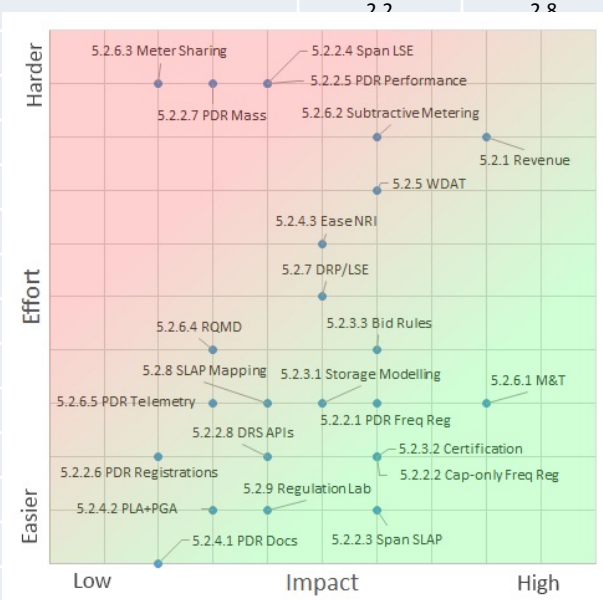
Supply DR CAISO Integration WG

8/26/2014

- DER Barriers / Challenges
- Some lessons from IRM2:
  - Baseline issues
  - DRP / LSE Agreements
  - Default Load Adjustments

Evaluated 24 Items for consideration

5.2.1	Improve Revenue Equality and Opportunity	2.6	1.4
5.2.2.1	Enhance PDR for Frequency Regulation	2.2	2.4
5.2.2.2	Add Capacity-only Frequency Regulation	2.2	2.6
5.2.2.3	Allow Resources to Span Sub-LAPs	2.2	2.8
5.2.2.4	Allow PDRs to Span LSEs		
5.2.2.5	PDR Performance Measurement Options		
5.2.2.6	PDR Registration Improvements		
5.2.2.7	Evaluate Mass Market PDR Improvements		
5.2.2.8	Improve DRS Integration Capabilities		
5.2.3.1	Evaluate Energy Storage Modeling Improvements		
5.2.3.2	Evaluate Certification Alternatives		
5.2.3.3	Introduce Dynamic Capacity Resource Aware Bidding Rules		
5.2.4.1	Enhance Documentation of PDR Integration Process		
5.2.4.2	Combine PLA and PGA for NGR Implementation		
5.2.4.3	Evaluate Streamlining NRI for Non-exporting NGRs		
5.2.5	Simplify and Standardize WDAT and Process for DER		
5.2.6.1	Complete Phases 1 and 2 of the Expanding Metering and Telemetry Options Proposals		
5.2.6.2	UDC subtractive and/or logical metering	2.2	1.4
5.2.6.3	ISO / UDC Meter Sharing	1.4	1.2
5.2.6.4	Standardize process for and access to RQMD	1.6	2.2
5.2.6.5	Evaluate Telemetry Requirements for PDRs	1.6	2.4
5.2.7	Establish Rules and Pro-forma Agreements for DRP / LSE Cooperation	2	2
5.2.8	Sub-LAP Mapping System for Stakeholders	1.8	2.4
5.2.9	Introduce Lab Environment for Regulation	1.8	2.8



15 Are Directly Relevant to DR*

5.1.1	Improve Revenue Equality and Opportunity
5.1.6.1	Complete Phases 1 and 2 of the Expanding Metering and Telemetry Options Proposals
5.1.2.3	Allow Resources to Span Sub-LAPs (Default-LAP PDR, NGR)
5.1.3.2	Identify and Evaluate Appropriateness of Certification Alternatives
5.1.3.3	Introduce Variable-Resource Aware Bidding Rules
5.1.7	**Establish Rules and Pro-forma Agreements for DRP / LSE Cooperation**
5.1.2.8	Demand Response Registration APIs
5.1.8	Sub-LAP Mapping System for Stakeholders
5.1.2.4	**Allow PDRs to Span LSEs**
5.1.2.5	**Performance Measurement Options for PDRs**
5.1.6.5	Revaluate Telemetry Requirements for PDRs
5.1.6.4	Standardize process for and access to RQMD
5.1.2.7	Evaluate Mass Market PDR Improvements
5.1.4.1	Enhance Documentation of PDR Integration Process
5.1.2.6	PDR Registration Improvements

