



# Is storage changing the way we use photovoltaics?

There was hardly any awareness of storage systems in the German market until the introduction of a federal subsidy program for the usage of home storage systems in 2013.

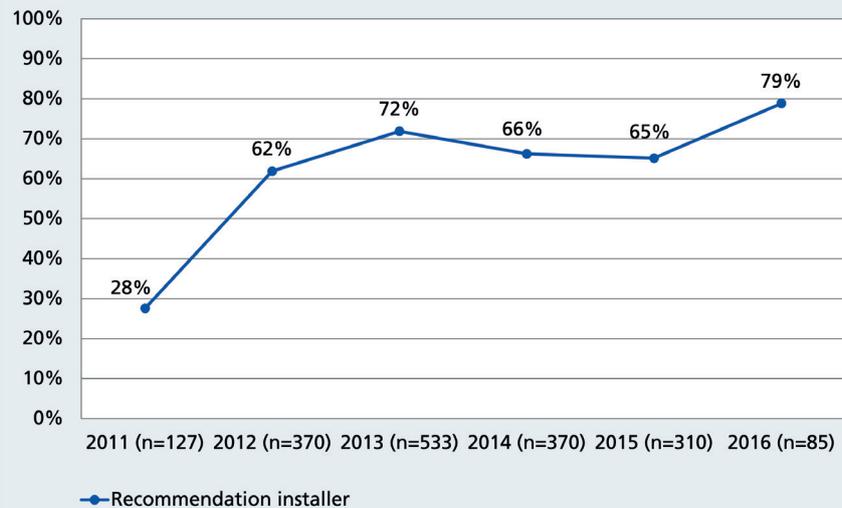
## Market development of PV storage solutions in Germany

In the beginning the new technology was met with scepticism from various market players; however, the federal subsidy program was able to slightly compensate the high price level for end customers. After around 5,000 storage installations in 2013, the installation numbers in the German market almost doubled in the years to come, so that by the end of 2015 a total of approximately 30,000 storage systems had been installed.

This market development was initially carried by the first subsidy program, which expired at the end of 2015. More or less every second storage system was installed with the help of the federal subsidy system during this period.

Source: EndCustomer Monitor© Volumes 1 to 6 by EuPD Research

## What are your reasons for choosing a manufacturer?



Research, the German PV storage market increased by around 25,000 new installed systems. For the current year the number of newly installed storage systems is expected to exceed 30,000 for the first time.

#### Increasing offer of storage solutions in a limited market environment

Today there are around 60 suppliers in Germany, offering around 300 different storage models in the private rooftop segment. The storage system suppliers originate from various industry sectors. Amongst them are inverter manufacturers, who are using their know-how to produce storage systems.

Furthermore, so-called system integrators as well as traditional cell- and battery manufacturers have their own products on the market. The fourth and fifth groups are distributors from the automotive sector, which are active as automotive distributors, as well as traditional utilities, which are classed as stationary distributors in the German storage market. At first glance it is remarkable that these suppliers show such a strong commitment in a limited market, with restricted growth opportunities, whereas this shows the future high significance of this technology for the implementation of photovoltaics in the energy market.

While lithium-based storage solutions clearly prevailed on a technological level as compared to lead-based systems, new technologies such as redox flow systems are slowly establishing themselves in the market. The development over the last twelve months has furthermore shown that additional services are becoming more and more important as a feature to further differentiate the product from the competition.

The virtual integration of one storage solution into a group of storage systems should allow both a sense of community as well as new marketing opportunities. Whereas there are currently only isolated economically feasible concepts, the offer of so-called residual current contracts, which complement the autarchy feeling of the storage owner, is already largely reality.

#### End customers' requirements in a period of change

For years decreasing prices for PV systems and diminishing feed-in tariffs have caused a trend of increasing self-consumption of self-generated electricity. Furthermore, analogous to this development the expected return has changed. Whereas during the boom years of the German PV market between 2010 and 2012 private home-owners expected a return of 5 to 7 percent, this picture has drastically changed.

On the one hand, the combination of self-consumption and feeding the self-generated electricity into the grid makes it hard to calculate the return and depends on the expected development of the electricity prices during the operating period; on the other hand, using a storage system makes the calculation of the profitability even more complex.

Therefore, not only the investment- and operating costs of the whole PV storage system, but also the field of applications and the revenue options change. While until now a PV system is only being used for feeding-in or for self-consumption, the expansion with a storage system theoretically would allow offering energy market services.

These developments are reflected in the

After a phase of uncertainty, a second federal subsidy program was initiated in March of 2016, to accompany the development of storage solutions for small roof-top systems until the end of 2018. When taking the current market development into account, the subsidy budget of 10 million euros per year was too limited to offer sufficient market stimulation in 2016 and the following years. For the first time, the subsidy budget for the whole year, was used up too early, by the fall of 2016.

Despite that the half-yearly decrease in the funding rate is further restricting the attractiveness of the subsidy, these kinds of announcements led to delayed investments in the coming subsidy period. According to estimations of the Bonn-based market and economic research company EuPD

results of EuPD Research’s “EndCustomer Monitor”. This long-duration measurement of the German market for PV and storage system displays the change amongst end customers. Whereas only 10% of the systems installed in 2008 or earlier were equipped to self-consume the generated electricity, the share of systems increased to 100% by 2014.

