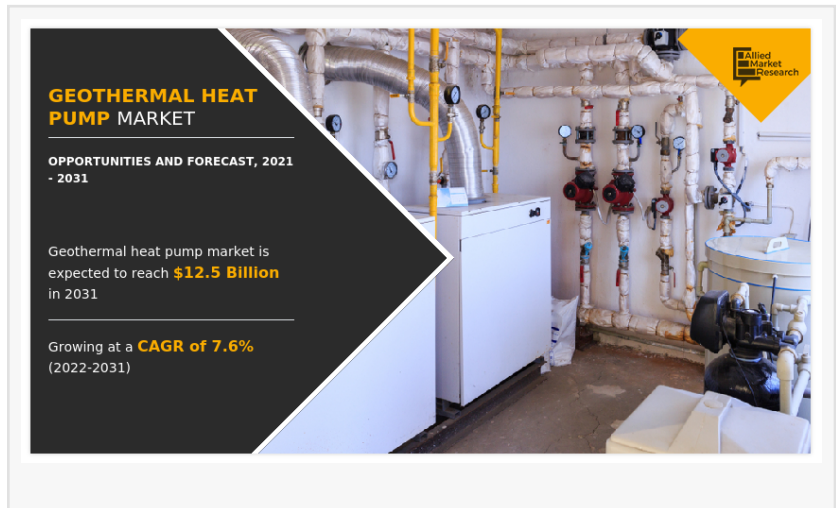


Geothermal Heat Pump Market Forecast: Poised for \$12.5 Billion by 2031

Global Geothermal Heat Pump Market Set for 7.6% CAGR Growth Amid Green Energy Transition

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September 19, 2025 /
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According to a new report by Allied Market Research, the [geothermal heat pump market](#) was valued at \$6.0 billion in 2021 and is projected to reach \$12.5 billion by 2031, growing at a CAGR of 7.6% from 2022 to 2031. This strong growth outlook reflects the global push toward renewable energy adoption, sustainable heating solutions, and net-zero carbon targets.



Geothermal heat pump market to hit \$12.5B by 2031, fueled by energy efficiency, climate goals, and rising demand for clean heating solutions."

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□ Key Findings

Asia-Pacific to record the highest CAGR of 8.5% from 2022–2031.

Japan to maintain 5.4% market share, growing at 7.6%

CAGR.

South Korea expected to grow at the fastest CAGR of 9.1%.

Closed loop systems dominate, holding over 80% share in 2021.

Residential applications projected to hold 75.1% share by 2031.

□ What is a Geothermal Heat Pump?

A geothermal heat pump (GHP), also called a ground source heat pump, is a central heating and cooling system that utilizes the stable temperatures beneath the earth's surface. By tapping into this natural energy source, geothermal systems provide efficient heating, cooling, and hot water supply.

Geothermal heat pump are widely used in surface water systems, recycled water facilities, sewage treatment plants, and rainwater harvesting applications. In hybrid setups, they can be combined with solar energy systems, further boosting performance and cost efficiency. Around the world, GHPs are also known as geoexchange, earth energy systems, or earth-coupled [heat pumps](#).

□ Regional Insights

Europe: Leading the market with ambitious climate policies and EU renewable energy directives. The region's focus on sustainable housing and green infrastructure boosts adoption.

Asia-Pacific: Expected to grow the fastest, at 8.5% CAGR. Countries like Japan (5.4% market share) and South Korea (1.9% market share, CAGR 9.1%) are investing heavily in GHP installations.

North America: Growing steadily, supported by federal incentives, state-level clean energy programs, and rising consumer demand for low-carbon heating systems.

□ Market Drivers

Several factors are propelling the geothermal heat pump market growth:

Energy Security: Policymakers are increasingly turning to renewable solutions to reduce dependence on fossil fuels.

Environmental Goals: GHPs significantly reduce greenhouse gas (GHG) emissions, aligning with global net-zero targets.

Cost Efficiency: While initial installation costs are high, GHPs provide long-term energy savings compared to conventional systems.

Government Incentives: Subsidies, tax credits, and renewable energy mandates are accelerating adoption.

□ Market Challenges

Despite its potential, the geothermal heat pump market faces hurdles:

High Upfront Costs: Installation of geothermal systems requires heavy investment.

Public Awareness: Many regions still lack knowledge and confidence in the benefits of GHPs.

Technological Gaps: Limited advancements in cost reduction and performance optimization have slowed adoption in some markets.

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□ Market Segmentation

By Technology:

Closed Loop Systems (dominant, >80% market share in 2021)

Open Loop Systems

Closed loop systems, including vertical and horizontal loops, remain the preferred choice for efficiency and reliability.

By End-Use:

Residential (leading segment, projected 75.1% share by 2031)

Commercial

Industrial

Residential applications dominate due to rising demand for energy-efficient home heating and cooling solutions.

By Region:

North America

Europe (leading region in 2021, CAGR 6.4%)

Asia-Pacific (fastest-growing region, CAGR 8.5%)

LAMEA

□ Impact of COVID-19

The COVID-19 pandemic temporarily slowed down the geothermal heat pump market due to:

Factory shutdowns and supply chain disruptions.

Shortages of key raw materials like iron castings, stainless steel, and aluminum tubing.

Declines in construction activity and project delays.

However, post-pandemic recovery has been strong. Governments have emphasized renewable energy as part of their green recovery strategies. For example, the UK's 10-point plan announced in 2020 aims to install 600,000 heat pumps by 2028, supporting the country's 2050 net-zero goal.

□ Competitive Landscape

The geothermal heat pump market is highly competitive, with global and regional players focusing on innovation, partnerships, and expansion strategies. Major companies include:

Bosch Thermotechnology Ltd

Carrier Global Corporation

ClimateMaster Inc.

Daikin Industries Ltd.

Danfoss Technologies

Dandelion Energy

Mitsubishi Electric Corporation

Viessmann

Wolf GmbH

These companies are investing in R&D, advanced designs, and hybrid geothermal systems to strengthen market share and meet rising demand for clean energy solutions.

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□ Conclusion

The [geothermal heat pump industry](#) is on a strong growth trajectory, expected to more than double by 2031. While high installation costs and limited public awareness present challenges, the advantages of energy efficiency, emission reduction, and long-term cost savings position GHPs as a critical technology in the global clean energy transition.

As governments, businesses, and households seek sustainable solutions, the geothermal heat pump market is set to play a pivotal role in achieving climate goals and shaping the future of green heating and cooling. □□

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David Correa

Allied Market Research

+ +1 800-792-5285

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