



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

Straw Proposal

Technical Working Group

March 29, 2018

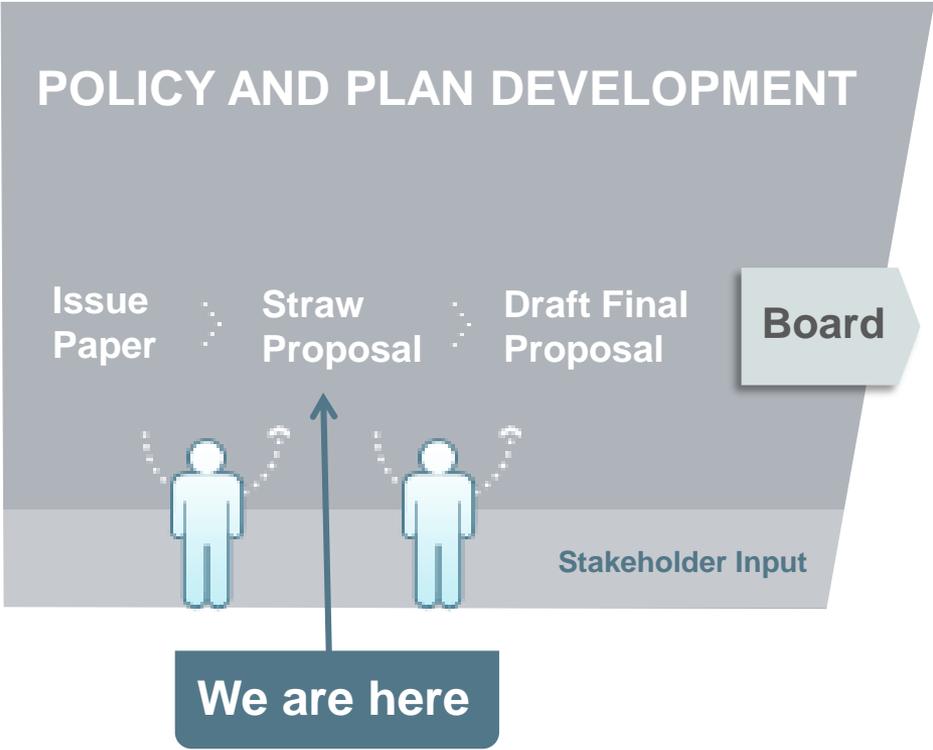
10 a.m. – 4 p.m. (Pacific Standard Time)

Agenda

Time	Item	Speaker
10:00 - 10:10	Stakeholder Process and Schedule	James Bishara
10:10 - 10:15	Introductions	Eric Kim
10:15 - 12:00	Recognition of EVSE Performance	
12:00 – 1:00	<i>Lunch Break</i>	
1:00 - 3:30	Load Shift Product	Eric Kim
3:50 - 4:00	Next Steps	James Bishara

STAKEHOLDER PROCESS

CAISO Policy Initiative Stakeholder Process



Scope/Objectives

Scope for ESDER 3

- New bidding and real-time dispatch options for demand response (DR)
- Removal of the single load serving entity (LSE) aggregation requirement and the need for application of a default load adjustment (DLA)
- Load shift product for behind the meter (BTM) storage
- Measurement of behind the meter electric vehicle supply equipment (EVSE) load curtailment
- Assessment of multiple-use application (MUA) tariff and market design changes
- Develop a process to qualify NGRs for use-limited status
- Identify policy developed for commitment costs that apply to NGRs

Objectives

The CAISO will be sharing design elements and do not reflect a final proposal

1. Review design elements
2. Discuss potential gaps or provide clarification
3. Suggest additional considerations

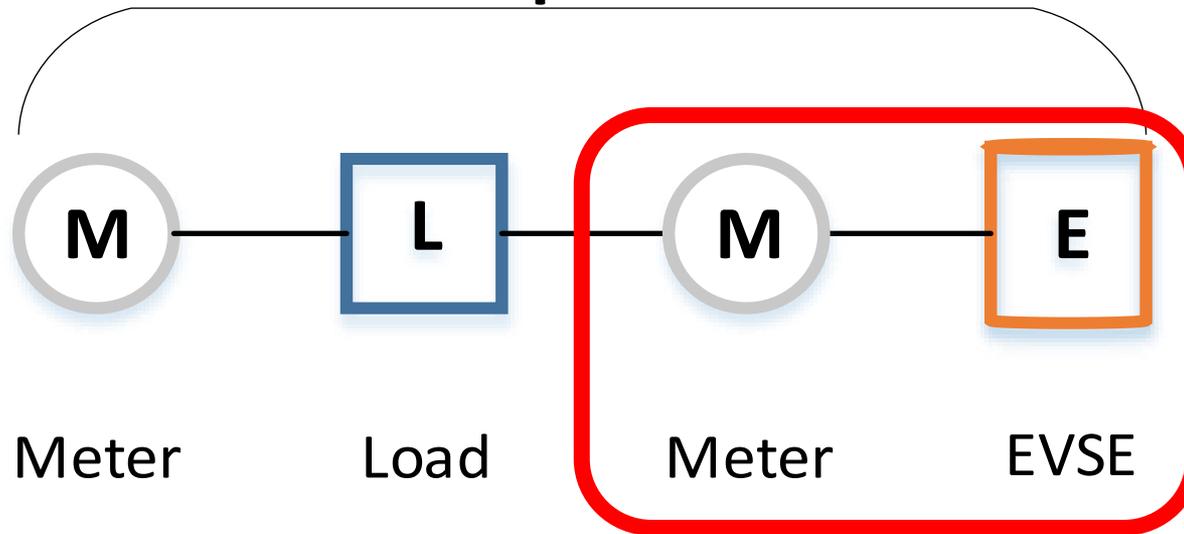
**If time permits, receive comments on other proposals outside of Load Shift and EVSE measurement*

