

PV electrical Balance of Plant

Smart grid connection

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*The MV-Inverter Station:
centerpiece of the PV eBoP solution*

Use of renewable energy sources is growing at a tremendous pace. A once static power generation landscape of large, central power plants is transitioning into a flexible, intelligent, and increasingly distributed system comprising many different actors. The intermittent, fluctuating nature of electricity feed-in from distributed generating sources, however, poses major challenges for power grids, and significantly affects the stability of medium-voltage and low-voltage networks.

What's needed are comprehensive approaches and customized products and systems serving a broad range of intelligent infrastructure and energy storage solutions, ensuring sustainable, reliable, and stable grids – for today and the future.

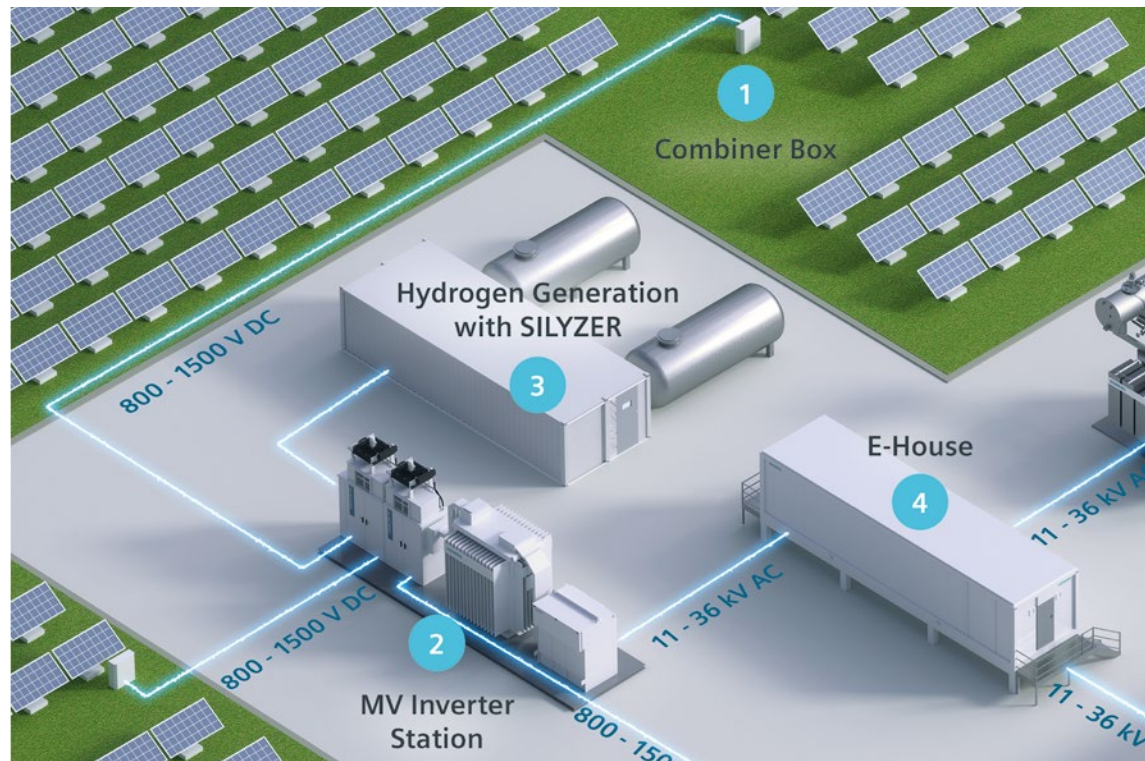
When it comes to state-of-the-art power grids, Siemens offers innovative solutions and comprehensive experience across the entire range of electrotechnical equipment for photovoltaic systems, including optimum interconnection of energy storage systems and even complete microgrids. The new electrical Balance of Plant (eBoP) solution for photovoltaic installations enables solar power to be intelligently integrated into the grid.

The portfolio includes all electrotechnical equipment needed. Siemens offers complete end-to-end planning, engineering, and financing, all the way to commissioning and service.

