

# Pumped Hydroelectric Storage Turbines Market Set to Expand at 8.2% CAGR by 2032 | Toshiba Corporation, Hitachi, Andritz

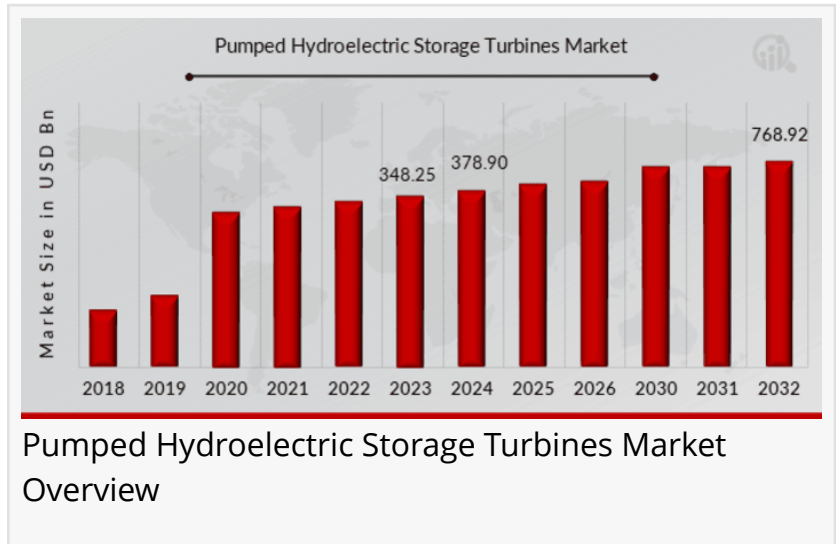
*Rising demand for renewable energy boosts growth in the Pumped Hydroelectric Storage Turbines Market worldwide.*

CALIFORNIA, CA, UNITED STATES, April

17, 2025 /EINPresswire.com/ --

According to a comprehensive research report by Market Research Future (MRFR), The [Pumped Hydroelectric Storage Turbines Market](#) Information by Type, Application and Region- Forecast till 2032, The Global Pumped

Hydroelectric Storage Turbines Market is estimated to reach a valuation of USD 768.92 Billion at a CAGR of 8.2% during the forecast period from 2024 to 2032.



## Pumped Hydroelectric Storage Turbines Market Overview



Rising demand for grid stability and renewable integration drives growth in pumped hydroelectric storage turbines."

MRFR

Pumped hydroelectric storage (PHS) turbines play a vital role in modern energy systems, serving as a highly efficient and scalable form of energy storage. These systems work by moving water between two reservoirs at different elevations to store and generate electricity. When electricity demand is low, excess energy is used to pump water to the higher reservoir.

During peak demand, water is released back to the lower reservoir through turbines, generating electricity. The turbines used in these systems are crucial components, determining overall system efficiency, responsiveness, and output. As global efforts to decarbonize energy systems accelerate, the pumped hydroelectric storage turbines market is witnessing renewed interest from governments, utilities, and private investors.

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## Key Players

Voith GmbH & Co. KGaA (Germany)

General Electric(US)

Toshiba Corporation (Japan)

Mitsubishi Heavy Industries, Ltd. (Japan)

NuStreem LLC (US)

GUGLER Water Turbines GmbH (Germany)

Natel Energy (US),

Andritz and Hitachi

## Market Dynamics

The market for pumped hydroelectric storage turbines is shaped by a complex set of factors including technological advancements, policy support for renewable energy, increasing power demand, and grid modernization initiatives. The integration of variable renewable energy sources such as solar and wind has led to greater volatility in electricity supply. PHS turbines offer an effective solution for balancing these fluctuations, providing grid stability and reliability. At the same time, innovations in turbine design, materials, and control systems are enhancing performance, reducing operational costs, and extending equipment lifespan.

Despite its advantages, the market is not without challenges. The high initial capital costs and long development timelines of pumped hydro projects can deter investment. Moreover, geographical limitations restrict the deployment of PHS systems, as they require specific topographical conditions. Regulatory hurdles and environmental concerns, especially around ecosystem disruption and water use, can also slow project approvals.

## Market Drivers

One of the primary drivers of the pumped hydroelectric storage turbines market is the global transition to renewable energy. Countries around the world are committing to net-zero emissions targets, which necessitates the adoption of energy storage technologies capable of

addressing the intermittent nature of renewables. PHS turbines are particularly well-suited for this role, offering grid-scale storage with proven reliability and long operational lifespans.

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Another significant driver is the increasing focus on energy security and grid resilience. As electric grids face more stress from extreme weather events, cyber threats, and aging infrastructure, utilities are investing in technologies that can ensure continuous power supply. Pumped hydro storage provides both spinning and non-spinning reserves, improving grid stability during emergencies.

Technological advancements also play a pivotal role in propelling the market. Modern variable-speed pumped storage turbines, for example, allow for more flexible and efficient operation, adapting to rapid changes in power demand. Improvements in construction techniques and digital control systems further enhance the feasibility and appeal of new installations.

Government support and favorable regulatory frameworks have also been instrumental in driving growth. In regions like the European Union and China, public funding, subsidies, and strategic planning have paved the way for new pumped hydro projects. In the U.S., initiatives like the Federal Energy Regulatory Commission's (FERC) licensing reforms aim to streamline project approvals, offering new opportunities for market expansion.

### Market Restraints

Despite strong drivers, the pumped hydroelectric storage turbines market faces several restraints. One of the most significant barriers is the high capital expenditure associated with the construction of new pumped storage facilities. These projects often require extensive civil engineering work, long lead times, and complex permitting processes, which can extend the time to profitability.

Geographic and environmental constraints also limit market growth. Not all regions possess the necessary topographical features such as steep gradients and suitable water sources. In addition, environmental impact assessments can uncover concerns related to habitat disruption, water quality, and biodiversity loss, potentially delaying or halting projects.

Moreover, the market is increasingly facing competition from alternative energy storage technologies, particularly battery energy storage systems (BESS). While PHS turbines remain unmatched for large-scale, long-duration storage, batteries offer more flexible deployment options and shorter construction timelines, making them attractive for certain grid applications.

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## Regional Analysis

The global market for pumped hydroelectric storage turbines is geographically diverse, with notable activity across North America, Europe, Asia-Pacific, and select regions in Latin America and the Middle East.

North America is witnessing renewed interest in PHS, particularly in the United States. Aging infrastructure and increased renewable energy penetration are driving investment in energy storage solutions. California and the Pacific Northwest are among the regions exploring new pumped hydro projects. Supportive policies from the Department of Energy and FERC are further catalyzing market activity.

Europe remains a leader in the global PHS turbines market, driven by ambitious climate goals and a strong commitment to renewable energy integration. Countries like Switzerland, Austria, Germany, and Norway have long utilized pumped hydro and are now upgrading their facilities with modern turbine technologies. The European Union's energy storage strategy emphasizes long-duration storage, providing a solid foundation for PHS growth.

Asia-Pacific is the fastest-growing region in the pumped hydroelectric storage turbines market. China is the world's largest market for pumped storage and is aggressively expanding its capacity to support its renewable energy ambitions. The country plans to add tens of gigawatts of pumped hydro capacity by the end of the decade. India, Australia, and Japan are also investing heavily in new projects and modernization of existing plants.

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