MEASUREMENT OF EVSE PERFORMANCE

CAISO is proposing to directly measure EVSE load curtailment

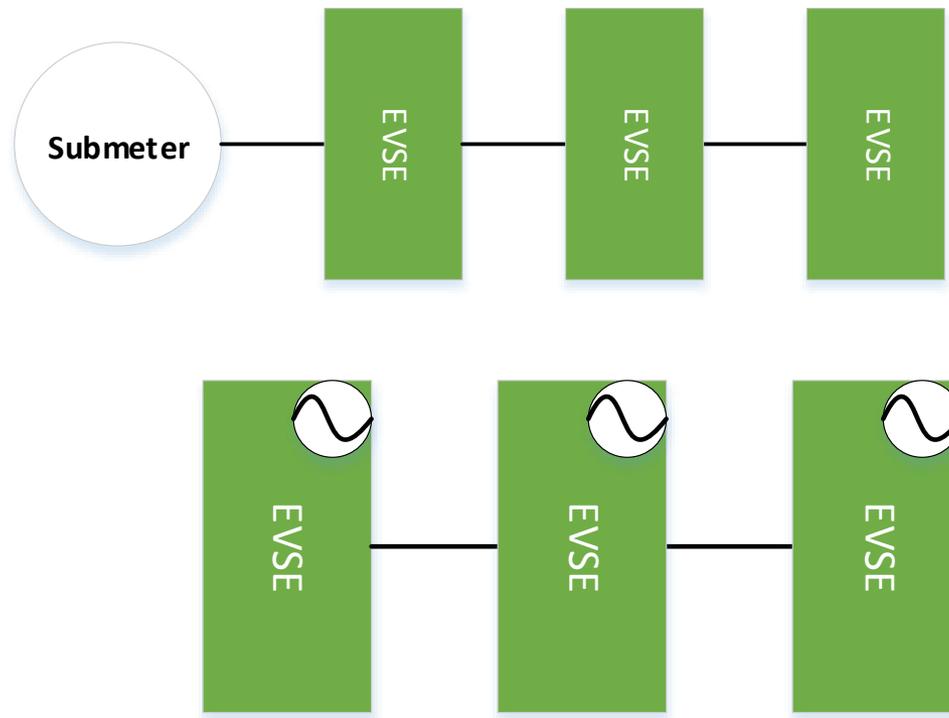
Currently, a DR resource with an electric vehicle supply equipment (EVSE) is measured without differentiating the performance of the EVSE, which can behave differently than normal load.

Demand Response Resource



Potential Metering Constructs

The CAISO needs to identify the meter that will provide the revenue quality meter data to measure the performance of the EVSE



Metering Standards

- All meters should follow the CAISO's Metering BPM – Appendix G and Settlement Quality Meter Data Plan requirements
 - Appendix G applies if relevant LRA has not set any standards
- Are there sub-metering standards or concerns the CPUC or LRAs must address to enable EVSE participation?
- Will EVSE meters be able to meet these requirements?

