



California ISO
Shaping a Renewed Future

Supply Resource Demand Response Integration Working Group
August 26, 2014

Implementation Overview for PDR

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CAISO has introduced two products both relying on the same technical functionality and infrastructure

Design	Acronym	Services	Market dispatch	Description
Proxy Demand Resource	PDR	Energy, non-spin, residual unit commitment (RUC)	Economic day-ahead and real-time	Bids into ISO markets as supply
Reliability Demand Response Resource	RDRR	Energy	Economic day-ahead, reliability real-time	Bids into ISO markets; used for reliability purposes

5/1/14

Wholesale demand response participates in the CAISO comparable to a supply resource

Proxy Demand Resource (PDR) participation overview

PDR can bid economically into the following markets:

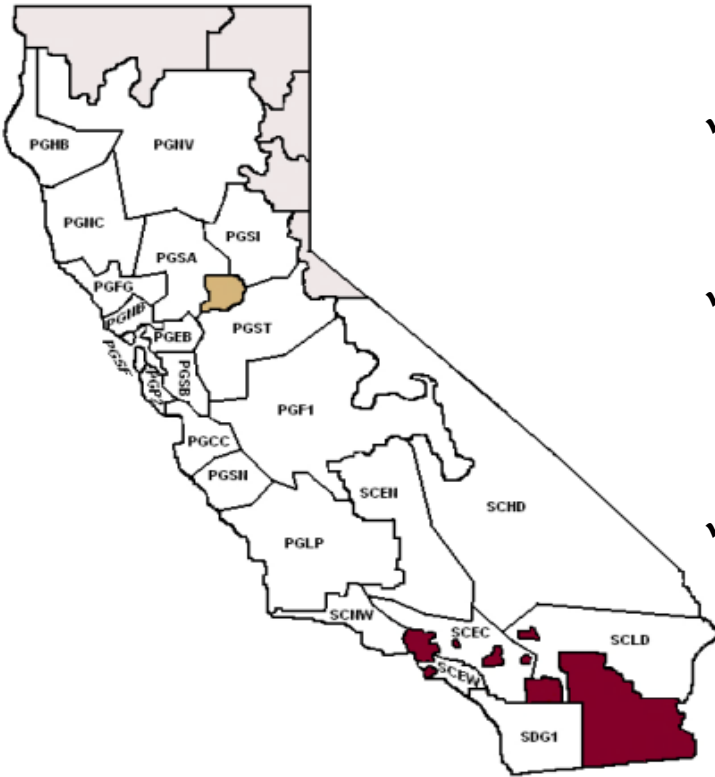
- Day-Ahead energy market
- Day-Ahead and Real-Time Non-Spinning Reserve market
- 5- Minute Real-Time Energy market

PDR must have minimum load curtailment:

- 0.1 MW (100 kW) for Day-Ahead and Real-Time energy
- 0.5 MW (500 kW) for Day-Ahead and Real-Time energy Non-Spinning Reserve
- Smaller Loads may be aggregated together to achieve minimum

Resource aggregations are required to be within a single sub-Load Aggregation Point (LAP).

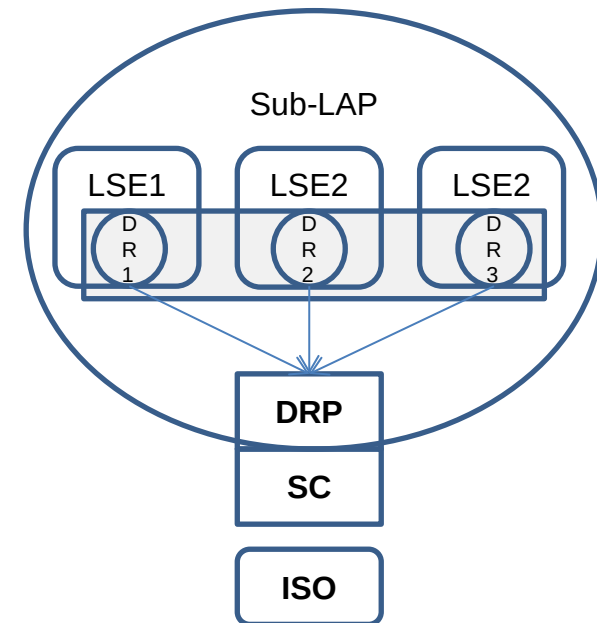
0 Ensures demand response resource dispatch does not create additional congestion



- ✓ A sub-LAP is an ISO-defined subset of pricing nodes (Pnodes) within a default LAP.
- ✓ 24 sub-LAPs were created to reflect major transmission constraints within each utility service territory (default LAP)
- ✓ Developed initially for congestion revenue rights (CRRs)

