

WASTE MANAGEMENT MARKET

GLOBAL FORECAST TO 2026

BY WASTE (HAZARDOUS, E-WASTE, PLASTIC, BIO-MEDICAL, OTHERS),
SERVICE (OPEN DUMPING, INCINERATION, LANDFILL, RECYCLING, OTHERS),
END USER (RESIDENTIAL, COMMERCIAL, INDUSTRIAL) AND REGION

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
APAC	Asia Pacific
CAGR	Compound Annual Growth Rate
CEO	Chief Executive Officer
EPA	Environmental Protection Agency
EPR	Extended Producer Responsibility
EU	European Union
EUR	Euro
FDA	Food and Drug Administration
GBP	Pound Sterling
GDP	Gross Domestic Product
HDPE	High-density Polyethylene
IMF	International Monetary Fund
LDPE	Low-density Polyethylene
MEP	Ministry of Environmental Protection
MOC	Ministry of Commerce
MSWI	Municipal Solid Waste Incineration
NCEAS	National Center for Ecological Analysis and Synthesis
NDRC	National Development and Reform Commission
OECD	Organisation for Economic Co-operation and Development
OWMA	Ontario Waste Management Association
PCC	Pollution Control Committee
PET	Polyethylene Terephthalate
PP	Polypropylene
PS	Polystyrene
PUR	Polyurethane
PVC	Polyvinyl Chloride
RCO	Recycling Council of Ontario
SPCB	State Pollution Control Board

SPI	Society of the Plastics Industry
UAE	United Arab Emirates
UK	United Kingdom
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
US	United States of America
USD	United States Dollar

1 INTRODUCTION

1.1 STUDY OBJECTIVES

- To define, describe, segment, and forecast the size of the waste management market based on waste type, service type, and end user, in terms of value
- To provide detailed information regarding the drivers, restraints, opportunities, and challenges influencing the growth of the market
- To strategically analyze the waste management market with respect to individual growth trends, future expansions, and contribution of each segment to the market
- To analyze market opportunities for stakeholders and provide details of the competitive landscape for market leaders
- To forecast the growth of the waste management market with respect to 5 key geographies, namely, Asia Pacific, Europe, North America, South America, and the Middle East & Africa
- To strategically profile key players and comprehensively analyze their market rankings and core competencies¹
- To analyze competitive developments in the waste management market, such as contracts, agreements, investments, expansions, product launches, mergers, and acquisitions

1.2 DEFINITION

Waste management includes handling and disposing of waste. This can be done by destroying, discarding, recycling, processing, reusing, and controlling different types of wastes. Waste management systems ensure the safe collection, segregation, storage, transportation, processing, and disposal of generated waste. Waste management also ensures that no harm is caused to the environment during this process, and the process is undertaken in accordance with the rules, regulations, and standards prescribed by governments or associations. Waste management helps prevent or mitigate pollution; manage or reduce waste streams; remediate contaminated sites; prevent the spread of waterborne and airborne diseases.

1. Core competencies of the companies are captured in terms of their key developments, product portfolio, and key strategies adopted to sustain their respective position in the market.

1.2.1 WASTE MANAGEMENT MARKET, BY SERVICE TYPE: INCLUSIONS & EXCLUSIONS

SERVICE TYPE	INCLUSION	EXCLUSION
Open Dumping	It includes solid waste disposal facilities or practices that pose a reasonable probability of adverse effects on health or the environment.	NA
Incineration/ Combustion	Incineration includes treating waste that involves the combustion of the organic substances found in waste materials.	NA
Landfill	Landfills are used for the disposal of solid waste. Landfills are located, designed, operated, and monitored to ensure compliance with federal regulations.	NA
Recycling	Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products.	NA
Composting & Anaerobic Digestion	Anaerobic digestion includes bacteria breaking down organic matter such as animal manure, wastewater biosolids, and food wastes in the absence of oxygen.	NA

Source: Secondary Sources, Primary Sources, and MarketsandMarkets Analysis

1.2.2 WASTE MANAGEMENT MARKET, BY END USER: INCLUSIONS & EXCLUSIONS

END USER	INCLUSION	EXCLUSION
Residential	Residential include households, municipalities, societies/ home associations, property management, and others.	NA
Commercial	The commercial segment includes office & retail, commercial property, restaurant, government offices, and education & healthcare facilities.	NA
Industrial	This segment includes manufacturing, construction, renovation, & demolitions.	NA

Source: Secondary Sources, Primary Sources, and MarketsandMarkets Analysis

1.3 MARKET SCOPE

1.3.1 WASTE MANAGEMENT MARKET SEGMENTATION



Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Company Websites, World Bank, Secondary Sources, Primary Sources, and MarketsandMarkets Analysis

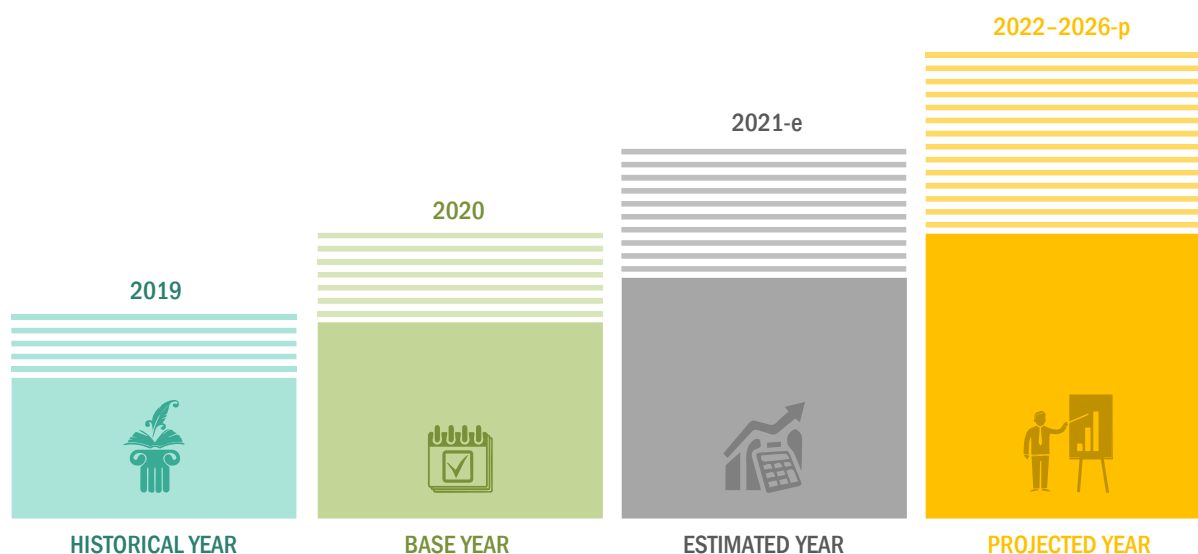
1.3.2 GEOGRAPHIC SCOPE



Note: Rest of Europe primarily includes the Netherlands, Norway, Sweden, Austria, and Switzerland; Rest of Asia Pacific mainly includes Singapore, Malaysia, Thailand, and Indonesia; Rest of the Middle East & Africa specifically includes Turkey, Nigeria, Egypt, Israel, Morocco; and Rest of South America mainly includes Venezuela, Ecuador, Peru, and Colombia.

Source: Company Websites, World Bank, Secondary Sources, Primary Sources, and MarketsandMarkets Analysis

1.4 YEARS CONSIDERED



Note: e: Estimated; p: Projected

The base year used for company profiles is 2020. Wherever information was unavailable for the base year, the year prior to the base has been considered. The forecast period considered for this study is from 2021 to 2026.

1.5 CURRENCY

- The base currency used in the report is the US dollar (USD), with the market size indicated in USD million and USD billion.
- Company revenues have been obtained from their latest annual reports.
- For companies reporting their revenues in currencies other than USD, the average annual currency conversion rate for that year has been used to convert the values to USD.
- The average historical exchange rates have been used from ofx.com, according to the year specified, to convert various currencies to USD.

1.6 LIMITATIONS

- The report covers the waste management market where only services are being defined from the point of consumption (end user) to the point of treatment.
- Quantitative information for some of the market segments has been kept confidential by industry players. Hence, qualitative insights gathered during the study have been used to arrive at the market size of such subsegments.

1.7 STAKEHOLDERS

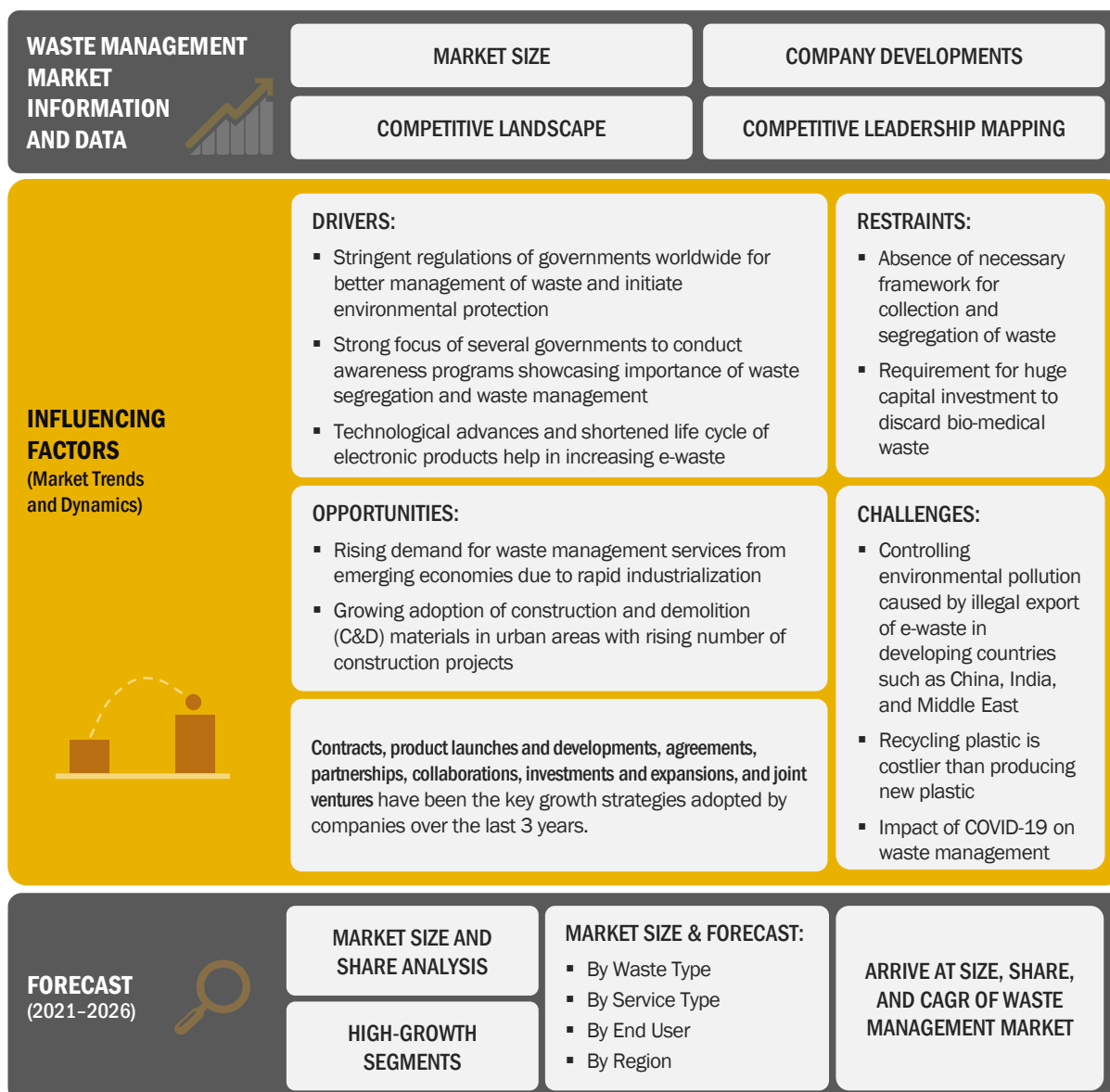
- Plastic and special plastic material and chemical providers
- Environmental service providers
- Government and regulatory bodies
- Commercial R&D institutions
- Associations and industry bodies
- Conservation professionals
- Municipalities, and local and regional authorities
- Other end users (materials recovery facilities, processors, sorters, plastic recycling plants, and manufacturers)

2 RESEARCH METHODOLOGY

2.1 RESEARCH DATA

This technical, market-oriented, and commercial study of the waste management market has involved the extensive use of secondary sources, directories, and databases, such as Hoovers, Bloomberg, Businessweek, Factiva, and World Bank, to identify and collect relevant information. Primary sources that have been considered include several industry experts from the core and related industries, preferred suppliers, manufacturers, distributors, service providers, technology developers, standards and certification organizations, and organizations related to all the segments of this industry's value chain. In-depth interviews have been conducted with various primary respondents to obtain and verify qualitative and quantitative information, as well as to assess prospects; these include key industry participants, subject-matter experts (SMEs), C-level executives of key market players, and industry consultants.

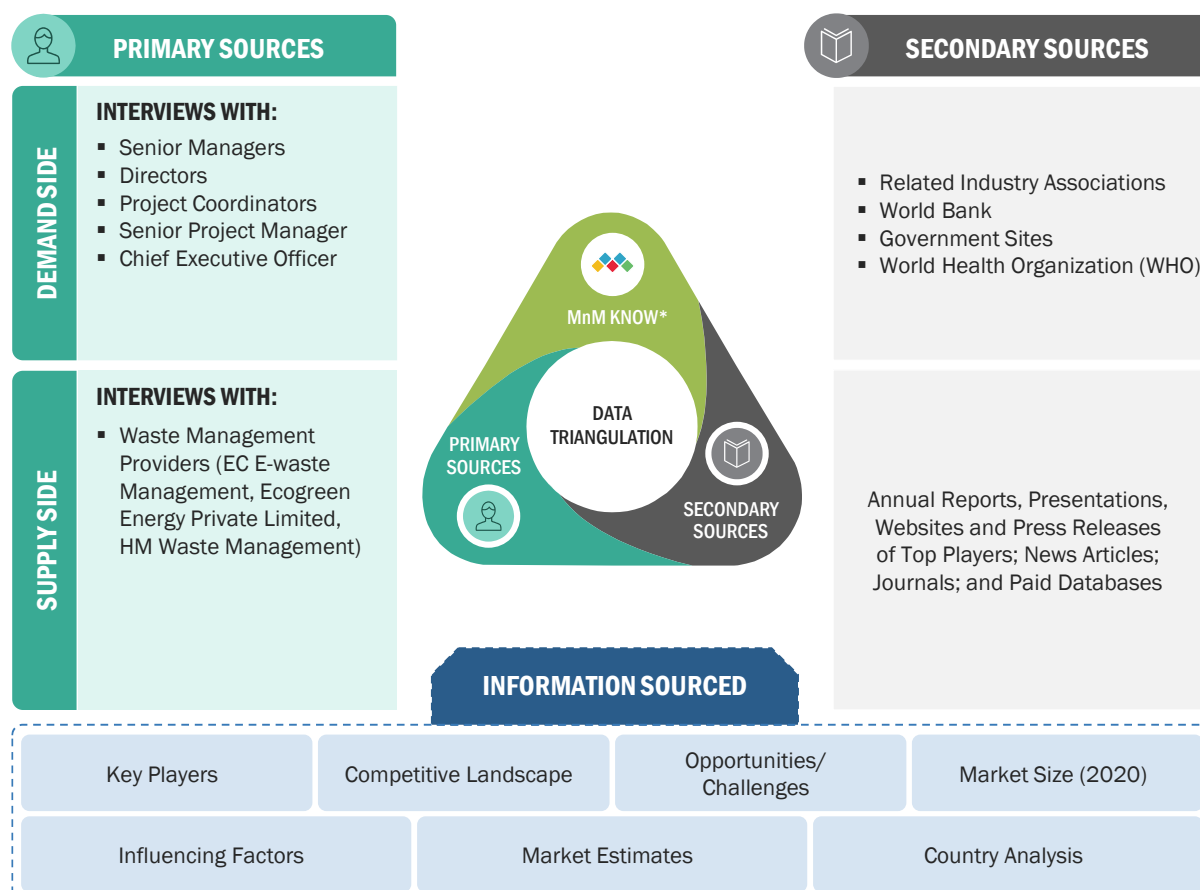
In the complete market engineering process, both top-down and bottom-up approaches have been extensively used, along with data triangulation methods, to perform market estimation and market forecasts for the overall market segments and subsegments listed in this report. Extensive qualitative and quantitative analyses have been carried out on the complete market engineering process to list key information/insights throughout the report. The following figure shows the market research methodology applied in making this report on the waste management market.

FIGURE 1 WASTE MANAGEMENT MARKET: RESEARCH DESIGN

2.2 MARKET BREAKDOWN AND DATA TRIANGULATION

After arriving at the overall market size from the estimation process explained below, the total market has been split into several segments and subsegments. The data triangulation and market breakdown procedures have been employed, wherever applicable, to complete the overall market engineering process and arrive at the exact statistics for all the segments and subsegments. The data has been triangulated by studying various factors and trends from both the demand and supply sides.

FIGURE 2 DATA TRIANGULATION METHODOLOGY



*MnM KNOW stands for MarketsandMarkets' "Knowledge Asset Management" framework. In this context, it stands for existing market research knowledge repository of over 5,000 granular markets, our flagship competitive intelligence and market research platform "Knowledge Store," subject-matter experts, and independent consultants. MnM KNOW acts as an independent source that helps us validate the information gathered from primary and secondary sources.

2.2.1 SECONDARY DATA

Secondary sources referred to for this research study include annual reports, press releases, investor presentations of companies, white papers, certified publications, articles from recognized authors, and databases of various companies and associations. Secondary research has been mainly used to obtain key information about the industry's supply chain, market's monetary chain, the total pool of key players, market classification and segmentation according to industry trends to the bottom-most level, regional markets, and key developments from both market- and technology-oriented perspectives.

2.2.1.1 Key data from secondary sources

PARAMETER	SOURCE
 MARKET SIZE (Value)	▪ Magazines ▪ Journals ▪ Press Releases ▪ Paid Databases ▪ MarketsandMarkets Data Repository
 COMPANY REVENUE	▪ Annual Reports ▪ Company Websites ▪ Public Databases ▪ MarketsandMarkets Data Repository
 QUALITATIVE INFORMATION (Market Dynamics and Trends)	▪ Company Websites ▪ Annual Reports ▪ Press Releases ▪ MarketsandMarkets Data Repository

2.2.2 PRIMARY DATA

In the primary research process, various primary sources from both the supply and demand sides have been interviewed to obtain qualitative and quantitative information for this report. Primary sources from the supply side include industry experts such as CEOs, vice presidents, marketing directors, technology and innovation directors, and related key executives from various companies and organizations operating in the waste management market.

In the complete market engineering process, both top-down and bottom-up approaches have been extensively used, along with several data triangulation methods, to perform market estimation and projection for the overall segments and subsegments listed in this report. Extensive qualitative and quantitative analyses have been conducted on the complete market engineering process to list key information/insights throughout the report.