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering>

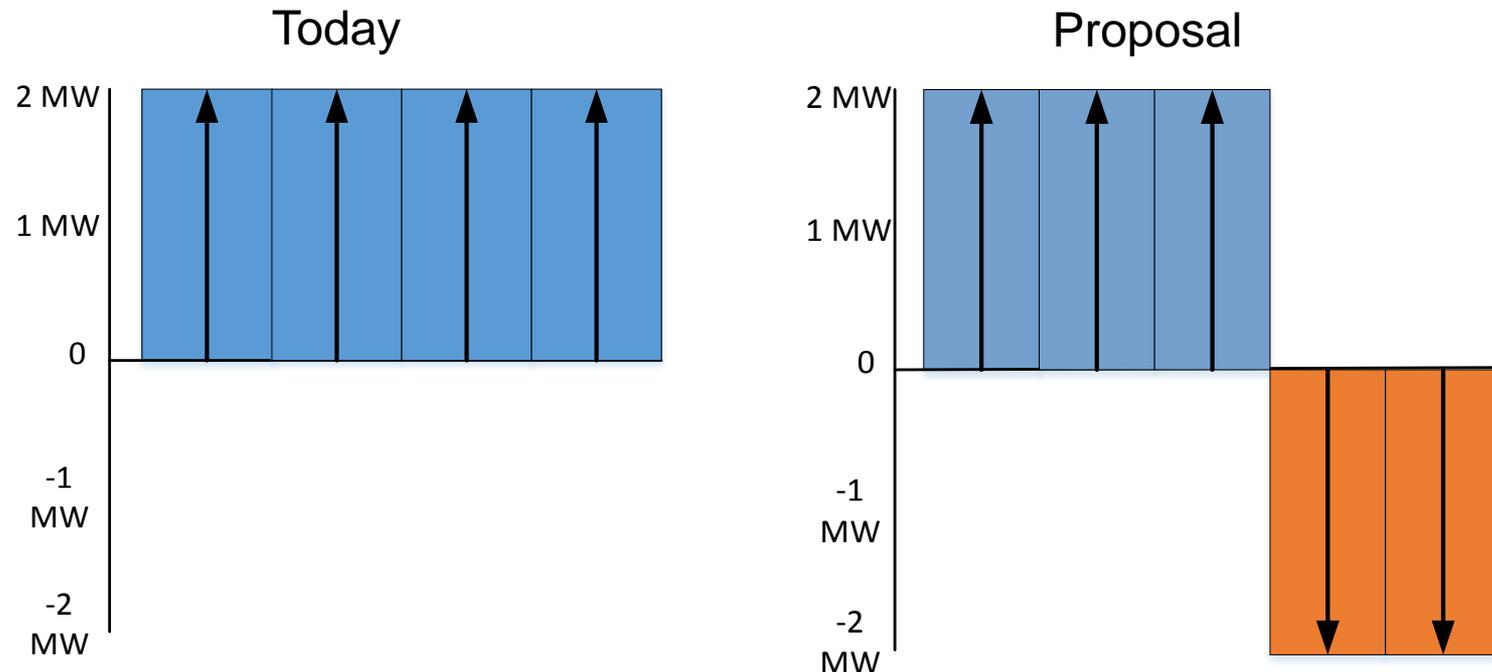
Performance evaluation methodology

- EVSE performance will be measured using the 10 in 10 customer load baseline (CLB) methodology
 - The 10 in 10 will have a look back period of 45 days using 10 of the most recent non-event hours
 - DR energy measurement (DREM) derived from CLB will be in 5-min granularity (ESDER 2)
- Load point adjustment
 - Adjusts the calculated baseline using the morning hours prior to the event (20% adjustment)
 - Used to capture temperature differences between the event and historical data
- Consideration of other baselines and/or adjustments?

LOAD SHIFT PRODUCT

Load shift product for behind the meter storage

Ability for behind the meter energy storage participating as a Proxy Demand Resource to bid in the real-time market to consume load



Load Shift Product will still be a demand response resource

Demand Response Provider Agreement

Proxy Demand Resource	Reliability Demand Response Resource	Load Shift
Economic demand response that only provides load curtailment	Emergency response resource	Economic demand response that provides both load curtailment and consumption

Key Features

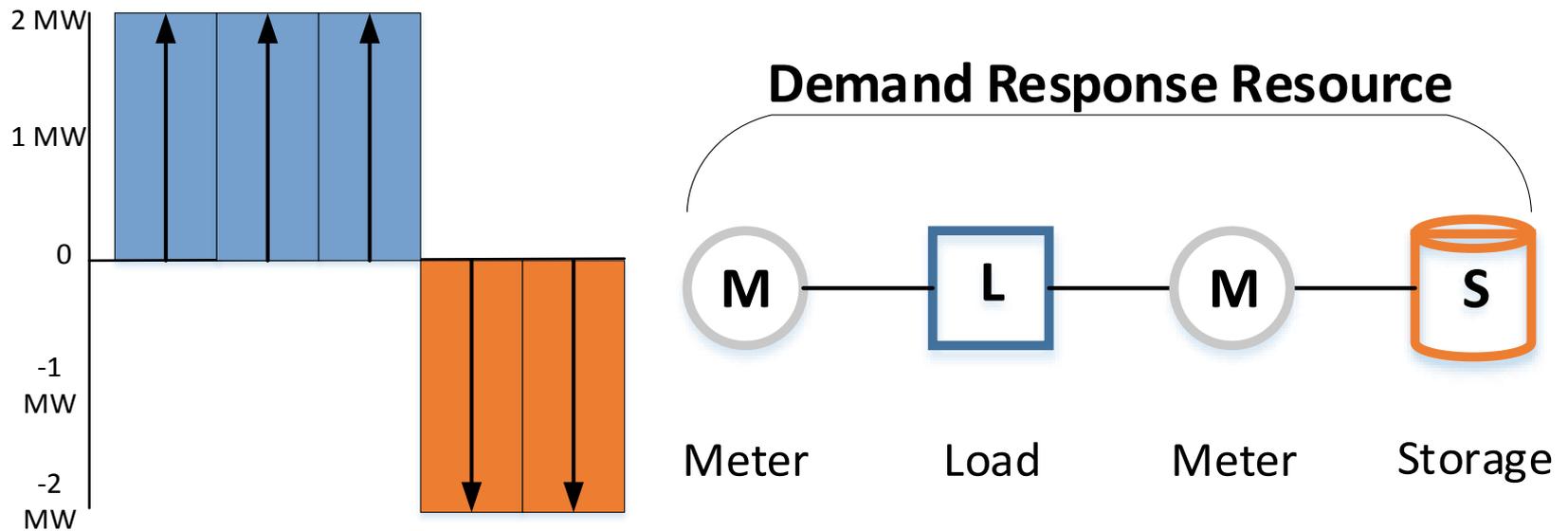
Demand Response Provider Agreement

Proxy Demand Resource	Reliability Demand Response Resource	Load Shift
<ul style="list-style-type: none">• Load curtailment• Resource Adequacy• Non-export• Economic product (bids both day ahead and real time)	<ul style="list-style-type: none">• Load curtailment• Resource Adequacy• Non-export• Economic day ahead bidding option• Primary purpose is emergency response	<ul style="list-style-type: none">• Load consumption for charging BTM storage• Load consumption does not qualify as Resource Adequacy• Non-export• Economic product (bids both day ahead and real time)• BTM storage participation <u>must</u> be directly metered

Pre-market Elements

- Must register as a load shift resource for both consumption/curtailment; cannot register to only offer load consumption
- Will register in MasterFile as two separate resource IDs
 - One resource ID for load consumption and one for curtailment
 - Both resource IDs will be able to register using the same service accounts; resources must include at least one service account with BTM storage.
- Resource Adequacy will only apply to curtailment
 - Must Offer Obligation still applies to the load curtailment resource ID

Market Elements



- Load curtailment = Positive Generation
- Load consumption = Negative Generation
- Load shift product will not be optimized across positive and negative generation

Bidding and energy services - load consumption

Bidding

- Both consumption/curtailment must submit 5-min bid
 - Still reviewing concept of 15-minute product
- Will be eligible for bid cost recovery
- Positive bids will not be allowed (bid floor -\$150 to \$0)