*Items related to frequency regulation for PDRs are omitted

LSE / DRP Requirements

- LSE / DRP Agreement Requirement
  - LSE Requirement, from the Proxy Demand Resource Agreement:

    The Demand Response Provider must certify to the CAISO that any required bilateral agreements between the Demand Response Provider and the Load Servicing Entities or other agreements required
  - Experience shows that the CAISO requires the bi-lateral agreement
- Availability of LSE in DRS
  - LSEs do not have to register in the Demand Response System (DRS)
  - PDRs cannot be created until the LSE registers
  - The process for LSE registration (and where the DRP fits into the communication path) are not clear
- Contrary to FERC's intentions LSE can in practice block registrations
- No contract process or templates

Objections and Concerns for LSEs

- LSEs:
  - Existing business models likely do not consider the dynamics of having a DRP bid their customers into market
  - No direct benefit to the LSE
  - Lack of notification capability in DRS requiring LSE to continuously monitor to avoid default validations.
  - LSE's providing DR offerings - perceived "ownership" of customers
  - **Default Load Adjustments**
- DRP:
  - LSE essentially granting approval (instead of just validation)
  - Conventional DR does not require Aggregators (our Customers) to get permission from their LSE

Baseline

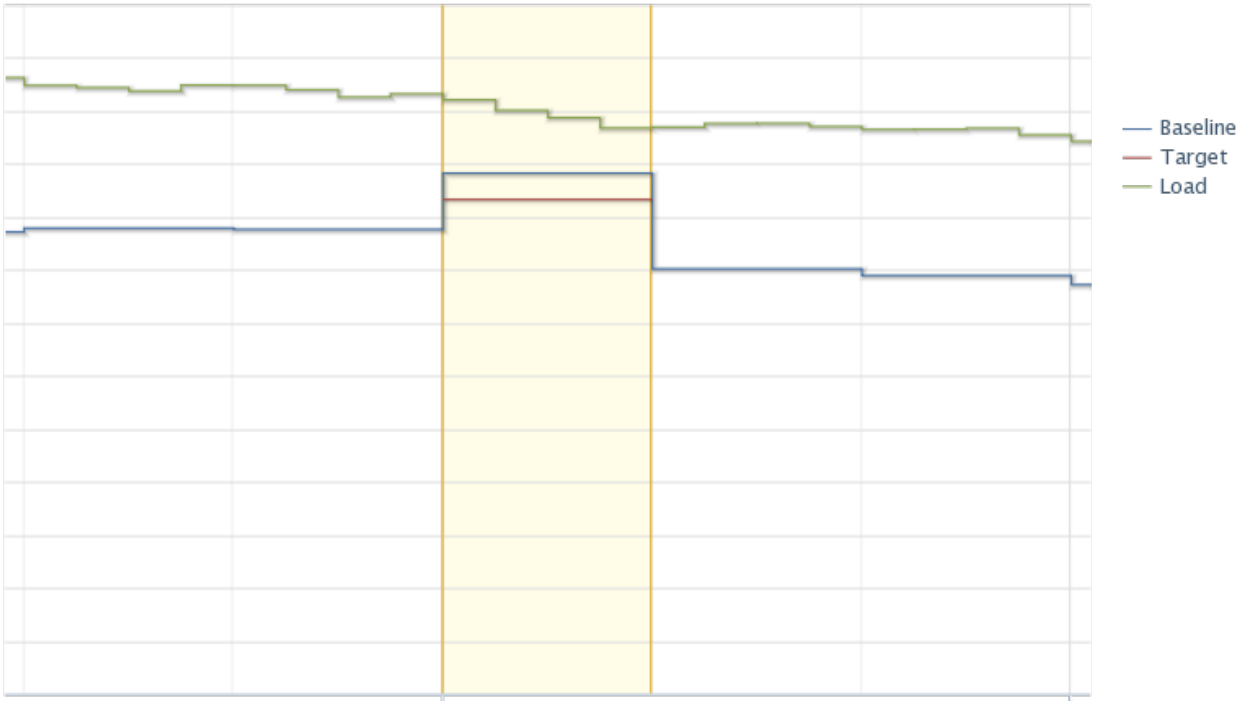
- PDR (and RDRR) energy “negawatts” comes from baseline algorithm
  - 10 in 10 non-event, like days with day-of adjustment
  - Input data is whole premises load
  - Does not work well when:
    - Average profile poorly reflects actual usage on any given day
    - Uncontrolled load moves during bid/award hours
    - Uncontrolled load dwarfs dispatchable load
  - Solutions could include
    - More baseline algorithms
    - Sub-metering options
- Could impact RA capacity value of some Supply side resources and potential disqualification after the fact.

