6th Capital Markets Day
SMA Integrated Storage System

Simply Intelligent Energy Management

With the SMA Integrated Storage System, which will be available in 2014, SMA presents a truly simple way of intelligent energy management for new systems. With its application-oriented battery capacity, it guarantees a lower initial investment and a far greater self-consumption rate.

The most important parts of this efficient solution are:

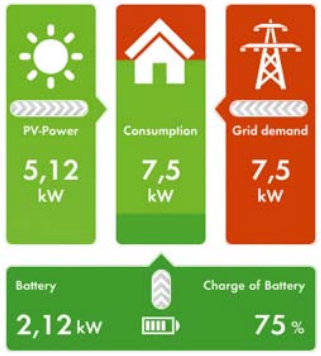
- Sunny Home Manager
- Sunny Boy Smart Energy
- SMA Energy Meter

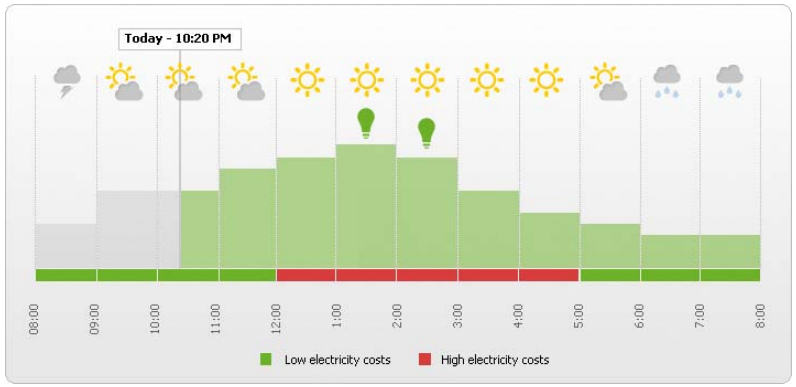
SUNNY HOME MANAGER

The Sunny Home Manager is the intelligent control center for the SMA Integrated Storage System. For example, it not only ensures the clear visualization of all energy flows in the household, it also ensures that the batteries are connected.

- Displays recommended actions for load management
- Memorizes the household's typical load profile
- Predicts PV generation by taking the local weather forecasts into account
- Automatic control of loads with SMA radio-controlled sockets

