

Flex RA PG&E Alternative Proposal

December 20, 2012

Key Summary

- Retains / Adopts most of CAISO proposal

Adding –

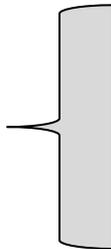
- A daily *energy* limit provision (mwh/day) with 6 hours/day qualification - not 17 hours/day
- Hydro Use-limited counting/qualification process based on annual and monthly “Flex RA Availability Demonstrations”
 - If showing indicates ≥ 6 hours equivalent energy (at Flex RA capacity), then resource can be used for Flex RA showings (Flex RA capacity may be less than Pmax, down to zero)
- Alternative Proposal can *help* CAISO Operations and Markets, it does not take away.
 - Even though there are restrictions and fuel (water) limitations on hydro resources (FERC license, safety, consumption, recreation and precipitation), meeting more of the Flex RA demonstrations with hydro resources rather than thermal alternatives may reduce concerns with min-load/over-gen, uplift and potential resource availability issues.

- CAISO proposal 2014 – 2016 Resource Adequacy, some key elements:
 - Flex RA need – between 7,000 mw (Jul) and 12,000 mw (Dec), allocated to LSEs
 - Flex RA resource qualification – capacity available within 3 hour start/ramp period, and able to provide a minimum of 3 hours of sustained energy delivery
 - Flex RA obligation –
 - must bid energy or a/s for HE 6 – 22, in IFM and RTM
 - resource must be available for dispatch for HE 6 – 22 hours (i.e. sufficient *energy* to support 17 hours of full Flex RA capacity dispatch) each day for full month, subject to non-performance penalties (with 10% grace), or resource substitution

- Concerns
 - Not certain a single “Flex RA” and associated targets (mws) will actually address CAISO renewables integration needs in the long term, more flexibility may be needed.
 - But time to adjust and change this in the future (for 2015)
 - Flex RA Obligations are un-necessarily restrictive, and would disqualify a significant amount of hydro use-limited resources (or create undue compliance risks, if counted).
 - 17 Hours of *energy* requirement daily, for a full month
 - Hydro Flex capacity based on *historical bids* based on an average year

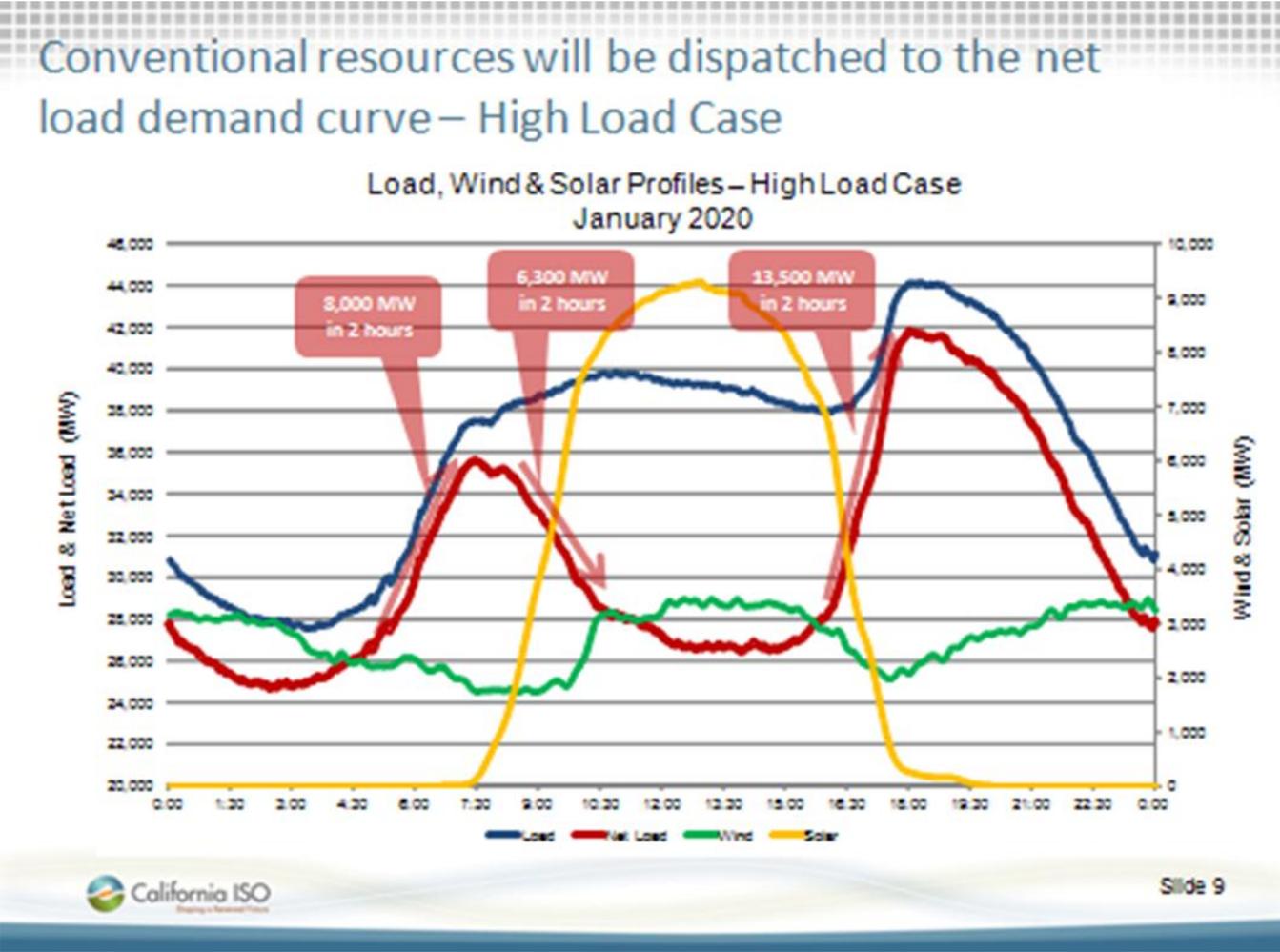
- PG&E has prepared an alternative to the CAISO proposal – to address the undue restrictions on use-limited resources
 - *Builds upon the CAISO proposal*
 - *Increases the pool of resources qualified to provide Flex RA (use-limited but flexible hydro resources).*
 - These resources may **help CAISO Operations and Markets** more so than thermal alternatives – advantageous with respect to over-gen (min load) during the day needed to bridge the two ramps; uplifts (min load, start-up costs); and possible resource availability (for second ramp, e.g. due to min. down times if cycled or one-start-per-day limitations).
 - Also, potentially lower cost and reduced GHG impacts (verses increased use of thermal alternatives)
 - *Implements new “daily energy limit” provisions within CAISO proposal*
 - Flex RA obligation / counting (qualification) –
 - must bid energy and a/s for HE 6 – 22, in IFM and RTM
 - resource must be available for dispatch for HE 6 – 22 hours each day for full month, subject to non-performance penalties, or resource substitution