Energy Services

- Energy (including Flexible Ramping Product)
- Imbalance Reserve Product (DAM enhancements initiative)

Not eligible for ancillary services

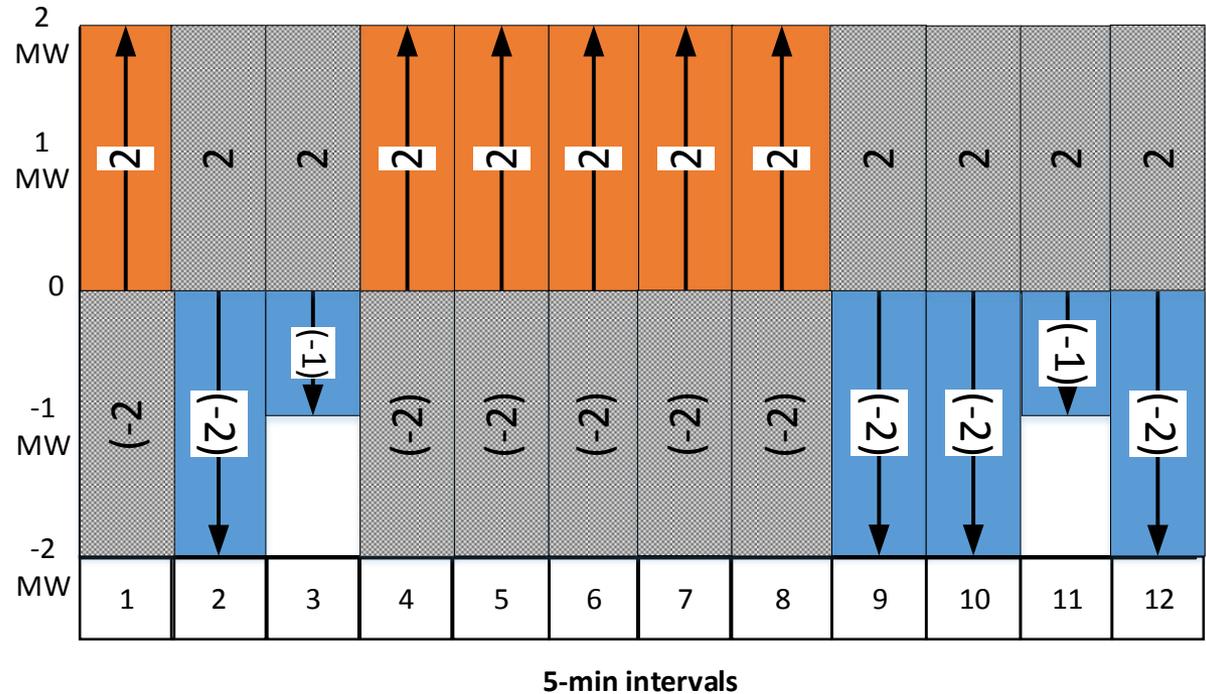
Resource bid stack and award within an hour

Resource ID – Load Curtailment

Amount (MWhs)	Bid
1	\$40
2	\$55

Resource ID – Load Consumption

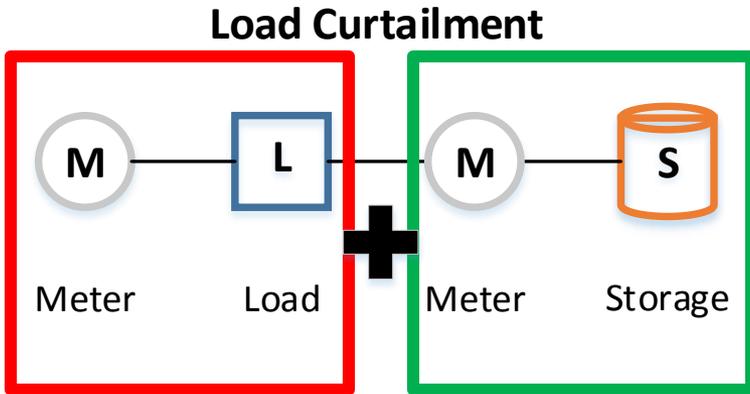
Amount (MWhs)	Bid
-2	-\$80
-1	-\$45



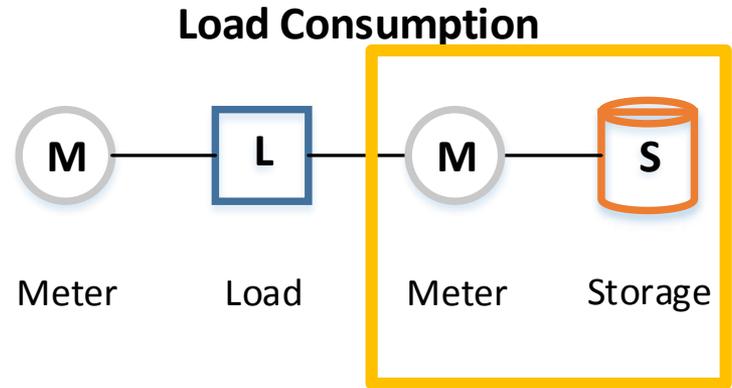
Post-Market Elements

- Load consumption will settle as negative-generation
- Metering data submission will follow the same requirements for all PDR/RDRR
- Consumption measurement will use the Metered Energy Consumption (“MEC”) methodology
- MEC methodology is similar construct as MGO on load curtailment side
 - Will measure and net out “typical consumption” to define incremental value of load shift provided

