

Kindling hope with the power of the sun

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Shifting environmental factors constantly challenge the efficiency of solar arrays; dust, debris and shade can drastically lower power output. With a conventional 'string' inverter system, the least-performing module determines the productivity of the entire array. APsystems' microinverters give more power, independently optimizing the output from each solar module, something that will no doubt be welcome in the shift towards carbon-free living.



microinverters to make the best technology available to all.

Microinverter systems are traditionally known to bring many benefits to residential solar rooftops. They eliminate shading problems, offer installation flexibility, maximize energy production, and the user can rely on safety by opting for a Plug and Play system. This last advantage has also led to the development of new uses with individuals wishing to implement their own energy production at home; the emergence of what is commonly called the 'Do It Yourself' segment.

From standalone balcony systems in Germany

With a growing awareness that power cuts could occur in Europe since the start of the conflict between Ukraine and Russia, the already strong demand for solar energy for homes has accelerated further since winter 2022. In Germany, for example, micro-installations for balconies have increased in popularity.

This type of application, favored by local legislation authorizing direct injection into the home's electrical network of up to 600 watts from solar energy, allows families to reduce their energy bill covering all or part of the related needs of a refrigerator, air conditioning system or washing machine, for example. Thus, every family can now guard against energy shortages without having to make a substantial investment beforehand, due to it being a very small installation. The microinverter is by nature ideal for this type of application, and there is very strong demand for dual microinverters for this type of solution in Germany in particular.

On the strength of this DIY demand, the company also plans to introduce a range of microinverters that are even easier to put into service, with integrated wifi technology enabling a direct connection with the user's internet router, to control the correct functioning of the installation or to proceed with upgrades of the electrical grid. This range of microinverters is scheduled to launch in Germany in the spring of this year.

To switching 22 gas-powered apartments to solar in the Netherlands

Driven more generally by self-consumption, now a well understood energy use case demanded by people across the globe, the microinverter continues to be adopted by system owners to cover residential and commercial rooftops. Professionals no longer hesitate in choosing microinverters for larger projects, combining rooftops and sometimes cladding. For example, a recent 88 kWp project in the Netherlands used 110 DS3 microinverters to switch 22 gas-powered apartments to clean electricity from solar, including hot water and heating.

In this period of global energy crisis against a backdrop of tensions and conflicts, solar technology continues to nurture the hope of our ability to implement progress towards a carbon-free world. A world in which energy will be accessible to as many people as possible. According to Solar Power Europe, the EU added a record-breaking 41.4 GW of solar power in 2022. The new capacity is equivalent to the power needs of 12.4 million European homes. Annual EU

solar power growth increased by 47% from 28.1 GW in 2021.

APsystems' mission is part of this world vision, where innovation continues to push the limits, creating new applications and accelerating energy transitions around the globe. With over 3 GW of microinverters delivered worldwide and customers in more than 100 countries, the group, now listed on the Shanghai stock exchange, continues to offer innovative multi-module



Erik de Zwart from Zonnepaneel Zeeland, the installer in charge of this project, explains: 'It was decided to connect every home to 10 solar panels. Together, these would provide 4,000 watts peak to each residence. However, space was lacking, and the roof offered too little capacity. So I considered completing the solar powered roof with a cladding project for 20 panels which, according to our calculations, was the optimum size of the installation. However, a new challenge arose. How do you divide all those panels among the residents in a fair way? We chose the ideal mix. Each house received 10 panels, some on the east, also a

few on the west and south. In this way, every home is guaranteed a minimum yield.

'Actually, connecting all those panels with different orientations together with a string would have never worked. The flexibility offered by the DS3 dual microinverters from APsystems ensured that every home would get an optimal 'solar power generation package' to cover its boiler and heating.'

C&I solar for supermarket car parks in France

Converting unused parking spaces across supermarkets in France into clean energy

stations via solar powered carports led to many debates in the National Assembly in France. It finally resulted in legislation last December that outdoor car parks of more than 1,500 m² will have to be equipped with photovoltaic structures by 2028.

As APsystems introduced the QT2 at the end of 2022, its second generation of native three-phase quad microinverters, the above example in France is an illustration of how the C&I solar segment is evolving. It is paving the way for a new generation of rooftop solar systems, leveraging at an affordable price the most advanced communication and conversion technologies embedded in APsystems microinverters like the QT2.

Some design offices, EPCs and developers have considered the use of microinverters for large rooftops only when a shading problem appears. The belief remains that it is too expensive compared to a string inverter, but the reality is quite different. A native three-phase microinverter like the QT2 guarantees on the one hand a perfect phase balance while connecting four modules of 500 or 600 watts per device. Therefore, for a 100 KW installation, only 25 microinverters are needed. They guarantee optimum production from each of the PV modules independently, without any impact on the panel located next to it. Cleaning of the panels, frequently needed for this type of installation with string inverters, is now much less of a priority, since each panel operates independently. This is a definite benefit for the project owner in terms of cost.

Because microinverters produce more power while requiring minimal maintenance, the



small upfront cost will be largely offset by a lower levelized cost of energy (LCoE) over the life of the system.

