solaredge

Solar-nu.nl

MAKING PV SYSTEMS SMARTER

SolarEdge Residential Offering

for Installers

Contents

12kW SolarEdge system, UK
Installed by WeRSolar
Project designed by Howarth Litchfield

SolarEdge Fact Sheet

About Us

In 2006, SolarEdge invented an intelligent inverter solution that has changed the way power is harvested and managed in PV systems. Since beginning shipments in 2010, SolarEdge has shipped more than 5.3GW of its DC optimized inverter solution and its products have been installed in PV systems in 120 countries. SolarEdge is traded on the NASDAQ under the SEDG symbol.

Vision

> For every solar panel to be individually managed by DC-DC panel-level electronics
> To accelerate the pace toward grid parity and make clean energy affordable and widespread

Bankability

> Bankable in major European and North American solar financing institutions and banks
> Publicly traded on NASDAQ as SEDG

Global Outreach

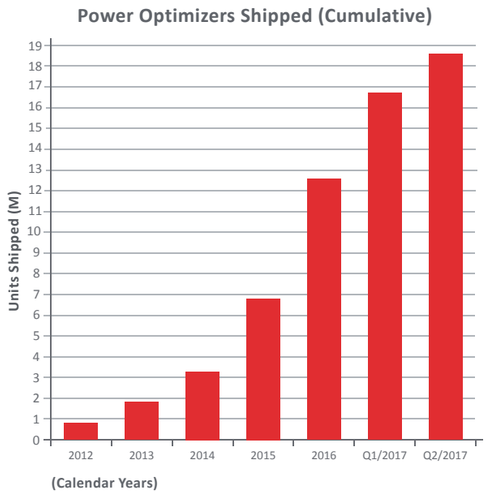
> Products sold in 50 countries
> Sales via leading integrators and distributors
> Follow the sun call centers
> Local expert teams
> Technical and sales training
> Global manufacturing with tier 1 electronic manufacturers

INNOVATION GUARANTEED

> Received nearly 30 awards, from prestigious organizations ranging from Red Herring to Frost & Sullivan

Business Figures

> 18,600,000 power optimizers and 766,000 inverters shipped worldwide
> Monitoring platform continuously tracks over 466,000 PV installations



Product Reliability

> Long product warranties: 25-year power optimizer warranty and 12-year inverter warranty, extendable to 20 or 25 years
> Each SolarEdge product and component undergoes rigorous testing
> Products and components have been evaluated in accelerated life chambers
> Reliability strategy includes proprietary application specific ICs (ASIC)

98 awarded patents and 142 additional patent applications

The Complete SolarEdge Residential Solution

The SolarEdge Smart Energy Management solution integrates solar energy production with battery storage and home energy management, all under the control of a single SolarEdge PV inverter. The SolarEdge DC-optimized system provides substantial benefits including more PV power, higher system visibility and advanced safety features.

Home Energy Management

Increase homeowners solar energy usage with SolarEdge smart home devices. Utilize excess PV production to power heat pumps, hot water boilers, lighting or other typical home appliances.

Homeowners will enjoy greater convenience with automatic, on-the-go control of their smart devices via the SolarEdge mobile monitoring app.

Dry Contact Switch

Immersion Heater Controller

Plug-In Socket with Meter

Monitoring

SolarEdge provides free panel-level performance monitoring, remote maintenance and alerts. This enables fewer trips to sites, less time spent on site and higher system uptime. Easy access from your computer or mobile device anytime, anywhere.

Power Optimizer

Connects to each solar panel on the roof enabling them to perform independently, providing greater energy harvest, enhanced safety, and constant feedback from each panel.

Inverter

The brains of the PV system, the SolarEdge inverter has a fixed input voltage and is responsible only for DC to AC conversion. Small and lightweight with 99% weighted efficiency, it's ideal for indoor or outdoor installations in both single and three phase powered homes.

Single phase
Three phase

StorEdge™

Store unused PV energy directly on compatible, high power DC batteries from LG Chem to maximize energy independence and lower electricity bills. StorEdge is a DC-coupled solution allowing for higher system efficiency.

LG Chem

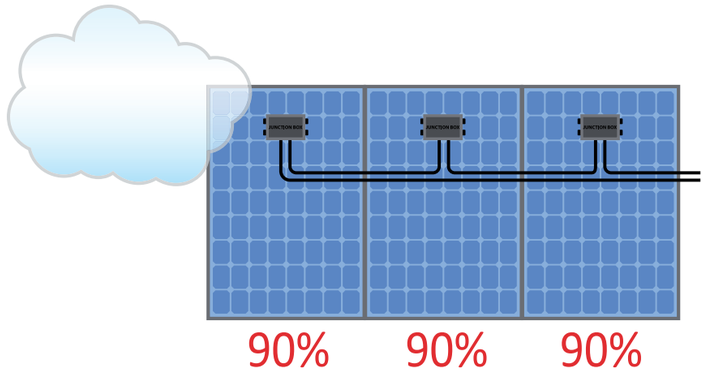
SolarEdge Benefits: More Energy From Each Panel

More Energy: Value for the Homeowner

More power = more revenue and more savings on your electricity bill.
One underperforming solar panel connected to a traditional string inverter negatively impacts the performance of an entire string. SolarEdge minimizes this issue by allowing each panel to perform to the best of its ability at all times.

In a PV system, each panel has an individual maximum power point. Differences between panels are unavoidable in PV installations. With traditional inverters, the weakest panel reduces the performance of all panels.

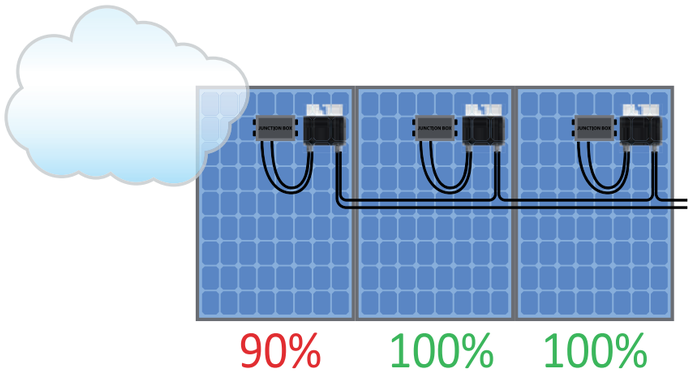
With SolarEdge, each panel produces the maximum energy, and mismatch-related power losses are eliminated.



Traditional Inverter

> One weak panel reduces the performance of all panels in the string or is bypassed

> Power losses occur due to panel mismatch



SolarEdge System

> Maximum power is produced and tracked from each panel individually

> Up to 25% more energy is harvested from the PV system

POWER LOSSES CAN RESULT FROM MULTIPLE FACTORS, INCLUDING:

Manufacturing Tolerance Mismatch

The warranted output power range for PV panels received from a manufacturing plant may vary greatly. A standard deviation of ±3% is sufficient to result in ~2% energy loss.

Guaranteed power output from panel manufacturers
0~+3%

Soiling, Shading & Leaves

Panel soiling, from dirt, bird droppings, or snow contributes to mismatch between panels and strings. While there may be no obstructions during site design, throughout a residential system's lifetime, a tree may grow or a structure may be erected that creates uneven shading.

Soiling

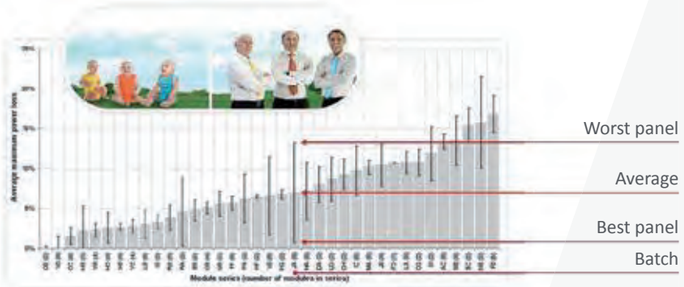
Snow

Bird droppings

Leaves

Uneven Panel Aging

Panel performance can degrade up to 20% over 20 years, however, each panel ages at a different rate, causing aging mismatch, which increases over time.



Source: A. Skoczek et. al., "The results of performance measurements of field-aged c-Si photovoltaic modules", Prog. Photovolt: Res. Appl. 2009; 17:227–240

SolarEdge Benefits: Superior Safety

Superior Safety: Value for the Homeowner

For decades now, PV systems have proven to pose minimal safety risks. SolarEdge further improves PV safety with its SafeDC™ feature, designed to reduce your PV system's high voltage to a safe 1 volt per module level whenever the grid is shut off, protecting solar professionals, installers, firefighters and your home.

With millions of photovoltaic (PV) systems installed around the world, this technology is designed to be relatively safe and reliable. However, as traditional PV installations can reach voltages as high as 1500VDC, precautions should be taken to ensure the safety of people and assets.

Traditional string or central inverters are limited in the safety level they offer installers, maintenance personnel and firefighters. Shutting down the inverter or the grid connection will terminate current flow, but electrocution risk remains, since DC voltage in the string cables will stay high for as long as the sun is shining.

In addition, the possibility of electrical arcs, which can result in a fire, creates a threat to the asset on which the PV system is installed, as well as to people who live or work in the vicinity of the PV system.

The SolarEdge system provides a superior safety solution for both electrocution and fire risks.

SafeDC™

SafeDC™ is a built-in panel-level safety feature which minimizes electrocution risk. During installation or when the grid or inverter is shut down (including during maintenance), power optimizers are designed to automatically switch into safety mode, in which the output voltage of each panel will be reduced to 1V. String voltage will be maintained below risk levels. For example, if 19 power optimizers are connected in series, the string voltage will be 19V.

