



# Energy Storage and Distributed Energy Resources (ESDER) Phase 3B

Training Session: Market Simulation Readiness  
June 22, 2020

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Customer Readiness

# Agenda

- ESDER 3 initiative
- Phase 3B changes
- Review application-specific details
- Market simulation activities



The ESDER initiatives are about refining market participation models and lowering barriers to storage and DER participation in ISO markets

ESDER 3 approved by ISO Board in September 2018 was divided into separate implementations

- Fall 2019: Hourly and 15-min DR bidding options, and removal of the single LSE requirement (successfully completed)
- Fall 2020: Load shift resource and electric vehicles supply equipment (EVSE) energy measurement

# Load shift product for behind the meter storage

- PDR-Load Shift Resource (PDR-LSR) allows storage to bid decreases and increases in load
  - Requires direct metering of behind the meter energy storage
  - Resource pays full retail rate for all charging energy
- PDR-LSR designed as two separate resource IDs
  - Load curtailment can bid from the net benefits test threshold price up to the bid cap
  - Load consumption can bid  $< \$0$  to the bid floor

# Enable sub-metering of behind the meter electric vehicle supply equipment (EVSE) load curtailment

- Currently, an EVSE's load curtailment value is coupled with its host facility's DR program participation
- ESDER 3B allows an EVSE to use a sub-meter to calculate a customer load baseline for its performance that is independent of the host facility
  - Only affects settlement value and does not allow for independent participation from host facility

# Demand response participation includes registration, bidding, and settlement activities

## Pre-Market Activities

- Secure Agreements
- Obtain System Access
- Submit request for Performance Evaluation Methodology approval
- Register Demand Resource
- Obtain Market Resource ID

Demand Response Processes/Systems effected by ESDER 3B Changes

## Market Activities

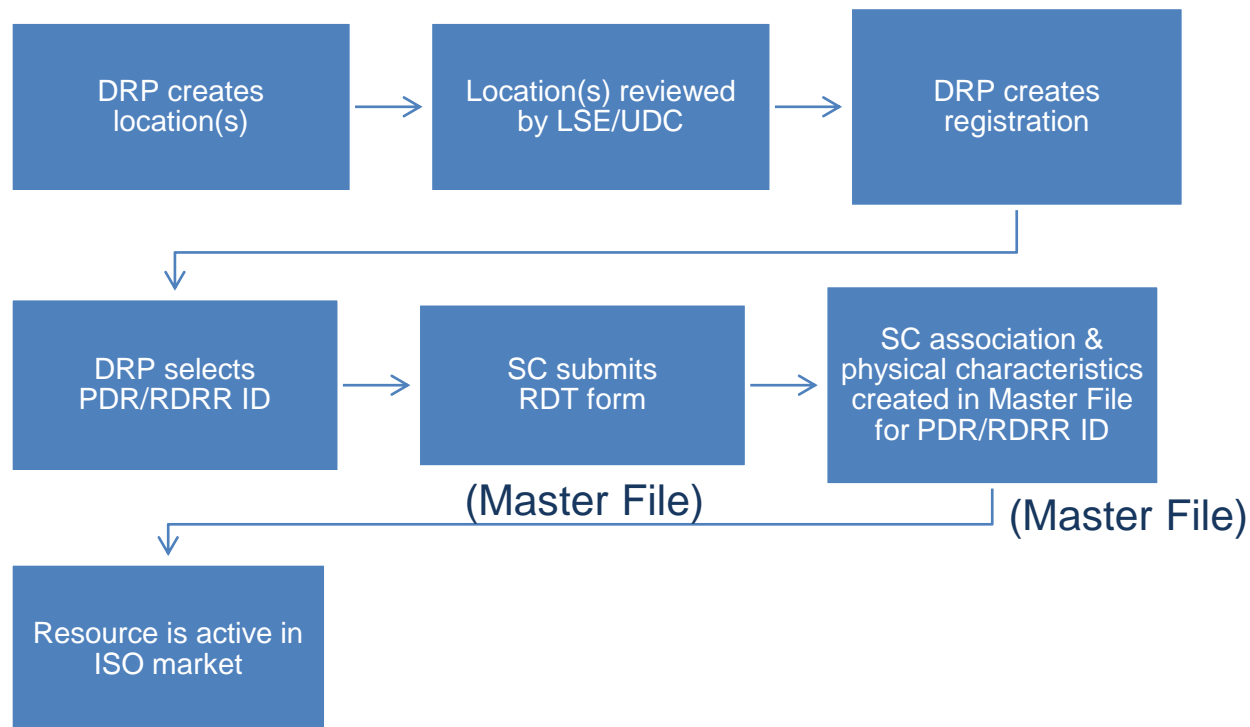
- Bidding Rules
- Bid Submission
- Customer Market Results Interface (CMRI) & Automated Dispatch System (ADS)

## Post-Market Activities

- Baselines – Performance Measurement
- Meter Data Submission
- Settlement

# Pre-Market Activities: Registration of locations provides visibility/auditability of aggregated participation to multiple entities

- Performance Evaluation Methodology aka Baseline Methodology approved
- Locations are created, reviewed, and registered in the Demand Response Registration System (DRRS) via user interface or API