Metered Generator Output (MGO) – Shift

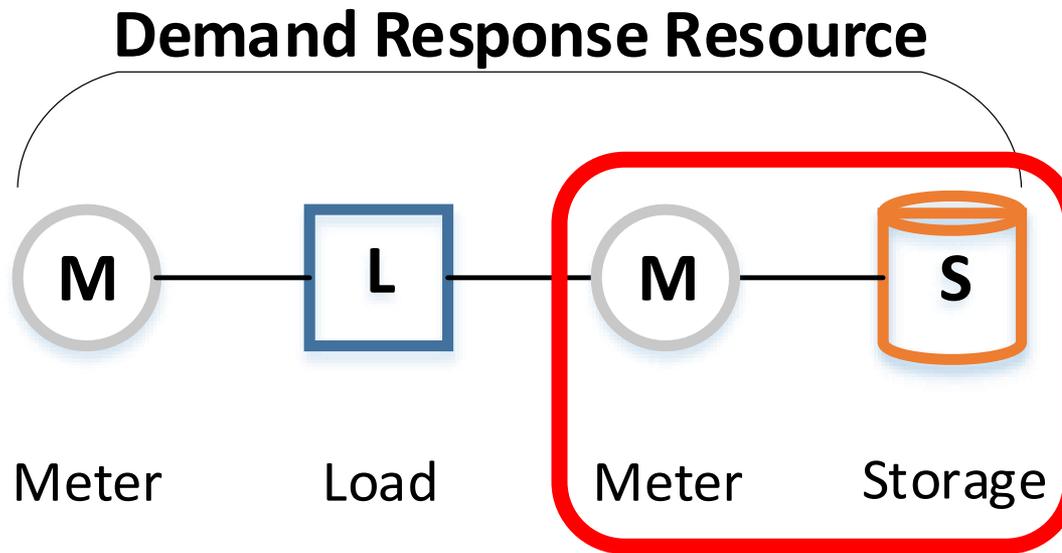


Option B3
Load and Generation
(MGO - ESDER 1 Policy)



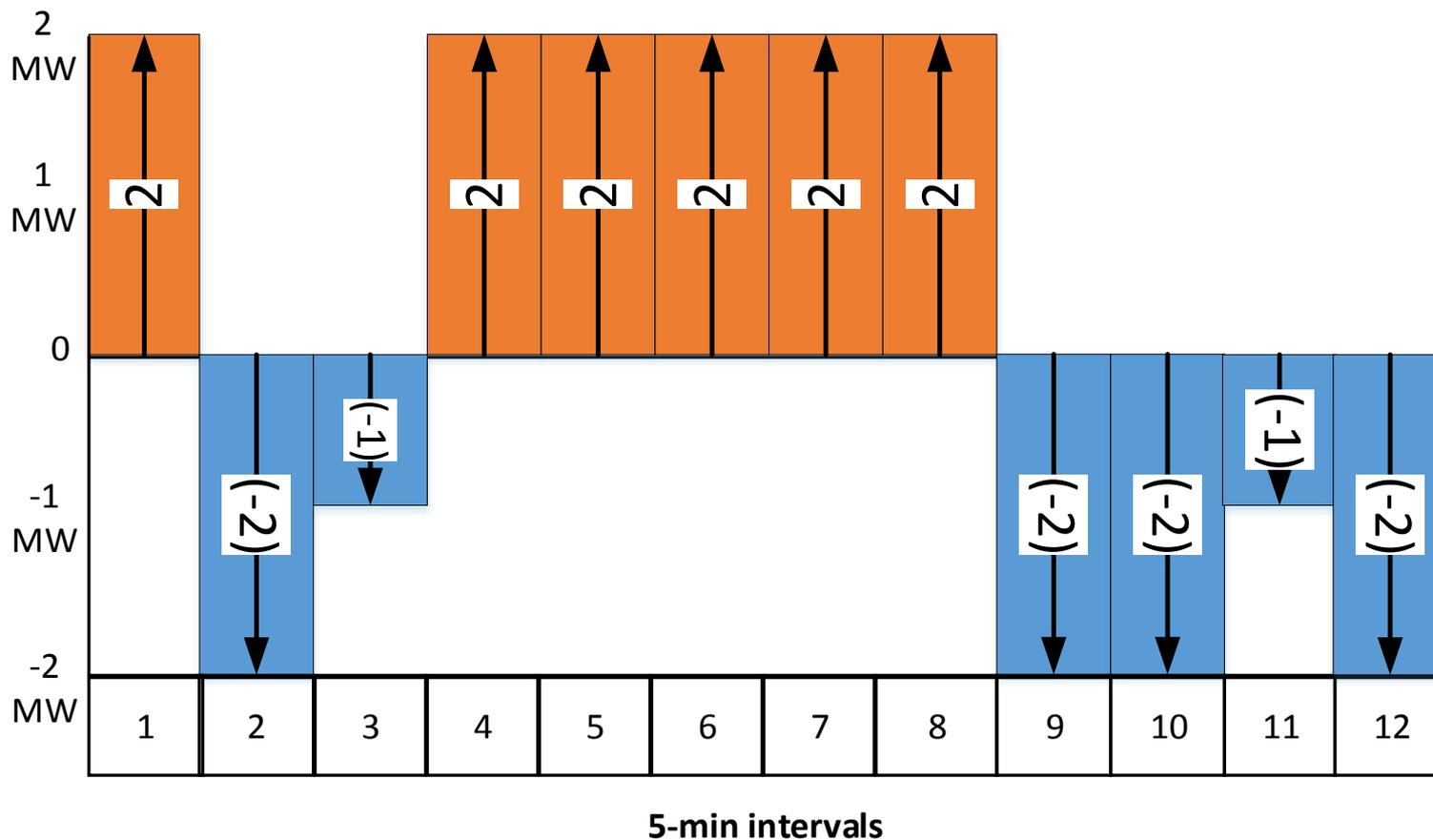
Metered Energy
Consumption (MEC)

