Long Duration Storage Initiative

PG&E
May 15, 2024

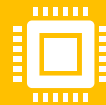# Long Duration Storage Modeling Options

Market modeling of long duration energy storage: opportunity to build upon existing market models

Hydro (daily energy limit, monthly plan) – add charging capability

Pumped hydro (discrete pumping state, commitment costs) – add dispatchable range to pump model

Existing NGR model: determine where short duration assumptions hamper use, enable begin and end of day SOC targets (and potential SOC ancillary service), enable discrete charge/discharge commitment states

Hybrid (market participant manages state of charge, provides telemetry so CAISO can verify feasibility after the fact) – enable model for individual LDES, enhance telemetry for non-battery storage

Long Duration Storage Modeling Benefits

Enhance market operator capabilities to capture or model sources of value not represented in current market processes (energy sufficiency, long-term telemetry)

Seasonal energy shifting

Backup energy to cover renewable unavailability, avoid fossil peaking

Potential for uses of stored energy outside of electric markets

Potential Long Duration Storage Market Updates

Storage as a product distinct from dispatched energy

- Enforce or price initial SOC and final SOC targets in DAM processes

- Consider enhancing multi-day modeling to capture and price storage opportunity costs over one to two week horizon

- Multi-month energy sufficiency products

- Model storage as a spread over a participant-determined horizon

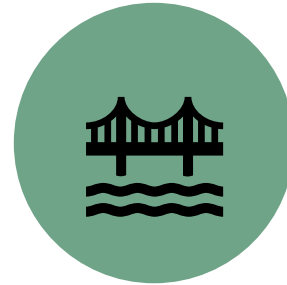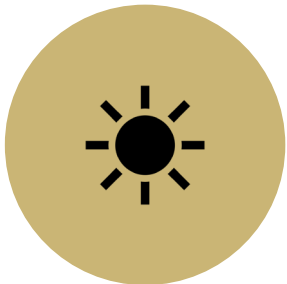# Intermittent Resource AS Initiative

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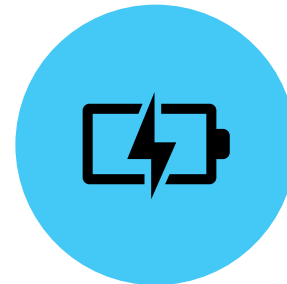# Ancillary Services for Solar (Intermittents/Hybrids)

Certification and Performance Requirements

Locational Procurement

Real-time AS reoptimization

Dynamic limits, default bids and RTD AS procurement

Real-time AS reoptimization

Consider IR procurement as aiding AS reoptimization

Use dynamic limit tool to determine solar buy-back

Determine constraints on rebidding to dis-incent pure arbitrage plays

Thank You

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