

## Photovoltaics

### On its Way to a Sunny Future

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#### Industry Overview

Germany is the most developed PV market in the world with 35.7 GWp of cumulated installations in 2013. This adds up to 26 percent of the world market, making Germany home to almost a fourth of the solar modules in operation worldwide. In 2013, a total of 3.3 GWp was installed. Grid parity was achieved in Germany in 2011 with levelized cost of energy (LCOE) of newly installed capacity well below retail electricity prices. Nowadays, the self-consumption segments are the driving force of the future PV market in Germany.

## Our Industry in Numbers

- N° 1 in Europe and N° 4 worldwide with 3.3 GWp of newly installed PV capacity in 2013. (EPIA, 2014)
- Europe remains the world's leading region in terms of cumulative installed capacity, with 81.5 GWp as of 2013. (EPIA, 2014)
- N° 1 worldwide with 35,7 GWp of cumulated PV capacity in 2013. (EPIA, 2014)
- Germany holds a 26% share of global cumulated PV capacity in 2013. (EPIA, 2014)
- EUR 4.2 billion of investments in new PV installations in 2013. (BMWl, 2014)
- EUR 3.6 billion turnover of PV manufacturers in 2013. (BMWl, 2014)

## Market Potential

The German PV market has developed over the last two decades to be one of the most sophisticated PV markets worldwide. With more than 1.4 million PV systems, a total electricity consumption share of around five percent (29.7 billion kWh) was produced in 2013. The majority (70 percent) of the new systems installed in 2013 were smaller than 10 kWp – making Germany by far the largest residential consumer market in Europe. The potential rooftop area in Germany alone would allow an installed capacity of around 200 GWp. Thus, Germany together with other European markets is expected to continue leading the global rooftop PV market in the next years. IHS research predicts new annual PV installations in Germany between 2 and 3.5 GWp in the coming years.

New business models are being used and further developed to build the base for an economic operation of PV systems outside of the feed-in tariff scheme. This opens up a window for new markets and technological innovations. The large pool of installed PV systems is one pillar for the development of the energy storage systems market. PV-battery systems could reach an annual installation volume of

more than 100,000 systems by 2018, according to EuPD research. But also retrofit storage installations will be a major driver to improve energy autarky in private households and commercial operations. The inverter market continues to profit from the large base of existing PV installations in Germany, as well as new inverter systems, such as hybrid or micro inverters for new PV systems. Furthermore, innovative data management systems and new tools to optimize the efficiency and operation of PV systems are promising fields for this new PV market.

### **Market Access**

As the pioneering market in this grid-parity environment, Germany now provides the opportunity for companies to test, define and introduce new industry standards. New PV sales strategies, system configurations, and integration processes, such as storage or demand management, are intrinsic components of the specialist expertise currently being developed in Germany. The country is actively welcoming foreign enterprises to

participate in its development.

Foreign companies wishing to sell photovoltaic products in the European Union must fulfill the established quality and safety requirements. In Germany, solar photovoltaic modules are certified according to the European Norm (EN) standards. This means that manufacturers must comply with the "safety class II" norms which certify the electrical safety of photovoltaic modules.

Furthermore, the certifications for design qualification and type approval (EN 61215 and EN 61464) have become an industry essential, even though they are not required by law. More detailed information about these norms can be found on the website of TÜV- the German compliance testing and certification office.

With respect to PV-storage systems, quality marks are still optional (with the exception of the CE-certificate). Without certain quality labels, however, battery customers cannot access certain incentive programs. For example the KfW program "Speicher 275", designed to support privately owned PV battery systems, requires the

grid connection norm  
VDE-AR-N 4105.

## **Supporting Institutions**

The **German Solar Industry Association** (BSW) represents the interests of about 800 companies in the sector. BSW-Solar provides industry information and acts as an intermediary between business and the political and public sectors. It also represents the common interests of enterprises within the solar energy supply chain.

The Ministry of Economic Affairs and Energy supports this sector with several incentives programs and has established a website to inform about innovative technologies and projects. The section 'companies' contains a list of businesses active in producing and marketing renewable energy products, including companies specializing in photovoltaics (see dena).

The **German Energy Agency "dena"** (Deutsche Energie-Agentur GmbH) is the competence center for energy efficiency and renewable energies in Germany. Dena initiates, coordinates and implements innovative projects and campaigns at a national and

international level for energy issues. Its shareholders are the Federal Republic of Germany and the KfW Bankengruppe (KfW Banking Group).

**The European Photovoltaic Association (EPIA)** is the industry association of the solar photovoltaic (PV) electricity market in Europe. EPIA's goal is to promote photovoltaic energy on the national, European and worldwide levels and to assist its members in their business development plans.

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