

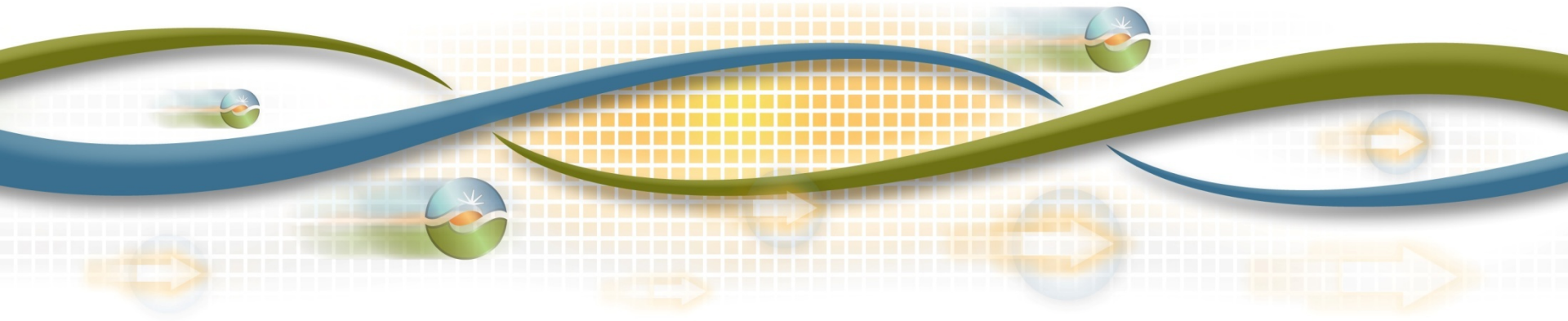
Flexible Resource Adequacy Criteria and Must-Offer Obligation

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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 maximum 3-hour net load ramp using changes in
 - Load
 - Wind output
 - Solar PV
 - Solar thermal
 - Distributed energy resources

The ISO will decompose the largest 3-hour net load ramp into five components to determine the LRA's final allocation

$$\text{Allocation} = \Delta \text{ Load} - \Delta \text{ Wind Output} - \Delta \text{ Solar PV} - \Delta \text{ Solar Thermal}$$

- $\Delta \text{ Load}$ – LSE's average contribution to load change during top five daily maximum three-hour net-load ramps within a given month from the previous year x total change in ISO load
- $\Delta \text{ Wind Output}$ – Percent of total wind contracted x total change in wind output
- $\Delta \text{ Solar PV}$ – Percent of total solar PV contracted x total change in solar PV output
- $\Delta \text{ Solar Thermal}$ – Percent of total solar thermal contracted x total change in solar thermal output

3-hour maximum net-load ramp used is coincident 3-hour maximum ramp

ISO proposes to allocate Δ Load component based on an LSE contribution to top five historical peak 3-hour net-load ramps

- Allocation is based on each LSE's contribution to load change during the peak net-load ramps
- Uses the LSE's contribution during the five maximum 3-hour net-load ramps, not monthly averages
 - Helps address uncertainty in forecasting and anomalous load changes
 - Maintains focus on peak net-load ramping events

PG&E's proposal to allocate load use non-coincident peak load ramps

- Calculate each LSE's single largest 3-hour maximum load ramp (non-coincident) in MWs for each month using the previous two years of historical loads
- Calculate monthly percentage allocators for each LSE by dividing an LSE's own 3-hour ramp requirement by the sum of the 3 LSEs' 3-hour ramp requirements
- Use the resulting 12 percentages to allocate the CAISO's monthly 3-hour max net load ramp requirements caused by changes in load

An example comparing the ISO and PG&E proposals

	LSE's maximum 3-hour load change in month (non-coincident)	LSE's share of total LSE load ramps in month	System's load ramp coincident with system's maximum 3-hour net-load ramp in month	LSE's monthly allocation of load for flexible requirement	LSE's monthly contribution to system's maximum 3-hour net-load ramp in month (coincident)	Difference Between PG&E proposal and ISO's proposal
LSE 1	2,000 MW (Day 2, HE 14-HE17)	2,000 MW/8,000 MW = 25%	5,000 MW (Day 6, HE 15-HE 18)	25% * 5,000 MW = 1,250 MW	1,250 MW or 25%	0 MW
LSE 2	3,000 MW (Day 6, HE 15-HE18)	3,000 MW/8,000 MW = 37.5%		37.5% * 5,000 MW = 1,875 MW	3,000 MW or 60%	-1175 MW
LSE 3	1,000 MW (Day 15, HE 14-HE17)	1,000 MW/8,000 MW = 12.5%		12.5% * 5,000 MW = 625 MW	-150 MW or -3%	775
LSE 4	2,000 MW (Day 30, HE 14-HE17)	2,000 MW/8,000 MW = 25%		25% * 5,000 MW = 1,250 MW	900 MW or 18%	350 MW
Total	8,000 MW					

The ISO proposal is consistent with cost causation principles

- Flexible capacity requirements set based on coincident peak ramps, allocation should also be based on coincident peak ramps
 - The ISO proposal is consistent with causation principles
- Not clear that PG&E's proposal resolves all free-rider problems
 - May just shift the ramping requirement to LSEs that ramp in non-peak ramping times
- The ISO's proposed methodology is consistent with how generic RA is currently allocated