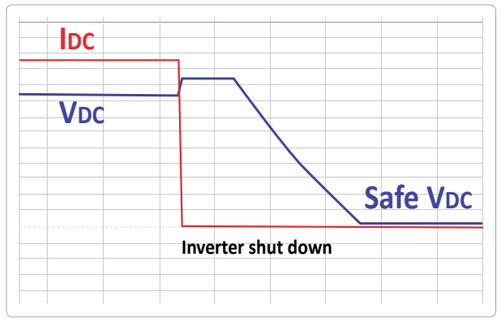
Panel-level shutdown is designed to occur automatically in either of these cases:

> During installation, as long as the string is disconnected from the inverter, or the inverter is turned off

> During maintenance or emergency, when the inverter is turned off or when the AC connection of the building is shut down

> When the thermal sensors of the power optimizers detect a temperature above 85˚C

The SolarEdge SafeDC feature is certified in Europe as a DC disconnect according to IEC/EN 60947-1 and IEC/EN 60947-3 and to the safety standards VDE AR 2100-712 and OVE R-11-1.

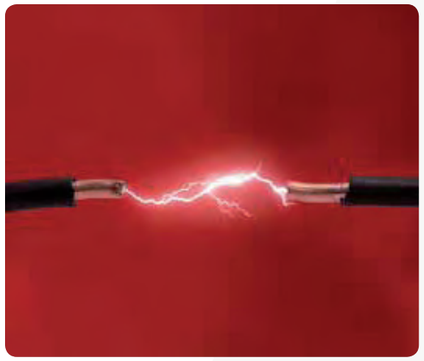


This graph represents an automatic string shutdown. As demonstrated, the current is shut down immediately once AC power or Inverter is turned off. The string voltage is reduced to safe voltage.

Arc Fault Detection and Interruption

SolarEdge inverters have a built-in protection designed to mitigate the effects of some arcing faults that may pose a risk of fire, in compliance with the UL1699B arc detection standard. The US standard, which came into effect as part of NEC2011, includes requirements for arc detection (i.e. arcs within the string) and for manual, on-site restart after an arc detection event.

Currently there is no comparable arc detection standard in the EU and therefore non-US SolarEdge inverters can detect and interrupt arcs as defined by the UL1699B standard. However, in addition to manual restart, a mechanism for auto-reconnect can be enabled during system commissioning.



SolarEdge Benefits: Design Flexibility

Design Flexibility: Value for the Homeowner

SolarEdge combines optimal rooftop usage with an aesthetic design, for more power and more savings. Mix and match panel types to easily expand your solar system later.

More power, more revenue & more aesthetic rooftops

The SolarEdge system topology enables efficient use of all available roof space through unprecedented design flexibility. A wide variety of string lengths is possible with no requirement for matching string lengths. With longer strings, the installer's BoS costs are lowered. The size and layout of an array is no longer defined by electrical constraints. Shaded panels do not bring down the entire string performance, and panels power rating, bin, and type can be mixed in multiple orientations or tilts, in the same string.

With SolarEdge's optimized design flexibility, every installation can become more profitable with the ability to sell more panels at no extra customer acquisition and installation costs.

SolarEdge Benefits: Peace of Mind

Peace of Mind: Value for the Homeowner

With real-time monitoring of system performance and long product warranties, SolarEdge assists you in protecting your investment and provides you with peace of mind.

Panel-Level Monitoring

SolarEdge delivers free, real-time remote monitoring at the panel, string, and system levels, ensuring that the installation is performing to the best of its ability at all times. The SolarEdge cloud-based monitoring platform provides comprehensive analytics tracking and reports of energy yield, system uptime, performance ratio, and financial performance. Pinpointed and automatic alerts for immediate fault detection, accurate maintenance, and rapid response result in minimal and shortened onsite visits.

The SolarEdge monitoring platform offers customizable views so that installers can share either system-level or module-level performance.

Numerous communication options exist for connecting SolarEdge inverters to the monitoring platform, via hardwired Ethernet, ZigBee wireless or GSM cellular connections. Access to the monitoring platform is easily available from your computer or mobile device, anytime, anywhere.

Protecting the Homeowner's Investment

As part of residential PV design, it is important to account for future costs that can impact the return on investment of a homeowner's PV system. The SolarEdge DC optimized inverter solution effectively minimizes these potential costs.

> **Replacement**: SolarEdge allows panels of different power classes and brands in the same string. Any panel available in the market could fit.

> **Expansion**: New power optimizers and panels can be utilized in the same string with older models.

SolarEdge products are built for long-term performance, with warranties of 25 years for power optimizers, 12 years for inverters, and free monitoring for 25 years. Affordable extended inverter warranties of up to 25 years are also available, with low-cost out-of-warranty inverter replacement at ~40% less than traditional inverters.

Power Optimizer | Inverter | Monitoring Platform

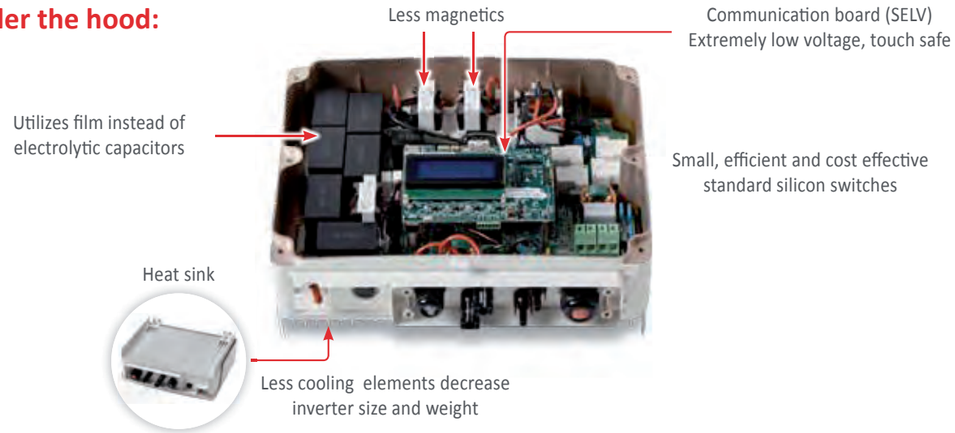
Residential Single Phase Inverters: The HD-Wave

A NEW ERA FOR INVERTER TECHNOLOGY

Representing one of the most significant leaps in solar technology in the past 20 years, SolarEdge's HD-Wave inverter technology is a novel power conversion topology that significantly decreases inverter size and weight, while also achieving record 99% weighted efficiency.

By employing distributed switching and advanced digital processing to synthesize a clean, high-definition sine wave, HD-Wave technology inverters have <1/2 the heat dissipation, 16x less magnetics, and 2.5x less cooling components than current SolarEdge inverters, which are already among the smallest on the market.

Under the hood:



Product features:

- **Multiple sizes** with 2.2kW to 6kW inverter range
- **More energy** from a record 99% weighted efficiency
- **More modules** on the rooftop with up to 155% DC/AC oversizing
- **Easy installation** due to small size and light weight
- **Improved reliability** with less heat and film capacitors
- **Superior safety** with SafeDC and arc detection
- **High visibility** with built-in module-level monitoring
- **Comprehensive commissioning** with automatic power optimiser ID and string assignment detection
- **Backward compatibility** with existing SolarEdge systems

Residential Three Phase Inverters: The E-Series

MAKING THREE PHASE INSTALLATIONS EASIER

The E-Series is the next generation of low power, three phase residential inverters from SolarEdge. Featuring multiple design improvements, the E-Series is smaller, lighter and easier to install than previous models. Suitable for both outdoor and indoor installations, these inverters run quieter than before following an upgrade to the internal fan and removal of the external fan.

Product features:

- **Multiple inverter sizes** including 3kW*, 4kW, 5kW, 7kW, 8kW, 9kW, and 10kW
- **Easy installation** due to small size and light weight
- **Quiet operation** designed for residential environments
- **Superior safety** with SafeDC and arc detection
- **High visibility** with built-in module-level monitoring
- **IP65-rated**, suitable for indoor or outdoor installations
- **Internet connection** via Ethernet or wireless communication (Wi-Fi, ZigBee Gateway, Cellular-GSM)

**** 3kW model available for Austria, Hungary, Italy, Switzerland, and Poland only***

Residential PV Case Study: More Energy on the Roof

- Ronco Briantino, Italy
- 5.75 kWp

The SolarEdge DC optimized inverter system enabled five additional panels to be installed and only required one 23-panel string - despite the roof having asymmetrical and opposite-facing facets.

Installation Date:	July, 2013
Inverter:	1 x three phase SE5K inverter
Power Optimizers:	23 x OPJ300-LV, Panel Embedded Power Optimizers
Panels:	23 x SOLON Black 220/16 250Wp
Installed by:	PETALO Srl

"The SolarEdge DC optimized inverter system significantly improved the ROI of this installation. The flexibility of design allowed us to put more panels on the roof, and decreased the BoS costs by €200."

> Matteo Pirota, Owner of Titolare Petalo Srl.

Increased Energy with Panel-Level MPPT

The homeowner decided to install a PV system in order to reduce electricity costs, and to take advantage of Net Metering and a 50% government tax rebate. With a small, multi-faceted roof, it was crucial to leverage all available space while maximizing energy from each panel. This meant that panels needed to be installed on multiple orientations, leading to varying MPPs. Panel-level MPP tracking performed by the SolarEdge DC optimized inverter solution allowed generation of maximum energy from every panel. Even though the panels are installed on different roof facets, each still generate energy according to its own MPP while connected in a single string.

These screenshots from the SolarEdge monitoring platform show the physical layout of the installation. These images illustrate how panels on opposing orientations perform differently throughout the day. Even though the panels are on the same string, each panel performs at its individual MPP to maximize energy harvest.

Comparing SolarEdge to a Traditional Inverter

PVsyst simulation software was used to compare the energy production of SolarEdge to a traditional inverter. According to the simulation, even with only 18 panels SolarEdge would gain an additional 6.7% yield compared to a traditional inverter, in the first year of operation.