2.2.2.1 Key data from primary sources

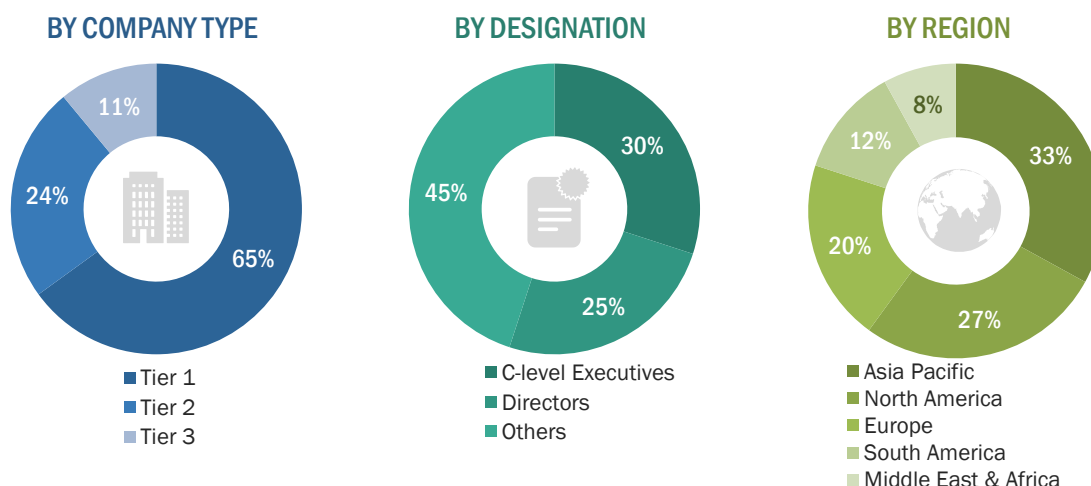


Source: Industry Experts and MarketsandMarkets Analysis

After the complete market engineering process (which includes calculations for market statistics, market breakdown, market size estimation, market forecast, and data triangulation), extensive primary research has been conducted to gather information and verify and validate critical numbers. Primary research has also been conducted to identify segments, industry trends, and the competitive landscape of the waste management market.

2.2.2.2 Breakdown of primaries

PROVIDERS OF SERVICES/TECHNOLOGIES FOR WASTE MANAGEMENT		ASSOCIATIONS AND AGENCIES
Waste Management	Waste Connections	National Solid Waste Association of India (NSWI)
SUEZ	Republic Services	Environmental Protection Agency (EPA)
Veolia	Biffa	Organisation for Economic Co-operation and Development (OECD)



Note: "Others" includes sales managers, engineers, and regional managers.

Tier 1 company—revenue >USD 5 billion, tier 2 company—revenue between USD 1 and USD 5 billion, and tier 3 company—revenue <USD 1 billion

2.3 IMPACT OF COVID-19 ON WASTE MANAGEMENT MARKET

COVID-19 is estimated to have a moderate impact on the growth of the waste management market globally. The demand for various waste management services by end users has been reduced owing to the pandemic and lockdowns. Governments across the world have forced citizens to reduce business activities to curb the spread of the coronavirus. Various industries across different geographies had to shut down their manufacturing facilities and services as partial or full lockdowns had been imposed in different countries to contain the spread of the virus. This resulted in the reduction in the demand for waste management products and services in 2020. However, post-COVID-19, the market is expected to grow with the increasing awareness of people regarding proper sanitation and handling of waste and the rising demand for a clean and sustainable environment.

2.4 MARKET SIZE ESTIMATION

Both top-down and bottom-up approaches have been used to estimate and validate the size of the global waste management market and its dependent submarkets. Key market players have been identified through secondary research, and their market shares in the respective regions have been identified through primary and secondary research. The research methodology included in the study is from the annual and financial reports of the top market players and interviews with industry experts, such as CEOs, VPs, directors, sales managers, and marketing executives, for key insights, both quantitative and qualitative, into the waste management market. The following segments provide details about the overall market size estimation process employed in this study.

2.4.1 BOTTOM-UP APPROACH

The bottom-up approach has been used to determine the overall global size of the waste management market and country-wise market share in terms of value. End users of waste management have also been analyzed to arrive at the global market size.

FIGURE 3 WASTE MANAGEMENT MARKET: INDUSTRY-REGION/COUNTRY-WISE ANALYSIS

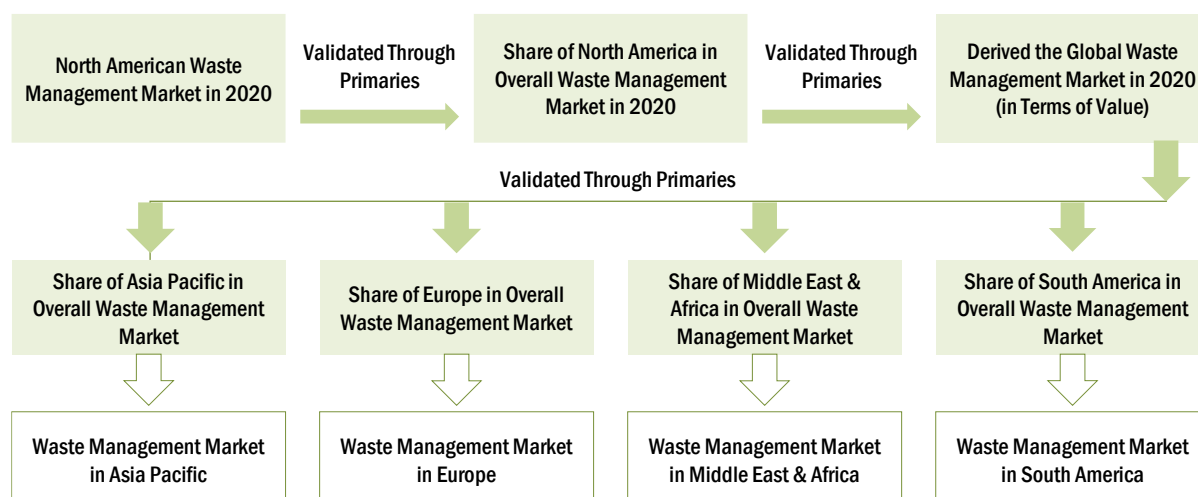


Source: World Bank, Environmental Protection Agency, Annual Reports, Investor Presentations, and Expert Insights

2.4.2 TOP-DOWN APPROACH

In the top-down approach, the overall market size has been used to estimate the size of individual markets through percentage splits from secondary and primary research. Through data triangulation and validation with the help of primaries, the overall parent and individual market sizes have been determined and confirmed in this study. The data triangulation process used for this study has been explained in the next section.

FIGURE 4 WASTE MANAGEMENT MARKET: TOP-DOWN APPROACH



2.5 DEMAND-SIDE METRICS

FIGURE 5 MAIN METRICS CONSIDERED FOR ANALYZING AND ASSESSING DEMAND FOR WASTE MANAGEMENT



Note: These data points have been analyzed to understand the trends and demand for waste management services.

Source: Expert Interviews, Company Annual Reports, and MarketsandMarkets Analysis

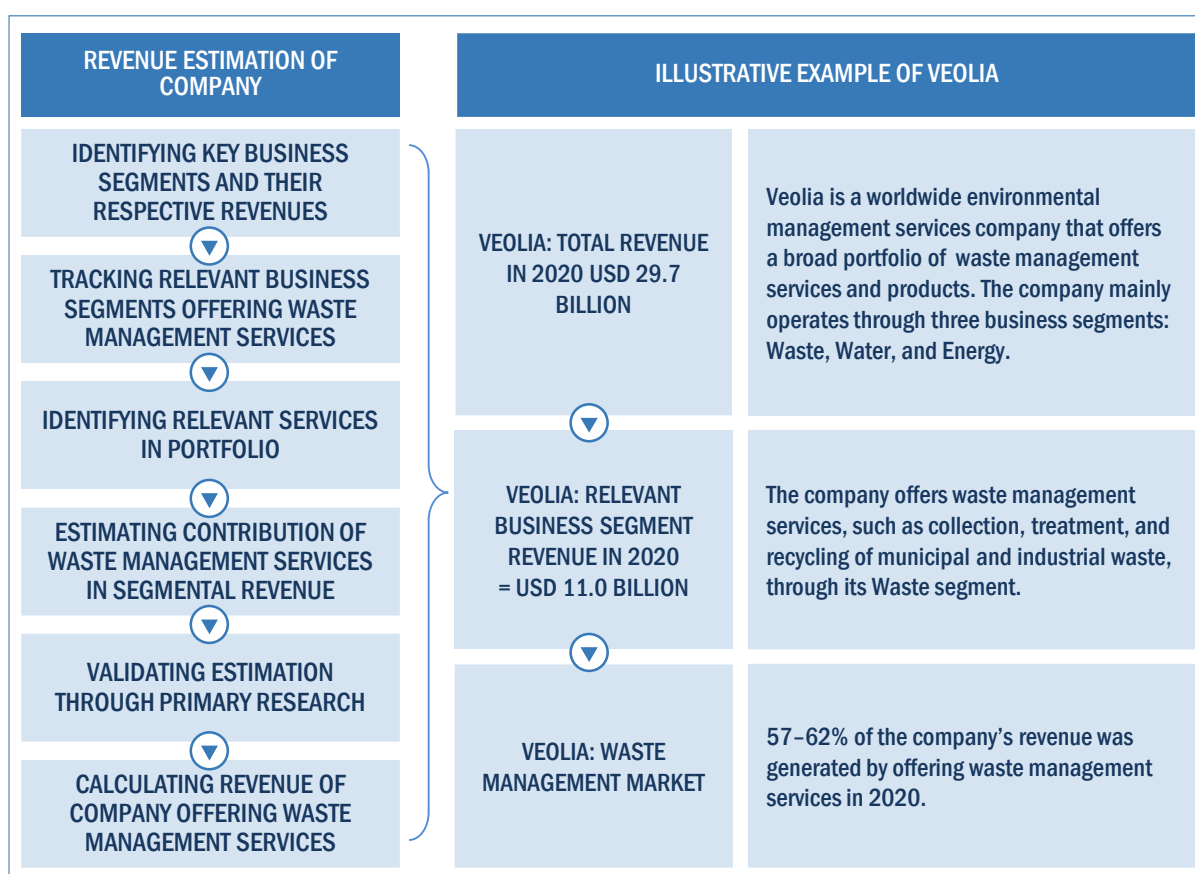
2.5.1 CALCULATIONS FOR DEMAND SIDE

- Global waste management market (USD billion) = total market size waste management market in US/share of US in the overall waste management market.
- Waste management market size in North America (USD billion) = global waste management market (USD billion)/share of North America in the overall waste management market (%)
- Waste management market size in Europe (USD billion) = global waste management market (USD billion)/share of Europe in the global waste management market (%)
- Waste management market size in South America (USD billion) = global waste management market (USD billion)/share of South America in the global waste management market (%)
- Waste management market size in Asia Pacific (USD billion) = global waste management market (USD billion)/share of Asia Pacific in the global waste management market (%)
- Waste management market size in Middle East & Africa (USD billion) = global waste management market (USD billion)/share of Middle East & Africa in the global waste management market (%)

2.6 SUPPLY-SIDE ANALYSIS

FIGURE 6 KEY STEPS CONSIDERED FOR ASSESSING SUPPLY OF WASTE MANAGEMENT

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Listing down the key providers of waste management services, such as SUEZ, Waste Management, Veolia, Waste Connections, and Republic Services	Analyzing annual revenue of these key providers to estimate the total market for waste management services	Analyzing revenues and subsegmental revenues of various service providers and supply channels of key players to triangulate the data with respect to the demand side Conducting similar analysis for different companies	Extrapolating data from steps 2 and 3 to arrive at the total market size during the period considered for the study Identifying the combined percentage shares of the top companies in the waste management market Calculating the overall size of the waste management market using the combined shares of the top companies and their revenues	Revalidating the market size and market share estimations through primary respondents
KEY SOURCES OF INFORMATION:				
Secondary sources such as company financials, press releases, paid databases (e.g., Factiva), and primary research	Secondary sources such as company financials, press releases, paid databases (e.g., Factiva), and primary research	Primary research with stakeholders	MarketsandMarkets' calculations	Primary research

FIGURE 7 WASTE MANAGEMENT MARKET: SUPPLY-SIDE ANALYSIS, 2020

2.6.1 CALCULATIONS FOR SUPPLY SIDE

- Annual revenues of all key companies have been tracked from their annual reports.
- Annual revenues have been split into segmental revenues, from which service revenues have been estimated.
- Market shares of companies assessed from secondary research and validated through primaries have been consolidated to estimate the total size of the waste management market.
- Segmental revenues of key providers of waste management services have been calculated and consolidated.

2.7 STUDY ASSUMPTIONS

PARAMETER	ASSUMPTION
COVID-19 IMPACT PERIOD	The COVID-19 pandemic impacted the waste management market as there was a decline in investment by various countries on managing wastes. Furthermore, it was observed that various industrial and commercial institutes were shut down owing to the global restrictions, which eventually led to a decrease in waste generated during the same period.
GLOBAL ECONOMIC LANDSCAPE	No economic downturns and economic collapses, apart from COVID-19, have been considered while estimating the market size in this research study.
SEGMENTAL SPLITS AND PROJECTIONS	Wherever the exact segmental market splits were not available, historic trends and inputs from primary respondents have been considered, and accordingly, splits and projection rates have been assumed.
SEGMENTATION CLASSIFICATION	All market segments and subsegments listed in this report through various forms of classification have been considered to be mutually exclusive of each other.
TRENDS	• The demand for waste management services will be high in those regions where stringent environmental regulations exist. • When analyzing waste management services, year-on-year volume of waste generation has been projected for the forecast period. • The CAGR projections were calculated on the basis of different types of waste generated across regions.

2.8 FORECAST

- The growth rate of the global waste management market has been calculated based on the following parameters:
 - Investments to manage hazardous waste.
 - Year-on-year waste generation by region.
 - The impact of COVID-19 on industrial production, chemical production, and supply chain disruptions has been clubbed with macroeconomic indicators, such as GDP, from the manufacturing industry.
 - Growth in the industry such as chemicals, construction, electronics, pharmaceuticals, agricultural, and nuclear waste.

3 EXECUTIVE SUMMARY

Waste management services are required to manage waste from its inception to its disposal. This includes the collection, transport, treatment, and disposal of waste, together with monitoring and complying with regulation of the waste management process. Different kinds of waste products are generated such as bio-hazardous waste, chemical waste, and organic waste. Each type of waste product requires different disposal and handling methods. Some waste products will be placed into incinerators to be disposed of, while some are discarded using landfills. Both of these common methods of waste disposal have an adverse impact on the environment. Problems like leachate occur when it rains, and water is penetrated into the garbage collected at landfills. Some poisons can be absorbed and end up in waterways underground that may be used for drinking purpose. Leachate generation is a major problem for municipal solid waste (MSW) landfills.

The amount of waste generated is closely linked to consumption and production patterns. Demographic changes such as an increase in the number of one-person households also affect the amount of waste generated (e.g., packaging goods in smaller units). The global waste management market is estimated to grow from USD 423.4 billion in 2021 to reach USD 542.7 billion by 2026; it is expected to grow at a CAGR of 5.1% during the forecast period. Based on region, the market has been segmented into North America, Europe, Asia Pacific, the Middle East & Africa, and South America. Asia Pacific is estimated to be the largest market for waste management services during the forecast period.

Some major players in the waste management market are Waste Management (US), Veolia (France), Republic Services (US), SUEZ (France), and Waste Connections (US).

TABLE 1 WASTE MANAGEMENT MARKET SNAPSHOT

PARTICULARS	2021 (E)	2026 (P)
Global Value (USD Billion)	423.4	542.7
Regional Share	- Asia Pacific: 39.5% - North America: 29.7% - Europe: 26.7% - South America: 2.5% - Middle East & Africa: 1.6%	- Asia Pacific: 42.2% - North America: 28.3% - Europe: 25.8% - South America: 2.2% - Middle East & Africa: 1.5%
	- E-waste: 25.7% - Hazardous Waste: 21.0% - Plastic Waste: 19.0% - Bio-medical Waste: 14.3% - Others: 20.0%	- E-waste: 26.0% - Hazardous Waste: 21.8% - Plastic Waste: 19.4% - Bio-medical Waste: 13.4% - Others: 19.4%
	- Landfill: 34.0% - Open Dumping: 33.2% - Recycling: 13.9% - Incineration/Combustion: 11.2% - Compositing & Anaerobic Digestion: 7.7%	- Landfill: 35.1% - Open Dumping: 31.5% - Recycling: 14.8% - Incineration/Combustion: 11.4% - Compositing & Anaerobic Digestion: 7.2%
By Waste Type	- E-waste: 25.7% - Hazardous Waste: 21.0% - Plastic Waste: 19.0% - Bio-medical Waste: 14.3% - Others: 20.0%	- E-waste: 26.0% - Hazardous Waste: 21.8% - Plastic Waste: 19.4% - Bio-medical Waste: 13.4% - Others: 19.4%
By Service Type	- Landfill: 34.0% - Open Dumping: 33.2% - Recycling: 13.9% - Incineration/Combustion: 11.2% - Compositing & Anaerobic Digestion: 7.7%	- Landfill: 35.1% - Open Dumping: 31.5% - Recycling: 14.8% - Incineration/Combustion: 11.4% - Compositing & Anaerobic Digestion: 7.2%

By End User	▪ Residential: 55.9%	▪ Residential: 57.0%
	▪ Industrial: 29.3%	▪ Commercial: 14.2%
	▪ Commercial: 14.8%	▪ Industrial: 28.8%

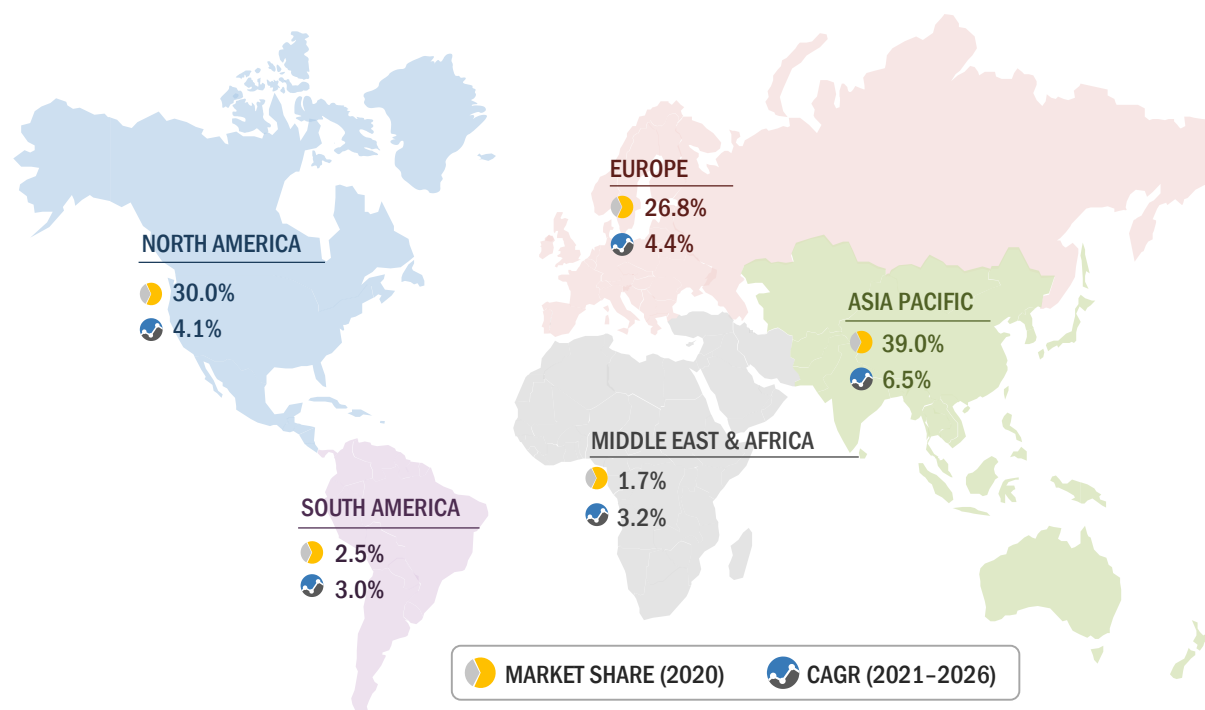
By Value, Global Market CAGR
(2021–2026)

5.1%

e- Estimated; p- Projected

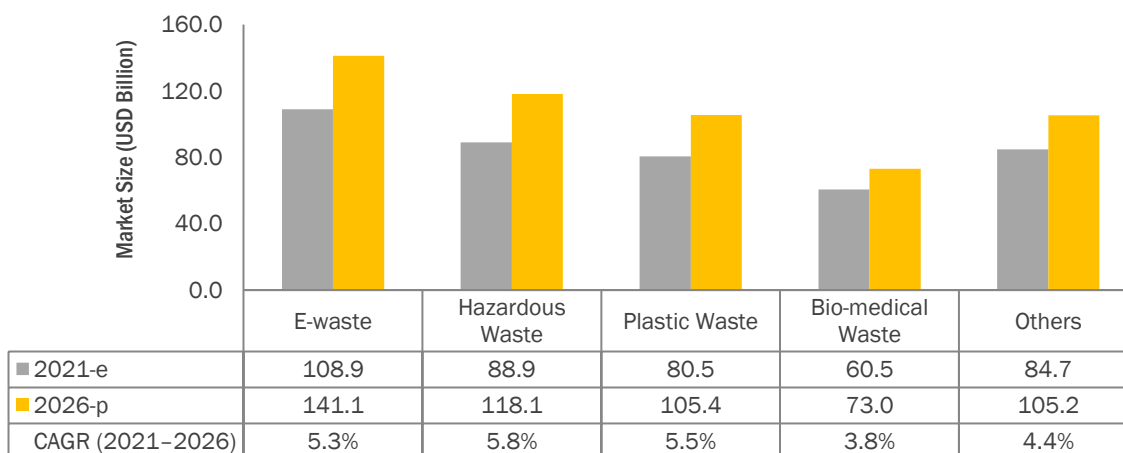
Note: Market share may not add up to 100% in some instances because of individual rounding off.

