

# Geothermal Heat Pump Market to Hit \$12.5 Billion by 2031, Registering a Strong 7.6% CAGR

*Global Geothermal Heat Pump Industry Set for Rapid Growth, Doubling by 2031*

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According to a recent report by Allied Market Research, the global [geothermal heat pump market](#) size was valued at \$6.0 billion in 2021 and is projected to reach \$12.5 billion by 2031, registering a CAGR of 7.6% from 2022 to 2031. The rising focus on clean and sustainable heating systems, coupled with energy security concerns, continues to drive strong market growth.

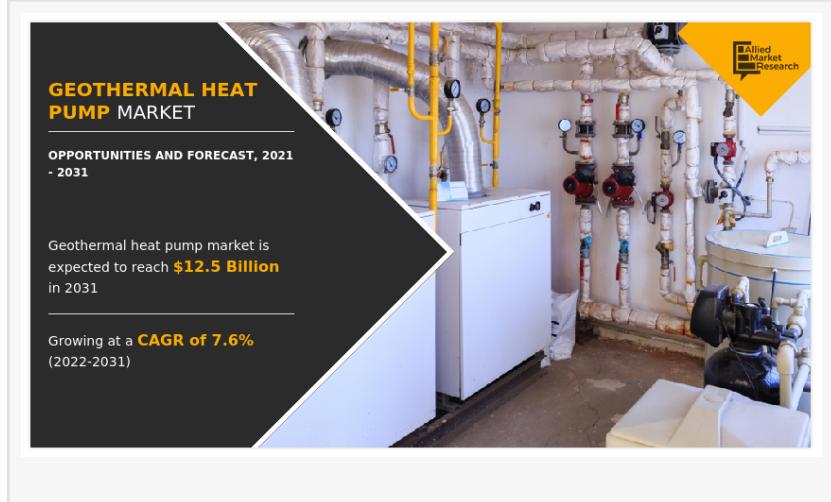
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The geothermal heat pump market will grow from \$6.0B in 2021 to \$12.5B by 2031, driven by rising clean energy demand and heating efficiency trends.”

*Allied Market Research*

into their clean energy frameworks.

The Asia-Pacific region, however, is expected to exhibit the highest CAGR of 8.5% during the forecast period, supported by strong growth in Japan (5.4%) and South Korea (9.1%). These nations are investing heavily in renewable energy infrastructure to meet carbon neutrality targets.



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□ Regional Insights

Europe led the global geothermal heat pump market in 2021 and is projected to maintain its dominance, expanding at a CAGR of 6.4%. Countries such as Germany, Sweden, and France are rapidly integrating [heat pumps](#)

## □ What is a Geothermal Heat Pump?

A geothermal heat pump (GHP), also known as a ground source heat pump, is a central water heating system that utilizes [geothermal energy](#) to heat or cool buildings efficiently. GHPs draw consistent thermal energy from the earth, making them one of the most reliable and eco-friendly heating solutions available.

These systems are widely used in applications such as surface water heating, rainwater harvesting, recycled water systems, and sewage treatment plants. In addition, hybrid systems combining solar and geothermal technologies are gaining traction for their high performance and cost efficiency.

## □ Market Drivers: Clean Energy and Efficiency

The geothermal heat pump industry is witnessing strong momentum due to global efforts toward energy efficiency, emission reduction, and climate resilience. Policymakers across regions are supporting renewable technologies to achieve net-zero carbon goals.

Key drivers include:

Rising concerns about energy security and sustainability

Increasing greenhouse gas (GHG) reduction initiatives

Growing adoption of energy-efficient heating technologies

Government incentives promoting low-carbon infrastructure

Moreover, geothermal heat pumps offer lower operational and maintenance costs compared to conventional systems, making them a long-term cost-effective solution.

## □□ Market Restraints and Challenges

Despite their benefits, the high initial installation cost and limited public awareness are major barriers to large-scale adoption, particularly in developing economies. Additionally, technological limitations and the need for skilled installation expertise hinder the rapid expansion of the geothermal heat pump market.

However, as innovations in system design, drilling technology, and digital energy management advance, these challenges are expected to diminish over the forecast period.

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## □ Market Segmentation

The geothermal heat pump market is segmented based on technology, end use, and region.

### By Technology:

Closed Loop Systems (Vertical & Horizontal)

Open Loop Systems

The closed loop systems segment dominated the market in 2021, accounting for more than 80% of the total share, owing to its reliability and reduced maintenance requirements.

### By End Use:

Residential (New Buildings & Retrofit Systems)

Commercial

Industrial

The residential segment is projected to hold nearly 75.1% of the market share by 2031, driven by the growing adoption of clean energy solutions in homes and smart city projects.

## □ Leading Companies

Prominent players in the geothermal heat pump industry include:

Bosch Thermotechnology Ltd.

Carrier Global Corporation

ClimateMaster Inc.

Daikin Industries Ltd.

Danfoss Technologies

Mitsubishi Electric Corporation

Viessmann Group

Dandelion Energy

Wolf GmbH

These companies are focusing on technological innovation, partnerships, and capacity expansion to strengthen their market presence and meet global demand.

## □ Impact of COVID-19

The COVID-19 pandemic initially disrupted supply chains, manufacturing activities, and raw material procurement, particularly in the heat pump manufacturing sector. However, as economies reopened, governments emphasized green recovery and carbon neutrality initiatives.

For instance, the UK government's 10-point plan (2020) to install 600,000 heat pumps by 2028 as part of its net-zero carbon goal by 2050 boosted post-pandemic market recovery. Similar policies worldwide have revitalized investments in renewable heating technologies.

## □□ Future Outlook

The future of the geothermal heat pump market looks promising, driven by:

Increasing residential and commercial adoption

Supportive government policies for green building initiatives

Integration of IoT-based smart control systems

Expansion of renewable energy infrastructure

As sustainability becomes central to energy planning, geothermal heat pumps will play a vital role in shaping the world's low-carbon heating future.

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## □ Conclusion

The geothermal heat pump market is poised for robust growth, projected to reach \$12.5 billion by 2031, driven by rising demand for energy-efficient and sustainable heating solutions. With governments worldwide emphasizing net-zero carbon goals and the adoption of renewable energy technologies, geothermal heat pumps are becoming a central component of eco-friendly

infrastructure.

Although high installation costs and limited awareness pose challenges, technological advancements, hybrid system integration, and supportive policies are expected to overcome these barriers. Residential, commercial, and industrial sectors will increasingly adopt these systems, particularly in regions like Europe and Asia-Pacific, making geothermal heat pumps a critical solution for the global transition to cleaner energy.

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