SUNNY HOME MANAGER



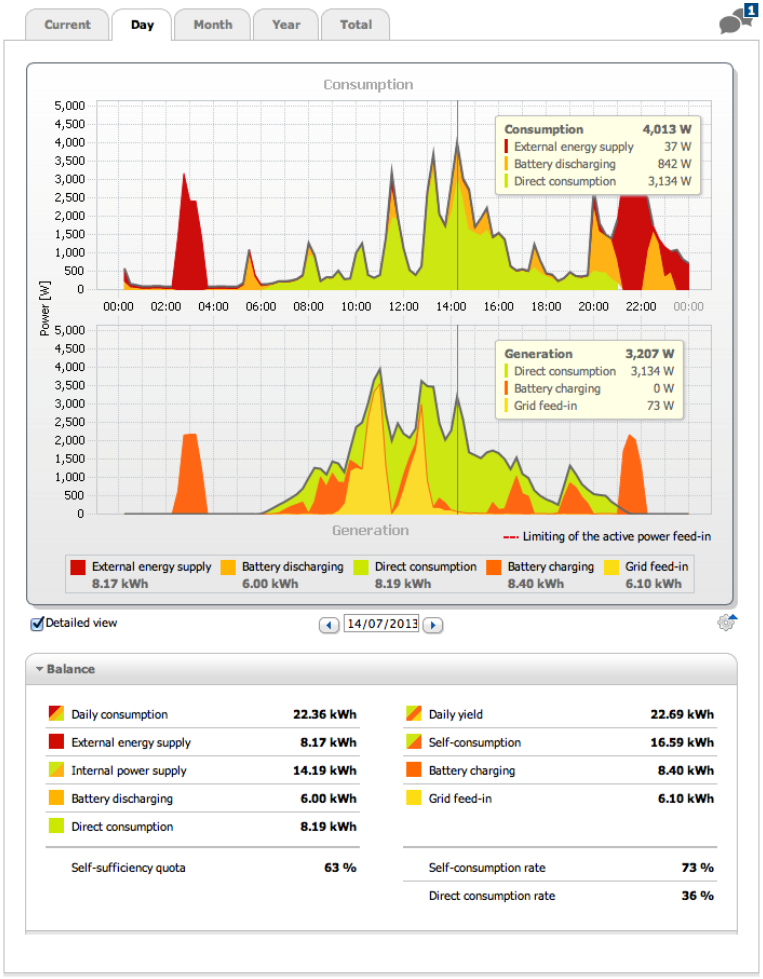


Sunny Portal provides a clear and yet comprehensive information and control function.

The status report displays current power generation, consumption, feed-in and purchased electricity data.

In addition, the system operator sees the PV generation forecast over the next hours as well as recommended actions.

SUNNY HOME MANAGER



The analysis page displays the energy balance for the desired time period and facilitates a variety of analyses.

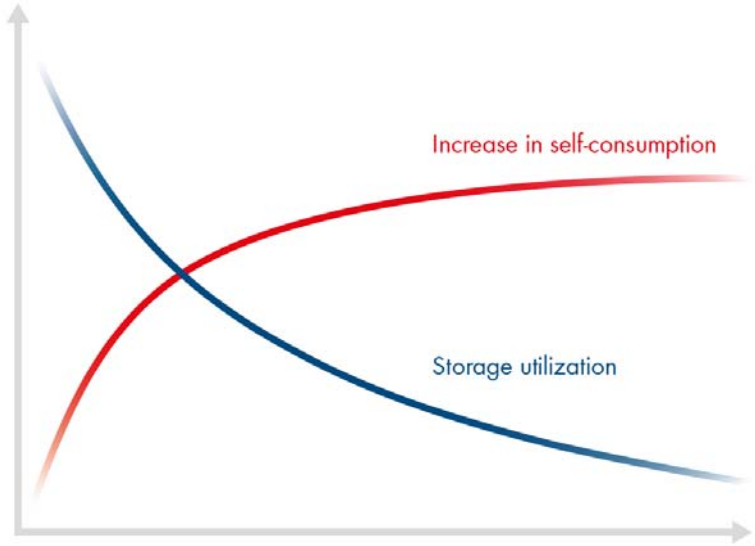
The separate consumption and generation views, for example, clearly show how high self-consumption is. The energy balance displays the extent to which power consumption is covered by self-produced and temporarily stored PV power.

SUNNY BOY 3600/5000 SMART ENERGY

It comes with everything. The Sunny Boy Smart Energy is currently the easiest and most affordable solution for common household PV applications. This combination of a modern PV inverter and an integrated battery storage with an effective capacity of two kilowatt-hours offers a host of advantages:

- Maximization of self-consumption through efficient charge and load management
- Easily installed like a PV inverter
- Integrated Webconnect function for direct access to Sunny Portal via Ethernet

Optimal Storage Capacity



The integrated lithium-ion battery from LG Chem, one of the world's leading battery manufacturers, has an effective capacity of around two kilowatt-hours.

This battery capacity ensures that virtually all generated solar energy is consumed, even with active power limitation, and increases the user's independence from rising energy prices with a self-consumption rate of up to 55 percent.

The Integrated Lithium-Ion Battery from LG Chem

LG Chem

Reliability included: The Sunny Boy Smart Energy is equipped with specially developed lithium-ion cells from LG Chem with integrated battery management ensuring maximum operational safety.