FIGURE 8 ASIA PACIFIC DOMINATED WASTE MANAGEMENT MARKET IN 2020



Source: Government Publications, Secondary Literature, Expert Interviews, and MarketsandMarkets Analysis

FIGURE 9 E-WASTE SEGMENT TO ACCOUNT FOR LARGEST SIZE OF WASTE MANAGEMENT MARKET, BY WASTE TYPE, DURING FORECAST PERIOD



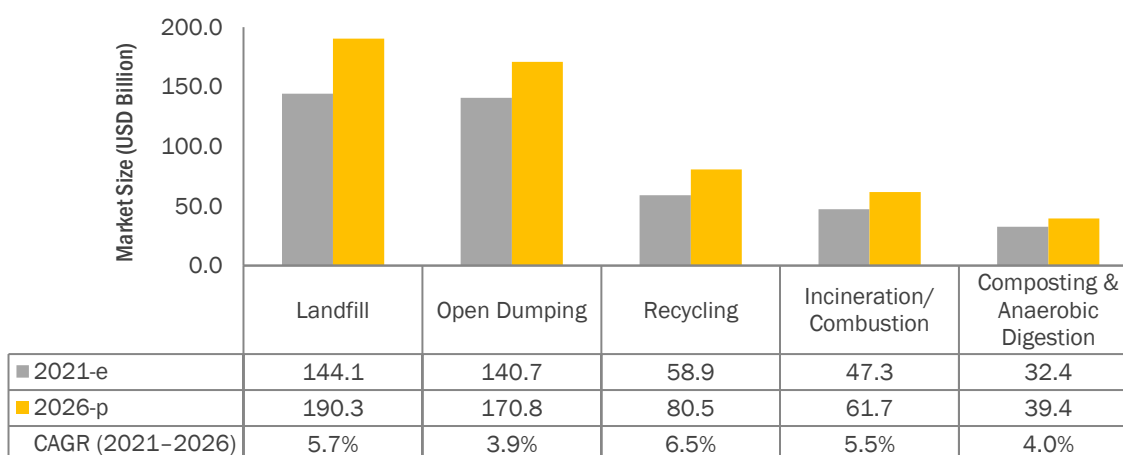
Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

e- Estimated; p- Projected

Source: Government Publications, Secondary Literature, Expert Interviews, and MarketsandMarkets Analysis

E-waste management has gained importance globally to secure the environment from the adverse effects of the materials such as lead and plastic. The recycled material is used to make next-generation goods. Each person across the world is using these electronic products in day-to-day life for multiple purposes. The increase in the usage of electronic goods is because of advancements in technology, which encourage electronic manufacturing companies to launch new products. As a result, cutting-edge technology-based new products replace conventional products. Thus, these outdated products are directed toward the electronics waste market for recycling because of which the market for e-waste management services is expected to boom in the near future. The product to be discarded is either refurbished, reused, or recycled.

FIGURE 10 LANDFILL SERVICES TO HOLD LARGEST SIZE OF WASTE MANAGEMENT MARKET FROM 2021 TO 2026

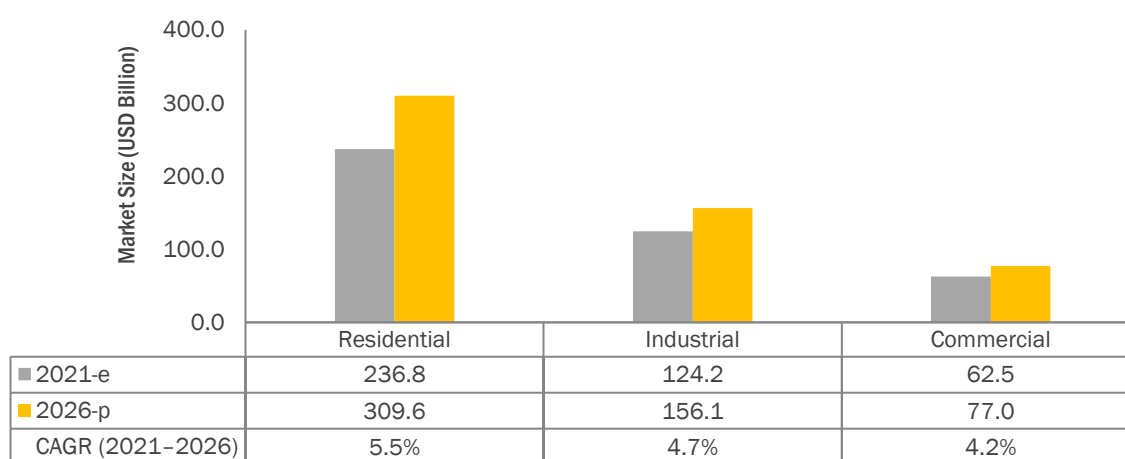


e- Estimated; p- Projected

Source: Government Publications, Secondary Literature, Expert Interviews, and MarketsandMarkets Analysis

Landfill services accounted for the largest market share in 2020, and a similar trend is likely to be observed during the forecast period. According to the Environmental Protection Agency, municipal solid waste (MSW) landfills are the third-largest human-generated source of methane emissions in the US, releasing nearly 99.4 million metric tons of carbon dioxide (CO₂) equivalent (MMTCO₂e) into the atmosphere in 2019 alone. With a global warming potential more than 25 times greater than CO₂ and a short (12-year) atmospheric life, methane is a potent greenhouse gas that is a key contributor to global climate change. As a result, reducing methane emissions from MSW landfills is one of the best ways to achieve a near-term beneficial impact in mitigating global climate change. Other benefits of landfills include the use of landfill gas to generate energy and build eco-friendly cities, towns, and districts; it also reduces the costs associated with regulatory compliance by turning pollution into a valuable community resource. All these factors are expected to drive the market for landfill services in the waste management market.

FIGURE 11 RESIDENTIAL END USERS TO LEAD WASTE MANAGEMENT MARKET DURING FORECAST PERIOD



e- Estimated; p- Projected

Source: Government Publications, Secondary Literature, Expert Interviews, and MarketsandMarkets Analysis

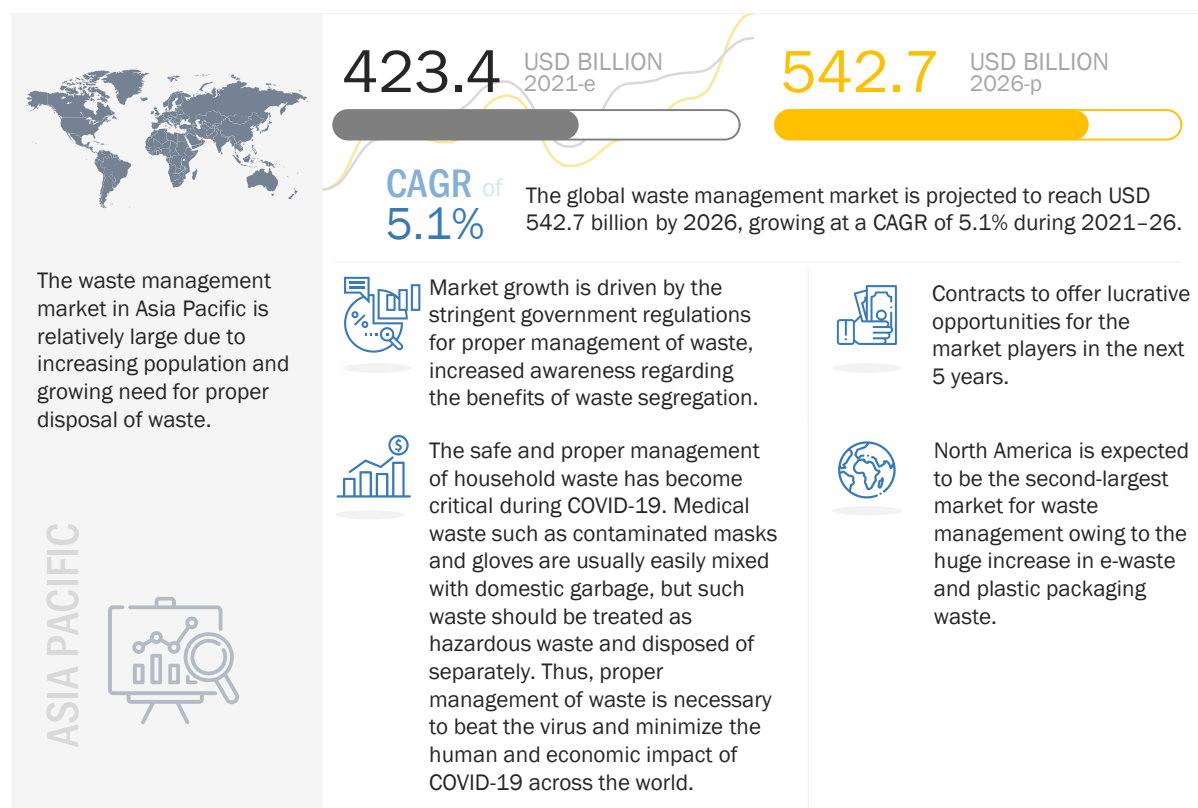
Residential end user accounted for a larger market share than the industrial and commercial end user in 2020, and a similar trend is likely to be observed during the forecast period. The growth of this segment is mainly driven by rapid urbanization, which results in an increase in municipal solid waste. Waste products such as product packaging, grass clippings, bottles, furniture, clothing, food scraps, newspapers, appliances, paints, batteries are generated frequently. Also, high disposable income and increased preference of consumers toward e-shopping have significantly raised the quantity of packaging waste generated by residents.

Major players in the global waste management market—Waste Management (US), Veolia (France), Republic Services (US), SUEZ (France), and Waste Connections (US)—compete with each other in terms of customer base, service portfolio, technological capability, and geographic presence. They cumulatively hold a significant percentage of the total market share. These market players have constantly been adopting both organic and inorganic growth strategies to sustain or increase their market share and enhance their portfolio of products and services. Contracts and partnerships have been the most widely adopted strategies by these players to ensure their market dominance.

4 PREMIUM INSIGHTS

4.1 ATTRACTIVE OPPORTUNITIES IN WASTE MANAGEMENT MARKET

FIGURE 12 INCREASING POPULATION AND GROWING NEED FOR PROPER DISPOSAL OF WASTE TO BOOST DEMAND FOR WASTE MANAGEMENT SERVICES IN COMING YEARS

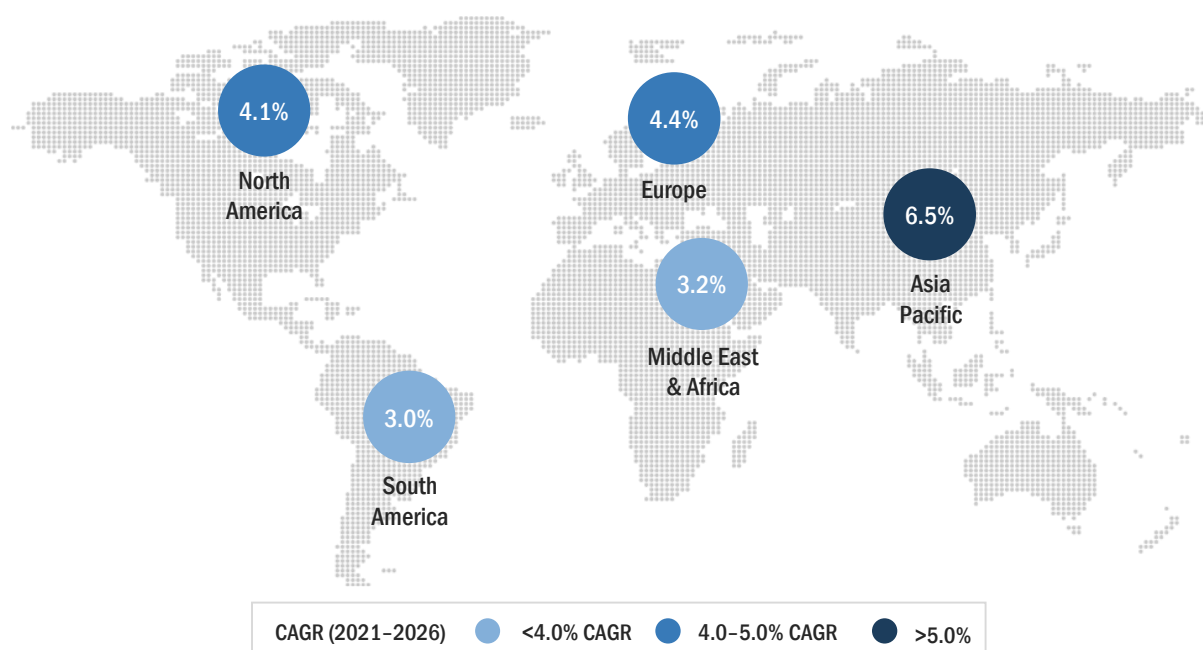


e- Estimated; p- Projected

Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

4.2 WASTE MANAGEMENT MARKET, BY REGION

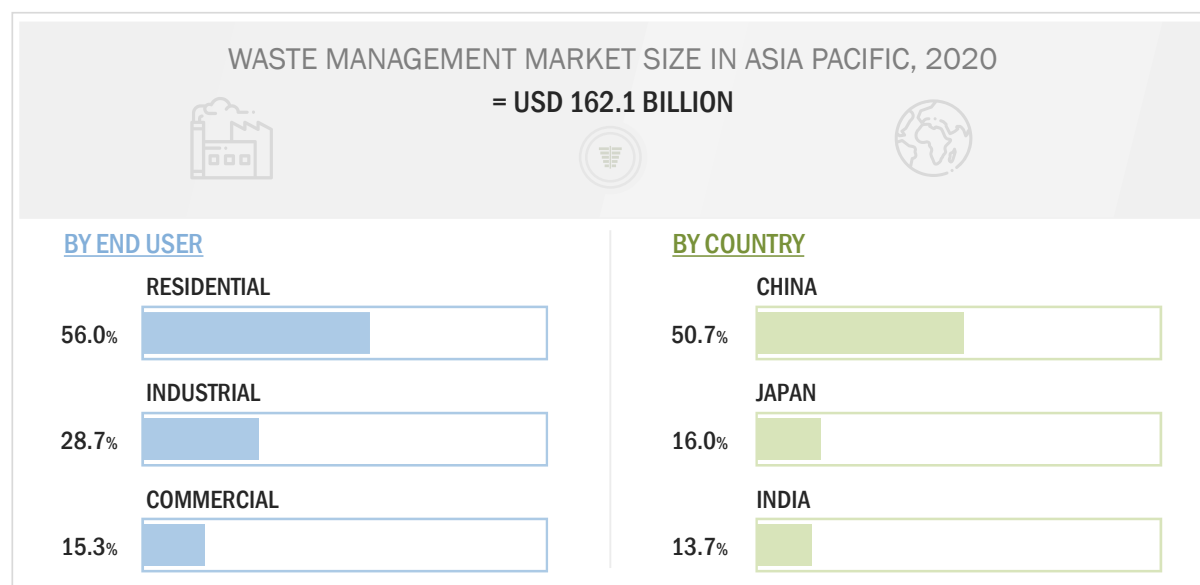
FIGURE 13 ASIA PACIFIC TO REGISTER HIGHEST CAGR IN WASTE MANAGEMENT MARKET DURING FORECAST PERIOD



Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

4.3 WASTE MANAGEMENT MARKET IN ASIA PACIFIC, BY END USER AND COUNTRY

FIGURE 14 RESIDENTIAL END USER SEGMENT AND CHINA DOMINATED WASTE MANAGEMENT MARKET IN ASIA PACIFIC IN 2020

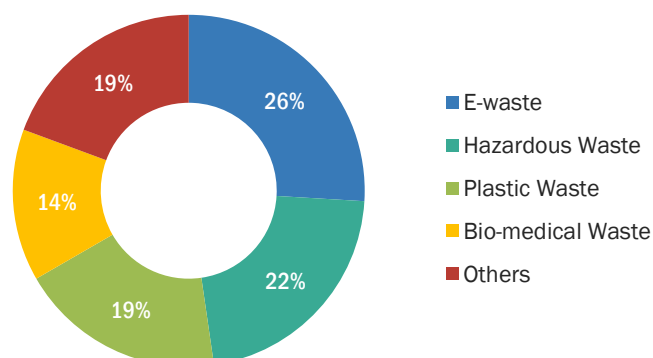


Note: Market share has been represented for only the top 3 countries in Asia Pacific.

Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

4.4 WASTE MANAGEMENT MARKET, BY WASTE TYPE

FIGURE 15 E-WASTE SEGMENT TO COMMAND WASTE MANAGEMENT MARKET, BY WASTE TYPE, IN 2026

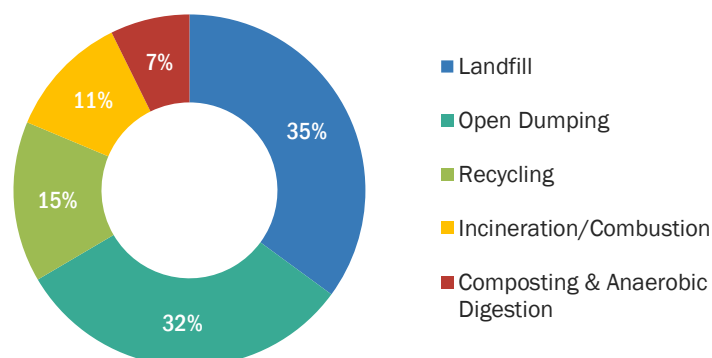


Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

4.5 WASTE MANAGEMENT MARKET, BY SERVICE TYPE

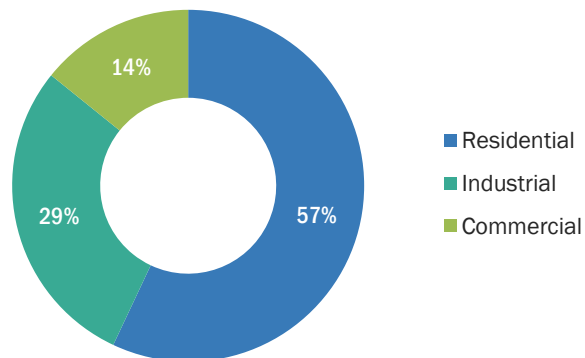
FIGURE 16 LANDFILL SERVICES TO DOMINATE WASTE MANAGEMENT MARKET IN 2026



Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

4.6 WASTE MANAGEMENT MARKET, BY END USER

FIGURE 17 RESIDENTIAL SEGMENT TO LEAD WASTE MANAGEMENT MARKET, BY END USER, IN 2026



Source: SEC Filings, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

5 MARKET OVERVIEW

5.1 INTRODUCTION

According to the Organisation for Economic Co-operation and Development (OECD), waste management activities include collection, transport, treatment, and disposal of waste; control, monitoring, and regulation of the production and disposal of waste; and minimization of waste production through in-process modifications, reuse, and recycling. Municipal waste covers waste from households, including bulky waste, similar waste from commerce and trade, office buildings, institutions, and small businesses, as well as yard and garden waste, street sweepings, the contents of litter containers, and market cleansing waste if managed as household waste.

Moreover, factors such as sustainable economic development in emerging economies, rapid urbanization and industrialization, and changing lifestyles of people have raised the levels of waste generation, posing a threat to the environment. The increasing awareness about the benefits of proper management of waste, as well as about the importance of reducing, reusing, and recycling waste to prevent its adverse impact on the environment and human health, further drives the market growth.

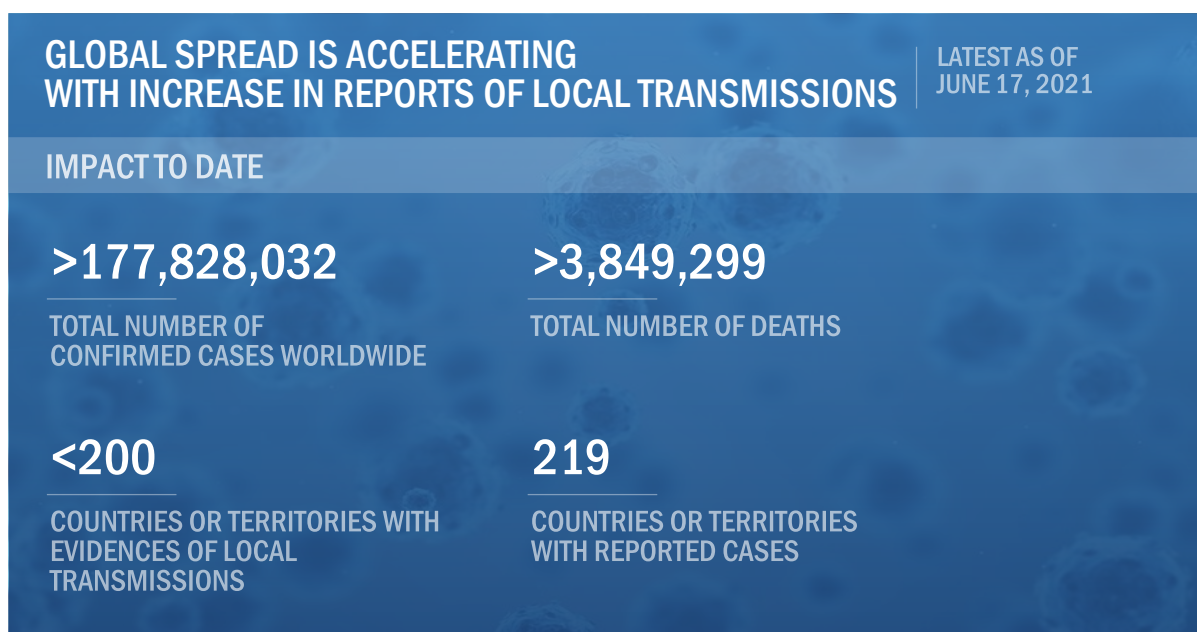
The ever-growing population and the increasing income levels of people are likely to generate new growth opportunities for the waste management market. New technologies have been developed globally, which have helped in bringing down the amount of waste generated. Also, the recycling of waste products such as paper, plastic, and metal not only reduces the production cost of the new products but also contributes to the sustainable development of the environment.

The demand for waste management services declined in 2020 owing to the sudden outbreak of COVID-19. Delivering basic urban services such as waste collection and management became a major challenge to cities grappling with the fallout from COVID-19. The market overview chapter analyzes the impact of COVID-19 and key dynamics on market growth.

5.2 COVID-19 HEALTH ASSESSMENT

COVID-19 is an infectious disease caused by the most recently discovered novel coronavirus. Largely unknown before the outbreak began in Wuhan (China) in December 2019, COVID-19 has moved from a regional crisis to a global pandemic in just a few weeks. The World Health Organization (WHO) declared COVID-19 as a pandemic on March 11, 2020. As this virus continues to spread rapidly globally, countries worldwide are trying to prevent further contagion by taking several measures, such as social distancing, contact tracing, self-quarantining, surveillance, communication, and testing. As of June 2021, China, South Korea, Japan, and Singapore have flattened the curve, while the US, Italy, Spain, Germany, France, and Iran impose drastic measures to slow down the spread and control fatalities.

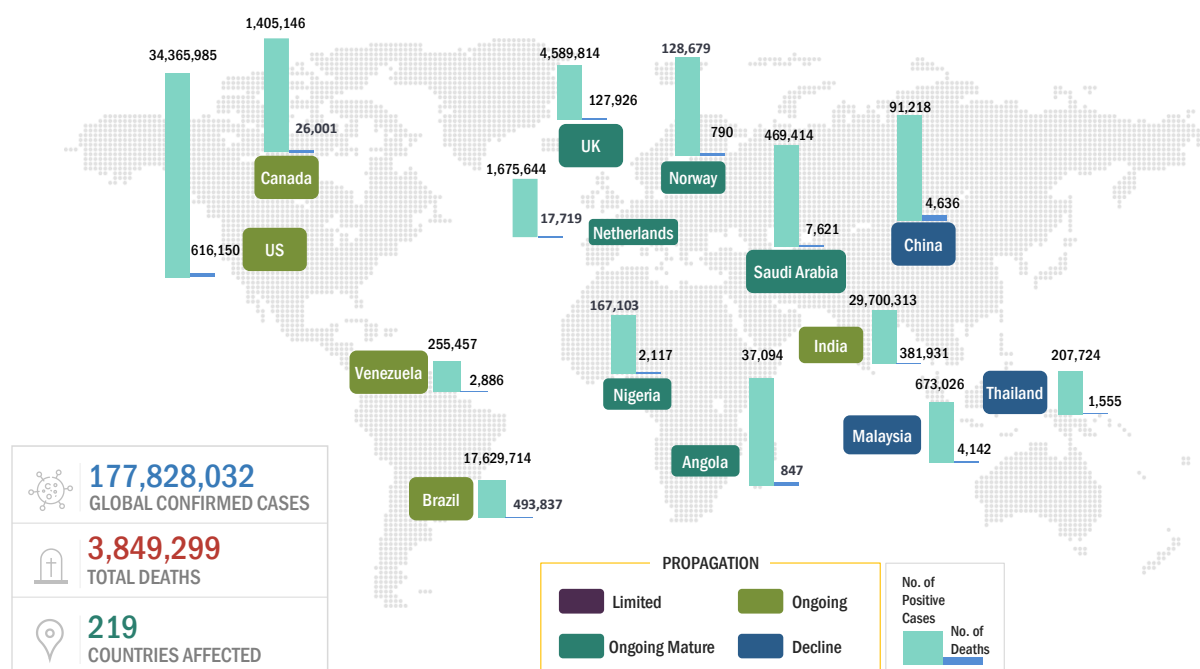
The pandemic is indeed an unprecedented crisis, which has put an enormous strain on healthcare providers worldwide. According to WHO, within 67 days, the first 100,000 confirmed cases were reported worldwide. It took 11 days to reach 200,000 confirmed cases, four days to reach 300,000 confirmed cases, and 12 days to reach 1 million confirmed cases.

FIGURE 18 COVID-19 GLOBAL PROPAGATION

Source: WHO and ECDC

As of June 17, 2021, the virus has spread to more than 219 countries, with over 177,828,032 reported cases and close to 3,849,299 deaths.

The actual number of infected people is probably higher than the official total as a few mild and asymptomatic cases are more likely not to be tested and counted.

FIGURE 19 COVID-19 PROPAGATION IN SELECTED COUNTRIES

Source: WHO (World Health Organization) Coronavirus Disease 2019; data as of June 17, 2021

5.3 ROAD TO RECOVERY

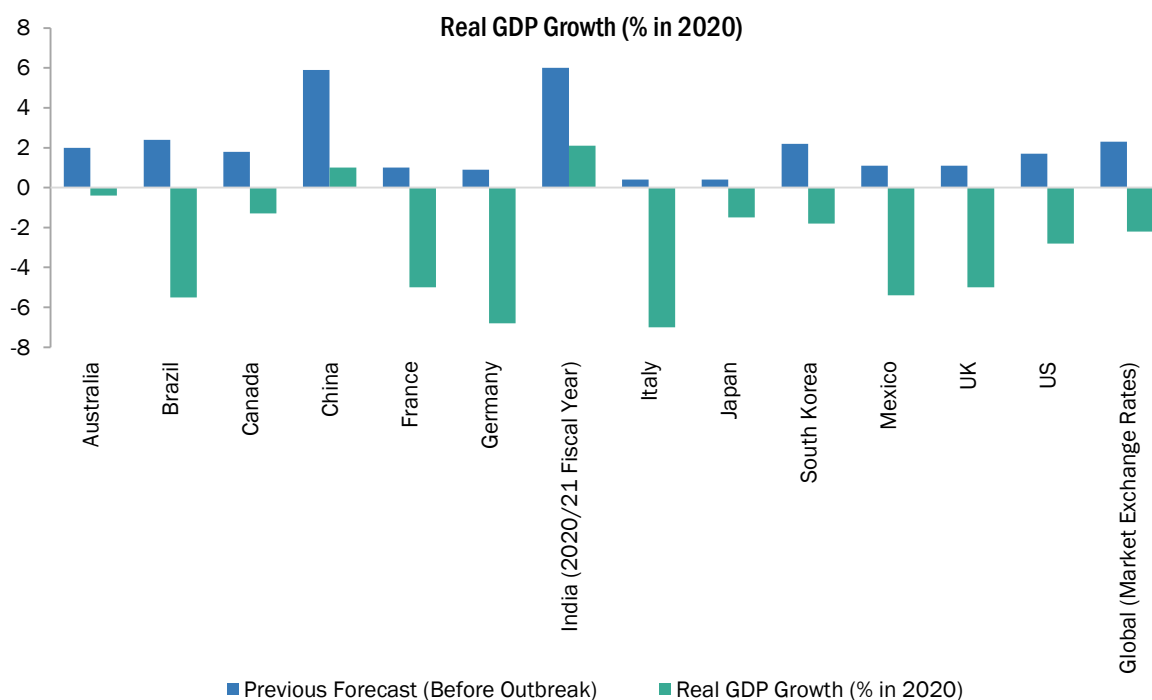
FIGURE 20 RECOVERY ROAD FOR 2020 AND 2021



5.4 COVID-19 ECONOMIC ASSESSMENT

The sudden outbreak of the pandemic has not only affected the healthcare sector but also affected the global economy on a large scale. It has had a significant economic impact on various financial and industrial sectors, such as travel & tourism, manufacturing, and aviation. It is predicted that the world economy will go into recession, with a loss of trillions of dollars. With an increasing number of countries imposing and extending lockdowns, economic activities are likely to decline further, which will, in turn, impact the global economy.

FIGURE 21 REVISED GDP FORECASTS FOR SELECT G20 COUNTRIES IN 2020



Source: The Economist Intelligence Unit

5.5 MARKET DYNAMICS

FIGURE 22 WASTE MANAGEMENT MARKET: DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES

 DRIVERS	▪ Stringent regulations of governments worldwide for better management of waste and initiate environmental protection ▪ Strong focus of several governments to conduct awareness programs showcasing importance of waste segregation and waste management ▪ Technological advances and shortened life cycle of electronic products help in increasing e-waste
 RESTRAINTS	▪ Absence of necessary framework for collection and segregation of waste ▪ Requirement for huge capital investment to discard bio-medical waste
 OPPORTUNITIES	▪ Rising demand for waste management services from emerging economies due to rapid industrialization ▪ Growing adoption of construction and demolition (C&D) materials in urban areas with rising number of construction projects
 CHALLENGES	▪ Controlling environmental pollution caused by illegal export of e-waste in developing countries such as China, India, and Middle East ▪ Recycling plastic is costlier than producing new plastic ▪ Impact of COVID-19 on waste management

Source: Secondary Research, Industry Expert Interviews, and MarketsandMarkets Analysis

5.5.1 DRIVERS

5.5.1.1 Stringent regulations of governments worldwide for better management of waste and initiate environmental protection

Concerns about the safety of the environment, flora, and fauna have forced governments to impose stringent regulations to minimize the ill effects of waste and its harmful by-products on the environment. Strict laws have been enforced by the governments for the proper handling of waste to reduce solid waste accumulating in landfills. Regulatory bodies in the US and Europe impose a huge fine for the non-compliance of standards and acts. The Waste Framework Directive by the European Commission has set a 50% household waste collection target by 2020. According to this directive, recycling and reuse of plastic packaging waste should be 60% of the total plastic packaging waste generated between 2020 and 2030. PlasticsEurope, a leading pan-European association, has an objective of zero landfills by 2040. The Waste (England and Wales) (Amendment) Regulations 2012 is related to the separate collection of waste, which states that waste collection authorities must collect paper, metal, plastic, and glass waste separately.

According to Plastic Waste Management Rules, 2016, advised by the Government of India and drafted by the Ministry of Environment & Forests, plastic carry bags should have a minimum thickness of 50 microns. Further, it also stated that the plastic waste producer has an extended responsibility to ensure a Collect Back scheme for plastic waste generated by them. The new Solid Waste Management Rules (SWM) in India, 2016, established by the Union Ministry of Environment, Forests, and Climate Change has mandated the source segregation of waste for recovery, reuse, and recycle. Plastic waste is segregated from the solid waste by the municipalities or the public-private partners involved in collecting and disposal of garbage.

The waste is then transported to recycling plants. In developed countries, plastic waste collection is more standardized. Separate bins are made available to the households and non-dwellings, such as offices and institutions, to discard plastics and plastic products. Such initiatives save time and efforts required to segregate plastic waste from other solid wastes and enable manufacturers to recover and recycle plastics at a faster rate and in a larger quantity. All these government efforts make waste management easy to handle.

Regulatory policies pertaining to e-waste management have come into existence to control the transboundary movement of hazardous waste and check the recycling of electronic and hazardous waste. These regulations encourage companies to recycle and reuse electric and electronic products and have become more stringent over the years, which have benefitted countries in keeping a check on the management of e-waste. Government regulations are framed with the help of the US Environmental Protection Agency (US EPA), the Waste Electronic and Electrical Equipment (WEEE) Directive, the Basel Convention (Geneva). These regulations have a direct impact on the amount of e-waste recycled in various countries. The impact of regulations is going to be high in the coming five years. Different states have different regulations for various products. The laws are passed accordingly. The table below elaborates on the laws passed in the US.

5.5.1.1.1 Laws in US for recycling of e-waste

TABLE 2 LAWS FOR RECYCLING E-WASTE IN DIFFERENT STATES IN US

STATE	DESCRIPTION
Massachusetts	Ban on disposing of cathode ray tube (CRT), as well as incineration of CRT
New Hampshire	Ban on the disposal of CRTs, liquid-crystal displays (LCDs), gas plasmas, and digital light processing in landfills and incinerators
Washington	Manufacturers to join in or create an individual plan to manage their share of collected products for recycling
Arkansas	Imposes fees on disposal of e-waste in landfills
Connecticut	Television, laptop, computer, desktop manufacturers to be responsible for the cost of their products and ensure they are delivered to recyclers
Minnesota	Manufacturers of computers and televisions required to recycle 60% of their market sales. Also, ban on disposing of CRTs with the municipal waste
North Carolina	Manufacturers to be responsible for the collection of electrical equipment
Oregon	Manufacturers to take part in the recycling program of desktops, laptops, monitors, and televisions or pay a fee to the state contractor program
Texas	Manufacturers to implement recycling plans
Virginia	Manufacturers to implement recycling plans
Hawaii	Established a program for the collection, recycling, enforcement, and monitoring of covered electronic devices
Illinois	Manufacturers to pay for the collection, transportation, and recycling products they sell in the state. Also, manufacturers need to ensure they recycle 60% of the total collected e-waste
Missouri	Manufacturers of computers to implement “recovery plans” for collecting and recycling their obsolete equipment

New Jersey	Manufacturers to register and pay a fee to the New Jersey Department of Environmental Protection (NJDEP), as well as to jointly or individually collect, transport, and recycle computers, monitors, printers, and televisions
Oklahoma	Manufacturers established a convenient and environmentally friendly program to collect, recycle, and reuse computers that have reached the end of their lives
Rhode Island	Manufacturers are responsible for collecting, recycling, and reusing electronic devices.
West Virginia	Manufacturers to register with the state and pay an annual fee for a special account in the state treasury known as the "covered electronic devices take-back fund"
Indiana	Manufacturers are charged a penalty if they fail to recycle 60% of the e-waste collected by weight of volume the previous year

Source: International Journal of Engineering Inventions of 2019 and MarketsandMarkets Analysis

5.5.1.1.2 Laws in Europe for recycling e-waste

TABLE 3 LAWS FOR RECYCLING E-WASTE IN EUROPE

LEGISLATION	DESCRIPTION
Waste Electrical and Electronic Equipment (WEEE) Directive	WEEE sets targets for the manufacturers to collect, reuse, and recycle electronic and electrical equipment.
Restriction of Hazardous Substances (RoHS) Directive	RoHS Directive encourages manufacturers to restrict/limit the use of hazardous materials in electric and electronic equipment.
Hazardous Waste Regulations	This regulation has been implemented across Europe to restrict the disposal of hazardous waste without pretreatment.

