California ISO
Shaping a Renewed Future

Flexible Resource Adequacy Criteria and Must-Offer Obligation

Working Group Meeting

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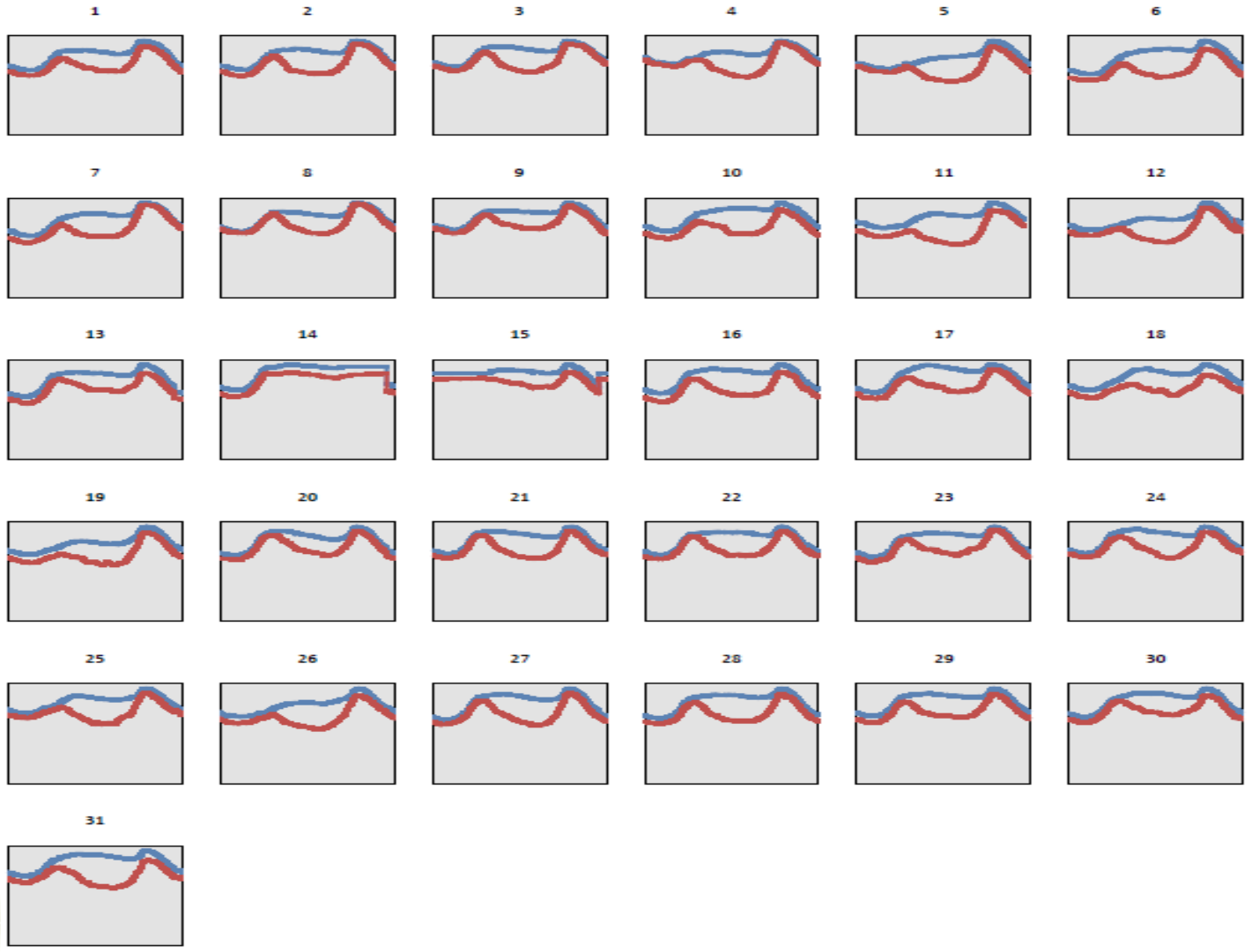
Outline

- Must offer obligation
- Allocation of flexible capacity resources to local regulatory authorities
- Standard flexible capacity product accounting and pricing