A reliable partner for the entire lifecycle



- 1 Combiner Box
- 2 MV-Inverter Station
- 3 SILYZER
- 4 E-House
- 5 Transformer
- 6 SIESTORAGE
- 7 Monitoring & Control Center
- 8 Solar Tracking



**Smart power distribution:
PV power distribution in perfect balance**

With fluctuating power generation and ever-changing demand, innovative ideas are needed for PV installations to ensure consistently stable and reliable grid operation.

The PV eBoP solution from Siemens provides the right answer: a complete package of proven components, modern systems, and comprehensive service offerings.

This total package comprises an end-to-end power distribution solution – from the combiner box right through to the medium- or high-voltage grid connection.

www.siemens.com/pvebop

**1 Bundled power:
the Combiner Box**

The combiner box combines the output of multiple PV modules, protects the electrical components, and forwards important data and measured values. It's also extraordinarily robust and is suitable for use in the most demanding climatic environments.

2 A MV-Inverter Station makes it all possible: skid or container

A highlight of this chain is the MV-Inverter Station, which comprises the switchgear, transformer, and inverter. With its broad portfolio of switchgear, Siemens offers the

right solution for any application – reliable and maintenance-free, for any climate. Their outdoor housing allows these switchgear to be installed in PV systems with no additional station enclosure. The state-of-the-art inverters can be operated at DC input voltages of up to 1,500 volts. The transformer, specially optimized for operation with PV inverters, ensures reliable and efficient connection to the medium-voltage grid.

www.siemens.com/sinacon-pv

3 Hydrogen generation with SILYZER

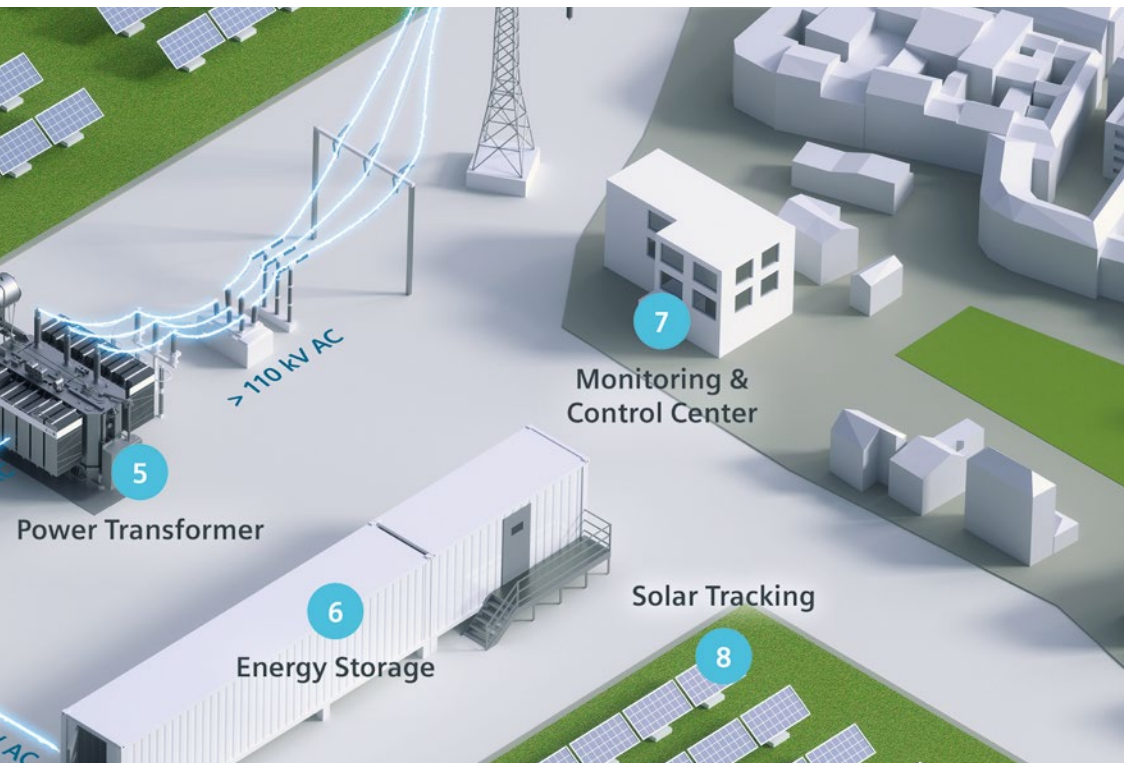
Siemens generates „green“ hydrogen from renewable energy using Proton Exchange Membrane (PEM) electrolysis, and this is making an important contribution to the global energy transition. The SILYZER product line helps integrating fluctuating energy sources like sun and wind in your process.

