



Grid Connected Storage Solution already available right here, right now



Solar Academy Trainer - Adrian Ho
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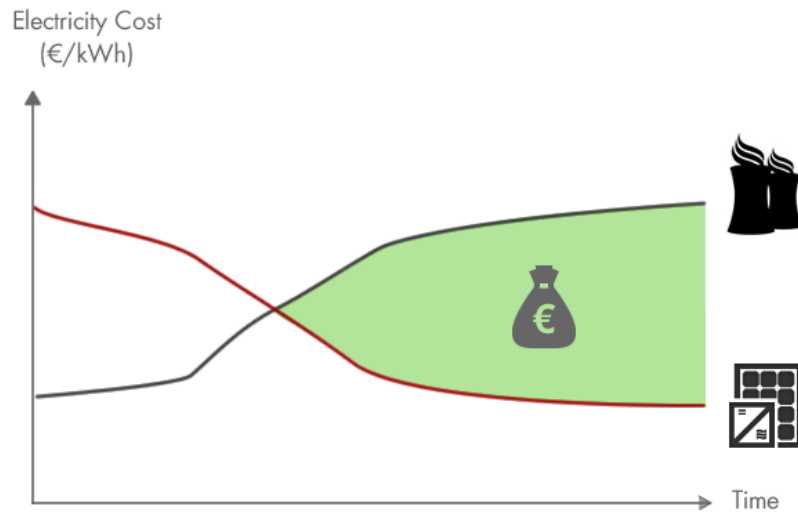
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Why Grid Connected Storage?

- > Self consumption
 - > Make the most out of your Renewable Energy System
- > Backup
 - > Brown Outs and Black Outs
- > Off-Grid
 - > Residential with 'Diesel-Off-Mode'
 - > Short Term Storage (Clouds, Multiple Diesel)
- > Grid Management
 - > Stabilisation of weak grids
 - > 'Horizon Power Requirements'
 - > SWER Lines



Market Status and Motivation



- > Energy consumption is steadily increasing e.g. heat pumps, e-vehicles, standby operation modes
- > Electricity costs are steadily rising
- > PV system cost decreased by > 50% in the last 3 years
- > Maturity of storage technology increased significantly

▶▶ **Already today, we see a significant cost advantage of PV generated energy in various markets – tendency growing. This advantage will be maximized by energy management and storage systems.**

Market Status and Motivation

The demands in the solar industry change quickly

Abolition of the feed-in tariff

Transition from a subsidised model to a self-dependent market model

Increasing self-consumption

New system technology, to optimize production and consumption of PV-energy by using energy management and storage solutions

