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Building-to-Grid Technology Market By Platform (Smart Sensing, Smart Metering, Control Technology, Energy Storage, Others), By Component (Hardware, Software, Service), By End-Use (Commercial, Industrial, Residential): Global Opportunity Analysis and Industry Forecast, 2025-2034

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Abstracts

The global building-to-grid technology market was valued at $54.9 billion in 2024, and is projected to reach $147.8 billion by 2034, growing at a CAGR of 10.5% from 2025 to 2034.

Introduction

Building-to-Grid (B2G) technology refers to the integration of buildings with energy systems, allowing them to both consume and supply power to the larger electricity grid. This system goes beyond traditional building energy management systems (BEMS) by enabling bidirectional energy flow between the building and the grid. Through this technology, buildings not only use electricity but also store, generate, and release energy back into the grid when necessary. B2G technology leverages smart meters, energy storage systems, renewable energy sources, and advanced communication networks to optimize energy use and contribute to grid stability. By synchronizing building energy needs with grid demands, B2G can improve energy efficiency, reduce costs, and enhance the resilience of the power grid.

Most B2G systems are powered by renewable energy sources, such as solar or wind. These systems allow buildings to generate electricity locally, reducing reliance on the central grid. Solar photovoltaic (PV) panels are a common solution in B2G applications,

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as they provide clean energy, reduce operational costs, and allow for grid contribution during peak generation times. Battery storage systems, like lithium-ion batteries or advanced storage technologies, play a crucial role in the B2G ecosystem. They store excess energy produced by the building when generation exceeds demand, and then discharge it when the building's energy needs surpass its production or during peak demand periods for the grid.

Market Dynamics

An increase in demand for resilient infrastructure is expected to drive the growth of the building-to-grid technology market. B2G systems enable buildings to maintain power supply even when the external grid is unavailable. Through the integration of distributed energy resources (DERs) such as solar panels, batteries, and microgrids, buildings can produce, store, and consume their own electricity, essentially becoming self-sufficient during outages. For instance, a building with solar panels and a battery storage system can continue to operate critical functions, such as lighting, heating, and cooling, even when the grid goes down, providing a safety net for residents, businesses, and essential services. In October 2023, the Odisha government allocated ?2,000 crore to develop disaster-resilient infrastructure. The plan includes establishing regional disaster response hubs and creating disaster management plans for over 10,000 vulnerable villages, aiming to strengthen the state's resilience to natural disasters.

However, the high initial investment in building-to-grid technology is expected to hamper the growth of the building-to-grid technology market. High initial investment remains one of the most significant barriers to the widespread adoption of Building-to-Grid (B2G) technology. Transitioning to a B2G-compatible infrastructure requires substantial capital outlay for both hardware and software components. This includes installing smart meters, advanced building automation systems, IoT-enabled sensors, energy storage solutions such as batteries, and software platforms for energy management and grid communication. Each of these components involves not only procurement costs but also expenses related to integration, calibration, and ongoing maintenance. For many building owners those managing older infrastructure, the cost of retrofitting can be particularly high. Legacy systems often lack the digital interfaces or energy-efficient frameworks necessary for B2G participation, requiring extensive upgrades or even complete overhauls. Additionally, implementing energy storage systems, a core component for maximizing B2G functionality, can be cost-prohibitive due to the high prices associated with batteries and their installation.

Segments Overview

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The building-to-grid technology market is segmented into platform, component, end-use, and region. On the basis of platform, the market is divided into smart sensing, smart metering, control technology, energy storage, and others. As per component, the building-to-grid technology market is categorized into hardware, software, and service. Depending on end-use, the building-to-grid technology market is divided into commercial, industrial, and residential. Region-wise, the market is divided into North America, Europe, Asia-Pacific, and LAMEA.

On the basis of platform, the smart metering segment dominates the building-to-grid technology market accounting for more than one fourth of the market share in 2024. Building-to-grid smart metering supports demand-side management and distributed energy resource (DER) integration. For example, during peak load times, a building can reduce its energy consumption or shift it to off-peak periods based on signals from the grid. In return, the building may receive incentives or lower tariffs. Smart meters play a key role in this interaction by providing granular data that utilities and building energy management systems can use to make informed decisions.

