

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

Training Session: Market Simulation Readiness June 22, 2020

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#### 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</p>



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

#### **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

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Demand Response Processes/Systems effected by ESDER 3B Changes

#### 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 Pmin to Pmax 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 Pmin 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 <i>curt</i>	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 <i>cons</i>	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</li>

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 nondispatched 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 nonresidential 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



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



Location Device Type	Baseline Methods for Registration				
Floatria Vahiala Supply	EVSE res				
Equipment (EVSE)	EVSE res+Day Matching 5/10				
	EVSE res+Day Matching 10/10				
	EVSE res+Day Matching Combined				
	EVSE res+Weather Matching		ww.with		
	EVSE non-res	ES	SDER 3B		
EVSE non-res+Day Matching 10/10					
	EVSE non-res+Weather Matching				
	EVSE non-res+Day Matching Combined				
	Weather Matching				
	Day Matching Combined				
	Day Matching 10/10	E	victing mothodo		
	Day Matching 5/10 (Residential Only)		xisuing methods		
	Control Group				



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



Location Device Type	Baseline Methods for Registration	า	
			-
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		New with
	MGO+Day Matching Combined		ESDER 3B
	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		
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Location Device Type	Baseline Methods for Registration	
Both ES and EVSE	EVSE non-res+Day Matching 10/10 EVSE non-res+Weather Matching EVSE non-res+Day Matching Combined	New with ESDER 3B
	Weather Matching	
	Meter Generation Output Day Matching Combined	Existing methods
	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).	Economic, Day- Ahead, and Real- Time	Bids into the ISO Markets as Supply
			Note: PDR electing 60 minute bid dispatchable option not considered in RUC.		
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_LSI	Curtailment	15, or 5. Must be the same for both Curtailment	Curtailment Resource ID: NBT Price to Bid	Curtailment Resource ID: Energy, Spin and Non-Spin, and	Economic, Day- Ahead, and Real- Time	Curtailment Resource ID: Bids into the ISO
A Single Resource	Resource ID Consumption Resource ID	and Consumption Resource ID	Cap.	Residual Unit Commitment (RUC)		Markets as Supply Consumption
		-	Consumption Resource ID:	Consumption Resource ID:		Resource ID: Bids into the ISO
			Negative Bid Floor to < \$0	Energy		Markets as NGR –
					Note: Curtailment and Consumption Resource ID may be dispatched independently	Dispatchable Demand Resource (DDR)





## **REVIEW APPLICATION-SPECIFIC DETAILS**



#### DRRS: The application URL is changing

DRRS

Changing from (existing)

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

Changing to (new)

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

DRRS

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)

te New Location			
Name* TestLocation		Address 1*	123 Street
SAN* SAN12345		Address 2	
t Date* 06/10/2020	t	City*	Folsom
d Date* 06/30/2022	1 1 1	State*	California
DRP* DRP1	~	Zip*	95630
UDC* UDC1	~	Address Type	
LSE* LSE1	~	Device Type	ES
IBLAP* SLAP_BBBB	~		EVSE
NODE	~		
IBLAP* SLAP_BBBB	<ul><li></li><li></li></ul>		EVSE



