

# Geothermal Power Generation Market Size and Forecast (2021 - 2031), Global and Regional Share, Trend, and Growth Opportunity Analysis Report Coverage: By Plant Type (Direct Dry Steam, Flash Steam, and Binary Cycle), End User (Residential, Commercial, and Industrial), and Geography

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## Abstracts

The geothermal power generation market size is projected to reach US\$ 27.14 billion by 2031 from US\$ 15.45 billion in 2023; it is estimated to record a CAGR of 7.3% from 2022 to 2030.

Geothermal energy is one of the key renewable energy sources for generating electricity. In order to generate enough energy to generate electricity, geothermal power plants rely on heat that exists several kilometers beneath the Earth's surface. In some areas, heat may exist naturally in the Earth's core in the form of steam or hot water. Many countries have developed methods of using geothermal energy such as flash steam, binary cycle, and direct dry steam. Different types of geothermal power are available in different parts of the world. For example, Iceland has numerous hot springs that are easily accessible, allowing most people to rely on geothermal springs as a safe, reliable, and inexpensive source of energy. In other countries, such as the US, a cost-intensive geothermal drilling process is involved in harnessing energy.

Flash steam power plants are the most common type of geothermal power plants, which registered the largest geothermal power generation market share in 2023. The volcanically active island nation of Iceland covers almost all of its electricity needs through a series of flash steam geothermal power plants. The steam and excess warm water produced by the flash steam process heats icy sidewalks and parking lots in the

cold arctic winter. The driving factors behind the global geothermal power generation market growth are a rise in demand for clean power generation, an increase in awareness of geothermal power extraction, and investment in tapping the geothermal energy potential across the globe. However, the high cost of drilling and exploration of geothermal energy and the availability of geothermal resources near tectonically active areas, which are prone to earthquakes, are among the factors restraining the geothermal power generation market growth.

Nevertheless, technological advancements play a crucial role in shaping the future of geothermal power generation market trends. One key area of innovation is the development of Enhanced Geothermal Systems (EGS). EGS technology involves creating engineered reservoirs in hot rock formations deep underground by injecting water into fractures to stimulate heat exchange. This has the potential to significantly expand the geographic reach of geothermal projects, tapping into previously untapped resources. By overcoming some of the limitations associated with traditional hydrothermal systems, EGS opened possibilities for increased capacity and widespread adoption of geothermal power.

In addition to EGS, advancements in binary cycle systems represent another significant technological opportunity. Binary cycle technology allows for the utilization of lower-temperature geothermal resources that were previously considered uneconomical. These systems operate by using a secondary fluid with a lower boiling point than water to drive a turbine, capturing energy from geothermal reservoirs with temperatures as low as 100°C. This innovation broadens the range of viable geothermal sites, making it possible to harness energy from more geographically diverse locations. The continuous improvement and deployment of such technologies contribute to the economic viability of geothermal power, making it a more attractive option in the global energy landscape.

The global geothermal power generation market analysis is segmented based on plant type, end user, and geography. Based on plant type, the geothermal power generation market is segmented into direct dry steam, flash steam, and binary cycle. Based on end users, the market is segmented into residential, commercial, and industrial. In terms of geography, the global geothermal power generation market is segmented into four major regions: North America, Europe, Asia Pacific (APAC), and the Rest of the World.

Northern California Power Agency, Turboden SpA, Toshiba Energy Systems & Solutions Corp, Berkshire Hathaway Inc, NIBE Industrier AB, General Electric Co., Fuji Electric Co Ltd, Kenya Electricity Generating Co Ltd, Carrier Global Corp., and Danfoss AS are among the key players profiled in the geothermal power generation market

report.

The overall geothermal power generation market size has been derived using both primary and secondary sources. Exhaustive secondary research has been conducted using internal and external sources to obtain qualitative and quantitative information related to the geothermal power generation market share. The process also helps obtain an overview and geothermal power generation market forecast with respect to all the market segments. Also, multiple primary interviews have been conducted with industry participants to validate the data and gain analytical insights. This process includes industry experts such as VPs, business development managers, market intelligence managers, and national sales managers, along with external consultants such as valuation experts, research analysts, and key opinion leaders, specializing in the geothermal power generation market.

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