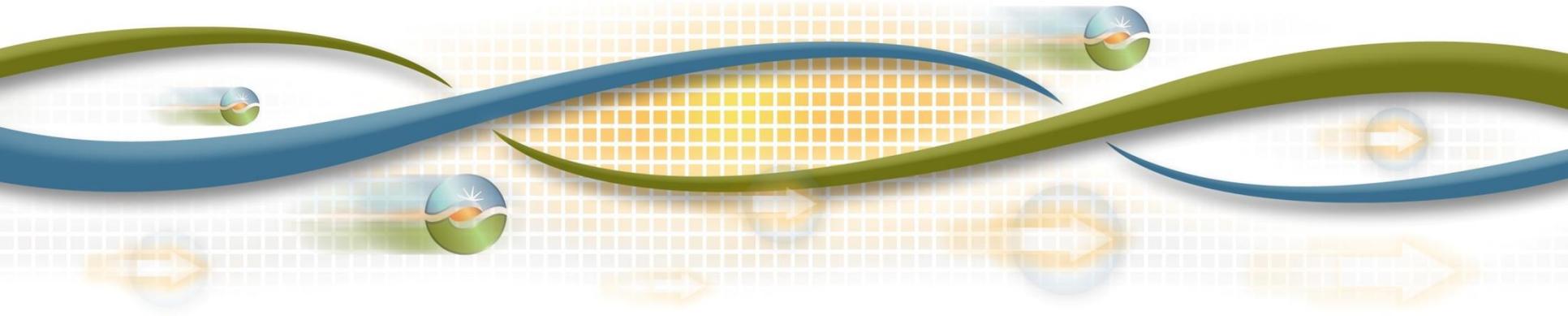




# Energy Storage and Distributed Energy Resources Phase 2 (“ESDER 2”)

## *Second Revised Straw Proposal*

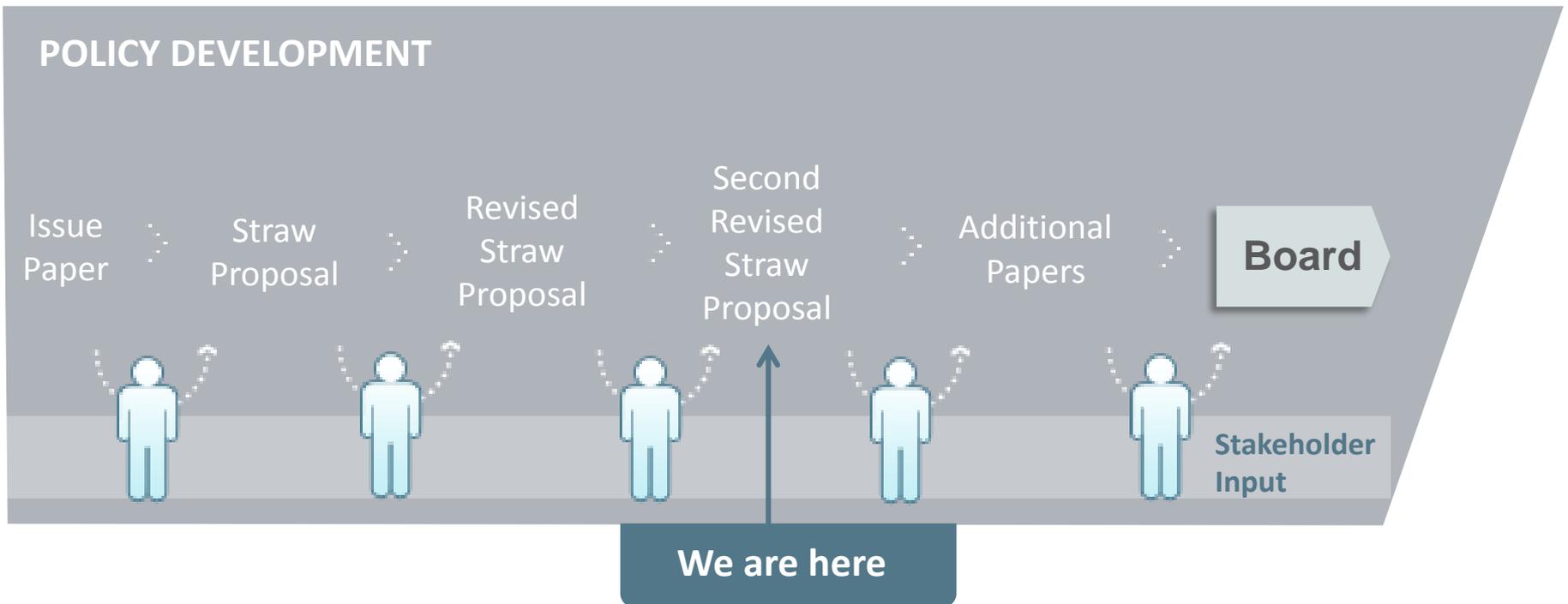
Stakeholder web conference  
September 27, 2016  
3:00 – 5:00 (Pacific Time)



