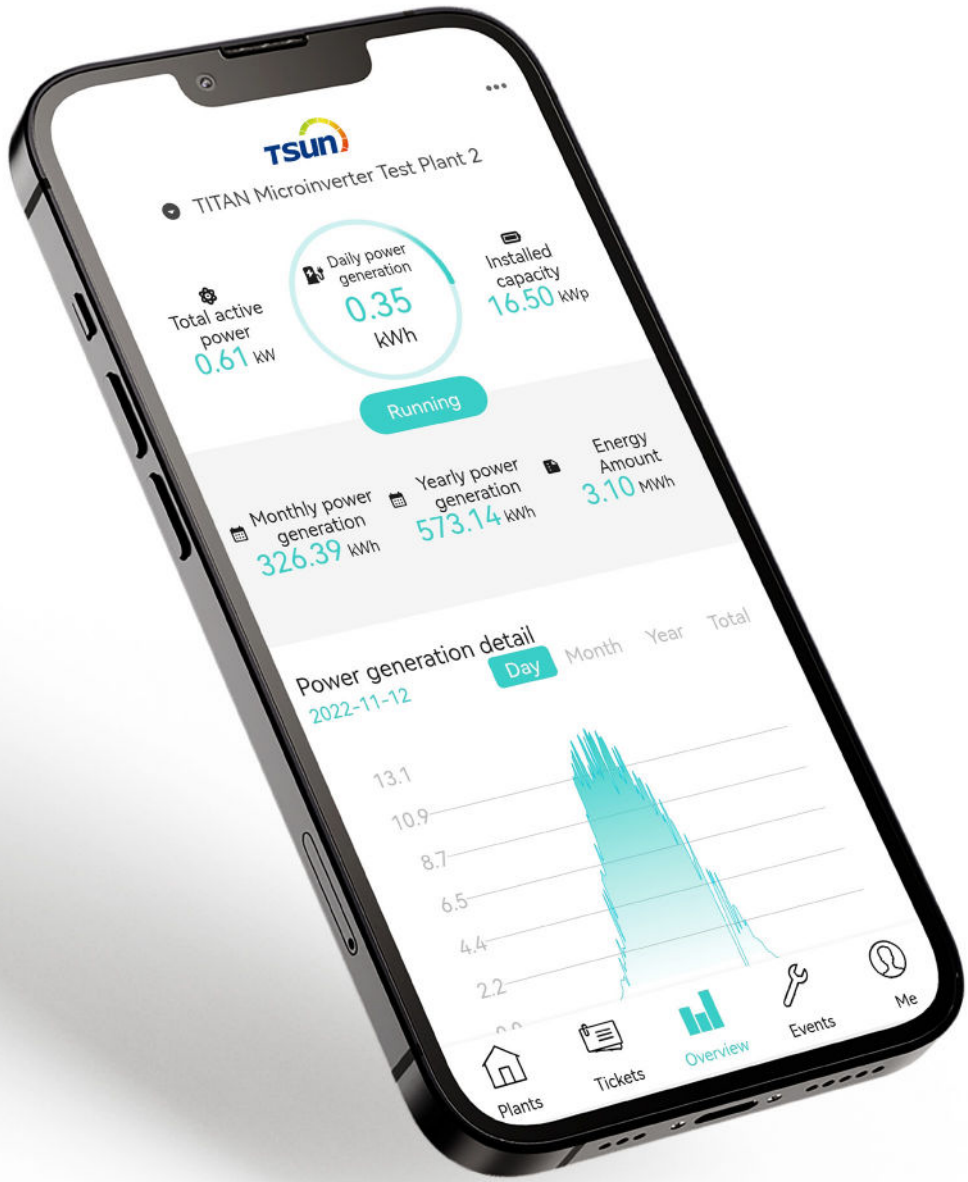
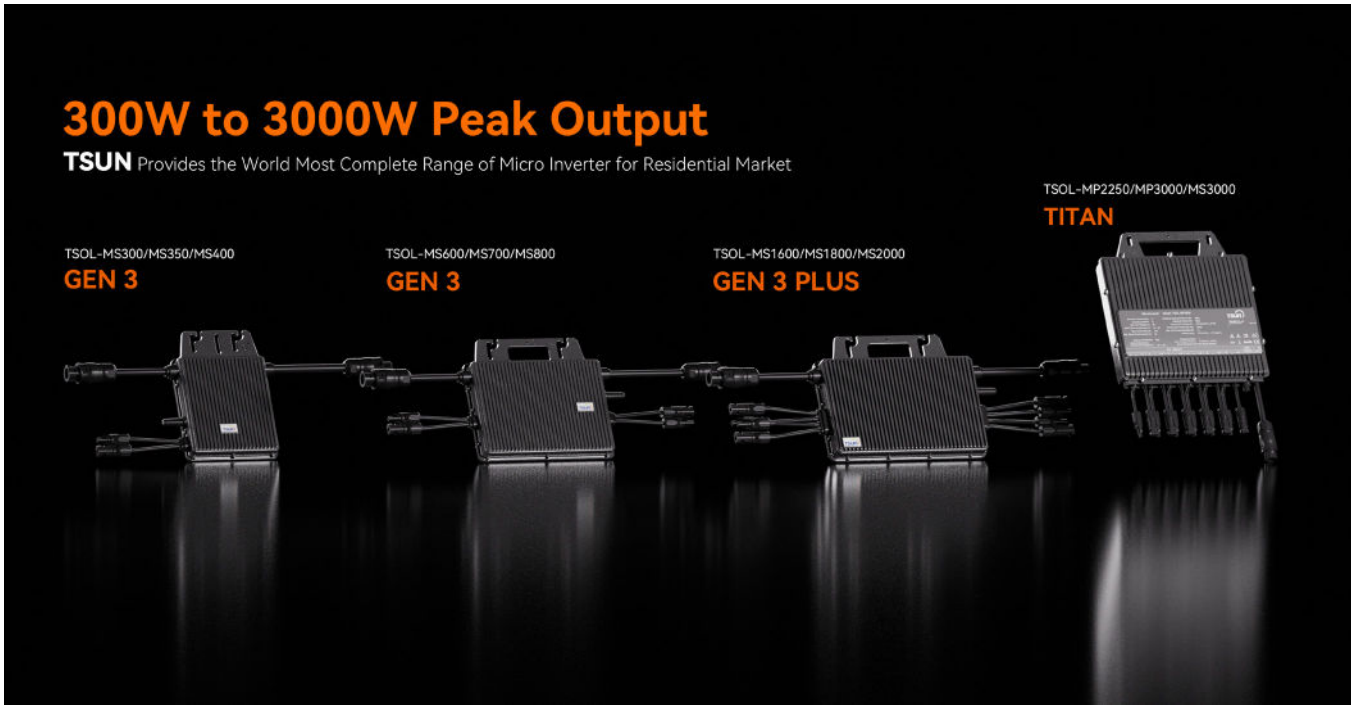


