

PV + storage solution

- Over one-third of all energy storage capacity installed in the U.S. is running on the GEMS platform
- Powering over 45 sites globally
- Working with more than 30 customers including 9 utilities/IPPs



The combination of PV (photovoltaic) and storage makes it possible to produce smooth power output when weather conditions are less than ideal, minimizing impacts on grid stability. PV on its own is an intermittent resource, one that can disrupt the grid with frequency and voltage fluctuations on cloudy days.

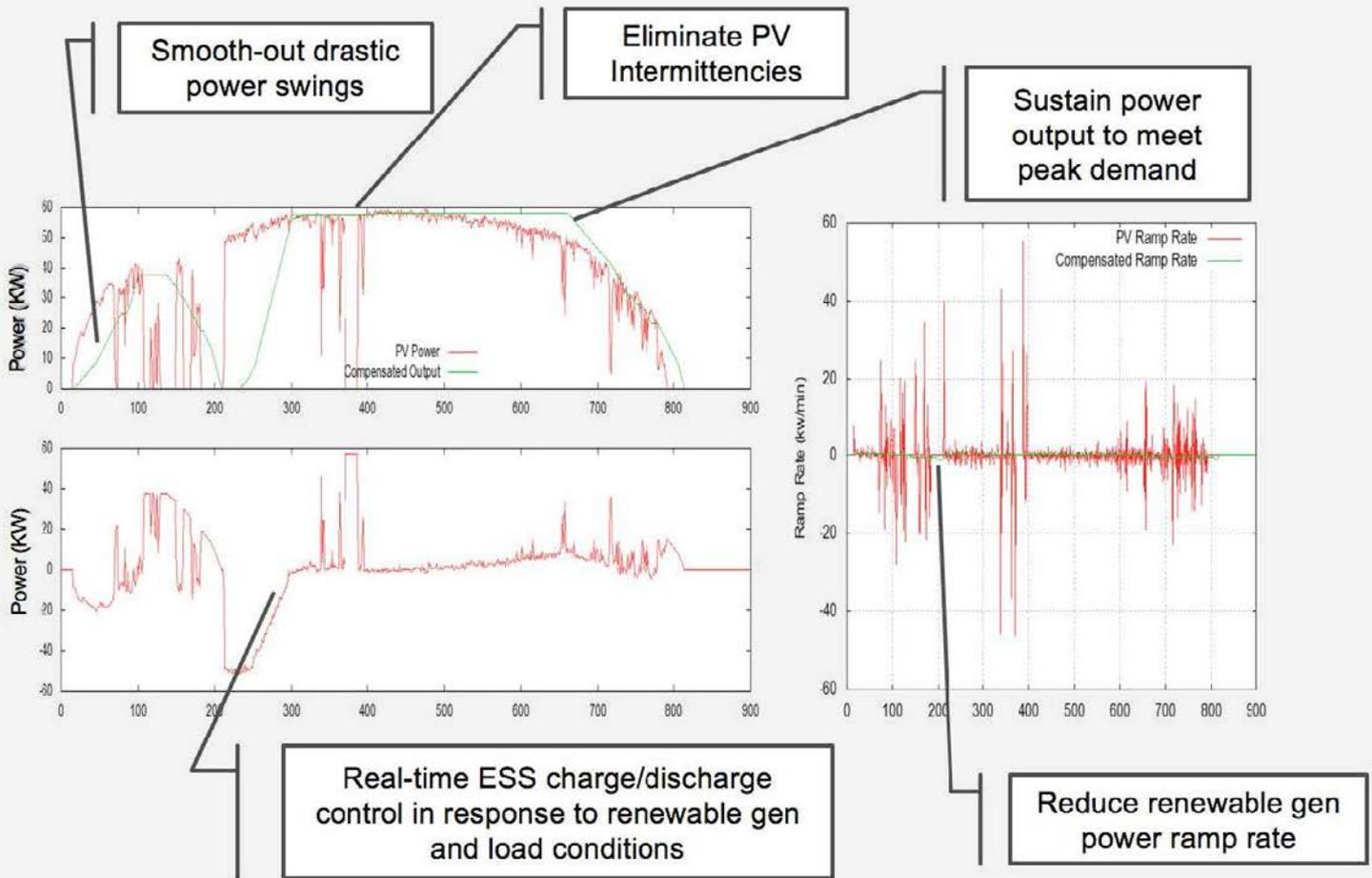
Fast-acting energy storage operating in concert with the PV system can control power quality by calibrating battery charging and energy exports to the grid. In doing so, storage mitigates the need for large-scale PV to curtail output as clouds come and go. As the needs of the grid change, the time-shifting power to isolate generation and demand will help solar plus storage evolve.

GEMS for PV + storage integration

Software delivers the core value of energy storage technology, bringing versatility to a container full of batteries and power conversion systems so they can execute on a variety of use cases. When performing ramp rate control, the system closely monitors irradiance and responds within hundreds of milliseconds with charging or discharging protocol. To

satisfy time-shifting objectives, the system calls upon a longer storage duration to fully charge in midday and discharge in the evening.

The GEMS (Greensmith Energy Management System) platform ensures maximum return on investment for PV-plus-storage integration while enabling optimal storage system design, integration, and operation.



Technology-neutral

GEMS has been integrated with 14 different batteries and 10 power conversion systems.

Maximize system ROI

Advanced algorithms maximize battery performance and longevity.

Efficient O&M

GEMS provides a comprehensive view of expected performance over the system's lifetime.

Ramp rate control

Everyone purchasing electricity, from the utility in the wholesale market to the residential end-customer, wants a stable supply of energy. Energy storage with ramp rate control is the only way to achieve stability with distributed solar and protect solar inverters from excessive wear and tear. The GEMS platform allows easy configuration for ramp rate control based on local requirements, according to real power output measured every minute or as a percentage of baseline output.

Energy time shifting

Daily peak energy consumption is a constantly moving target affected by demand growth, energy efficiency, temperature and other factors. Energy storage helps bridge the gap between daily production and consumption. The GEMS platform optimizes performance to provide a fast response when called upon throughout the day while storing enough energy to discharge when it's needed most.

wartsila.com

WÄRTSILÄ® is a registered trademark.
Copyright © 2017 Wärtsilä Corporation.
Specifications are subject to change
without prior notice.