Measurement of Performance

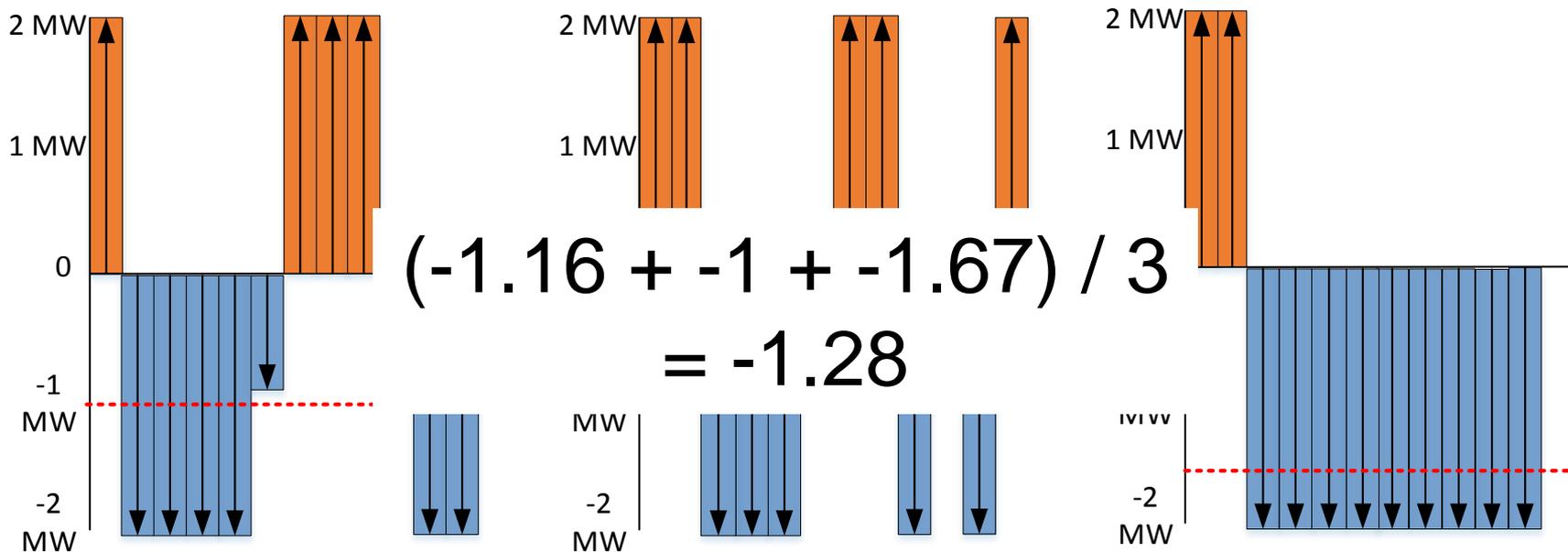


- Measure consumption of storage device at the meter in front of the storage device
- Net out “typical use” to capture incremental value through a 10 in 10 baseline methodology

Resource's performance in an hour- Mirroring MGO



- 10 non-event hours will be used to calculate typical use
- This value will only apply when it is below 0