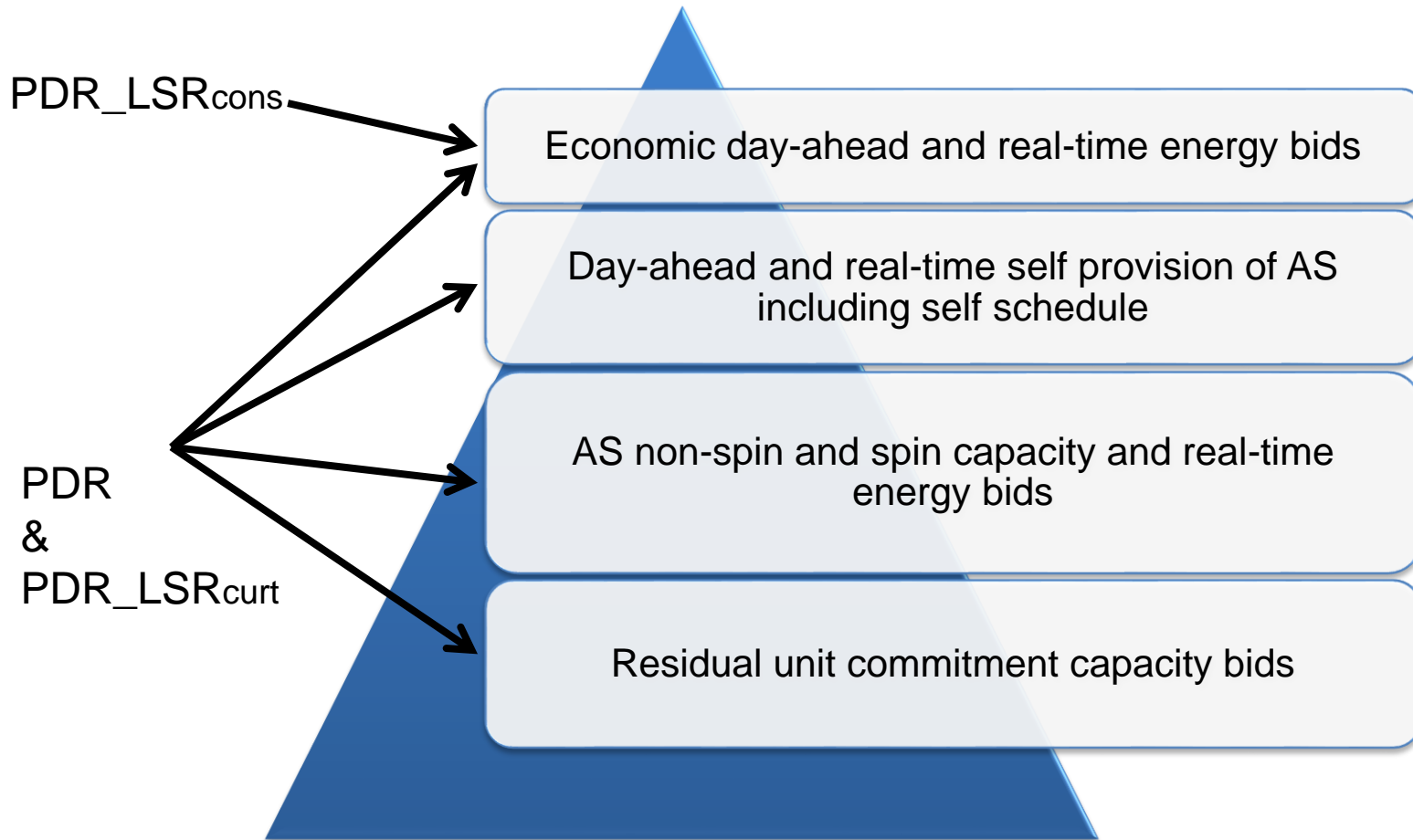
## Pre-Market Activities for PDR-LSR: Registration, Master File, and DRRS

A PDR-LSR must create a registration for both curtailment and consumption; cannot register to only offer load consumption

- Registrations for both resources will utilize the same service account(s)
- Registrations must include locations with a sub-metered storage device
- The ISO will enforce ramp rates to ensure that resource can be fully dispatchable from  $P_{min}$  to  $P_{max}$  in 15 or 5 min
- The PDR-LSR will be registered as two separate resource IDs in the Master File
  - In DRRS, PDR-LSR will be registered under the curtailment resource ID only
- Resource ID for curtailment must register with a  $P_{min}$  of 0 MW



# Market Activities: Scheduling Coordinators submit bids via Scheduling Infrastructure & Business Rules (SIBR) tool



# Overview of PDR Load Shift participation model

Design	Acronym	Services	Market dispatch	Description
Proxy Demand Resource	PDR	Energy, AS non-spinning, AS spinning, and Residual Unit Commitment (RUC)	Economic day-ahead and real-time	Bids into ISO markets as supply
Proxy Demand Resource Load Shift	PDR_LSR			
- Curtailment	PDR_LSR <sub>curt</sub>	Energy, AS non-spinning, AS spinning, and Residual Unit Commitment (RUC)	Economic day-ahead and real-time	Bids into ISO markets as supply
- Consumption	PDR_LSR <sub>cons</sub>	Energy		

- Both PDR-LSR bidding options must be uniform
  - 15-minute or 5-minute dispatchable
- Will be eligible for bid cost recovery
- PDR-LSR<sub>curt</sub> can bid from net benefits threshold NBT price to Bid Cap
  - Eligible to provide resource adequacy
- PDR-LSR<sub>cons</sub> can bid from Bid Floor to < \$0

Can bid in 10kW increments

Minimum load curtailment ≥ 100kW for energy

Minimum load curtailment ≥ 500kW for AS

Smaller loads may be aggregated to achieve minimum targets

Telemetry is required for resources ≥ 10MW and/or AS certification

## Post-Market Activities: Multiple types of Performance Evaluation Methodology baselines are supported for the measurement of a resource's performance

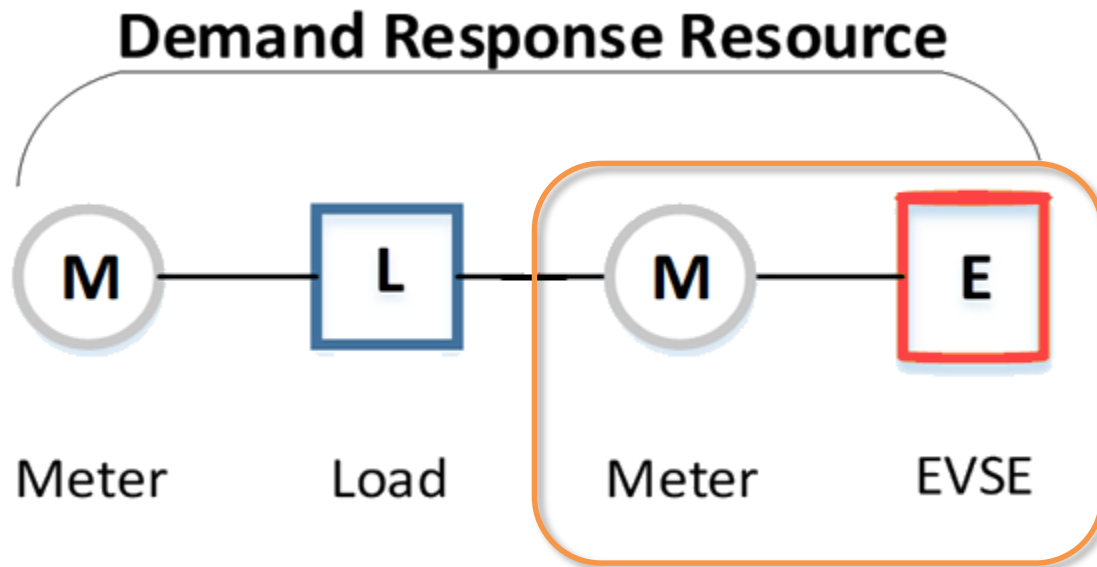
- **Control Groups**
  - Establishes baseline of load patterns during curtailment event using non-dispatched customers with similar profiles
- **Day Matching**
  - Estimates what electricity use would have been in absence of DR dispatch, using electricity use data on non-event but similar days
- **Weather Matching**
  - Estimates what electricity use would have been in absence of dispatch during non-event days with most similar weather conditions
- **Meter Generation Output**
  - Sub metered measurement of load offset from energy storage discharge
- **PDR\_LSR**
  - Sub metered measurement of load offset from energy storage discharge and load consumption from energy storage charge
- **EVSE**
  - Sub metered measurement of reduction from electric vehicle supply equipment estimating reduction of EV charging when dispatched as a separate contribution to resource performance measurement

