As complex distributed energy systems that feature local generation and storage to power groups of interconnected loads, Microgrids present a unique set of challenges for grid owners and operators. These islanded systems can operate with or without a connection to the grid. The ability to operate independently assures reliability and resiliency for customers with critical power needs who cannot afford untimely service interruptions. With dynamic energy storage control software, microgrids can take on a high penetration of renewables while optimizing various generation sources to provide the most cost-effective power source and providing stable and reliable power to the grid.

GEMS for Microgrids

Reliable field performance derives from many years of pre-commercial energy storage system modelling and simulation. Upon delivery, systems should have a proven track record for safety and reliability for high-power applications such as frequency response as well as high-energy functions like load shifting. Each complex task carried out by the energy storage management system, whether connected to the power grid or operating as an independent microgrid, tests the validity of the system’s software. Nothing less than 100 percent safety is acceptable. The GEMS platform ensures maximum return on investment for microgrids while enabling optimal storage system design, integration, and operation. Greensmith has delivered a 1 MW turnkey microgrid project to a California customer and will soon deploy a 125 kW behind-the-meter, utility-owned project integrated with PV generation and building critical load.
Technology-Agnostic
GEMS has been integrated with 14 different batteries and 10 power conversion systems

Maximize System ROI
Advanced algorithms maximize battery performance and longevity

Increased Value
Enables additional value streams such as frequency regulation, spinning reserve or VAR support

Efficient O&M
GEMS provides a comprehensive view of expected performance over the system’s lifetime

Enabling a System of Systems

Operating as a system of systems, energy storage is dynamically managing complex commands in real-time. Like any other system of systems, without the proper control mechanisms, if any one piece is out of sync—the entire system itself is at risk. The GEMS software platform provides the essential architecture for safe and reliable microgrids, while ensuring maximum return on investment by enabling optimal storage system design, integration, and operation.

Islanding

Traditional grid operators, without adequate energy storage capacity, follow conservative limits on the deployment of distributed energy resources to maintain reliability. With islanding capabilities, microgrids can safely lift all limits on renewable penetration, bringing a substantial benefit in places where electricity prices exceed the levelized cost of electricity for distributed renewables.

The GEMS software platform integrates multiple power generation sources (i.e. renewables, coal, nuclear, etc.) and seamlessly leverages the most cost-effective source in real-time, while maintaining...