



Simple and efficient directly into the grid

Reliable connection to medium voltage for trouble-free feed-in



Today, up to 99% of the power generated by PV power plants flows into medium voltage grids all around the globe. In order to maintain and continually expand this power supply, it is essential to ensure that PV power plants operate trouble-free and maintain their connection to medium voltage grids throughout the world. This can only be guaranteed by a stable medium voltage connection serving as the backbone of an overall system, which consists of the PV power plant and all its components on one end, and the connection to the local grid on the other.

Perfectly matched components

If the overall system works smoothly, the inverter as its central control unit can feed in power reliably, ensuring maximum yields. This poses a number of challenges because trouble-free operation involves more than simply complying with the grid operator's requirements, adhering to grid codes, responding to control commands, and executing the advanced grid management capabilities of the inverters.

It is also particularly important that the individual components of the overall system are designed not only for the

unique requirements of the PV power plant operation, but also for the ambient conditions of the region where the system is used. This ensures reliable, maximum yields for the entire service life of the plant – something that cannot be achieved with “standard” electrical power distribution components, where the unique needs of the specific application have not been considered.

A complete, single-sourced solution from the most experienced partner in PV applications is therefore the optimum choice for reliable operation and profitable investments.

Challenge qualification

It's a big challenge to track down and compile the specific requirements of individual countries. On one hand, it involves addressing the ambient conditions, and legal regulations on the other. Almost every country has different regulations for the individual components of a station like this, and these standards are definitely the bottleneck in the qualification process.

We use the irradiation and temperature data collected in each country to create the specifications for the inverters and transformers. In addition, we create load profiles to compare the performance of the inverter in various PV park layouts. Oversizing, the type of panels, and the expected full-load hours all play a role here. Additionally, the housing and the communication equipment also have to be coordinated and submitted for qualification – as do the individual suppliers.

SMA has used this process to develop compact medium voltage solutions that are suitable for many countries, which is really the best solution for PV plant operators. PV power can be fed into local grids easily, reliably and directly. It is a complete and optimized system made with ideally matched components from a single source. It just has to be hooked up.

USA: Accelerated permitting process



PV penetration on the US grid continues to increase, creating new challenges for US Utilities to ensure grid availability and performance. The system engineered approach of SMA's medium voltage solutions provides Utilities with the tools and feature sets needed to ensure grid stability. The solutions are designed to be installed quickly, maintained easily and minimize the effect on the PV plant's generation during service activities when the inverters must be deenergized.

Permitting remains a challenge for PV projects in the US market due to a lack of solar exposure by local agencies combined with Utility grade products often being assessed using specific regulations. To assist our customers in overcoming these challenges, SMA has developed the Compact Medium Voltage Power Platform. This medium voltage solution has an overall NRTL listing for the entire platform to help expedite the permitting process and eliminate the need for continual interpretation of codes and standards on a per project basis.

Medium Voltage Solutions for all countries

Every country has its own standards, regulations and laws when it comes to feeding electric current into local power distribution grids. To ensure that PV projects with SMA solutions deliver maximum yields across the board, SMA has designed country-specific Transformer Compact Stations to comply exactly with the requirements of the respective country. These Transformer Compact Stations also support the grid management features of SMA central inverters.

SMA also offers a turnkey container solution with its Medium Voltage Power Station, based on the IEC standard. It can be deployed all over the world as a plug and play solution that can be easily transported.



Decentralized into medium voltage



Additionally SMA now offers an attractive option for PV power plants in Germany with a decentralized system structure. The SMA Tripower Package is a complete package consisting of string inverters, a medium voltage station, and optional accessories such as controls and communications, making life easy for system builders, and ensuring maximized returns for the operator.

Saudi Arabia, Japan, Israel – soon ready for medium voltage

Simple, reliable and quickly installed in any medium voltage grid in the world. This goal can only be achieved with long-lasting, reliable system solutions that have been optimized for PV use, and that feature individual components that have been perfectly matched with each other. SMA takes all relevant aspects of individual countries into consideration. Country-specific medium voltage solutions already exist for Australia, Bulgaria, France, Germany, Great Britain, India, Italy, Romania, Spain, South Africa and the United States. System solutions will soon be available for additional PV markets such as Saudi Arabia, Japan and Israel. In addition, the Medium Voltage Power Station in a container design is available worldwide for alternative use.

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