

Germany leads the global residential storage market, but for how long?

With increased market activity and investment witnessed in recent months, inspiratia delves into the market dynamics and outlook of the world's dominant residential storage market

After more than 120,000 units have been deployed across the country, Germany boasts leadership globally when it comes to the residential energy storage market, followed by Australia and the US – the three accounting for three-quarters of global installations.

A series of developments during the past three months has created an extra buzz around the country's success story, with multiple players either entering the market or upscaling their offerings.

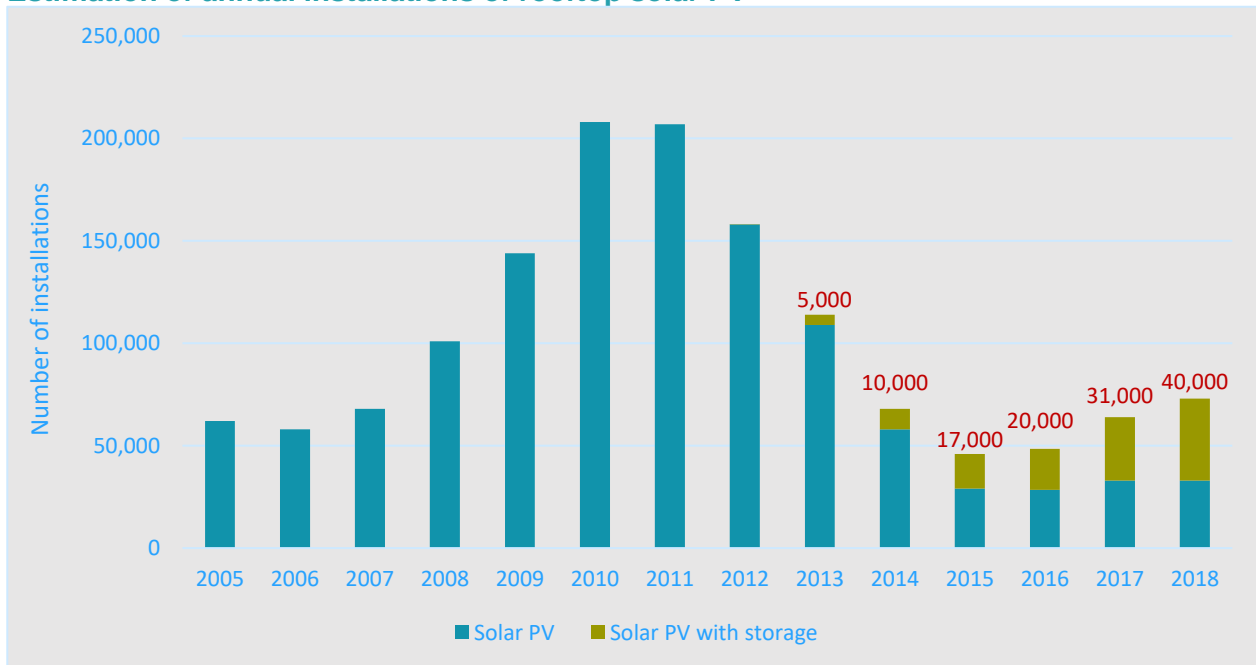
On 19 February [2019], oil conglomerate Shell acquired a 100% stake in energy storage start-up sonnen, following on from its participation in a €60 million fundraising round last year.

Days before, Siemens became the most recent industrial giant to enter the market by launching the rollout of its own home battery pack, Junelight Smart Battery.

At the end of 2018, sonnen secured pre-qualification from system operator TenneT to participate in the Primary Reserve Control (PCR) market with a Virtual Power Plant (VPP) comprised exclusively from residential storage systems, inaugurating the beginning of a new era.

But where does this growth come from? And where is it going?