Source: MarketsandMarkets Analysis

Increasing quantities of municipal solid waste (MSW) are incinerated, generating 0.7 and 1.7 tonnes of CO₂ by burning 1 tonne of MSW. Incinerating waste causes air pollution and may lead to acid rain since incinerators may contain heavy metals and other toxins, thereby having a high impact on climate. A large number of facilities are creating CO₂ emissions without compensating for the damage done. Therefore, governments' strong focus on adopting an environmentally friendly approach to discard waste is likely to drive the demand for different types of waste management services.

TABLE 4 CARBON TAXES IN EUROPE, 2021

COUNTRY	CARBON TAX RATE (PER TONNE OF CO ₂ EMISSIONS) (USD)
Denmark	28.00
Estonia	2.36
Finland	73.02
France	53.00
Iceland	35.00
Ireland	39.45
Netherlands	35.33
Norway	69.00
Spain	17.67
Sweden	137.00
Switzerland	101.00
United Kingdom	25.00
Ukraine	0.30

Source: Tax Foundation and MarketsandMarkets Analysis

5.5.1.2 Strong focus of several governments to conduct awareness programs showcasing importance of waste segregation and waste management

Waste management is a global concern as it directly affects the economy and the environment. The increasing awareness regarding the benefits of waste segregation and disadvantages of uncontrolled dispersal of waste materials in the environment. Low awareness in rural areas about systematic disposal of waste causes inappropriate dumping, which destroys the ecosystem. The awareness initiatives taken by governments globally educate the masses on identifying different categories of waste, transportation of the collected waste, treatment, and disposal of waste. These awareness programs will help in implementing the basic waste management practices such as proper segregation of dry and wet waste from the source level and will contribute to resource efficiency and cycle economy. For instance, the Government of India launched the Swachh Bharat Mission in 2014, which is in line to generate awareness about the harmful impact of plastic waste on the environment and human health, ensuring plastic waste segregation. With a systemized segregation of different kinds of waste, the recovered amount of plastic waste will increase, providing an opportunity for growth in the waste management market.

Moreover, they look into the availability and effective use of technologies and the human workforce, along with measures taken to ensure the safety of these resources. Global Waste Management Practices is one of the sets of guidelines given by the World Bank and the United Nations Environment Programme (UNEP) for maintaining the process of waste management. The United States Environmental Protection Agency has organized a tribal waste management program in India. This program encourages municipal solid and hazardous waste management practices in Indian states.

Electrical and electronic equipment consists of toxic materials that can be harmful to the environment and health if not disposed of properly as it can lead to high levels of pollution. Some common techniques used for disposing of e-waste include landfilling and incineration. Both these methods cause high levels of pollution. Therefore, there is an increasing demand for proper e-waste management techniques, driving the growth of the waste management market.

The table provided below gives details about hazardous substances in each type of electronic product, along with their impact on the environment, as well as on human health.

TABLE 5 EFFECTS OF E-WASTE ON HEALTH AND ENVIRONMENT

SOURCE OF E-WASTE	CONSTITUENT	HEALTH EFFECT
Computer monitors	Lead	The burning of this metal can cause damage to the nervous and circulatory system, as well as kidneys.
Chip resistors and semiconductors	Cadmium	The burning of this metal can damage kidneys and liver, and it can also cause neural damage.
Printed circuit boards	Mercury	It can cause skin and respiratory disorders.
Untreated galvanized steel plates	Hexavalent chromium	It can cause DNA damage.
Computer cables	Plastics	The burning of plastic can interfere with regulatory hormones. It may also cause damages to the reproductive system.
Plastic housing of boards	Brominated flame retardants	It causes disruption of the endocrine system.
Front panel of CRTs	Barium	It can cause damage to the liver, heart, and spleen.
Motherboards	Beryllium	The metal is carcinogenic and can also cause skin disorders

Source: Experts Interviews and MarketsandMarkets Analysis

Initiatives such as sustainable programs and conferences play a crucial role in creating awareness about the drawbacks of mishandling of waste, as well as the importance of segregating and manage medical waste carefully and even about the benefits of medical waste management. Several associations and organizations organize conferences to create awareness about the use of advanced technologies for the treatment and disposal of medical waste. Details for a few conferences have been provided below:

- In March 2020, the International Conference on Waste Recycling and Management (ICWRM 2020) was organized in Amsterdam, Netherlands, to provide a forum for discussion on electronics communication technologies and address the unique challenges in these fields.
- In May 2019, the Waste360 Healthcare Waste Conference was organized in Las Vegas, US, to launch the Sterilwave biomedical waste treatment solution. The conference intended to discuss innovative practices and effective ways to manage medical waste. These conferences bring together academia, researchers, and professionals across the world to spread awareness of the effective management of medical waste.
- In March 2019, the 1st International Conference on Medical Waste Management in Russia was organized in Moscow to discuss gaps in the Russian legislation for medical and pharmaceutical waste management.

5.5.1.3 Technological advances and shortened life cycle of electronic products leading to increase in e-waste

The typical life cycle of the electronic product includes product development, introduction, growth, maturity, and disposal or recycling. An electronic product comes to a recycling stage either due to the end of its life cycle, technological advances, or changing requirements of consumers. Rapid advancements in technology result in new electronic products and upgraded versions of the existing products, such as laptops, mobile phones, and televisions. Similarly, increasing buying power of individuals leads to a decrease in the shelf life of electronic products. New versions of mobiles and other electronic products are being launched every year; the older versions are either being thrown away or are sold via websites for the purpose of reuse. Thus, with the shrinking life cycle of electronic products, more and more e-waste is generated. This accumulation of electronic waste triggers the need to recycle electronic products, which, in turn, drives the need for electronic waste management.

The average lifespan of consumer devices and the parts that go into them have been rapidly decreasing since the introduction of PCs and mobile phones. Initially expected to last 40+ years, the average lifespan of electronics has come down to 1.5 to 13 years, with the majority averaging 4–5 years.

TABLE 6 LIFE EXPECTANCY MAJOR HOME APPLIANCES (YEARS)

LIFE EXPECTANCE (YEARS)	LOW	HIGH	AVERAGE
Dryers, Electric	11	18	14
Dryers, Gas	11	16	13
Dishwashers	9	16	12
Garbage Disposals	10	15	13
Freezers	12	20	16
Microwaves	5	10	8
Ranges, Electric	13	20	16
Ranges, Gas	15	23	19
Refrigerators, Compact	4	12	8
Refrigerators, Standard	10	18	14
Washing Machines	8	16	12

Source: MarketsandMarkets Analysis

5.5.2 RESTRAINTS

5.5.2.1 Absence of necessary framework for collection and segregation of waste

Waste segregation refers to the separation of dry and wet garbage, which paves the way for other processes in waste management, such as composting, recycling, and incineration. The goal is to reduce waste from landfills and, eventually, prevent land, water, and air pollution. Proper waste collection and segregation are critical for recycling waste and plastic products or any other items such as paper, metals, and wood products. Inappropriate disposal of waste poses a big threat to municipalities and other concerned bodies involved in waste management. Improper disposal of waste can greatly affect the health of the population living nearby the polluted area or landfills. Exposure to improperly handled wastes can

cause skin irritations, blood infections, respiratory problems, growth problems, and even reproductive issues.

Developed countries such as the US, Australia, Japan, and Germany have successfully implemented waste management frameworks, enabling effective handling of waste and ensure productive results from it through recycling. However, while considering the actual scenario, these examples are very few.

Countries such as Egypt, Turkey, South Africa, Nigeria, Brazil, as well as Middle Eastern countries are yet to standardize and organize the waste management framework, which is causing improper handling of waste materials to a large extent. The segregation of different types of waste should take place at the source level, which would help recover a good amount of recyclable waste and would reduce the total effort and time. The major problems affecting solid waste management are unscientific treatment, improper collection of waste, and ethical problems such as dumping e-waste. This, in turn, leads to hazards such as environmental degradation, water pollution, soil pollution, and air pollution, restraining the growth of the waste management market.

5.5.2.2 Requirement for huge capital investment to discard bio-medical waste

Hospitals, healthcare institutes, and pharmaceutical companies have to make significant investments to ensure appropriate collection and processing of waste, which ultimately reduces environmental pollution. The disposal of hazardous waste, such as infectious agents and radioactive waste, requires advanced technologies and significant capital investments. Huge setup costs, followed by their preventive and breakdown maintenance costs, further increase the investments required. For instance, according to the International Committee of the Red Cross Society, the installation cost of an autoclave, a device used to regulate medical waste, is approximately USD 500 to USD 102,600. Thus, high installation costs of waste discarding machinery hinder the growth of the market.

According to the United Nations' World Health Organization (WHO), the improper treatment and handling of medical waste (primarily using infected hypodermic needles and syringes) caused the following infections worldwide: Hepatitis B, Hepatitis C, and HIV infections. According to the WHO directive, hazardous waste needs to be processed near its place of generation. The risks involved in the transportation of hazardous waste are huge, and the risk factor found in some materials (e.g., those that are infectious) increases daily, further restraining the growth of the waste management market.

TABLE 7 SOUTHERN ASIA: COST FOR INCINERATORS

CAPACITY	EQUIPMENT	COST (USD)
50 kg/day	Manual loading, manual de-ashing, one combustion chamber, without flue-gas cleaning	20,000
100 kg/day	Manual loading and de-ashing, secondary combustion chamber (temperature >1,000 °C, residence time >1s), without flue-gas cleaning	200,000
100 kg/hour	Mechanical loading and de-ashing, secondary combustion chamber (temperature >1,000 °C, residence time >1s), without flue-gas cleaning	400,000
200 kg/hour	Automatic loading, mechanical de-ashing, secondary combustion chamber (temperature >1,000 °C, residence time >1s), with flue-gas cleaning	800,000
400 kg/hour	Automatic loading and de-ashing, secondary combustion chamber (temperature >1,000 °C, residence time >2s), with flue-gas cleaning and emission monitoring	1,700,000

Source: World Health Organization

5.5.3 OPPORTUNITIES

5.5.3.1 Rising demand for waste management services from emerging economies due to rapid industrialization

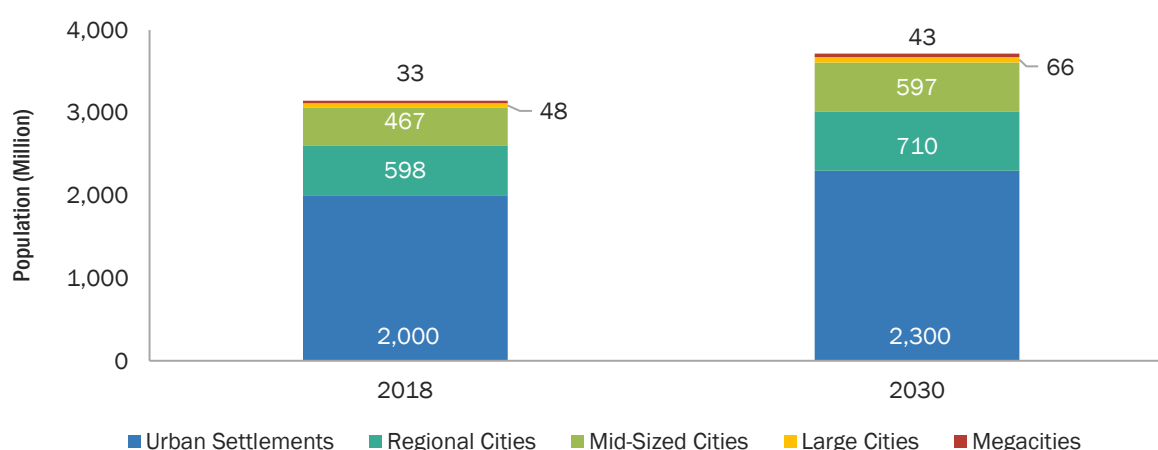
Developed countries from North America and Europe have a framework to dispose of plastic products. However, the framework for the collection, transportation, and disposal of waste in developing countries of APAC, the Middle East, and South America is not yet organized. Hence, it has become a challenging environmental issue as waste is often dumped in the outskirts of towns and cities, which leads to overflowing of landfills or open dumping. Countries such as Brazil, India, Argentina, South Africa, Nigeria, and Middle Eastern countries would provide tremendous opportunities for the growth of the waste management market owing to the ever-growing population and steady economic growth. Only a few countries (such as France, Hungary, Japan, Slovak Republic, Spain) have decoupled their total waste generation from socio-economic developments.

Furthermore, rapid urbanization and industrialization have contributed to the generation of an increased amount of waste in the form of discarded packaging films, plastic consumer durables, toys, electronics, municipal solid waste, FMCG products, chemical waste, and others. For instance, the shift of the Asia Pacific population from rural to urban areas is expected to result in a rapid increase in solid waste generation. The total population in Asia Pacific is expected to reach 5.1 billion by 2050, out of which the urban population is projected to account for at least a 64.0% share.

Also, the increasing GDP and per capita income lead to an increase in industrialization, which has doubled the generation of waste in various forms, such as solid waste, e-waste, medical waste, bottles, bags, packaging materials, appliances, and furniture. Thus, the increasing urbanization and industrialization increase the amount of solid waste accumulated in landfills. All these factors are likely to create remarkable opportunities for waste management services in emerging economies.

Rapidly rising populations in megacities and major cities will be significant contributors to generating waste, but it is also worth noting that the number of mid-sized cities (500 k to 5 million inhabitants) will swell drastically by 2030, becoming more influential economic hubs in the process. According to World Economic Forum, it is expected that over one-third of the projected urban growth between now and 2050 will occur only in three countries, namely, India, China, and Nigeria.

FIGURE 23 GLOBAL URBAN POPULATION, BY SIZE OF CITY, 2018 VS. 2030 (MILLION)



Source: World Economic Forum

5.5.3.2 Growing adoption of construction and demolition (C&D) materials in urban areas with rising number of construction projects

Construction and demolition (C&D) materials are used during the construction, renovation, and demolition of buildings, roads, and bridges. The Environmental Protection Agency (EPA) promotes a Sustainable Materials Management (SMM) approach, which identifies certain C&D materials as commodities that can be used in new building projects, avoiding the need to mine and process virgin materials. Most construction and demolition waste currently generated in the US is lawfully destined for disposal in landfills regulated under the Code of Federal Regulations (CFR).

In some regions, all or part of construction and demolition waste stream is unlawfully deposited on land or in natural drainages, including water, contrary to regulations to protect human health, commerce, and the environment. Businesses and citizens of the US legally dispose of millions of tons of building-related waste in solid waste landfills each year.

Smart cities are developed in urban areas to create sustainable economic development. According to the United Nations, by 2030, 60% of the world's population will live in cities, and one in three individuals will live in a city with a population of half a million or more. Currently, more than 100 smart city projects are in progress across the world, which offers huge opportunities for the construction sector. Need for building, roads offer lucrative opportunities for the waste management market players.

An increase in construction activities creates a substantial amount of construction-related waste that is removed from the waste stream through a process called diversion. Diverted materials are sorted for subsequent recycling, and in some cases, they are reused. Volumes of building-related waste generated are significantly influenced by macroeconomic conditions affecting construction, societal consumption trends, and natural and anthropogenic hazards. In recent years, awareness regarding the disposal and reuse of construction material has resulted in a reduction in volumes of construction and demolition waste disposed of in landfills. Many opportunities exist for the significant reduction and recovery of materials that would otherwise be destined for disposal as waste.

5.5.4 CHALLENGES

5.5.4.1 Controlling environmental pollution caused by illegal export of e-waste in developing countries such as China, India, and Middle East

E-waste discarded from developed countries is exported to developing countries, such as China, India, and the Middle East, for the purpose of reuse or repair. Some electronic products are repaired, while some of them are reused. However, most of these products are simply dumped in these countries since no facilities exist to safely recycle these products. The problem of illegal dumping persists in all developing countries. According to government legislation and laws, it is illegal to export broken electronic goods. The elements toxic to the environment are not removed from these products, thereby causing pollution in developing countries.

The government laws and regulations need to be strict enough to export these products to developing countries is prohibited. Toxic materials in these products need to be removed before exporting these products.

Export of e-waste has also been linked to organized crime. The e-waste from the US and Europe is exported to countries such as China and Hong Kong, with the help of fishermen carrying e-waste to developing countries where e-waste is disposed of illegally. Containers of e-waste are filled and disposed to other countries via tourists, who are not questioned and thus, e-waste travels to other countries, creating the way for organized crime. This is due to no laws and regulations implied on the inflow and outflow of the e-waste.

5.5.4.2 Recycling plastic is costlier than producing new plastic

The basic raw materials required to manufacture virgin plastics are petrochemicals such as oil and natural gas. The recycled form of plastic is polyethylene terephthalate (PET). The problem associated with recycling plastic is the generation of a pure stream of recycled material. PET plastics do not have a residual value; they can, however, be recycled into other products, such as new containers and fleece clothing. Several additives are added while manufacturing plastic products; some of these are fillers and colorants. The recycling companies are not usually aware of what is added to plastic, which affects the recycling of plastic products.

Separating plastic from various types of waste streams is a problematic process in energy recovery through different thermochemical processes. The sorting of plastics is an essential step in different waste management techniques. Moreover, the sorting and separating of plastic (according to its different grades, kinds, and the mixture of additives used) are highly labor-intensive and expensive compared to the manufacturing of new plastic from petrochemicals, which is quite cheaper or economical.

5.5.4.3 Impact of COVID-19 on waste management

The COVID-19 pandemic has already had a tremendous impact on the waste sector. At first, while the pandemic was progressing and lockdowns imposed in many countries, public authorities and municipal waste operators had to rapidly adapt their waste management systems and procedures to the situation. Inadequate waste management increases the risk of disease spread either directly from uncollected or dumped waste or the contamination of water and crops.

Poor waste management practices are estimated to result in between 400,000 and 1 million deaths annually in developing countries; productivity loss due to illness would be many times higher in magnitude. The waste sector's health impacts in ordinary times are more devastating than that of COVID-19 to date. According to the World Health Organization, there have been 3,920,463 global fatalities attributed to COVID-19 as of June 28, 2021.

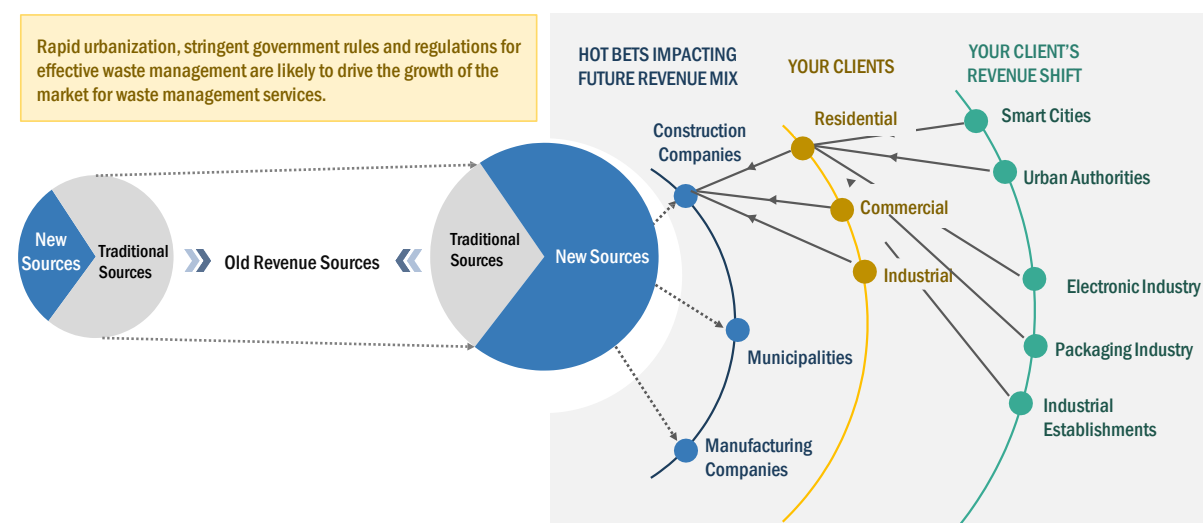
There is a substantial slowdown in the recycling of plastic and other products. While the immediate driver for the slowdown is the perceived risk of COVID-19 transmission, other key factors include supply chain disruptions and reduction in manufacturing and commercial activities. There is a risk that the economic recession, combined with low commodity prices, may increase reliance on cheaper virgin raw materials instead of recycled feedstock.

