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Hydropower Market Forecasts to 2032 – Global Analysis By Component (Turbines, Generators, Control & Automation Systems, Transformers & Switchgear, Civil Infrastructure, Powerhouse Structures and Auxiliary Systems), Capacity, Technology, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Hydropower Market is accounted for $279.77 billion in 2025 and is expected to reach $401.60 billion by 2032 growing at a CAGR of 5.3% during the forecast period. Hydropower utilizes the kinetic energy of moving or falling water to produce electricity, serving as a sustainable and renewable energy solution. Recognized as one of the earliest methods of generating power, it offers reliable, large-scale electricity with minimal environmental impact. Hydropower infrastructure ranges from small-scale installations to extensive dam projects, enhancing energy stability and storage via pumped systems. Beyond electricity, it aids in irrigation, flood management, and water provision. Due to its high efficiency, low operating expenses, and eco-friendly nature, hydropower remains an essential element in global renewable energy development, particularly in water-rich regions seeking sustainable energy alternatives.

According to the International Energy Agency (IEA, 2021 Hydropower Special Market Report), Data shows that hydropower accounted for nearly 16% of global electricity generation and over 40% of renewable electricity in 2020, making it the largest source of renewable power worldwide.

Market Dynamics:

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Driver:

Rising global demand for renewable energy

Increasing demand for renewable energy is significantly propelling the hydropower market. Nations and organizations are shifting toward sustainable power sources to lower carbon emissions and comply with climate objectives. Hydropower delivers reliable, large-scale electricity with minimal environmental impact, supporting energy diversification and grid stability. Investments in sustainable energy infrastructures often prioritize hydropower due to its durability, operational efficiency, and long-term benefits. Additionally, heightened environmental consciousness among governments, industries, and the public is encouraging the expansion of hydropower projects, positioning them as a key solution in achieving global renewable energy targets.

Restraint:

High initial investment

The hydropower market faces significant limitations due to the high initial costs associated with project development. Building dams, turbines, and infrastructure requires massive investments, often discouraging investors in less developed areas. Extended construction periods and detailed planning amplify upfront expenses, making financial justification difficult despite low operational costs. Economic instability, interest rate variations, and limited budgets further hinder project implementation. These financial challenges restrict the initiation of new hydropower projects, slowing market growth, even though hydropower offers long-term efficiency and sustainability benefits. The need for substantial capital remains a primary constraint on the widespread expansion of hydropower facilities worldwide.

Opportunity:

Government incentives and renewable policies

Supportive government policies and incentives provide promising opportunities in the hydropower sector. Tax credits, subsidies, and affordable financing encourage the initiation of new projects, while renewable energy targets reinforce policy backing. Simplified regulatory frameworks and expedited approval processes reduce project delays, attracting local and international investors. Collaborations between public and private sectors improve project feasibility, and global climate funds offer additional

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financial support. By integrating hydropower into national energy strategies and carbon reduction plans, governments establish a conductive environment for investment. Ongoing policy support ensures stability and long-term market growth, positioning hydropower as a key player in the worldwide transition toward clean energy.

Threat:

Climate change and water variability

Hydropower is highly susceptible to climate change, which threatens water supply and river flow consistency. Irregular rainfall, extended droughts, and severe weather events can lower electricity output and disrupt operations. Seasonal water fluctuations further challenge steady power production, reducing reliability in some areas. Unpredictable water availability may also increase maintenance and operational costs. Growing climate uncertainties can discourage investment in large hydropower projects, affecting market stability. This creates risks of revenue variability and diminished investor confidence, underlining the vulnerability of hydropower infrastructure to climate-driven changes in water availability and emphasizing the need for adaptive strategies to ensure long-term market resilience.

Covid-19 Impact:

The hydropower market faced notable disruptions due to the COVID-19 pandemic, impacting construction schedules, supply chains, and project completion timelines. Lockdowns, workforce limitations, and transportation challenges delayed operations and increased costs. Financial pressures and lower government revenues slowed new project approvals and investment activity. Reduced industrial and commercial electricity consumption also temporarily lowered hydropower generation. Nevertheless, the sector remained resilient owing to its critical contribution to renewable energy supply. Recovery efforts are now driven by renewed government initiatives, stimulus measures, and investments in clean energy infrastructure, positioning hydropower to regain momentum and continue its role in sustainable electricity generation worldwide.