SMA solutions



Intelligent forecast and energy management

New systems with external batteries



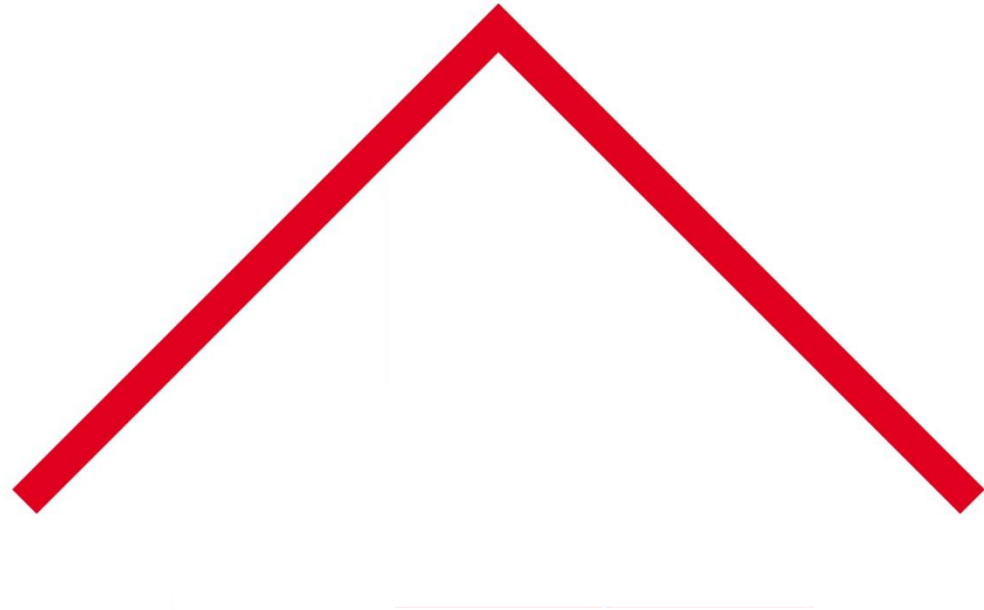
Remote plant monitoring

Smart Homes

System Solution for greater independence

Functions

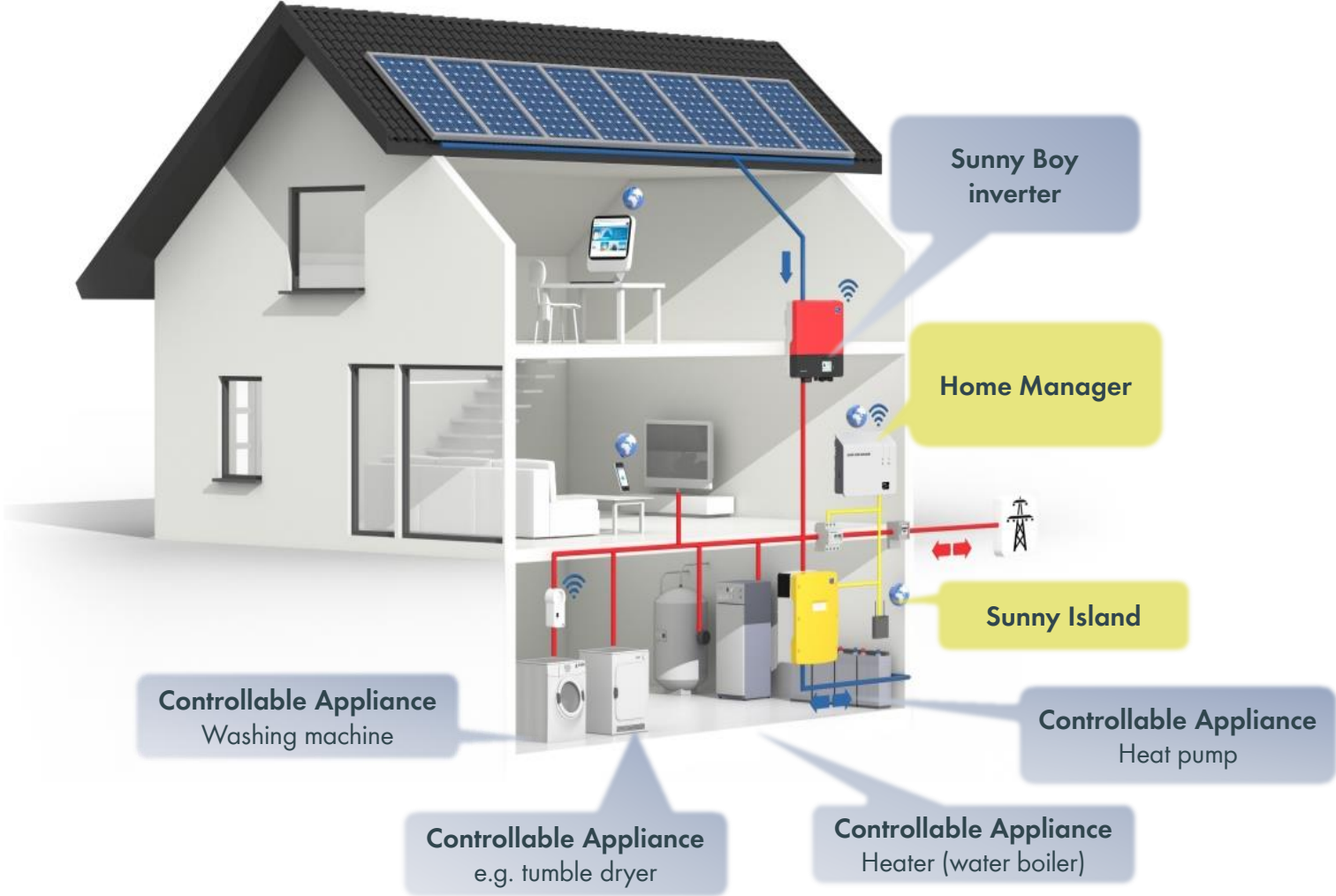
- > Energy Generation
- > Temporary Storage
- > Intelligent Planning and Control
- > Consumption
- > E-Mobility
- > Transparency
- > Intelligent Grid Connection