# Electric Vehicle Supply Equipment (EVSE)

- Tailored for EVSE market participation
- EVSEs with sub-metering will be able to participate independent of, or in combination with, its host customer load
- New performance methodologies for residential and non-residential installations have been added

# Enable EVSE sub-metering and extend MGO performance method for EVSEs

- An EVSE's performance can be measured differently from the host facility



# EVSE: Registration and Metering Standards

- EVSEs will be able to calculate two types of customer load baselines
  - EVSE residential: Will use a 5-in-10 customer load baseline
  - EVSE non-residential: Will use a 10-in-10 customer load baseline
- All meters will follow the ISO's Metering BPM – Appendix G and Settlement Quality Meter Data Plan requirements
  - Appendix G applies if relevant LRA has not set any standards

## EVSE: Performance evaluation methodology

- EVSE performance will be measured using either the 5 in 10 or the 10 in 10 customer load baseline methodology
  - Both methodologies will have a look back period of 45 days using either 5 or 10 of the most recent non-event hours
  - Meter data derived from CLB will be 5-min granularity
    - If an EVSE generates 15-minute interval data, the SC will transpose the data to three 5-minute intervals
- Load point adjust will not apply to the EVSE baselines

# Baseline Method Reference Matrix – by location type

Location Device Type	Baseline Methods for Registration	
Energy Storage (ES)	PDR-LSR	New with ESDER 3B
	PDR-LSR+Day Matching 5/10	
	PDR-LSR+Day Matching 10/10	
	PDR-LSR+Weather Matching	
	PDR-LSR+Day Matching Combined	
	MGO+Day Matching 5/10	
	MGO+Day Matching 10/10	
	MGO+Day Matching Combined	
	MGO+Weather Matching	
	Weather Matching	
	Meter Generation Output	Existing methods
	Day Matching Combined	
	Day Matching 10/10	
	Day Matching 5/10 (Residential Only)	
	Control Group	



# Baseline Method Reference Matrix – by location type

Location Device Type	Baseline Methods for Registration	
Electric Vehicle Supply Equipment (EVSE)	EVSE res	New with ESDER 3B
	EVSE res+Day Matching 5/10	
	EVSE res+Day Matching 10/10	
	EVSE res+Day Matching Combined	
	EVSE res+Weather Matching	
	EVSE non-res	
	EVSE non-res+Day Matching 10/10	
	EVSE non-res+Weather Matching	
	EVSE non-res+Day Matching Combined	Existing methods
	Weather Matching	
	Day Matching Combined	
	Day Matching 10/10	
	Day Matching 5/10 (Residential Only)	
	Control Group	

# Baseline Method Reference Matrix – by location type

## Location Device Type

## Baseline Methods for Registration

Neither ES Nor EVSE

Weather Matching  
Day Matching Combined  
Day Matching 10/10  
Day Matching 5/10 (Residential Only)  
Control Group



Existing methods

# Baseline Method Reference Matrix – by location type

Location Device Type	Baseline Methods for Registration
Both ES and EVSE	PDR-LSR
	PDR-LSR+Day Matching 5/10
	PDR-LSR+Day Matching 10/10
	PDR-LSR+Weather Matching
	PDR-LSR+Day Matching Combined
	MGO+Day Matching 5/10
	MGO+Day Matching 10/10
	MGO+Day Matching Combined
	MGO+Weather Matching
	EVSE res
	EVSE res+Day Matching 5/10
	EVSE res+Day Matching 10/10
	EVSE res+Day Matching Combined
	EVSE res+Weather Matching
	EVSE non-res

New with  
ESDER 3B

# Baseline Method Reference Matrix – by location type

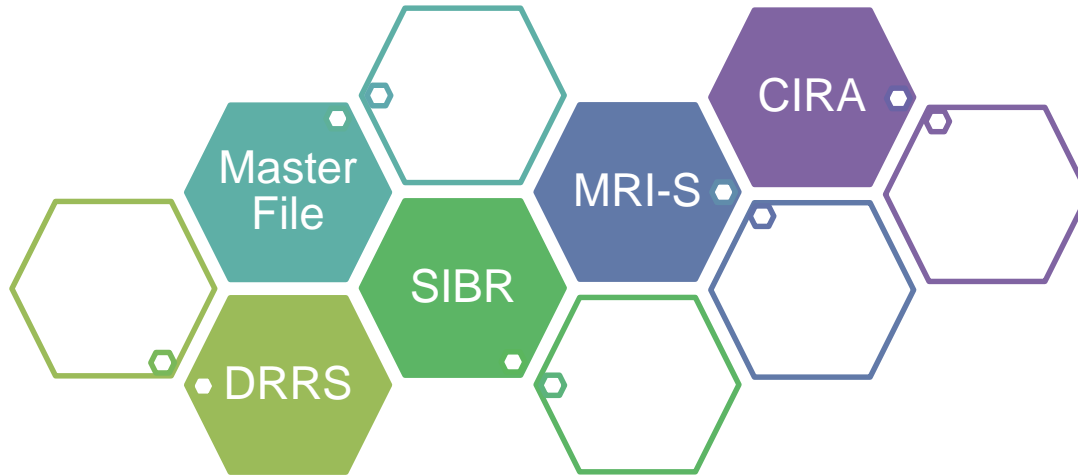
Location Device Type	Baseline Methods for Registration		
Both ES and EVSE	EVSE non-res+Day Matching 10/10	New with ESDER 3B	
	EVSE non-res+Weather Matching		
	EVSE non-res+Day Matching Combined		
	Weather Matching	Existing methods	
	Meter Generation Output		
	Day Matching Combined		
	Day Matching 10/10		
	Day Matching 5/10 (Residential Only)		
	Control Group		

# Summary of DR Resource Types, Bidding, and Energy Services

DR Resource Type (DR_TYPE)	Bid Dispatchable Option (BID_DISP_OPT)	Bid Range	Services	Market Dispatch	Description
PDR	60, 15, or 5	NBT Price to Bid Cap	Energy, Spin and Non-Spin, and Residual Unit Commitment (RUC).  Note: PDR electing 60 minute bid dispatchable option not considered in RUC.	Economic, Day-Ahead, and Real-Time	Bids into the ISO Markets as Supply
RDRR	5	NBT Price to Bid Cap	Energy	Economic, Day-Ahead, Reliability Real-Time	Bids into the ISO Markets as Supply; used for reliability purposes

# Summary of DR Resource Types, Bidding, and Energy Services

DR Resource Type (DR_TYPE)		Bid Dispatchable Option (BID_DISP_OPT)	Bid Range	Services	Market Dispatch	Description
PDR_LSR		15, or 5.  Must be the same for both Curtailment and Consumption Resource ID	Curtailment Resource ID:	Curtailment Resource ID: Energy, Spin and Non-Spin, and Residual Unit Commitment (RUC)	Economic, Day-Ahead, and Real-Time	Curtailment Resource ID:
A Single Resource	Curtailment Resource ID		NBT Price to Bid Cap.			Bids into the ISO Markets as Supply
	Consumption Resource ID			Consumption Resource ID:		Consumption Resource ID:
			Consumption Resource ID:	Energy		Bids into the ISO Markets as  NGR – Dispatchable Demand Resource (DDR)
			Negative Bid Floor to < \$0		Note: Curtailment and Consumption Resource ID may be dispatched independently	