Estimation of annual installations of rooftop solar PV



Source: BSW-Solar, inspiratia

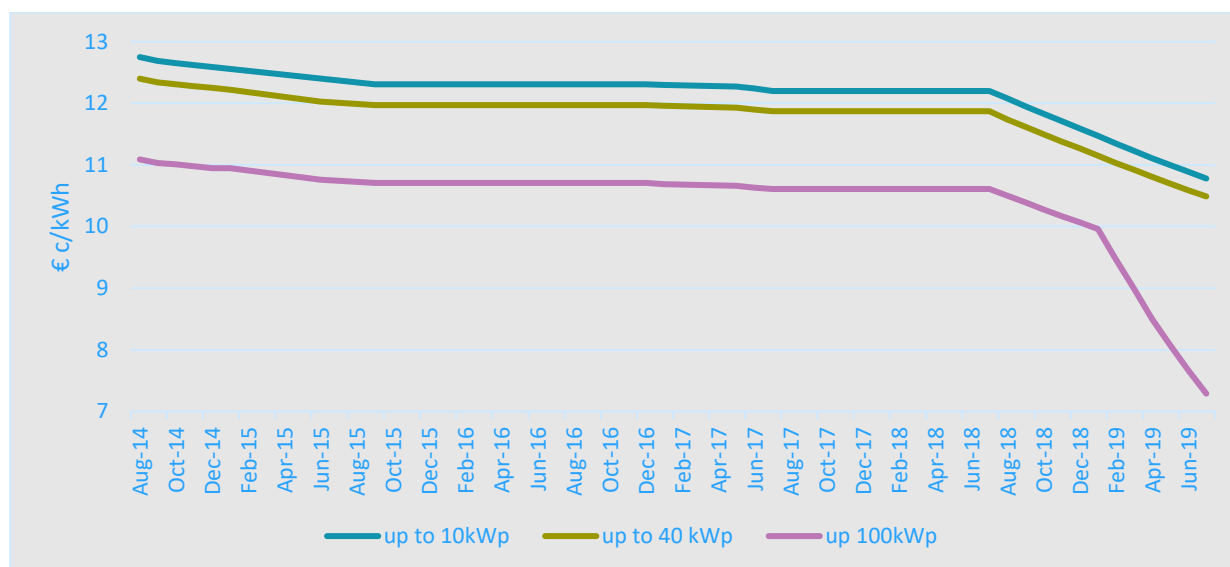
Market drivers

- *Electricity prices and low FiTs*

Increasing electricity prices and decreasing revenues from rooftop feed-in tariffs (FiT) are some of the key success drivers in the country.

Retail electricity prices in Germany are the second highest in Europe after Denmark. According to the latest data, for S1 2018 households in Germany paid €29.50 cents per kWh – an increase of more than 40% from 2008 rates.

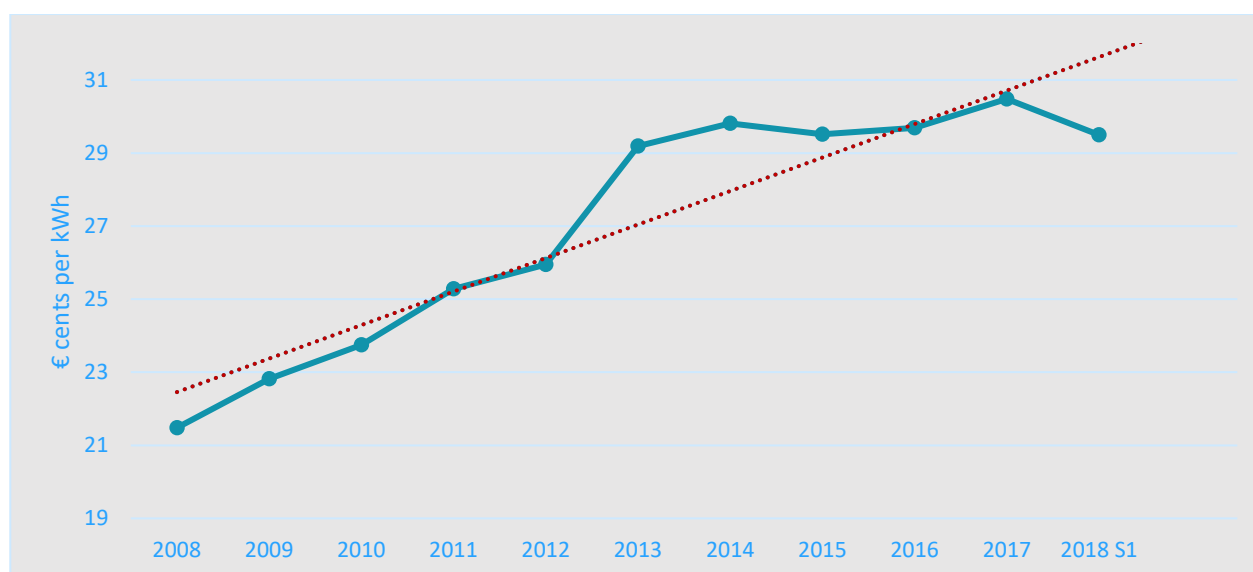
Feed-in Tariffs for Rooftop PV



Source: BMW-Solar, inspiratia

With the most recently updated FiT rates at €11.23 cents per kWh, the offset of feeding electricity to the grid with storing it to a home battery and increase self-consumption is getting more compelling.

Electricity prices for medium-sized households



Source: Eurostat, inspiratia

- **Early adopters**

Despite local market conditions improving the economics of storage, the German market is still considered an early adopter one, which is principally driven by non-return driven customers.

Florian Mayr, a partner at cleantech advisory Apricum, calls this segment ‘dentists and retired engineers’.

