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Global Enhanced Geothermal System Market Size Study, by Resource Type (Hot Dry Rock, Sedimentary Basin, Radiogenic, Molten Magma), by Depth (Shallow, Deep), by Simulation Method (Hydraulic, Chemical, Thermal), by End Use (Residential, Commercial) and Regional Forecasts 2022-2032

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Abstracts

Global Enhanced Geothermal System Market is valued approximately at USD 2.10 billion in 2023 and is anticipated to grow with a healthy growth rate of more than 5.2% over the forecast period 2024-2032. Enhanced Geothermal Systems (EGS) represent a transformative approach to geothermal energy, harnessing the Earth's core heat to generate power. Unlike traditional geothermal systems, which rely on naturally occurring steam and hot water, EGS creates artificial geothermal reservoirs by injecting water into hot, dry rock formations deep below the Earth's crust. This water is then heated by the surrounding rocks and brought back to the surface, where it converts into steam to drive turbines and generate electricity. Utilizing techniques such as hydraulic fracturing to create fractures for water circulation, fluid injection to enhance heat exchange, and effective steam extraction, EGS provides a steady and sustainable source of renewable energy with minimal greenhouse gas emissions.

The enhanced geothermal system market is experiencing robust growth driven by several key factors. The increasing demand for clean energy solutions is a primary driver, as EGS is considered a clean energy option with negligible environmental impact and the ability to provide reliable, sustainable power without significant greenhouse gas emissions. Unlike traditional fossil fuels that involve combustion, EGS leverages the Earth's natural heat, substantially reducing the emission of harmful pollutants and greenhouse gases. Additionally, EGS does not produce air pollution, contributing to

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improved air quality and reduced health risks for nearby populations. The ability of EGS to provide consistent baseload power further enhances its appeal, ensuring a continuous and reliable electricity supply, unlike intermittent renewable sources such as solar and wind.

Another significant factor driving the growth of the enhanced geothermal system market is the high consumption of electricity globally. As nations increasingly transition to cleaner, renewable energy sources, geothermal power has emerged as a viable option. Geothermal reservoirs, with proper management, can supply energy for extended periods, aligning with the growing need for a stable and reliable power supply as societies continue to develop and urbanize. The capability of geothermal power plants to provide baseload power is crucial for maintaining system stability amidst the increasing demand for electricity driven by industrialization and urbanization.

However, the market growth is constrained by the high investment costs associated with enhanced geothermal systems. The complexity of the technology, drilling and construction processes, and initial development of geothermal reservoirs contribute to the significant upfront costs. Drilling deep wells to reach the necessary rock strata for heat extraction requires precision, efficiency, and specialized equipment, leading to higher initial expenses. Additionally, constructing the necessary infrastructure, including well construction, fluid injection systems, and surface facilities, involves substantial investment. Despite low operating expenses once operational, the longer payback period for these initial investments may deter some investors seeking quicker returns.

The rise in construction activities presents a lucrative growth opportunity for the enhanced geothermal system market. In the construction sector, EGS can be used for power generation, heating, and cooling buildings, supporting more environmentally responsible building practices and potentially lowering operational costs. Geothermal heat pumps, which utilize the Earth's stable subsurface temperature, can enhance the efficiency of heating and cooling systems in buildings. EGS can also support district heating systems, distributing heat to multiple buildings from a central source, reducing the need for individual heating systems and promoting sustainability in construction practices.

The key regions considered for the global Enhanced Geothermal System Market study include Asia Pacific, North America, Europe, Latin America, and Rest of the World. Europe is a dominating region in the Enhanced Geothermal System Market in terms of revenue. The market growth in the region is being attributed to factors including stringent climate targets and renewable energy mandates, a robust research and

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development ecosystem, existing geothermal infrastructure in some regions, and a focus on energy independence and security. Whereas, the market in Asia Pacific is anticipated to grow at a significant rate over the forecast period fueled by increasing energy demand, stringent environmental regulations, government support for renewable energy, abundant geothermal resources in certain regions, and the need for a stable and reliable baseload power source to support rapid industrialization and urbanization.

Major market players included in this report are:

Mitsubishi Heavy Industries, Ltd.

Ormat

TOSHIBA CORPORATION

Enel Spa

Yokogawa Electric Corporation

AltaRock Energy, Inc.

Aboitiz Power Corporation

Terra-Gen, LLC

Cyrq Energy, Inc.

Innergex Renewable Energy Inc.

Energy Development Corporation

Reykjavik Geothermal

Calpine Corporation

First Gen

Fuji Electric Co., Ltd.

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The detailed segments and sub-segment of the market are explained below:

By Resource Type:

- Hot Dry Rock
- Sedimentary Basin
- Radiogenic
- Molten Magma

By Depth:

- Shallow
- Deep

By Simulation Method:

- Hydraulic
- Chemical
- Thermal

By End Use:

- Residential
- Commercial

By Region:

North America

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- U.S.
- Canada

Europe

- UK
- Germany
- France
- Spain
- Italy
- ROE

Asia Pacific

- China
- India
- Japan
- Australia
- South Korea
- RoAPAC

Latin America

- Brazil

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Mexico

RoLA

Middle East & Africa

Saudi Arabia

South Africa

RoMEA

Years considered for the study are as follows:

Historical year – 2022

Base year – 2023

Forecast period – 2024 to 2032

Key Takeaways:

Market Estimates & Forecast for 10 years from 2022 to 2032.

Annualized revenues and regional level analysis for each market segment.

Detailed analysis of geographical landscape with Country level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

Analysis of competitive structure of the market.

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Demand side and supply side analysis of the market.

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