# Agenda

<b>Time</b>	<b>Agenda Item</b>	<b>Speaker</b>
3:00-3:10	Introduction, Stakeholder Process	Tom Cuccia
3:10-3:40	NGR Enhancements	Peter Klauer
3:40-4:10	Demand Response Enhancements	Working Group Representatives
4:10-4:40	Multiple-Use Applications	Lorenzo Kristov
4:40-4:50	Station Power	Bill Weaver
4:50-5:00	Next Steps	Tom Cuccia

# ISO Stakeholder Initiative Process



# Stakeholder process schedule

Step	Date	Event
Issue Paper	March 22	Post issue paper
	April 4	Stakeholder web conference
	April 18	Stakeholder comments due
Straw Proposal	May 24	Post straw proposal
	May 31	Stakeholder web conference
	June 9	Stakeholder comments due
Revised Straw Proposal	July 21	Post revised straw proposal
	July 28	Stakeholder web conference
	August 11	Stakeholder comments due
Second Revised Straw Proposal	September 19	Post second revised straw proposal
	September 27	Stakeholder web conference
	October 11	Stakeholder comments due
Additional Papers As Needed	TBD	Post additional papers
	TBD	Stakeholder web conferences
	TBD	Stakeholder comments due
Board Approval	TBD	Board of Governors meeting

# NGR Enhancements

## Represent use limitations in the NGR model

- Use limitations within the NGR model remain a priority for many stakeholders.
- NGR modeled resources qualifying as use limited need methods to quantify start-up costs, minimum load costs and minimum MWh run-time for bid submission.
- The ISO established a Storage Use-Limited Working Group and held its first meeting on September 13 to examine this topic area in greater detail.

# Storage Use-Limited Working Group Objectives

- Develop common understanding of Use-Limited Status.
- Discuss and document use limitations of storage.
- Explore the merits of Use-Limited status for NGR modeled storage resources.
- Determine whether NGR Enhancements are warranted.

# Storage Use-Limited Working Group Discussion and Feedback

- Any use limitations for NGR would align to Commitment Cost Enhancement 3 (CCE3) processes for registering resources as Use-Limited beginning Fall 2017.
- To qualify as Use-Limited under NGR, storage resources need to address:
  - What are the limitations for NGR and can they be reflected in the market optimization?
  - What are the costs for NGR and should/how would they be reflected in the market?

## Storage Use-Limited Working Group Discussion and Feedback (continued)

- Working group discussed existing NGR modeling capabilities with regard to MW and MWh limitations.
- Stakeholders would like to see a daily limit on MWh similar to a Use-Limited peaker plant or hydro resource.
- Stakeholders would like to discuss how Major Maintenance Adder (MMA) may be applied for energy storage.
- Stakeholders would like to see the same outage card functionality to indicate when limitation has been reached, and no longer assessed under Resource Adequacy Availability Incentive Mechanism (RAAIM).

# Storage Use-Limited Working Group Discussion and Feedback (continued)

- Stakeholders would like clarity between Must Offer Obligation (MOO) hours, Use-Limited Resource's (ULR) availability hours, and the Resource Adequacy Availability Incentive Mechanism (RAAIM) assessment hours.
- Some stakeholders have provided feedback that storage should not be considered 'use-limited' by exogenous factors and that limitations can be modeled and are the responsibility of the resource owner to factor in to the bid price.

# Model Enhancements for high and low State of Charge

- Previously the ISO was investigating a dynamic ramping rate model based on a resource's State of Charge (SOC).
- A battery resource's ramping rate is not dependent on SOC. The challenge is in a resource's ability to sustain a MW output at a given SOC due to operating restrictions. MW throughput may already be managed in an NGR's bid.
- Some stakeholders suggested enabling of multiple bid stack submission for different SOC levels, but the ISO is not pursuing that option at this time. The issue may be reevaluated when more resources are participating.

# Demand Response Enhancements

# Stakeholder-led Work Groups are Up and Running

## **Baseline Analysis Working Group (BAWG)**

*Leads: Kathryn Smith (SDG&E) and Cherish Balgos (SCE)*

- Exploring additional baselines to assess the performance of PDR when application of the current approved 10-in-10 baseline methodology is sufficiently inaccurate.

