Now even more attractive with the German incentive program for storage systems

SMA FLEXIBLE STORAGE SYSTEM

The versatile solution for new and existing PV systems*

The SMA Flexible Storage System is the adaptable solution for new and existing systems and keeps generated solar energy on reserve until it is needed in the household. It is comprised of the Sunny Island battery inverter, Speedwire data module, Sunny Remote Control, Sunny Home Manager and SMA Energy Meter. These can be combined with an SMA PV inverter, SMA radio-controlled sockets and an individually customized number of batteries. With great flexibility in terms of storage capacity and system power, this system offers the ideal solution for high self-consumption and intelligent energy management for nearly all applications within the SMA Smart Home system.

* System not yet available in all countries
SMA FLEXIBLE STORAGE SYSTEM
The versatile solution for new and existing PV systems*

1 Sunny Boy 5000TL
2 Sunny Home Manager
3 Sunny Portal
   The Sunny Portal is used to operate and configure the Sunny Home Manager. These functions are available via any Internet browser and can be accessed using a PC or smartphone. Furthermore, the live display of all power and energy values encourages to save on power consumption.
4 Sunny Island 6.0H/8.0H
5 Electricity meter
6 SMA Energy Meter
7 Uncontrolled loads
   Stoves, TVs, computers, and other electronic devices are not controlled by the Sunny Home Manager. The Sunny Home Manager memorizes the typical load profile of the building and takes it into account during automatic controllable load management planning.
8 Washing machine
9 Clothes dryer
10 Heat pump
11 Thermal energy storage with heating element
   SMA Smart Heater**
   The heating element increases self-consumption by converting electric energy into thermal energy.
12 SMA Bluetooth® radio-controlled socket
13 Utility grid
14 Router

* System not yet available in all countries
** Available as of Q2 2014
SUNNY HOME MANAGER
The control center for smart energy management

With its standard access to the Sunny Portal, the Sunny Home Manager enables optimized load management. It not only records all energy flowing in the home and integrates the PV generation forecast into its planning, but also incorporates the charging and discharging of batteries. In addition, it can activate controllable household appliances via the optional SMA radio-controlled sockets.

SUNNY ISLAND 6.0H / 8.0H for Grid-Connected Applications
The battery inverter for maximum flexibility

Together with the Sunny Remote Control, the flexible, retrofittable battery inverter Sunny Island offers the perfect features for operators to temporarily store their self-generated solar electricity for later consumption. Thanks to the fast, closed-loop control of the total current, it is also able to accurately balance consumption on the other phases. Reliable and rapid communication with other system components is ensured with the integrated Speedwire data module.

SMA ENERGY METER
Universal recording of measured values for intelligent energy management

The SMA Energy Meter takes phase-exact and balanced electrical measured values as a grid feed-in and purchased electricity meter and communicates these values via Speedwire. In this way, all of the data relating to PV generation, purchased electricity and grid feed-in can be transmitted via standard Ethernet cables, for example to the Sunny Home Manager or to the Sunny Island.
Information about integrating storage systems with the SMA FLEXIBLE STORAGE SYSTEM

DC connection vs. AC connection of the storage system

In principle, it is possible to connect the storage system on either the DC side or the AC side. Both solutions have their own specific advantages and disadvantages:

DC systems have fewer energy conversion stages than AC systems, which allows DC systems to operate with greater efficiency and at lower costs. Alongside the higher degree of integration (i.e., the battery), the battery charge controller and inverter are located together in a single enclosure, giving operators the benefit of a highly efficient and cost-effective storage solution. However, the reduced flexibility makes it more difficult to add subsequent components or upgrade the system, and as a result it is often necessary to replace the existing PV inverter as well.

Connecting the storage system on the AC side offers huge advantages over the DC-side connection, both in terms of flexibility and in terms of upgrade capability. With the customizable SMA Flexible Storage System, the owner-operator has the ability to plan the entire PV system according to his or her personal requirements and specifications. In other words, this system offers maximum flexibility in terms of storage system performance, battery type, battery capacity and PV system design. Likewise, connecting the storage system on the AC side is also advantageous when it comes to upgrade solutions, as this allows continued use of the existing PV inverter.

What many customers do not know is that by using highly efficient and perfectly coordinated components (all products come from the same supplier), the SMA Flexible Storage System delivers a higher overall efficiency than many other DC-connected storage systems currently on the market.

Reduction of purchased electricity on all three phases thanks to Sunny Island

Within the SMA Flexible Storage System, the Sunny Island is only connected to one phase of the domestic circuit. Even with single-phase connection of the Sunny Island, the control is always based on the total grid exchange power. As a result, the battery inverter is able to reduce the amount of electricity purchased for domestic use on all three phases. This also means that the owner-operator does not need to choose a fixed phase, as the balance calculations for generation and consumption in the overall system are sufficient.

Consumption in one phase can be offset by generating power in this phase or any other phase. This holds true even if the storage system is designed to be single-phase. As a result – and based on the expected magnitude of the domestic electricity demand – a more cost-effective and easy to install single-phase system is adequate.