# REVIEW APPLICATION-SPECIFIC DETAILS

# DRRS: The application URL is changing

DRRS

## Changing from (existing)

- <https://portalmap.caiso.com/drrs> URL for market sim
- <https://portal.caiso.com/drrs> URL for production

## Changing to (new)

- <https://drrs.map.caiso.com> URL for market sim
- <https://drrs.prod.caiso.com> URL for production



- New baseline methods have been added for both PDR-LSRs and EVSEs
- New attribute for locations to indicate an energy storage (ES) device or Electric Vehicle Supply Equipment (EVSE)
- PDR-LSR registration must include at least 1 Service Account with a Energy storage (ES) device
- A PDR-LSR curtailment resource ID can only be selected and associated to a registration if that registration has selected a PDR-LSR baseline method

# DRRS: Creating locations

New **Device Type** field has been added to DRRS

Location Creation	Before ESDER 3B Activation	On/After ESDER 3B Activation
Location without Device Type Effective today onward	Applicable	Applicable
Location with Device Type (ES or EVSE) Effective with ESDER 3B		Applicable

# DRRS: Creating Locations

In the DRRS location module, DRP user has the option to define a **Device Type**: (ES = Energy Storage, EVSE = Electric Vehicle Supply Equipment, or None/Blank)

The screenshot shows a web interface for creating a new location. The breadcrumb trail is '> DRP VIEW > Create New Locations'. The form title is 'Create New Location'. The fields are as follows:

Name*	TestLocation	Address 1*	123 Street
SAN*	SAN12345	Address 2	
Start Date*	06/10/2020	City*	Folsom
End Date*	06/30/2022	State*	California
DRP*	DRP 1	Zip*	95630
UDC*	UDC 1	Address Type	
LSE*	LSE 1	Device Type	ES EVSE
SUBLAP*	SLAP_BBBB		
PNODE			

At the bottom of the form are three buttons: Cancel, Save, and Submit.

# DRRS: DRP Location View



DRP Location view showing the new **Device Type** column

Locations

Select Loc ID | Name | SAN | DRP | UDC | LSE | SUBLAP | Device Type | PNODE | Start Date | End Date | Status | Defense Active? | Defense Start | Defense End | Rows 25

Select Loc ID	Name	SAN	DRP	UDC	LSE	SUBLAP	Device Type	PNODE	Start Date	End Date	Status	Defense Active?	Defense Start	Defense End
<input type="checkbox"/>	11538751	GK Loc AA for FRQ900	567890125				EVSE		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11538750	GK Loc AA for FRQ900	567890124				ES		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11538749	GK Loc AA for FRQ900	567890123				ES		06/09/2020	07/08/2020	Inactive			
<input type="checkbox"/>	11538785	GK Loc AA for FRQ901	56781230				ES		06/10/2020	07/09/2020	Pending			
<input type="checkbox"/>	11538791	GK Loc AA for FRQ902	56784351				EVSE		06/10/2020	07/09/2020	Inactive	Y	06/10/2020	06/12/2020
<input type="checkbox"/>	11538799	GK Loc AA for FRQ902 - Incumbent	56784352				ES		06/10/2020	07/10/2020	Inactive	Y	06/10/2020	06/12/2020
<input type="checkbox"/>	11538801	GK Loc AA for FRQ902 - Prospective	56784352				ES		06/10/2020	07/10/2020	Duplicate			
<input type="checkbox"/>	11538792	GK Loc AA for FRQ902 - Prospective	56784351				EVSE		06/10/2020	07/10/2020	Duplicate			
<input type="checkbox"/>	11538760	GK Loc AA for FRQ903	567890134				ES		06/09/2020	07/08/2020	Disputed			
<input type="checkbox"/>	11538759	GK Loc AA for FRQ903	567890133				ES		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11538758	GK Loc AA for FRQ903	567890132				EVSE		06/09/2020	07/08/2020	Disputed			
<input type="checkbox"/>	11538757	GK Loc AA for FRQ903	567890131				ES		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11538756	GK Loc AA for FRQ903	567890130				EVSE		06/09/2020	07/08/2020	Disputed			
<input type="checkbox"/>	11538755	GK Loc AA for FRQ903	567890129				ES		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11538754	GK Loc AA for FRQ903	567890128				EVSE		06/09/2020	07/08/2020	Disputed			
<input type="checkbox"/>	11538753	GK Loc AA for FRQ903	567890127				ES		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11538752	GK Loc AA for FRQ903	567890126				EVSE		06/09/2020	07/08/2020	Pending			
<input type="checkbox"/>	11537549	LOC_ES and EVSE_LOC_TEST	SAN_ES and EVSE_LOC_TEST				ES+EVSE		06/08/2020	12/31/2020	Active			

# DRRS: LSE/UDC Location View

DRRS

LSE/UDC Location view showing the new **Device Type** column

Locations

Select Loc ID    Name    SAN    DRP    UDC    LSE    SUBLAP    **DEVICE TYPE**    PNODE    Start Date    End Date    Review Start    Review End    Status

Select Loc ID	Name	SAN	DRP	UDC	LSE	SUBLAP	DEVICE TYPE	PNODE	Start Date	End Date	Review Start	Review End	Status
<input checked="" type="checkbox"/>	11535761000001	LOC_TEST_1_2SAV1					ES		06/10/2020	12/30/2021	06/10/2020	06/12/2020	Pending
<input type="checkbox"/>	11538804	UD_LOC_TEST1_700					EVSE		06/10/2020	12/30/2020	06/10/2020	06/12/2020	Pending
<input type="checkbox"/>	11538803	LOC_ST_A6_Test1					ES+EVSE		06/10/2020	12/31/2020	06/10/2020	06/12/2020	Pending
<input type="checkbox"/>	11538802	UD_TESTB4_ES4					ES		06/10/2020	12/30/2030	06/10/2020	06/12/2020	Pending
<input type="checkbox"/>	11538801	GK Loc AA for FRQ902 - Prospective					ES		06/10/2020	07/10/2020			Duplicate
<input type="checkbox"/>	11538799	GK Loc AA for FRQ902 - Incumbent					ES		06/10/2020	07/10/2020	06/10/2020	06/12/2020	Inactive
<input type="checkbox"/>	11538798	UD_TESTB4_EVSE1					EVSE		06/10/2020	12/30/2030			New
<input type="checkbox"/>	11538795	UD_LOC_TEST_150					ES+EVSE		06/12/2020	12/30/2020	06/10/2020	06/12/2020	Pending
<input type="checkbox"/>	11538794	LOC_TESTB4_ES2					ES		06/10/2020	12/30/2030			New
<input type="checkbox"/>	11538792	GK Loc AA for FRQ902 - Prospective					EVSE		06/10/2020	07/10/2020			Duplicate

