United States Solar Energy Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 138 pages | Mordor Intelligence

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Report description:

The US solar energy market is expected to record a CAGR of 17.32% during the forecast period (2022-2027), reaching a solar installed capacity of 270 GW by 2027 from 96.19 GW in 2020. Unlike many other industries, the country's solar energy industry was not severely impacted by the COVID-19 pandemic, resulting in significant new installations of 19.22 GW in 2020. Factors such as declining solar PV costs and supportive government policies are expected to drive the solar energy market in the country. However, supply chain vulnerability due to increasing geopolitical tensions and increasing consumption of natural gas are expected to hinder the market's growth during the forecast period.

Key Highlights
The solar photovoltaic (PV) segment is expected to dominate the market. In 2020, the country's PV installations increased by 25.17% Y-o-Y, with the residential and utility-scale markets growing by 20.5% and 31%, respectively.
The perovskite-based PV cells attracted attention in recent years. Perovskite-based PV cells offer high ease of manufacturing, high efficiency, and excellent semiconducting behavior. Hence, they are comparable to silicon-based solar PV in terms of solar-to-electric efficiency. Hence, technological advancements in the manufacturing of PV cells will likely lead to mass-scale production, offering growth opportunities.
Declining costs and increasing efficiencies of solar PV panels are expected to drive the country's solar energy market during the forecast period.

US Solar Energy Market Trends

Solar Photovoltaic (PV) Expected to Dominate the Market

Solar power has become more accessible and prevalent in the United States. In the last decade alone, solar experienced an average annual growth rate of 42%. Since the last decade, solar installations in the country have grown 30-fold. Total installed capacity in the United States reached 96.18 GW in 2020, representing an increase of about 26% compared to the previous year. The solar energy markets are maturing rapidly around the country, and solar electricity is now economically competitive with conventional energy sources in several states, including California, Hawaii, and Minnesota.
The solar photovoltaic (PV) market is mainly driven by strong federal policies, such as the solar Investment Tax Credit (ITC), rapidly declining costs, and increasing demand for clean electricity across the private and public sectors.
In 2020, the country installed around 19.2 GW of solar PV capacity. The first quarter of 2020 was largely unaffected by the COVID-19 pandemic, resulting in the installation of 3.6 GW. However, once the supply chain was restored and the workforce became available, the second half of 2020 witnessed a growth in installation.
According to the Solar Energy Industries Association (SEIA), in 2020, solar energy accounted for 43% of all new electricity generating capacity added to the grid. At the end of 2020, there were approximately 2.7 million residential PV systems in the United States.
In 2020, the total PV installed capacity in the residential and commercial sectors in the United States was 19113.5 MW and 13943.8 MW, witnessing a rise of 20% and 12%, respectively, compared to 2019.
In Q2 2021, the United States installed 5.7 gigawatts (GW) of solar PV capacity, which is enough to power 18.9 million homes. Due to a large portfolio of projects and supportive federal policies, the capacity is expected to increase through 2021 and continue to surge significantly during the forecast period.
In June 2021, the New Jersey legislature passed A3352, which will require new warehouses to be solar-ready buildings. If the governor signs this bill into law, new warehouses constructed on or after July 1, 2022, will need to include a building design optimized for solar installations. This factor is expected to drive the solar PV market during the forecast period.
Hence, owing to the above-mentioned points, solar photovoltaic (PV) is expected to dominate the US soar energy market during the forecast period.

Declining Costs and Increasing Efficiencies of Solar Panels Expected to Drive the Market

Since the last decade, the average cost of a solar PV panel has dropped by nearly 90% globally. Prices of other components have also fallen significantly since 2011, reducing the Levelized Cost of Electricity (LCOE) for residential and utility-scale solar PV generation.
Due to a combination of techno-economic and geopolitical factors, the rate of decline of solar PV panel prices is estimated to reduce slightly, but prices will continue to decline during the forecast period.
According to the United States National Renewable Energy Laboratory (NREL), since 2010, there has been a 64%, 69%, and 82% reduction in the cost of residential, commercial-rooftop, and utility-scale PV systems in the United States, respectively.
Due to the declining prices, many residential and commercial consumers are opting for rooftop solar PV systems to reduce energy costs and recovery time. Similarly, for large-scale utility project operators, lower panel costs enable them to sign Power Purchase Agreements (PPA) with consumers at a lower cost.
Over the past decade, the efficiency of solar PV panels has risen steadily. With the emergence of new technologies and manufacturing capabilities, this trend is expected to continue during the forecast period. The most efficient solar panels commercially available in the market have efficiency ratings as high as 22.8%, whereas most panels have an efficiency rating ranging from 16% to 18%.
As of January 2022, SunPower's monocrystalline solar PV panels had the highest efficiency rating of any commercially available solar panel brand in the market. In April 2020, NREL announced that its six-junction solar cell achieved a record 47.1% solar conversion efficiency, the highest globally.

Therefore, owing to the above-mentioned points, declining costs and increasing efficiencies of solar PV panels are expected to drive the country's solar energy market during the forecast period.

US Solar Energy Market Competitor Analysis

The US solar energy market is fragmented. Some of the key players include M. A. Mortenson Company, First Solar Inc., NextEra Energy Inc., SOLV Energy, and 8minutenergy Renewables LLC.

Additional Benefits:

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