Good economics begins at home with microinverters

As solar energy becomes increasingly popular among homeowners, there is a growing demand for more efficient and cost-effective solutions for residential solar installations. One of the key components is the inverter, which converts the DC power generated by the solar panels into AC power that can be used in homes or exported to the grid. While traditional string inverters have been the go-to option for many years, microinverters have emerged as a viable alternative.



Microinverters are small, individual inverters that are installed on each solar panel, allowing for module-level monitoring and optimization. This can increase the overall efficiency of the system and mitigate shading issues. Let us examine the adoption of microinverters in various regions globally.

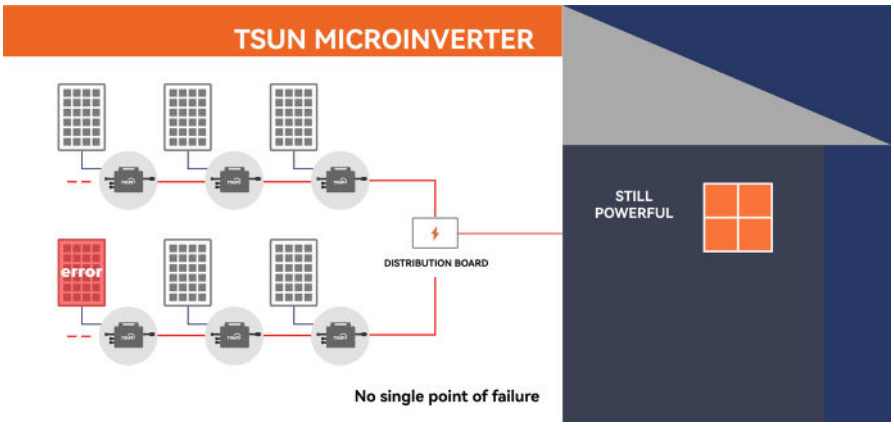
MarketResearch reports that the Europe Micro Inverter Market is expected to experience significant growth, with a CAGR of 17.3% during the forecast period of 2022-2028. In 2021, the German market dominated the Europe Micro Inverter Market by Country and is projected to remain a dominant market until 2028, reaching a market value of $438.4 million. The UK market is also expected to grow at a CAGR of 16.3% during 2022 - 2028, while France will display a CAGR of 18.1% during 2022 - 2028. These statistics demonstrate that although microinverter usage varies across different regions worldwide, they are gaining popularity and becoming increasingly crucial components in residential solar PV systems.