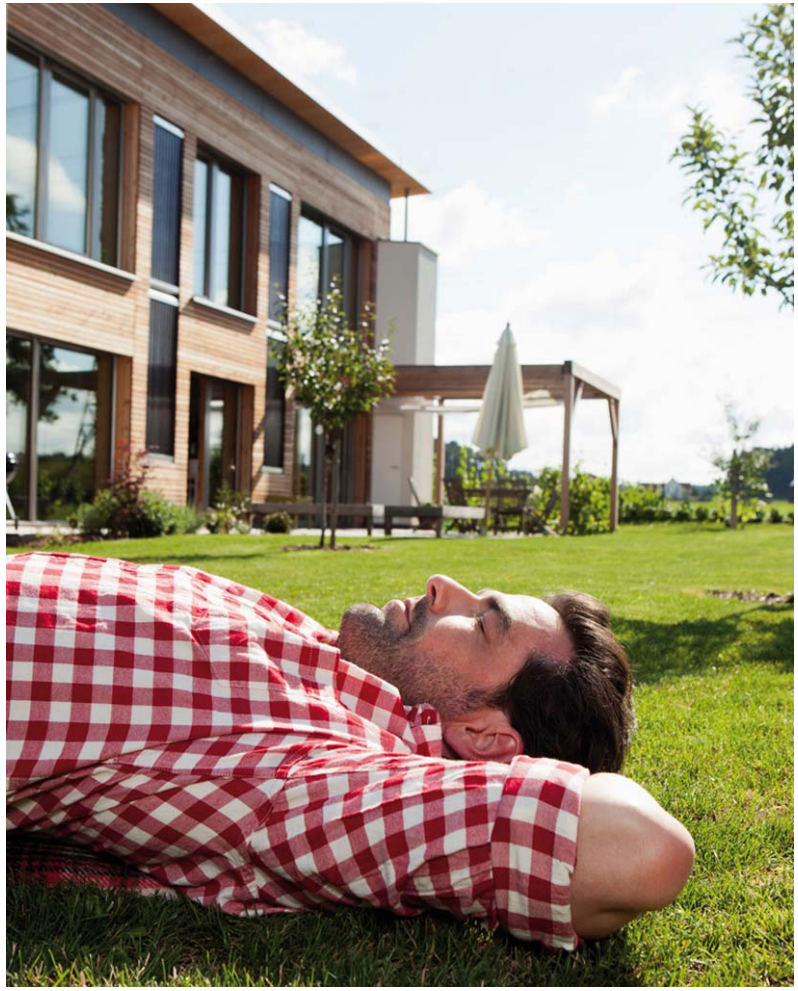
High-quality guaranteed: LG Chem is global market leader in the field of lithium-ion technology for stationary storage solutions and has a vast array of expertise, synergy effects and production capacities.

SMA ENERGY METER

The powerful measuring device for intelligent energy management as part of the SMA Smart Home solution: The SMA Energy Meter takes electrical measured values and communicates these values via Speedwire.

- Transfer of purchased electricity and feed-in data via a standard Ethernet cable at high-speed rate
- Quick plug and play installation
- Graphic visualization of current measured values in Sunny Portal
- Easily and flexibly combined with SMA Smart Home components

Benefits at a Glance:



- Approx. 52 % * less electricity from utility companies
- Self-consumption rate boosted from 30 to an average of 55 %*
- Significantly reduced initial investment thanks to application-oriented battery capacity
- Nearly all PV power generated annually is used, even when the active power is limited to 70 or 60 % of the nominal PV power according to the Renewable Energy Sources Act (EEG) resp. the energy storage subsidy
- Maximum reliability with specially developed lithium-ion cells from LG Chem with integrated battery management

*All figures are based on an annual PV generation and power consumption of 5,000 kWh, an effective battery capacity of 2 kWh and the use of the Sunny Home Manager.

SMA Partnerships with Other Innovative Companies

SMA collaborates with worldwide well-known and innovative companies from the following industries:

Heating, air-conditioning, hot water:
Stiebel Eltron, Vaillant

For example, a heat pump is controlled in such a way that it uses as much PV energy as possible. This is carried out by the Sunny Home Manager, which plans optimum use based on the generation and consumption forecasts.