On the basis of end-use, the commercial segment dominated the building-to-grid technology market growing with the CAGR of 10.4% during the forecast period. In commercial industries, building-to-grid technology plays a crucial role in enhancing operational efficiency and reducing energy costs. Businesses can leverage real-time data analytics and automation to optimize their energy usage based on grid signals, pricing models, and occupancy levels. For instance, during peak demand periods, a commercial facility can reduce non-essential power usage or draw energy from on-site batteries, thus minimizing strain on the grid and avoiding high tariffs. Such capabilities are particularly valuable in energy-intensive sectors such as data centers, manufacturing, and large-scale retail, where even minor efficiency gains can lead to significant financial savings.

Region wise, Asia-Pacific dominated the building-to-grid technology market, representing the CAGR of 10.9% during the forecast period. Building-to-Grid (B2G) technology, which facilitates two-way energy and data exchange between buildings and the power grid, is gaining traction across Asia-Pacific as countries pursue decarbonization and energy efficiency goals. Japan’s Ministry of Economy, Trade and Industry (METI) is experimenting with blockchain-based energy trading among buildings, supporting peer-to-grid models, a next step beyond basic B2G. South Korea’s approach to B2G stands out for its emphasis on artificial intelligence and real-time data analytics. The Seoul Metropolitan Government has partnered with tech firms

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to develop AI-powered building energy management platforms that autonomously adjust lighting, HVAC, and appliance loads in response to grid signals. South Korea is also exploring the integration of B2G into its urban planning policy, making it a requirement for newly constructed “Zero Energy Buildings” by 2030.

Competitive Analysis

The key players operating in the building-to-grid technology market include Siemens AG, Schneider Electric, ABB Ltd., General Electric, Honeywell International Inc., Landis+Gyr Group AG, Enphase Energy, S&C Electric Company, Itron Inc, and Oracle.

In April 2025, South Korea has expanded its ZEB requirements to include all public buildings starting in 2024 and private buildings over 1,000 m? by 2025. The goal is to convert all public sector buildings to ZEB grade 3 (60%–80% energy independence) and all private buildings to ZEB grade 5 (20%–40% energy independence) by 2030.

In May 2025, Octopus Energy, through its AI platform Kraken, manages smart energy consumption, grid balancing, and consumer interactions using real-time data. Kraken now supports 70 million customers globally and aims for 100 million by 2027, with the potential to reach a billion. Octopus's AI-driven innovations include the "Zero Bills" project, allowing homeowners to live with no energy costs by leveraging green tech and detailed consumption analytics.

Key Benefits For Stakeholders

This report provides a quantitative analysis of the market segments, current trends, estimations, and dynamics of the building-to-grid technology market analysis from 2024 to 2034 to identify the prevailing building-to-grid technology market opportunities.

The market research is offered along with information related to key drivers, restraints, and opportunities.

Porter's five forces analysis highlights the potency of buyers and suppliers to enable stakeholders make profit-oriented business decisions and strengthen their supplier-buyer network.

In-depth analysis of the building-to-grid technology market segmentation assists to determine the prevailing market opportunities.

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Major countries in each region are mapped according to their revenue contribution to the global market.

Market player positioning facilitates benchmarking and provides a clear understanding of the present position of the market players.

The report includes the analysis of the regional as well as global building-to-grid technology market trends, key players, market segments, application areas, and market growth strategies.

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Product Benchmarking / Product specification and applications

Product Life Cycles

Upcoming/New Entrant by Regions

Technology Trend Analysis

Market share analysis of players by products/segments

New Product Development/ Product Matrix of Key Players

Patient/epidemiology data at country, region, global level

Regulatory Guidelines

Additional company profiles with specific to client's interest

Additional country or region analysis- market size and forecast

Historic market data

Import Export Analysis/Data

Key player details (including location, contact details, supplier/vendor network etc. in excel format)

List of customers/consumers/raw material suppliers- value chain analysis

SWOT Analysis

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Key Market Segments

By Component

- Hardware
- Software
- Service

By Platform

- Smart Sensing
- Smart Metering
- Control Technology
- Energy Storage
- Others

By End-Use

- Commercial
- Industrial
- Residential

By Region

- North America
  - U.S.

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- Canada
- Mexico

Europe

- Germany
- France
- UK
- Spain
- Italy
- Rest of Europe

Asia-Pacific

- China
- India
- Japan
- South Korea
- Australia
- Rest of Asia-Pacific

LAMEA

- Brazil
- South Africa
- Saudi Arabia

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Rest of LAMEA

Key Market Players

ABB Ltd.

General Electric

Landis+Gyr Group AG

Enphase Energy

Itron Inc.

Oracle

Schneider Electric

Honeywell International Inc.

S&C Electric Company

Siemens AG

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