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UAE Smart Grid Market Assessment, By Network Area [Home Area Network (HAN), Neighbourhood Area Network (NAN), Wide Area Network (WAN), and Long-Range Wide Area Network (LoRaWAN)], By Components [Hardware and Software], By Technology [Distribution Automation, Conservation Voltage Reduction (CVR), Substation Automation, and Advanced Metering Infrastructure (AMI)], By Application [Generation, Transmission, Distribution], By Region, Opportunities, and Forecast, 2016-2030F

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Abstracts

The Smart Grid Market in the UAE has been experiencing noteworthy advancements and is anticipated to reach a value of USD 2.68 billion by 2030, reflecting substantial growth from USD 1.47 billion in 2022, at a CAGR of 7.82% during the forecast period.

The UAE has been at the forefront of adopting and implementing smart grid technologies. A smart grid refers to an advanced electrical grid that incorporates digital communication and automation to enhance efficiency, reliability, and sustainability. The UAE's driving factors for embracing smart grids include the need to diversify their energy mix, reduce dependency on fossil fuels, enhance grid resilience, and promote renewable energy integration. Moreover, the government has launched various smart grid strategies and invested in infrastructure to support smart grid development.

Smart grid strategies are essential in the UAE to enhance energy efficiency, optimize grid operations, integrate renewable energy sources, and ensure a reliable and resilient

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electricity infrastructure. These strategies support the country's sustainability goals, reduce carbon emissions, and foster a more efficient and sustainable energy future.

For example, DEWA's (Dubai Electricity and Water Authority's) Smart Grid Programme, with an investment of USD 1.91 billion, is aligned with the UAE government's vision of transforming Dubai into the world's happiest and smartest city. This program plays a vital role in DEWA's strategy to develop advanced infrastructure, supporting the Dubai Clean Energy Strategy 2050 and Dubai Net Zero Emissions Strategy 2050. DEWA initially established its Smart Grid strategy in 2014, extending it until 2035, and has successfully achieved its short-term goals. In 2021, DEWA launched an updated smart grid strategy focusing on value-driven approaches and consolidating their 10 smart grid programs into six themes with 19 globally leading smart grid capabilities. Consequently, smart grid strategies play a pivotal role in expediting the smart grid market in the UAE.

Focus on Utilizing Smart Grid Technologies

The UAE has been actively developing renewable energy projects with a focus on utilizing smart grid technologies. These projects aim to enhance the integration and efficiency of renewable energy sources into the electrical grid.

For example, On December 22, 2021, Abu Dhabi National Energy Company (TAQA) announced a significant renewable energy project targeting the reduction of carbon emissions from Abu Dhabi National Oil Company's (ADNOC) offshore production operations, supporting UAE's net-zero goals by 2050. In September 2022, TAQA successfully reached the financial close for this USD 3.8 billion project, establishing connections with offshore centralized power hubs through HVDC subsea transmission lines. This enables ADNOC's offshore facilities to directly import electricity from TRANSCO's onshore national power grid, with an expected 30% reduction in carbon footprint for ADNOC's offshore operations.

Installation of Smart Meters

The UAE has been actively installing smart meters as part of its efforts to modernize and optimize the energy infrastructure. Smart meters provide two-way communication between consumers and utilities, allowing for real-time monitoring of energy consumption and efficient billing processes. They enable consumers to track their energy usage, make informed decisions, and potentially reduce energy costs. Smart meters also facilitate the integration of renewable energy sources, demand response

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programs, and grid optimization. Additionally, the deployment of smart meters in the UAE fosters energy efficiency, grid reliability, and contributes to the country's transition to a more sustainable and digitally advanced energy sector.

According to DEWA, Dubai's population currently benefits from 2.1 million smart electricity and water meters, a substantial increase from the initial 200,000 meters installed during the first phase completed in January 2016. Furthermore, under the guidance of visionary leaders, the Dubai Electricity and Water Authority (DEWA) is steadfast in developing an advanced infrastructure that incorporates cutting-edge technologies from the Fourth Industrial Revolution. DEWA's objective is to establish a smart and interconnected grid system to efficiently manage facilities and services, aligning with the city's vision for a technologically advanced and sustainable future.

Government Regulations

Government regulations play a vital role in the development and operation of smart grids in the UAE. They ensure interoperability among different smart grid components and promote fair market practices. By establishing clear regulatory frameworks, the government can foster innovation, attract investments, and facilitate the seamless deployment of smart grid solutions. These regulations also help in achieving the UAE's energy goals, promoting sustainable development, and ensuring a reliable and resilient energy infrastructure for the future.

For example, on December 22nd, 2022, the UAE introduced a federal law governing the connection of distributed renewable energy units to the national electrical grid, aimed at increasing the proportion of clean energy in the overall power mix and reducing the carbon footprint. The Ministry of Energy and Infrastructure highlighted that the law also targets the reduction of electricity demand during peak periods from distribution networks. Moreover, the legislation allows distributed generation units, when connected to the electric utility's lower voltage distribution lines, to supply clean power to more customers and minimize electricity losses along transmission and distribution lines. The introduction of this law demonstrates the UAE's commitment to expanding clean energy usage and enhancing the efficiency and sustainability of its electrical grid.

Impact of COVID-19

The COVID-19 pandemic had both immediate and long-term impacts on the UAE's smart grid sector. In the short term, the pandemic disrupted supply chains, delayed project timelines, and hindered the deployment of smart grid technologies. The strict

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lockdown measures and restrictions on movement also affected the ability to conduct maintenance and fieldwork. However, the pandemic has also highlighted the importance of smart grid infrastructure in ensuring resilient and reliable energy systems. The UAE has recognized the need to invest in digital technologies and automation to enhance grid resilience and enable remote monitoring and control.

Moreover, the pandemic has accelerated the adoption of digital solutions, such as remote asset management and virtual inspections. Furthermore, the increased reliance on remote work and digital platforms during the pandemic has emphasized the role of smart grids in enabling flexible and efficient energy management. Hence, it can be stated that overall, the COVID-19 pandemic has underscored the significance of smart grid technologies in building a more resilient and sustainable energy future for the UAE.

Key Players Landscape and Outlook

The smart grid market in the UAE is experiencing significant growth as organizations recognize the significance of smart grid infrastructure in ensuring grid stability. These organizations are strategically positioning themselves to maintain market share and explore international expansion prospects. They are allocating resources towards technological advancements in smart grid systems, energy resilience, research and development, and fostering collaborations to promote the installation of smart devices. Additionally, they are investing in utility-scale hydrogen plants and expanding distribution networks through notable mergers, acquisitions, and joint ventures.

In October 2022, the Emirates Nuclear Energy Corporation (ENEC) and its operations and maintenance subsidiary, Nawah Energy Company (Nawah), collaborated with Abu Dhabi Transmission & Despatch Company (TRANSCO), a subsidiary of Abu Dhabi National Energy Company (TAQA), to establish the connection of Unit 3 of the Barakah Nuclear Energy Plant to the UAE grid. This successful collaboration marked a milestone achievement, dispatching the plant's first megawatts of carbon-free electricity to the nation.

In June 2022, DEWA (Dubai Electricity and Water Authority) introduced an Automatic Smart Grid Restoration System (ASGR) in the UAE, aimed at enhancing control, management, and monitoring of the power network. The ASGR operates autonomously 24/7, eliminating the need for human intervention, and utilizes an intelligent centralized system to detect faults, isolate them, and automatically restore disrupted service.

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