

Grid Services and VPP Solution

The Grid of the Future, Today

Accelerating the transition to a renewable, more stable, and cost-effective grid

Promoting a new model of energy generation, SolarEdge grid services deliver near real-time aggregative control and data reporting, enabling the pooling of distributed energy resources — photovoltaic systems, battery storage, electric vehicle chargers, and loads — in the cloud for the creation of virtual power plants.

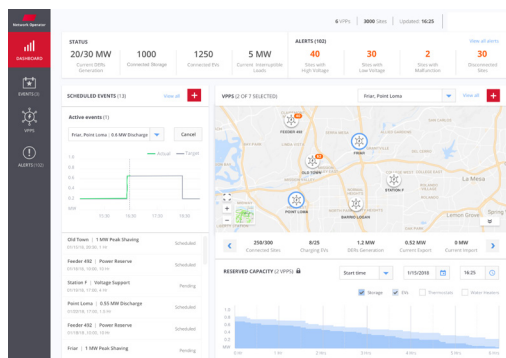
The SolarEdge grid services and VPP solution provides sophisticated management platforms to enable real-time, aggregated control of available energy resources to meet ever-changing supply needs and demand.

Flexible, Reliable, Scalable Power Supply

Meeting Energy Supply Shortages

Utilities can avoid building costly and often underutilized network infrastructure by leveraging pooled energy in VPPs to instantly overcome local supply shortages.

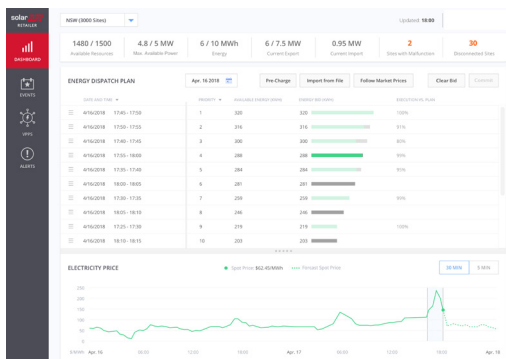
This type of solution also provides the flexibility to gradually increase storage capacity to meet growing demand, and allows the utilities to utilize the pooled power to compensate for gap between demand/supply as it evolves over the years.



SolarEdge Cloud Interface for Network Operators

Hedging Against Pricing Volatility

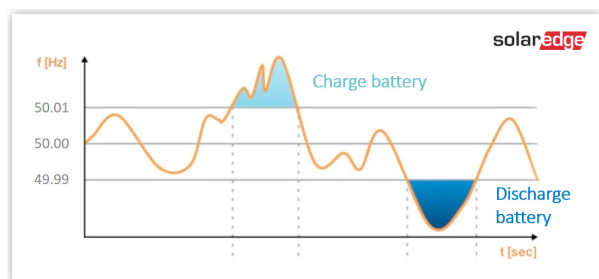
Energy retailers can reduce costs during peak price hours by facilitating access to stored energy and interruptible loads through automatically discharging energy, or removing demand to reduce consumption based on price signals.



SolarEdge Cloud Interface for Retailers and Market Participants

Maintaining Grid Stability

Network operators can use pools of PV systems, batteries, and EV chargers to instantly, and automatically, modify generation or consumption to stabilize grid frequency and voltage.



SolarEdge Solutions for Grid Services and Virtual Power Plants

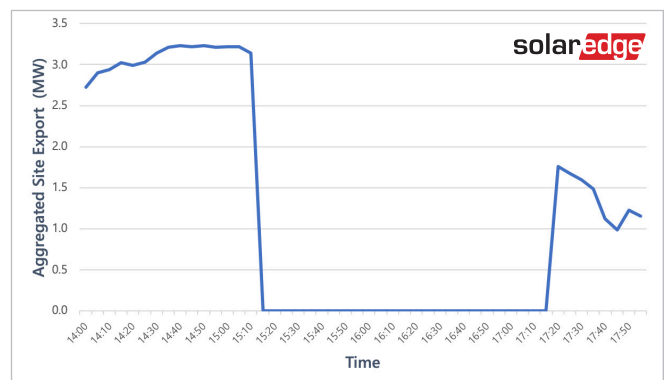
As a leading hardware vendor, SolarEdge has extensive experience with monitoring and controlling Distributed Energy Resources (DER), including PV inverters, residential storage, and EV chargers, and is ideally positioned to provide utility customers technical access to new systems, and a large installed base.

