Vietnam Smart Grid Market Assessment, By Network Area [Home Area Network, Neighborhood Area Network, Wide Area Network, Long Range Wide Area Network], By Components [Hardware, Software], By Application [Distribution Automation, Conservation Voltage Reduction, Substation Automation, Advanced Metering Infrastructure, Others], By Region, Opportunities and Forecast, 2017-2031F

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Report description:

Vietnam smart grid market is projected to witness a CAGR of 18.4% during the forecast period 2024-2031, growing from USD 0.42 billion in 2023 to USD 1.63 billion in 2031. The market is growing due to the proactive initiatives undertaken by the government to modernize its electrical infrastructure with a focus on sustainability and efficiency. These ambitions lie in Vietnam's ambitious targets, decreasing the intensity of carbon emissions by 20% by 2030 and 45% by 2050, emphasizing its commitment to environmental responsibility.

On September 5, 2023, Vietnam presented its comprehensive scheme on smart grid development from 2023 to 2030, with a vision extending to 2045, under Report No. 6068/TTr-BCT of the Ministry of Industry and Trade, to the Prime Minister. The strategic roadmap capitalizes on Vietnam's progress in reducing electricity loss rates from 8.85% in 2012 to 6.24% in 2022, indicating drastic improvements in grid efficiency. The scheme includes various critical targets aimed at transforming Vietnam's energy landscape by enhancing grid digitalization, broadening advanced metering infrastructure, upgrading the ability in distribution automation, and encouraging the application of efficient demand response systems. Such initiatives are critical in optimizing power generation, transmission, and consumption in the country.
Furthermore, investments in renewable energy sources, such as solar and wind, drive the need for smart grids to integrate and handle fluctuating energy inputs effectively. Growing urbanization and industrialization boost demand for reliable electricity supplies, necessitating smart grid technologies to maintain grid stability and resilience. The evolution of technologies in areas

including IoT, data analytics, and AI empowers smarter monitoring, control, and optimization of energy distribution.
With strong government policies and massive investment, the smart grid sector is gaining drastic attention in Vietnam from domestic stakeholders, international technology providers, and investors. However, with the problems persisting in regulatory complexities and financial constraints, Vietnam stays undeterred in its quest for energy security and sustainability through innovative smart grid solutions.

Harnessing Grid-Forming Inverter Technology for Vietnam's Smart Grid Future

The introduction of grid-forming inverter technology in the Vietnam smart grid market represents opportunities with profound implications. It enables power electronics to emulate inertia as traditionally provided by synchronous generators, which is critical in maintaining grid stability as Vietnam targets a future of 100% renewable energy.
Grid-forming inverter technology, which holds a promising opportunity in Vietnam, has already been successfully piloted in Vietnam with storage systems. Advanced technologies make the integration of solar and wind renewable energy sources much smoother, significantly improving grid stability during variable energy inputs. Grid-forming inverter technology improves operational reliability and reduces dependence on fossil fuels, thereby helping to address Vietnam's goals about sustainable energy. Moreover, the technology is expected to drive much-needed investment in smart grid infrastructure, energy storage solutions, and advanced control systems. In developing the country's energy sector, the technology pushes economic growth and fosters job creation and technological innovation. At the forefront of regional energy transformation, Vietnam embraces grid-forming inverter technology in line with the global trends toward sustainable energy solutions.

Vietnam's Renewable Milestones Drive Market Growth

The smart grid market in Vietnam is growing at a robust pace, driven largely by proactive government initiatives aimed at modernizing the energy sector. In 2024, the government introduced Vietnam's Power Development Plan 8 (PDP8), which sets ambitious targets for augmenting electricity generation from renewable sources. The plan serves as a comprehensive roadmap for Vietnam's electricity sector till 2030 and beyond, till 2050. Vietnam aims to raise its renewable energy output to around 186 billion kWh by 2030 from the present levels, resulting in a sharp transition toward sustainable energy solutions. The program contributes to cutting the country's carbon emissions and promote the uptake of smart grid technologies.
To achieve these targets, Vietnam intends to increase the renewable energy share of electricity mix to 26 percent by 2030 and more than 60 percent by 2050. Smart grids are an intrinsic element in enabling the integration of variable renewable sources, such as wind and solar, into the national grid while keeping stable and efficient distribution. The focus on renewable energy and smart grid technologies helps Vietnam's environment and stimulates investment in advanced grid infrastructure, thereby driving the smart grid market in the forecast period.

Market Expansion with Advanced WAMS Integration

In a country like Vietnam, which is undergoing rapid urbanization and industrialization, grid stability is essential. Integration of the Wide Area Monitoring System (WAMS) is instrumental in improving grid reliability and performance. WAMS extends monitoring capabilities to both the 500 kV and critical 220 kV networks to enable comprehensive oversight of voltage stability, oscillation detection, and overall network health. Thus, sophisticated monitoring becomes crucial for understanding the risks associated with growing energy demand and infrastructure expansion in the country.
Moreover, WAMS strengthens Vietnam's energy infrastructure and pushes the smart grid market further by ensuring a more resilient and efficient grid system. Therefore, such technological progress supports the goals of sustainable development through the optimization of energy distribution, operational efficiency, and reduction of downtime owing to grid disturbances. With Vietnam embracing smart grid solutions, WAMS provides the benchmark for accelerating the application of smart grid technologies countrywide.

Smart Grid Expansion Across Regions to Drive Market Demand

The market is growing phenomenally, primarily driven by strategic developments across different regions. Each region is aiming to harness smart grid technologies to meet the growing energy demands effectively with sustainability. For instance, Tropical Vietnam, full of sunlight year-round, forecasts the capacity of solar power generation to be 4,100 MW by 2030, with its elements of land and sea solar farms, together with the promotion of rooftop production all over the country. Besides the reduction of carbon emissions and environmental sustainability, these initiatives are instrumental in increasing the adoption of smart grid technologies across each region. The smart grid market in Vietnam is growing fast, driven by active government policies and

increasing investments in renewable energy infrastructure. The growth scenario underscores Vietnam's emerging role in the adoption and deployment of smart grid technologies in Southeast Asia.
Future Market Scenario (2024 - 2031F)
-Upgradation of SCADA/EMS/DMS systems at national dispatch, regional dispatch, and sub-ordinate dispatch levels shall result in enhanced monitoring and control capabilities in the grid.
-A model between Transmission System Operators (TSO) and Distribution System Operators (DSO) for coordination in managing distributed energy resources to foster grid stability and efficiency.
-Two-way communication in smart meters will be deployed and demand response programs integrated to optimize energy consumption are expected to increase the reliability of the grid.
-Advanced algorithms for frequency regulation, integration of Microgrid and HVDC technologies, and AI and big data solutions will improve grid flexibility and cybersecurity measures.
Key Players Landscape and Outlook
In recent years, the landscape of the Vietnam smart grid market has become increasingly collaborative, with a blend of international and local stakeholders driving innovation. Multinational corporations are leveraging their global experience to provide cutting-edge technologies and smart grid solutions tailored to Vietnam's unique challenges.
In September 2022, Industrial University of Ho Chi Minh City inaugurated the country's first university Smart Grid Lab, powered by ABB solutions. The state-of-the-art facility aims to educate and train 350 students yearly from the electrical, electronics, control, and automation faculties. The lab provides a real-time visualization of power grid operations, offering students a hands-on experience to tackle future power network challenges effectively. This move underscores the strong academic-industry partnership in preparing the next generation of professionals equipped to address Vietnam's evolving energy landscape.

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