5.6 TRENDS

5.6.1 REVENUE SHIFT AND NEW REVENUE POCKETS FOR PLAYERS IN WASTE MANAGEMENT MARKET

Increasing awareness programs regarding sustainable waste management practices and stringent government rules and regulations for effective waste management drive the growth of the waste management market. Players in the waste management market focus on providing environmental sustainability and reducing the carbon footprint in waste management facilities. Facilities are creating CO₂ emissions without compensating for the damage done. Hence, governments across the world strongly focus on environmental safety.

FIGURE 24 REVENUE SHIFT FOR WASTE MANAGEMENT



Source: MarketsandMarkets Analysis

- Key end user of waste management are residential, commercial, and industrial sectors. The waste treatment trend of waste management services among these end users is expected to positively impact the future revenues of waste management service providers.
- In the next 5–7 years, end user of waste management might shift their focus toward smart cities, urbanization, and industrialization. With this shift, providers of waste management services will also have to shift their focus toward new revenue sources.
- The demand for recycled plastic packaging solutions has increased substantially; this is due to increasing awareness about environmental concerns (such as air and water contamination and greenhouse gas emissions), which further boosts the demand for sustainable and green packaging solutions among end-user industries across the world. Companies are switching from paper packaging to plastic packaging (especially recycled plastic packaging) solutions, and as a result, these end-user industries demand those packaging solutions, which are partially or completely manufactured with recycled plastic materials. For instance, companies such as Continental Renewable Energy Co., Ltd. (Kenya) use recycled plastics to manufacture roof tiles, and fence posts to develop affordable homes. Similarly, Chrysler (US), an automotive manufacturer, uses recycled polyurethane foam plastic in its Jeep Grand Cherokee (for seat cushions) and Jeep Wrangler (for the wheel liners).

5.7 MARKET MAP

The market map provides a quick glimpse of key stakeholders involved in the waste management market, from waste management service providers and end users to regulatory bodies/standards. The list is not exhaustive and is meant to give an idea of the key players involved in the market.

FIGURE 25 MARKET MAP FOR WASTE MANAGEMENT

Source	R&D	Service Providers	Collection & Segregation	Regulatory Bodies/ Standards
- Residential - Commercial - Industrial	- Development - Innovation	- Waste Management - SUEZ - Veolia - Waste Connections - Republic Services	Waste collection and waste segregation	- US Environmental Protection Agency (EPA) - National Institutes of Health (NIH) - US National Library of Medicine - National Institutes of Health

Source: MarketsandMarkets Analysis

5.8 TRADE DATA STATISTICS

Export and import value of (Product Harmonized System Code: 854810) of waste and scrap of primary cells, primary batteries, and electric accumulators; spent primary cells, spent primary batteries, and spent electric accumulators

TABLE 8 REGION-WISE IMPORT, 2017–2020 (USD MILLION)

Region	Import	2017	2018	2019	2020
Asia Pacific	854810	610.2	658.9	697.4	481.4
North America	854810	502.7	522.3	492.7	397.1
South America	854810	0.01	0.01	0.03	0.02
Europe	854810	143.7	147.0	144.2	126.6
Middle East & Africa	854810	0.3	1.4	3.0	4.0
Total	854810	1,256.9	1,329.6	1,337.3	1,009.1

Note: Trade data for the child market has been given as the same was not available for the waste management market. Trade data provided is for waste and scrap of primary cells, primary batteries, and electric accumulators; spent primary cells, spent primary batteries, and spent electric accumulators.

Source: AHRI, UN Comtrade, and MarketsandMarkets Analysis

TABLE 9 REGION-WISE EXPORT, 2017–2020 (USD MILLION)

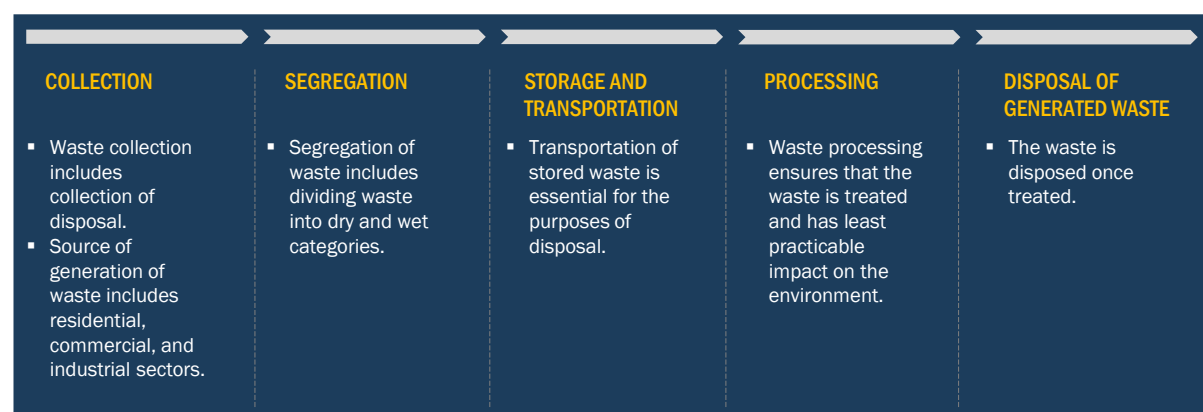
Region	Export	2017	2018	2019	2020
Asia Pacific	854810	111.9	79.2	9.8	8.9
North America	854810	518.2	567.0	583.4	523.4
South America	854810	0.03	0.13	0.09	0.09
Europe	854810	191.9	189.7	169.0	149.3
Middle East & Africa	854810	36.4	49.9	64.2	0.3
Total	854810	858.4	885.9	826.5	681.9

Note: Trade data for the child market has been given as the same was not available for the waste management market. Trade data provided is for waste and scrap of primary cells, primary batteries, and electric accumulators; spent primary cells, spent primary batteries, and spent electric accumulators.

Source: AHRI, UN Comtrade, and MarketsandMarkets Analysis

5.9 SUPPLY CHAIN ANALYSIS

The supply chain is an essential part of the waste management value chain. The supply chain of the waste management ecosystem comprises providers of different services such as waste collection, segregation, storage and transportation, processing, and disposal of generated waste. The supply chain is affected by fluctuations in industrial growth and changes in regulations. Waste management includes activities and actions taken to manage waste from its inception to its final disposal.

FIGURE 26 WASTE MANAGEMENT: SUPPLY CHAIN ANALYSIS

Source: Secondary Research, Expert Interviews, and MarketsandMarkets Analysis

5.9.1 COLLECTION

Solid waste collection means removing solid waste from the premises of a primary generating source to a place of solid waste disposal. It is collected from the residential, commercial, and industrial sectors. Collection of municipal waste may be selective, for a specific type of product, or undifferentiated, or covering all kinds of waste simultaneously. Proper solid waste collection is crucial for the protection of public health, safety, and environmental quality. It is a labor-intensive activity, accounting for approximately three-quarters of the total cost of solid waste management.

5.9.2 SEGREGATION

Segregation of waste is essential as the amount of waste being generated causes immense problems. Certain items are not biodegradable but can be reused or recycled. Household waste is separated daily into different dustbins for different categories of waste, such as wet and dry waste, which is disposed of separately. Wet wastes, which consist of leftover foodstuff, vegetables, peels, etc., are placed in an organic waste converter. Dry waste consisting of cans, aluminum foils, plastics, metals, glass, and paper can be recycled. A dustbin is also necessary for toxic wastes such as medicines, batteries, dried paints, old bulbs, and dried shoe polish.

5.9.3 STORAGE AND TRANSPORTATION

Solid waste storage means the interim containment of solid waste in an approved manner after generating and prior to the collection and disposal. A storage container means a garbage can, dumpster, or other containers used or designed for the deposit or storage of solid waste before transporting it to the landfill. Transportation of the waste stored at waste storage depots at regular intervals is essential to ensure that no garbage bins/containers overflow, and waste is not seen littered on streets. Wastes from hotels, restaurants, households, hospitals, construction sites, and others are transported to waste processing facilities.

5.9.4 PROCESSING

Waste processing is the physical alteration in waste to make it best suited for technology adopted for its treatment. The processing of wastes helps achieve the best possible benefit from every functional element of the Solid Waste Management (SWM) system. It requires a proper selection of techniques and equipment for every element to derive maximum economical value. Treating waste allows it to be further processed into reusable materials, thereby maximizing the savings of primary resources and energy, as well as reducing environmental burdens.

5.9.5 DISPOSAL OF GENERATED WASTE

Waste is disposed of mainly through three options—into the atmosphere, either through evaporation or through the volatile effluent from incineration; into rivers and oceans via the sewer system and wastewater treatment facilities; and into landfills. In addition, incineration is a disposal method in which solid organic wastes are subjected to combustion, wherein they are converted into residue and gaseous products. This method is useful for the disposal of both municipal solid waste and solid residue from wastewater treatment. Disposal of household waste is usually regulated by municipalities, while hazardous waste disposal is regulated by the federal government and often also by state governments and municipalities.

5.10 TECHNOLOGY ANALYSIS

5.10.1 RECYCLING TECHNOLOGY FOR WASTE MANAGEMENT

Recycling technologies use waste materials to make new products. They involve collecting recyclable materials, manufacturing or reprocessing them into new products, and purchasing products made from recycled materials. Recycling reduces the amount of waste sent to landfills, conserves natural resources, and saves energy, thereby reducing greenhouse-gas emissions. Various techniques have been developed to recycle plastics, metals, glass, paper, wood, and electronic waste.

The Ministry of Electronics and Information Technology (MeitY) developed affordable technologies to recycle valuable materials and plastics in an environmentally sound manner, including two exclusive printed circuit boards (PCB) recycling technologies, viz 1,000 kg/day capacity (~35 MT e-waste) and 100 kg/batch (~3.5MT e-waste) processes, with acceptable environmental norms. The 1,000 kg PCB/day continuous process plant would be suitable for creating an eco-park in the country, whereas the 100 kg

PCB/batch process plant would be suitable for the informal sector. This was done by upgrading and transforming the present state of affairs of informal sectors.

E-waste also contains plastic, up to nearly 25% of its weight. Novel recovery and conversion of e-waste plastics to value-added products have been successfully developed. The developed process can convert a majority (76%) of the waste plastics into suitable materials, which could be used for virgin plastic products. The technology has been transferred for commercialization. High-grade metals such as gold, silver, copper, and palladium in the e-waste can be separated for re-sale in totally safe conditions. There is no reason to burn plastic, micro-factories can create filament with plastic by compressing the waste in a temperature-controlled area.

5.11 WASTE MANAGEMENT: CODES AND REGULATIONS

This section provides an overview of codes, regulations, and standards applicable to waste management. These codes, regulations, and standards are from various governments and authorities across the world, such as the California Department of Resources Recycling and Recovery, the Government of India; the National Center for Biotechnology Information; the Ministry of Electronics & Information Technology; and the Solid Waste Association of North America

TABLE 10 WASTE MANAGEMENT: CODES AND REGULATIONS

SR. NO.	REGION	COUNTRY	POLICY NAME	DESCRIPTION
1	Asia Pacific	China	Prevention and Control of Environmental Pollution by Solid Waste	This act regulates the import of solid waste and states that the import of solid waste for the recycling of heat energy shall be banned. Also, relevant licenses for imports shall be obtained from the General Administration of Customs. The company importing solid waste should have measures to prevent spread, seepage, and leakage.
2	Asia Pacific	China	Environmental Protection Law of the PRC	The purpose of this law is to protect and improve the environment; prevent and control pollution and other public hazards; safeguard public health; promote ecological civilization improvement; and facilitate sustainable economic and social development. It encourages the recycling of waste to reduce waste generation.
3	Asia Pacific	China	Law of the PRC on Prevention of Environment Pollution Caused by Solid Waste	This law was passed to supervise and control pollution caused by solid waste, which includes industrial solid waste and urban residential refuse. It also carries special stipulations on pollution caused by dangerous waste.
4	Asia Pacific	China	Cleaner Production Promotion Law of the PRC	This act states the roles and responsibilities of various enterprises in the manufacturing, agriculture, service, and construction & mining sectors for using clean energy and raw materials, improving management, and using advanced technologies. This law aims at reducing pollution at its source.
5	Asia Pacific	China	Circular Economy Promotion Law of the PRC	This law promotes sustainable development by enhancing resource utilization rate; protecting and improving the environment; and reducing resource consumption and waste generation by using waste, fully or partly, to produce parts of other products.
6	Asia Pacific	China	National Sword Policy	Under the policy, China banned 24 types of scraps and implemented stricter regulations on importing waste with rigorous contamination standards.

7	Asia Pacific	Japan	Waste Disposal and Cleaning Law	Under this law, business owners have to disclose the location and other data on waste. The amendment to this in 2010 includes the recycling of waste generated by Japanese companies in developing countries. The companies can collect and import the waste generated by their products from other countries. The firms that do not abide by this law can be fined between USD 1.1 million to USD 3.3 million.
8	Asia Pacific	Japan	Containers and Packaging Recycling Law	Containers and wrappings account for 60% of the waste generated by households in Japan. Under this law, consumers should separate the waste generated, which will be collected by the municipality. Businesses have to recycle the waste collected to manufacture new products.
9	Asia Pacific	Japan	Waste Management and Public Cleansing Law	This law defines the duties of a municipality, waste generator, waste management company, and other stakeholders. It also states guidelines that regulate social and technical conditions for the construction of a facility, as well as the installation and operation of equipment.
10	Asia Pacific	Japan	Home Appliance Recycling Act	Under this act, retailers are in charge of collecting used home appliances, and the home appliance manufacturer takes care of recycling these products.
11	Asia Pacific	India	Environmental Protection Act	The act aims to establish a sufficient protection system for the environment. It gives the power to the central government to regulate all forms of waste and tackle specific problems that may present themselves in different regions of India.
12	Asia Pacific	India	Recycled Plastics Rules	The regulation states that the use of recycled and virgin-colored polybags for non-food applications is discouraged for packaging food items. Plastic bags of thickness less than 20 microns are banned, and the guidelines for recycling plastics were made mandatory.
13	Asia Pacific	India	Plastic Manufacture, Sale, and Usage Rules	The rules include “prohibition of the manufacturing, stocking, distribution, or selling of carry bags made of virgin or recycled plastic less than 20 x 30 centimeters in size and 20 microns in thickness.” Plastic bag manufacturers should register with the respective State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) before starting production.
14	Asia Pacific	India	The Plastics (Manufacture, Usage, and Waste Management) Rules	Carry bags and containers made of virgin plastics should not use coloring agents. Pigments used in recycled plastic and the recycling process should be in accordance with the specifications stated by the Bureau of Indian Standards.
15	Asia Pacific	India	Plastic Waste (Management and Handling) Rules	The minimum thickness of plastic bags was raised to 40 microns. Compostable plastic manufactured through recycling should be in accordance with the guidelines shared by the Bureau of Indian Standards. Plastic sachets for storing, packing, and selling tobacco products are banned. Municipalities should engage with unorganized sectors, such as waste pickers, agencies, or groups working in waste management. Carry bags are not to be made available free of cost.

16	Europe	Germany	The Closed Substance Cycle and Waste Management Act	The Act states that the producer, marketer, or consumer of goods is responsible for recycling, reuse, and environmentally sound disposal of waste that arises. This act was established to build a circular economy that avoids the generation of waste.
17	Europe	Germany	The Packaging Ordinance	It was established to avoid or reduce the impact of packaging waste on the environment. The regulation supports the reuse, recycling, or recovery of packaging waste rather than its disposal.
18	Europe	Germany	End-of-Life Vehicles Act and Ordinance	This act applies to vehicles, and it states that from 2006, “manufacturers, importers, distributors, and the disposal industry must ensure jointly that at least 85%, by an average weight of an end-of-life vehicle, is reused and recovered and at least 80% are reused and recycled. As of January 2015, the targets will be 95% (reuse and recovery) and 85% (reuse and recycling).”
19	Europe	Germany	Waste Disposal Ordinance	This law states that a person cannot dispose of waste on any land or premise unless he has a license from the Director to use the land or premise. If any person disobeys the law, for the first offense, he/she will have to pay a fine of USD 200,000 and would face imprisonment for six months.
20	Europe	UK	Waste Framework Directive	This directive provides the legislative framework for the collection, transportation, recovery, and disposal of waste.
21	Europe	France	Grenelle Law	The law defined the recycling and prevention of waste objectives from 2012 to 2015; the law limited the quantity of waste sent to landfills and incineration. It also specified measures to reduce the production of waste.
22	Europe	France	The Law on Classified Installations	This law covers all environmental activities pertaining to industries and facilities. The installations whose impact is minimum should be declared, whereas others should gain authorization from the Prefect.
23	Europe	France	The Waste Law	This law defines waste and classifies it under 16 different categories. It states that any person holding or producing waste should make sure it does not cause harm to a person or the environment; they should engage in activities such as collection, transportation, segregation, recovery, and proper disposal of waste.
24	North America	US	Solid Waste Disposal Act (SWDA)	This act regulates the storage, treatment, and disposal of solid hazardous and non-hazardous waste. The aim of this act was to regulate municipal waste disposal technologies.
25	North America	US	Resource Conservation and Recovery Act (RCRA)	This act describes the waste management programs made mandatory by Congress. The act establishes a framework for solid waste management in the nation. It has also established regulations that impose a ban on open dumping of waste and sets minimum criteria for operations of waste landfills.

26	North America	US	Pollution Prevention Act (PPA)	This act states that “pollution should be prevented or reduced at the source, whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner, whenever feasible; and that disposal or other releases into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.” The implementing agency of this act is the EPA.
27	North America	Canada	Waste Diversion Act	Waste Diversion Ontario is a non-profit organization that created this act. This act aims to promote the reduction, reuse, and recycling of waste derived from products. The producers are held responsible for the recovery and disposal of waste derived from their products.
28	North America	Canada	Canadian Environmental Protection Act	This act encourages the prevention of pollution and protection of the environment and human health to build a sustainable future. It makes necessary social and economic decisions and other preventive measures to effectively manage the increasing waste.