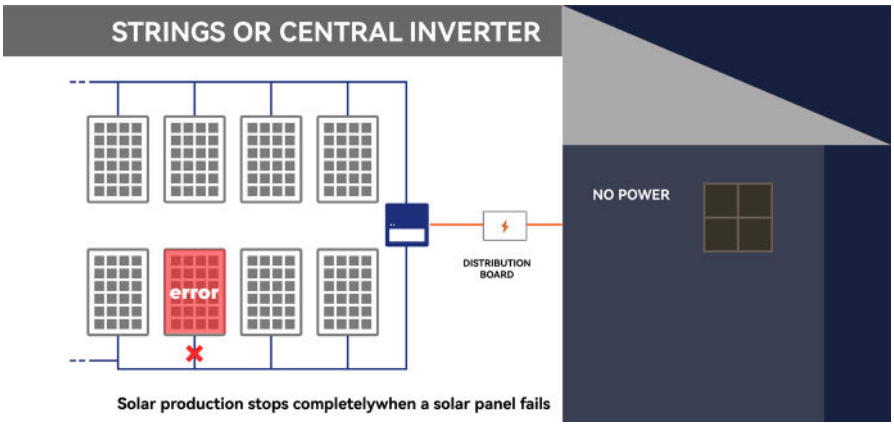
In most cases, microinverters are more expensive than string inverters, which can add up to a significant cost increase for a residential solar installation.

A cost-effective solution

So, are microinverters worth the extra cost? It depends on several factors. One of the key factors to consider is the size of the system. For smaller systems, the cost difference between microinverters and string inverters may not be significant enough to justify the use of microinverters. However, for larger systems, the increased efficiency and flexibility of microinverters may outweigh the higher upfront cost.

According to a study by the National Renewable Energy Laboratory (NREL), microinverters can increase the energy yield of a system by up to 20%, resulting in a 3-5% increase in overall system output. This can translate to significant savings over the life of the system, particularly in areas with high electricity costs. For example, let's say a homeowner in Frankfurt installs a 10 kW solar system with a string inverter. According to the GlobalPetrolPrices, the average retail price of electricity in Germany is €0.51 per kWh. Assuming the system produces 1,600 kWh per month, the homeowner would save €816 per month on their electricity bill.





TSUN provides microinverters that can last up to 25 years or more with proper maintenance, while its string inverters typically last around 10-15 years before needing to be replaced.

Now, let's compare that to a system with microinverters. If the homeowner chooses TITAN microinverters from TSUN, the cost will be around €0.07 per watt, that is €700 for a 10 kW system. The cost is lower than the normal cost of micro inverters, as well as the cost of a string inverter for the same system, which usually ranges from €1000 to €2500. Furthermore, based on the NREL study, the energy yield of the system with the microinverter would increase by 20%, resulting in an additional 320 kWh per month. This would make an additional homeowner's monthly savings of €163 per month. In this scenario, TSUN offers an affordable and reliable option for residential solar installations.

Putting energy loss in the shade

Another factor to consider is the shading profile of the installation site. According to a study by Sandia National Laboratories, shading on just 9% of a solar panel can result in a 64% reduction in energy output. With a string inverter, shading on one panel can affect the output of the entire system. This would result in a significant loss of energy and cost savings. With microinverters, however, each panel operates independently, so shading on one panel does not affect the output of the entire system.

Take TSUN as an example. Its microinverters all adopt multiple MPPT designs to cope with the power generation crisis caused by the barrel effect. MPPT, or Maximum Power Point Tracking, is a core technology in PV power generation systems, which means that the inverter adjusts the output power of the PV array according to different ambient temperatures, light intensity and other characteristics, so that the maximum power is always output.

Taking the world's largest single-phase microinverter, TITIAN series, pioneered by TSUN as an example, TSOL-MP3000 adopts a 6 MPPT design, which means higher accuracy of single-way tracking and faster dynamic response, and its maximum power generation efficiency can reach 97.1%. Therefore, the stability and high efficiency of microinverters make them a more cost-effective choice for installation areas that are shaded by trees or other obstacles.

Digital monitoring

In terms of the monitoring cost, microinverters are typically more cost-effective than string inverters, because they have built-in communication capabilities, such as Wi-Fi or Bluetooth, that allow for easy data collection and analysis. However, string inverters often require additional hardware or software to enable monitoring capabilities. This can include data loggers, sensors, and other equipment that must be installed alongside the inverter. These additional components can add significant costs to the system and may require ongoing maintenance and calibration.

As for TSUN microinverters, both Gen3 and TITAN series come equipped with built-in WiFi, enabling precise maintenance and management of the entire PV system, including fault diagnosis and firmware upgrades. They also support one-button networking by the APP, or Talent Monitoring, for real-time power generation monitoring. In this way, homeowners no longer need to pay for extra monitor service.

Looking at longevity

Lastly, microinverters have a longer lifespan compared to traditional string inverters. TSUN provides microinverters that can last up to 25 years or more with proper maintenance, while its string inverters typically last around 10-15 years before needing to be replaced.

When considering all these factors together, microinverters are ultimately a cost-effective solution for residential solar installations. As the pioneer of high-power microinverters in the world, TSUN is dedicated to providing microinverters with increased efficiency, guaranteed safety, better monitoring capabilities, and longer lifespans, to make them a worthwhile investment for homeowners looking to maximize their solar energy savings.

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