- Intelligent self-consumption
- Energy storage
- Use of synergies between electricity and heat balance

SMA Partnerships with Other Innovative Companies

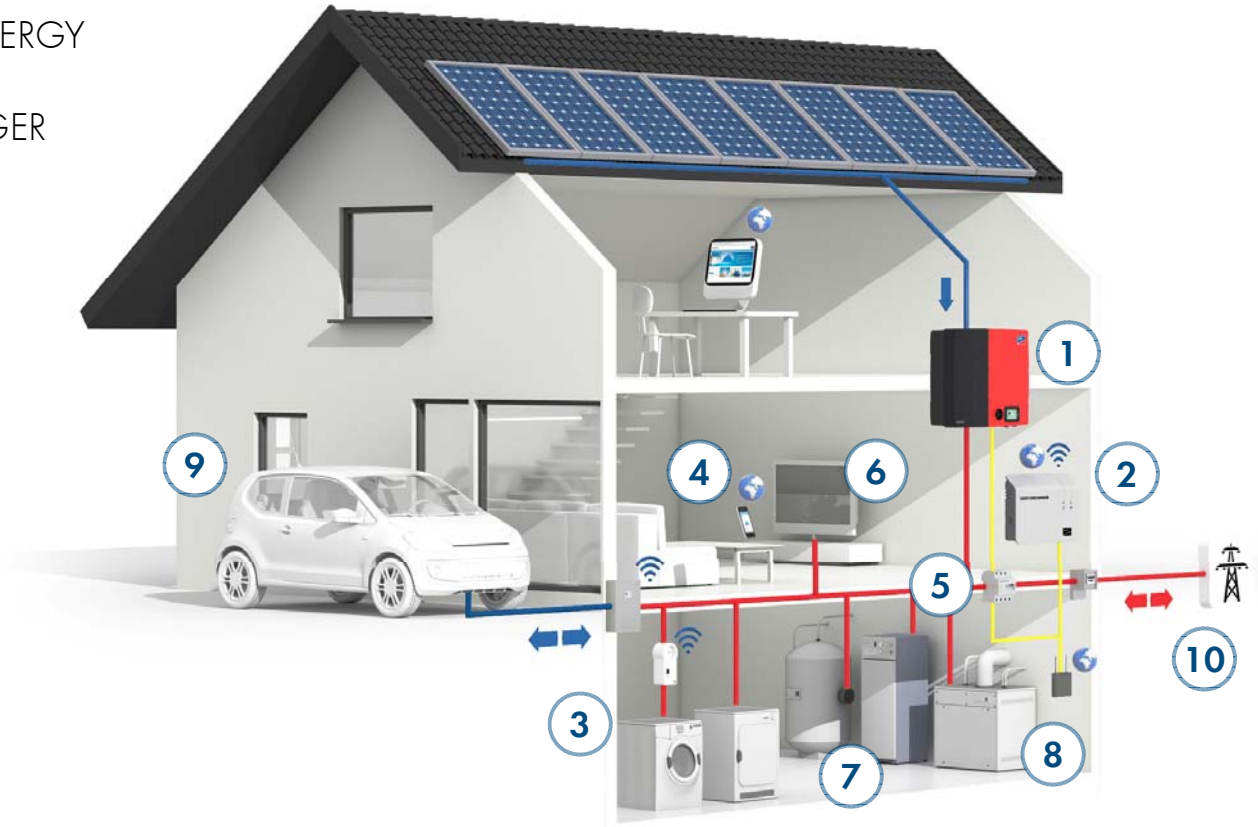
Household devices: Miele

Washing machines, dishwashers or dryers start automatically and finish no later than the customer's desired time. Here, the Sunny Home Manager also activates the smart grid capable Miele appliances based on generation and consumption forecasts.

- Intelligent self-consumption
- Maximum use of PV energy without any loss of convenience

SMA Integrated Storage System

1. SUNNY BOY SMART ENERGY
2. SUNNY HOME MANAGER
3. SMA *Bluetooth®* radio-controlled socket
4. SUNNY PORTAL
5. SMA ENERGY METER
6. Uncontrolled loads
7. Controlled loads
8. Micro-CHP system
9. Electric car
10. Utility grid



SUNNY BOY SMART ENERGY

The state-of-the-art PV inverter with an integrated battery can buffer roughly two kilowatt-hours of solar energy. This enables it to increase self-consumption and at the same time, reduce the feed-in power.

SUNNY HOME MANAGER

As central energy manager, it analyzes various input parameters and ensures optimal timing of power generation and consumption with intelligent planning.