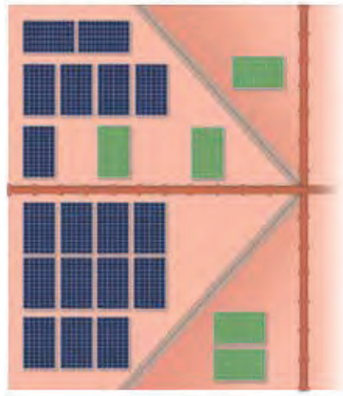
PVsyst Simulation Results		Traditional Inverter	SolarEdge	SolarEdge Advantage
PVsyst Yield Forecast: Year 1	Annual AC Energy	3759 kWh/year	4012 kWh/year	+6.7%
	Performance Ratio	71.74%	76.57%	
PVsyst Design	Inverters	1	1	
	Strings	1	1	
	Panels per Strings	18	18	

Residential Case Study: More Energy on the Roof

~30% More Panels on the Roof

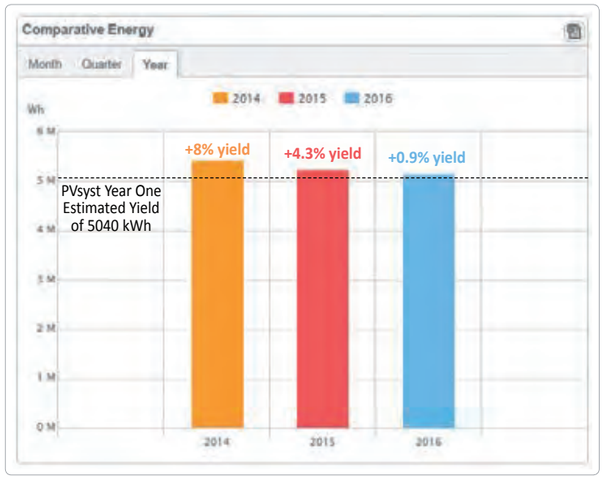
The site was initially designed with a typical string inverter with 18 panels; however, this limited the amount of panels that could be placed on the roof. With the SolarEdge DC optimized inverter system, the homeowner was able to benefit from five additional panels for a total of 23 panels on the roof.

The SolarEdge DC optimized inverter system enabled installation of five additional panels, represented in green. This addition equalled 1.25 kW, or an increase in system size of 28%.



PVsyst vs. Actual Measured Data

Using production data taken from the SolarEdge monitoring platform, SolarEdge outperformed the energy prediction in the field by 5.5% in the first year of operation.

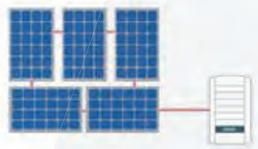


€200 Reduction in BoS Costs through Maximum Design Flexibility

The SolarEdge DC optimized inverter solution has a fixed input voltage which allows efficient use of all available space through unprecedented design flexibility - multiple orientations, tilts, and even panel types and sizes in the same string. This 5.75kWp system has two major opposite-facing facets with East-West orientations and an additional North-facing facet, but with SolarEdge only needs one three phase inverter with a single string of 23 panels. This reduction in strings decreased BoS costs by €200.

This flexibility of design also enabled the installation of vertical and horizontal panels in the same string. This allowed panels to be installed where it would be impossible with a typical string inverter.

Multiple orientations in a single string



Vertical and horizontal panels in a single string

Enhanced Maintenance and Yield Assurance

The SolarEdge DC optimized inverter solution offers lifetime free monitoring via its cloud-based monitoring platform. Performance monitoring at the panel, string, and, system level in addition to pinpointed troubleshooting and remote maintenance provide increased system uptime.

The monitoring system automatically alerted the installer to a drop in system energy production. The installer was able to remotely troubleshoot the problem and quickly order a replacement part to minimize energy loss. Without panel-level monitoring, this failure could have gone unnoticed for months and significantly decreased energy production.

The Chart view from the SolarEdge monitoring platform shows the performance of every individual panel. This screenshot shows how panels in the same string placed on different orientations perform independently of each other.

The StorEdge Solution: Enabling Energy Independence

Combining SolarEdge's breakthrough PV inverter technology with leading battery storage systems, the StorEdge solution helps homeowners reduce their electricity bills while maximizing energy independence from the grid.

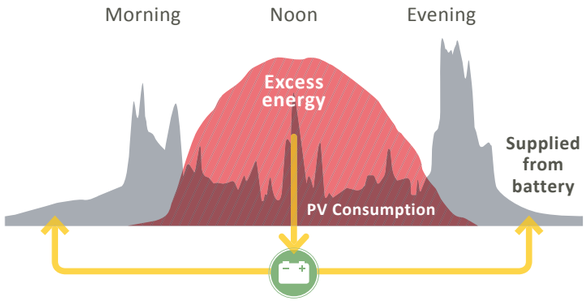
StorEdge is based on a single SolarEdge DC optimized inverter that manages and monitors PV production, consumption and storage. The StorEdge solution is compatible with high voltage batteries from LG Chem.

LG Chem RESU

TWO APPLICATIONS ARE AVAILABLE

Optimizing Self-Consumption

The StorEdge solution can be used to increase energy independence for homeowners, by utilizing a battery to store power and supply power as needed. To optimize self-consumption, the battery is automatically charged and discharged to meet consumption needs and reduce the amount of power purchased from the grid.



Using StorEdge, excess energy produced during peak sunlight hours when consumption is low is stored to a battery and used later. Energy isn't wasted!

Optimizing Self-Consumption + Backup Power*

In addition to optimizing self-consumption, StorEdge can also automatically provide backup power to pre-selected loads when the household suffers from grid interruptions. A combination of PV and battery is used to power important loads such as the refrigerator, TV, lights and AC outlets, day or night.

* Backup capability is only available in certain countries. Check with your local SolarEdge sales person.

Providing backup power day or night

Charge battery from the PV system

Daytime: *Important loads are powered first by the PV system and then by the battery. The battery can be charged from the PV as needed*

Nighttime: *Important loads are powered by the battery*

Maximizing the Homeowner's Solar Investment with StorEdge

The StorEdge system has many benefits for the homeowner as well as the PV installer.

More Energy

> Power optimizers increase rooftop energy harvest
> PV power is stored directly in the battery
> DC coupled battery solution allows high system efficiency
> No additional conversions from AC to DC and back to AC

Simple Design & Installation

> A single inverter for PV, storage and backup power
> Outdoor installation allows flexibility in battery location
> No special wires are required > utilizes the same PV cables

Full Visibility & Easy Maintenance

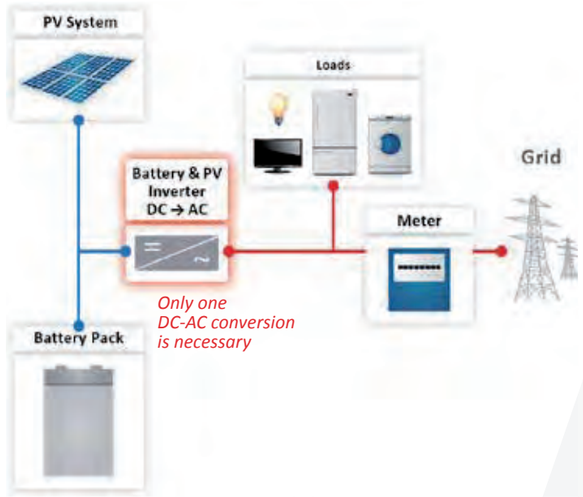
> Monitor the battery status, PV production, and self-consumption data from a single dashboard
> Smarter energy consumption to reduce electricity bills
> Monitor battery energy levels and remaining hours of backup power
> Remote diagnostics
> Remote firmware upgrades to both inverter & battery

Enhanced Safety

> PV array and battery voltage reduced to a safe voltage automatically upon AC shut down when not in backup mode
> Complies with VDE 2100-712 and IEC 60947