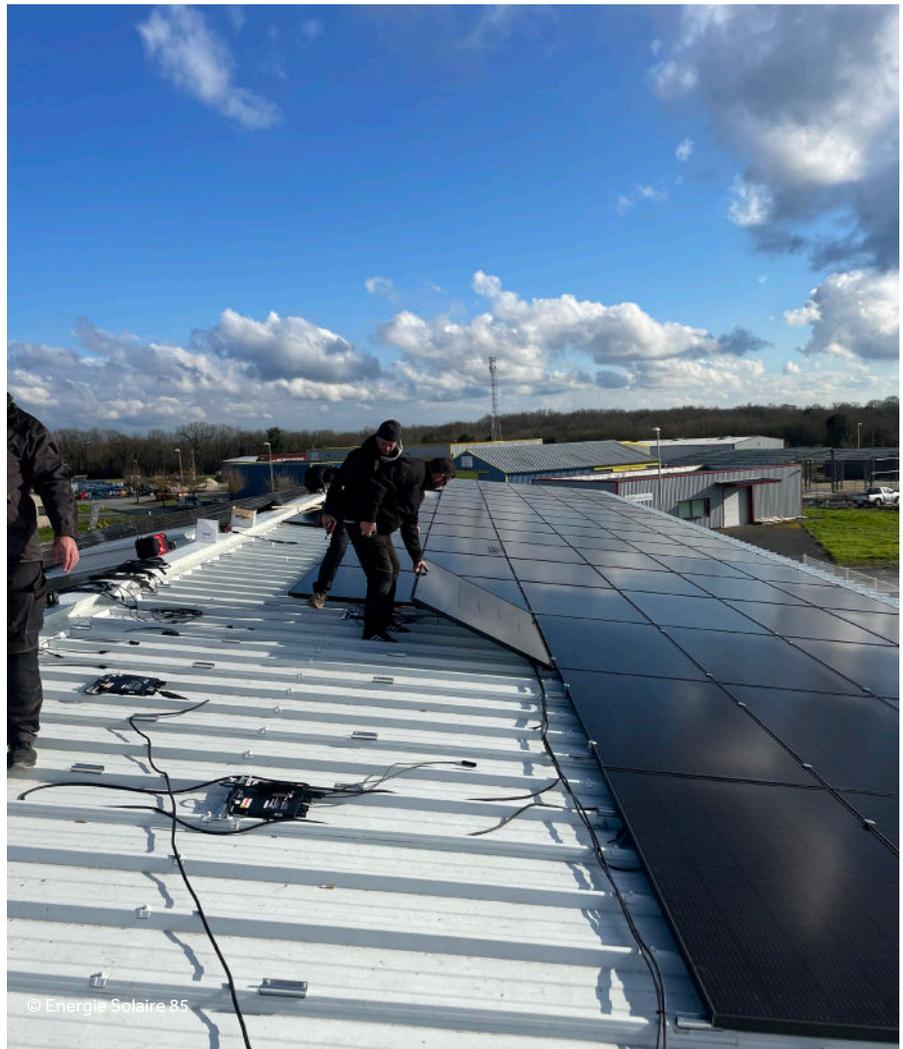
Microinverters also present many advantages that a string inverter cannot offer, including greater flexibility. When it comes to fitting a roof with different angles or orientations, accommodating other roof obstacles or limited space, microinverters make design simple. Safety is also maximized, as there is no high voltage DC on the roof, an important concern for a building such as a school or a supermarket car park.

It is also a very good way to raise users' awareness of the project, as the production of each module is accessible online and free of charge on the real-time monitoring portal.

Some installers are now convinced of the benefits of our solutions for commercial projects, including Mr Levèque, head of installation company Energie Solaire 85 in the west of France. The company has carried out several 100 KW projects with APsystems microinverters. Among them, is a 136 KW project recently completed in Nantes, France. 'This logistics building, specializing in cosmetics for hairdresser outlets, opted for a self-consumption PV project with safe and high-performance solutions with microinverters from APsystems,' he explained.

Storage is still to come

Generating clean energy from solar powered roofs, cladding or carports is a fast, ever-growing trend, but the next step is the ability to store that energy and use it anywhere, anytime. This is driving the next wave of product innovations APsystems will launch on the market this year, under the APstorage brand. APstorage is already introducing the SEA range, its first generation of smart power conversion systems (PCS) with the ELS battery charger solution.



Based on APsystems innovative Module Level Power Electronics technologies, the ELS 3K or 5K PCS provide a modular, single-phase AC coupling and energy storage solution for residential solar.

With compatible low voltage LiFePO4 batteries connected, including APstorage batteries, it becomes the ideal AC coupling storage solution for residential PV applications, able to store from 5kWh to 20kWh for the household. With automatic energy management features, system owners can choose between back-up function, self-consumption and peak valley time modes to secure critical loads during power outages and maximize energy savings for their houses.

Another Portable Power Station (PPS) will complete the APstorage range this year. The LAKE1000 is a mobile power storage solution with 1kWh capacity, particularly tailored to meet the charging needs of various small home appliances such as a microwave, coffee machine, LCD or notebook for several hours. Something people can easily bring for the weekend to their country cottage to save energy.

With many innovations to come again this year, the APsystems product portfolio aims to make solar energy accessible to everyone.

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