

Thermoelectric Generators Market by Application (Waste Heat Recovery, Energy Harvesting, Direct Power Generation, Co-Generation), Temperature (500°C) Wattage, Type, Material, Vertical, Component, Region - Global Forecast to 2027

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Abstracts

The thermoelectric generators market is projected to grow from USD 761 Million in 2022 to USD 1,233 Million by 2027, at a CAGR of 10.1% from 2022 to 2027. Growing need for fuel efficiency amidst stringent emission control norms to drive market growth during the forecast period.

Thermoelectric generators (TEG) are used for power generation across automotive, aerospace & defense, industrial, consumer electronics, healthcare, oil & gas mining, and telecommunications industries. The adoption of TEGs in these verticals is increasing, owing to the demand for power sources in remote areas. In the oil & gas industry, gas fuel thermoelectric generators (GTEGs) are used to power condition monitoring sensors as these generators are extremely reliable electric DC power sources. They help monitor material degradation (corrosion), pipeline management, and control of greenhouse gas emissions. Moreover, in mining industry is focusing on applying new technologies and methods to reduce energy consumption and use renewable energy sources. TEGs are used in sensors for deep-down mining activities.

Based on application, directed power generation segment is projected to grow at fastest growth rate during forecast period

Based on application, the thermoelectric generators market is segmented into energy harvesting, waste heat recovery, direct power generation, and co-generation. Among these, directed power generation application segment witness strong growth during

2022-2027. Efficiency in direct power generation is not only limited to thermoelectric generators; it also depends on overall system efficiency. Various factors that affect system efficiency are combustion efficiency, recovery of the exhaust gases, system heat losses, fan power consumption, pump power, and power conditioning losses. Due to this, direct power generation is used in long life and smaller power sources for numerous applications. Increasing demand for thermoelectric generators in the aerospace, mining, and industrial sectors is expected to drive the direct power generation segment during the forecast period.

Based on vertical, Automotive held largest share in base year

Based on vertical, the thermoelectric generators market is segmented into automotive, aerospace & defense, marine, industrial, consumer, healthcare, oil & gas, mining, and telecommunications. Among these, automotive segment held largest share in base year. According to the International Organization of Motor Vehicle Manufacturers (OICA) 2021, vehicle manufacturing increased by 3% between 2020 and 2021. Automobile manufacturers such as Volkswagen, BMW, and Volvo are working with NASA to develop thermoelectric waste heat recovery devices for fuel economy. Similarly, using these generators (with temperature differentials) to power wireless sensors would eliminate battery longevity and reliability difficulties. Such advancements in thermoelectric generators and their applications improve end-user adoption trends.

Europe is anticipated to grow at higher growth rate during 2022-2027

Europe is anticipated to grow at higher CAGR during the forecast period. Increasingly stringent regulations related to CO₂ emissions from vehicles are one of the major factors driving the market for TEGs in Europe. The EU is the world's largest region that uses renewable energy. According to Eurostat, roughly 26% of the EU's electricity, 17% of the EU heating and cooling industry, and 6% of EU transport energy are derived from renewable energy sources. Europe invests significantly in total renewable energy, owing to its increasing use in the power sector and the growing demand for renewable electrical energy across various industries. This, in turn, is expected to fuel the demand for thermoelectric generators in the region.

The break-up of the profiles of primary participants in the thermoelectric generators market is as follows:

By Company Type: Tier 1–35%; Tier 2–45%; and Tier 3–20%

By Designation: C Level Executives–35%; Directors–25%; and Others–40%

By Region: Asia Pacific–30%; North America–40%; Europe–20%; and Rest of the World–10%

Major players in the thermoelectric generators market are Coherent Corp. (US), Gentherm Inc. (US), Ferrotec Holdings Corporation (Japan), Laird Thermal Systems, Inc. (UK), and Komatsu Ltd. (Japan). These companies adopted strategies including new product launches, new service launches, contracts, partnerships, agreements, collaborations, and expansions. Also focusing on expanding distribution networks in North America, Europe, Asia Pacific, and Rest of the World in turn driving the demand for thermoelectric generators market.

Research Coverage

This research report categorizes classified the thermoelectric generators market into platform, application, range, technology, product, and region. The thermoelectric generators market has been studied for North America, Europe, Asia Pacific, and Rest of the World.

The scope of the report covers detailed information regarding the major factors, such as drivers, restraints, challenges, and opportunities, influencing the growth of the thermoelectric generators market. A detailed analysis of the key industry players has been done to provide insights into their business overviews; solution; key strategies; contracts, joint ventures, partnerships & agreements, acquisitions, and new product launches associated with the thermoelectric generators market. Competitive analysis of upcoming startups in the thermoelectric generators market ecosystem is covered in this report.

Reasons to Buy this Report

This report is expected to help market leaders/new entrants with information on the closest approximations of the revenue numbers for the overall thermoelectric generators market and its segments. This study is also expected to provide application and vertical-wise information, wherein TEG with different power and material is used for different applications and verticals. This report aims at helping the stakeholders understand the competitive landscape of the market, gain insights to improve the position of their businesses, and plan suitable go-to-market strategies. This report is also expected to

help them understand the pulse of the market and provide them with information on key drivers, restraints, challenges, and opportunities influencing the growth of the market.

The report provides insights on the following pointers:

Market Penetration: Comprehensive information on thermoelectric generator system offered by the top players in the market.

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product and services launches in the thermoelectric generators market.

Market Development: Comprehensive information about lucrative markets – the report analyzes the thermoelectric generators market across varied regions.

Market Diversification: Exhaustive information about new products, untapped geographies, recent developments, and investments in the thermoelectric generators market

Competitive Assessment: In-depth assessment of market shares, growth strategies, products, and manufacturing capabilities of leading players in the thermoelectric generators market

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