SMA RADIO-CONTROLLED SOCKET with *Bluetooth*

Loads that can be operated at various times and have no control interface can be activated at the optimal time by the Sunny Home Manager via an SMA radio-controlled socket. The socket also features an integrated measurement function that records the exact energy consumption of the connected device to improve planning accuracy.

SMA RADIO-CONTROLLED SOCKET with *Bluetooth*

As a window to the SMA Smart Home, the Sunny Portal is used to operate and configure the Sunny Home Manager as well as to visualize and monitor the PV system and its power.

These functions are available via any Internet browser and can be accessed using a computer or smartphone.

SMA ENERGY METER

As a powerful measuring device for intelligent energy management, the SMA Energy Meter takes electrical measured values and communicates the data of purchased electricity and grid feed-in via Speedwire to the Sunny Home Manager or to the Sunny Boy Smart Energy.

Uncontrolled Loads

Electrical appliances, such as stoves, televisions, or computers

are not controlled by the SMA Smart Home. However, the Sunny Home Manager memorizes the individual load profile of the household and takes it into account during automatic controllable load management planning.

Controlled Loads

Electrical appliances that do not have specific turn-on times can be remotely activated by the Sunny Home Manager and are thus included in the intelligent load management system.

Examples:

- Washing machine
- Clothes dryer
- Thermal energy storage with SMA Smart Heater
- Heat pump

Micro-CHP System

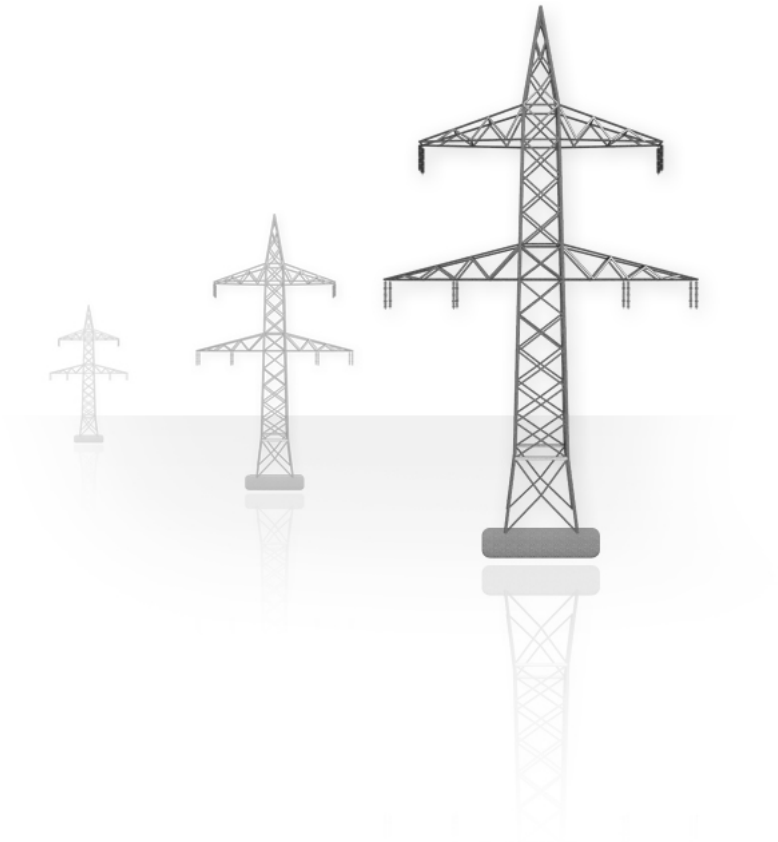
CHP plants are extremely suitable as controlled power generators in the scope of future intelligent energy management, since the heat they generate during operation can be ideally stored in tap and heating water.

They can make better use of fuel energy by generating both heat and electric current at the same time.

Electric Car

An electric car battery is more than just another electrical load – when combined with the right inverter, it can also be used for additional power storage in the SMA Smart Home.

Utility Grid



The load on the grid is reduced through self-consumption because the household consumes less power from the utility grid and at the same time feeds less PV power into it. In the future, it will be possible to further reduce the electricity bill: If there is a surplus of (and therefore cheaper) energy in the grid, the Sunny Home Manager will take that into account when managing loads.