## **Load Consumption Working Group (LCWG)**

*Lead: Spence Gerber (Olivine)*

- Exploring the ability for PDR to consume load based on an ISO dispatch, including the ability for PDR to provide regulation service.

# Baseline Analysis Working Group Update

## **Group Purpose:**

To create specific recommendations for additional settlement methodologies to be incorporated into the CAISO settlement process for PDR and RDRR.

## **Analysis Performed**

The accuracy of a variety of baseline and control group settlement methodologies was tested on four customer groups:

- Residential Customers on AC Cycling programs
- BIP customers
- Agricultural customers
- Commercial AC Cycling programs

# Proposed Settlement Options for PDR and RDRR

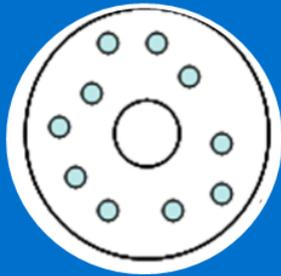
Customer Type	Option 1	Option 2	Option 3
Residential	4 day weather match by max temperature	Control Group	
Commercial	10 of 10 with adjustment 20% cap	Average of previous 5 days	Control Group

The 4 day weather matching baseline and the control group analysis will need to be calculated by the SC or DRP.

If a resource has both residential and commercial customers then the load impact should be separately calculated for the residential and commercial customers using the appropriate methodology and later combined.

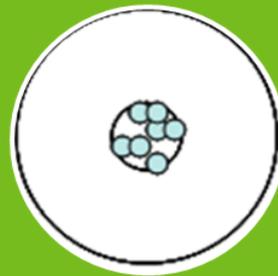
# Baseline Analysis Working Group Update (cont.)

## Establishment of Control Groups



### Little or No Bias

A good control group should not exhibit bias. It doesn't need to be perfect but bias must be small enough that it can be corrected with small same day adjustments



### 90/10 Precision

The margin of errors on individual days and hours must be less than 10% with 90% confidence



