

Japan Waste to Energy Market Assessment, By Waste Type [Municipal Waste, Agriculture Waste, Others], By Technology [Direct Combustion, Mechanical and Thermal, Thermo-Chemical, Biomechanical], By Region, Opportunities and Forecast, FY2018-FY2032F

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Report description:

Japan waste to energy market is expected to observe a CAGR of 6.33% during the forecast period FY2025- FY2032, rising from USD 8.88 billion in FY2024 to USD 14.51 billion in FY2032. The market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years.

Waste to energy (WTE) conversion in Japan is crucial for sustainable waste management and renewable energy production. This method not only meets the ever-growing demand for energy, but also enhances Japan's decarbonization efforts, making it one of the more progressive countries in developing solutions for effective waste management. Additionally, Japanese companies are currently focusing on upgrading their WTE facilities to meet the increasing demand for renewable energy throughout the country. For instance, in June 2024, Mitsubishi Heavy Industries Environmental & Chemical Engineering Co., Ltd. (MHIEC) received a contract from Yokohama city for the reconstruction of a closed waste-to- energy (WTE) facility located in its Hodogaya area. This reconstruction addresses Japan's future waste processing capacity shortage. The overall value of the deal is about USD 444.51 million. The contract involves the demolition of the old facility and construction of a new plant using three stoker incinerators, which can dispose of 1,050 tonnes of waste per day.

The Advent of New Waste to Energy Technologies is Proliferating the Market Growth

Demand for innovative WTE technologies in Japan is rapidly growing due to high waste generation and the urgent need for sustainable solutions for waste management. The commitment of the Japanese government to expand WTE facilities in its overall sustainability agenda also fuels the increasing demand for these plants. Moreover, to reach net-zero carbon emissions by 2050, Japanese organizations have invested significantly in WTE technologies. These initiatives also support the environment by dealing with waste disposal issues while pushing Japan towards its environmental objectives, thus sparking growth in the WTE sector

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market.

For instance, in November 2024, Powerhouse Energy Group Plc announced the granting of its Japanese Patent 7577260, titled "Method and Apparatus for the Treatment of Waste Material,". This patent comprises a new technology for controlling heating in the Thermal Conversion Chamber (TCC) by waste to energy conversion which involves the production of synthesis gas (syngas) from non-recyclable wastes. This milestone marks Powerhouse's achievement in enhancing its competitive edge in the waste to energy sector and supporting its ongoing discussions with potential clients seeking sustainable waste solutions.

Increase in Demand for Pyrolysis is Augmenting the Market Growth

Pyrolysis is a vital part of Japan's waste management and energy recovery strategy. The process helps convert difficult-to-recycle materials, such as plastics and tires, into fuels like diesel. Pyrolysis helps Japan achieve carbon neutrality and reduce dependence on landfills while lowering greenhouse gas (GHG) emissions, thereby promoting innovative waste-to-energy solutions nationwide. Moreover, Japanese organizations are focusing on setting up new pyrolysis plants, making the process more efficient and profitable, which in turn will promote sustainable energy production, thereby amplifying the market growth.

In November 2023, Henan Doing Company extended its support towards the construction of an eco-friendly WTE recycling plant in Japan. The system includes a pyrolysis plant and a pyrolysis oil refining plant with waste processing capacities of 15 tons per day (tpd) and 10 tpd, respectively. The main aim of the system is to help Japanese customers to convert waste tires and plastic scraps into diesel fuel, ensuring higher profitability and promoting sustainable waste management.

A necessity for Conversion of Municipal Wastes into Sustainable Energy Augments Market Growth

The demand for innovative WTE projects in Japan is growing rapidly as the country generates a lot of municipal waste and dire need sustainable solutions for waste management. This trend is further supported by the Japanese government's intention to expand WTE facilities under its broader objectives of sustainability. The government targets net-zero carbon emissions in 2050, with significant investments in WTE technologies. These initiatives address municipal waste disposal challenges and contribute to Japan's environmental targets, thereby fostering market growth in the WTE sector.

For example, in February 2023, Mitsubishi Heavy Industries Environmental & Chemical Engineering Co., Ltd. (MHIEC) received an order for constructing a new WTE plant with a waste processing capacity of 194 tons per day (tpd) from Owarihokubu Waste Disposal Association for construction in Konan City, Aichi Prefecture. The new facility will replace two old plants in the city, and as per the agreement, MHEIC also agreed to maintain the facility for 20 years. The project looks forward to enhancing the efficiency of converting MSW into electrical energy, minimizing toxic emissions, and encouraging sustainable energy production in the country.

Central Japan Emerged as the Market Leader

Central Japan emerged as the market leader and is expected to continue its dominance in the country. This region's significant urban population and limited landfill space have led to a rise in the concentration of advanced waste to energy facilities, utilizing thermal treatment technologies to manage municipal solid waste effectively. Moreover, incineration technology is most widely implemented for waste to energy conversion in the region. Additionally, Tokyo employs 19 advanced incineration plants that efficiently convert waste into energy while minimizing environmental impact. The region's focus on sustainable waste management practices has established it as a leader in the country's waste-to-energy sector, contributing to Japan's overall energy recovery efforts.

For example, in February 2024, Hitachi Zosen Corporation proposed the "Development of High CO2 Concentration Waste Incineration Technology" under the project "Achieving Carbon Neutrality in the Waste and Resource Circulation" initiated by the New Energy and Industrial Technology Development Organization, or NEDO in Tokyo. The new technology focuses on capturing and separating CO2 emissions produced from the incineration process. Hitachi Zosen will implement the technology at the Shinagawa Waste Incineration Plant by cooperating with the Clean Authority of Tokyo. The technological process is expected to yield significant benefits in the diminishment of carbon footprints in the waste management sector, thereby contributing towards making Japan more sustainable while encouraging a circular economy.