Future-Proof Solutions

- > Cooperation with leading manufacturers in the areas of Smart Metering, Storage Technologies, Household Appliances, Heating and E-Mobility

SMA Flexible Storage System



SMA Flexible Storage System

The heart of the system: Sunny Island 6.0/8.0H and Sunny Home Manager



> Flexible

- In terms of battery capacity and battery type
- In terms of PV plant size and PV inverters
- For new PV plants and retrofits
- Can be upgraded with standby power function

> Efficient

- High overall system efficiency
- Increased self-consumption thanks to dynamic power limiting at the feed-in point

Basic Solution for Intelligent Energy Management

SMA Home Manager – Features & Functions



- > The Sunny Home Manager allows for a maximum of three kWh-meters to be connected directly to the device
 - Consumption meter
 - Feed-in meter
 - PV production meter
- > The data from the meters is also transferred to the Sunny Portal
- > Customer can get real-time insight into their consumption and feed-in

Basic Solution for Intelligent Energy Management

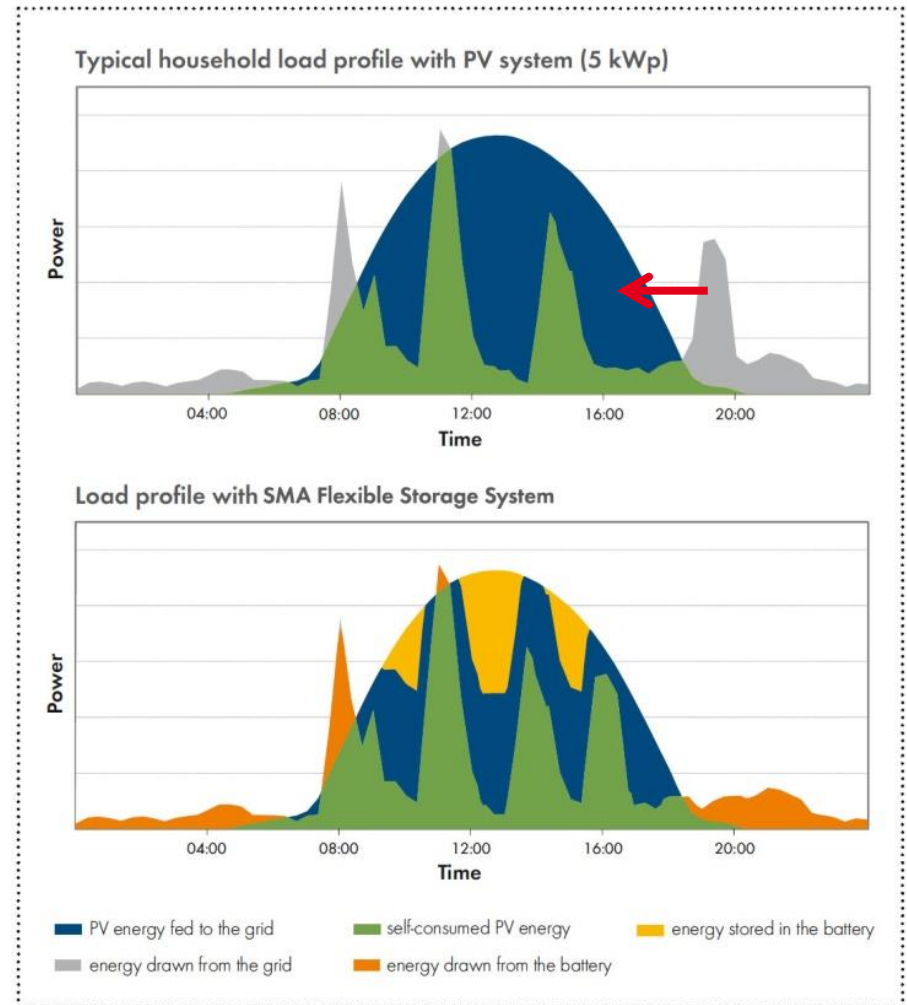
SMA Energy Meter – Features & Functions



- > 3/1-phase, bi-directional energy
- > Max current 63A for direct installation
- > CT supported
- > Visualization of current values in Sunny Portal
- > DIN rail mounting
- > Standard Ethernet cable for fast Speedwire communication

