170 kWh smart grid

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The global smart grid market size was USD 40.61 billion in 2023. The market is projected to grow from USD 49.21 billion in 2024 to USD 203.92 billion by 2032 at a CAGR of 19.45% during the forecast period.

Attributed to the COVID-19 pandemic, various industries and countries were left in economic turmoil. Many projects have been considerably disrupted owing to the shutdown of industrial facility chains, disturbance in supply chain analysis, and the unavailability of ample funds among customers.

Energy companies must continually develop production facilities in which complex and injury-prone business processes are automated, and control and decision-making are performed remotely. This requires social sanitation requirements in the current energy economy, which has become more complicated because of the COVID-19 crisis that has added concerns to the global energy crisis.

The substantial decline in smart meter installations in 2020 could be attributed to the economic downturn caused by COVID-19 pandemic. Moreover, the sharp recovery of the market in 2021 is a result of the investment and the economy recovery in many leading countries. In addition, investment in infrastructure increased in 2021 after the decline in 2020. The 2020 drop could be attributed to economic stagnation at the peak time of the COVID-19 pandemic, with post-pandemic investment recovery.

This type of grid can have millions or even billions of possible connections, from microgrid generators to smart meters. Storing such huge data sets comes with its own set of challenges. Some of them include dependence on Internet-based technology, such as the Internet of Things and smart grid-connected devices that can make power grids prone to hacking and cyber-attacks. This challenge became apparent in May 2021 when the Colonial Pipeline fell into the hands of hackers demanding a ransom, cutting off fuel from half of the U.S. East Coast.

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Several governments have made smart meters a central part of national energy policies. Most of them are designed to improve energy efficiency and reduce CO2 emissions. Some governments have required nationwide deployment (e.g., the U.K.). Some governments have also encouraged green technologies, including the introduction of smart meters, in the hope that they will create jobs and offset the global recession. With the support of smart meters, utility companies can reduce the amount of non-technical transmission and distribution losses (T& D) (electricity theft, billing errors, and others). In developing countries, protection offered by the smart meters can be a determining factor for its adoption as the loss of electricity due to theft is high.

On November 14th, 2023, the Biden-Harris administration announced that up to USD 3.9 billion is available

for fiscal years 2024 and 2025 through the second round of the Grid Resilience and Innovation Partnerships (GRIP) funding opportunity. Successful projects use federal funding to maximize deployment for grid infrastructure at scale and leverage private sector and non-federal public capital to advance deployment goals.

On October 18th, 2023, the U.S. Department of Energy announced investments of up to USD 3.46 billion in 58 projects in 44 states under the GRIP (Grid Resilience and Innovation Partnerships) program to strengthen the resilience and reliability of the electric grid throughout America. This program includes 34 projects selected through Smart Grid Grants.

Smart grid infrastructure is essential in the transition to a low-carbon electricity grid that includes intermittent renewable energy production, such as solar, wind, and smaller DER grids. As more governments demand decarbonization of the energy sector, utilities are turning to the product to ensure net-zero targets.

For example, Canada, through the Department of Natural Resources, launched its Renewable Energy and Electrification Pathways (SREP), a four-year, USD 795 million program to support the deployment of smart grid technologies. The aim is to expand its range of renewable energy sources to reduce and modernize carbon dioxide emissions. The program enables the introduction of next-generation and smart goods. Canada"s natural resources minister, Seamus O"Regan Jr. commented on the development that the new SREP program will increase the renewable capacity of the country"s grid and improve its reliability and sustainability. This means a cleaner and more reliable electricity supply for Canadians. Moreover, Canada"s goal is to achieve net zero by 2050.

Based on end-user, the smart grid market is categorized into utility, industrial, residential, and commercial.

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