Battery Storage

What is this measure?

This measure would provide incentive funding for residential, commercial, or institutional battery storage projects. Battery storage is used to store energy during off-peak hours when demand is low, and dispatch the stored energy, when needed, at peak demand time. There are several types of battery storage technologies currently available on the market, with lithium-ion batteries being the most prevalent.

Why would someone do this as mitigation?

Battery storage indirectly reduces greenhouse gas emissions associated with fossil fuel-fired power plants by storing renewable energy that is generated when energy demand is low, and maximizing the integration of renewable energy into the grid by dispatching stored energy when demand is high.

This measure aligns with the state's climate goals of generating 50% of electricity from renewable sources by 2030 (SB 350) and reducing GHG emissions by 80% below 1990 levels by 2050 (SB 32). The state hasn't yet codified any residential/commercial energy storage targets. However, this measure could supplement the CPUC's Self-Generation Incentive Program[1] and the pending Energy Storage Initiative (SB 700).[2] This measure would help accelerate the state's transition from a more centralized electrical system dominated by large power plants and longer transmission of electricity, to a system that relies more on local, decentralized energy sources. State legislation and CPUC decisions call for energy storage procurement targets for electricity retailers and other electric service providers.

The co-benefits of battery storage are manifold:

- Battery storage increases the reliability and flexibility of the electric grid by increasing its reserve capacity when the grid is under stress.
- Storage increases energy efficiency due to less renewable energy being curtailed during off peak hours as well as decreasing energy losses as a result of shorter transmission and distribution lines.
- Ratepayers can benefit in several ways, including decreased energy costs, Time-of-Use rate savings for those with battery storage systems, and lower wholesale energy prices during peak demand.
- Reduced need for building new fossil fuel-powered peaking power plants.

How would you implement this measure?

Implementing Agency

One possible model for implementing this measure is the existing Self-Generation Incentive Program (SGIP) administered by the California Public Utilities Commission (CPUC). If SB 700 is codified into law, the SGIP would transition into the Energy Storage Initiative.

The implementing agency would be responsible for all aspects of the program including ranking applicants, selecting recipients, conducting inspections and distributing incentives. Eligible applicants would be Santa Barbara County residents, commercial/institutional facilities, non-profits and

[1] www.cpuc.ca.gov/sgip/

[2] SB 700: leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201720180SB700

government agencies. In the event that there are more applicants than incentive funds available, recipients could be chosen based on a ranking system and lottery. Highest priority could be given to applicants with eligible renewable energy systems installed.

Enforceability

Under the SGIP model referenced above, recipients of the funding would be awarded the incentive after the system is installed, interconnected and operational. The implementing agency would conduct an onsite inspection to verify equipment operation, performance and consistency with the application.

Interaction with Existing Programs

This program would supplement the CPUC's existing Self-Generation Incentive Program by funding additional battery storage systems. The SGIP is funded through a surcharge paid by ratepayers of the Investor Owned Utilities and can be awarded to both energy storage and generation projects with 13% of the funding available to small residential projects (<10kW). A Santa Barbara county program could focus exclusively on battery storage technologies and could also increase access for residential and small commercial projects.

How would you quantify the benefits?

The benefits of this measure would be quantified based on the energy capacity of battery storage installed (kilowatt-hour) multiplied by the number of full discharges per year. Battery storage projects must be capable of discharging fully at least once per day in order to realize the full GHG reduction benefits of the measure. The GHG benefits are assumed to be equal to the difference between the GHG emitted during the off-peak charging of the system and the GHG emissions avoided from the discharge of the battery during peak hours.[3]

Questions for Discussion

- Is there a good source of data to quantify the GHG benefits from this measure?
- Which agency or nonprofit group would be best suited to implement this measure?
- Should a measure focus on residential, business/commercial, or institutional projects?
- What locations in Santa Barbara County are particularly suitable for battery storage projects?
- Would it be preferable to implement this as an incentive measure, or to directly implement projects?

Input Received

Comments Made at Workshops

Opportunities:

- Combine installing solar PV with energy efficiency retrofits and battery storage.
- Battery storage projects should target commercial projects, instead of residential; due to the way that utility pricing works, businesses have more of a financial incentive to offset their peak demand.
- Solar-plus-storage can boost local resiliency and preparedness in case of a natural disaster.

[3] SGIP Handbook, Appendix E [May 17, 2017], found at: www.cpuc.ca.gov/sgip/

    a. This is an important consideration for critical facilities like hospitals, schools and government buildings.
    b. Can be used in place of emergency diesel generators, adding resiliency and reducing GHG emissions.
- Does UCSB have any battery storage on-site?
- Where else in the County is there battery storage?
    a. Could site storage next to the County's Calle Real solar array

Challenges:

- Renters and multifamily housing are an untapped potential for installing battery storage but have unique challenges; property owners are responsible for costs, while tenants enjoy benefits.

Potential Implementers:

- Community Environmental Council
- Tesla as a potential implementing partner

Comments Submitted in Writing

The Smart Electric Power Alliance's 2017 Utility Energy Storage Market Snapshot[4] was forwarded to the District after the workshops. The report summarizes 2016 energy storage deployment based on national utility data collected, and provides an update on market developments for the first half of 2017. The full report is available on the District's website.

Additional District Discussion

- We estimated GHG emission reductions for a hypothetical "battery + solar" combination project in a separate spreadsheet tab and included it in the revised spreadsheet.[5]
- UCSB doesn't currently have any battery storage on-site, but according to their draft 2016 Climate Action Plan, energy storage is one of their planned strategies for reducing GHG emissions in the future.[6]
- The Battery Storage Initiative (SB 700) has been suspended until next year's legislative session.

[4] Information on the Smart Electric Power Alliance's 2017 Utility Energy Storage Market Snapshot is included here: www.ourair.org/ghgmitigation-sbc/.
[5] See spreadsheet at www.ourair.org/ghgmitigation-sbc/.
[6] UCSB 2016 Draft Climate Action Plan, Table 6: Planned Energy Efficiency Projects (2017-2021): www.sustainability.ucsb.edu/wp-content/uploads/Draft_2016-CAP_2_1_2017.pdf