$$0-2-2-2-2-1+0+0+0-1-2-2 = -14$$

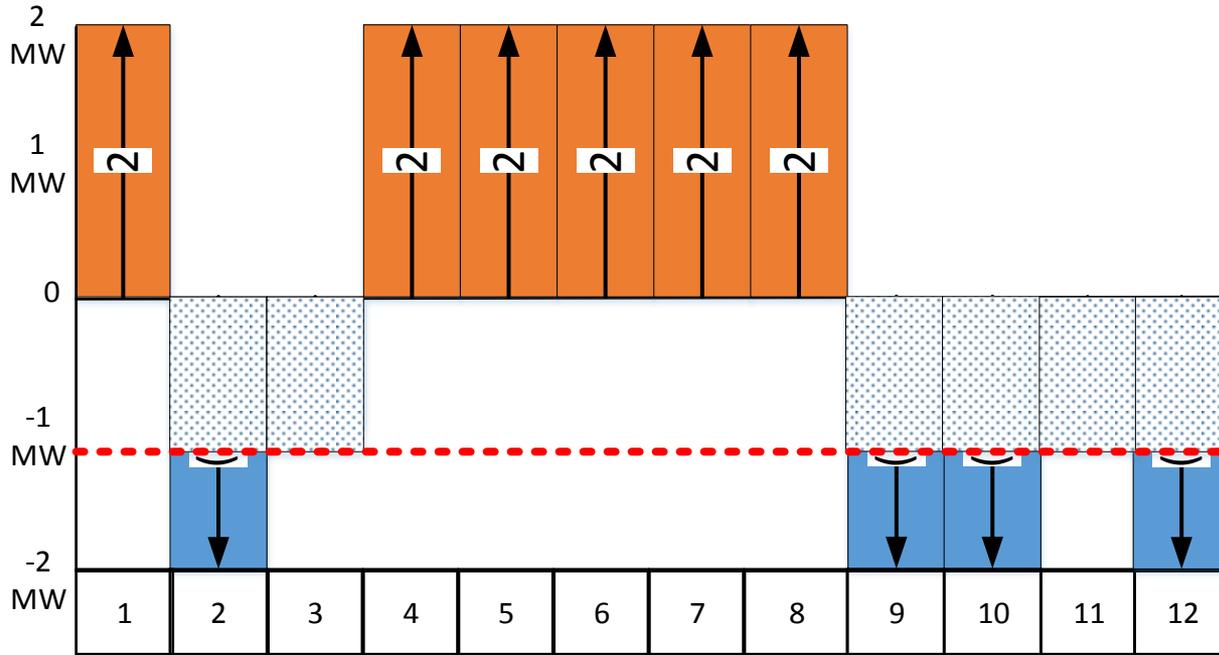
$$-14/12 = -1.16$$

$$0+0-2-2-2-1+0+0-2-1-2+0 = -12$$

$$-12/12 = -1$$

$$0+0-2-2-2-2-2-2-2-2-2-2 = -20$$

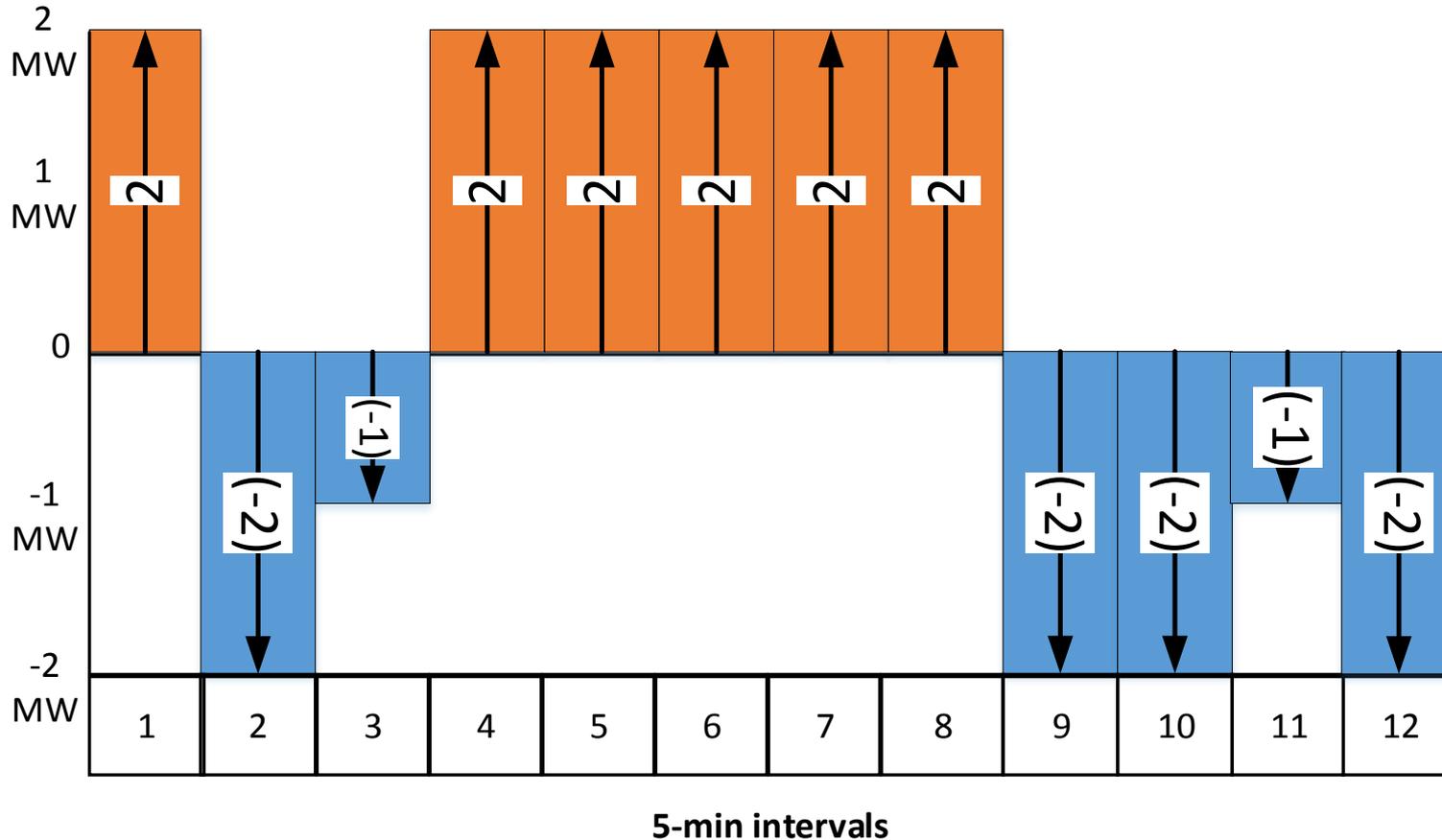
$$-20/12 = -1.67$$



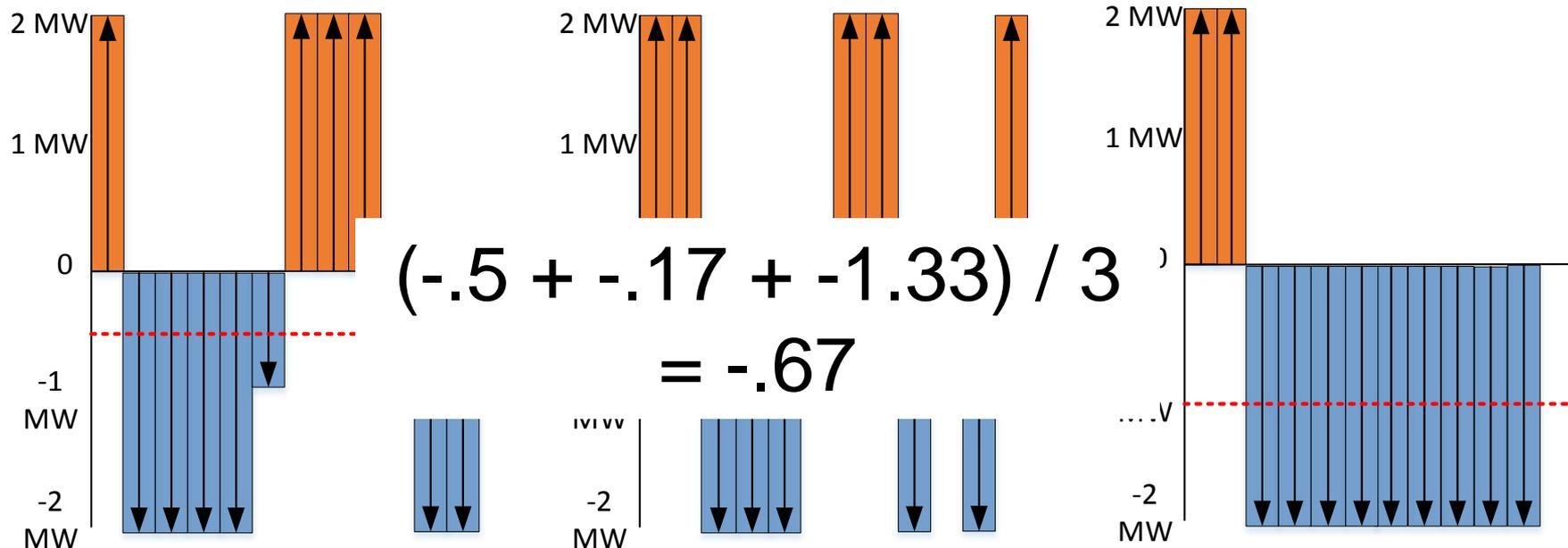
5-min intervals

Interval	Previous MW	Actual MW
2	-2	$-1.28 - (-2) = .72$
3	-1	$-1.28 - (-1) = 0 (-.28)$
9	-2	$-1.28 - (-2) = .72$
10	-2	$-1.28 - (-2) = .72$
11	-1	$-1.28 - (-1) = 0 (-.28)$
12	-2	$-1.28 - (-2) = .72$

Slightly different approach...



- 10 non-event hours will be used to calculate typical use
- This value will only apply when it is below 0



$$2-2-2-2-2-1+2+2+2-1-2-2 = -6$$

