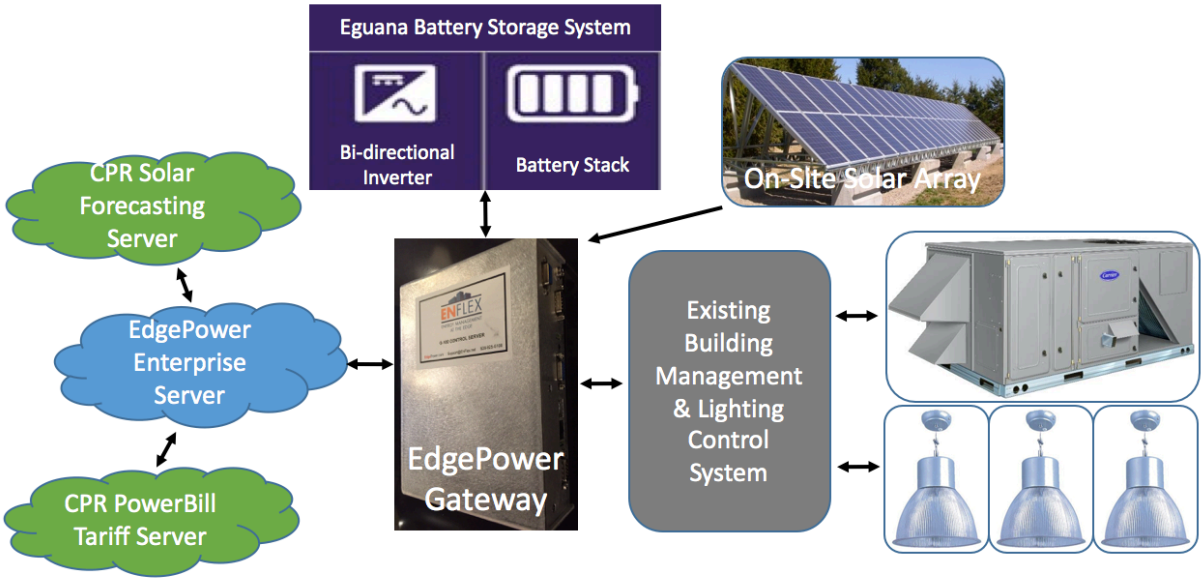
6 July 2017

GPG FY16 Technology and Site Criteria

EdgePower - Solar Plus Battery Storage Integrated Load Control

Technology Overview

EdgePower's solar plus storage integrated load control technology combines solar production and forecasting, battery storage, and automated building load control algorithms to reduce electricity demand charges in commercial buildings. The technology is currently in development under a Department of Energy SunShot award. EdgePower is looking for a host customer for this project which offers a zero-cost battery storage system and demonstration pilot installation to one commercial building owner. This technology is enabled through use of EdgePower's cloud-hosted Enterprise energy management application and the locally installed EdgePower Gateway. The EdgePower Gateway integrates with the facility's Building Management System and disparate building equipment for control of electrical loads.



GSA Value Proposition

EdgePower's integrated control technology has both environmental and economic benefits to building owners. Economically, the primary benefit of the technology is a reduction in electricity demand charges. With typical demand charges ranging from $10-$30/kW per month for commercial buildings, there is a large opportunity to save building owners money. Current estimates show 6-14% savings in annual demand charges is possible with this technology.

Environmentally, as commercial solar PV customers around the country have experienced, reliable demand charge reduction is not available from solar alone. This is primarily due to solar intermittency and the lack of integration between solar production and building operations. The proposed solution utilizes load control and battery storage to cost-effectively maximize demand charge savings. This increases the value proposition of solar by providing reliable demand charge reduction; opening new markets of solar customers that were not previously financially viable.

M&V Strategy & Objectives

The performance of this technology will be evaluated through a demonstration pilot during the summer of 2018. During the demonstration pilot, EdgePower will actively control building loads while discharging the battery storage system in order to reduce building electric demand charges. After the pilot period, a savings verification report will be developed in partnership with NREL. The verified saving report will compare baseline electricity cost (existing building with solar alone) to the experienced electricity cost resulting from integrated management of solar, controllable loads, and battery storage.