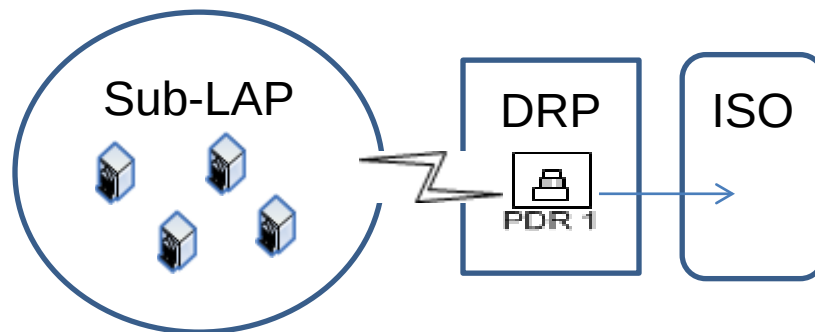
Resource aggregations are required for a single load serving entity (LSE)

- ✓ Provides visibility of DR awards to LSEs
- ✓ Ensures ability to identify individual default load adjustment (DLA) contribution of LSE specific location performance

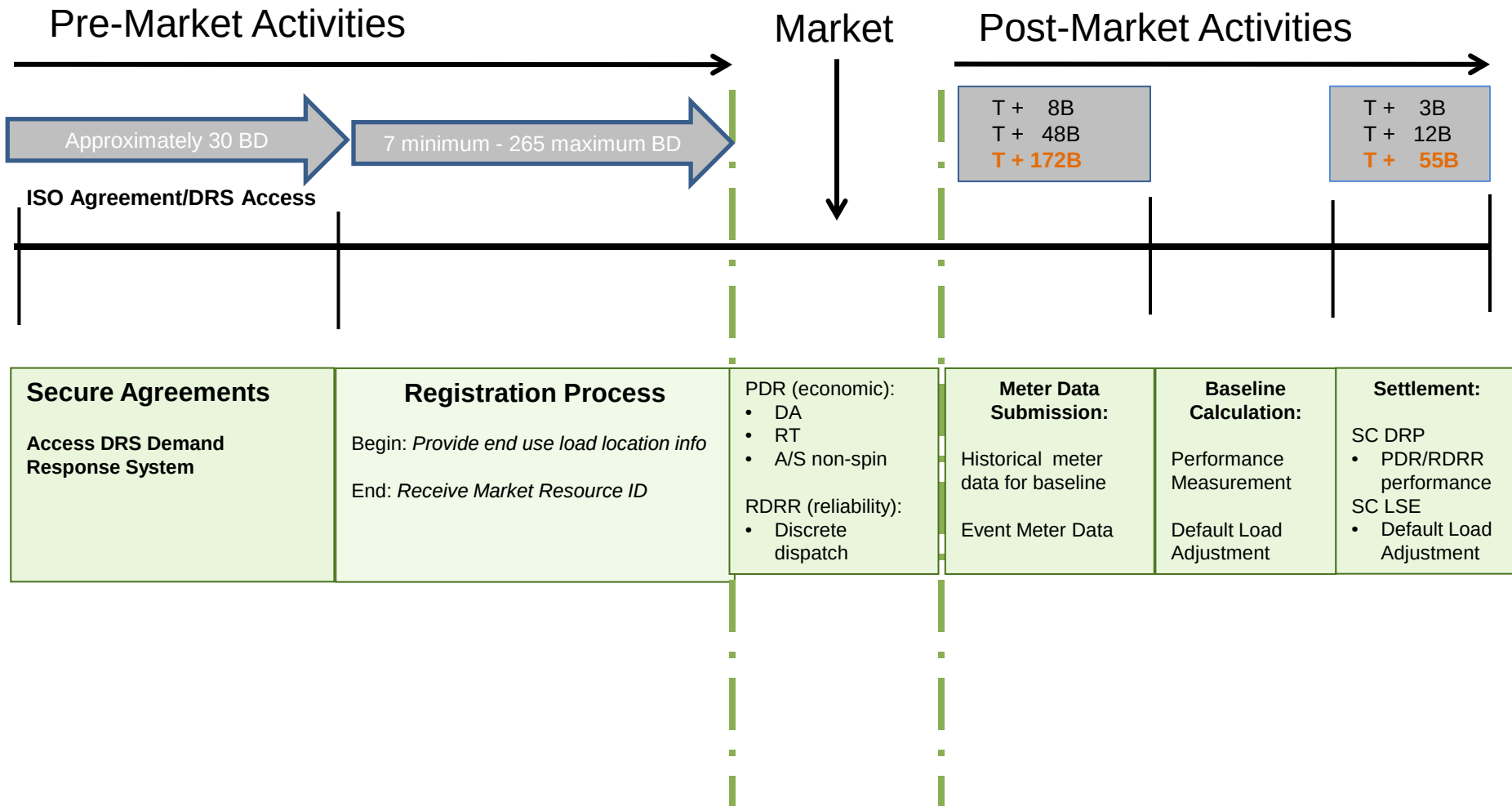


Resource aggregations of 10 MW and above and those providing ancillary services require telemetry.