Sunny Island discharges the battery on phase 1, thereby also reducing power consumption on phases 2 and 3. The total output of the purchased electricity meter is 0 kW.
ADVANTAGES AT A GLANCE:

» Approximately 57 percent less electricity from utility company*

» Self-consumption rate boosted to 65 percent (up from 30)**

» Use of solar power possible 24 hours a day

» All PV power generated annually is used, even when active power is limited to 70 or 60 percent of the nominal PV array power according to the Renewable Energy Sources Act (EEG) or the energy storage subsidy (KfW)

» Capability to upgrade almost any existing PV system

» Maximum flexibility in terms of storage, battery type and battery capacity

» Future-proof with smart grid compatibility

* Compared to a household without a PV system
** All figures are based on an annual PV generation of 5,000 kWh, annual power consumption corresponding to PV generation, an effective battery capacity of 5 kWh and the use of a Sunny Home Manager.
# SMA FLEXIBLE STORAGE SYSTEM

**System options**

<table>
<thead>
<tr>
<th></th>
<th>Example 1</th>
<th>Example 2</th>
<th>Example 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average power consumption</td>
<td>5000 kWh</td>
<td>5000 kWh</td>
<td>5000 kWh</td>
</tr>
<tr>
<td>Nominal power of the PV system</td>
<td>5 kWp</td>
<td>5 kWp</td>
<td>8 kWp</td>
</tr>
<tr>
<td>Usable battery capacity*</td>
<td>5 kWh</td>
<td>8 kWh</td>
<td>5 kWh</td>
</tr>
<tr>
<td>Battery inverter</td>
<td>4.6 kW</td>
<td>4.6 kW</td>
<td>4.6 kW</td>
</tr>
<tr>
<td>Technology</td>
<td>Li-ion</td>
<td>Li-ion</td>
<td>Li-ion</td>
</tr>
<tr>
<td>Nominal capacity</td>
<td>5.5 kWh</td>
<td>11 kWh</td>
<td>20 kWh</td>
</tr>
<tr>
<td>Battery life</td>
<td>Up to 20 years</td>
<td>Up to 20 years</td>
<td>Up to 20 years</td>
</tr>
<tr>
<td>Maximum depth of discharge</td>
<td>Up to 90 %</td>
<td>Up to 90 %</td>
<td>Up to 90 %</td>
</tr>
<tr>
<td>Self-sufficiency rate (typical)</td>
<td>57 %</td>
<td>61 %</td>
<td>67 %</td>
</tr>
<tr>
<td>Self-consumption rate (typical)</td>
<td>65 %</td>
<td>69 %</td>
<td>48 %</td>
</tr>
<tr>
<td>Repayment subsidies** for new installations</td>
<td>Approx. €3,000</td>
<td>Approx. €1,500</td>
<td>Approx. €3,000</td>
</tr>
<tr>
<td>Repayment subsidies** for retrofitting</td>
<td>Approx. €3,000</td>
<td>Approx. €1,500</td>
<td>Approx. €3,300</td>
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</table>

## Combinations with single-phase PV inverter

<table>
<thead>
<tr>
<th></th>
<th>Sunny Home Manager</th>
<th>Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example 1</td>
<td>SB 5000TL</td>
<td>SI 6.0H</td>
</tr>
<tr>
<td>Example 2</td>
<td>SB 5000TL</td>
<td>SI 6.0H</td>
</tr>
<tr>
<td>Example 3</td>
<td>SB 5000TL</td>
<td>SI 6.0H</td>
</tr>
</tbody>
</table>

## Combinations with three-phase PV inverter***

<table>
<thead>
<tr>
<th></th>
<th>Sunny Home Manager</th>
<th>Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example 1</td>
<td>STP 5000TL</td>
<td>SI 6.0H</td>
</tr>
<tr>
<td>Example 2</td>
<td>STP 5000TL</td>
<td>SI 6.0H</td>
</tr>
<tr>
<td>Example 3</td>
<td>STP 8000TL</td>
<td>SI 6.0H</td>
</tr>
</tbody>
</table>

## Other necessary system components

- Speedwire data module for Sunny Island, Sunny Remote Control, SMA Energy Meter

## Optional system components

- SMA Bluetooth® radio-controlled sockets, BatFuse B.01 battery fuse, DC cable

## Type designations

- Sunny Boy: SB 1X00TL-10 / SB 2100TL / SB XX00TL-21 / SB XX00TLST-21, Sunny Tripower: STP 1X000TL-10 / STP XX000TL-20 / STP XX000TLEE-10, Sunny Island 6.0H for grid-connected applications: SI6.0H-11, Speedwire data module: SWDMSI-NR10, Sunny Remote Control: SRC-20, SMA Energy Meter: EMETER-10, Sunny Home Manager: HM-8T-10, Sunny Home Manager Set: HM-8T-10-SET, SMA radio-controlled socket with Bluetooth: BT-SOCKET-10, Battery fuse: BATFUSEB.01, DC cable (3 m/6 m): DC-CABLE.70-3/DC-CABLE.70-6

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* Batteries not supplied by SMA
** Based on the KfW incentive program for battery storage systems in Germany
*** In combination with a three-phase PV inverter and a single SI 6.0H, the standby power function can only be realized without PV support.