

United States Distributed Energy Generation Market Assessment, By Technology [Diesel and Oil Gensets, Natural Gas Gensets, Mini Hydropower Grids, Gas & Steam Turbine, Fuel Cells, Solar Photovoltaic, Wind Turbine, and Biomass Generators], By End-user [Residential, Commercial and Industrial], By Region, Opportunities, and Forecast, 2016-2030F

https://marketpublishers.com/r/UBF31AD9C455EN.html

Date: February 2025 Pages: 122 Price: US\$ 3,300.00 (Single User License) ID: UBF31AD9C455EN

Abstracts

United States has been witnessing significant developments in its distributed energy generation market which is projected to reach USD 67.95 billion by 2030 from USD 33.19 billion in 2022 growing with a CAGR of 9.37%. Significant advancements in distributed energy generation technologies, such as solar panels, wind turbines, energy storage systems, and smart grid infrastructure, have improved efficiency, performance, affordability and most importantly adoption of renewable energy generation. Cost reductions, particularly in solar and wind technologies, have made distributed energy generation more accessible to a broader range of consumers and businesses, thereby augmenting market growth in coming years.

Additionally, the developed smart grid infrastructure in the United States has contributed to the surging distributed energy generation market in the country. Smart grids enable better integration of distributed energy resources (DERs), including solar panels, wind turbines, and energy storage systems, into the electrical grid. Advanced monitoring, control, and communication technologies facilitate the seamless integration and management of these distributed energy sources, allowing for efficient utilization of renewable energy and optimal grid operation. Hence, smart grids have played a pivotal role in facilitating the adoption of distributed energy generation.



In recent years, the United States has witnessed remarkable growth in its hydroelectric generation capacity. The country's ability to generate hydroelectric power has experienced a steep surge, indicating a notable increase in production capabilities. This surge signifies a rapid and significant expansion in the capacity to harness the power of water to generate electricity. According to U.S. Department of Energy Report 2021, by the end of 2019, there was almost a development pipeline of 217 Hydropower projects in the United States, adding 1,490 MW of capacity. The proposed capacity was primarily focused on powering non-powered dams (NPDs) and expanding existing facilities, accounting for approximately 93% of the total capacity. Hence, it can be delineated that a steep surge in hydroelectric generation capacity has indeed boosted market growth to a great extent.

Rise in the Capacity of Solar Power Generation

Solar energy has experienced significant growth in distributed energy generation in the United States. As distributed energy generation refers to the production of electricity at or near the point of consumption, often through smaller-scale renewable energy systems. Solar power has emerged as a leading source of distributed energy generation, owing to the modularity and scalability of solar power systems. Solar power systems can be easily scaled up or down to match specific energy requirements. They can range from small-scale residential installations to large utility-scale solar farms. This modularity allows for flexible deployment in various locations, making it well-suited for distributed energy generation.

Furthermore, the United States has a vast land area with diverse climates and ample sunlight in many regions. States like California, Arizona, Nevada, Texas, and Florida receive high levels of solar irradiation, making solar energy a particularly attractive option for generating electricity. These abundant solar resources enable the widespread adoption of solar power for distributed energy generation across the country. According to U.S. Solar Energy Industries Association, in 2022, the United States installed 20.2 gigawatts (GWdc) of solar photovoltaic (PV) capacity, resulting in a total installed capacity of 142.3 GWdc. Furthermore, the residential solar sector experienced a record-breaking year, with nearly 6 GWdc of installations, representing a remarkable 40% growth compared to 2021.

Government Initiatives

The United States government has made significant contributions to the growth of solar power in the country. Various federal initiatives, policies, and financial incentives have



been implemented to support and encourage the adoption of solar energy in the country.

Businesses, nonprofit organizations, and local and tribal governments have access to two tax credits specifically designed for them when they invest in solar energy systems. The Production Tax Credit (PTC) is a federal tax incentive available for renewable energy production, encompassing wind, biomass, geothermal, and hydropower. It offers a tax credit per kilowatt-hour of electricity generated by qualified renewable energy projects. Investment Tax Credit (ITC) allows for a reduction in federal income tax liability for a percentage of the solar system's cost that is installed within the tax year.

Moreover, by providing a stable and predictable financial incentive for renewable energy generation, PTC helped attract investors and spurred the development of solar and other qualifying technologies across the country. The PTC also supported the deployment of distributed energy generation projects, including solar installations, by making them more economically viable and competitive with traditional energy sources.

Impact of COVID-19

The Distributed Energy Generation market faced workforce challenges due to lockdowns, social distancing measures, and travel restrictions. Construction and installation activities were temporarily halted or limited, affecting the progress of distributed energy generation projects. Additionally, the shift to remote work and the need for safety protocols impacted the ability to carry out inspections, maintenance, and repairs.

However, the pandemic also created new opportunities for the distributed energy generation market. As governments and businesses look to stimulate economic recovery, there is growing recognition of the role that renewable energy and distributed energy generation can play in creating jobs, reducing carbon emissions, and enhancing energy security. Stimulus packages and recovery plans may include provisions and incentives to accelerate the deployment of distributed energy generation technologies. Hence from the above-mentioned statements it can be concluded that the COVID-19 pandemic had both positive and negative aspects on the market.

Key Players Landscape and Outlook

The distributed energy generation market in the United States is witnessing substantial expansion where the leading players of the country are emphasizing the importance of



quality and brand positioning to sustain their market share and expand their presence worldwide. These companies are allocating increased resources to research and development, technological advancements, marketing, and expanding their distribution networks. Moreover, leading companies in this market are working on enhancing the efficiency of energy generation systems like solar PV panels. This would allow them to distinguish themselves from the competitors and grab major market share.

In 2023, Trina Solar Co., Ltd introduced a new range of solar panels called the TOPCon series specifically designed for rooftop photovoltaic (PV) systems. The company announced that these solar panels incorporate a double-glass structure and utilize n-type technology. With an efficiency ranging from 20.8% to 22.3%, they are capable of producing a power output between 415 W and 445 W. This innovative design aims to improve the effectiveness of energy distribution in the region.



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- *Companies mentioned above DO NOT hold any order as per market share and can be



changed as per information available during research work

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