Application Priorities – Strawman **DRAFT**

Date: April 16, 2012

The following application priorities and definitions are based on informal input/discussion between CPUC Staff, CESA, SCE, PGE, SDGE on April 12, 2012.

Basis for Prioritization

1. Magnitude of societal benefits
2. Magnitude of direct benefits
3. Renewables enablement (key California policy priority)
4. Fit with CPUC jurisdictional control
5. Availability of commercially ready energy storage technologies
6. Ability to be deployed quickly and achieve 'quick wins'

Key Definitions to Standardize in our Language:

1. Benefit = 'a single avoided cost and/or revenue which maybe captured by an energy storage system in the context of the grid. Benefits may come from a market revenue (direct market participation), a reduced or deferred cost relative to the status quo or an environmental benefit
2. End Use = 'operational use (SCE)' = specific targeted operational use for energy storage in the field, may result in capture of one or more benefits.
3. Application = combination of end uses (and benefits) that an energy storage system may capture when sited at a specific place and managed in a particular way (consistent with SCE and CESA's definition)

Proposed Next Steps:

1. Obtain informal feedback from IOUs and CPUC staff on this document (Basis for Prioritization, Key Definitions, Application Priorities) – target another informal group meeting/conference call end of April/early May 2012 to discuss
2. Procedural next steps – CPUC can consider issuing an Assigned Commissioner's Ruling to formally close out Phase 1 and kickoff Phase 2 – target by ????
3. Conduct public workshop introducing application framework, basis for prioritization, definitions and strawman application priorities) – target by end of May???
4. Complete Phase 2 ASAP! Certainly sooner than what is called for in AB 2514 (October 2013) especially given that the CPUC made this OIR a priority by launching efforts a year ahead of schedule!

#	Application (use case)	Description/Problem Solving	Likely Compensation or Ownership	Likely Siting	Primary End Uses	Status Quo Technology Solution	Commercially Available Energy Storage Solutions	Energy Storage Case Study Example
1	Distribution Deferral (or Equip-ment# Life Extension)	Avoids distribution upgrades. Probably rate-based (Not a load modifier) (Example: overloaded wire and/or transformers and/or capacitors)	• Ratebased	• At or down-stream from overloaded equipment • Substation • Circuit	• Upgrade Deferral* • Replacement Deferral* • Electric Supply* • Ancillary Services*	• Conventional Capacity (trans-formers, wires, capacitors)	• State-of-the-art L/A • Advanced L/A • NiMH • LIon • Various flow batteries • Thermal Storage (for A/C) • Above ground CAES	• AEP CES • Detroit Edison CES • Raleigh, NC (TAS Energy)
2	Community Energy Storage@	Improve local service reliability. In-lieu of peaking electric supply resources. Avoid/defer adding distribution capacity	• Ratebased	• Adjacent to loads, on utility 'easement'	• Service Reliability* • Electric Supply* • Ancillary Services* • D Deferral* • T Congestion*	• Conventional Capacity (generation, transformers, wires, capacitors)	• State-of-the-art L/A • Advanced L/A • NiMH • LIon • Various flow batteries	• AEP CES • Detroit Edison CES • SMUD Solar Smart RES/CES Project

3	Distributed Peaker@ (Load Modifier)	Distribution Substation level Energy cycling to address peaking needs (½ year operated by utility, ½ year operated by CAISO)	• Market revenue • Ratebased	• Subtransmission • Substation	• Electric Supply* • Service Reliability* • Ancillary Services* • D Deferral* • T Congestion*	• Conventional Generation (CT, CC) • PPA • Demand Response • Critical Peak Pricing (CPP) • Energy Efficiency	• State-of-the-art L/A • Advanced L/A • NiMH • LIon • Various flow batteries • Above-ground CAES • Generation Storage (can be added to cogen facilities so it can change their peak power needs)	• AEP CES • Detroit Edison CES
4	VER-sited (renewables)	Variable RE Generation Integration including generation shifting, firming, smoothing, help with grid interconnection	• Market/higher PPA values • Third party	• At or near RE Generation ✓ Subtransmission ✓ Substation ✓ Distribution	• Variable RE Generation Integration ✓ energy time--shift ✓ capacity-firming ✓ ramping ✓ Volt/VAR •	• Additional Sub-T or D Infrastructure • Static VAR Compensator (SVC) • Switched Capacitor Banks •	• State-of-the-art L/A • Advanced L/A • NiMH • LIon • Various flow batteries • Flywheels • Above ground CAES • Generation Storage	• SMUD Solar Smart RES/CES Project • Xtreme Power - various • Bulk Solar Therma • Generation Storage (molten salt)

5	Bulk Generation	Electric Supply Capacity/Resources	• Ratebased • Market • Third Party	• Transmission	• Electric Supply* • Ancillary Services*	• Conventional Generation (CT, CC) • PPA • Demand Response • Critical Peak Pricing (CPP) • Energy Efficiency •	• Pumped Hydroelectric • Bulk CAES • Generation Storage • Redox Flow Batteries	• Utility-owned Pumped Hydro-electric • Alabama CAES • TAS Energy Generation Storage case study
6	Demand Side Management	End-use Customer Bill Management	• Customer • Third-party • Market (for ancillary services)	• Customer-side of Meter	• T.O.U. Energy Cost Management • Demand Charge Management • Reliability (back-up power) • Power Quality • Ancillary Services *	• Energy Efficiency • Combined Heat and Power (CHP) • Combined Cooling Heat and Power (CCHP)	• State-of-the-art L/A • Advanced L/A • NiMH • LIon • Various flow batteries • Thermal () Storage (for A/C) • Above-ground CAES • Generation Storage on combined heat and power facilities	• Alameda County Santa Rita Jail • Various SGIP funded projects
7	Demand Side	Service	• Ratebased	• Customer-side of	• Electric Supply*	• Conventional	• State-of-the-art	• SCCPA (Ice

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	Management (or, Behind the Meter Community Energy Storage)	Reliability/ Quality	Third party owned with service contract to utilities	Meter	Service Reliability* • Ancillary Services* • D Deferral* • T Congestion*	Generation (CT, CC) • PPA • Demand Response • Critical Peak Pricing (CPP) • Energy Efficiency	L/A • Advanced L/A • NiMH • LIon • Various flow batteries • Above-ground CAES	Energy)

Notes
#Heavily loaded transformers and underground cables with slow or no load growth.
*Responds to utility and/or ISO signals.
@Includes resource adequacy in the form of supply capacity and reserves.