# DRRS: Creating registrations



In the DRRS registration module, DRP user can choose from their own approved list of baselines (old + new)

DRP VIEW > Registration

Registration

Reg Id:

Name:

Start Date:

End Date:

DRP:

UDC:

DRP SCID:

Program:

Resource Type:

Resource:

PMax:

Status:

Baseline Method

SUBLAR

Refresh Available

Show/Refresh

Available

Control Group

Day Matching 10/10

Day Matching 5/10 (Residential Only)

Day Matching Combined

EVSE non-res

EVSE non-res+Day Matching 10/10

EVSE non-res+Day Matching Combined

EVSE non-res+Weather Matching

EVSE res

EVSE res+Day Matching 10/10

EVSE res+Day Matching 5/10

EVSE res+Day Matching Combined

EVSE res+Weather Matching

Meter Generation Output

MGO+Day Matching 10/10

MGO+Day Matching 5/10

MGO+Day Matching Combined

MGO+Weather Matching

PDR-LSR

PDR-LSR+Day Matching 10/10

PDR-LSR+Day Matching 5/10

PDR-LSR+Day Matching Combined

PDR-LSR+Weather Matching

Weather Matching

ID	Name	End Date	Device Type	PNODE	Rows
					25

Selected Locations

Distribution Factor

# DRRS: Changes to look and feel



California ISO Demand Response Registration System

DRP VIEW | UDC VIEW | LSE VIEW | ADMINISTRATION

DRP VIEW Locations

LOC ID [ ] LOC Name [ ] SAN [ ] DRP [ALL] UDC [ALL] LSE [ALL] SUBLAP [ALL] Defense Active [ALL] Apply Reset

Create Copy Delete Defend Withdraw Edit End Date Register

Locations

Select Loc ID	Name	SAN	DRP	UDC	LSE	SUBLAP	PNODE	Start Date	End Date	Status	Defense Active?	Defense Start	Defense End
<input type="checkbox"/>													

Registrations

Reg ID	Reg Name	Start Date	End Date	Status
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**CURRENT**

California ISO Demand Response Registration System

DRP VIEW | UDC VIEW | LSE VIEW | ADMINISTRATION

DRP VIEW > Locations

LOC ID [ ] LOC Name [ ] SAN [ ] DRP [I] UDC [ALL] LSE [ALL] SUBLAP [ALL] Defense Active [ALL] Updated Since DateTime [ ] Apply Reset

Create Copy Delete Defend Withdraw Edit End Date Register

Locations

Select Loc ID	Name	SAN	DRP	UDC	LSE	SUBLAP	Device Type	PNODE	Start Date	End Date	Status	Defense Active?	Defense Start	Defense End
<input type="checkbox"/>														

Registrations

Reg ID	Reg Name	Start Date	End Date	Status
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**FALL 2020**

# DRRS: Registration baselines

DRRS

Registration Baselines		Before ESDER 3B Activation	On/After ESDER 3B Activation
<b>Pre-existing to ESDER 3B Effective today onwards</b>	1)Weather Matching	X	X
	2)Day Matching Combined	X	X
	3)Day Matching 10/10	X	X
	4)Day Matching 5/10 (Residential Only)	X	X
	5)Control Group	X	X
	6)*Meter Generation Output (without an Energy Storage location)	X	
<b>*MGO **MGO with 10 in 10 will retire/deprecate</b>	*Meter Generation Output (at least one Energy Storage location)		X
	**Meter Generation Output with 10 in 10	X	Not Available
<b>New with ESDER 3B – Load Shifting Effective starting ESDER 3B</b>  <b>Requires at least one location with an Energy Storage (ES) device type</b>	1)PDR-LSR		X
	2)PDR-LSR+Day Matching 5/10		X
	3)PDR-LSR+Day Matching 10/10		X
	4)PDR-LSR+Weather Matching		X
	5)PDR-LSR+Day Matching Combined		X
	6)MGO+Day Matching 5/10		X
	7)MGO+Day Matching 10/10		X
	8)MGO+Day Matching Combined		X
	9)MGO+Weather Matching		X
<b>New with ESDER 3B – Electric Vehicle Supply Equipment Effective starting ESDER 3B</b>  <b>Requires at least one location with an Electric Vehicle Supply Equipment (EVSE) device type</b>	1)EVSE res		X
	2)EVSE res+Day Matching 5/10		X
	3)EVSE res+Day Matching 10/10		X
	4)EVSE res+Day Matching Combined		X
	5)EVSE res+Weather Matching		X
	6)EVSE non-res		X
	7)EVSE non-res+Day Matching 10/10		X
	8)EVSE non-res+Weather Matching		X
	9)EVSE non-res+Day Matching Combined		X



# DRRS: Some re-registration is required

DRRS

- MGO 10-in-10 methodology is being retired/deprecated
  - Current registrations set up with this baseline methodology must be end-dated and re-registered with a location that has a storage device
- Service Accounts for which an **energy storage** device exists must be terminated and re-registered to identify energy storage device
- Service Accounts for which an **EVSE device** exists must be terminated and re-registered to identify the EVSE device

The following API enhancements will be implemented along with the Fall 2020 release

- Ability to retrieve/view incremental data changes (locations/registrations)
- Data that was previously available in the UI only will be accessible via the API:
  - Retrieving:
    - Locations that are under the defense process
    - Location review workflow results (UDC/LSE approval status, comments, contact, phone)
    - Location defense workflow results (Incumbent/Prospective DRP approval status, comments, contact, phone)
    - Location review period (start/end)

- New choices added to **DR\_TYPE** column:
  - Added option for PDR\_LSR Consumption/PDR-LSR Curtailment
  - Two Resource IDs will be assigned to allow consumption/curtailment participation
    - Both resource IDs must have the same:
      - Scheduling Coordinator
      - Bid Dispatchable Option Type (must be 5 or 15 min)
      - Start/End Dates
  - PDR-LSR Consumption Model
    - $P_{min} < \text{zero } (0)$  /  $P_{max}$  of zero (0)
  - PDR-LSR Curtailment Model
    - $P_{min} = \text{zero } (0)$  /  $P_{max} > \text{zero } (0)$
  - Validation rules apply to Worst Operational Ramp Rate  
 $(RAMP\_MIN\_RATE) \geq (MAX\_GEN - MIN\_GEN) / BID\_DISP\_OPT$

# Scheduling Infrastructure & Business Rules (SIBR)

SIBR

All PDR-LSR-Consumption bids submitted in both the Day-Ahead and Real-Time Market must be:

- Equal to or greater than the current bid floor price of -\$150
- Less than \$0.00
- If submitted bid does not meet this criteria, SIBR will:
  - reject the bid
  - provide an appropriate error message
  - allow the rejected bid to be corrected and resubmitted