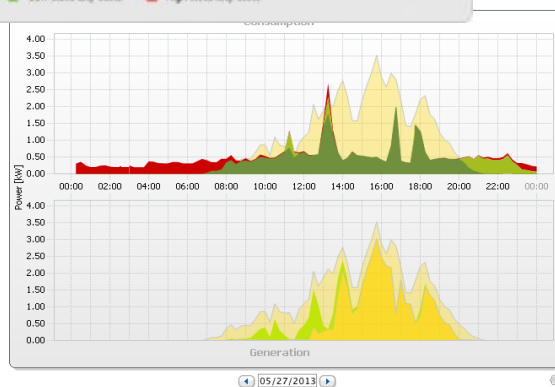
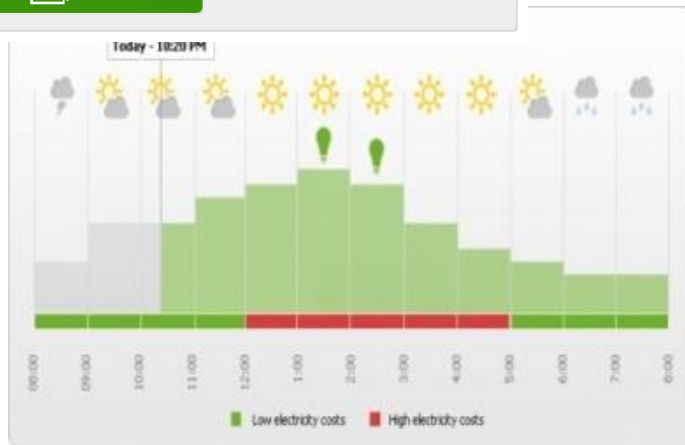
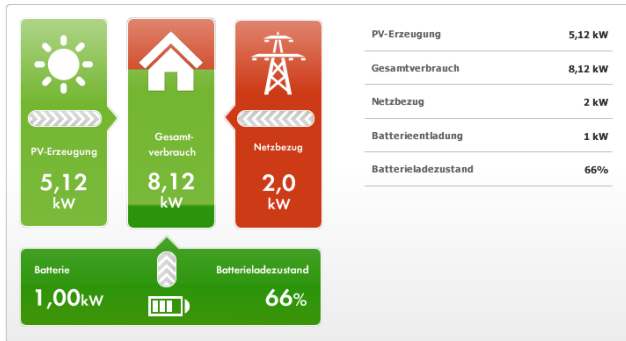
Flexible Storage System

- > Increasing the Self Consumption Rate from 30% to 65%*
- > Usage of Solar Energy 24/7
- > Switch your household appliances on at the right moment
- > Maximum flexibility with Battery Capacity, Battery Type and Battery Power



* All numbers are based on an energy production and consumption of 5,000kWh per year, a usable battery capacity of 5kWh and utilisation of a SUNNY HOME MANAGER

Basic Solution for Intelligent Energy Management



> Plant monitoring

- How much electricity is being generated and stored right now?
- How much electricity is being drawn from the grid?
- How much PV energy have I produced this month?
- Are all the inverters working equally well?

