Innovation is moving in all directions

The cube-shaped Sunny Tripower CORE1 aims to drastically reduce the amount of fitting work on the roof or in a "green field". PHOTO: SMA

Because inverters must meanwhile be able to do almost anything, the manufacturers are taking different paths in their development. The Intersolar once again had lots to offer: improved communication, simplified remote diagnostics and compatibility with various battery storage systems.

The huge exhibition stand in hall B3 could not be overlooked. Huawei had put a lot on its plate for the Intersolar: no less than the start of the "Huawei FusionHome Smart Energy Solution" for the European home roof systems market. This new concept should bring the same level of advantages to wholesalers, installers and operators alike, for it was announced as being an "easy-to-distribute, easy-to-install and easy-to-use solution".

Huawei had brought the three most important components of the FusionHome concept to Munich: the one-phase inverter SUN2000L 2-5KTL (2 to 5 kW), the Smart Optimizer and the Smart PV Safety Box, an interface which enables communication between the inverter and the power optimisers.

"More silicon and less copper"

The specification sheet for the inverter claims a maximum efficiency of 98.6 % and a European efficiency of 98.0 %. Huawei says that the 5-level topology is why inversion losses are low: "We create the course of the sine wave using five IGBTs that work at five different voltage levels," says Solution Sales Director Holger Grau on the principle and adds: "We thus get closer to the ideal sine wave." The better you can match the sine wave and the smaller the "steps" are, the less the wave must afterwards be treated with smoothing filters. The increased use of semi-conductors thus enables a reduction in inductance and capacitance. Huawei summarises this method succinctly: "more silicon and less copper". Whether the electronic effort is worth it will be seen in practice.

Huawei aims to make the workload easier for wholesalers with a list of recommendations and approvals. They can thus combine the Huawei products with the rest of the components required for a Smart Home Solution and hand these over to the installer as a package. Among the recommended products is the solar electricity storage by LG Chem, for example. Huawei wishes to make working with the units as easy as possible: "The fitting can be carried out by a normal electrician," says Grau: "a special training by the manufacturer is not required."

And ultimately, the operator should also benefit from the FusionHome concept. Remote diagnosis, which has so far only been possible with larger inverters, is now also available for the SUN2000L. With the aid of special software it can measure the electricity voltage performance

curves of the connected strings. The Huawei portal is then ready on the Internet to analyse the results. The Safety Box supports the UI analysis, which can be triggered as a "remote diagnosis" and aims to differentiate between 17 different types of module damage.

The next optimiser generation is moving to the fore

When power optimisers appeared a few years ago, which enabled MPP tracking of every single PV module, many were fascinated by this more finely tuned control and the expectation that individually shaded modules could no longer affect the whole string. But generally having to retrofit the modules with the power optimisers also put off a lot of users.

One of the inverter manufacturers which have initially waited to see if new technical developments would make something simpler possible is Fronius. "We do not wish to stick an additional unit on the module, but are getting ready for the next generation of module optimisers," explained Martin Hackl, Head of the Business Unit Solar Energy, during the Intersolar. This is because the chip manufacturer Maxim Integrated has recently developed a chip which can be included in the module as a DC/DC converter, enabling MPP tracking of each individual cell string.

The new chips replace the bypass diodes in the connection box, and this simplification is naturally appealing to the module manufacturers as well. The Eagle MX module made by JinkoSolar is one of the first to come onto the market with integrated chips. But the innovation can only fully unfurl itself when the communication between the new modules and the inverters works smoothly.

The Fronius inverters were already prepared for communication using open interfaces early on

PHOTO:SOLAR PROMOTION

The SunSpec Alliance, to which several module and inverter manufacturers belong, thus began about a year ago to drive forward a standardisation of the communication with the optimisers. "In the future there will be smart modules which, in the Plug-and-Play version, can communicate with any inverter which has integrated this standard," announced Hackl, "and we are thus going to integrate this standard in all our inverters." The communication does not require its own cable, as it takes place via Powerline.