- ✓ RDRR does not require telemetry
- ✓ Telemetry is provided for the aggregate resource
- ✓ A single remote intelligent gateway (RIG) can represent multiple DR resources (1:many)



Sequential activities prepare for PDR/RDRR market participation



Registration provides visibility and auditability of aggregated participation to multiple entities.

Create location

- UDC account # primary key
- validations
 - o duplication check between DRP's registered locations
 - o completeness validation

Create registration

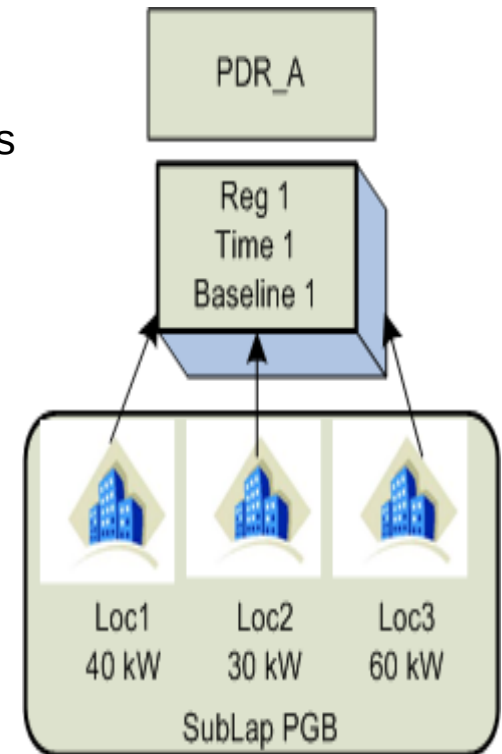
- locations aggregated to create registration
- validations
 - o duplicate location check across DRP registrations
 - o Sub-Lap/LSE/total load reduction

LSE/UDC/ISO registration review

- UDC/LSE review registration including locations

Create resource and confirm

- resource ID provided, Resource data template submitted
- masterfile updated



Deadlines for DR resources remain consistent with timelines for all resource types including load.

Meter data submitted by SC as SQMD

- historical meter data for baseline
- event meter data

T + 8 B initial
T + 48B recalculation
T + 172B recalculation

Calculation in DR system

- baseline
- performance measurement
- only

Settlement

- Direct settlement of PDR/RDRR performance with DRP's SC
- Default load adjustment calculated and applied to LSE load meter data if applicable

T + 3B initial
T + 12B recalculation
T + 55B recalculation

Participants have options for their baseline methodology.

- ✓ **10 in 10 non-event day baseline methodology will be calculated by ISO**
- ✓ **Alternative baseline can be used with ISO approval**

Date	Type	Event	HE14
4/15/2009	WD	N	15.00
4/16/2009	WD	N	15.75
4/17/2009	WE	N	10.50
4/18/2009	WE	N	9.50
4/19/2009	WD	N	13.75
4/20/2009	WD	N	14.00
4/21/2009	WD	N	14.75
4/22/2009	WD	N	14.00
4/23/2009	WD	N	13.75
4/24/2009	WE	N	6.00
4/25/2009	WE	N	15.75
4/26/2009	WD	Y	14.80
4/27/2009	WD	Y	15.50
4/28/2009	WD	N	14.00
4/29/2009	WD	N	14.00
4/30/2009	WD	N	13.80

- Conform to North American Energy Standards Board (NAESB) standards
- May require tariff amendment
- Submitted as generation meter data
 - “Hourly Gen” choice in DRS

Selection Criteria Type=WD
 Event=N
Where WD = Week Day
 WE = Week End
 Event = Y if DA schedule, RT/AS dispatch or Outage

Date	MWH	Selection
4/15/2009	15.00	10
4/16/2009	15.75	9
4/19/2009	13.75	8
4/20/2009	14.00	7
4/21/2009	14.75	6
4/22/2009	14.00	5
4/23/2009	13.75	4
4/28/2009	14.00	3
4/29/2009	14.00	2
4/30/2009	13.80	1
10 Day Avg (Raw Baseline)		14.28

CAISO website has comprehensive training material for PDR and RDRR participation

Reliability Demand Response Resource link:

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=8642B12B-43E5-42B8-BC31-662880F6565A>

Proxy Demand Resource link:

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=F5B0124F-E035-45C3-A482-7F1F3F8B590A>