrected and resubmitted"**

Q: Can CAISO clarify the data retention for bids? Is there a restriction to how many bids can be submitted?

A: No changes to the current data retention. And there is no restrictions as to how many bids submitted, however, the submittal will be based on Master File timeline.

Questions Received – ESDER3a

Q: Two of the 11 performance methodologies for EVSE registrations are listed as “EVSE-Res” and “EVSE-Non-Res” without further qualifiers. Do these assume a performance methodology, and, if so, are they 5 / 10 for Residential and 10 / 10 for Non-Residential? E.g., does EVSE-Res assume a 100% EVSE PDR while EVSE-Res + Day Matching 5/10 assumes a combination of EVSE and non-EVSE demand response, whether always at the same service account ID location or some submetered EVSE-only sites commingled in a registration with standard metering sites?

A: Yes EVSE-Residential will use a 5-in-10 and the EVSE-Non-Res will use a 10-in-10 methodology. And yes, “EVSE-Res + Day Matching 5/10” allows for a combination of EVSE and non-EVSE demand response as long as the combination is associated with a single service account ID.

Q: eMotorWerks seeks to confirm CAISO staff's commitment that EVSE-Res and EVSENon- Res will be able to be combined into a single PDR, and that the scheduling coordinator would be responsible for calculating separate baselines and settlements before aggregating based on the respective performance methodologies, as was the case when the new baseline methodologies were implemented with ESDER 2 in November 2018.

A: EVSE Non-Res and Res will be able to combine into a single PDR but will need to select the EVSE-Non-Res option and perform a 10/10 EVSE calculation (not a separate 5/10 and 10/10). If the PDR is 100% residential, the DRP can choose the “EVSE-Res 5/10” methodology.

Next Steps

The ISO is not anticipating future CPGs, remaining implementation detail and timelines will be communicated via the RUG and TUG calls.

- Customer Partnership Groups presentation available at: http://www.caiso.com/informed/Pages/MeetingsEvents/CustomerPartnershipGroups/Default.aspx
- RUG and TUG webpage available at: http://www.caiso.com/informed/Pages/MeetingsEvents/UserGroupsRecurringMeetings/Default.aspx