“Given that at the moment the solar PV system basically cross-subsidises the storage unit, the market is still dominated by people not primarily driven by monetary considerations, but rather by being part of the *energiewende* (the national clean energy master plan), a decreased dependency from utilities, and technical curiosity,” he says.

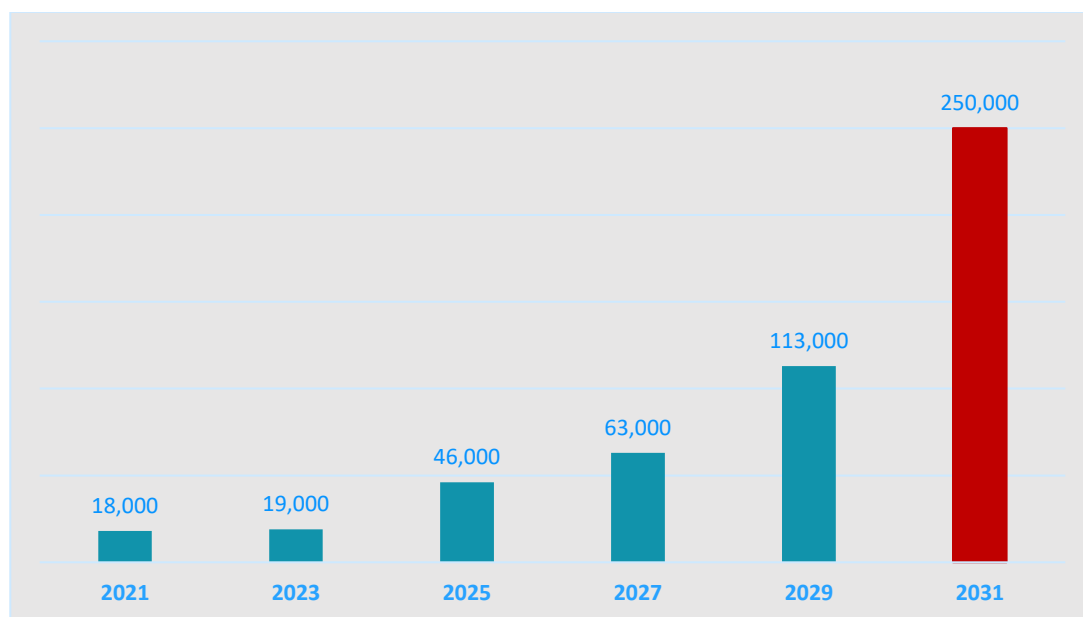
- **Retrofit of existing rooftop solar PV systems**

With more than 1 million households having invested in residential PV systems, the market for retrofitting presents tremendous opportunities in the coming years.

According to the current figures, only 10% of total rooftop PV installations include a storage system.

Given the fact that the first PV installations took place in the early 2000s, the first wave of households exiting the FiT scheme is expected from 2021 onwards setting in motion a spree among energy players to secure a share of this upcoming market.

Battery retrofit potential for existing rooftop PV



Source: GTAI, inspiratia

Business models

The most common business model in the German market is utilities offering a residential storage system at a fixed price, which also includes a fixed flat monthly electricity rate usually lower than the household’s previous electricity bill.

Under this model, customers ‘upload’ the excess clean electricity they produce to a ‘cloud’, where they can ‘consume’ it at a different time or even different geography. In this case, utilities receive the FiT from the excess electricity.

Apricum’s Mayr says that the principal value proposition of this model is the customer’s convenience since the household only needs to deal with one provider and has secured high electricity price protection for a long time.

All the major utilities across the country provide such offerings, including E.ON, EWE, EnBW, and RWE.

On March [2018], EnBW, one of Germany’s ‘top four’ utilities, acquired local storage manufacturer Senec to expand its residential storage proposition.

- **Aggregation: the next big thing**

Smart energy storage start-up sonnen became the first to receive the much-desired pre-qualification status to participate in the primary control reserve market (PCR) in Germany with a VPP comprising aggregated home battery packs.

The news sparked interest because it is the first time a VPP of this kind managed to meet the high standards of the PCR scheme while inaugurating the participation of households in ancillary services provision.

The plan required quite some time and investment from sonnen's side, with the pre-qualification having taken roughly two years.

Sonnen was already factoring the provision of grid services in their sonnenBatterie offering before the VPP started generating revenues in the PCR. This meant that up until now, the company was subsidising its own business.

The VPP has a total capacity of 1MW, and it comprises approximately 600 hundred batteries of 3.3kW each, with half of them acting as back up.

To date, sonnen has sold more than 30,000 battery packs across the country. With more than 120,000 systems deployed in total, the country has the potential to replace at least 390MW of baseload capacity.

