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Geothermal Power Generation Market Forecasts to 2034 – Global Analysis By Resource Type (Hydrothermal, Enhanced Geothermal Systems (EGS) and Geopressured & Hot Dry Rock), Power Capacity, Technology, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Geothermal Power Generation Market is accounted for $10.9 billion in 2026 and is expected to reach $16.4 billion by 2034 growing at a CAGR of 5.3% during the forecast period. Geothermal energy production utilizes underground heat to generate electricity in a consistent and environmentally friendly way. By drilling deep wells, steam or heated water is brought to the surface to spin turbines linked to power generators. In contrast to variable renewables, geothermal facilities deliver uninterrupted baseload energy. Key system types include dry steam, flash steam, and binary cycle technologies, designed for varying heat levels. The approach has a limited environmental impact, requiring less land and producing fewer emissions. Increasing global focus on sustainable energy, along with improvements in drilling techniques and resource optimization, is accelerating the expansion of geothermal power worldwide.

According to the IEA, global geothermal electricity generation capacity reached ~16 GW in 2023, producing about 95 TWh annually, primarily in the U.S., Indonesia, Philippines, Turkey, and New Zealand.

Market Dynamics:

Driver:

Growing demand for clean and renewable energy

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Increasing focus on lowering greenhouse gas emissions is fueling the expansion of the geothermal power generation market. Governments and businesses are actively shifting toward sustainable energy options to address environmental challenges and reduce reliance on conventional fuels. Geothermal energy stands out due to its low environmental impact and long-term availability. Its consistent power output makes it more dependable than other renewables with variable generation patterns. Supportive regulations, climate commitments, and global sustainability initiatives are encouraging its uptake. As awareness of environmental issues grows, geothermal energy is becoming an essential component of the worldwide movement toward cleaner and greener energy solutions.

Restraint:

High initial capital investment

One of the primary challenges for the geothermal power market is the substantial upfront investment required. Establishing geothermal facilities involves costly exploration, drilling, and construction activities before any returns are realized. The uncertainty associated with locating viable geothermal resources adds financial risk to projects. These high entry costs often discourage investors, especially in developing regions with limited funding options. Extended development periods also contribute to increased financial pressure. Although geothermal plants offer long-term operational savings, the heavy initial expenditure remains a significant obstacle, restricting wider adoption and delaying the growth of geothermal energy infrastructure worldwide.

Opportunity:

Expansion of enhanced geothermal systems (EGS)

The growth of Enhanced Geothermal Systems offers a major opportunity by allowing geothermal energy production beyond naturally resource-rich areas. By engineering underground reservoirs in hot rock formations through fluid injection, this approach broadens the reach of geothermal power. It enables access to extensive untapped heat reserves, increasing the potential for energy generation in diverse regions. Ongoing technological progress and demonstration projects are expected to lower costs and enhance viability. As EGS continues to evolve, it has the potential to significantly expand the global footprint of geothermal energy, making it a more flexible and scalable renewable resource.

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Threat:

Competition from other renewable energy sources

Geothermal energy faces intense rivalry from renewable sources like solar and wind, which are becoming more affordable and widely implemented. These energy options offer advantages such as faster installation, lower initial investment, and broader location suitability. Policymakers frequently support these technologies due to their scalability and rapid deployment capabilities, reducing focus on geothermal development. Improvements in storage solutions are also addressing their variability issues. As a result, geothermal projects struggle to attract investments and maintain competitiveness. This growing competition poses a significant threat, potentially slowing the expansion of geothermal power in the global renewable energy market.

Covid-19 Impact:

The pandemic created both challenges and opportunities for the geothermal power market, with early disruptions affecting operations and development. Restrictions on movement delayed exploration, drilling, and construction activities, while supply chain issues hindered equipment availability. Financial uncertainties led to reduced investments and a temporary drop in energy consumption. Despite these setbacks, geothermal facilities maintained continuous power generation due to their reliability. As economies recovered, governments prioritized renewable energy in stimulus plans, boosting interest in geothermal projects. This shift toward sustainable energy and resilience is expected to drive the market’s recovery and future expansion.

