

**Vietnam 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**

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**Report description:**

Vietnam Distributed Energy Generation Market has been witnessing significant developments and is projected to reach USD 4.49 billion by 2030 from USD 1.99 billion in 2022 with a CAGR of 10.72% for the forecast period between 2023 and 2024. The country has abundant renewable energy resources, including solar, wind, biomass, and hydropower. These resources offer great potential for distributed energy generation. Solar energy is abundant due to the country's geographical location, which is utilized in floating solar photovoltaics (PVs).

Vietnam has recognized the potential of floating solar PV to contribute to the country's renewable energy goals and increase the share of distributed electricity generation. By harnessing solar energy on water surfaces, floating solar PV systems provide a localized electricity supply to the nearby communities and industries in Vietnam. This enhances energy access and reduces the dependence on centralized grid infrastructure, particularly in areas where grid connectivity may be limited.

For example, Da Mi Floating Solar PV Park located in Binh Thuan, Vietnam that has a capacity of 47.5MW. It involves the installation of a floating solar photovoltaic (PV) system on the surface of Tri An Reservoir in Dong Nai Province. The Tri An Floating Solar PV Park consists of thousands of solar panels mounted on floating platforms that are anchored to the reservoir. The panels harness solar energy and convert it into electricity. The project maximizes the use of the water surface area, allowing for the generation of clean and renewable energy without occupying valuable land resources.

Moreover, the floating solar PV park offers several advantages. First, it optimizes the use of the reservoir, which is associated with a hydropower plant, by utilizing the water surface for solar energy production. Second, it contributes to reducing greenhouse gas

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emissions and mitigating climate change by displacing fossil fuel-based electricity generation. Third, the shading effect of solar panels helps to reduce water evaporation from the reservoir, potentially preserving water resources. Hence, it can be stated clearly that floating solar PVs is augmenting the market growth extensively and is expected to continue over the years to come.

#### Rise in Installation of Stand-Alone Off-grid Solar Systems

Stand-alone systems serve as a form of distributed energy generation in Vietnam, particularly in areas where grid access is limited or unreliable. These systems provide localized power generation and can operate independently of the main electricity grid. Off-grid solar systems are widely deployed in rural and remote areas of Vietnam. They consist of solar panels, batteries for energy storage, charge controllers, and inverters. Solar panels capture sunlight and convert it into electricity, which is stored in batteries for later use. Off-grid solar systems are used to power residential homes, schools, healthcare centres, and community buildings in off-grid locations, providing essential electricity for lighting, appliances, and other basic energy needs.

As per Renewable Energy and Energy Efficiency Partnership (REEEP), the organization intends to leverage this strategy to create a workable business model that offers energy solutions to off-grid communities in Vietnam. This model would incorporate a financial framework that includes practical payback periods and repayment rates. Furthermore, this project effectively supplied two remote villages with 100 MWh of renewable electricity each year, resulting in an energy reduction of 42 MWh annually, valued at USD 12,000. Additionally, the project successfully contributed to an annual decrease of 20,000 tons of CO<sub>2</sub> emissions equivalent.

#### Increasing Hydropower Plant Installations

Vietnam has a long coastline and mountainous regions that provide excellent wind resources. Coastal areas have high wind speeds, making them ideal for wind power generation. The country's geographic features create favorable conditions for harnessing wind energy and have attracted investments in wind power projects. For example, GE Renewable Energy has installed South-East Asia's biggest hydropower plant namely Son La hydropower plant in the northwest of Hanoi, Vietnam. The 2400 MW Son La plant, has the capability to produce up to 10 billion kWh annually, establishing it as the largest hydropower plant in Southeast Asia. Moreover, GE installed six 400 MW Francis hydro turbine-generator units and provided plant engineering and auxiliary balance-of-plant components. Hence, it can be stated that the increase in the number of hydropower plant installations is augmenting the overall market growth at an exponential rate.

#### Government Schemes and Support

The Vietnamese government is currently focused on increasing of investments in distributed energy generation. As a result of which, the government, has launched many schemes to improve the efficacy of distributed energy generation in Vietnam. Vietnam's Ministry of Energy has unveiled its National Power Development Plan VIII, spanning from 2021 to 2030, with the goal of enhancing the country's energy security. The government intends to invest approximately USD 135 billion (USD 200 billion) in expanding power generation capacity and upgrading grid infrastructure. This plan includes initiatives to connect Vietnam's power network with neighboring countries, aiming to enhance the effectiveness of distributed energy generation throughout the country.

Additionally, the plan sets forth a vision for Vietnam to become a net exporter of energy by 2030, with electricity exports projected to range between 5 GW and 10 GW. The government aims for renewable energy sources to constitute over 70% of the country's energy mix by 2050. Hence, it can be stated that the rise in investments by the government towards the increase in efficacy of distributed energy generations is expediting the market growth effectively.

#### Impact of COVID-19

The COVID-19 pandemic has had both positive and negative impacts on the distributed energy generation market in Vietnam. On one hand, the pandemic has resulted in an economic slowdown, affecting investment activities and financing options for distributed energy projects. Uncertainty in the business environment and financial constraints have made it more challenging for developers to secure funding for renewable energy projects. On the other hand, the pandemic has emphasized the importance of reliable electricity supply for healthcare facilities, remote areas, and rural communities. This has created opportunities for distributed energy generation projects, such as solar microgrids and mini-hydropower systems, to provide electricity access to underserved regions.

Moreover, the Vietnamese govt has also announced that due to the pandemic they changed their policy adjustments and incentives in order to promote the development of distributed energy generation as part of the post-pandemic recovery efforts.

#### Key Players Landscape and Outlook

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The distributed energy generation market in Vietnam is witnessing substantial expansion, and leading firms emphasize the importance of quality, brand positioning, and safety regulations to sustain their market share and expand their presence worldwide. These companies are allocating increased resources to research and development on advanced technologies, marketing, and expanding their distribution networks. Manufacturers are actively studying consumer behavior to gain deeper insights into their requirements and continually introduce new products to meet those demands.

In April 2022, Boviet Solar revealed its intentions to undertake a rebranding of its solar modules, alongside a shift in focus towards new cell technologies. The company has expertise in producing monocrystalline PERC PV cells, along with both monofacial and bifacial modules. Currently, it is engaged in various research and development (R&D) initiatives in collaboration with three Vietnamese universities and one Chinese university.

In October 2021, IREX, a Vietnamese organization, introduced a brand-new glass-glass solar panel that offers an output power of 265 W as well as a power conversion efficiency of nearly 18.1%. Additionally, the organization noted that IREX utilizes specially designed glass with carefully calculated transparency for the solar PV modules. This approach aims to allow sunlight to pass through while effectively managing temperature and humidity levels. As a result, a consistent and uninterrupted energy distribution to the power plants is ensured.

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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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