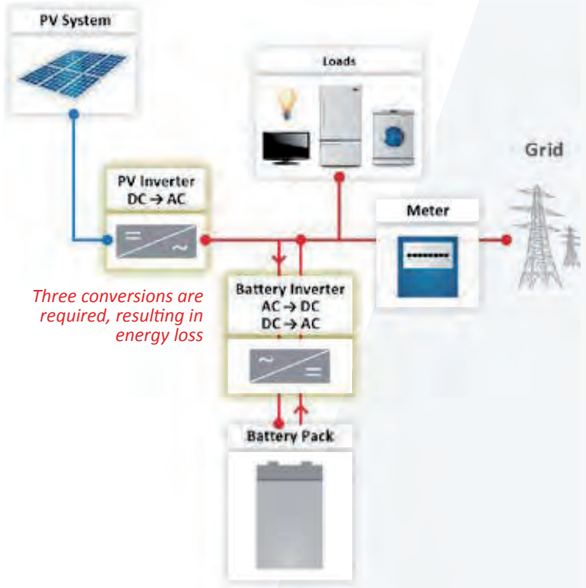
PV System with DC-Coupled Storage

solaredge



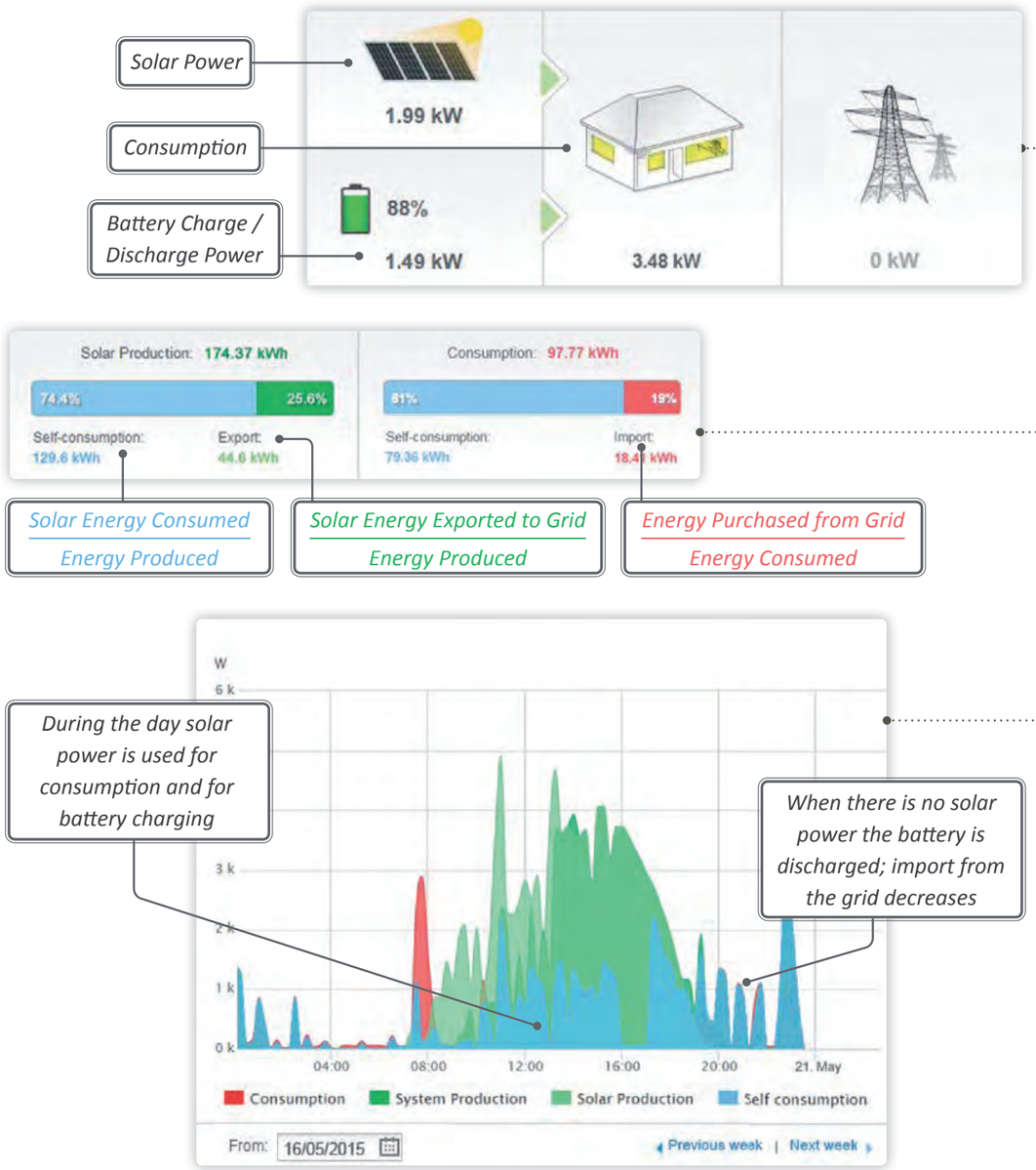
Vs.

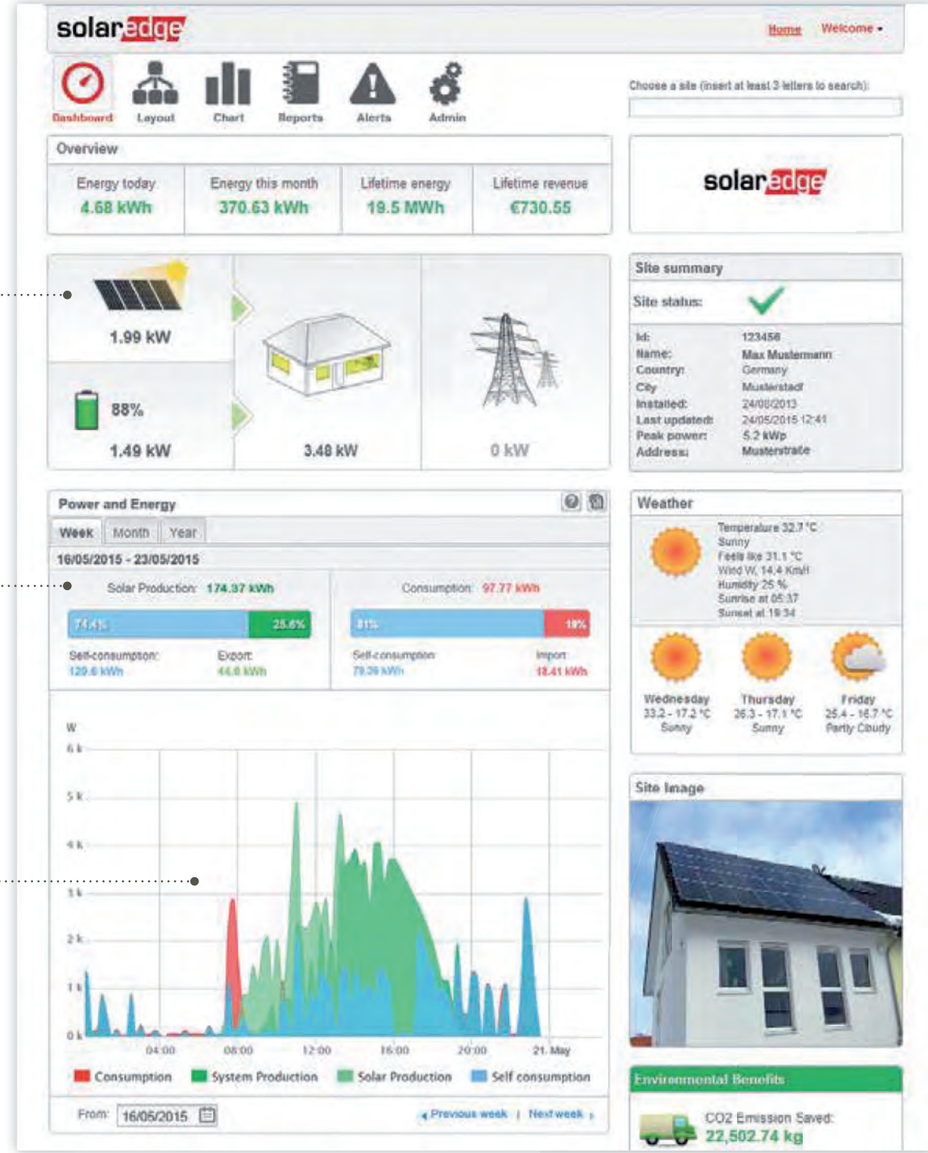
PV System with AC-Coupled Storage



Full Monitoring of PV and StorEdge Systems

The SolarEdge cloud-based monitoring platform provides insight into household PV production and consumption, displaying the power flow between the PV array, battery, grid and house loads as well as tracking real-time system data.

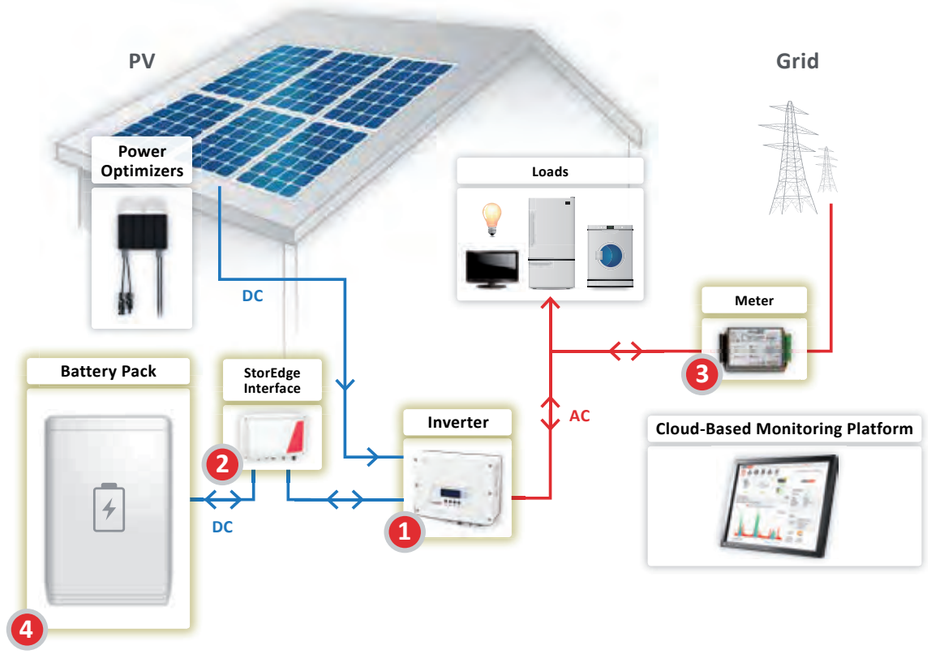




Dashboard from the SolarEdge cloud-based monitoring platform

Basic StorEdge Applications

Optimizing Self-Consumption



1 SolarEdge Single Phase Inverter

The SolarEdge inverter manages battery and system energy, in addition to its functionality as a DC PV inverter