- External DRPs shall submit meter data for a resource that is associated to a registration with one of the EVSE or PDR-LSR baseline methods using the matrix provided on the following slide
- Meter Billing Determinants
  - PDR-LSR Curtailment resource meters are mapped to BA\_5M\_RSRC\_PERF\_METER\_QTY
  - PDR-LSR Consumption resource meters are mapped to BA\_5M\_RSRC\_METER\_QTY

# MRI-S Data Submittal Requirements for Demand Response Resources



Baseline Method	AS Resource Only						
	LOAD	MBMA	LOAD	GEN	CBL	TMNT	BASE
Control Group	X	X		X	X	X	X
Day Matching 5/10	X	X		X	X		X
Day Matching 10/10	X	X		X	X		X
Day Matching Combined	X	X		X	X		X
Weather Matching	X	X		X	X		X
MGO	X	X		X		X	
MGO with Day Matching 5/10	X	X		X	X	X	X
MGO with Day Matching 10/10	X	X		X	X	X	X
MGO with Day Matching Combined	X	X		X	X	X	X
MGO with Weather Matching	X	X		X	X	X	X
PDR-LSR (Curtailment)	X	X		X		X	
PDR-LSR (Consumption)			X	X		X	
PDR-LSR (Curtailment only) with Day Matching 5/10	X	X		X	X	X	X
PDR-LSR (Curtailment only) with Day Matching 10/10	X	X		X	X	X	X
PDR-LSR (Curtailment only) with Day Matching Combined	X	X		X	X	X	X
PDR-LSR (Curtailment only) with Weather Matching	X	X		X	X	X	X
EVSE res	X	X		X			
EVSE res with Day Matching 5/10	X	X		X	X	X	X
EVSE res with Day Matching 10/10	X	X		X	X	X	X
EVSE res with Day Matching Combined	X	X		X	X	X	X
EVSE res with Weather Matching	X	X		X	X	X	X
EVSE non-res	X	X		X			
EVSE non-res with Day Matching 10/10	X	X		X	X	X	X
EVSE non-res with Day Matching Combined	X	X		X	X	X	X
EVSE non-res with Weather Matching	X	X		X	X	X	X

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources

Measurement Type	Data Granularity	Baseline Method	Comments
LOAD	5 minute	<ul style="list-style-type: none"> <li>Control Group</li> <li>Day Matching 5/10 (Residential Only)</li> <li>Day Matching 10/10</li> <li>Day Matching Combined</li> <li>Weather Matching</li> <li>Meter Generation Output<sup>1</sup></li> <li>Meter Generation Output with Customer Load Baseline<sup>2</sup></li> <li>PDR-LSR (CUR only)</li> <li>PDR-LSR (CUR) with Customer Load Baseline<sup>3</sup></li> <li>EVSE-Res</li> <li>EVSE-Res with Customer Load Baseline<sup>4</sup></li> <li>EVSE-Non-Res</li> <li>EVSE-Non-Res with Customer Load Baseline<sup>5</sup></li> </ul>	<p>AS Resource only</p> <p>This is the actual load for intervals the resource receives an Ancillary Service award.</p> <p>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.<sup>6</sup></p> <p>For PDR-LSR, and PDR with Customer Load Baseline, data is submitted for the PDR-LSR curtailment (CUR) ID only.</p> <p>For EVSE it would be the load at the EVSE. For EVSE with CLB submit load at the facility level.</p>

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources

Measurement Type	Data Granularity	Baseline Method	Comments
LOAD	5 minute	<ul style="list-style-type: none"> <li>PDR-LSR(CON)</li> </ul>	<p>PDR-LSR Consumptions (CON) ID submit "LOAD" only. This represents the energy consumption or reduction when dispatched.</p> <p>Data required for intervals where TEE&gt;0.</p>
GEN	5 minute	<ul style="list-style-type: none"> <li>Control Group</li> <li>Day Matching 5/10 (Residential Only)</li> <li>Day Matching 10/10</li> <li>Day Matching Combined</li> <li>Weather Matching</li> <li>Meter Generation Output</li> <li>Meter Generation Output with Customer Load Baseline</li> <li>PDR-LSR (CUR and CON)</li> <li>PDR-LSR (CUR) with Customer Load Baseline<sup>3</sup></li> <li>EVSE-Res</li> <li>EVSE-Res with Customer Load Baseline<sup>4</sup></li> <li>EVSE-Non-Res</li> <li>EVSE-Non-Res with Customer Load Baseline<sup>5</sup></li> </ul>	<p>Demand Response Energy Measurement (DREM) or performance data of the resource in response to an award or dispatch.</p> <p>Data required for intervals where TEE&gt;0.</p>



# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources

MRI-S

Measurement Type	Data Granularity	Baseline Method	Comments
MBMA	5 minute	<ul style="list-style-type: none"> <li>Control Group</li> <li>Day Matching 5/10 (Residential Only)</li> <li>Day Matching 10/10</li> <li>Day Matching Combined</li> <li>Weather Matching</li> <li>Meter Generation Output</li> <li>Meter Generation Output with Customer Load Baseline<sup>2</sup></li> <li>PDR-LSR (CUR only)</li> <li>PDR-LSR (CUR) with Customer Load Baseline<sup>3</sup></li> <li>EVSE-Res</li> <li>EVSE-Res with Customer Load Baseline<sup>4</sup></li> <li>EVSE-Non-Res</li> <li>EVSE-Non-Res with Customer Load Baseline<sup>5</sup></li> </ul>	<p>AS Resource Only</p> <p>This is the actual load data for the interval preceding, during, and following the trading intervals for which they were awarded ancillary services.<sup>7</sup></p> <p>For PDR-LSR and PDR-LSR with Customer Load Baseline, data is submitted for the PDR-LSR curtailment ID only.</p> <p>For EVSE it would be the load at the EVSE. For EVSE with CLB submit load at the facility level.</p>

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources



Measurement Type	Data Granularity	Baseline Method	Comments
CBL	Hourly	<ul style="list-style-type: none"> <li>Control Group</li> <li>Day Matching 5/10 (Residential Only)</li> <li>Day Matching 10/10</li> <li>Day Matching Combined</li> <li>Weather Matching</li> <li>Meter Generation Output with 10 in 10 (Customer Load Baseline)<sup>2</sup></li> <li>PDR-LSR (CUR) with Customer Load Baseline<sup>3</sup></li> <li>EVSE-Res with Customer Load Baseline<sup>4</sup></li> <li>EVSE-Non-Res with Customer Load Baseline<sup>5</sup></li> </ul>	<p>For monitoring only.</p> <p>Underlying load data used in the customer load baseline calculation for all baseline methods. 90 days of historical data prior to the day of the event is required.</p> <p>PDR-LSR with CLB Curtailment ID only</p> <p>This is applicable for the “MGO and EVSE res and non-res with CLB”<sup>8</sup> 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</p> <p>PDR-LSR with CLB submit resource IDs PDR-LSR curtailment</p>

