

Asia-Pacific Pumped Hydro Storage - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Asia-Pacific Pumped Hydro Storage Market size in terms of installed base is expected to grow from 82 gigawatt in 2024 to 103.10 gigawatt by 2029, at a CAGR of 4.70% during the forecast period (2024-2029).

Key Highlights

Over the medium term, factors such as increasing adoption of renewable energy coupled with supportive government policies are projected to thrive in the Asia-Pacific pumped hydro storage market.

On the other hand, the competition from other energy storage technologies is expected to threaten the growth of the pumped hydro storage market in the region.

Nevertheless, the growing technological advancements in pumped hydro storage technology are expected to create significant opportunities for the market during the forecasted period.

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Asia-Pacific Pumped Hydro Storage Market Trends

Closed-loop Segment is Expected to Witness Significant Growth

In closed-loop systems, pumped hydro storage plants are created so that one or both the reservoirs are artificially built, and no natural water inflow is involved with either of them. Closed-loop pumped hydro storage offers high flexibility, reliability, and high-power output. Since the closed-loop pumped-hydro systems are not connected to existing river systems, their impact on the environment is less compared to open-loop pumped hydro storage systems. Moreover, they can be positioned where support for the grid is required.

According to the International Renewable Energy Agency, the capacity of installed pure pumped hydro storage in Asia was recorded at 80,988 MW in 2022, the highest among all the regions across the world. The capacity grew consistently in the last five years due to the growing demand for closed-loop pumped hydro storage plants in the region.

For instance, in May 2023, Rewa Ultra Mega Solar Ltd (RUMSL) initiated a Request for Proposal (RFP) process to allocate locations for a combined 13.8 GW of pumped hydro storage (PHS) projects in Madhya Pradesh. The offering includes a total of 12 sites where developers can establish PHS capacities ranging from 600 MW to 2 GW.

A research team from Australia has concluded through a research study that the closed-loop pumped hydro storage plants may overshadow the open-loop PSH plants in the near future due to the benefits they provide, like overcoming the problem of finding suitable sites for pumped hydro storage plant location, and no environmental effects on water resources.

Furthermore, closed-loop pumped hydro storage offers high flexibility, reliability, and power output. The other major factor for their preference is the certainty of gaining an operating license or permit since they do not interfere with the existing river systems or any water streams.

Such factors pave the way for an explicitly visible momentum for the closed-loop pumped hydro storage market during the forecast period.

China is Expected to Dominate the Market

China led the global hydropower market with around 36.77 GW of renewable hydropower capacity as of 2022. Hydro sources constitute about 16% of the total electricity generation mix. The country is also strenuously working on a lucid pumped hydro storage development, particularly with new policies and project goals.

In 2022, the country's pure pumped hydro storage installed capacity was around 45.79 GW, the highest among all the Asian countries. The technology is set to bloom even more in China due to the efforts made by the government and private entities.

For example, in June 2022, the Power Construction Corporation of China announced that it had started working on the new 270 GW of pumped hydro storage capacity to be added to the country's electricity mix, with the installation of 200 pumped hydro storage plants by 2025. It is expected to raise China's installed capacity by around 10% and the world's energy storage capacity by about 170%.

Furthermore, in January 2022, the country commissioned the world's largest pumped hydro storage plant in China's Hebei province. The 3.6 GW pumped hydro storage facility consists of 12 reversible pumps generating sets with 300 MW each and possesses a power generation capacity from storage of 6.6 billion kWh.

In November 2023, the State Grid Corporation of China inaugurated the Fukang pumped-storage power station in northwest China's Xinjiang region. The project features three 300 MW turbines with a total capacity of 1.2 GW. The facility is the first of its kind in northwestern China.

Such developments are projected to drive the pumped hydro storage market in the country in the near future.

Asia-Pacific Pumped Hydro Storage Industry Overview

The Asia-Pacific pumped hydro storage market is fragmented. Some of the key players (in no particular order) include Enel SpA, General Electric Company, Siemens AG, Voith GmbH & Co. KGAA, and Tokyo Electric & Power Company.

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