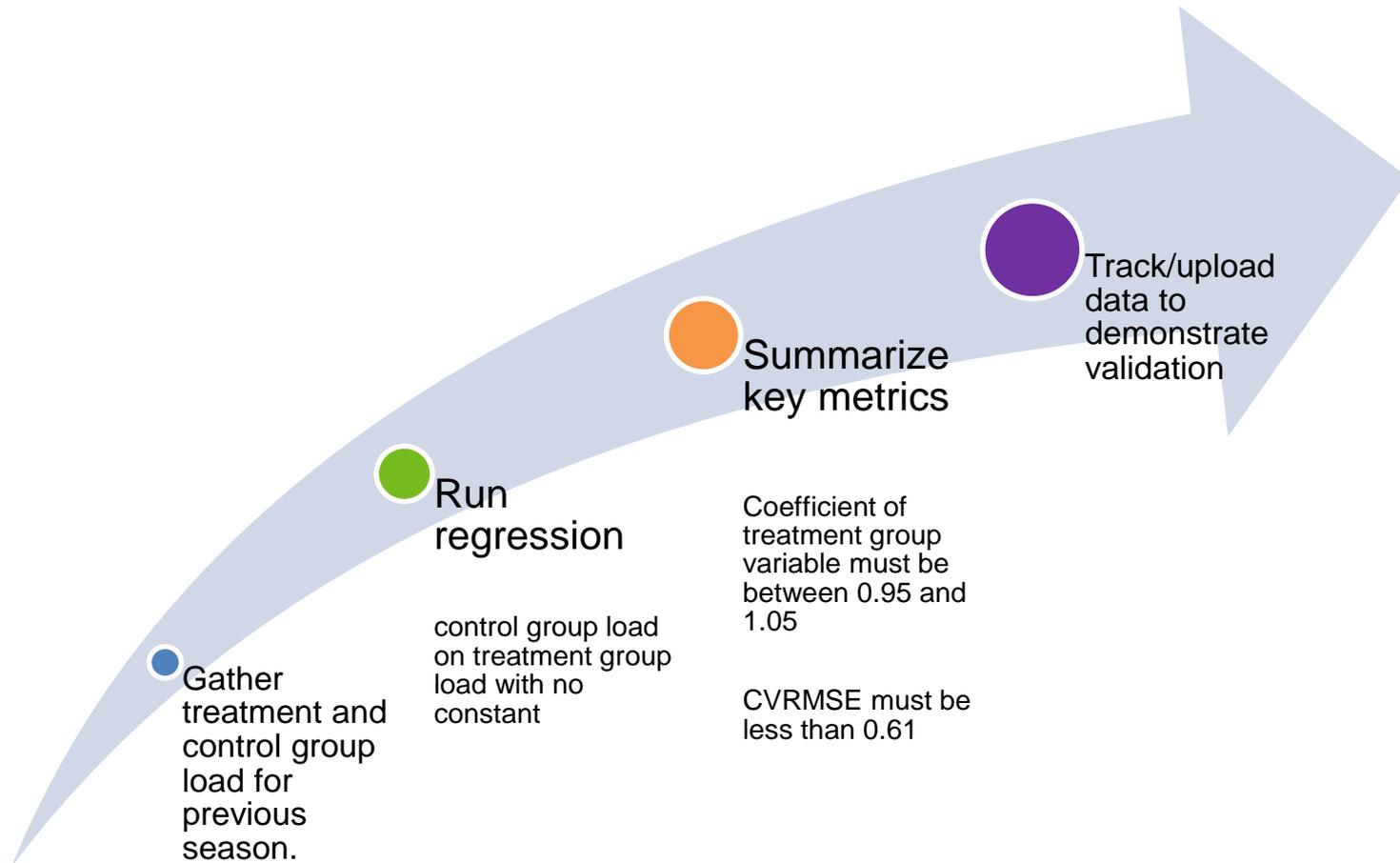
### Minimum Sample Size of 100

Anything below is insufficient

Validation is required for each season and needs to be updated for population changes

# Baseline Analysis Working Group Update (cont.)

## Establishment of Control Groups



# Load Consumption Working Group Update

- Recommending modifications to PDR to allow bi-directional modelling and bidding.
  - Accommodates load consumption.
  - Regulatory opinion that direct impact to wholesale rates under CAISO/FERC jurisdictional.
  - Frequency regulation concept allowing bidirectional without energy settlement and directional with.
- Open issues list identifies areas for continued vetting.

# Load Consumption Working Group Update (cont.)

- Clarifications
  - Non exporting
  - “Inverse” baseline to measure additional consumption



# Multiple-Use Applications

# Multiple-Use Applications

- Multiple-use applications (MUA) are those where an energy resource or facility provides services to and receives compensation from more than one entity.
- DER could potentially provide and be compensated for many services to customers, the distribution system and the wholesale markets.

## Multiple-Use Applications (cont.)

- In the context of CPUC Energy Storage Track 2 proceeding (R. 15-03-011) the ISO has collaborated with CPUC staff to
  - conduct workshop on this topic on May 3
  - review stakeholder comments and reply comments
- At this time the ISO has not identified MUA issues or topics that require separate treatment in ESDER 2.
- ISO will continue its collaboration with the CPUC.
- If the CPUC proceeding reveals an issue that should be addressed in an ISO initiative, ISO will consider it in the stakeholder initiatives catalog and roadmap for 2017.

# Station Power

# Distinction between charging energy and station power

- Energy for resale is considered wholesale under the Federal Power Act, which means that charging a storage device is a wholesale, FERC jurisdictional activity.
- Station power is energy consumed to operate a generator. It is a retail, state jurisdictional activity.
- For station power purposes, storage resources will be treated similarly to generators.
- The ISO believes energy used to charge a battery for later resale – including efficiency losses – should be subject to a wholesale rate.

# Clarifications on “Netting”

- The CAISO does not “net” retail consumption and wholesale generation as part of its settlement process.
- The generators themselves do the “netting” by self-supplying the energy for their station power load.
  - The CAISO thus sees slightly reduced output onto the grid, and the UDC sees reduced (or no) energy drawn from the grid.

## The CAISO proposes to seek Board approval in two ways:

- To revise the CAISO tariff definition of station power to exclude explicitly charging energy
- Permit the CAISO to revise its tariff later to be consistent with IOU tariffs, as needed, in the event that they revise their station power rates
  - We speculate this could manifest in two ways:
    1. Treat negative generation as positive such that storage resources can net charging like discharging
    2. Allow storage resources and station power supplier to develop mutually agreeable metering configuration

# Next Steps

Request stakeholder comments by COB October 11

Be sure to use comments template provided

Submit to comments mailbox:  
[initiativecomments@caiso.com](mailto:initiativecomments@caiso.com)

Step	Date	Event
Second Revised Straw Proposal	September 19	Post second revised straw proposal
	September 27	Stakeholder web conference
	October 11	Stakeholder comments due

Thank you!