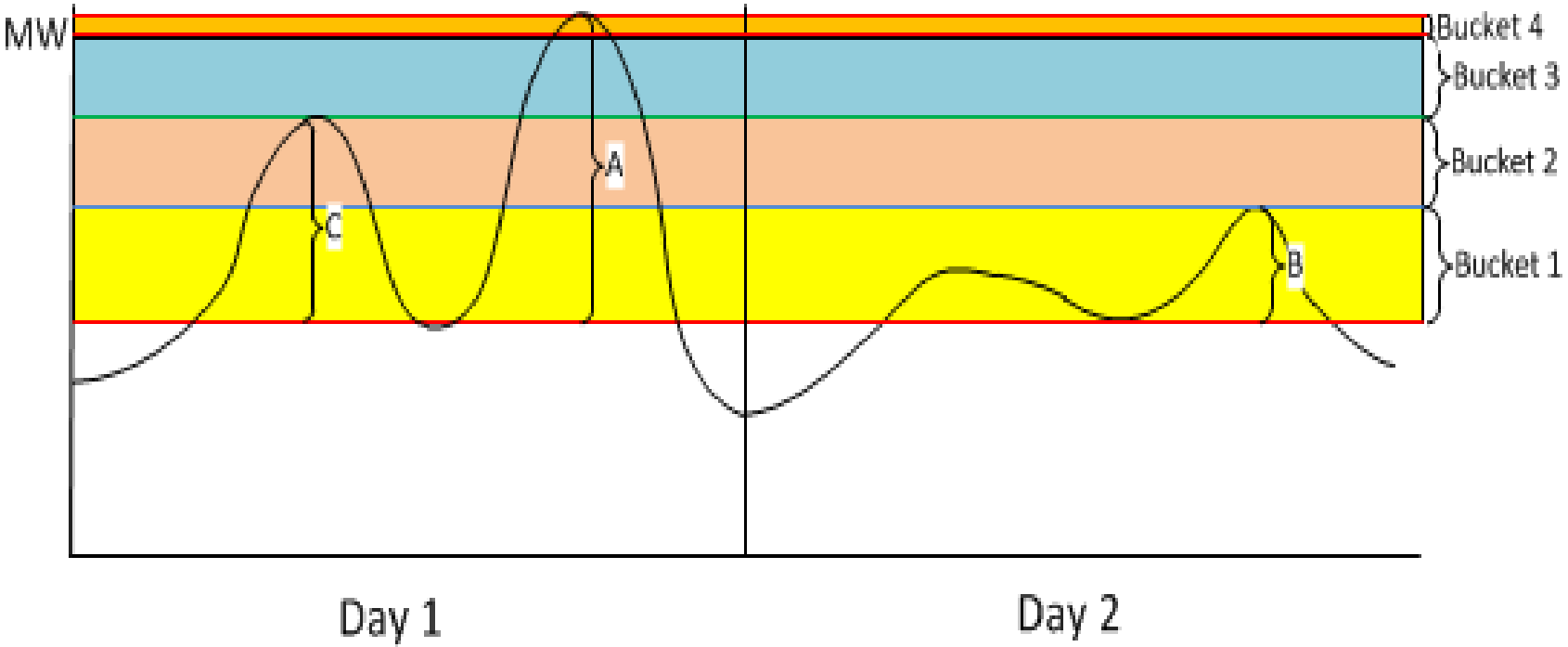
Outlining the ISO's flexible capacity needs: The flock of ducks (forecasted March 2016)



Why the need for change

- Tech specific offer obligations were designed to provide feasible solutions for a wide range of resources including DR, storage, and VERs
- Stakeholders asserted that technology based offer obligations were
  - Complex
  - Discriminatory
  - Might not ensure the ISO has the sufficient flexible capacity
- ISO is considering a generalized needs based
  - Blocked or bucketed operational needs

Trying to categorize ramping needs



A: The maximum 3-hour net-load ramp for a month

B: The smallest daily maximum daily 3-hour net-load ramp in a month

C: The largest secondary 3-hour net load ramp of the month (i.e. the largest ramp on days that have bimodal ramping)

Image is for illustrative purposes only and does not represent actual data

Preliminary bucket offer-obligations proposal (actual percentages still under development)

- Bucket 1: 24 hour offer obligation, no use-limitations– Minimum of 50% of total flexible capacity showing
- Bucket 2: 17 hour offer obligation, At least two start and minimum of 6 hours of run time (replacement required for ULRs) – Maximum of 50%
- Bucket 3: 5 hour seasonally determined offer obligation, at least one start per day and minimum of 3 hours of run time (replacement required for ULRs) – Maximum of 20%
- Bucket 4: 5 hour seasonally determined offer obligation, at least one start per day and minimum of 3 hours of run time and available for at least 5 flexibility based dispatches per month (no replacement required for ULRs) – Maximum of 5%

The ISO is still assessing all implications of switching to the generalized needs based approach

- Resources types
  - Offer obligations
  - SFCP availability and compensation
  - Supply plans
- LSEs/LRAs
  - Allocations
  - Replacement/substitution
  - Backstop
  - RA showings

The ISO's most recent proposal

- ISO proposes using an allocation methodology which is consistent with the system requirement determination based on the maximum net load ramp

- ISO believes that allocating an RA requirement to generating resource is a significant change to the current RA construct.
  - This proposal may merit additional consideration, such changes to the RA construct is beyond the scope of FRAC-MOO

Flexible capacity requirement is split into its two component parts to determine the allocation

- Maximum of the Most Severe Single Contingency or 3.5 percent of forecasted coincident peak
  - Allocated to LRA based on peak-load ratio share
- The largest 3-hour net-load ramp is decomposed into four components to determine the LRA's allocation

  Allocation* =

  Δ Load – Δ Wind Output – Δ Solar PV – Δ Solar Thermal

  * Changes in DG component captured in Δ Load

Pricing the Standard Flexible Capacity Product

- The ISO has considered using
  - CPUC RA pricing data
  - Flexible ramping constraint
- Other proposals from stakeholders include
  - Divide the flexible ramping constraint costs by the flexible capacity requirement (NRG)
  - Assess regulation ancillary service price and derive price per/kw-month (CDWR)
    - Adder price (monthly) = Reg up price (monthly average) – CPM price

Options for SFCP moving forward

- Continue developing one of the previously discussed options
- Defer until a later date
  - SFCP would not go into place until 2016
  - Other stakeholder initiative may provide additional information for pricing SFCP (i.e. Flexible Ramping Product, Reliability Services Auction, etc.)

Proposed timing

- ISO proposes to take final FRAC-MOO proposal to the March board meeting
  - Fifth revised draft straw proposal scheduled for early January
  - Draft final proposal in early February