Source: EIA and EU and Other Secondary Sources

5.12 WASTE MANAGEMENT: PATENT REGISTRATIONS

TABLE 11 WASTE MANAGEMENT MARKET: INNOVATIONS AND PATENT REGISTRATIONS, 2017–2021

YEAR OF PATENT	TITLE	PUBLICATION NUMBER	APPLICANT	DESCRIPTION
2021	Apparatus and Method for Waste Monitoring and Analysis	US 10955284 B2	Zabble Inc.	This patent provides devices, systems, and methods for measuring waste material weight within two or more waste collection bins. The bins can be measured using one or more waste measurement devices, and the measurements can be collected and transmitted to networked data storage. Waste measurement data can be collected over time from multiple bin locations, and the stored data can be analyzed and processed to generate reports and ratings of waste collection, disposal, and diversion trends over time.
2019	Method of Recycling Carbon Fiber Prepreg Waste and Transparent Thermoplastic Waste	US 10507598 B2	Univ United Arab Emirates	The method of recycling carbon fiber prepreg waste and transparent thermoplastic waste includes shredding of a volume of transparent thermoplastic waste and a volume of carbon fiber prepreg waste, where the carbon fiber prepreg waste includes a colored backing film.

2017	Waste Plastic Container Recycling System and Method Thereof	US 2017/0043504 A1	Oriental Inst of Tech	A waste plastic container recycling system and a method thereof are provided for determining whether the spectrum of a waste container to be recycled belongs to any one of the spectrums of plastic materials and for classifying waste containers of different plastic materials since the plastic materials have different spectral characteristics.
2017	Process for Converting Mixed Waste Plastic into Liquid Fuels and Waxes by Catalytic Cracking	WO 2017/103013 A1	Solvay	The present invention relates to a process for converting mixed waste plastic into liquid fuels and waxes by catalytic cracking. The process comprises the steps of introducing mixed waste plastic and a catalyst comprising a zeolite-type catalyst within a reactor; allowing at least a portion of the mixed waste plastic to be converted to liquid fuels and waxes within the reactor; and removing a product stream containing said liquid fuels and waxes from the reactor.
2020	Systems, Methods, and Apparatuses for Recycling Electronic Waste	US 10626051 B2	Emm Llc	A method for recycling electronic waste comprises receiving electronic waste from an electronic waste-generating entity, separating components of the electronic waste into valuable recyclable material, hazardous material, and disposable non-hazardous material, creating a plurality of building material units comprising the disposable non-hazardous material, and sending at least a portion of the plurality of building material units back to the electronic waste-generating entity.
2017	Multistage Thermolysis Method for Safe and Efficient Conversion of E-waste Materials	US 9850433 B2	Chz Tech Llc	Clean, safe, and efficient methods, systems, and processes for utilizing thermolysis methods to processes to convert various e-waste sources into Clean Fuel Gas and Char source are disclosed.
2020	Method and Installation for Handling Medical Waste Collected in a Disposable Receptacle for Medical Waste	EP 3500377 B1	Evac Oy	A method and installation for handling medical waste, bio-waste, or other corresponding contaminated waste, which is collected in a receptacle for medical waste.

Source: Lens.org

5.13 CASE STUDY ANALYSIS

5.13.1 WASTE COLLECTION

5.13.1.1 Sainsbury's sustainability plan

5.13.1.1.1 Problem statement: June 2020

To deal with Sainsbury's store formats, collecting backhauled waste while collecting material from urban convenience stores at operational restricted areas.

5.13.1.1.2 Solution

Sainsbury is the second-largest chain of supermarkets in the UK. Sainsbury diverted all of its 85,000 tonnes of waste away from landfills. Sainsbury's '20x20' sustainability plan was achieved through its nine-year partnership with Biffa. Biffa implemented a two-pronged approach to deal with the challenges, which was presented by Sainsbury's store formats, collecting backhauled waste from larger supermarket stores while collecting material from urban convenience stores, where operational restrictions prevent backhaul.

Sainsbury's donates surplus food to a food distribution charity, while unsold bread is processed for animal feed. Meanwhile, Biffa treats any remaining food and biodegradable waste through anaerobic digestion (AD) at plants such as its Poplars AD facility in Cannock, generating enough electricity to power 2,500 homes.

Waste backhauled from Sainsbury's supermarkets is processed at Biffa Transfer Stations and exported as Refuse Derived Fuel. Biffa offered solutions to Sainsbury, which is an integral part of sending zero waste to landfills.

5.14 PORTER'S FIVE FORCES ANALYSIS

The competitive environment prevailing in the industry can be analyzed through the Porter's five forces analytical framework. This analysis helps in decision-making about entering and exiting a particular segment or industry. The model helps in defining the attractiveness of the waste management market. The changes in Porter's five forces analysis can have a drastic effect on the market. These forces analyze the market from 5 different perspectives, namely, the competitive rivalry within the industry, the threat of new entrants, the bargaining power of suppliers, the bargaining power of buyers, and the threat of substitutes.

FIGURE 27 PORTER'S FIVE FORCES ANALYSIS: WASTE MANAGEMENT MARKET



Source: Annual Reports, SEC Filings, Press Releases, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

TABLE 12 WASTE MANAGEMENT MARKET: PORTER'S FIVE FORCE ANALYSIS

PORTER'S FIVE FORCES	IMPACT
Threat of New Entrants	Moderate
Threat of Substitutes	Low
Bargaining Power of Suppliers	Moderate
Bargaining Power of Buyers	High
Rivalry Among Existing Competitors	High

Source: Secondary Research, Expert Interviews, and MarketsandMarkets Analysis

5.14.1 THREAT OF NEW ENTRANTS

The threat of new entrants refers to the threat that new competitors pose to the current players in an industry. In waste management, huge capital is required to enter the market. Also, new players have to obtain the necessary permits and licenses from regulatory authorities to initiate their operations. Other key factors affecting new entrants include the capital required, location factor, and market growth rate. Rapid industrialization and advancement in recycling technology have led to a high concentration of waste in regions such as Asia Pacific and Europe. The accumulation of waste in APAC is compelling governments to pass regulations mandating waste recycling. Many of the new entrants are finding opportunities in this region. Also, foreign investors are interested in technology transfer and entering the waste recycling industry. Thus, government regulations are playing an important role in getting new players into the market. At present, the threat of new entrants is moderate but is expected to become high later. The high growth rate of waste management is another factor fueling the growth of new entrants in this market.

Keeping in mind the decent industry growth and considering all factors mentioned above, the threat of new entrants is understood to be moderate in the waste management market.

5.14.2 THREAT OF SUBSTITUTES

The threat of substitutes is defined as any technology replacement or innovation with the capacity to entirely replace the use of current technology or service. There is virtually no substitution for this service at this point in time. The existing players tend to adopt new technologies in the transportation and treatment of waste but find no substitute for disposal services. For instance, major factors that could lead to the threat of substitutes in e-waste management include the substitute methods of e-waste management, technology alternatives, product alternatives, and switching cost. The substitute methods of e-waste management majorly consider different e-waste management methods generated by electric and electronic equipment (EEE). Landfill, incineration, and recycling are the major ways of e-waste disposal. The substitute for recycling e-waste is dumping the waste without proper treatment, and it is carried out illegally in many nations. However, new government regulations and rules are spreading the awareness of the ill effects of such dumping, and in the future, these substitute methods would be eradicated permanently, and 100% recycling would be the main aim of each organization. In many developing regions, governments are even offering incentives on the proper e-waste recycling initiative taken by organizations. The improvement in the processing technologies is likely to make the e-waste management market grow with low investment.

Considering the factors mentioned above, the threat of substitutes is currently low in the market.

5.14.3 BARGAINING POWER OF SUPPLIERS

The suppliers' power refers to the pressure that waste management service providers can exert on market players. There will be a high demand for waste management services and products in the future due to the rapid industrialization and urbanization in developing and developed nations. With stringent regulations being implemented across the world, manufacturing companies are bound to follow these policies, thereby creating huge opportunities for waste management service providers. However, the suppliers' power varies from one region to another due to the difference in waste management regulations.

As a result, the suppliers' power is understood to be moderate.

5.14.4 BARGAINING POWER OF BUYERS

Factors that impact the bargaining power of buyers include buyer's switching costs and trends, buyer's independence, chances of backward integration, level of bulk purchasing, and consumer acceptance and adoption. The buyer's power refers to the pressure that buyers can exert over market players. In the case of the waste management market, the number of service buyers is on the rise. The cost of switching from one supplier to another is also low. Waste generators always look for better waste management services.

As a result, buyers' power is understood to be high.

5.14.5 RIVALRY AMONG EXISTING COMPETITORS

The waste management market is highly fragmented, with the presence of a large number of regional and local players. As a result, there is stiff competition in the industry. Rivalry occurs when competitors sense pressure to improve their position in the industry. Waste management companies need to compete not only with other competitor companies but also with government agencies. Cost-cutting techniques are a common practice in some regional markets. Therefore, while waste management companies enjoy market leadership in the industry, there are many competitors who are continuously looking for ways to grab the attention of customers of their competitors through available necessary means. The increasing awareness of waste management due to strict government regulations attracts new players, which, in turn, intensifies the competition.

For these reasons, the degree of competition is considered high in the waste management market.

6 WASTE MANAGEMENT MARKET, BY WASTE TYPE

KEY FINDINGS

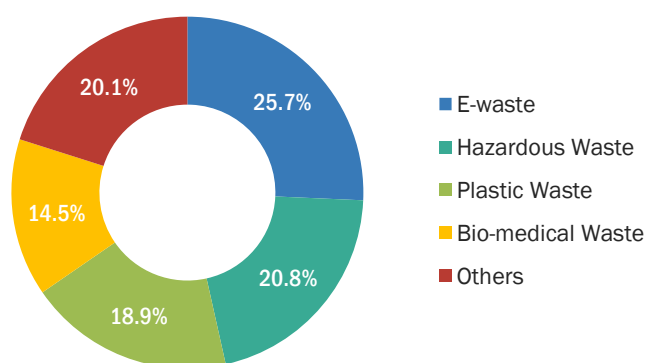
- The e-waste segment held the largest market share of 25.7% in 2020 owing to the increasing use of electrical and electronic equipment.
- In Asia Pacific, the e-waste market is projected to reach USD 60.9 billion by 2026, growing at a CAGR of 6.7% during the forecast period.
- The growing need to protect the environment and human health is likely to drive the market for waste management services to dispose of hazardous waste.
- In Asia Pacific, the market for the hazardous waste segment is expected to grow at a CAGR of 7.2% during the forecast period.
- A growing focus on technological advancements in waste management for plastic recycling is likely to drive the growth of the plastic waste management market, which accounted for a market share of 18.9% in 2020.

6.1 INTRODUCTION

By waste type, the waste management market has been segmented into hazardous waste, e-waste, plastic waste, bio-medical waste, and others. Others include agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste. Economic development and improving living standards in emerging economies have led to an increase in the volume of waste generated. This is further driven by the growing number of industrial and bio-medical facilities, which add a substantial volume of hazardous waste that potentially hampers the environment and human health. Therefore, information about waste generation and management is a crucial parameter for managing waste materials.

The US Environmental Protection Agency (EPA) launched the Sustainable Materials Management (SMM) framework for enhancing the use and reuse of waste materials in the most productive and sustainable way across their entire lifecycle. Waste generation is increasing in the regions such as Asia Pacific, Europe, and North America, mainly from industrial end users. Through SMM, EPA helps meet the material needs of the future by providing methods to decrease the environmental impact of material use while increasing economic competitiveness.

FIGURE 28 WASTE MANAGEMENT MARKET SHARE, IN TERMS OF VALUE, BY WASTE TYPE, 2020 (%)



Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

TABLE 13 WASTE MANAGEMENT MARKET, BY WASTE TYPE, 2019–2026 (USD BILLION)

Waste Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Hazardous Waste	92.6	86.6	88.9	92.1	96.4	101.8	108.6	118.1	5.8%
E-waste	114.7	106.6	108.9	112.3	116.9	122.9	130.5	141.1	5.3%
Plastic Waste	84.3	78.6	80.5	83.1	86.8	91.4	97.2	105.4	5.5%
Bio-medical Waste	65.5	60.1	60.5	61.5	63.1	65.4	68.5	73.0	3.8%
Others	90.6	83.6	84.7	86.7	89.5	93.3	98.1	105.2	4.4%
Total	447.8	415.6	423.4	435.7	452.7	474.9	502.9	542.7	5.1%

Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

6.2 HAZARDOUS WASTE

6.2.1 INCREASED NEED TO PROTECT ENVIRONMENT AND HUMAN HEALTH TO SPUR MARKET GROWTH

Hazardous waste accounted for a share of 20.8% of the waste management market in 2020. According to the Resource Conservation and Recovery Act (RCRA), hazardous waste is defined as any waste or combination of waste products that poses a substantial present or potential hazard to human health or living organisms because of several reasons; for example, such wastes are non-degradable and persistent, they can be biologically magnified, they can be lethal, or they may otherwise cause or tend to cause detrimental cumulative effects. Hazardous waste is generated from various end users from the industrial, commercial, and residential segments. However, hazardous waste generated from industrial end users is expected to account for the largest market share during the forecast period. Hazardous waste includes chemical waste disposal, liquid waste disposal, construction waste disposal, industrial waste disposal, and hazardous waste transportation. EPA focuses on developing hazardous waste regulations that balance the conservation of resources while ensuring the protection of human health and the environment. Many hazardous wastes can be recycled safely and effectively, while other wastes will be treated and disposed of in landfills or incineration plants. According to EPA, recycling hazardous waste has a variety of benefits, including reducing the consumption of raw materials and the volume of waste materials that must be treated and disposed of. However, improper storage of those materials might cause spills, leaks, fires, and contamination of soil and drinking water. To encourage hazardous waste recycling while protecting the health and the environment, EPA developed regulations to ensure recycling processes to be performed safely.

Moreover, to manage hazardous waste, Treatment Storage and Disposal Facilities (TSDFs) are established to provide temporary storage and final treatment or disposal for hazardous wastes. These facilities manage large volumes of waste and conduct activities that may present a higher degree of risks. TSDFs are stringently regulated. The TSDF requirements establish generic facility management standards, specific provisions governing hazardous waste management units, and additional precautions to protect soil, groundwater, and air resources.

TABLE 14 WASTE MANAGEMENT MARKET FOR HAZARDOUS WASTE, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	27.6	25.5	25.9	26.6	27.5	28.8	30.4	32.7	4.8%
Europe	23.9	22.2	22.6	23.3	24.2	25.4	26.9	29.0	5.1%
Asia Pacific	37.4	35.4	36.8	38.7	41.0	43.9	47.4	52.2	7.2%
Middle East & Africa	1.5	1.3	1.4	1.4	1.4	1.5	1.5	1.6	3.8%
South America	2.3	2.1	2.1	2.2	2.3	2.3	2.4	2.6	3.6%
Total	92.6	86.6	88.9	92.1	96.4	101.8	108.6	118.1	5.8%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

6.3 E-WASTE

6.3.1 RAPID URBANIZATION, TRANSFORMING URBAN MOBILITY, AND INCREASED NEED TO REDUCE CARBON EMISSIONS TO BOOST DEMAND FOR WASTE MANAGEMENT SERVICES

The e-waste segment accounted for a share of 25.7% of the waste management market in 2020. Electronic waste (e-waste) is also known as Waste Electrical and Electronic Equipment (WEEE). The appliances that use electricity and have become old or are to be discarded or trashed are known as e-waste. E-waste includes electrically powered component waste. They include appliances such as computers, consumer electronics, and refrigerators. E-waste is a mixture of useful and hazardous materials that demand careful handling and recycling of materials. Thus, e-waste management has gained importance globally to secure the environment from the adverse effects of the materials such as lead and plastics. The recycled material is used to make next-generation goods.

E-waste contains several toxic additives or hazardous substances, such as mercury, brominated flame retardants (BFRs), and chlorofluorocarbons (CFCs), or hydrochlorofluorocarbons (HCFCs). The increasing levels of e-waste, low collection rates, non-environmentally sound disposal, and treatment of this waste pose significant risks to the environment and even human health.

Improper management of e-waste also contributes to global warming. At first, if the materials in e-waste are not recycled, they cannot substitute primary raw materials and reduce greenhouse gas emissions from extraction and refinement of primary raw materials. Next, refrigerants that are found in some temperature change equipment create greenhouse gases. A total of 98 Mt of CO₂ equivalents were released into the atmosphere from discarded fridges and air-conditioners that were not managed in an environmentally sound manner. According to the Energy Information Administration (EIA), this is approximately 0.3% of the global energy-related emissions in 2019.

The consumption of electrical and electronic equipment (EEE) is strongly linked to widespread global economic development. EEE has become indispensable in modern societies and improve living standards, but its production and usage can be resource-demanding. Moreover, higher levels of disposable incomes, rapid urbanization, and sustainable urban mobility are likely to drive the demand for electronics. On average, the total weight (excluding photovoltaic panels) of global EEE increases annually by 2.5 million metric tons (Mt). According to the Global E-waste Monitor 2020, the world generated 53.6 Mt of e-waste, an average of 7.3 kg per capita in 2019.

TABLE 15 WASTE MANAGEMENT MARKET FOR E-WASTE, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	33.8	31.1	31.4	32.0	33.0	34.3	36.0	38.5	4.2%
Europe	31.0	28.6	29.1	29.8	30.8	32.2	34.0	36.5	4.7%
Asia Pacific	45.2	42.6	44.0	46.0	48.5	51.7	55.6	60.9	6.7%
Middle East & Africa	1.9	1.8	1.8	1.8	1.8	1.9	2.0	2.1	3.3%
South America	2.8	2.6	2.6	2.7	2.7	2.8	2.9	3.1	3.2%
Total	114.7	106.6	108.9	112.3	116.9	122.9	130.5	141.1	5.3%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

6.4 PLASTIC WASTE

6.4.1 TECHNOLOGICAL ADVANCES IN RECYCLING OF PLASTIC WASTE TO SUPPORT MARKET GROWTH

Plastic waste accounted for a share of 18.9% of the waste management market in 2020. The market for plastic waste management has experienced an increasing trend of collection, domestic recycling, recovery of plastic, export of plastic waste, and implementation of legislative regulations. These activities have significantly contributed to the growing demand for plastic waste management services. Strict laws pertaining to waste management and disposal, along with the increasing awareness of the adverse impact of accumulating plastic waste, have led to the involvement of the public sector (such as municipalities) and the private sector in plastic waste management.

Factors such as increasing urban population, rapid industrialization, growing concern toward the environmental impact of the improper disposal of plastic waste, along with stringent laws and regulations regarding disposal and treatment of plastic waste, have propelled the growth of global plastic waste management industry. The increase in the GDP of a particular country will enable it to work with more advanced and effective waste management solutions, which will, in turn, increase the demand for waste management services, equipment, and technologies.

Plastics are segmented into thermoplastics and thermosetting plastics. Thermoplastics are those that can be molded after exposure to a certain temperature and can retain that shape after cooling. If a thermoplastic is frozen, it maintains a glass-like feature and becomes prone to fracture. Thermoplastics are used to manufacture products using techniques such as injection molding, extrusion, and compression molding. These attributes make them recyclable. Thermoset plastics are also known as thermosetting plastics. Thermosets are usually cured using heat or radiation, and once they are molded in a particular shape, they cannot be melted and shaped differently. Thermosets are stronger than thermoplastics and are suited for application in high temperatures. The molecules in a thermoset plastic are interconnected with permanent, irreversible bonds. A thermoset cannot be recycled as reheating destroys the material entirely. However, researchers in the Netherlands claim that some thermoset plastics can be remolded and recycled when heated at about 100°C. This segment focuses on plastic waste collected on the basis of the type of polymer used. These are segmented into polypropylene (PP), low-density polyethylene (LDPE), high-density polyethylene (HDPE), polyvinyl chloride (PVC), polyurethane (PUR), polystyrene (PS), polyethylene terephthalate (PET), and others. Moreover, recycling plastic waste has several benefits, such as reduction in pollution across ecosystems, conservation of natural resources, and saving of significant amount of landfill space. 7.4 cubic yards of landfill space can be saved by recycling 1 ton of plastic.