Fronius was an early mover in preparing for communication via open interfaces. "The controlling of loads is made easier by this," explains Hackl, "and we are thus joining the fray this year on the subject of sector integration." The company is cooperating with Loxone in order to be able to use solar electricity as effectively as possible for hot water generation (using the familiar "Ohmpilot")

and also for e-mobility. Via the network-capable Fronius inverter, a PV system can be integrated into the "Loxone Smart Home" in order to simplify the energy management.

But this local energy management, related to a single house, is also undergoing continuous change. Hackl believes that the control of household appliances will become less important in the long term, as the controlled activation of a washing machine or any other appliance depending on the availability of electricity, is only attractive for households which do not have any electricity storage. The more households there are which are equipped with a storage solution for solar electricity, the less you will need to perform load transfers. "You will need larger PV systems on the roof and larger batteries in the cellar," says Hackl, "and the energy management in the home will be replaced by a regional energy management."

Multi-faceted hybrid inverters

Just like Fronius, Steca also highlights the compatibility with the Jinko Eagle MX module. All Steca grid inverters are able to communicate with this "smart" PV module. It can be seen that there is a growth in technical impulses coming from the leading module manufacturers, which are playing a role in the further development of inverters.

As we know, Steca's domain is off-grid systems, and the new hybrid inverter thus generated a lot of interest amongst the exhibition visitors, as the company reported. The Solarix PLI enables a supply to AC appliances at 230 V, charges the battery with an integrated MPPT charge controller, and simultaneously enables a connection to a generator or an available electricity grid. Steca has integrated these functions into one unit for the first time. Because the Solarix PLI is permanently synchronised with just 10 milliseconds required for switching, it can also be used for supplying uninterrupted electricity supplies.

Kostal's new storage inverter Plenticore is compatible with various high-voltage storage systems. PHOTO: KOSTAL

Evermore communication

Kostal had already lifted its veil before the exhibition, but the company did save some novelties for the show. It was already known that the new PIKO IQ would be coming and there was also the expectation that this three-phase inverter in the power class of 4.2 to 10 kW would soon replace the previous PIKO series. But what does IQ mean? The "increased intelligence" which Kostal announced refers mainly to communication. The new "Smart Communication Board" is to serve as a platform for current and future communication standards and enable an integration into the Smart Home as easily as possible. "The integrated remote service carries out any necessary updates on its own," promises Kostal, and the new encryption concept with direct transfer should provide a high level of security.

The new storage inverter which Kostal presented at the Intersolar is called Plenticore, a name which highlights the idea of plenty. In addition to the two PV inputs, Kostal has provided a "combi-input" to which an optional battery or a further PV string can be attached. The Plenticore is compatible with various high-voltage storage solutions.

Powerful cube on the roof

With a universal inverter for rooftop and ground-mounted systems, as well as covered parking, SMA surprised both Intersolar visitors and the jury of the Intersolar Award, which honoured the Sunny Tripower CORE1 with the coveted prize. The free-standing, cube-shaped inverter not only distinguishes itself from all others through its unusual design, but has also been equipped by SMA with all the attributes necessary for a smooth and successful operation.

Thanks to its power of 50 kW the CORE1 is scalable into the megawatt range. Six MPP trackers make sure that temporary shading of individual strings does not affect the total power. The cooling system, OptiCool, which SMA originally designed for the central inverter and which gets by without a filter, will now also protect the new string inverter from overheating.

The SunSpec-Modbus protocol interface extends the range of possible uses. With this open industrial standard, other suppliers can integrate SMA units into their systems without knowing the inverter protocol typical for SMA. And last but not least: it is the world's first free-standing inverter which can be sited on a company roof or in a field. This "independence" has the big advantage of easier installation. SMA promises a time saving of up to 60 %.

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