

Global Waste-to-Energy Market to Reach USD 50.92 Billion by 2032, Growing at 4.5% CAGR

Global Waste-to-Energy Market to Grow from USD 34.50 Billion in 2023 to USD 50.92 Billion by 2032 at 4.5% CAGR

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EINPresswire.com/ -- The global [waste-to-energy \(WtE\) market](#) is growing steadily as governments, industries, and communities seek sustainable waste management solutions alongside renewable energy generation. Valued at USD 34.50 billion in 2023, the market is expected to expand from USD 35.84 billion in 2024 to USD 50.92 billion by 2032, registering a compound annual growth rate (CAGR) of 4.5% over the forecast period.



WtE, also referred to as “energy from waste,” uses thermochemical and biochemical technologies to recover energy from municipal and industrial waste streams. These processes can reduce the original waste volume by up to 90%, producing electricity, heat, steam, and fuels. By serving as both a waste management solution and a clean energy source, WtE plays a vital role in addressing greenhouse gas (GHG) emissions, landfill reduction, and rising global energy demand.

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In 2023, the Asia Pacific region dominated the global market, holding a 47.24% share, thanks to rising urbanization, strong government initiatives, and large-scale waste management projects in China, Japan, and India. The U.S. market is also projected to grow significantly, reaching USD 3.49 billion by 2032.

Market Overview

2023 Market Value: USD 34.50 billion

2024 Estimated Value: USD 35.84 billion

2032 Forecast Value: USD 50.92 billion (CAGR: 4.5%)

Regional Leader: Asia Pacific (47.24% share in 2023)

Technology Leader: Biochemical processes such as anaerobic digestion and biogas production

Application Leader: Electricity generation

WtE offers two clear benefits: safe waste disposal and renewable electricity generation. These twin advantages make it a cornerstone of the circular economy, where waste is no longer discarded but reused as a resource.

Key Industry Trends

Digital Transformation

The integration of advanced systems like Supervisory Control and Data Acquisition (SCADA) and Programmable Logic Controllers (PLC) allows real-time monitoring and automation of WtE plants. This enhances transparency, reduces manual intervention, and improves operational efficiency.

Circular Economy Strategies

Municipalities and industries are embracing solid recovered fuel (SRF), recycling, and bio-CNG facilities. These initiatives align with global sustainability goals, turning waste into usable materials and energy.

Public-Private Partnerships (PPPs)

Governments, particularly in developing regions, are partnering with private players to expand WtE infrastructure, boosting both capacity and technological adoption.

Automation & Sorting Technologies

Emphasis is being placed on creating homogeneous waste streams at the source. Automated sorting enhances feedstock quality, improving energy recovery efficiency.

Market Dynamics

Driving Factors

Urbanization and Rising Waste Volumes: Rapid industrialization and urban growth are fueling municipal solid waste generation, necessitating advanced energy recovery solutions.

Government Incentives & Regulations: Policies like the EU's 32% renewable energy target by 2030 and India's bio-CNG mission are accelerating investments in WtE projects.

Environmental Benefits: WtE helps mitigate GHG emissions and reduces reliance on landfills, making it a sustainable alternative to traditional waste management.

Industrial Adoption: Sectors such as food processing, dairy, and wastewater treatment are increasingly adopting WtE to cut costs and improve efficiency.

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Restraining Factors

High Costs: Compared to established renewables like wind and solar, WtE remains a relatively costly option for energy generation.

Complex Policies & Fragmentation: Inconsistent regional regulations make scaling projects difficult.

Feedstock Availability: Continuous and reliable waste streams are essential; shortages or inconsistencies reduce efficiency.

Segmentation Analysis

By Technology

Biochemical Technology: Dominates due to widespread use of anaerobic digestion for biogas production. This aligns with EU renewable energy goals and is expanding globally.

Thermochemical Technology: Incineration leads this segment, favored for its maturity, cost-effectiveness, and efficiency of around 25%. Suitable in both urban and rural contexts, incineration accepts a broad range of waste types.

By Waste Type

Municipal Solid Waste (MSW): The largest share, reflecting high waste generation from households, institutions, and commercial activities.

Process Waste: Rising with industrial activity; regulatory frameworks encourage reuse of industrial by-products.

Agricultural Waste: Increasing adoption in gasification and pyrolysis technologies, particularly in regions with large farming outputs.

Other Waste Types: Includes manure, silts, pesticides, and other byproducts now being used for energy recovery.

By Application

Electricity Generation: Leading application in 2023, supported by rising energy demand and the global shift away from fossil fuels.

Heat Generation: Also significant, particularly in residential and industrial heating applications. Heat is often produced as a byproduct, providing added value streams.

Regional Insights

Asia Pacific

Market size: USD 16.30 billion in 2023.

Leadership driven by high waste volumes, economic growth, and government initiatives.

Japan is a frontrunner with highly efficient waste management systems and strong government support.

Europe

Mature WtE market with a strong focus on recycling and energy recovery.

The EU Renewable Energy Directive plays a pivotal role in promoting biogas and bioenergy adoption.

North America

Expected to hold a significant share due to high waste generation.

The U.S. Environmental Protection Agency (EPA) promotes sustainable solid waste practices emphasizing source reduction, energy recovery, and recycling.

Middle East, Africa & Latin America

Growing adoption fueled by circular economy initiatives.

Countries are increasingly investing in WtE facilities to address rising urban waste volumes.

Competitive Landscape

The market is fragmented, with both multinational corporations and local operators. Leading companies include:

Veolia (France)

China Everbright International (China)

Covanta (U.S.)

SUEZ (France)

EDF (France)

Huawei Enterprise (China)

Ramboll Group (Denmark)

AVR (Netherlands)

Viridor (U.K.)

Attero (India)

These companies are focusing on capacity expansion, partnerships, and technological innovation to strengthen their positions.

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Recent Developments

June 2022 – AVR & HaloSep AB (Netherlands/Sweden): Partnered to transform hazardous flue gas cleaning residues into harmless materials, advancing circular practices.

June 2022 – Veolia & Suez (France/U.K.): Veolia tendered the sale of Suez's U.K. waste segment while consolidating global leadership in ecological transformation.

April 2022 – Veolia (France): Announced two new projects, including the world's largest CO₂-neutral biomethanol refinery in Finland.

April 2022 – Viridor (U.K.): Sold landfill gas business to Frank Solutions, focusing on energy

recovery and polymer reprocessing.

2022 – HDFC Bank & Indore Clean Energy (India): Partnered to establish Asia's largest bio-CNG plant (550 tons/day capacity).

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