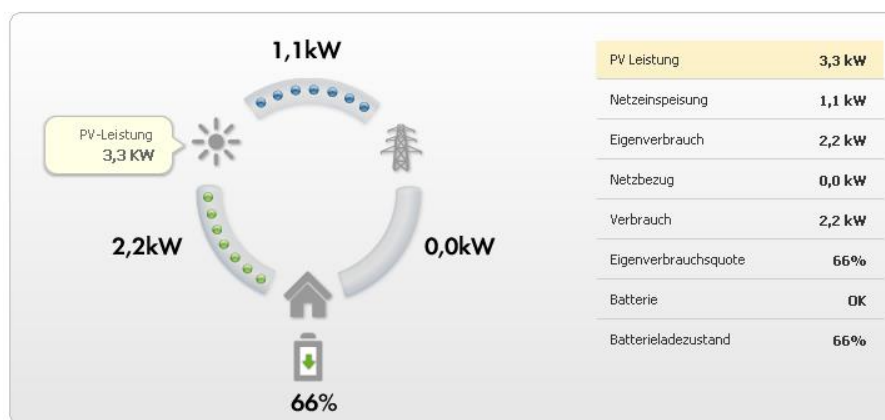
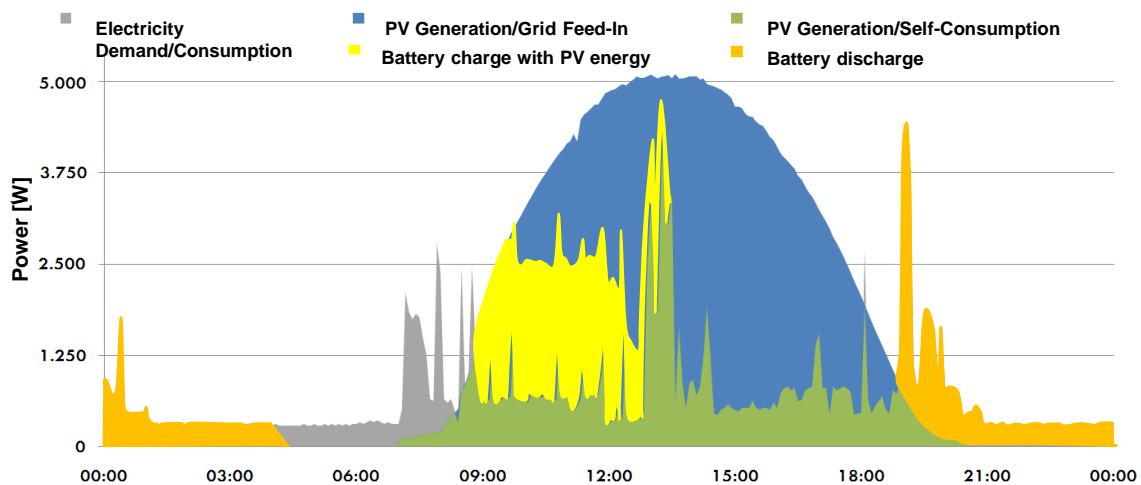
> Energy monitoring

- What devices are currently in operation?
- How much PV energy is being generated right now, and how much is available?
- Was I independent of the electricity grid today?