2 StorEdge Interface

Connects the battery to a SolarEdge inverter

Connects to the inverter in parallel to the PV strings

3 SolarEdge Meter

For measuring electricity import and export

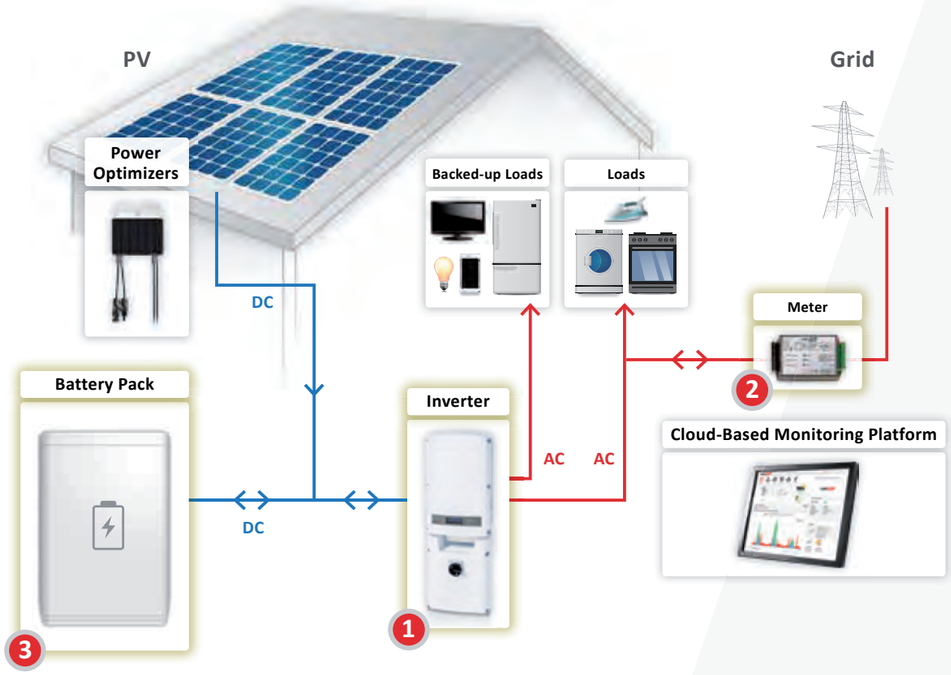
Meter is required for self-consumption management

4 Battery Pack

Compatible with DC coupled, high-voltage and high-efficiency batteries from LG Chem

Compatible with LG Chem

Optimizing Self-Consumption + Backup Power*



1 SolarEdge Single Phase StorEdge Inverter

The StorEdge Inverter manages battery, system energy and backup power, in addition to its functionality as a DC PV inverter

2 SolarEdge Meter

For measuring electricity import and export

Meter is not required for a backup-only solution

3 Battery Pack

Compatible with DC coupled, high-voltage and high-efficiency batteries from LG Chem

Compatible with LG Chem

* In supported regions only. Check with your local SolarEdge sales person.

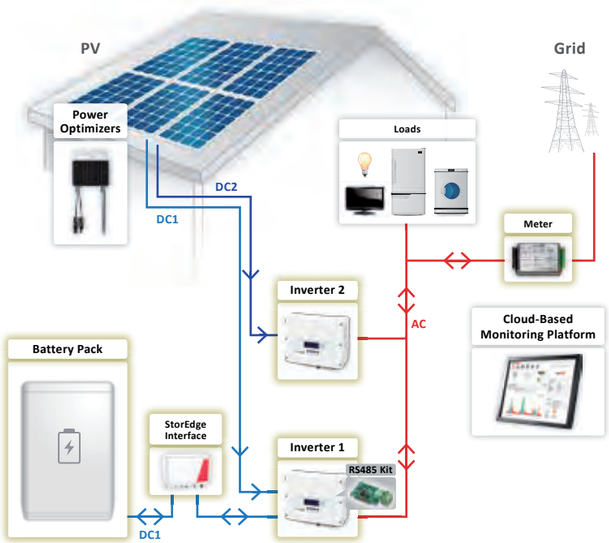
Additional StorEdge Applications

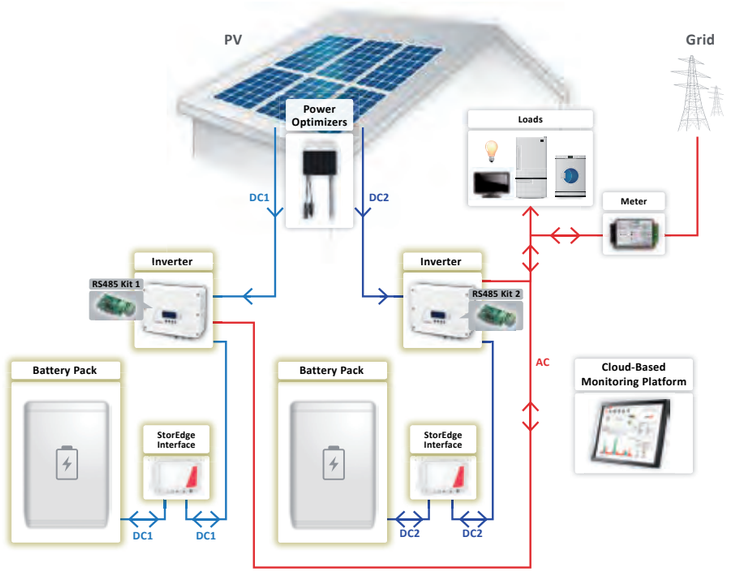
The StorEdge system can be modified to provide homeowners with a solution specific to their energy requirements.

Homeowner Requirement	How is StorEdge Connected?
1 More PV power	Add a second single phase inverter to handle additional PV power from the array
2 More battery capacity (kWh) and more power (kW)	Add one more single phase inverter and battery. For the self-consumption application only, each of the two batteries is connected to a separate StorEdge interface
3 Connection to a three phase SolarEdge inverter	Connect the StorEdge system to the SolarEdge inverter's AC output (AC-coupled solution)
4 Connection to a non-SolarEdge inverter	Connect the StorEdge system to the non-SolarEdge inverter's AC output (AC-coupled solution)
5 Time of Use without PV	Charge the battery from the AC grid when electricity tariffs are low, and discharge the battery to meet house loads when tariffs are high
6 Backup power without PV	Charge the battery by connecting it to the AC grid for backup power

1 More PV Power

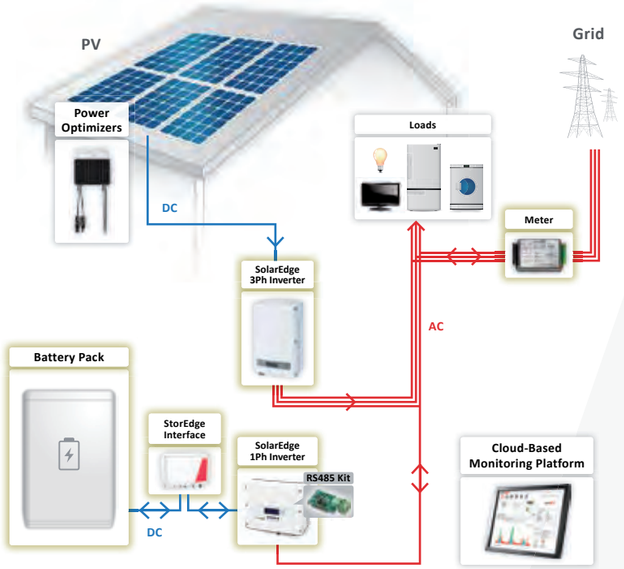
A second single phase inverter is added for the purposes of handling the additional PV power needed.





2 More Battery Capacity (kWh) & More Power (kW)

Where more power and capacity are needed, two 1-phase inverters are installed with two batteries each connected to a separate StorEdge interface.



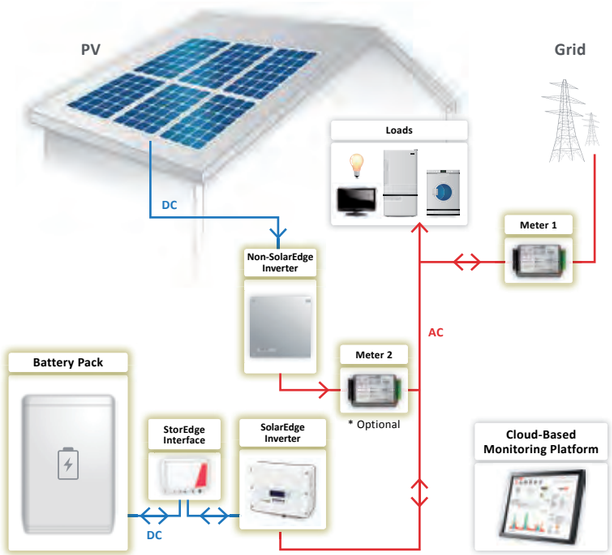
3 Three Phase SolarEdge PV Systems

For installations using a SolarEdge three phase inverter, the StorEdge system, including an additional single phase SolarEdge inverter, connects to the three phase inverter's AC output (AC-coupled)

Additional StorEdge Configurations

4 Non-SolarEdge PV Systems

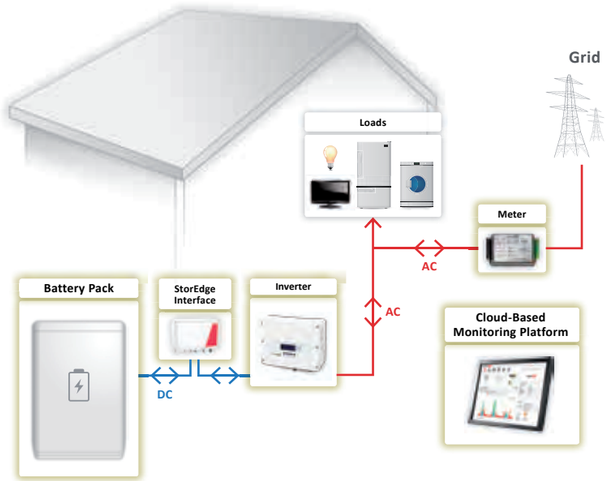
To upgrade existing single or three-phase non-SolarEdge PV installations, the StorEdge system, including an additional single phase SolarEdge inverter, connects to the non-SolarEdge inverter's AC output (AC-coupled. The SolarEdge inverter charges the battery using the PV power produced by the non-SolarEdge inverter.



