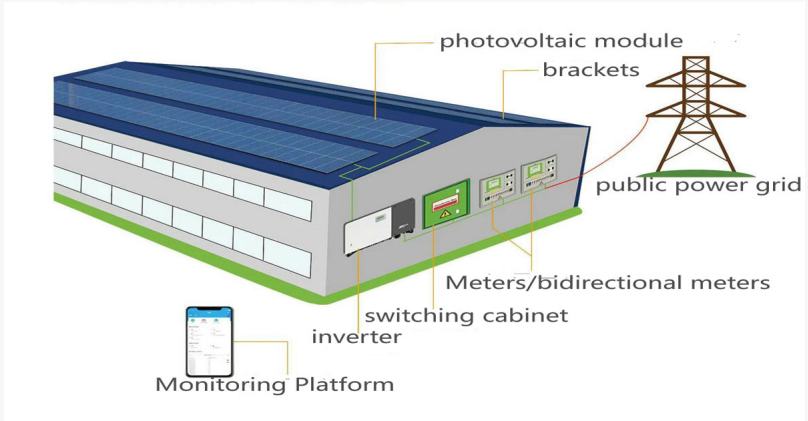
52% jump Rooftop PV and storage continue to soar in Germany in 2023

The data shows that the number of residential solar installations in Germany has increased by 52% compared to the previous year.

Many homes are just starting to use outdoor PV.



Detailed photovoltaic power generation process from grid to inverter

SAN FRANCISCO, USA, October 6, 2023 /EINPresswire.com/ -- In 2023, the number of residential solar and energy storage systems installed in Germany has increased by 52% compared to the previous year, while three-quarters of Germans would consider installing rooftop solar.

For such an operation, it is precisely balcony photovoltaics that have become increasingly popular in recent years.

In recent years, overseas, especially in the European region, balcony photovoltaics surged and received great attention.

In February this year, the German VDE Electrical Engineers Association drafted a document with direct reference to the German National Electricity Standard. Proposed to simplify the rules of balcony photovoltaic system under the condition of ensuring safety, and raising the power limit to 800W, which is on par with the European standard. The drafting document pushes balcony PV into another boom.

According to research and calculations by the German Solar Energy Industry Association, the past four years have seen a five-fold increase in residential solar cell systems and a four-fold

increase in installed stand-alone residential PV capacity. In 2022 alone, the installed capacity of domestic solar storage projects in Germany will grow by 52 percent, and domestic PV deployment will grow by more than 40 percent.


Very common balcony power system arrangement


Photovoltaic system at work on the balcony


Outdoor photovoltaic system generating electricity

About balcony PV systems
Balcony PV systems, known in Germany as "balkonkraftwerk", as the name suggests, are ultra-small distributed PV systems, also known as plug-in PV systems, that are installed on a balcony. The user simply attaches the PV system to the balcony railing and plugs the system cable into a socket at home. A balcony PV system usually consists of one or two PV modules and a microinverter. The solar modules generate DC power, which is then converted to AC power by the inverter, which plugs the system into an outlet and connects it to the home circuit.

Clearly, this is both a sleek and high-tech model of power generation. It's even a near-perfect solution for how to utilize renewable energy - to power a home or apartment.

The popularity of balcony PV power systems
1 The biggest reason for the popularity of balcony power systems is the significant increase in electricity prices in Germany.

Some time ago, according to Tennet, the cost of the German power grid soared by 250% during the energy crisis due to soaring market prices for gas and electricity. In addition, the rising costs are also due to the so-called grid reserve costs. These have prompted the government to take measures to prevent further cost increases. Under the 65 billion euro bailout program adopted in early September 2022, Germany will allocate funds to cushion soaring grid operating costs, grid operators Tennet TSO, Amprion, 50Hertz, and TransnetBW said in a statement on

Wednesday. Starting Jan. 1, 2023, the cost of the grid is set at 3.12 cents per kilowatt hour for all German electricity consumers. This year, the range of charges for the four operators was between 2.94 cents and 3.29 cents.

2 Another reason for the popularity is also the easy installation of balcony power systems.

Balcony PV systems are easy to install and require little maintenance to generate a constant stream of free power. This makes them an ideal choice for those who want to live sustainably without sacrificing outdoor space. The power generation system also doesn't have to take the environment into account, as it simply needs to be placed outdoors where it has access to sunlight, and it will continue to do its job.

