

Renewable Energy Market, By Type [Solar Energy, Wind Energy, Hydroelectric Energy, Geothermal Energy, Others], By Application [Residential, Commercial, Industrial, Others], By Sales Channel [Direct, Channel], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

Global renewable energy market was valued at USD 931 billion in 2022, which is expected to reach USD 2179.7 billion in 2030. Owing to the drop in the demand for fossil fuels and the viability of a more sustainable and greener energy future, the need for a renewable energy market is expanding worldwide. Technological improvements in energy storage offer plenty of room for expansion, thereby, the market is expected to grow at a robust CAGR of 11.22% for the forecast period between 2023 and 2030. Moreover, the market is driven by rising energy demand due to population growth, economic development, and increased volatility of fossil fuel prices. The main propelling factors of the market are favorable government policies, increased usage of green energy, and falling prices for solar cells and wind turbine installations. As the world grapples with the challenges of climate change, the volatility and unpredictability of fossil fuel costs are likely to drive the global renewable energy will continue to expand and play an important role in global renewable energy in the coming years.

Transformative Role of Technology in Renewable Energy Expansion

Technological developments are contributing significantly to the growth of the worldwide green energy industry. Renewable energy methods such as solar, wind, and hydropower are becoming more efficient, cost-effective, and available as technology



advances. For instance, solar photovoltaic (PV) technology has greatly decreased the cost of solar panels, making solar electricity more accessible for households and businesses. Similarly, wind turbine design and manufacturing improvements have resulted in greater efficiency and lower wind energy expenses.

India and the United States have jointly inaugurated the Renewable Energy Technology Action Platform (RETAP) as part of their Strategic Clean Energy Partnership. This initiative, held in August 2023, between India's Ministry of New and Renewable Energy and the US Department of Energy, is geared towards strengthening bilateral cooperation in renewable energy. RETAP adopts a technology-driven and timesensitive approach to achieve its objectives. RETAP's primary area of focus encompass green hydrogen, wind energy, and long-duration energy storage solutions. Furthermore, the platform will actively explore opportunities in geothermal and ocean/tidal energy, along with other emerging technologies within the renewable energy sector, thus broadening the horizons of renewable energy avenues.

Cost Reductions Drive Renewable Energy Affordability and Adoption

Over the past decade, advancements in manufacturing, materials, and economies of scale have significantly reduced the production costs of renewable energy equipment. For instance, solar photovoltaic (PV) technology has experienced a sharp drop in the cost of solar panels, making solar-generated electricity more affordable and competitive with conventional fossil fuels. This cost reduction is driven by improvements in solar cell efficiency, streamlined production processes, increased market competition, and government incentives that promote adoption. These cost reductions have made renewable energy technologies more environmentally sustainable and economically viable, attracting increased investments and expediting the shift towards a cleaner and more sustainable global energy landscape. In 2021, renewable energy costs continued to decline, with full impact of supply chain challenges and increasing commodity prices realized in project expenses. Specifically, the cost of onshore wind power decreased by 15%, offshore wind by 13%, and solar photovoltaic (PV) energy by 13%, compared to the rates observed in 2020.

Government-led Initiatives

Governments of many nations are spreading awareness about the importance of renewable energy sources to reduce carbon pollution and fight climate change. This has increased investment in renewable energy, and the market is anticipated to expand further in the coming years. Government initiatives have played a significant part in



propelling this development. Many nations have adopted renewable energy policies, such as feed-in tariffs, tax rebates, and renewable portfolio requirements. For instance, to end carbon dioxide emissions before 2030 and achieving carbon balance by 2060, China has set a target for total installed wind and solar power capacity to achieve 1,200 gigawatts (GW) by 2030, nearly doubling the 635GW capacity in place at the end of last year.

Hydroelectric's Significance in Shaping the Market Worldwide

Hydroelectric energy occupies a prominent position within the global renewable energy landscape, constituting a substantial share that surpasses the collective contributions of wind, solar, and geothermal energy sources. This preeminence is attributed to its wellestablished infrastructure, reliability, and consistent power generation capabilities, rendering it as a cornerstone of low-carbon electricity production and a crucial agent in combating climate change.

Hydroelectric power is indispensable in generating low-carbon electricity, representing nearly half the global total. Its output exceeds nuclear energy by 55% and surpasses the combined production of all other renewable sources, including wind, solar photovoltaic, bioenergy, and geothermal. In 2020, hydroelectric power contributed 17% in the global electricity generation mix, ranking as the third-largest energy source following coal and natural gas. Despite a 70% increase in global capacity over the past two decades, hydroelectric energy's share of the overall electricity generation has remained relatively stable, primarily due to concurrent wind, solar photovoltaic, coal, and natural gas growth.

Pioneering Nations in Renewable Energy Adoption

Several regions worldwide are taking proactive steps towards embracing renewable energy sources. Europe, home to significant players such as Germany, Denmark, and Spain, has made substantial strides in adopting renewable energy technologies. Meanwhile, China is the world's largest renewable energy market, followed closely by the United States and India. These nations are rapidly implementing policies, instituting regulatory reforms, and initiating market transformations to address the energy challenge more swiftly than initially anticipated.