* Optional - needed for full system monitoring: consumption, self-consumption and inverter production

5 Time of Use without PV

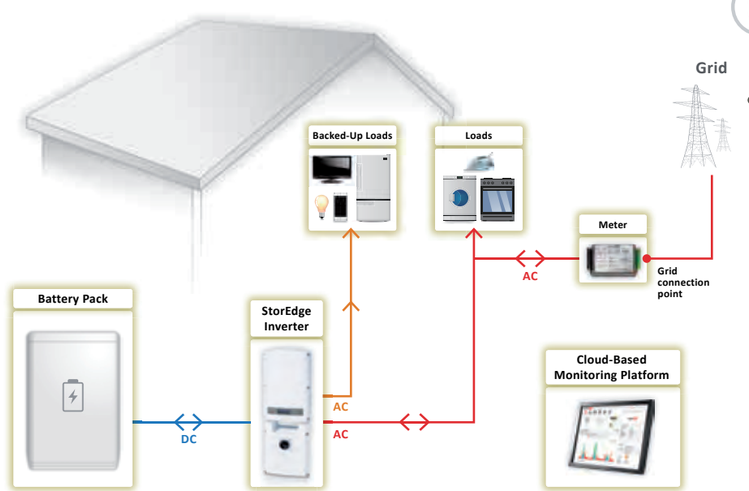
A StorEdge system may be installed without a PV system, to take advantage of Time of Use (TOU) tariffs. Charge the battery from the grid when electricity prices are low, and discharge the battery to supply house loads and increase self-consumption when tariffs are high.



6 Backup Power without PV*

A StorEdge system may be installed for sites without a PV system requiring backup power. The battery is charged from the AC grid only.

* In supported regions only. Check with your local SolarEdge sales person.



StorEdge Case Study: Increasing Self-Consumption

By simply adding StorEdge to its existing SolarEdge PV system, this typical household was able to more than double its self-consumption levels

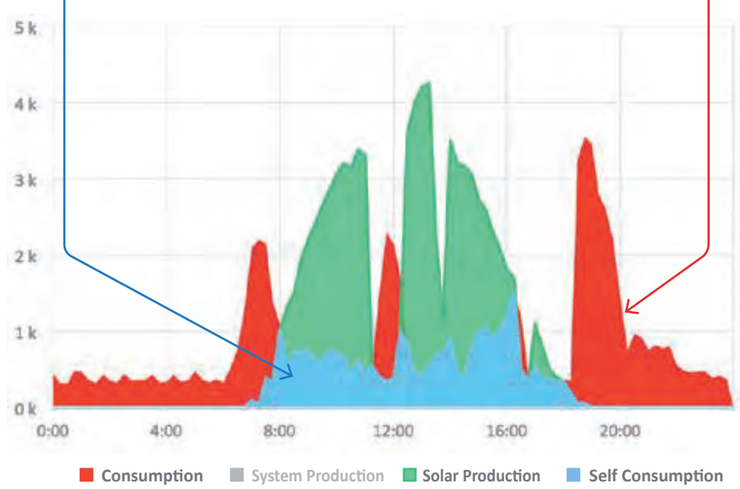
BEFORE - monitoring self-consumption:

5kW System on April 8, 2015 (before battery installation)

Total produced energy	Total purchased energy	Total consumed energy	Self-consumption level
21.37 kWh	13.57 kWh	20.61 kWh	7.04kWh | 33%

During the day, PV powers the house, less energy is purchased

When there is no PV, all consumed energy is purchased from the grid



*Based on a SolarEdge 5kW residential PV system

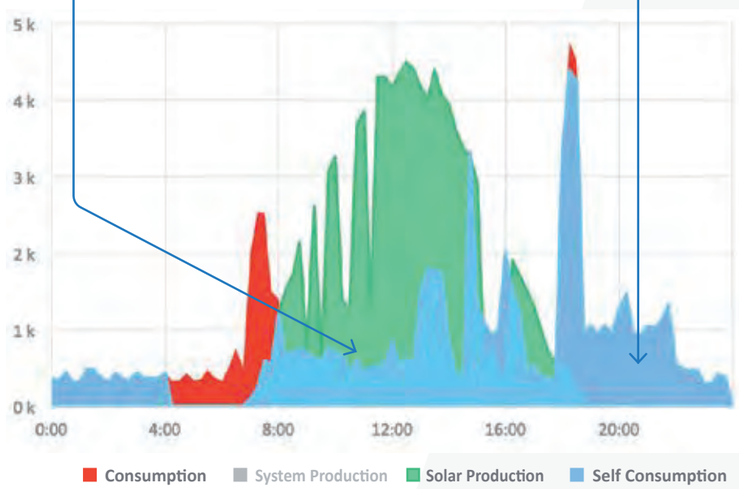
AFTER - increasing self-consumption:

5kW System on April 15, 2015 (after battery installation)

Total produced energy	Total purchased energy	Total consumed energy	Calculated self-consumption level
25.41 kWh	3.17 kWh	21.53 kWh	18.36kWh | 72%

During the day, PV powers the house and charges the battery

When there is no PV, the battery is discharged; less energy is purchased

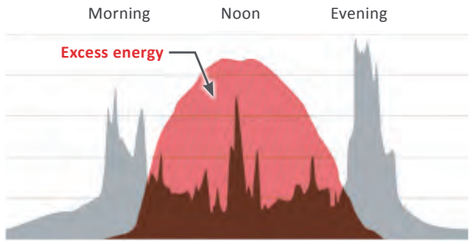


After installing StorEdge, PV self-consumption jumped from **33% to 72%**

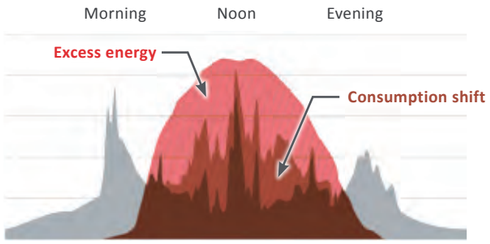
SolarEdge Home Energy Management Solutions

Designed to automatically use the PV system's excess power to increase solar energy usage, SolarEdge's Home Energy Management products help the homeowner achieve lower electricity bills, higher energy independence, and greater convenience. The Home Energy Management suite is part of SolarEdge's Smart Energy Management solution, combining solar energy, storage management and home energy management under the control of a single SolarEdge inverter.

Without
Home Energy Management



With
Home Energy Management



Home Energy Management Applications

Immersion Heater Controller
ZigBee wireless controller automatically diverting excess PV energy to the hot water boiler, providing hot water and highly cost effective energy storage

AC Switch with Meter & Plug-In Socket with Meter
ZigBee wireless plugs and relays for controlling electrical loads, such as pool pumps, fans, lighting and other typical home appliances

Dry Contact Switch
ZigBee wireless switch for controlling high loads using an external control interface, such as smart grid-ready supported heat pumps

Control in the Palm of Your Hand

Use SolarEdge smart switches to control household appliances remotely and on-the-go, anytime, anywhere, via the SolarEdge mobile monitoring app.

Home Energy Management dashboard

Set water heater schedule

Homeowner Benefits for Using Home Energy Management

It's Automated
A smart, self-learning system featuring efficient use of excess solar energy to power appliances

It's Modular
Homeowners have the flexibility to choose from several solutions and install a system best fitting their present and future energy needs, for maximized self-consumption

It's User Friendly
Simple and intuitive user interface to monitor system performance and remotely control devices

The Added Value of the Immersion Heater Controller

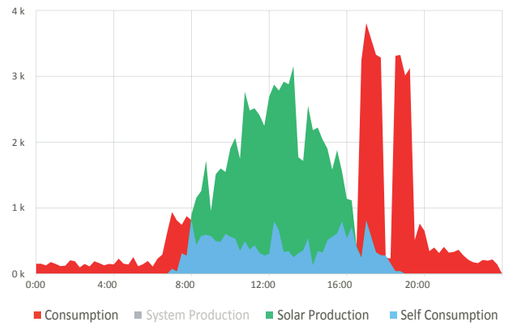
A typical UK home with a 4kW PV system and immersion heater, before and after installation of the SolarEdge Immersion Heater Controller*

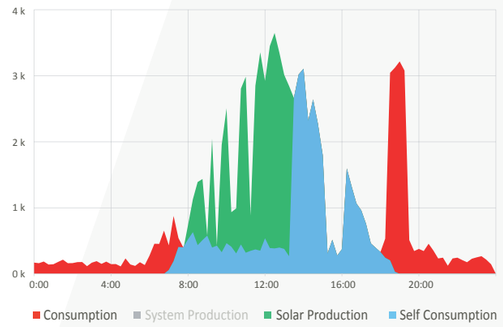
4kW System
Before Immersion Heater Controller installation

Total produced energy	Total consumed energy	Self-consumed energy	Total purchased energy	Electricity bill saving
17.90 kWh	15.37 kWh	5.07kWh	10.30 kWh	33%

4kW System
After Immersion Heater Controller installation

Total produced energy	Total consumed energy	Self-consumed energy	Total purchased energy	Electricity bill saving
18.48 kWh	15.27 kWh	9.24kWh	6.03 kWh	61%





* Reduces electricity (or gas) consumption for water heating

SolarEdge Export Limitation Solution

REDUCE ELECTRICITY BILLS, INCREASE YOUR SELF-CONSUMPTION

Grid electricity prices are constantly on the rise. This situation motivates the installation of large PV systems that allow owners to minimize consumption from the grid during the day. However, in some countries local regulations limit the amount of PV power that can be exported to the grid or allow no export whatsoever, while allowing the use of PV power for self-consumption. Therefore, without an energy management system, PV systems cannot be installed (if no export is permitted) or are limited in size.

The SolarEdge Smart Energy Management solution offers an export limitation option, integrated in the SolarEdge inverter firmware, which dynamically adjusts PV power production. This allows you to use more energy for self-consumption when the loads are high, while maintaining the export limit also when the loads are low.