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for DR Resources



Measurement Type	Data Granularity	Baseline Method	Comments
TMNT	Hourly	<ul style="list-style-type: none"> <li>Control Group</li> <li>Meter Generation Output<sup>1</sup></li> <li>Meter Generation Output with 10 in 10 (Customer Load Baseline)<sup>2</sup></li> <li>PDR-LSR (CUR and CON)</li> <li>PDR-LSR (CUR) with Customer Load Baseline<sup>3</sup></li> <li>EVSE-Res</li> <li>EVSE-Res with Customer Load Baseline<sup>4</sup></li> <li>EVSE-Non-Res</li> <li>EVSE-Non-Res with Customer Load Baseline<sup>5</sup></li> </ul>	<p>For monitoring Only</p> <p>Submit for trade date where TEE &gt; 0. 90 days of historic data prior to the day of the event is required. For the Control Group baseline method, data represents the actual load data for those locations in the treatment group.</p> <p>For the MGO and MGO 10 in 10 baseline methods, TMNT data represents the generation device metered values.</p> <p>For PDR-LSR submit both resource IDs, the consumption and curtailment IDs. For PDR-LSR with CLB, submit only the curtailment only ID.</p> <p>For all EVSEs, this represents the load at the EVSE.</p>

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources

Measurement Type	Data Granularity	Baseline Method	Comments
BASE	Hourly	<ul style="list-style-type: none"> <li>Control Group</li> <li>Day Matching 5/10 (Residential Only)</li> <li>Day Matching 10/10</li> <li>Day Matching Combined</li> <li>Weather Matching</li> <li>Meter Generation Output with Customer Load Baseline<sup>2</sup></li> <li>PDR-LSR (CUR) with Customer Load Baseline<sup>3</sup></li> <li>EVSE-Res with Customer Load Baseline<sup>4</sup></li> <li>EVSE-Non-Res with Customer Load Baseline<sup>5</sup></li> </ul>	<p>For monitoring Only</p> <p>Calculated customer load baseline (CLB) values used to derive DREM.</p> <p>For the MGO with CLB, EVSE res with CLB, EVSE non-res with CLB, and PDR-LSR (CUR) with Customer Load Baseline, BASE data represents the customer load baseline used to calculate the DREM attributed to the pure load reduction only.</p> <p>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.</p>

- PDR\_LSR Consumption resources are not eligible for Resource Adequacy
- CIRA will not allow a PDR-LSR Consumption resource to submit a request for NQC

California ISO | Customer Interface for Resource Adequacy

Plans RA Validation Substitutions RAAIM Pre-Calc CSP Offers Reports Legacy Replacements

### Upload Submit NQC Request Form

- ❗ Invalid ResourceId (Cell B3)
- ❗ NQC upload not allowed for PDR-LSR Consumption Resource PGCC\_1\_PDRPCON002 (Cell B3)
- ❗ Invalid ResourceId (Cell B2)
- ❗ NQC upload not allowed for PDR-LSR Consumption Resource PGCC\_1\_PDRPCON001 (Cell B2)

SCID

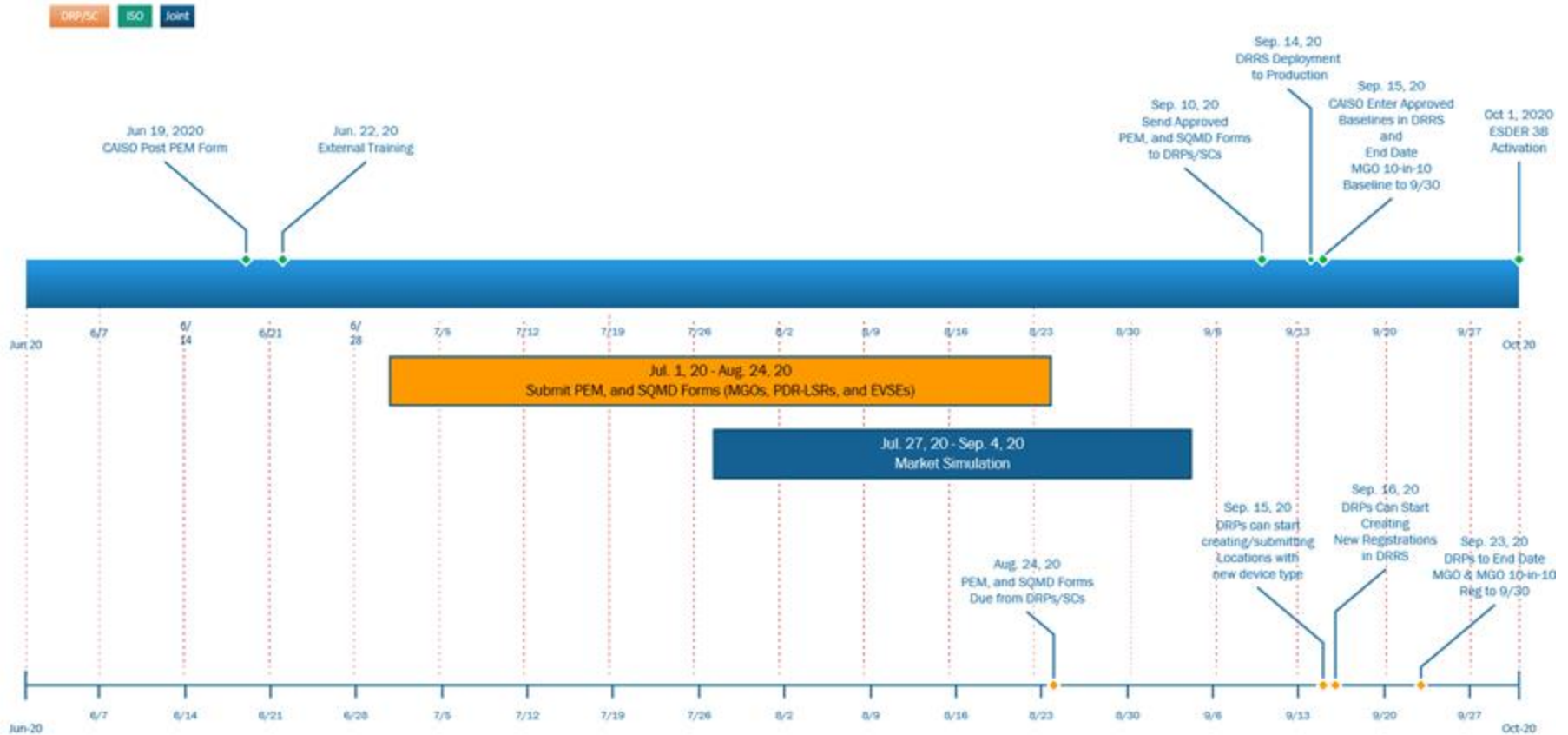
NQC Request Form

Performance Evaluation Methodology (PEM) Form  
Market Simulation

# READINESS ACTIVITIES

# Implementation Timeline

\* Attend the RUG and Market Sim calls for any updates to the dates below \*



**Note:** SC shall follow the normal Master File process. Master File may take up to 10 business days for processing.

# Performance Evaluation Methodology (PEM) Form

- Performance Evaluation Methodology (PEM) form posted on June 19
- Begin submitting these forms July 1