The turbines segment is expected to be the largest during the forecast period

The turbines segment is expected to account for the largest market share during the forecast period due to their essential function of converting flowing water into mechanical energy for electricity generation. The performance, efficiency, and reliability of hydropower plants heavily depend on turbine technology. Advanced designs,

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including Francis, Kaplan, and Pelton turbines, enable optimal operation under diverse water flow and capacity conditions. Continuous innovation and investment in turbine efficiency enhance energy production while lowering operational expenses. This critical component drives the effectiveness and expansion of hydropower infrastructure worldwide. The leading market share of turbines highlights their central importance in powering sustainable energy generation and supporting the growth of the hydropower sector.

The micro hydropower (100 kW %- %1 MW) segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the micro hydropower (100 kW %- %1 MW) segment is predicted to witness the highest growth rate. Its flexibility and suitability for rural and off-grid areas make it highly attractive. Lower initial investment and shorter development periods compared to large-scale projects enable quicker implementation. These systems provide consistent electricity to underserved communities, fostering sustainable development. Advances in small-scale turbines and modular designs improve performance and affordability. Supportive government policies, funding programs, and renewable energy initiatives are encouraging adoption, fueling rapid expansion. As a result, micro hydropower is emerging as a key contributor to global hydropower growth and decentralized renewable energy deployment.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share, owing to its vast water resources, supportive government policies, and rising energy needs. China stands out as a major contributor, holding a substantial share of the world's hydropower capacity. Countries like India and Brazil are also making significant strides in hydropower development. The region's focus on renewable energy has led to considerable investments in various hydropower projects, both large and small. Advancements in technology and favorable policies continue to drive the sector's expansion. Consequently, Asia Pacific is projected to retain its leadership in the hydropower market in the coming years.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, fueled by robust investments in renewable energy and favorable government initiatives. China and India are at the forefront, with China holding a significant portion of

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the world's hydropower capacity. The region's commitment to sustainable energy, along with the development of various hydropower projects, accelerates its market growth. Advancements in technology and a rising demand for eco-friendly energy solutions further enhance the sector's development, establishing Asia Pacific as a dominant force in the global hydropower industry.

Key players in the market

Some of the key players in Hydropower Market include Voith Group, Andritz Hydro, General Electric, China Three Gorges Corporation, Alfa Laval, Hydro-Qu?bec, ABB, Engie, Tata Power, Siemens Energy, Statkraft Sweden, Norsk Hydro ASA, Hitachi Mitsubishi Hydro Corporation, Renewable Japan Co., Ltd. and J-POWER Group.

Key Developments:

In August 2025, GE Vernova Inc. will invest C$22.2 million in its Quebec operations, expanding hydropower and grid equipment production to support rising energy demand in Quebec and across Canada. The company will put C$16.2 million into its hydropower manufacturing site in Sorel-Tracy and more than C$6 million into its La Prairie facility, which produces high-voltage grid equipment.

In July 2025, Andritz has secured a contract for the refurbishment of Mozambique’s principal hydropower facility, Cahora Bassa, operated by Hidroel?ctrica de Cahora Bassa (HCB). The project will boost the plant’s efficiency and increase its generating capacity by more than 4%.

In June 2025, Voith and HeiTech Padu Berhad (HeiTech), a technology company located in Malaysia, has been awarded the contract to modernize three hydropower stations operated by TNB Power Generation Sdn. Bhd. (TNB Genco) a subsidiary of Tenaga Nasional Berhad (TNB) as part of the Life Extension Program (LEP).

Components Covered:

- Turbines
- Generators
- Control & Automation Systems

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- Transformers & Switchgear
- Civil Infrastructure
- Powerhouse Structures
- Auxiliary Systems

Capacities Covered:

- Pico Hydropower (100 MW)

Technologies Covered:

- Reservoir-Based Hydropower
- Run-of-River Hydropower
- Pumped-Storage Hydropower
- In-Stream Hydrokinetic Systems
- Free-Flow Turbines
- Hybrid Hydro-Solar Systems

End Users Covered:

- Utilities
- Independent Power Producers (IPPs)
- Industrial & Captive Users
- Rural Electrification Agencies

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- Commercial & Institutional Campuses

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan
  - China
  - India
  - Australia
  - New Zealand

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South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

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- Company Profiling
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  - SWOT Analysis of key players (up to 3)
- Regional Segmentation
  - Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)
- Competitive Benchmarking
  - Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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(2024-2032) ($MN)
Table 28 Global Hydropower Market Outlook, By Commercial & Institutional Campuses (2024-2032) ($MN)
Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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