Example from IRM2

- 500 kW PDR resource
  - 7 hours (3 test and 4 in market) :

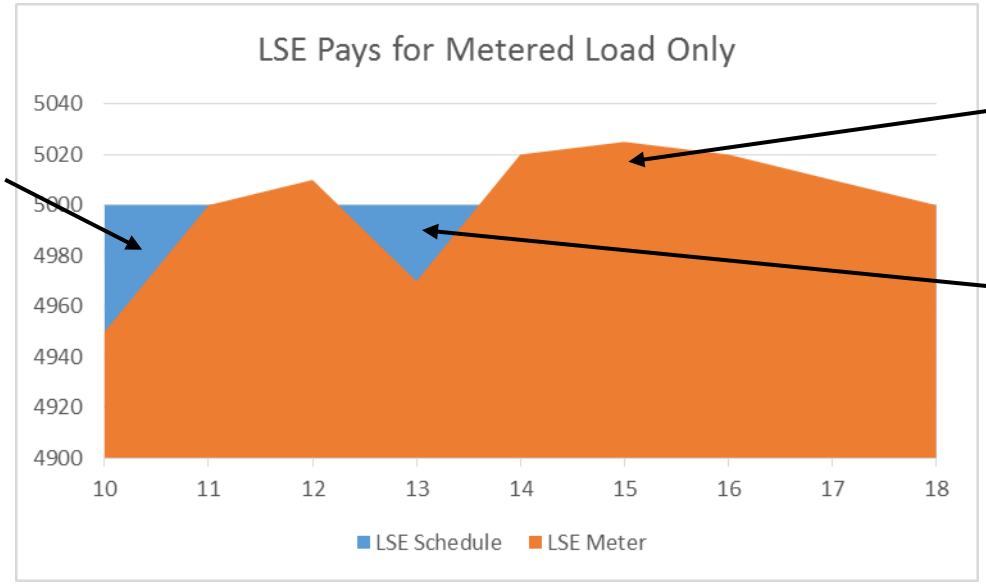
Event hour	(Whole premises) Before/After	ISO Baseline Performance	ISO Drop
1	109%	650%	3.2 MW
2	36%	526%	2.6 MW
3	31%	401%	2 MW
4	19%	77%	.3 MW
5	47%	103%	.5 MW
6	36%	69%	.3 MW
7	85%	-223%	-1.1 MW

Example from last IRM2 award hour



DLA Background

- Status quo for utility-based programs
  - IOU forecasts DR, and may influence load schedule to ISO
  - IOU procurement aware of DR dispatch
  - Direct Access LSE notified of event
  - LSE settled on metered load, irrespective of DR impact
  - LSE not impacted financially



