

SMA  
ENERGY  
SYSTEMS

LARGE SCALE SOLUTIONS

# Focus on Profitability

Step up future energy supply



A woman with brown hair tied back, wearing a white lab coat, is shown in profile, looking intently at a piece of equipment in a technical or laboratory setting. The background is slightly blurred, showing various pieces of machinery and cables.

# Step Up Performance

## A new dimension of PV power plants

Realize PV projects smoothly with maximum profits and availability over the entire lifespan of the project. SMA Energy Systems Large Scale for PV power plants offer plant operators, investors and EPCs the highest degree of flexibility in planning and implementation. Maximum availability, safety and long-term yields over the entire life cycle guarantee project success and an optimum return on investment.

Depending on the project requirements, storage solutions can be connected on the DC side, on the AC side or on both sides within the solar power plant – either during the construction of the project or during later expansions.





## One step ahead: Sunny Central UP

With an output of 4.6 MW, the new Sunny Central UP is SMA's most powerful inverter for central PV power plants. The power output has been successfully increased by more than 50%. This makes it possible to significantly reduce the number of inverters in large PV projects with 1,500 V of DC voltage. Consequently, considerable decrease in operating costs is achieved.

The new Sunny Central UP is the first SMA central inverter to feature a fully integrated hardware and software solution for optimum storage integration. DC or AC battery storage systems can be easily connected.

### Cost efficiency

- » Lowest service costs per MW
- » Lower transportation, installation and commissioning costs
- » 17% to 54% fewer units needed

### Flexibility

- » DC & AC-coupled storage solutions
- » Innovative service model

### Security

- » New level of cybersecurity
- » Maximum reliability

# Step Up Future Energy Supply



## Always the best solution for maximum availability

With the growing share of renewable energies in grids, large-scale PV power plants and large storage systems are becoming an increasingly important topic worldwide. With perfectly coordinated devices and systems, SMA always offers the best solution for highest availability and maximum yields for all PV power plants.

Thanks to its perfectly harmonized components and integrated optional hardware and software solutions for every large-scale PV power plant layout, the SMA Energy Systems Large Scale offers particularly high design flexibility for successful PV projects plus storage in the megawatt class. Accompanying digital services and worldwide O&M service ensure highest return on investment.

# SMA Energy Systems for large-scale operations

OPTIMIZE YOUR PV SYSTEM WITH INTEGRATED COMPONENTS.

## DC-coupled storage integration



### SMA DC-DC CONVERTER

Up to six DC-DC Converters can be connected and operated simultaneously on the Sunny Central UP central inverter. This minimizes battery short-circuit currents for high energy applications and avoids the need for additional and expensive protection measures inside the battery container.

- » Retrofittable (storage solution can be integrated anytime)
- » Step-up/step-down converter with battery charge/discharge function
- » Limits high short-circuit currents of the battery
- » Intelligent power flow control of the system in the Sunny Central
- » Coordinated protection concept with Sunny Central
- » High efficiency at different DC voltages as well as partial and full load
- » Enables new business models

## Plant control



### SMA HYBRID CONTROLLER

The SMA Hybrid Controller intelligently controls energy flows and enables seamless integration of renewable energies into power grids. With the new diesel-off function, it operates micro grids based entirely on renewable energies and keeps the utility grid stable even if strong fluctuations occur.

- » Meet grid operator requirements including primary control reserve and frequency response
- » Stable utility grid operation without generators or electricity
- » Microgrid frequency and voltage control
- » High-precision frequency and voltage measurement
- » Control utility grid storage systems and generators
- » Support for cloud cameras

## AC-coupled storage integration



### SUNNY CENTRAL STORAGE

The Sunny Central Storage is the central component of the SMA system solution for integration of large-scale storage systems on the AC side of the PV power plant. It is designed to compensate fluctuations in solar energy generation and offers comprehensive grid management services, e.g., automatic frequency control.