# Application access



California ISO

## Market Applications

[Market Participant Portal](#)

[CAISO.com](https://www.caiso.com)

**MAP-STAGE**

### Application Access



**AIM**

Access and Identity Management

### Inquiries & Disputes



**CIDI**

Customer Inquiry Dispute and Information

### Market & Operations



**CMRI**

Customer Market Results Interface



**CRR**

Congestion Revenue Rights



**SIBR**

Scheduling Infrastructure & Business Rules



**SIBR Reports**

Scheduling Infrastructure & Business Rules Reports

### Metering



**OMAR**

Operational Meter Analysis & Reporting

### OASIS



**OASIS**

Open Access Same-Time Information System

### Outage Coordination



**WebOMS**

Outage Management System

### Reliability Requirements



**CIRA**

Customer Interface for Resource Adequacy



**RAAM**

Resource Adequacy Availability Management

### Renewables & Demand Response



**DRS**

Demand Response System



**DRRS**

Demand Response Registration System



**PIRP**

Participating Intermittent Resource Program

### Settlements



**MRI-S**

Market Results Interface - Settlements

### Systems & Resource Modeling



**TR**

Transmission Registry



**Master File**



**RIMS**

Resource Interconnection Management System



**RIMSG**

Resource Interconnection Management System - Generation

# Market Simulation Activities: PDR-LSR Curtailment

Market simulation structured scenarios provide customers with the ability to preview and test the following items from bid to bill:

- PDR-LSR Curtailment
  - Dispatch PDR-LSR Curtailment Resources for Spin/Non spin Awards with Resources complying with dispatch instructions for duration of the dispatch
  - Dispatch PDR-LSR Curtailment Resources for Spin/Non spin Awards with the Resources not complying with dispatch instructions for duration of the dispatch

## Market Simulation Activities: PDR-LSR Consumption

Market simulation structured scenarios provide customers with the ability to preview and test the following items from bid to bill:

- PDR-LSR Consumption
  - Dispatch PDR-LSR Consumption Resources for trade date where Resource complies with CAISO dispatch instructions
  - Dispatch PDR-LSR Consumption Resources for trade date where Resource does not comply with CAISO dispatch instructions

# Setup for Market Simulation Activities

- Complete additional setup for structured scenarios by the dates listed below
- Market participants will need to register their request with the ISO to participate in this simulation via the [MarketSim@caiso.com](mailto:MarketSim@caiso.com) mailbox
- Identify up to three Baseline Methodologies that will be utilized in the registrations for PDR-LSR, and up to three for EVSE by 7/13/2020

# Market Simulation Activities

- Identify up to three PDR-LSR Resource IDs that will be registered in the Master File for use in the structured scenarios by 7/20/20:
  - PDR-LSR Curtailment
  - PDR-LSR Consumption
- Identify any PDR registrations/resource ID that will be submitted for market runs that reflect EVSE by 7/20/20
- Additional instructions and dates are listed in the market sim structured scenarios document

# Market Simulation Activities

- Link to market sim structured scenarios included in the reference section
- Users must be provisioned for access in order to participate in market simulation
- Attend the Market Simulation calls to stay informed on the timing of activities for this and other Fall 2020 release initiatives

# Questions?



**Thank you for your participation!**

For more detailed information on anything presented, please  
visit our website at:

[www.caiso.com](http://www.caiso.com)

Or send an email to:  
CustomerReadiness@caiso.com



# REFERENCE MATERIAL

# Reference Material

- Business Practice Manual changes:
  - [BPM Change Management](#)
    - Demand Response – changes identified in PRR 1247
    - Market Instruments – changes identified in PRR 1245
    - Market Operations – changes identified in PRR 1246
    - Metering – changes identified in PRR 1253
    - Outage Management – changes identified in PRR 1248
    - Reliability Requirements – changes identified in PRR 1243
- Business Requirements Specification:
  - <http://www.caiso.com/Documents/BusinessRequirementsSpecificationClean-EnergyStorageandDistributedEnergyResourcesPhase3.pdf>
- Demand response net benefits test results:
  - <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=AA4CD173-9624-4B52-B148-3D3C8EAB375C>

# Reference Material

- DRRS User Guide will be updated prior to market simulation. Currently scheduled to post on 7/20/20
- ESDER Initiative webpage:
  - [http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage\\_DistributedEnergyResources.aspx](http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx)
- Market Simulation Structured Scenarios:
  - <http://www.caiso.com/Documents/ESDER3BMarketSimulationStructuredScenariosFall2020.pdf>
- Master File Changes – new Generator Resource Data Template will be posted with the rest of the Fall release changes at this location:
  - <http://www.caiso.com/market/Pages/NetworkandResourceModeling/Default.aspx>

# Reference Material

- Technical Specifications – located on the [ISO's Developer Site](#) which provides detailed descriptions of the API changes for:
  - DRRS
  - Master File

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources (footnotes)

- <sup>1</sup>“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”.
- <sup>2</sup>“MGO with Customer Load Baseline” formerly known as “Meter Generation Output 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 of Day Matching 10 in 10, Day Matching 5 in 10 (residential customers only), Day Matching Combined, weather matching combined with the DREM from load reduction attributed to generation offset (MGO). Referred to as “load and generation”
- <sup>3</sup>PDR-LSR with Customer Load Baseline (CLB) includes Day Matching 5-in-10, Day Matching 10-in-10, Weather Matching, and Day Matching combined.
- <sup>4</sup>EVSE residential with Customer Load Baseline (CLB) includes Day Matching 5-in-10, Day Matching 10-in-10, Weather Matching, and Day Matching combined

# Baseline/Performance Evaluation Methodology MRI-S Data Submittal Requirements for Demand Response Resources (footnotes)

- <sup>5</sup>EVSE non-residential with Customer Load Baseline (CLB) includes Day Matching 10-in-10, Weather Matching, and Day Matching Combined.
- <sup>6</sup>For a Proxy Demand Resource or Reliability Demand Response Resource using behind-the-meter generation to offset demand utilizing one of the MGO performance methodology options, meter data submitted for LOAD and MBMA represents metered load for the service account (customer) not of the sub-metered behind-the-meter generator.
- <sup>7</sup>California Independent System Operator Corporation Tariff Section 4.13.4
- <sup>8</sup>“MGO with CLB” provides for the use of Day Matching 10 in 10, Day Matching 5 in 10 (residential customers only), Day Matching Combined, and weather matching performance evaluation methods in the calculation of the DREM portion attributed to customer load response only.