New



- market awards **subject to maximum daily energy use-limits** (mwhrs per day), once reached there would be no further Flex RA obligations
- Flex RA qualification requirement – **minimum available energy to support 6 or more hours** of full Flex RA capacity dispatch
- 6 hours based on the need to support **two, 3 hour ramps per day** (next slide)
- Counting (qualification) based on annual and monthly **prospective “Flex RA Availability Demonstrations” by resource owner** (not to exceed Pmax, must be dispatchable)
- **subject to non-performance penalties** if bids are not provided (HE6-22, IFM and RTM) (with 10% grace, or resource substitution)

- Key CAISO Ramping Needs
 - Generally (most periods of the year), two ramp events per day of about three hours each



- Summary Comparison – CAISO Proposal and PG&E Proposal

Flex RA			CAISO Proposal		PG&E Proposal	
			All Resources		<i>Non-Use-Limited = same as CAISO</i>	
					Use-Limited	
Qualifications						
	start up < 90 min	Pmax	yes		yes	
	su > 90m	Pmax-Pmin	yes		yes	
	min 90m sustain		yes		yes	
Must Bid HE6-22 (17 hrs)			yes		yes	
Submit feasible bids/schedules			yes		yes	
Unrestricted ability to bid (floor to cap)			yes		yes	
Obligation for 17 hrs <i>energy</i>			yes		<i>no</i>	min 6 hrs to qualify
	or replacement, penalty					

Example

Resource A - 250 MW Pmax

Inflexible Capacity - 100 MW

Flexible Capacity counted for Flex RA - 150 MW

Economic Must-Bid Obligation - 150 MW (HE6-22, IFM and RTM)

Daily Energy Limit - 900 MWhrs (6 hrs x 150 MW)

CAISO will receive 17 hours of economic bids (IFM and RTM). The CAISO will optimize to assure the most effective use of the 900 MWhrs of energy across the 17 hours (placement of the 6 hours of energy). Once the daily energy limits have been reached, a resource would have no further Flex RA obligations.

In Summary

- The proposed alternative still provides for the CAISO ramping needs, while also helping the CAISO operations and markets (potential overgen/min load, uplift costs, resource availability), and with potentially lower costs and GHG emissions (relative to a greater reliance on thermal alternatives).