European Market Outlook

For Residential Battery Storage

2021–2025

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SolarPower Europe is a member-led association that aims to ensure that more energy is generated by solar than any other energy source by 2030.

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Foreword

Welcome to our European Market Outlook for Residential Battery Storage 2021-2025.

Solar & battery storage is probably the greatest couple in the energy transition – they truly bring out the best in each other. While solar shows larger versatility and increasingly lower cost than any other power generation technology, battery energy storage systems (BESS) are important partners to extend the reach of solar into periods when the sun doesn't shine or just simply to make the energy system more flexible. This affection is true for all PV power applications – large-scale and distributed solar. BESS is only growing more attractive for solar, as the steep learning curve of batteries has resulted in cost levels which make this duo's economics more and more interesting to PV power generators, in particular in the residential segment, which is the scope of this report.

Indeed, the growth numbers speak for themselves. In 2020, around 140,000 household battery systems with a combined storage capacity over 1 GWh were installed in Europe, which contains two landmark numbers – for the first time, over 100,000 systems were added in one year, and for the first time, the annual GWh-scale was reached. The total residential battery storage market grew by 54% to over 3 GWh of installed capacity by the end of 2020.

However, the bulk demand for residential batteries in Europe was shouldered only by a handful of countries. Germany alone was responsible for 70% of newly installed storage capacity, and the share of the Top 5 markets together (Germany, Italy, UK, Austria, Switzerland) reached 93% in 2020; that's even higher than the year before. Our 5-year market outlook sees the same dynamic in the future – the identical Top 5 will hold an 88% share, even while the market volume is expected to grow over fourfold to 12.8 GWh in 2025.

The message from this picture is clear – as a key tool to complement flexible solar, battery storage needs much higher attention from energy policy makers across Europe. When the 2030 National Energy Climate Plans (NECPs) will be revised, the gigantic potential of battery storage has to be acknowledged. This has to happen alongside higher targets for solar, which have to be significantly increased – we are talking about a factor of around 2.5X to comply with the 1.5°C Paris Agreement.

In fact, the EU Clean Energy Package already provides many very helpful provisions to remove barriers to a Europe-wide storage roll-out. Unfortunately, only a few EU members states have implemented these prosumer and self-consumption friendly guidelines into national legislation. Those who did, enable citizens to become less dependent from rising energy prices, and allow companies to create business models based on the large toolkit offered by battery storage technology, such as aggregation, peer-to-peer, ancillary services. Unlocking these features would also facilitate better grid planning and ensure the distribution grids are fit for a renewables-based energy system.

While battery storage is a natural fit to residential solar, policy frameworks that are missing or are counterproductive to self-consumption, like net metering in the Netherlands, can have disastrous effects on the evolution of a battery storage market, even if the rooftop solar segment is thriving. As the German example shows, an established solar rooftop market in an environment of high retail power prices does not need direct subsidies for battery storage anymore. In the country, battery attachment rates for new PV systems are 60%. However, to kick-start the battery storage segment under adverse conditions, like in many eastern European countries, initial support schemes will help, as they did in at the outset of Germany's market development.. A very successful support programme was implemented in Italy last year, and extended until 2023. The tax credit for efficiency measures, which includes solar & storage, financed from a COVID-19 recovery fund has strongly accelerated the application of BESS in Europe's second largest market.

Like residential solar, the market for battery storage will continue its upward path; the crucial question is how fast will it grow? In this regard, it's of utmost importance that the upcoming EU Battery Regulation does not burden storage technology manufacturers and investors. Appropriate regulations for improved sustainability and safety performance of batteries are very welcome and important, but a battery framework must avoid any distortive market effects. Ultimately, many European countries soon need to create a 'Happy Ending' for the most promising couple of the energy transition, in order to enable Europe to meet its climate targets for 2030 and beyond.

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Methodology: SolarPower Europe's five-year forecast consists of Low, Medium and High scenarios. The Medium Scenario anticipates the most likely development given the current state of play of the market. The Low Scenario forecast is based on the assumption that policymakers halt solar and storage support and other issues arise, including interest rate hikes and severe financial crisis situations. Conversely, the High Scenario forecasts the best optimal case in which policy support, financial conditions and other factors are enhanced.

Residential solar and storage systems are defined as installations with a PV capacity below 10 kW. SolarPower Europe's methodology includes only grid-connected systems. Installed PV capacity is always expressed in DC.

All figures are based on SolarPower Europe's best knowledge at the time of publication.

Executive summary

The **strong growth path of residential battery energy storage systems (BESS) across Europe** continued in 2020 with a 44% year-on-year increase in annual installed capacity. In spite of the COVID-19 health crisis, for the first time the European **BESS market reached the landmark GWh scale, totalling 1,072 MWh of storage capacity installed in a single year**. With about 140,000 battery systems installed in 2020, this was also the first time in which more than 100,000 battery units were installed in a year.

While the increase in the annual BESS market has been very steep, the **growth in cumulative installed storage capacity is even more pronounced**. The residential BESS fleet jumped from less than 2 GWh in 2019 to over 3 GWh in 2020, with a 54% year-on-year increase. Total storage capacity has grown 14 times its size, compared to just five years ago.

Although more and more national markets are looking at solar & storage as a means to decrease dependency from volatile electricity prices and make better use of self-produced green energy, the deployment of this technology is still **largely driven by a handful of leading countries.** Germany, the European powerhouse in both residential solar PV and residential battery storage systems, constitutes 70% of the total European home storage market. The great performance of the domestic PV market in 2020 and a high attachment rate with battery storage led to a large increase of the BESS market, which stood at 749 MWh, a 51% increase from the year before. In Italy, the introduction of a strong fiscal incentive for solar & storage, in addition to the already existing support schemes, resulted in a yearly 44% market growth with 94 MWh installed. Different market conditions allowed the remaining top 5 countries to grow in the two-digit range – including the availability of prosumer-friendly electricity tariffs in the UK, and government incentives and supportive policy frameworks in Austria and Switzerland. Taken together, the five largest markets represent 93% of total European installations.

Our five-year market outlook foresees that the European residential BESS market will continue its upward path, as many European countries see the first tangible results of the recovery packages and other measures put in place to relaunch the economy in the aftermath of the COVID-19 health crisis. We expect 1.37 GWh of home storage capacity to be installed in 2021, up 28% from 2020 levels. **In our Medium Scenario, the market will grow to 2.51 GWh by 2025, up 134% compared to 2020**.

Strong growth rates can also be seen when looking at total installed capacity scenarios. In our Medium Scenario, we expect the **cumulative residential storage capacity installed across Europe to reach 4.4 GWh in 2021 and 12.8 GWh in 2025, with annual growth rates consistently above 20%** for all the intervening years. Under optimal conditions, Europe's residential prosumers could operate a battery fleet as large as 14.6 GWh by the end of 2025, compared to 10.2 GWh in the most pessimistic scenario.

The report delves into the specific features of the top 4 largest European markets, which will continue to provide the strongest push for home batteries across the continent. In our five-year analysis, Germany is poised to remain the undisputed leader in the field of residential storage, followed by Italy by some distance. These, together with other two leading markets UK and Austria, will still constitute the top 4 markets in 2025, according to our Medium Scenario. At the same time, as the cost of storage quickly decreases, and enjoys backing from national and regional policy initiatives, private prosumers in several other European markets will increasingly embrace solar and stationary batteries as well.