Energy management

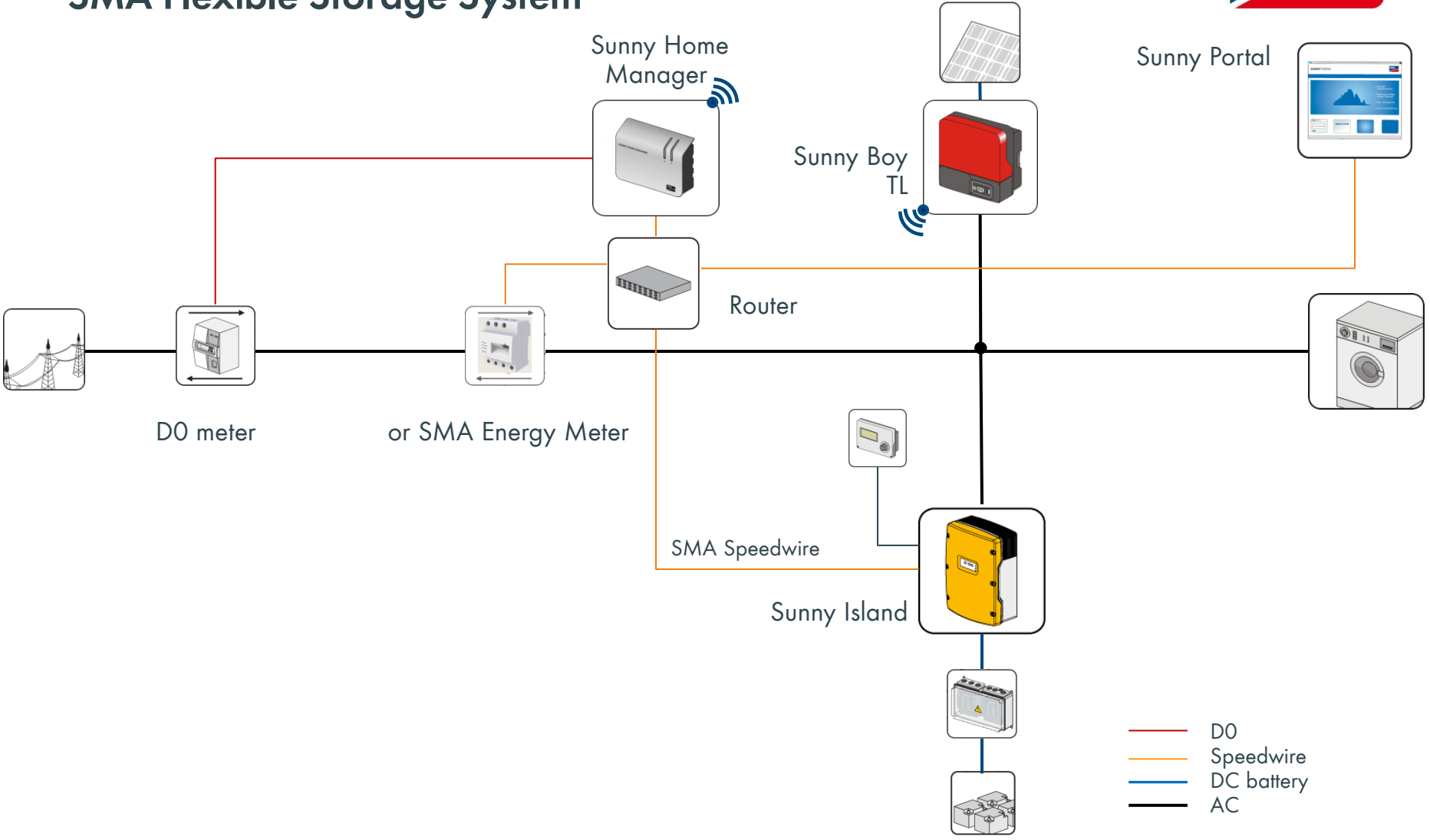
- Get the weatherforecast for the next days
- Schedule the loads for the next hours/days at high PV production

Flexible Storage System: Example

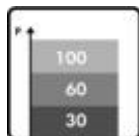




SMA Flexible Storage System

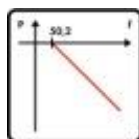


Grid Management



> Active power limitation on demand

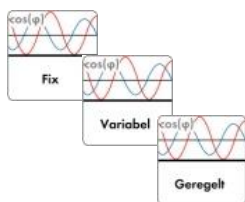
Target: Reducing the active power of a PV-plant via remote signal



> Frequency-dependent control of active power

Frequency > 50,2 Hz reduction of active power

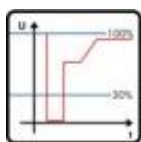
Target: Reducing the active power in the grid



> Reactive power setting

Reactive power supply by fix $\cos \varphi$, $\cos \varphi(t)$, $\cos \varphi(P)$ or $Q(U)$

Target: Stabilise the voltage in the grid



> Dynamic grid support

During a grid failure the inverter still stays on the grid (specific time and special conditions)

Target: Stabilise the grid during grid failure

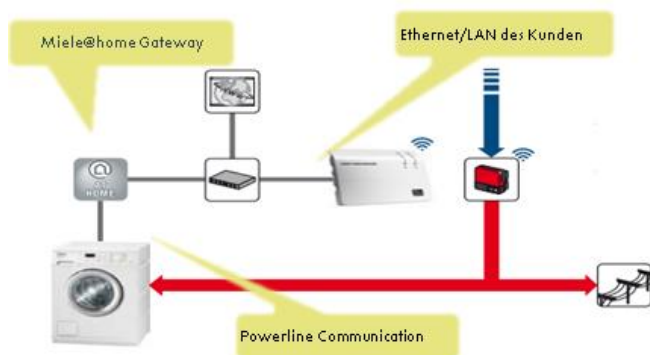
SMA Smart Home Components

STIEBEL ELTRON

 **Vailant**

Miele

- > Heating, air-conditioning, hot water, washing machines, heat pump
- > Appliances can start automatically and finish no later than the customer's desired time.
- > 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