Future Market Scenario (FY2025 - FY2032)

-□The Japanese government has introduced stringent regulatory frameworks for promoting waste-to-energy conversion. This, in turn, is expected to cater to extensive market growth opportunities over the upcoming years.

-□The incineration technology is crucial for Japan's waste-to-energy (WTE) future, as it addresses the country's limited landfill

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capacity while generating renewable energy. This enhances environmental sustainability and supports energy recovery, eventually catering to extensive opportunities for growth in the future.

-Increased public awareness programs in Japan regarding waste-to-energy conversion will significantly enhance participation in recycling and waste management initiatives. As Japanese citizens recognize the environmental benefits of converting waste into energy, they are more likely to support local projects. This initiative can lead to a rise in efficiency in waste processing and a reduction in landfill reliance, thereby resulting in massive opportunities for market growth in the future.

Key Players Landscape and Outlook

The market players are continuously competing against each other to gain a significant edge in the market. Moreover, due to the huge availability of municipal wastes and government support, Japanese companies are highly investing in the development of technologies for WTE plants as well as striving for strategic collaborations for effective operations and cost-cutting. This, in turn, is expected to foster huge opportunities for market prosperity in the years to come.

For instance, in September 2024, LanzaTech inked a Master License Agreement with Sekisui Chemical Co., Ltd to develop several commercial-scale waste-to-ethanol plants across Japan. This partnership will convert municipal solid wastes (MSW) and industrial waste into ethanol on a sustainable basis by harnessing the advanced waste-to-energy technologies developed at LanzaTech. Moreover, Sekisui Chemical expects that the facility will be able to produce 10-12 kilotons of ethanol annually. The produced ethanol will be converted to ethylene and kerosene, which in turn, will be used for sustainable aviation fuels. Thus, the agreement serves an important objective in addressing the waste management needs of Japan.

Table of Contents:

- 1. Project Scope and Definitions
- 2. Research Methodology
- 3. Executive Summary
- 4. Voice of Customer
 - 4.1. Management Services and Offerings
 - 4.2. Factors Considered in Purchase Decisions
 - 4.2.1. Overall Expenses
 - 4.2.2. Facility Requirements
 - 4.2.3. Government Incentive
 - 4.2.4. Gasifier Efficacy
- 5. Japan Waste to Energy Market Outlook, FY2018-FY2032F
 - 5.1. Market Size Analysis & Forecast
 - 5.1.1. By Value
 - 5.2. Market Share Analysis & Forecast
 - 5.2.1. By Waste Type
 - 5.2.1.1. Municipal Waste
 - 5.2.1.2. Agriculture Waste
 - 5.2.1.3. Others
 - 5.2.2. By Technology
 - 5.2.2.1. Direct Combustion
 - 5.2.2.2. Mechanical and Thermal
 - 5.2.2.3. Thermo-Chemical
 - 5.2.2.3.1. Gasification
 - 5.2.2.3.2. Pyrolysis
 - 5.2.2.3.3. Liquefaction
 - 5.2.2.3.4. Incineration
 - 5.2.2.4. Biomechanical
 - 5.2.3. By Region

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- 5.2.3.1.□North [Hokkaido and Tohoku]
- 5.2.3.2.□Central [Kanto and Chubu]
- 5.2.3.3.□South [Kansai, Chugoku, Shikoku, and Kyushu & Okinawa]
- 5.2.4.□ By Company Market Share Analysis (Top 5 Companies and Others - By Value, FY2024)
- 5.3.□Market Map Analysis, FY2024
- 5.3.1.□ By Waste Type
- 5.3.2.□ By Technology
- 5.3.3.□ By Region
- 6.□Porter's Five Forces Analysis
- 7.□PESTLE Analysis
- 8.□Market Dynamics
- 8.1.□Market Drivers
- 8.2.□Market Challenges
- 9.□Market Trends and Developments
- 10.□Case Studies
- 11.□Competitive Landscape
- 11.1.□Competition Matrix of Top 5 Market Leaders
- 11.2.□SWOT Analysis for Top 5 Players
- 11.3.□Key Players Landscape for Top 7 Market Players
- 11.3.1.□Mitsubishi Heavy Industries Environmental & Chemical Engineering Co., Ltd. (MHIEC)
- 11.3.1.1.□Company Details
- 11.3.1.2.□Key Management Personnel
- 11.3.1.3.□Products and Services
- 11.3.1.4.□Financials (As Reported)
- 11.3.1.5.□Key Market Focus and Geographical Presence
- 11.3.1.6.□Recent Developments/Collaborations/Partnerships/Mergers and Acquisition
- 11.3.2.□Kanadevia Corporation
- 11.3.3.□Kawasaki Heavy Industries Ltd.
- 11.3.4.□JFE Engineering Corporation
- 11.3.5.□Ebara Environmental Plant Co., Ltd.
- 11.3.6.□Sumitomo Heavy Industries, Ltd.
- 11.3.7.□Sekisui Chemical Co., Ltd
- *Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.
- 12.□Strategic Recommendations
- 13.□About Us and Disclaimer

Japan Waste to Energy Market Assessment, By Waste Type [Municipal Waste, Agriculture Waste, Others], By Technology [Direct Combustion, Mechanical and Thermal, Thermo-Chemical, Biomechanical], By Region, Opportunities and Forecast, FY2018-FY2032F

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