#### **DRRS: DRP Location View**



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

Loc	.ocations														
3	了应多	4 4 1 - 25 of 138 🕨 🔰	GO												Rows 25
Select	Loc ID	Name	SAN SAN	DRP	UDC	LSE	SUBLAP	Device Type	PNODE	Start Date	End Date	Status	Defen	P Defense Start	Defense End
								E%	•		100 C	🛗 [[ALL]	~		
	1153875	GK Loc AA for FRQ900	567890125					EVSE		06/09/2020	07/08/2020	Pending		1211	
	1153875	GK Loc AA for FRQ900	567890124					ES	Contract of the	06/09/2020	07/08/2020	Pending			
	1153874	GK Loc AA for FRQ900	567890123					ES		06/09/2020	07/08/2020	Inactive			
	1153878	GK Loc AA for FRQ901	56781230					ES	Contractor of the	06/10/2020	07/09/2020	Pending			
	1153879	GK Loc AA for FRQ902	56784351					EVSE	and the second second	06/10/2020	07/09/2020	Inactive	Y	06/10/2020	06/12/2020
	1153879	GK Loc AA for FRQ902 - Incumbent	56784352					ES	And a state of the local division of the loc	06/10/2020	07/10/2020	Inactive	Y	06/10/2020	06/12/2020
	1153880	GK Loc AA for FRQ902 - Prospective	56784352					ES	and a second	06/10/2020	07/10/2020	Duplicate			
	1153879	GK Loc AA for FRQ902 - Prospective	56784351					EVSE	States - same	06/10/2020	07/10/2020	Duplicate			
	1153876	GK Loc AA for FRQ903	567890134					ES	And a state of the second s	06/09/2020	07/08/2020	Disputed			
	1153875	GK Loc AA for FRQ903	567890133					ES	and the second s	06/09/2020	07/08/2020	Pending			
	1153875	GK Loc AA for FRQ903	567890132					EVSE	Contraction of the	06/09/2020	07/08/2020	Disputed			
	1153875	GK Loc AA for FRQ903	567890131					ES	And and Address of the Owner, where the	06/09/2020	07/08/2020	Pending			
	1153875	GK Loc AA for FRQ903	567890130					EVSE		06/09/2020	07/08/2020	Disputed			
	1153875	GK Loc AA for FRQ903	567890129					ES		06/09/2020	07/08/2020	Pending			
	1153875	GK Loc AA for FRQ903	567890128					EVSE	and the second s	06/09/2020	07/08/2020	Disputed			
	1153875	GK Loc AA for FRQ903	567890127					ES	and the second s	06/09/2020	07/08/2020	Pending			
	1153875	GK Loc AA for FRQ903	567890126					EVSE	the second second	06/09/2020	07/08/2020	Pending			
	1153754	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**



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

Locations													
🔋 🔽 🖄 🚝 🛛	4 4 1 - 25 of 138 🕨 🎽 🗾 GO												
Select Loc ID	Name	SAN	DRP	UDC	LSE	SUBLAP	DEVICE TYPE	PNODE	Start Date	End Date	Review Start	Review End	Status
							E%			<b>#</b>			🛗 [ALL] 🗹
11535761000	0001 LOC_TEST_ 1_2SAV1	SAN_TEST2SAV1					ES		06/10/2020	12/30/2021	06/10/2020	06/12/2020	Pending
11538804	UD_LOC_TEST1_700	SAN_LOC_TEST1_700					EVSE		06/10/2020	12/30/2020	06/10/2020	06/12/2020	Pending
11538803	LOC_ST_A6_Test1	SAN_ST_A6_Test1					ES+EVSE		06/10/2020	12/31/2020	06/10/2020	06/12/2020	Pending
11538802	UD_TESTB4ES4	UD_TESTB4ES4					ES		06/10/2020	12/30/2030	06/10/2020	06/12/2020	Pending
11538801	GK Loc AA for FRQ902 - Prospective	56784352					ES	and a second	06/10/2020	07/10/2020			Duplicate
11538799	GK Loc AA for FRQ902 - Incumbent	56784352					ES	and the second sec	06/10/2020	07/10/2020	06/10/2020	06/12/2020	Inactive
11538798	UD_TESTB4EVSE1	SAN_TESTB4EVSE1					EVSE		06/10/2020	12/30/2030			New
11538795	UD_LOC_TEST_150	SAN_LOC_TEST_150					ES+EVSE		06/12/2020	12/30/2020	06/10/2020	06/12/2020	Pending
11538794	LOC_TESTB4ES2	SAN_TESTB4ES1					ES		06/10/2020	12/30/2030			New
11538792	GK Loc AA for FRQ902 - Prospective	56784351					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			DRP SCID*		
Name*	TestReg		Program*	*	
Start Date*	06/10/2020		Resource Type*	*	
End Date*	06/30/2022		Resource*	*	
DRP*	DRP1		PMax	x	
UDC*	UDC1		Status	s New	
Baseline Method*	Control Crown				
SUBLAI	Day Matching 10/10 Day Matching 5/10 (Residential Only)				
Refresh Availal I	Day Matching Combined EVSE non-res				
Show/Ret	EVSE non-res+Day Matching Combined 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				
Availab	EVSE res+Day Matching S/10 EVSE res+Day Matching Combined			> Selected Locations	Distribution Factor
⇒ Y	Meter Generation Output	End Data Davias Tura			
ID Nain	MGO+Day Matching 5/10 MGO+Day Matching 5/10	End Date Device Type	PNODE	Rows 25	PNODE Distribution Factor (2 decimal places allowed)
	MGO+Day Matching Combined			ID NAME SAN Start End Device PNODE Control Treatment	
	PDR-LSR PDR-LSR+Day Matching 10/10		1	Date Date Type Group Group	
	PDR-LSR+Day Matching 5/10 PDR-LSR+Day Matching Combined				
	PDR-LSR+Weather Matching Weather Matching	<b>)</b>			







