

Green Power Global Market Insights 2025, Analysis and Forecast to 2030, by Market Participants, Regions, Technology, Application

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Abstracts

Green Power Market Summary

Introduction to the Green Power Industry

Green power encompasses electricity generated from renewable sources, including solar, wind, hydropower, bioenergy, geothermal, and marine energy, offering a low-carbon alternative to fossil fuels. With global renewable capacity reaching 4,448 GW in 2024, per IRENA, solar (1,865 GW) and wind (1,133 GW) dominate, accounting for 96.6% of new additions. Green power serves industrial, commercial, and residential sectors, driven by decarbonization policies, cost declines in solar and wind, and rising energy demand. The industry benefits from technological advancements, such as high-efficiency solar panels and offshore wind, but faces challenges from grid integration, land use conflicts, and intermittency, necessitating storage and smart grid solutions.

Market Size and Growth Forecast

The global green power market is projected to reach USD 1.2 trillion to USD 1.4 trillion by 2025, with an estimated CAGR of 8% to 10% through 2030, fueled by policy mandates and renewable technology advancements.

Regional Analysis

Asia Pacific expects a growth rate of 9% to 11%. China leads with massive solar and wind additions, while India and South Korea accelerate renewable deployments through subsidies.

North America anticipates a growth rate of 7% to 9%. The U.S. drives growth with solar and wind projects, supported by federal tax credits and state renewable mandates.

Europe projects a growth rate of 7% to 9%. Germany and the UK prioritize offshore wind and solar, aligning with EU's 2030 climate goals.

South America expects a growth rate of 5% to 7%. Brazil's hydropower and wind sectors grow, though grid constraints limit scalability.

Middle East and Africa anticipate a growth rate of 4% to 6%. The UAE and South Africa invest in solar, but funding gaps hinder broader adoption.

Application Analysis

Industrial: Projected at 8% to 10%, driven by energy-intensive sectors like manufacturing adopting renewables for cost savings and emissions compliance.

Commercial: Expected at 7% to 9%, used in offices and retail for green certifications, with rooftop solar gaining traction.

Residential: Anticipated at 6% to 8%, supported by home solar systems and community wind projects, with affordability driving adoption.

Key Market Players

Exelon: A U.S. leader, Exelon focuses on renewable utilities and grid integration.

Duke Energy: A U.S. firm, Duke invests in solar and wind projects.

NextEra Energy: A U.S. company, NextEra excels in wind and solar generation.

Southern: A U.S. player, Southern expands renewable portfolios.

Dominion Energy: A U.S. firm, Dominion prioritizes offshore wind.

EDF: A French company, EDF drives solar and wind in Europe.

Rosatom: A Russian player, Rosatom supports renewable energy projects.

Engie SA: A French firm, Engie focuses on green power solutions.

Public Service Enterprise: A U.S. company, PSEG invests in solar and wind.

FirstEnergy: A U.S. player, FirstEnergy supports renewable utilities.

CNNC: A Chinese firm, CNNC integrates renewables with nuclear.

Porter's Five Forces Analysis

Threat of New Entrants: Moderate. High capital costs and regulatory hurdles create barriers, but declining solar and wind costs enable new players like CNNC in emerging markets. Established firms like NextEra Energy leverage scale and grid access, limiting entrants' impact.

Threat of Substitutes: Moderate. Fossil fuels and nuclear energy compete, but renewables' cost declines and policy support reduce their appeal. Green hydrogen and storage solutions challenge standalone renewables, pushing EDF to integrate hybrid systems.

Bargaining Power of Buyers: High. Industrial and commercial buyers negotiate due to abundant renewable suppliers and government incentives. Residential customers have less leverage, but utilities like Exelon face pressure to offer competitive green tariffs.

Bargaining Power of Suppliers: Moderate. Suppliers of solar panels, wind turbines, and grid equipment influence costs, but diversified sourcing by Duke Energy mitigates risks. Specialized offshore wind components grant some supplier power.

Competitive Rivalry: High. NextEra Energy, EDF, and CNNC compete on capacity, cost, and innovation, with rapid solar and wind deployments driving R&D. Regional players like Engie SA leverage local policies, intensifying global rivalry.

Market Opportunities and Challenges

Opportunities

Renewable Capacity Growth: The 4,448 GW renewable capacity in 2024 drives demand, benefiting NextEra Energy's wind and solar projects.

Policy Mandates: EU's 2030 targets and U.S. tax credits favor EDF's renewable expansion.

Cost Declines: Falling solar and wind costs enhance affordability, supporting Duke Energy's mass-market adoption.

Offshore Wind: Europe's offshore wind boom creates niches for Dominion Energy's coastal projects.

Emerging Markets: India's solar push offers export potential for CNNC, leveraging scale.

Grid Modernization: Smart grids enhance renewable integration, favoring Exelon's utility solutions.

Corporate Sustainability: Industrial demand for green certifications drives Engie SA's commercial contracts.

Challenges

Grid Integration: Intermittency strains grids, impacting Southern's renewable scaling.

Land Use Conflicts: Wind and solar projects face opposition, challenging FirstEnergy's deployments.

Raw Material Shortages: Silicon and rare earths constrain supply, pressuring EDF's solar growth.

High Initial Costs: Capital-intensive projects deter investment, impacting Rosatom in developing regions.

Policy Uncertainty: Shifting subsidies in South America hinder PSEG's

planning.

Storage Dependency: Limited long-duration storage pressures Duke Energy to invest in PHS.

Regulatory Complexity: Diverse global standards raise compliance costs for CNNC.

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