www.siemens.com/silyzer

4 Efficient power supply solution: E-House

Siemens' prefabricated and factory-tested grid connection stations can be easily connected on-site and immediately put into operation. And this solution packs a punch: Every E-House contains the complete range of medium- and low-voltage switchgear needed, along with busbar trunking systems for power distribution.

www.siemens.com/e-house



Siemens' electrical Balance of Plant (eBoP) solution for utility-scale photovoltaic power plants enables PV power to be reliably integrated into the grid.

5 Specially made for PV grid connection: transformers

Siemens offers transformers for up to 200 MVA in many variants – for reliable grid connection that is environmentally friendly and efficient.

www.siemens.com/transformers

6 A modular energy storage system: SIESTORAGE

SIESTORAGE – an energy storage system for any need. The offering is supplemented by this energy storage system, which is based on lithium-ion batteries. This system enhances grid stability while also enabling integration of higher volumes of power from renewable energy sources.

Using SIESTORAGE technology, active power can be exchanged between the battery storage system and the power grid. What's more, it can also be used to supply reactive power to stabilize the grid voltage.

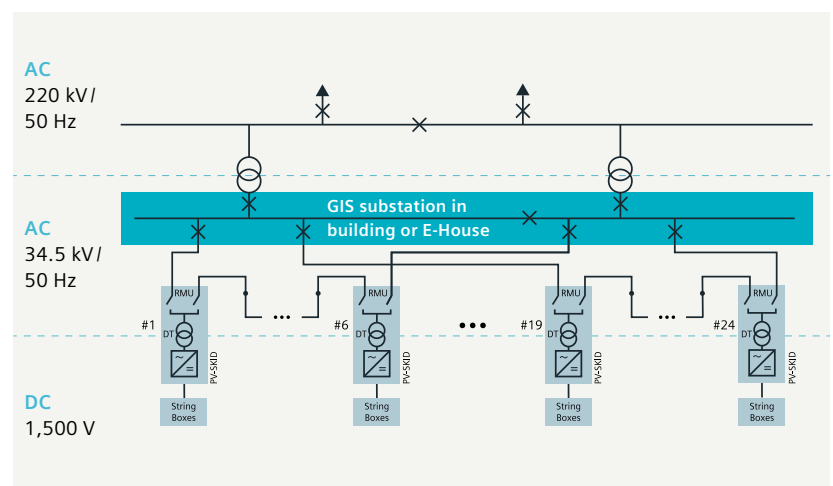
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7 Interface to all stakeholders: Monitoring & Control Center

Reliable monitoring, continuous analysis, and consistent, end-to-end communication – all controlled centrally: the SCADA system offers a broad range of functions and benefits. It can be flexibly adapted to meet your specific needs.

8 Make the most of the sun with optimal solar tracking

With our control systems for single-axis or dual-axis trackers for horizontal and/or zenithal tracking of solar modules, you can significantly improve performance. Tracking is calculated using a high-precision astronomical algorithm (accuracy 0.0003°). The core of our tracking solution is the SIMATIC S7-1200 controller in combination with the ready-to-use solar tracking toolbox. This library reduces your engineering effort and easily enables modular and scalable applications.



MV-Inverter Station: centerpiece of the PV eBoP solution

Practical as well as time- and cost-saving. The MV-Inverter Station is a convenient “plug-and-play” solution offering high power density for particularly large photovoltaic installations. Three high-performance components in the station optimally work together to ensure future-proof power distribution.



Central inverter

- 1,000 or 1,500 V DC input voltage
- Modular design for up to 5 MW
- Suitable for extreme ambient conditions, with an innovative cooling system



Medium-voltage transformer

- Robust design that stands up to heat and harsh weather conditions
- Reliable, environmentally friendly, and efficient



Ring main unit (RMU)

- Gas-insulated switchgear 8DJH 36 for up to 36 kV
- Arc-tested
- Maintenance-free and suitable for any climate
- Outdoor housing



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