Facility Manager Workload

Low. Technology will be installed as a stand-alone system with wireless connectivity. EdgePower will coordinate the majority of installation and operation. Facility Manager feedback will be required on system operation, support in connecting existing building systems, and to provide access to the building. The Facility Manger will also be required to support the installation of a system that is physically secure, operationally safe, and protected from cyber security risks. This will require providing guidance of existing building equipment, operation, and IT infrastructure.

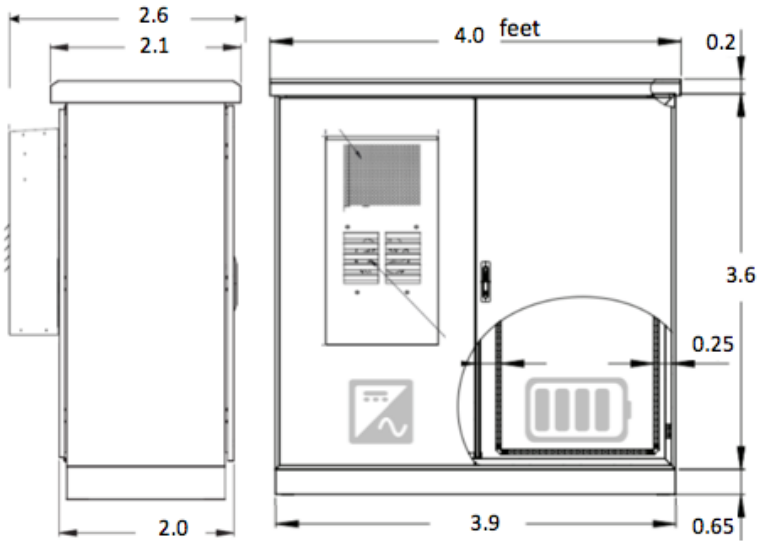
Tenant Impact

Low. This technology is not anticipated to have any impact on tenant workspaces or their daily operations. The load control algorithms are intended to be unnoticeable to tenants and override control capabilities will be provided. This will be confirmed through surveys of building staff and tenants throughout the duration of the pilot period.

How Will Success Be Measured?

QUANTITATIVE OBJECTIVES	METRICS & DATA	SUCCESS CRITERIA
Demand Charge Savings	Solar-alone baseline load compared to post-load control and battery storage load	6-14% savings in demand charges during the pilot period
Cost-Effectiveness	Simple payback	< 5-year payback at scale < payback of battery storage alone
Commercial Market Potential	Model using EnergyPlus/OpenStudio to simulate savings across climate zones, building types, and utilities	Payback and savings achieved in most climate zones, building types, and utilities Commercialization plan documenting full-scale deployment plans and target markets
QUALITATIVE OBJECTIVES		
Ease of Use / Understanding	Interview facility manager on use of application and understanding of operation	Manager routinely uses system and understands how operation impacts electricity cost
Operability	Interview facility manager and tenants to determine occupant comfort during load control	Load control algorithms effectively reduce building load while remaining unnoticeable to tenants

Site Requirements

SYSTEM	CHARACTERISTIC
Solar	**>50kW solar array installed with +12-months of 15-minute historical production data***
Energy Meters	**+12-months of 15-mintue historical building load data** (or access to Green Button Data) +2-years of data preferred * Access to sub-meter data for major electricity consuming devices (HVAC, lighting, pumps, fans, garbage compactors, etc.) **
Facility	**Facility Manager willingness to allow load control algorithms to adjust setpoints*** **Sizeable, controllable building loads available** (HVAC, lighting, processing equipment, etc.) * **Semi-routine occupancy schedules** (similar occupancy per day-of-week)** **Space for battery storage system installation** (3 units with dimensions below, total of 12 feet wide, 4' 6'' tall, 2' 8'' deep and a combine weight of 4,800 lbs) * 
Building Management System	**BMS with integration/control of the majority of loads (HVAC, lighting, etc.) that can integrate with EdgePower Gateway (BACnet, Modbus, etc.) for receiving control commands****

Climate	Seven or more months of cooling season **
Utility Tariff	Electricity tariff with substantial demand charge rates (>$12/kW) and a monthly electricity cost for the facility that is greater than 35% demand charges ** Facility electricity charges should be a minimum of $5,000 per month **
Coordination	Access to facility (electrical room, boiler room, roof, chillers, etc.), on-site facility personnel, and IT personnel (if required)*

***Required** ****Strongly Preferred**

SunShot Award Overview

Department of Energy EERE Award Announcement - EdgePower