In addition, Siemens has stated that the value the company is seeing in this new product does not come from direct sales profits, but from the services these assets will be able to provide in the future.

The giant is set to develop a software for energy trading and ancillary services, while it has already declared that said software will be suitable even for non-Junelight batteries

Outlook

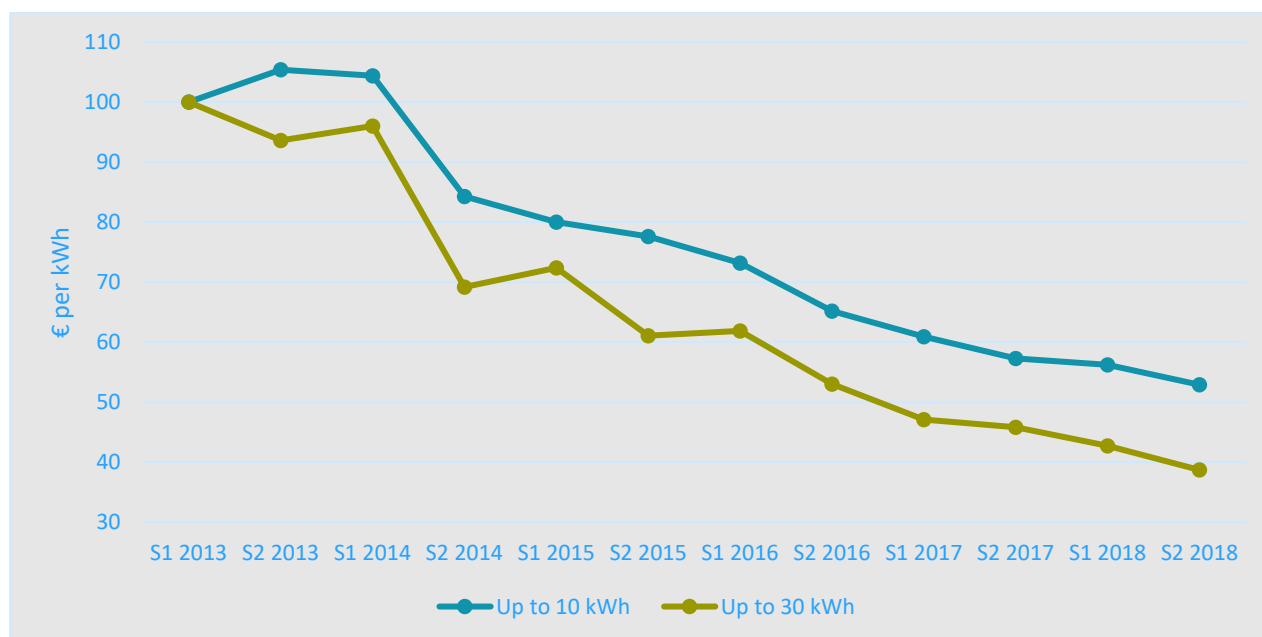
Despite the global reign of the German home storage market, the amount of installations compared to the country's population is still marginal.

The massive boost the sector experienced is mainly attributed to early adopters who have acted on a non-returns basis.

"The 'early-adopters' segment is finite," Mayr states. "The key challenge will be to improve the economic attractiveness by reducing costs and increase the revenue streams through aggregated business models," he adds.

As indicated below, the German Solar Association (BSW Solar) has boasted a 60% reduction in residential solar battery storage system costs. Nonetheless, customers pursuing pure profits will still need extra incentives.

Costs of solar energy storage after savings



Source: BMW-Solar, inspiratia

"In order to make the transition to aggregated business models, regulation will need to improve access of such models to the market," Mayr stresses.

With regards to this, he points out that because regulators are usually driven by the perceived sense of urgency in each jurisdiction, the abundance of flexibility options in Germany such as its advanced interconnectivity with foreign markets is impacting the speed at which regulatory barriers for distributed storage are removed.

"The PCR is already open to distributed energy storage, but if we look at the example of sonnen, it took more than expected to achieve this," says Mayr.

On the bright side, after sonnen worked for two years to make residential VPP suitable for the PCR, regulators now feel more comfortable with the model.

"In Germany, instead of regulation creating incentives for storage, we observe a different phenomenon: creative players proactively taking the effort of demonstrating the value and technical feasibility of energy storage to the power system and thereby creating regulatory precedents," Mayr adds.

Furthermore, Germany-based players are setting in motion plans to transfer their expertise in other markets, transferring know-how and lessons learned, while diversifying from the German market.

For example, sonnen has plans to re-create its residential VPP in Australia, where the need for grid stabilisation is significant.

Markets such as Australia, UK and particularly the US are seen by some analysts as the ones that may overtake Germany's leading position soon.

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