SolarEdge Export Limitation

- Export limitation is integrated into the inverter firmware - install only an energy meter
- Fast Response Time - ensuring that even with rapid changes in load consumption and PV production the export power does not exceed the limit
- Failsafe Operation - the operation is designed to guarantee that the exported power will never exceed the preconfigured limit under any fault

SolarEdge Inverter as Energy Manager

- Export limit is configured via the inverter user interface
- In a multi-inverter system, one inverter will serve as the energy manager
- Installed SolarEdge inverters can be firmware upgraded with the export limitation option

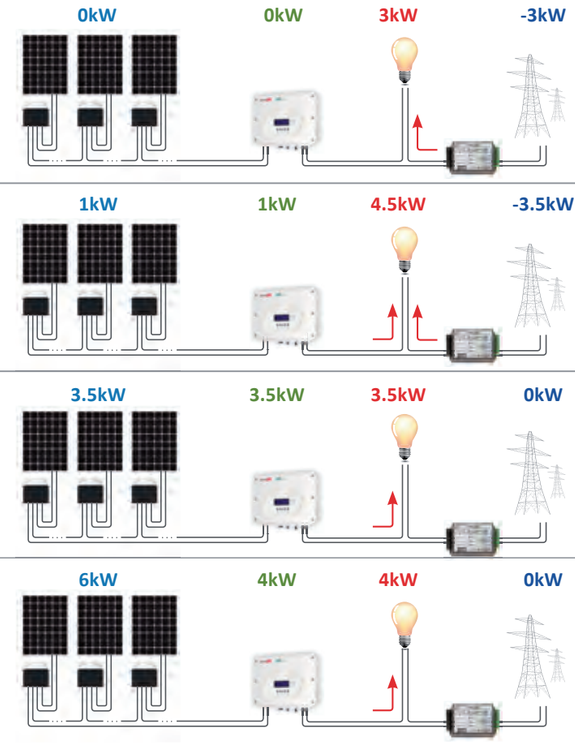
Meter Support

- The inverter can read a meter installed either at the grid connection point or at the load consumption point
- Two types of meters may be used:
  - An RS485 meter, available from SolarEdge; the meter connects to the RS485 terminal block of the SolarEdge inverter
  - A meter with an S0 interface and an S0 meter adapter cable available from SolarEdge
- The inverter maintains the output power limit with accuracy equal to that of the meter

Export Limitation Operation Example

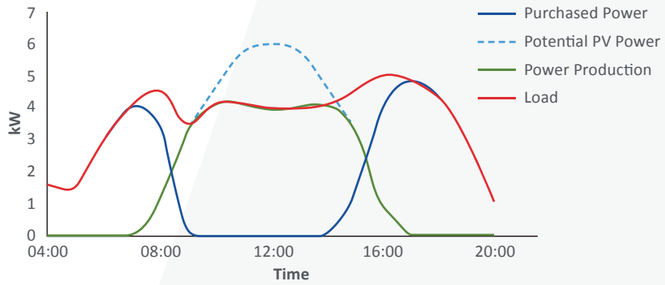
The following example illustrates the behavior of a 6kW PV system, with an export power limit of 0W - no export to the grid.

	Potential PV Power	Power Production	Load	Export Power*
6AM • No PV production • Loads powered from grid	0kW	0kW	3kW	-3kW
8AM • PV production lower than loads • Loads powered from PV & from grid	1kW	1kW	4.5kW	-3.5kW
9AM • PV production equal to load • No power to/from grid	3.5kW	3.5kW	3.5kW	0kW
12PM • PV potential greater than load • PV production limited to maintain export limit • No power to/from grid	6kW	4kW	4kW	0kW



* Minus sign indicates power is purchased from the grid

The overall behavior of the example system throughout the day can be seen in the following chart:



Working with SolarEdge

SolarEdge offers its PV installers a wide range of services to help make your SolarEdge experience as positive as possible.

Support

SolarEdge offers comprehensive pre and post-sale technical services including technical documentation and personal project-based technical consulting. Don't hesitate to contact the SolarEdge support team with any technical or service request. Just open a case via the Support tab of your SolarEdge monitoring dashboard or from the SolarEdge website **Support** page. SolarEdge support staff is available to provide remote assistance, either locally or from our follow-the-sun service center.

Training

Expand your knowledge of SolarEdge products and solutions by taking advantage of a wide variety of webinars and E-learning courses directly available on the SolarEdge website **Training** page. Don't forget to register for SolarEdge training seminars taking place in a location near you and learn first-hand from our local sales and training staff.

Alliance Program

SolarEdge welcomes you to its **Alliance program**. Start accumulating 15 points for every kW of SolarEdge system that you register on the SolarEdge monitoring platform. Redeem your points promotional materials or gifts, perfect for company employees or family members.

There is no need to register for the program, and points can be redeemed for a wide selection of attractive gifts.
To redeem your accumulated points, just open an Alliance case or send an email to: **alliance@solaredge.com**.

Marketing Tools

Grow your business with SolarEdge by utilizing existing marketing collateral to help you sell SolarEdge solutions. Visit the SolarEdge website **Downloads** section to access product catalogs, brochures, case studies, datasheets and more.

Consult with SolarEdge when designing your showroom or exhibition space to ensure the latest products and solutions are on display. SolarEdge also supports you with customized marketing tools by adding your company logo to end user collateral or by preparing tailored marketing materials.

Contact your local SolarEdge sales or marketing person for more information on any of SolarEdge's marketing and support services.

The best selfie with solar

Staying cool with rooftop PV

Getting power from the sun

Teamwork to take this roof solar

Taking solar to the edge

SolarEdge at home

Solar energy makes you strong

Powering the world with solar

Green fields, blue PV, and yellow sunshine

SolarEdge Ordering Information

Contact your local SolarEdge distributor

Part Number	Product Description
▸ **Single Phase HD-Wave Inverters**; 12-year warranty included	
SE2200H-RW000NNN2	HD-Wave Inverter 1ph, 2.2kW, (-20°C)
SE3000H-RW000NNN2	HD-Wave Inverter 1ph, 3.0kW, (-20°C)
SE3500H-RW000NNN2	HD-Wave Inverter 1ph, 3.5kW, (-20°C)
SE3680H-RW000NNN2	HD-Wave Inverter 1ph, 3.68kW, (-20°C)
SE4000H-RW000NNN2	HD-Wave Inverter 1ph, 4.0kW, (-20°C)
SE5000H-RW000NNN2	HD-Wave Inverter 1ph, 5.0kW, (-20°C)
SE6000H-RW000NNN2	HD-Wave Inverter 1ph, 6.0kW, (-20°C)
▸ **E-Series Three Phase Inverters**; 12-year warranty included; Smaller, quieter, easier to install than previous generation	
SE4K-RW00ENNN2	E-Series Inverter 3ph, 4.0kW, (-20°C)
SE5K-RW00ENNN2	E-Series Inverter 3ph, 5.0kW, (-20°C)
SE7K-RW00ENNN2	E-Series Inverter 3ph, 7.0kW, (-20°C)
SE8K-RW00ENNN2	E-Series Inverter 3ph, 8.0kW, (-20°C)
SE9K-RW00ENNN2 **NEW**	E-Series Inverter 3ph, 9.0kW, (-20°C)
SE10K-RW00ENNN2 **NEW**	E-Series Inverter 3ph, 10.0kW, (-20°C)
▸ **Three Phase Inverters**; 12-year warranty included	
SE12.5K-ER-01	Inverter 3ph, 12.5kW, (-20°C)
▸ **Single Phase HD-Wave Inverters with Built-In Wi-Fi**; 12-year warranty included for the inverter and 5-year warranty for the Wi-Fi card	
SE2200H-RW000NWN2	HD-Wave Inverter 1ph, 2.2kW, Wi-Fi, (-20°C)
SE3000H-RW000NWN2	HD-Wave Inverter 1ph, 3.0kW, Wi-Fi, (-20°C)
SE3500H-RW000NWN2	HD-Wave Inverter 1ph, 3.5kW, Wi-Fi, (-20°C)
SE3680H-RW000NWN2	HD-Wave Inverter 1ph, 3.68kW, Wi-Fi, (-20°C)
SE4000H-RW000NWN2	HD-Wave Inverter 1ph, 4.0kW, Wi-Fi, (-20°C)
SE5000H-RW000NWN2	HD-Wave Inverter 1ph, 5.0kW, Wi-Fi, (-20°C)
SE6000H-RW000NWN2	HD-Wave Inverter 1ph, 6.0kW, Wi-Fi, (-20°C)
▸ **Single Phase HD-Wave Inverters with Built-In GSM**; 12-year warranty included for inverter and GSM cellular modem	
SE2200H-RW000NGN2	HD-Wave Inverter, 1ph, 2.2kW, GSM, (-20°C)
SE3000H-RW000NGN2	HD-Wave Inverter, 1ph, 3.0kW, GSM, (-20°C)
SE3500H-RW000NGN2	HD-Wave Inverter, 1ph, 3.5kW, GSM, (-20°C)
SE3680H-RW000NGN2	HD-Wave Inverter 1ph, 3.68kW, GSM, (-20°C)
SE4000H-RW000NGN2	HD-Wave Inverter 1ph, 4.0kW, GSM, (-20°C)
SE5000H-RW000NGN2	HD-Wave Inverter 1ph, 5.0kW, GSM, (-20°C)
SE6000H-RW000NGN2	HD-Wave Inverter 1ph, 6.0kW, GSM, (-20°C)

Note: Single and three phase inverters (excluding those with built-in Wi-Fi) operating at temperatures down to -40 °C may be purchased at an additional cost. Use the following part number: SExxxx-RWxxxxxx4