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

The hydrothermal segment is expected to account for the largest market share during the forecast period owing to their natural presence and advanced technological maturity. They rely on existing underground reservoirs of heated water and steam, which simplifies development and reduces costs compared to alternative systems. Their consistent performance, lower uncertainty during exploration, and extensive commercial deployment contribute to their strong market position. A significant number of operational geothermal plants utilize hydrothermal technology, backed by established infrastructure and industry experience. The ease of access and supportive regulatory environments further reinforce their dominance in the global geothermal energy sector.

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The remote & off-grid applications segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the remote & off-grid applications segment is predicted to witness the highest growth rate, driven by the need for dependable energy in areas without grid connectivity. Geothermal energy offers a consistent and self-sustaining power source, making it ideal for isolated locations. It eliminates the need for fuel logistics while ensuring uninterrupted electricity supply. Increasing efforts to provide power access to rural communities are boosting demand in this segment. Additionally, innovations in compact geothermal technologies are enabling easier installation and operation, contributing to rapid expansion and making this segment a key growth area in the market.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, supported by rich geothermal resources and developed infrastructure. The region's geology, especially in tectonically active zones, allows effective utilization of underground heat for power production. Supportive government policies, incentives, and sustained investments in clean energy have contributed to market growth. The availability of advanced technologies and skilled industry participants enhances operational efficiency and project success. Growing emphasis on lowering emissions and strengthening energy independence is further encouraging geothermal expansion, reinforcing North America's leading position in the global geothermal energy landscape.

Region with highest CAGR:

Over the forecast period, the Asia-Pacific region is anticipated to exhibit the highest CAGR, driven by rising electricity needs and expanding urban development. Governments are actively promoting renewable energy to enhance energy security and limit fossil fuel reliance. Many countries in this region possess considerable untapped geothermal resources due to suitable geological conditions. Efforts to support sustainable growth and improve energy access in remote areas are further boosting demand. Moreover, partnerships with global organizations and increased financial investments are helping accelerate project development, establishing Asia-Pacific as a key high-growth region in geothermal energy generation.

Key players in the market

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Some of the key players in Geothermal Power Generation Market include Ormat Technologies Inc., Mitsubishi Heavy Industries Ltd., SLB, Enel Green Power, Calpine Corporation, KenGen, Star Energy Geothermal, Toshiba Energy Systems, Fuji Electric Co. Ltd., Ansaldo Energia SpA, Baker Hughes Company, Turboden, PT Pertamina Geothermal Energy, ENGIE SA, Aboitiz Power Corporation, First Gen Corporation, Sosian Energy Ltd. and Tetra Tech Inc.

Key Developments:

In January 2026, Fuji Electric has signed an agreement with Robert Bosch to collaborate on silicon carbide (SiC) power semiconductor modules for electric vehicles, focusing on mechanical package compatibility. The companies plan to develop SiC power modules with matching outer dimensions and terminal positions, enabling either supplier’s module to be integrated into an inverter without mechanical redesign.

In November 2025, Mitsubishi Heavy Industries, Ltd. and ICM, Inc. have entered into a strategic alliance to accelerate innovation in ethanol dehydration. The collaboration focuses on integrating MHI's Mitsubishi Membrane Dehydration System (MMDS™) with ICM's bioethanol process design. Together, the companies aim to increase efficiency in ethanol production by reducing energy consumption, enhancing process reliability, and supporting the industry's efforts to lower carbon intensity.

In October 2025, Enel and Masdar complete the partnership agreement signed in March 2025 for 446 mw of photovoltaic plants operating in Spain. This transaction, which follows the partnership with Masdar finalized, relating to a 2 GW portfolio of other solar assets already operating in Spain, is in line with the “Partnership” business model outlined by Enel in its 2025-2027 Strategic Plan with the aim to retain control of strategic assets while maximizing productivity and returns on invested capital.

Resource Types Covered:

- Hydrothermal
- Enhanced Geothermal Systems (EGS)
- Geopressured & Hot Dry Rock

Power Capacities Covered:

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Small-scale (100 MW)

Technologies Covered:

Dry Steam Plants

Flash Steam Plants

Binary Cycle Plants

End Users Covered:

Utilities & Grid Operators

Industrial Power Users

Commercial & Institutional Facilities

Remote & Off-grid Applications

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

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France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

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Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

- Saudi Arabia
- United Arab Emirates
- Qatar
- Israel
- Rest of Middle East

Africa

- South Africa
- Egypt
- Morocco

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Rest of 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 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

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

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the

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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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