#### **DRRS:** Registration baselines

DRRS

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



#### 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



#### **DRRS API Enhancements**

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)



DRRS

#### **Master File**

- 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
    - Pmin < zero (0) / Pmax of zero (0)</li>
  - PDR-LSR Curtailment Model
    - Pmin = zero (0) / Pmax > zero (0)
  - Validation rules apply to Worst Operational Ramp Rate (RAMP\_MIN\_RATE) > = (MAX\_GEN-MIN\_GEN)/BID\_DISP\_OPT



Master File

## Scheduling Infrastructure & Business Rules (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



**SIBR** 

Market Results Interface – Settlements (MRI-S)

- 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

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



Measurement Type	Data Granularity	Baseline Method	Comments
LOAD	5 minute	<ul> <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 ir 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> </ul>	AS Resource only This is the actual load for intervals he 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. <sup>6</sup> For PDR-LSR, and PDR with Customer Load Baseline, data is
		EVSE-Non-Res with s     Customer Load Baseline <sup>5</sup> c	submitted for the PDR-LSR curtailment (CUR) ID only.
		F E	For EVSE it would be the load at the EVSE. For EVSE with CLB submit oad at the facility level.



Measurement Type	Data Granularit	y Baseline Method	Comments
LOAD	5 minute	• PDR-LSR(CON)	PDR-LSR Consumptions (CON) ID submit "LOAD" only. This represents the energy consumption or reduction when dispatched. Data required for intervals where TEE>0.
GEN	5 minute	<ul> <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>	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.
iliornia ISO	ISO P	UBLIC - © 2020 CAISO	40

Measurement Type	Data Granularity	Baseline Method	Comments
MBMA	5 minute	<ul> <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>	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. <sup>7</sup> For PDR-LSR and PDR-LSR with Customer Load Baseline, data is submitted for the PDR-LSR curtailment ID only. For EVSE it would be the load at the EVSE. For EVSE with CLB submit



	Measurement Type	Data Granularity		Baseline Method	Comments
CBL	Hou	ırly	•	Control Group Day Matching 5/10 (Residential Only) Day Matching 10/10 Day Matching Combined Weather Matching Meter Generation Output with 10 in 10 (Customer Load Baseline) <sup>2</sup> PDR-LSR (CUR) with Customer Load Baseline <sup>3</sup> EVSE-Res with Custome Load Baseline <sup>4</sup> EVSE-Non-Res with Customer Load Baseline <sup>5</sup>	For monitoring only. 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. PDR-LSR with CLB Curtailment ID fonly 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 PDR-LSR with CLB submit resource IDs PDR-LSR curtailment



Measurement Type	Data Granularity	Baseline Method	Comments
TMNT	Hourly	<ul> <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>	For monitoring Only Submit for trade date where TEE > 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. For the MGO and MGO 10 in 10 baseline methods, TMNT data represents the generation device metered values.
			For PDR-LSR submit both resource IDs, the consumption and curtailment IDs. For PDR-LSR with CLB, submit only the curtailment only ID.
			For all EVSEs, this represents the load at the EVSE.
ifornia ISO	ISO PUBLI	C - © 2020 CAISO	43

Measurement Type	Data Granularity	Baseline Method	Comments
BASE	Hourly	<ul> <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>	For monitoring Only Calculated customer load baseline (CLB) values used to derive DREM. 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.
			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.