The subsequent popularity of balcony photovoltaic power generation

Data show that the number of small solar power systems has doubled so far this year. The market master data register of the Federal Network Agency shows that there are now around 230,000 plug-and-play photovoltaic power plants in Germany, of which almost 137,000 plants, or more than half, were put into operation this year, so the number of systems could be even higher. There are also about 30,000 other systems on the register with an output of less than 1 kilowatt, according to the Federal Network Agency, and it is unclear whether any of these are also balcony power plants. In addition, an unknown number of systems are unregistered and not registered with electricity providers.

Safety of balcony PV

With the popularity of balcony PV in recent years, fire has become a great concern when using it. Data shows that the frequency of fires after balcony PV use is about 30-45% higher than before.

Balcony power generation has led to a rise in the outbreak of fire incidents

1 Evolution of the power generation system
With the growing size of silicon wafers and the increasing efficiency of cells, the increasing current of the module has become an inevitable trend. It can be seen that the module current is getting bigger and bigger, and the inverter power or the number of strings corresponding to the convergence box is also increasing.

As the system power and current on the DC side of the PV increases, the consequent risk of failure and fire is also increasing.

When a fault occurs, the short-circuit current generated at the point of the fault also increases accordingly. According to Joule's law $Q=I^2Rt$, it can be seen that the current doubles, the thermal effect at the point of short-circuit increases by 4 times, and the risk of fire is also greatly increased.

In the future, the power of the DC side of the PV will be further increased, but the protection function of the traditional program has not been improved and upgraded, obviously not keeping up with the rhythm of the system power evolution. It is obvious that the protection function has not been improved and upgraded, and has not kept pace with the evolution of system power. It is time to solve this problem without delay.

2 PV Power Station Scenario Application
Due to the convenience of the balcony PV power generation system, its use is now not only limited to the balcony. From the desert to agricultural light, fishing light, mountain, roof development, covering PV and construction, agriculture, mountain, fisheries, and other complex scenes.

When "PV+" is getting richer and richer, fire becomes the biggest safety hazard. Once a fire accident occurs in a photovoltaic power station, it will not only lose the cost of the power station and power generation revenue but also cause building and personal injury in serious cases.

At the end of fall and the beginning of winter, the mountainous areas are covered with withered grass below the power station components, and the loss caused by mountain fire is incalculable, so the power station's requirements for fire prevention are inevitably higher.

Agricultural photovoltaic power stations, roof photovoltaic, and other scenes of photovoltaic components are usually arranged in greenhouses or buildings above, and more closely in contact with the personnel, cable or inverter short-circuit triggered by fire, will also be a great threat to the safety of personal property.

However, even with such risks, as long as we can do to prevent problems before they occur, balcony power generation is still very worth choosing. Because the benefits of balcony power generation can not be ignored.

New policy
In January 2023, the German government introduced some policies to face these problems. January 23 German VDE drafted a document proposing to simplify the rules related to balcony photovoltaic systems and accelerate the popularization of small photovoltaic systems. The content is as follows:
1 From the previous 600W power limit to 800W, to enhance the power of a single balcony system, expanding the market space.
2 Require that any type of meter can be adapted to 800W small-scale PV systems, so there is no need to wait for the government to replace smart meters to install them.
3 Simplify the registration and commissioning, only need to register or deregister the micro-generation system in the Federal Network Agency.
4 Allows the use of grounded plugs, i.e. Schuko plugs, which eliminate the need for professional electricians to install them and reduce installation costs.

5 Require manufacturers to fully demonstrate the risks associated with the safe assembly and commissioning and to ensure that the system power safe, it is recommended that an independent body carry out the relevant tests.

Germany wants to promote "universal photovoltaic"

Although the cost and savings of individual installations are basically insignificant, "balkonkraftwerks" can make a significant contribution to the energy transition during the Russian-Ukrainian crisis. As a result, the German government wants to further simplify the installation of the devices, which is driving the market to grow significantly.

Some time ago, the German Federal Cabinet adopted a new PV development package to help consumers remove barriers to installing PV systems on balconies and said that the corresponding law is expected to be discussed in Parliament in the fall and could enter into force at the beginning of 2024. The German government sees this as part of citizen participation in clean energy generation.

Overall, although the share of "balcony power plants" in Germany's overall energy supply is relatively small and the impact of these devices is limited at present, as the German government further simplifies the installation process and promotes changes in energy policy, "balcony power plants" in the future will have greater potential and influence. At the same time, their popularity may also drive down electricity prices to a certain extent, reducing the pressure on residents to live under inflation.

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