In this same period the share of customers, who invested in a system for a targeted return, decreased to around 12 to 15 percent. This is reflected in the statement whether investing in a PV system is seen as a safe investment. Whereas around 50% of the surveyed end customers acknowledged this in 2012, this share continuously decreased to merely 4% in 2016.

The investments of end customers, unlike commercial investors, are mainly motivated by protecting the environment. Secondly, there is no financial aspect, namely the desire to reduce the external electricity costs; however, this can also be understood as striving towards autarchy.

Therefore, the investments of private households in PV systems are made less due to a rational motivation for return, but rather for independence and autarchy. Taking this trend into account it is understandable that the offers for residual current contracts are increasing, which theoretically cater to the need for autarchy.

The financial approach in some of the offers even suggests that the surplus generated PV electricity in sunny months can be stored and used in the less-sunnier autumn- and winter months.

**The role of the installers – gate keeper for the market development**

A further result of the annual German end customer survey shows the importance of the installer during the buying process for PV and storage systems. Over the years, the recommendation for PV storage systems by the installer has grown in importance; whereas in 2011 merely 28% said the installer’s recommendation was important, in 2016 nearly 80% followed their installer’s advice.

Next to the importance of the installer’s expertise, the market development depends on the general offer of battery storage. The introduction of storage solutions in 2013 shows that merely offering the products does not necessarily create a new market.

It is essential to convince the various market players of these solutions, be it the end customer as the final decision-maker or the installer as the most important market intermediary.

Despite the federal subsidy program to support the investment in PV energy

storage systems, which was made available in 2013, the reaction of the installers was restrained. Only 71 percent of the installers offered storage to their customers. The main concern regarded the technical aspects of this still rather unknown system component.

Furthermore, due to the pricing there was hardly any economic benefit for the customers. However, over the course of time various technical product trainings have led installers to feel more secure when it comes to handling and installing storage systems.

Additionally, due to technical advancements and numerous new suppliers the prices have decreased, which in turn has led to an economically profitable usage of storage solutions.

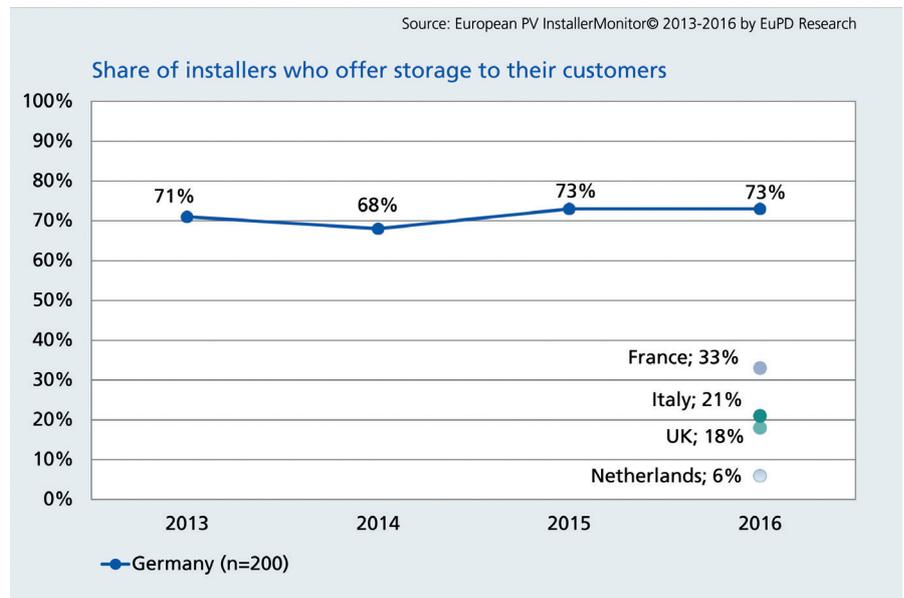
The annual survey of installers, the European PV InstallerMonitor, clarifies the development of offerings for storage systems in Germany and other European markets over the years. The report shows that German installers have taken storage on board; however the lack of interest in

Although the share of utilities, which are actively offering PV and energy storage systems, is still relatively small, clear growth can be seen, which further increases the attractiveness of this industry as a new sales channel for storage manufacturers.

The automotive industry brings along a further fundamental change to sales and marketing structures. Over the course of the successively developing market for mobile storage solutions in electric vehicles, the automotive manufacturers are also breaking into the field of stationary storage.

In this case, the basic idea that electric mobility can only achieve the desired environmental effect, in combination with renewable energies, comes into effect. The automotive sector is therefore expanding the current definition of a PV storage system by adding features from the loading box up to the electric vehicle. In this way car dealerships are establishing showrooms until becoming sales portals for the renewable energy industry.

Further developments such as the so-called integrated energy, which starts with the



other countries has clearly decelerated the market development.

**New players establish new sales channels for end customers**

With the establishment of storage systems various new players came into the market. Today there is a tighter relationship between manufacturer and end customer, alongside the usual sales channels via wholesale or direct sales, to the installer.

Additionally, the utilities, the traditional contact for end customers for energy-related issues, are becoming more aware of their vital role in the new energy landscape.

integration of mobility, can already be seen. The electrification of the warm water heat supply and heating are inevitable steps towards decarbonisation.

With all these new fields of applications for self-generated PV electricity, energy storage takes up a vital role, as it makes PV electricity flexibly usable when the sun does not shine. And this, in turn, is the fundamental premise of photovoltaics: to secure their importance as the most important consumer friendly renewable energy source.

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