- 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

Plans	RA Validation	Substitutions	RAAIM Pre-Calc	CSP Offers	Reports	Legacy Replacement
Upload	Submit NOC Re	quest Form				
101000000000						
() Invali	d ResourceId (Cell B3)					
Invali	d ResourceId (Cell B3) upload not allowed for	PDR-LSR Consumpti	on Resource PGCC_1_P	DRPCON002 (Cell I	33)	
Invali NQC I Invali	d ResourceId (Cell B3) upload not allowed for d ResourceId (Cell B2) upload not allowed for	PDR-LSR Consumpti	on Resource PGCC_1_P	DRPCON002 (Cell I	33) 32)	
Invali     NQC I     Invali     NQC I     NQC I	d ResourceId (Cell B3) upload not allowed for d ResourceId (Cell B2) upload not allowed for	PDR-LSR Consumpti	on Resource PGCC_1_P	DRPCON002 (Cell I DRPCON001 (Cell I	33) 32)	
Invali NQC o Invali NQC o SCID	d ResourceId (Cell B3) upload not allowed for d ResourceId (Cell B2) upload not allowed for	PDR-LSR Consumpti	on Resource PGCC_1_P	DRPCON002 (Cell I DRPCON001 (Cell I	33) 32)	
Invali NQC i Invali NQC i SCID	d ResourceId (Cell B3) upload not allowed for d ResourceId (Cell B2) upload not allowed for	PDR-LSR Consumpti	on Resource PGCC_1_P	DRPCON002 (Cell I DRPCON001 (Cell I	33) 32)	



Performance Evaluation Methodology (PEM) Form Market Simulation

## **READINESS ACTIVITIES**



#### **Implementation Timeline**



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**

<b>e</b>	California ISO	Market	Applications	Market Participant Porta CAISO.com MAP-STAGE	<u>al</u>
Application	Access	Metering		Renewables	& Demand Response
🗊 АІМ	Access and Identity Management	🌏 omar	Operational Meter Analysis & Reporting	💽 DRS	Demand Response System
Inquiries & [	Disputes	OASIS			Demand Response Registration System
😥 СІДІ	Customer Inquiry Dispute and Information	🔊 OASIS	Open Access Same-Time Information System		Participating Intermittent Resource Program
Market & Or	perations	Outage Coor	dination	Settlements	
	Customer Market Results Interface	🍪 WebOMS	Outage Management System	🕥 MRI-S	Market Results Interface - Settlements
🕘 CRR	Congestion Revenue Rights	Reliability Re	quirements	Systems & F	Resource Modeling
💽 SIBR	Scheduling Infrastructure & Business Rules	🙀 CIRA	Customer Interface for Resource Adequacy	🛞 TR	Transmission Registry
SIBR Reports	Scheduling Infrastructure & Business Rules Reports	🚇 RAAM	Resource Adequacy Availability Management	🕢 Master Fi	ile
				💽 RIMS	Resource Interconnection Management System

California ISO

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 <u>complying</u> with dispatch instructions for duration of the dispatch
  - Dispatch PDR-LSR Curtailment Resources for Spin/Non spin Awards with the Resources <u>not complying</u> 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 <u>does not</u> 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 <u>MarketSim@caiso.com</u> 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: <u>www.caiso.com</u>

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:
  - <u>http://www.caiso.com/Documents/BusinessRequirementsSpecificationClean-EnergyStorageandDistributedEnergyResourcesPhase3.pdf</u>
- Demand response net benefits test results:
  - <u>http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=AA4CD173-</u> 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:
  - <u>http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergySto</u> <u>rage\_DistributedEnergyResources.aspx</u>
- Market Simulation Structured Scenarios:
  - <u>http://www.caiso.com/Documents/ESDER3BMarketSimulationStructure</u> <u>dScenariosFall2020.pdf</u>
- Master File Changes new Generator Resource Data Template will be posted with the rest of the Fall release changes at this location:
  - <u>http://www.caiso.com/market/Pages/NetworkandResourceModeling/Def</u> <u>ault.aspx</u>



#### **Reference Material**

- Technical Specifications located on the <u>ISO's Developer Site</u> which provides detailed descriptions of the API changes for:
  - DRRS
  - Master File



- <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



- <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.

