Energy Harvesting Systems - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The Energy Harvesting Systems Market is expected to register a CAGR of 9.8% during the forecast period.

Key Highlights
- The widespread use of IoT devices in automation, the expansion of urban areas, the rising demand for reliable, safe, and long-lasting systems, the increasing popularity of green energy, the widespread adoption of energy harvesting technology in building and home automation, and supportive government policies are all anticipated to contribute to the market's expansion during the forecast period.
- Energy harvesting systems are primarily used in low-power electrical utilities, such as sensors, watches, and home appliances. These systems provide an efficient alternative to conventional power sources, like batteries.
- Moreover, supportive government policies and increased awareness about the environment, along with the reduction in the emission of greenhouse gases, have helped raise the demand for such technologies.
- Using energy harvesting systems is advantageous since the connected devices can run for a very long time without causing adverse environmental effects. Additionally, the solar, thermal, and vibrational energy forms of energy are those that energy harvesting systems use the most frequently among the various sources of ambient energy, including light energy, thermal energy, radiofrequency energy, kinetic energy, chemical/biological energy, and others.
- The energy harvesting systems are also deployed in applications that require a backup battery, and primarily battery is located remotely at a difficult place to reach. The transmitters and receivers used in the energy harvesting systems should be installed close to each other for better signal transmission. Collecting data at the central receiver is difficult when these sensors are deployed in remote locations.
- Owing to the outbreak of the COVID-19 pandemic, the Chinese solar industry and its economy are reeling under the impact. The exports are yet to be gauged fully. Such delay would restrict the growth of the energy harvesting systems.

Energy Harvesting Systems Market Trends

Consumer Electronics to Hold Significant Market Share

- Energy harvesting systems are increasingly used in consumer electronics, such as wearables, smartphones, remote control units, wireless appliances, body implants, etc.
- Moreover, Energy harvesting systems allow consumer electronic products to operate where conventional power sources are unavailable. Such features extend the use and eliminate the geographical constraint for devices to always be near a power source. Such features are driving the use of energy harvesting systems in consumer electro.
- For instance, energy harvesting systems are used in remote control units, where power is harvested from the force applied by the user in pressing the button. Recently, ARM has built such a device with the low power of the ARM Cortex-M0+ processor.
- The energy captured may be used in most wireless applications, body implants, wearables, and other low-power consumption applications. Even if the harvested energy is not enough to power the entire device, it may still be used to extend the life of conventional batteries.
- For example, researchers from the Chinese University of Hong Kong have developed a device that may harvest energy from the human knee during walking without a substantial increase in effort for wearers. The demonstrated device generates up to 1.6 mW of power without significantly changing breathing patterns.
- The proliferation of connected devices and the need for less expensive and reliable energy sources drive the growth of energy harvesting systems in the consumer electronics industry.

North America to Hold the Largest Market Share

- Due to the region's ongoing and rapid technical advancements, North America has emerged as the most critical market for investments in building and home automation, which employ renewable energy and propel the demand for energy harvesting systems.
- The majority of the region's revenue came from the United States. Due to the administration's intention to make the nation an energy-independent state and the thriving industrial and transportation sectors, the industry is anticipated to experience significant expansion.
- Comparatively to other markets, the North American market is seeing a high level of industrial IoT adoption, boosting the need for energy harvesting systems.
- Government programs to reduce energy emissions from outdated and public buildings have also contributed to this growth. For instance, 50 of the federal government's most energy-intensive buildings will have installed sophisticated and smart building technology due to a deal the U.S. General Services Administration signed with IBM.
- Additionally, the smart cities project launch has altered the local market environment. In addition to holding events to promote collaboration and knowledge sharing amongst cities, businesses, and colleges involved in creating smart cities around the nation, this effort also includes various grants and funding packages.

Energy Harvesting Systems Industry Overview

Energy Harvesting Systems Market is very competitive. Among others, ABB Limited and STMicroelectronics NV are the market's two biggest competitors. However, a few new entrants are drawing considerable investments into the industry due to significant

advances in product lines.

In September 2022, E-Peas SA and Energous Corporation announced the launch of a new Wireless Energy Harvesting Evaluation Kit, developed for energy harvesting applications for smart buildings/smart homes, industrial IoT medical, and asset trackers for retail and warehouses. The kit includes the company's 1W WattUp PowerBridge transmitter, delivering an over-the-air solution that enables device manufacturers to implement wireless power and energy harvesting across a range of connected devices along with two evaluation boards from e-peas: the AEM30940 RF Evaluation Board and the EP112 Energy Harvesting Optimized Antenna Evaluation Board.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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