SolarEdge Offerings

SolarEdge's Grid Services API

Integrates with third-party software interfaces via a dedicated grid services API

- / Near real-time control and data reporting for large groups of resources (1000's)
- / Controls batteries, EV chargers, water heaters, thermostats, etc.
- / Cloud-based
- / Aggregative
- / Can control SolarEdge, and non-SolarEdge systems
- / Curtailment as a Service – control grid export of aggregated PV systems at times and levels needed. Applicable for both residential and commercial sites



Site level curtailment on commercial site

SolarEdge Cloud Interface

Provides a dedicated customizable cloud interface for Virtual Power Plants

- / Use-case focused user interface
- / Forecasting and optimization algorithms
- / Integration with 3rd party hardware (including thermostats, residential batteries and solar inverters)
- / Interfacing with other systems (grid-responsive, price-responsive, weather-aware, load-responsive)



SolarEdge Grid Services API Specifications

The API offers advanced features enabling effective management and monitoring of individual or aggregated Distributed Energy Resources (DERs) according to the fleet operator's business and technical objectives.

Key Features

- / Arrange DERs in customer-meaningful groups (e.g. network hierarchy/utility programs, DERs type, etc.)
- / Dynamically update groups by adding/removing/ = moving sites and DERs
- / Control and monitor groups of DERs as a single virtual resource

Inverters

- / Set power flow configurations and limits
- / Set curtailment event with rapid sub-minute response time
- / Set operating curve settings or limited-time events
 - / Volt-Var and Volt-Watt operating curves
 - / Dynamic Power Factor
 - / Frequency regulation settings
- / Report fleet metrics
 - / Total DER generation
 - / Grid Voltage measurements
 - / Current export/import readings

Batteries

- / Charge/discharge groups at a set power for a set duration
- / Set battery modes (backup, maximize self-consumption, disable)
- / Set battery energy reserve

Loads

- / Curtail EV charging load (group or individual charger level)

Convenience APIs

- / Reporting on all DERs listed under the utility account
- / Reporting on supported commands and metrics per DER type
- / Easy to use — utilizing standard JSON content and RESTful patterns
- / Near real time fleet management (response in a few seconds, network dependent)
- / Flexible, near-real time reporting interval (down to 1 minute)
- / High availability uptime, 24/7
- / Easy and quick onboarding process
- / Utilizes utility-level security standards
- / GSM data plans for higher reliability

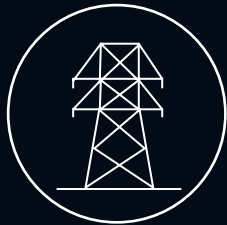
Pre-requisites

SolarEdge Energy Bank battery, LG Chem RESU batteries and other qualified batteries. Access to inverters not owned by the API Licensee requires system owner's consent.

SolarEdge

Bringing Value for all Stakeholders

Joining a shared energy economy offers benefits to all stakeholders: utilities have the tools to leverage distributed energy generation systems, energy retailers can enjoy protection from price peaks, and PV system owners have an additional source to increase their revenue



Distribution/Transmission Utility

Unlock the flexibility of distributed energy generation systems to more efficiently meet demand

- / Grid stabilization
- / Advanced automation and control
- / Increased efficiency
- / Resilient electricity networks
- / Meet energy supply shortages



Retailer/Market Participants

Meet demand with a pool of distributed batteries rather than with energy purchased at market prices

- / Energy stability
- / Protection from energy price peaks
- / Energy price reduction
- / Opportunities for new services to customers



Households

Receive compensation while enjoying flexible, green energy

- / Maximize self-consumption
- / New customer choices to produce and sell excess energy through access to the new shared economy

To learn more about SolarEdge innovative grid solutions, contact a member of our solutions team at: gridservices@solaredge.com
www.solaredge.com