# Energy Storage Preliminary Monitoring Plan

**Please complete the following:**

Project Site Address:

Host Customer:

System Owner:

Developer:

Storage Make/Model: Pika Energy Harbor (Plus / Flex)

**Please select project type:**

* Storage (<30 kW) – Paired with and Charging at least 75% from Onsite Renewables
* Storage (≥30 kW) – Paired with and Charging at least 75% from Onsite Renewables
* Storage (≥30 kW) – Stand Alone or Charging less than 75% from Onsite Renewables

**For all projects, please provide the following information:**

1. Describe the proposed system, including major system components.

The system to be installed consists of **(one) Pika Energy (Harbor Plus / Harbor Flex) Smart Battery unit**, powered by an internal stack of Panasonic Lithium-ion battery modules. The Smart Battery is coupled with an onsite PV array on a smart DC bus, and connected through **(one) Pika Energy Islanding Inverter** with integrated communications gateway. Onsite clean power generation will be provided by an array consisting of **(XX YYY-watt) crystaline silicon PV modules**. The solar-plus-storage system will serve onsite loads and interact with the grid. A diagram of the system is included below.

1. Describe the intended system operation and primary use case at the project site. (In other words, what specific service(s) will the storage system provide to the customer?)

The Energy Island supports operational modes including:

* Self-Supply: When solar output exceeds local demand, excess production is stored in the battery. When local demand exceeds solar output (or at night), battery discharges to supply local needs in preference to use of grid power.
* Time-of-Use Arbitrage: Energy Island system stores solar energy during Off-Peak periods (low electricity cost), and delivers that energy during On-Peak periods (high energy cost). Specific schedules are available to match the new Time-of-Use rate schedules in California.

**The primary service mode of the storage system will be (Self-Supply / Time-of-Use Arbitrage).**

The system will also provide backup power to a dedicated loads panel upon temporary loss of grid service. Additionally, the system owner may elect to use the system to participate in approved programs, such as aggregated demand response or distributed energy resource management.

1. Is there a “back-up only” setting or operational mode available for the storage system, whereby the system will only discharge in the event of a grid outage?

* Yes
* No

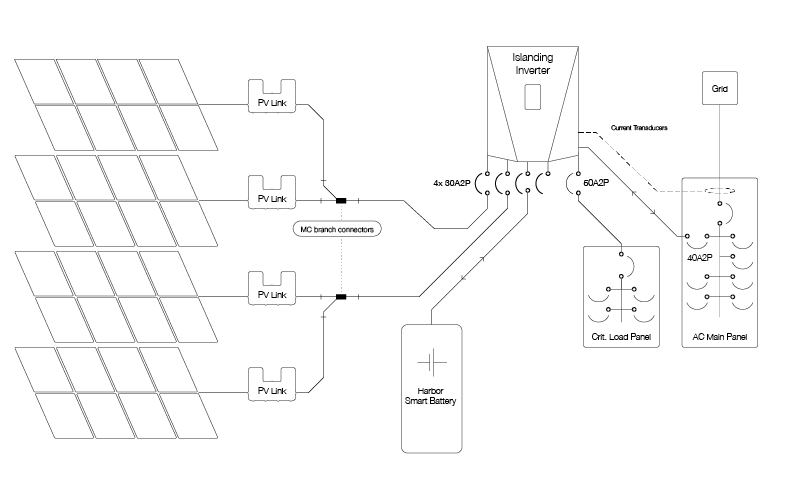
If yes, please explain how you are ensuring that this project will meet SGIP operational requirements, notwithstanding the “back-up only” option, over the 10 year permanency period:

While the Energy Island system is capable of operating the batteries in a ‘back-up only’ mode, the installer will program the system to operate in (Self-Supply / Time-of-Use Arbitrage) mode as described above, and instruct the system owner/operator of the operational requirements of SGIP handbook section 5.3.3. ***The customer has received clear written notification that Backup-Only modes are prohibited throughout the 10-year permanency period, per the terms of the SGIP program.***

1. Describe the existing load to be displaced by storage system operation.

The Energy Island solar-plus-storage system is designed to generate and store energy to provide power for general household loads (lighting, refrigeration, HVAC, etc.). The battery will be used to time-shift the solar peak to maximize local use of locally-generated solar power and improve system economics under Time-of-Use billing schedules. The system will also provide secure back-up power to a subset of customer-selected loads (e.g. refrigerator/freezer) segregated to a ‘supported loads’ subpanel.

1. Insert a simplified system layout of identifying major components and the proposed metering points at the project site.



1. Describe the metering components of the system, data to be collected at metering points, reasoning behind selected metering locations, and a description of the data acquisition system.

Solar-plus-storage system performance will be monitored using the internal data-collection capabilities of the Islanding Inverter. Data collected include operational state, power, voltage, current, temperature and cumulative energy. Additionally, current transformers are installed at the Main Service Panel per the diagram above, and monitored by the Islanding Inverter at high frequency (over 60Hz), to allow closed-loop control of net power flow to the building, enabling accurate Self-Supply and other energy management services. The net flow of electrical energy between the grid and the customer site is metered by the customer’s utility using the customary meter at the service entrance.

1. Describe the approach for collecting, storing and transferring operational data to the program. Describe the monitoring data source, frequency for collecting data, and the system’s data storage capabilities.

The Energy Island system collects extensive performance data from each system component (PV, Smart Battery, Inverter) at 20 second intervals, and transfers the data to Pika Energy’s cloud-based database via local ethernet connection. Daily cumulative energy production data for each component is also stored locally.

1. List the make and model of the external meters or energy management system to be installed that will log and transmit operational data.

The system will use the internal energy management and monitoring capability of the Islanding Inverter. Additionally, the inverter reads external current transformers (LEM 100A 50-60Hz TT 100-SD, TDK CCT354571-300-24-02, or TDK CCT406393-600-36-02) to enable Self-Supply/Time-of-Use capabilities.

**For projects paired with and charging ≥75% from onsite renewables, please provide the following information:**

1. How will the system charge at least 75% from onsite renewables? Describe the anticipated charge/discharge schedule and/or control approach of the storage system and operational mode(s) to be deployed for this project site.

The Energy Island single-inverter, DC-coupled energy management platform significantly simplifies power flow control and energy management compared to multiple-inverter, AC-coupled systems. Pika’s proprietary REbus DC nanogrid technology automates the flow of power using voltage as a “market price signal”. By modifying software limits on the voltage ranges over which each component (e.g. Inverter, Smart Battery) will source or sink power, the battery can be prevented from drawing DC current from the inverter.

* Systems operating in Self-Supply mode will charge the battery only from solar power.
* For systems operating in Time-of-Use arbitrage mode, the installer will be instructed to select Time-of-Use schedules that Pika Energy has approved for California utility service territories, and these schedules will not include ‘buy-from-grid’ segments. Therefore the scheduler will not permit the battery to charge from grid power. End user/host customers will not have access to the controls needed to change the Time-of-Use schedule.

1. Who will operate the system? I.e.: Developer, Manufacturer, Host Customer, System Owner (if different from Host Customer)

The system will be operated by the host customer.

**For projects ≥30 kW only, please provide the following information:**

1. Are the meters listed on the Go Solar California [database](http://www.gosolarcalifornia.ca.gov/equipment/system_perf.php)?

☐ Yes

☐ No

1. Performance Data Provider (PDP)



1. How will the storage system’s operational data be transferred to the PDP for monthly reporting?