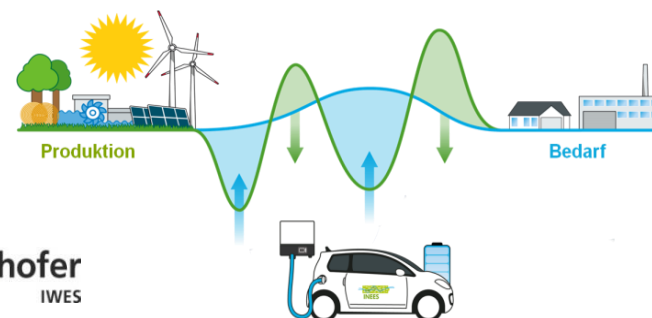


SMA Smart Home Components

Bi-directional charging station "Wallbox" for e-cars



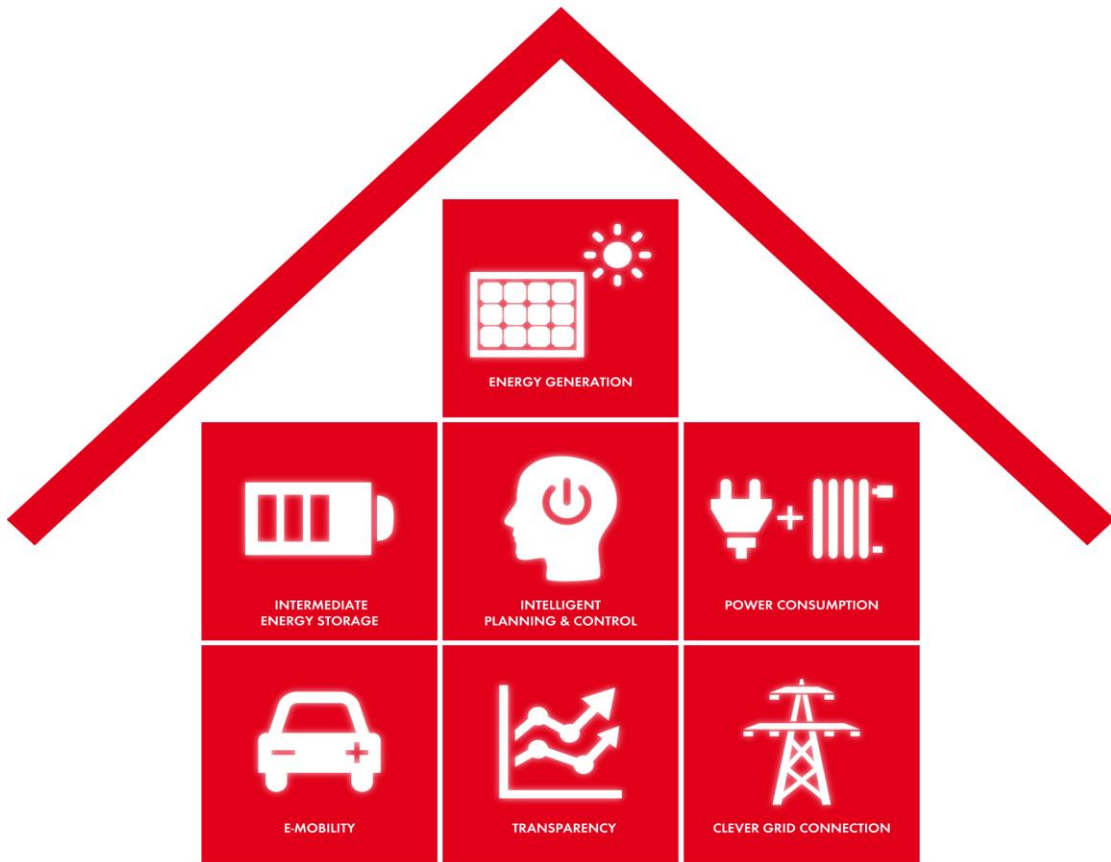
- > Using self-produced solar energy in electric mobility provides independence from constantly rising fuel prices and offers additional advantages:
 - As a intermediate storage system to supply electricity to the home
 - Charging electric vehicles for environmentally friendly driving





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