Credited for over-procurement

Charged for under-procurement

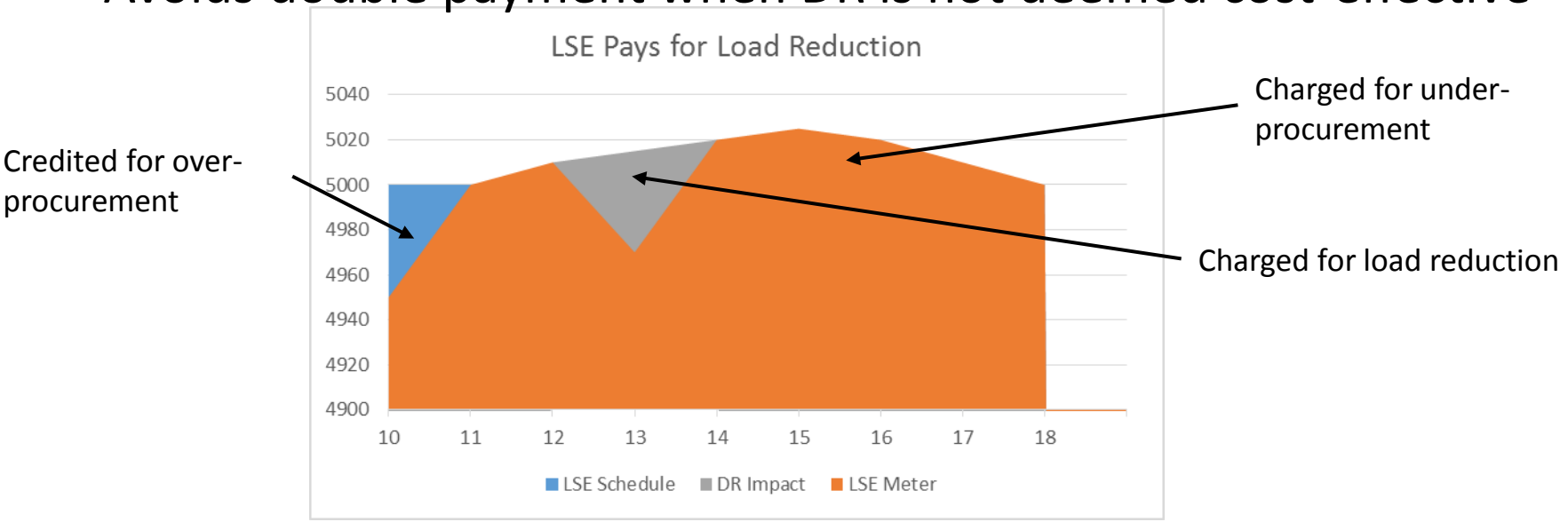
DR, no different from any over-procurement

DLA Background

- Wholesale integrated DR
  - DRP bids into the market
  - LSE procurement unaware of DR bid (for 3rd party DRP)
  - LSE notified (through ISO CMRI) of awards
  - LSE pays for metered load, irrespective of DR impact
  - LSE not impacted financially
- Exactly the same as the “status quo” in terms of LSE settlement (when no DLA)

DLA Background

- What happens when there is a Default Load Adjustment (DLA)?
  - LSE meter data is adjusted upwards
  - LSE is no longer being credited for over-procurement
  - LSE is impacted financially
- Avoids double payment when DR is not deemed cost-effective

