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Japan Photovoltaics Market Assessment, By Type [Monocrystalline Silicon, Polycrystalline Silicon, Thin Film Cells, and Organic PV], By Grid Type (On grid, Off grid, and Hybrid), By Installation [Ground Mounted, Roof Mounted, Building Integrated Photovoltaics, & Floating Photovoltaics], By Application [Solar Farms, Electronic Devices, Healthcare Facilities, Public Infrastructure, Aerospace, Construction, Military, and Defence, Transportation, and Others], By End-user [Residential, Commercial & Industrial, and Utility], By Region, Opportunities, and Forecast, FY2017-FY2031F

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Abstracts

The Japan Photovoltaics Market is projected to reach USD 15.7 billion by FY2031 from USD 8.36 billion in FY2023 with a CAGR of 8.2% during the forecast period FY2024-FY2031. The surging market growth of Photovoltaics (PV) in Japan can attributed to a variety of factors such as the government's emphasis on energy security, the need for the transition towards renewable energy sources, a strong domestic manufacturing base of solar PVs, etc. Japan has limited domestic energy resources, and historically it has heavily relied on fossil fuel imports to meet its energy needs. The Fukushima disaster highlighted the vulnerability of this energy strategy. Hence, to enhance energy security and reduce dependence on imported fuels, Japan has placed a strong emphasis on expanding renewable energy sources, with solar PV being a major component of its renewable energy portfolio.

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By harnessing the abundant sunlight available in the country, Japan can reduce its dependence on imported fossil fuels to meet energy demand and mitigate the risks associated with nuclear power. Moreover, solar PV provides a clean, renewable, and domestic source of energy, offering a more secure and sustainable option. An example to ensure energy security in Japan is the promotion of distributed generation by integration of residential and commercial PV systems, encouraging the installation of rooftop solar panels in homes and businesses across the country. For example, The Ministry of Economy, Trade and Industry had announced that it will create a new category for rooftop solar in its feed-in tariff program, with plans to offer around 12 yen (9 cents) per kilowatt-hour, which is almost 20% to 30% more than that of solar power generated on open land.

Hefty Investment in the R&D

Like many other countries, Japan is committed to transitioning towards a more sustainable and low-carbon energy system. Investing in solar PV research and development supports this goal by promoting the adoption of renewable energy sources including solar energy and reducing greenhouse gas emissions. By investing in solar PV R&D, the government aims to maintain and enhance its position as a leader in solar energy. This includes developing more efficient solar panels, improving energy storage systems, and advancing grid integration capabilities.

The National Institute of Advanced Industrial Science and Technology (AIST) in Japan has been actively involved in the development of solar cells, which are known for their higher efficiency and performance. AIST is dedicated to enhancing the performance and integration techniques for CIGS solar cells, as well as developing high-efficiency, cost-effective thin-film silicon solar cells and high-performance organic solar cells. Furthermore, they also aim to improve the reliability of photovoltaic modules. Such investments made by the Japanese government in the R&D programmes can improve its technological advancements thereby leading to extensive market growth in future.

Burgeoning Demand for Solar Parks

Japan, being a densely populated country with limited available land, faces challenges in finding suitable sites for solar installations. The rise in the number of such solar parks is augmenting the market growth which in turn is increasing the demand for Solar PVs in order to meet the electricity needs in Japan. Solar parks optimize land utilization by concentrating a large number of solar panels in a single location. For example, Softbank

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has successfully completed the construction of a large-scale solar park with a capacity of 102.3 MW in Hokkaido, Japan. This solar park is supported by a significant energy storage system consisting of 27 MWh of lithium-ion batteries. The project occupies an area of 132 hectares near the town of Yakumo. Notably, the solar park incorporates the largest operational solar-plus-storage power plant in Japan. The generated electricity from the solar park is sold to Hokkaido Electric Power. The total power generation from the project is expected to meet the annual electricity needs of approximately 27,965 households.

Government Schemes

The Japanese government is sheer focusing on the improvisation of the quality of solar PVs in Japan and has adopted myriad schemes in order to achieve the same. Moreover, it has been estimated that these schemes will indeed yield fruitful growth in the demand for solar PVs in Japan in the coming years. Japan introduced Feed-in Tariff Scheme to incentivize renewable energy development, including solar PV. The program guarantees long-term contracts and fixed electricity prices for solar power producers, providing stability and financial viability for solar PV projects. The Feed-in Tariff system was implemented with the aim of encouraging investments in renewable energy generation, including solar power, by providing long-term purchasing guarantees for electricity. This mechanism enhances the prospects of recovering the substantial initial expenses associated with constructing renewable energy plants. In Japan's Feed-In-Tariff system, electric utilities and retailers procure electricity generated from renewable sources at prices and contract durations determined by the Ministry of Economy, Trade, and Industry.

To cover the renewable energy component of the overall power supply, end-users pay an additional fee or surcharge . Hence it can be deciphered that such initiatives, and regulations being introduced by the Japanese government will lead to an exponential market growth rate in the future.

Impact of COVID-19

The PV industry relies on global supply chains for components like solar panels, inverters, and mounting systems. The pandemic disrupted international trade and caused delays in the delivery of these components, affecting project timelines and installation schedules. Pandemic-related restrictions, including lockdowns and social distancing measures, resulted in temporary halts or delays in construction activities. This impacted the completion of solar panel installation projects, leading to potential

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revenue losses for project developers and installers, which in turn, adversely impacted the market for photovoltaics in Japan. Moreover, the economic slowdown caused by the pandemic led to an increase in electricity demand. In Japan, reduced industrial activity and lower overall energy consumption potentially dampened the immediate demand for PV installations.

Key Players Landscape and Outlook

The solar photovoltaic (PV) market in Japan is experiencing significant growth, prompting international companies to focus on maintaining their market share and expanding globally through quality and brand positioning strategies. These companies are making active investments in research and development, marketing efforts, setting up numerous solar stations and expanding their distribution networks. Manufacturers are actively studying consumer behaviour to better understand their needs and preferences and are continually introducing new products to meet those demands. In April 2023, Luxor Solar, a German module manufacturer, and AirWater Inc. from Japan collaborated to offer vertical photovoltaic (PV) systems designed specifically for parking areas. These innovative systems are capable of generating an equivalent amount of energy as traditional PV carports, while occupying less space. The vertical PV system includes 460 W heterojunction solar panels, power optimizers, and vertical racks.

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