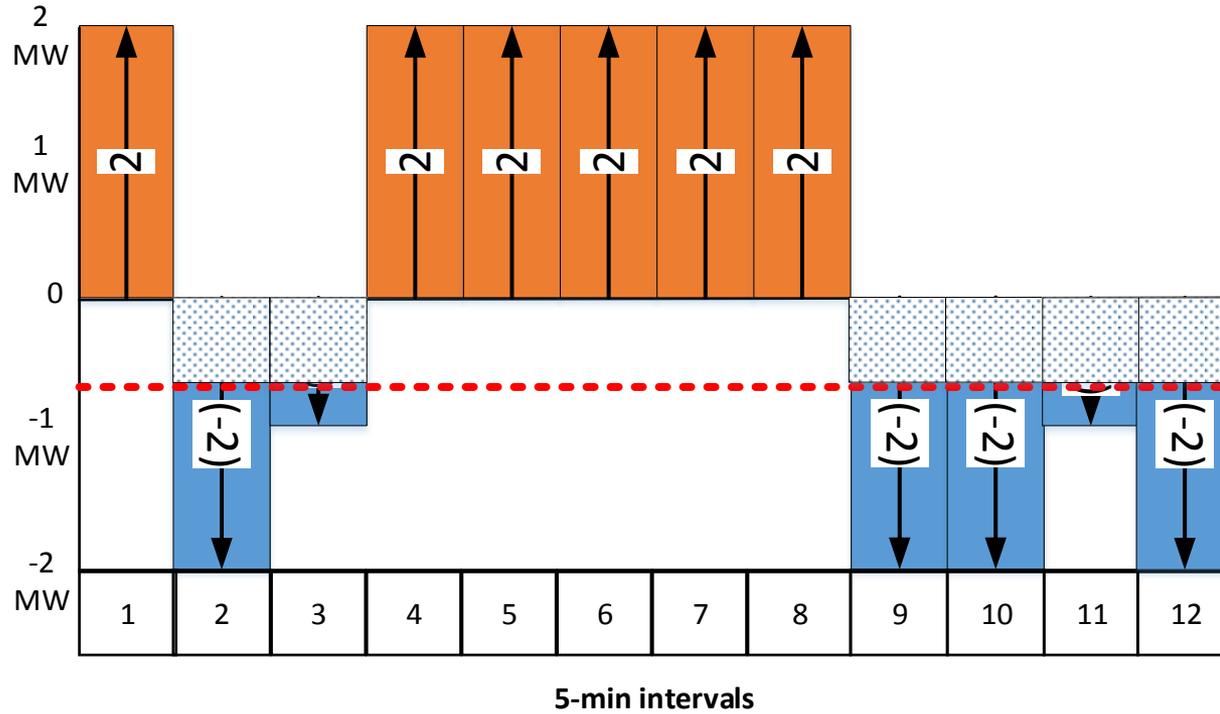
$$-6/12 = -.5$$

$$2+2-2-2-2-1+2+2-2-1-2+2 = -2$$

$$-2/12 = -.17$$

$$2+2-2-2-2-2-2-2-2-2-2-2-2-2 = -16$$

$$-16/12 = -1.33$$



Interval	Previous MW	Actual MW
2	-2	$-.67 - (-2) = 1.33$
3	-1	$-.67 - (-1) = .33$
9	-2	$-.67 - (-2) = 1.33$
10	-2	$-.67 - (-2) = 1.33$
11	-1	$-.67 - (-1) = .33$
12	-2	$-.67 - (-2) = 1.33$

NEXT STEPS

Next Steps

Written stakeholder comments on today's technical working group are due by COB April 9 to InitiativeComments@caiso.com.

Materials related to the ESDER Phase 3 initiative are available on the ISO website at http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx

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