China, driven by its recent rollout of the 14th Five-Year Plan, is poised to make a substantial contribution, accounting for nearly half of the new global renewable energy capacity that will be added between 2022 and 2027. In parallel, the United States has



taken significant steps towards supporting renewable energy expansion through initiatives such as the Inflation Reduction Act, which provides renewed support and longterm clarity for the growth of renewable energy within the country.

Impact of COVID-19

The COVID-19 pandemic impacted the global renewable energy market in various ways. Disruptions in supply chains and mobility restrictions led to delays in the execution of new renewable energy projects, mainly due to constraints on labor availability. Moreover, the economic downturn triggered by the pandemic resulted in reduced investment in the renewable energy sector.

Nevertheless, several countries have recognized the importance of green energy and prioritized it in their post-pandemic economic recovery plans. Additionally, the reduced demand for fossil fuels during the pandemic has underscored the feasibility of a cleaner, sustainable energy future.

Impact of the Russia-Ukraine War

The Russia-Ukraine conflict disrupted supply chains for renewable energy technologies such as solar panels and wind turbines, as many of these components are made in Ukraine and Russia. This has caused project delays and increased expenses for major players in the market. Additionally, the war has reduced funding availability for green energy projects, as investors have become more risk-averse in the face of geopolitical uncertainty.

The energy security apprehensions resulting from Russia's incursion into Ukraine have increasingly prompted nations to embrace renewable energy sources like solar and wind. This shift aims to lessen their dependence on imported fossil fuels, prices of which have experienced significant surges.

Key Players Landscape and Outlook

Companies are focusing on developing advanced energy storage solutions, including large-scale batteries and grid-scale storage, to address the intermittency of renewable energy sources and reliable power. Companies undertake various initiatives that reflect a strategic response to market dynamics, environmental consciousness, and the imperatives for long-term sustainability and competitiveness.



For instance, General Electric (GE) Company had tripled its manufacturing capacity for solar and battery energy storage Power Electronics Systems to 9 GW annually by the end of 2022. This expansion was driven by a substantial increase in backlog in the preceding months and a positive demand forecast. Similarly, Xcel Energy plans to expand its solar capacity with a proposed 250 MW solar project near the Sherco plant site in Minnesota. This project, alongside the ongoing 460 MW Sherco Solar development, is a part of Xcel Energy's commitment to clean energy. The combined capacity of these projects, set to be completed by 2025, which will replace retiring coal units. Xcel Energy is considering purchasing power from Wisconsin's 100 MW Apple River solar project. These solar initiatives contribute to the company's goal of tripling its Upper Midwest solar capacity by 2028, benefiting both affordability and sustainability.



Contents

- **1. RESEARCH METHODOLOGY**
- 2. PROJECT SCOPE & DEFINITIONS

3. IMPACT OF COVID-19 ON GLOBAL RENEWABLE ENERGY MARKET

4. IMPACT OF RUSSIA-UKRAINE WAR

5. EXECUTIVE SUMMARY

6. VOICE OF CUSTOMER

- 6.1. Product and Market Intelligence
- 6.2. Sources of Information
- 6.3. Factors Considered in Purchase Decisions
 - 6.3.1. Overall Expenses
 - 6.3.2. Facility Requirement
 - 6.3.3. Operational Manpower Expertise
 - 6.3.4. Number of Installation Units
 - 6.3.5. Experience in the Industry
 - 6.3.6. Efficiency
- 6.3.7. After Sales Support
- 6.4. Purpose of Installation
- 6.5. Demand and Supply Mechanism
- 6.6. Consideration and Understanding of Safety Regulations
- 6.7. Application of Legal Compliances
- 6.8. Existing User or Intended Purchaser

7. GLOBAL RENEWABLE ENERGY MARKET OUTLOOK, 2016-2030F

- 7.1. Market Size & Forecast
 - 7.1.1. By Value
 - 7.1.2. By Volume
- 7.2. By Type
 - 7.2.1. Solar Energy
 - 7.2.2. Wind Energy
 - 7.2.3. Hydroelectric Energy



- 7.2.4. Geothermal Energy
- 7.2.5. Others
- 7.3. By Application
 - 7.3.1. Residential
 - 7.3.2. Commercial
 - 7.3.3. Industrial
 - 7.3.4. Others
- 7.4. By Sales Channel
 - 7.4.1. Direct
 - 7.4.2. Channel
- 7.5. By Region
 - 7.5.1. North America
 - 7.5.2. Europe
 - 7.5.3. South America
 - 7.5.4. Asia-Pacific
 - 7.5.5. Middle East and Africa
- 7.6. By Company Market Share (%), 2022