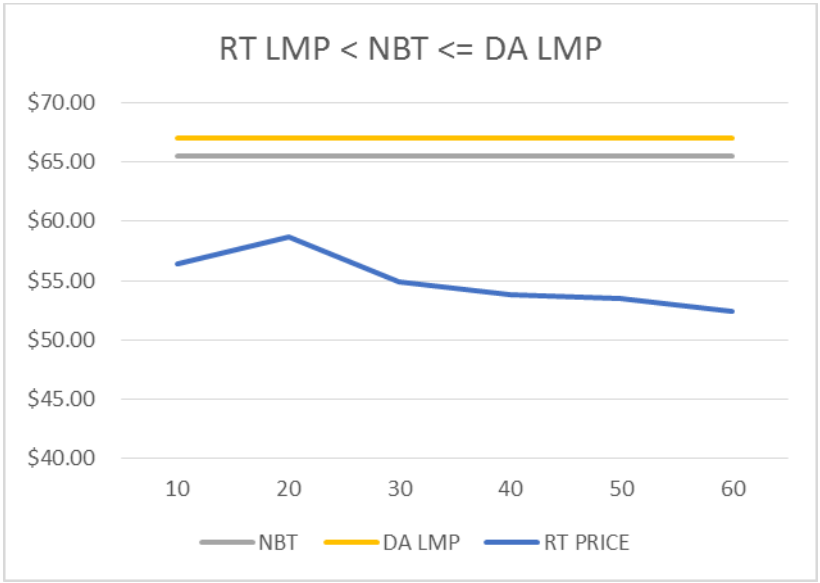


DLA Background

- Initially the thought was that DRPs should compensate the LSEs for the increase in metered load; however,
  - FERC ordered that the DLA did not apply when DR is cost effective
  - DR is cost effective when paid at (or above) the Net Benefits Test (NBT)
  - The CPUC ordered that DR would not be bid into the CAISO below the NBT, and therefore no compensation was necessary
- There may have been a belief that there would be no DLA

DLA Occurrence

- In fact, resources are paid for DR below the NBT even when bid above the NBT, when:
- DA LMP >= NBT, RT < NBT
  - Resource over-delivers
  - Other cases are possible too
- *IRM2 Example, 2/3/2014 HE 9:*
  - February NBT of $65.57
  - DA award of .45 MW @ $67.03
  - Participant over-delivered .12 MW
  - Average RT price was $54.94



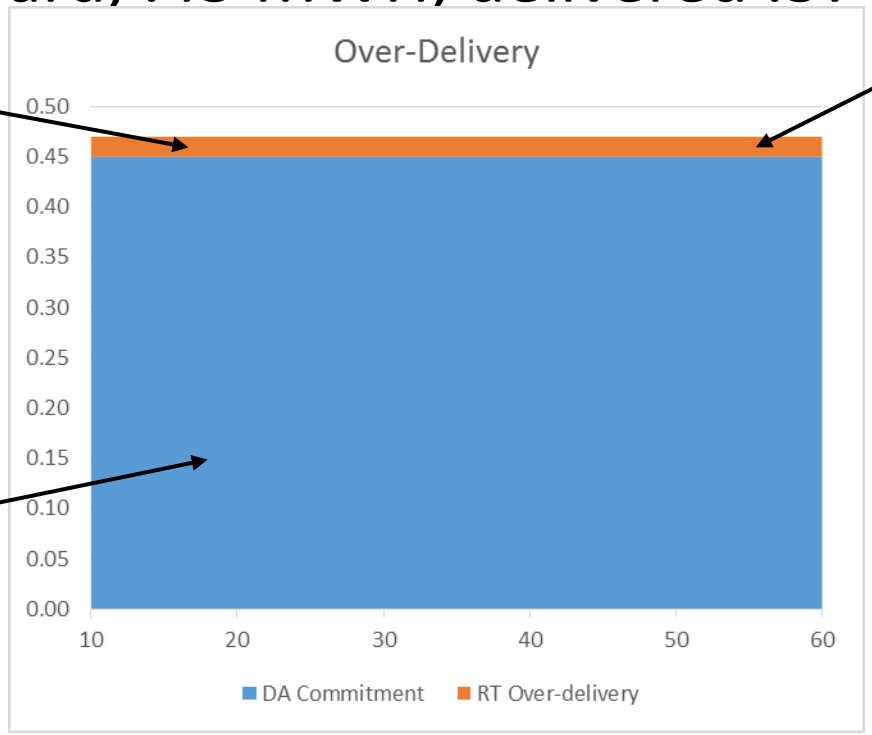
- DLA may also result from RT bids due to intra-hour ramping
- End result: LSE gets DLA added to meter

DLA Calculation

- DLA should occur for only energy paid < NBT
- IRM2 Example, 2/3/2014 HE 9, NBT $65.57
  - DA Award, .45 MWH, delivered .57 MWH

Additional .12 MWH paid RT imbalance of $54.95 / MWH
Below NBT

DA .45 MWH paid $67.03 / MWH
Above NBT



Expected DLA of .12 MWH on over-delivery

Actual DLA of .57 MWH, though .45 MWH was deemed cost-effective

Call To Action