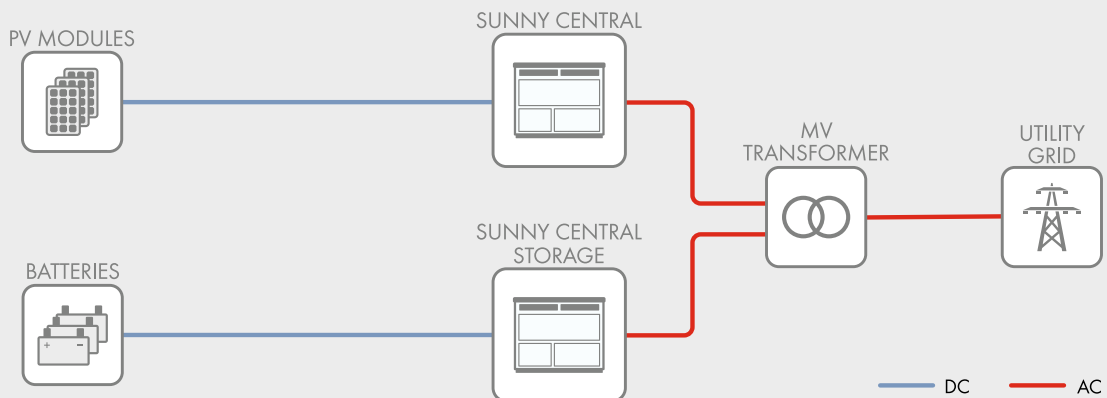
- » Worldwide outdoor use in any climate
- » Proven OptiCool™ technology for intelligent, effective cooling
- » Conforms to all relevant grid requirements worldwide
- » Four quadrant operation for reactive power support
- » Available as turnkey solution with medium-voltage block
- » Integrated battery communication
- » Customized monitoring and control
- » Dynamic grid support
- » Integrated voltage supply for internal consumption and external loads



# Step Up Flexibility

## Add storage systems on AC or DC side

### AC-COUPLED PLANT LAYOUT



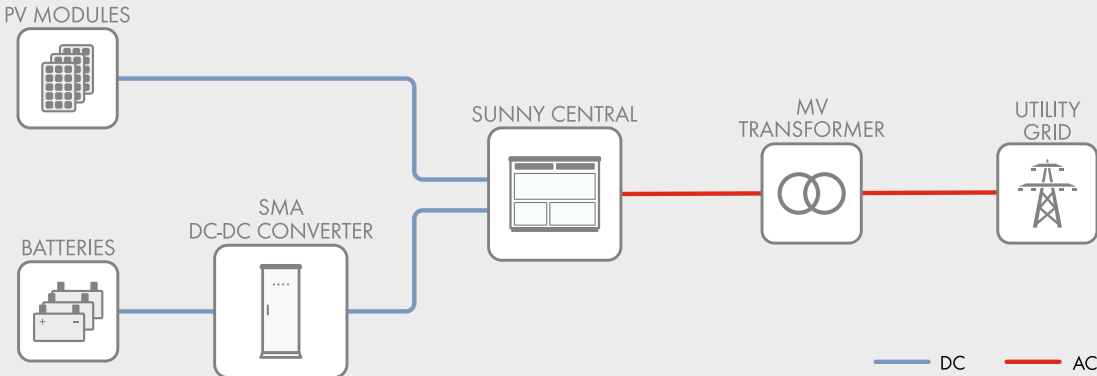
# Explore new business opportunities with the flexible connection of storage solutions.

The Sunny Central UP offers integrated solutions for coupling both AC-linked storage systems and DC coupled battery storage systems – either during construction or during a later expansion. This gives PV power plants in the megawatt class a new level of design flexibility. New business opportunities are available with the flexible connection of storage solutions.

### DC-coupling benefits:

- » Cost-efficient integration of DC-coupled batteries
- » No battery inverter needed
- » Up to 6 DC inputs for DC-DC Converter with batteries
- » PV disconnect for nocturnal charging and discharging of batteries
- » Autonomous load flow control from the PV system / battery / network

### DC-COUPLED PLANT LAYOUT





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