Part Number	Product Description
▸ **E-Series Three Phase Inverters with Built-In GSM**; 12-year warranty included for inverter and GSM cellular modem; Smaller, quieter, easier to install than previous generation	
SE4K-RW00ENGN2	E-Series Inverter 3ph, 4.0kW, GSM, (-20°C)
SE5K-RW00ENGN2	E-Series Inverter 3ph, 5.0kW, GSM, (-20°C)
SE7K-RW00ENGN2	E-Series Inverter 3ph, 7.0kW, GSM, (-20°C)
SE8K-RW00ENGN2	E-Series Inverter 3ph, 8.0kW, GSM, (-20°C)
SE9K-RW00ENGN2 **NEW**	E-Series Inverter 3ph, 9.0kW, GSM, (-20°C)
SE10K-RW00ENGN2 **NEW**	E-Series Inverter 3ph, 10.0kW, GSM, (-20°C)
▸ **Three Phase Inverters with Built-In GSM**; 12-year warranty included for inverter and GSM cellular modem	
SE12.5K-RW000NGN2	Inverter 3ph, 12.5kW, GSM, (-20°C)
▸ **StorEdge**; 12-year warranty included for the inverters and 10-year warranty included for the interface	
SESTI-S1	StorEdge Interface
SESTI-S2	StorEdge Interface for Higher Power Output
SESTI-S4	StorEdge Interface for HD-Wave Inverters, compatible with LG Chem batteries
SE5000-RWS00NNB2 *	Inverter 1ph, 5kW, StorEdge Inverter (with Backup)
SE6000-RWS00NNB2 *	Inverter 1ph, 6kW, StorEdge Inverter (with Backup)
SE5000-RWS20NNB2 *	StorEdge Inverter (with Backup) for Higher Power Output, 1ph, 5kW
SE6000-RWS20NNB2 *	StorEdge Inverter (with Backup) for Higher Power Output, 1ph, 6kW
SE3680H-RWSACNNN2	HD-Wave StorEdge AC Coupled Inverter, 1ph, 3.68kW
SE5000H-RWSACNNN2	HD-Wave StorEdge AC Coupled Inverter, 1ph, 5.0kW
SE-1PH-STRG-K1	StorEdge Upgrade Kit for 1ph Inverter (not for HD-Wave inverters)
SE-3PH-STRG-K1	StorEdge Upgrade Kit for 3ph Inverter
* StorEdge Inverters (with Backup) are available in certain countries. Check with your local SolarEdge sales person.	
▸ **Power Optimizers**; 25-year warranty included	
P300-5RM4MRS	For 60 cells, with max Vin (@ min temp) 48V, output cable length 0.95m
P370-5RM4MRM	For 72 cells, with max Vin (@ min temp) 60V, output cable length 0.95m
P404-5RM4MRM	For 60/72 cells, with max Vin (@ min temp) 80V, output cable length 1.2m
P405-5RM4MRM	For Thin Film panels, with max Vin (@ min temp) 125V, output cable length 1.2m, single input
P405-5RMDMRM	For Thin Film panels, with max Vin (@ min temp) 125V, output cable length 1.2m, dual input
P500-5RM4MRM	For 96 cells, with max Vin (@ min temp) 80V, output cable length 1.2m

SolarEdge Ordering Information

Contact your local SolarEdge distributor

Part Number	Product Description
▸ Frame-Mounted Power Optimizers; 25-year warranty included	
P300-5RM4MFS	For 60 cells, with max Vin (@ min temp) 48V, output cable length 0.95m
P370-5RM4MFM	For 72 cells, with max Vin (@ min temp) 60V, output cable length 0.95m
P404-5RM4MFM	For 60/72 cells, with max Vin (@ min temp) 80V, output cable length 1.2m
P500-5RM4MFM	For 96 cells, with max Vin (@ min temp) 80V, output cable length 1.2m
▸ Branch Cables for Parallel Connection of Panels	
SE-CBY-3MM	3-Panel branch cable for power optimizer input (10 pairs)
SE-CBY-2MM	2-Panel branch cable for power optimizer input (20 pairs)
▸ Communication Products; 5-year warranty included	
SE1000-ZBGW-K5	SolarEdge Home Gateway + Slave Kit
SE1000-ZBRPT05	SolarEdge ZigBee Repeater (range extender)
SE1000-ZB05-SLV	ZigBee Inverter Slave Kit
SE1000-RS485-IF	RS485 Expansion Kit
SE-SIM-R12-EU-S1	SolarEdge 12-Year Prepaid Data Plan, for residential systems
SE-SIM-R12-EU-S2	SolarEdge 12-Year Prepaid Data Plan, for StorEdge systems
SE-1PH-GSM-K1	GSM Upgrade Kit for Single Phase Inverters (not compatible with HD-Wave inverters)
SE-3PH-GSM-K2	GSM Upgrade Kit for Three Phase Inverters
SE1000-GSM02	Cellular GSM Kit (for inverters with a GSM connector)
SE1000-WIFI01	SolarEdge Wi-Fi Card Kit
SE1000-CCG-G	SolarEdge Control and Communication Gateway
▸ Metering Solutions	
SE-WND-3Y400-MB-K1	1Ph/3Ph 230/400V Elect. Meter W/ RS485, DIN-rail
SE-ACT-0750-50	50A Split-Core Current Transformer
SE-CTM-0360-070 **NEW**	70A Small Split-Core Current Transformer
SE-ACT-0750-100	100A Split-Core Current Transformer
SE-ACT-0750-250	250A Split-Core Current Transformer
SE-CTS-2000-1000	1000A Split-Core Current Transformer
SE1000-S0IF01	S0 meter adapter cable
▸ Home Energy Management Products; 5-year warranty included	
SEHAZB-HEAT-CONT-3	3kW Immersion Heater Controller
SEHAZB-SWITCH-MTR	AC Switch with Meter
SEHAZB-DR-SWITCH-2	2 x Dry Contact Switch
SEHAZB-SCKT-MTR-GB	Plug-in Socket with Meter, Great Britain
SEHAZB-SCKT-MTR-DE	Plug-in Socket with Meter, Germany
SEHAZB-SCKT-MTR-FR	Plug-in Socket with Meter, France
SEHAZB-SCKT-MTR-IT	Plug-in Socket with Meter, Italy
SE1000-ZB06-MOD *	Home Energy Management ZigBee Card

* For every system using Home Energy Management products, one Home Energy Management ZigBee Card is required

Part Number	Product Description
▸ Inverter Warranty Extensions	
For HD-Wave inverters, purchased within 24 months of shipment date	
WE-HD1S-20	20 years, HD-Wave 1ph inverter < 4 kW
WE-HD1S-25	25 years, HD-Wave 1ph inverter < 4 kW
Purchased within 24 months of shipment date, up to 20 years	
WE-1S-20	20 years, 1ph inverter < 4 kW
WE-1M-20	20 years, 1ph inverter 4-6 kW
WE-3M-20	20 years, 3ph inverter <15 kW
Purchased within 24 months of shipment date, up to 25 years	
WE-1S-25	25 years, 1ph inverter < 4 kW
WE-1M-25	25 years, 1ph inverter 4-6 kW
WE-3M-25	25 years, 3ph inverter <15 kW
StorEdge Inverters, purchased within 24 months of shipment date, up to 25 years	
WE-S1S-20	20 years, StorEdge Inverter (with Backup), 1ph
WE-S1S-25	25 years, StorEdge Inverter (with Backup), 1ph
▸ Cloud-Based Monitoring Services	
Free, real-time, panel-level monitoring of PV system performance via the SolarEdge monitoring platform. Accessible from your computer or mobile device.	For full details about the SolarEdge monitoring platform visit: http://www.solaredge.com/products/pv-monitoring#/
SE-SAT-PR-S1	Satellite-based Performance Ratio; one site, for one year
SE-SAT-PR-S2	Satellite-based Performance Ratio; one site, for one year plus one year historical data
▸ Display Products	
SE6000H-RW-EMP	Demo 1ph HD-Wave inverter
SE8K-RW00E-EMP	Demo E-Series 3ph inverter
SE17K-EMP	Demo 3ph inverter
P300-5RM4MEMP	Demo power optimizer
SESTI-S1-EMP	Demo StorEdge Interface
SE5000-RWS-EMP	Demo StorEdge Inverter (with Backup)

SolarEdge invented an intelligent inverter that has changed the way power is harvested and managed in PV systems. The SolarEdge DC optimized inverter maximizes power generation at the individual PV panel-level while lowering the cost of energy produced by the PV system.

Addressing a broad range of solar market segments, from residential to commercial and large-scale solar, the SolarEdge DC optimized inverter solution includes PV inverters, power optimizers, and cloud-based monitoring. By connecting power optimizers to each panel, the system enables superior power harvesting and panel management. System costs remain competitive by centralizing the DC-AC inversion and grid interaction at a simplified PV inverter. Enhanced PV asset management including reduced O&M costs are enabled through panel-level monitoring and remote troubleshooting. Another benefit is the automatic DC shutdown, for installer, maintenance personnel, and firefighter safety, through the SafeDC™ mechanism.

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SolarEdge

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www.solaredge.com

This document includes estimates of various parameters of the compared solar systems, including annual A/C energy production, performance ratio and shading loss based on PVsyst computer-simulated results for installations using our and competing systems. While we are not aware of any reason to believe these estimates and comparisons are materially inaccurate or misleading, they are inherently uncertain and the projected results are not guaranteed. Actual results will vary depending on a number of factors, including actual field conditions, quality of installment and other variances from the assumptions underlying the estimates. Although care has been taken to ensure the accuracy, completeness and reliability of the estimates and comparisons presented, SolarEdge assumes no responsibility for these. MORE SPECIFICALLY, IN NO EVENT SHALL SOLAREDGE BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL OR INCIDENTAL LOSSES OR DAMAGES RESULTING FROM OR ARISING OUT OF USE OF OR RELIANCE ON THE ESTIMATES AND COMPARISONS PRESENTED.

Cautionary Note Regarding Market Data and Industry Forecasts: This catalog may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.