8. GLOBAL RENEWABLE ENERGY MARKET OUTLOOK, BY REGION, 2016-2030F

- 8.1. North America*
 - 8.1.1. Market Size & Forecast
 - 8.1.1.1. By Value
 - 8.1.1.2. By Volume
 - 8.1.2. By Type
 - 8.1.2.1. Solar Energy
 - 8.1.2.2. Wind Energy
 - 8.1.2.3. Hydroelectric Energy
 - 8.1.2.4. Geothermal Energy
 - 8.1.2.5. Others
 - 8.1.3. By Application
 - 8.1.3.1. Residential
 - 8.1.3.2. Commercial
 - 8.1.3.3. Industrial
 - 8.1.3.4. Others
 - 8.1.4. By Sales Channel
 - 8.1.4.1. Direct
 - 8.1.4.2. Channel
 - 8.1.5. United States*



- 8.1.5.1. Market Size & Forecast
- 8.1.5.1.1. By Value
- 8.1.5.1.2. By Volume
- 8.1.5.2. By Type
- 8.1.5.2.1. Solar Energy
- 8.1.5.2.2. Wind Energy
- 8.1.5.2.3. Hydroelectric Energy
- 8.1.5.2.4. Geothermal Energy
- 8.1.5.2.5. Others
- 8.1.5.3. By Application
- 8.1.5.3.1. Residential
- 8.1.5.3.2. Commercial
- 8.1.5.3.3. Industrial
- 8.1.5.3.4. Others
- 8.1.5.4. By Sales Channel
- 8.1.5.4.1. Direct
- 8.1.5.4.2. Channel
- 8.1.6. Canada
- 8.1.7. Mexico

*All segments will be provided for all regions and countries covered

8.2. Europe

- 8.2.1. Germany
- 8.2.2. France
- 8.2.3. Italy
- 8.2.4. United Kingdom
- 8.2.5. Russia
- 8.2.6. Netherlands
- 8.2.7. Spain
- 8.2.8. Turkey
- 8.2.9. Poland
- 8.3. South America
 - 8.3.1. Brazil
 - 8.3.2. Argentina
- 8.4. Asia-Pacific
 - 8.4.1. India
 - 8.4.2. China
 - 8.4.3. Japan
 - 8.4.4. Australia
 - 8.4.5. Vietnam



8.4.6. South Korea
8.4.7. Indonesia
8.4.8. Philippines
8.5. Middle East & Africa
8.5.1. Saudi Arabia
8.5.2. UAE
8.5.3. South Africa

9. SUPPLY SIDE ANALYSIS

- 9.1. Capacity, By Company
- 9.2. Production, By Company
- 9.3. Operating Efficiency, By Company
- 9.4. Key Plant Locations (Up to 25)

10. MARKET MAPPING, 2022

10.1. By Type10.2. By Application10.3. By Sales Channel

10.4. By Region

11. MACRO ENVIRONMENT AND INDUSTRY STRUCTURE

- 11.1. Supply Demand Analysis
- 11.2. Import Export Analysis Volume and Value
- 11.3. Supply/Value Chain Analysis
- 11.4. PESTEL Analysis
 - 11.4.1. Political Factors
 - 11.4.2. Economic System
 - 11.4.3. Social Implications
 - 11.4.4. Technological Advancements
 - 11.4.5. Environmental Impacts
 - 11.4.6. Legal Compliances and Regulatory Policies (Statutory Bodies Included)
- 11.5. Porter's Five Forces Analysis
- 11.5.1. Supplier Power
- 11.5.2. Buyer Power
- 11.5.3. Substitution Threat
- 11.5.4. Threat from New Entrant



11.5.5. Competitive Rivalry

12. MARKET DYNAMICS

- 12.1. Growth Drivers
- 12.2. Growth Inhibitors (Challenges, Restraints)

13. KEY PLAYERS LANDSCAPE

- 13.1. Competition Matrix of Top Five Market Leaders
- 13.2. Market Revenue Analysis of Top Five Market Leaders (in %, 2022)
- 13.3. Mergers and Acquisitions/Joint Ventures (If Applicable)
- 13.4. SWOT Analysis (For Five Market Players)
- 13.5. Patent Analysis (If Applicable)

14. PRICING ANALYSIS

15. CASE STUDIES

16. KEY PLAYERS OUTLOOK

- 16.1. General Electric Company
 - 16.1.1. Company Details
 - 16.1.2. Key Management Personnel
 - 16.1.3. Products & Services
 - 16.1.4. Financials (As reported)
 - 16.1.5. Key Market Focus & Geographical Presence
- 16.1.6. Recent Developments
- 16.2. Vestas Wind Systems A/S
- 16.3. Xcel Energy Inc.
- 16.4. Tata Power Company Limited
- 16.5. EDF Energy Ltd.
- 16.6. First Solar, Inc.
- 16.7. Enerwhere Sustainable Energy Limited
- 16.8. Acciona, S.A.
- 16.9. Innergex Renewable Energy Inc.

16.10. Enel S.p.A.

*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work



17. STRATEGIC RECOMMENDATIONS

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