TABLE 16 WASTE MANAGEMENT MARKET FOR PLASTIC WASTE, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	25.8	23.8	24.1	24.7	25.5	26.5	27.9	30.0	4.5%
Europe	22.2	20.6	21.0	21.5	22.3	23.4	24.7	26.6	4.9%
Asia Pacific	32.8	30.9	32.1	33.6	35.5	37.9	40.8	44.9	6.9%
Middle East & Africa	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.5	3.5%
South America	2.1	2.0	2.0	2.1	2.1	2.2	2.3	2.4	3.4%
Total	84.3	78.6	80.5	83.1	86.8	91.4	97.2	105.4	5.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

6.5 BIO-MEDICAL WASTE

6.5.1 ESCALATED DEMAND FOR HEALTHCARE SERVICES TO BOOST MARKET GROWTH

Bio-medical waste accounted for a share of 14.5% of the waste management market in 2020. Bio-medical waste means any waste generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities pertaining to that or in the production or testing of biologicals. Bio-medical waste includes pharmaceutical waste disposal, medical waste disposal, and laboratory waste disposal.

Bio-medical waste can be disposed of through incineration or decontamination by heating with steam under pressure in an autoclave. Approximately 75–90% of the biomedical waste is non-hazardous and as harmless as any other municipal waste. The remaining 10–25% is hazardous and can be dangerous to humans or animals and harmful to the environment. If both these types are mixed, then the whole waste becomes harmful. Non-hazardous waste constitutes about 85% of the waste generated in most healthcare setups. This includes waste comprising food remnants, fruit peels, wash water, paper cartons, packaging materials, and so on. Biological hazards, also known as biohazards, refer to biological substances that threaten the health of living organisms, primarily that of humans. This may include medical waste or samples of a microorganism, virus, or toxin (from a biological source) that can impact human health. Other hazardous waste includes radioactive wastes, discarded glass, chemical wastes, pressurized containers, cytotoxic waste, and infectious wastes include non-sharps, sharps, plastic disposables, and liquid wastes.

Growth in the bio-medical waste management industry is primarily driven by the increasing volume of medical waste generated. This increasing volume can largely be attributed to the significant rise in demand for healthcare services worldwide. As a result, hospitals, laboratories, research centers, mortuaries, autopsy centers, blood banks, and test sample collection centers have shown increased activity. According to the World Health Organization (WHO) report, out of the total waste generated by healthcare activities, 85% of waste is non-hazardous, and 15% is hazardous. High-income countries generate an average of up to 0.5 kg of hazardous waste per hospital bed on a daily basis, while low-income countries generate an average of 0.2 kg.

TABLE 17 WASTE MANAGEMENT MARKET FOR BIO-MEDICAL WASTE, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	21.0	19.2	19.2	19.4	19.8	20.5	21.3	22.6	3.3%
Europe	19.3	17.7	17.7	17.9	18.3	18.9	19.7	20.9	3.3%
Asia Pacific	22.2	20.6	20.9	21.5	22.3	23.3	24.7	26.5	4.9%
Middle East & Africa	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.3	2.8%
South America	1.7	1.5	1.5	1.6	1.6	1.6	1.6	1.7	2.1%
Total	65.5	60.1	60.5	61.5	63.1	65.4	68.5	73.0	3.8%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

6.6 OTHERS

Other types of waste accounted for a share of 20.1% of the waste management market in 2020. Others include agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste. Agriculture waste is waste produced as a result of various agricultural operations. It includes manure and other wastes from farms, poultry houses, and slaughterhouses; harvest waste; fertilizer run-off from fields; pesticides that enter into the water, air, or soil; and salt and silt drained from fields.

Paper products, including newspaper, shredded paper, phonebooks, cardboard, magazines, computer paper, envelopes, construction paper, are the most recycled materials. By recycling cardboard and other paper products, millions of new paper products are produced, such as egg cartons, tissue, toilet paper, newspaper, paper bags, notebooks, stamps, business cards, and calendars. Newspapers/mechanical papers include newspapers, directories, inserts, as well as some advertisement and direct mail printing. According to EPA, overall 18.5% of durable goods are recycled. With a 99% recycling rate in 2018, lead-acid batteries continued to be one of the most recycled products.

There is a growing demand for wastes such as durable goods (e.g., tires and furniture), nondurable goods (e.g., newspapers and plastic plates/cups), containers and packaging (e.g., milk cartons and plastic wraps), and other wastes (e.g., yard waste and food). This generally refers to common household waste, as well as office and retail wastes, but excludes industrial, hazardous, and construction wastes.

TABLE 18 WASTE MANAGEMENT MARKET FOR OTHERS, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	27.6	25.2	25.2	25.5	26.1	26.9	28.1	29.8	3.4%
Europe	24.4	22.4	22.5	22.9	23.5	24.3	25.4	27.0	3.7%
Asia Pacific	34.8	32.6	33.5	34.7	36.3	38.3	40.9	44.4	5.8%
Middle East & Africa	1.6	1.4	1.4	1.4	1.4	1.5	1.5	1.6	2.6%
South America	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4%
Total	90.6	83.6	84.7	86.7	89.5	93.3	98.1	105.2	4.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

7 WASTE MANAGEMENT MARKET, BY SERVICE TYPE

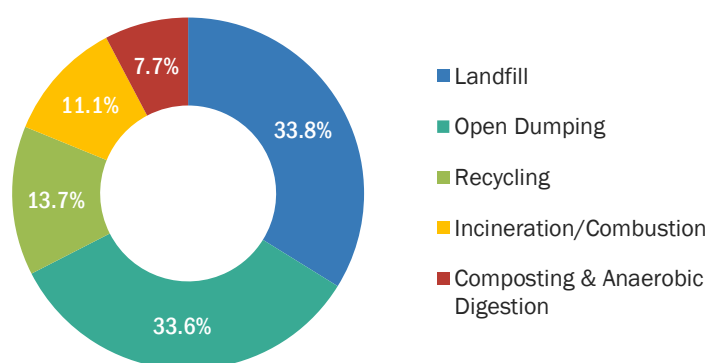
KEY FINDINGS

- Landfill services held the largest market share of 33.8% in 2020 as these services are in demand to protect the environment from contaminants, which may be present in the waste stream.
- The market for landfill services in Asia Pacific is projected to reach USD 82.2 billion by 2026, growing at a CAGR of 7.2% during the forecast period.
- The increasing need to dispose of waste that cannot be recycled is likely to boost demand for landfills.
- The market for recycling services in Asia Pacific is expected to grow at a CAGR of 6.9% during the forecast period.
- The growing need to destroy toxic waste at high temperatures for incineration/combustion is likely to drive the waste management market.

7.1 INTRODUCTION

Services covered in the waste management market involve open dumping, incineration/combustion, landfill, recycling, and composting and anaerobic digestion. In general, waste material undergoes recycling or thermal treatment, and in cases where it is not economically viable, the waste is deposited in a landfill following suitable treatments. The recyclable and non-recyclable waste products are first collected, transported, treated, and then converted into a new product for use in applications such as automobile, furnishing, packaging, and other industries. It has been observed that collection and transportation are the most crucial tasks involved in waste management because wastes are often mixed, which causes contamination, making them difficult to treat.

FIGURE 29 WASTE MANAGEMENT MARKET SHARE, IN TERMS OF VALUE, BY SERVICE TYPE, 2020 (%)



Source: Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

TABLE 19 WASTE MANAGEMENT MARKET, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	151.9	139.5	140.7	143.3	147.2	152.8	160.0	170.8	3.9%
Incineration/ Combustion	49.7	46.3	47.3	48.8	50.9	53.6	57.0	61.7	5.5%
Landfill	150.7	140.7	144.1	149.2	155.9	164.6	175.3	190.3	5.7%
Recycling	60.8	57.1	58.9	61.4	64.6	68.6	73.6	80.5	6.5%
Composting & Anaerobic Digestion	34.8	32.1	32.4	33.1	34.1	35.4	37.0	39.4	4.0%
Total	447.8	415.6	423.4	435.7	452.7	474.9	502.9	542.7	5.1%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

7.2 OPEN DUMPING

7.2.1 INEXPENSIVE AND CONVENIENT WAY TO DISCARD WASTE WOULD BOOST DEMAND FOR OPEN DUMPING

Open dumping services accounted for a share of 33.6% waste management market in 2020. An open dump is an illegal waste disposal site and not a permitted municipal solid waste landfill or a recycling facility. If allowed to remain, open dumps often grow larger and may attract the dumping of both solid and hazardous wastes. For instance, abandoned piles of household garbage, appliances, bags of yard waste, old barrels, used tires, and demolition debris such as shingles, lumber, pipes, and asbestos threaten the health of humans, wildlife, and the environment.

Open dumps pose several health, safety, and environmental threats, such as a fire and explosion; contamination of drinking water; inhalation of toxic gases; damage to plants and wildlife habitats; injury to children playing on or around the dumpsites; diseases carried by mosquitoes, flies, and rodents; contamination of soil and groundwater; contamination of streams, rivers, and lakes; and diminishing quality of life of residents living nearby waste disposal sites. Open dumping may result in substantial penalties, specifically for conditions such as litter, scavenging, placement of waste in standing or flowing water, open burning, standing or flowing liquid discharge from the dumpsite, and deposition of construction or demolition debris.

TABLE 20 WASTE MANAGEMENT MARKET FOR OPEN DUMPING SERVICES, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	46.6	42.6	42.7	43.2	44.2	45.6	47.5	50.4	3.4%
Europe	39.3	35.9	36.0	36.4	37.1	38.3	39.8	42.2	3.3%
Asia Pacific	59.5	55.2	56.3	57.8	60.0	62.9	66.6	71.8	5.0%
Middle East & Africa	2.6	2.3	2.3	2.3	2.3	2.4	2.4	2.5	1.6%
South America	3.8	3.5	3.5	3.5	3.6	3.6	3.7	3.8	1.5%
Total	151.9	139.5	140.7	143.3	147.2	152.8	160.0	170.8	3.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

7.3 INCINERATION/COMBUSTION

7.3.1 SURGED NEED TO DESTROY TOXIC WASTE AT HIGH TEMPERATURE TO PROPEL MARKET GROWTH

Incineration/combustion services accounted for a share of 11.1% of the waste management market in 2020. Incineration is the process in which the combustion of materials in waste takes place. Modern incinerators include pollution mitigation equipment, such as flue gas cleaning tools. Due to incineration, waste materials are converted into ash, flue gas, and heat. Incineration is also known as thermal treatment as the combustion takes place at high temperatures. Incineration reduces the solid mass of the waste by 80–85% and volume by 95%, depending on the degree of recovery of materials and their composition. Incineration does not replace landfilling completely; however, it greatly reduces the necessary volume of disposable materials.

Certain types of waste products, such as clinical waste and other medical and hazardous waste containing pathogens and toxins, are generally destroyed at high temperatures. For this, incineration is mostly the preferred method. The incineration process is generally observed in countries such as Japan, where waste disposal in landfills is difficult due to limited land resources. Countries such as Denmark and Sweden are a few of the leading players that have extracted maximum energy from the incineration process over the last few decades, with localized heat and power facilities.

A few incineration plants use developing technology-based solutions, such as burn pile, burn barrel, moving grate, and brick-lined cell. The burn pile, also termed burn pit, is one of the earliest and simplest forms of an incinerator, comprising a mound of combustible material piled on the ground surface and set to fire. The burn barrel is typically different; it is a controlled form of incineration, having a metal barrel inside, in which the material is dumped with metal grating on top of the exhaust. This barrel helps in two ways: it prevents the spread of burning material in windy conditions and allows the combustion remains to settle down at the bottom.

A moving grate incinerator is generally preferred for handling municipal solid waste. They are also known as municipal solid waste incinerators (MSWI). The main advantage of such incineration plants is that they enable the movement of the waste through a combustion chamber, allowing it to be more efficient for complete combustion. A single-moving grate boiler can handle waste at the rate of 35 KT per hour and can operate up to 8,000 hours per year with minimum stops, except for inspection and maintenance.

TABLE 21 WASTE MANAGEMENT MARKET FOR INCINERATION/COMBUSTION SERVICES, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	15.6	14.3	14.5	14.8	15.2	15.8	16.6	17.8	4.2%
Europe	11.8	10.9	11.1	11.4	11.8	12.3	13.0	14.0	4.8%
Asia Pacific	20.2	19.1	19.8	20.7	21.9	23.4	25.2	27.6	6.9%
Middle East & Africa	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	3.5%
South America	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	3.5%
Total	49.7	46.3	47.3	48.8	50.9	53.6	57.0	61.7	5.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

7.4 LANDFILL

7.4.1 INCREASED NEED TO DISPOSE OF WASTE THAT CANNOT BE RECYCLED CREATES REQUIREMENT FOR LANDFILLS

Landfill services accounted for a share of 33.8% of the waste management market in 2020. Modern landfills are well-engineered and managed facilities for the disposal of solid waste. Landfills are designed, located, operated, and monitored to ensure compliance with federal regulations. They are also designed to protect the environment from contaminants, which may be present in the waste stream. Landfills cannot be built in environmentally sensitive areas, and they are placed using on-site environmental monitoring systems. These monitoring systems check for any sign of groundwater contamination and landfill gas. Landfills have a stringent design, operation, and closure requirements established under the Resource Conservation and Recovery Act (RCRA).

Consumer plastic waste, which becomes unrecoverable, is disposed of in landfills. The government of every nation has constantly been focusing on bringing down the rate of plastic waste disposal to increase the potential of material recycling, as well as to reduce the ill effects of landfilling on soil and water. For instance, various European countries, including Switzerland, Austria, the Netherlands, Germany, Sweden, Luxembourg, Denmark, Belgium, and Norway, have a landfill ban to reduce the harmful environmental impact of landfills. However, landfills offer various advantages, such as it offers good energy sources; it is an eco-friendly option; it keeps cities, towns, and districts clean, and helps keep hazardous waste segregated; it is a relatively cheaper option for waste management.

TABLE 22 WASTE MANAGEMENT MARKET FOR LANDFILL SERVICES, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	46.4	42.7	43.3	44.2	45.6	47.5	50.0	53.6	4.4%
Europe	39.2	36.4	37.1	38.2	39.7	41.6	44.1	47.6	5.1%
Asia Pacific	59.0	55.8	58.0	60.9	64.6	69.1	74.6	82.2	7.2%
Middle East & Africa	2.5	2.3	2.3	2.3	2.4	2.5	2.6	2.8	4.1%
South America	3.6	3.4	3.5	3.6	3.7	3.8	4.0	4.2	3.9%
Total	150.7	140.7	144.1	149.2	155.9	164.6	175.3	190.3	5.7%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

7.5 RECYCLING

7.5.1 HIGH ESSENTIALITY TO REDUCE GREENHOUSE GAS EMISSIONS TO STIMULATE MARKET GROWTH

Recycling services accounted for a share of 13.7% of the waste management market in 2020. Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products. Recycling can benefit the community and the environment. Recycling, recovery, and reprocessing of waste materials are useful to produce new products. The basic phases in recycling are the collection of waste materials, their processing into new products, and purchasing of those products, which may then themselves be recycled. Typical materials that can be recycled are iron and steel scraps, aluminum cans, glass bottles, paper, wood, and plastics. The materials reused in recycling serve as substitutes for raw materials obtained from such increasingly scarce natural resources as petroleum, natural gas, coal, mineral ores, and trees. Recycling can help reduce the quantities of solid waste deposited in landfills, which has become increasingly expensive. Recycling also reduces the pollution of air, water, and land, resulting from waste disposal. Recycling helps reduce energy usage, decrease the amount of new/fresh raw materials, and minimize greenhouse gas emissions.

The recycling process of plastic waste involves sorting, cleaning and drying, shredding and agglomeration, pelletizing, and finally, manufacturing recycled products. In the case of developing countries, such as India, much of the waste collected from residential areas is not sorted before it is collected, which makes the recycling of plastic waste difficult. However, in developed countries, waste is sorted and deposited in containers; sorting also occurs after collecting waste. In this stage, recovered plastic waste is segregated into different grades either by the Society of the Plastics Industry (SPI) code or by the type of plastic, additives, and fillers used. The segregation is done as different types of plastic require different treatments while recycling them to make different types of products. Plastic sorting can be done manually, automated, or using a combination of both methods. Automated plastic sorting techniques include dry sorting, air

sorting, NIR (near-infrared) sorting, and electrostatic sorting. Mechanical sorting, sorting by melting, chemical sorting, and wet sorting techniques are the other automated techniques through which plastic waste can be sorted.

TABLE 23 WASTE MANAGEMENT MARKET FOR RECYCLING SERVICES, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	18.9	17.6	17.9	18.4	19.1	20.0	21.1	22.8	5.0%
Europe	14.6	13.7	14.0	14.5	15.1	16.0	17.0	18.5	5.7%
Asia Pacific	24.5	23.4	24.5	25.9	27.7	29.8	32.5	36.0	8.0%
Middle East & Africa	1.1	1.0	1.0	1.0	1.0	1.1	1.2	1.3	5.1%
South America	1.6	1.5	1.5	1.6	1.6	1.7	1.8	1.9	4.3%
Total	60.8	57.1	58.9	61.4	64.6	68.6	73.6	80.5	6.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

7.6 COMPOSTING & ANAEROBIC DIGESTION

7.6.1 HIGH DEMAND FOR BIOGAS AND COMPOSTING THAT REDUCE ENVIRONMENTAL RISKS TO FOSTER MARKET GROWTH

Composting and anaerobic digestion services accounted for a share of 7.7% of the waste management market in 2020. Anaerobic digestion is a process through which bacteria break down organic matter, such as wastewater biosolids, animal manure, and food wastes, in the absence of oxygen. Anaerobic digestion for biogas production takes place in a sealed vessel called a reactor, which is designed and constructed in various shapes and sizes specific to the site and feedstock conditions. These reactors contain complex microbial communities that break down (or digest) the waste and produce resultant biogas and digestate discharged from the digester.

Multiple organic materials can be combined in one digester, a practice called co-digestion. Co-digested materials include manure; food waste (i.e., distribution, processing, and consumer-generated materials); energy crops; crop residues; and fats, oils, and greases (FOG) from restaurant grease traps, and many other sources. Co-digestion can increase biogas production from low-yielding or difficult-to-digest organic waste. Composting is the natural process of recycling organic matter, such as leaves and food scraps, into valuable fertilizers that can enrich soil and plants.

Anything that grows decomposes eventually; composting speeds up the process by providing an ideal environment for bacteria, fungi, and other decomposing organisms (such as worms, sowbugs, and nematodes) to carry out the process. The resulting decomposed matter, which often ends up looking like fertile garden soil, is called compost. Composting enriches the soil, helping retain moisture and suppress plant diseases and pests, reduces the need for chemical fertilizers; encourages the production of beneficial bacteria and fungi that break down organic matter to create humus, a rich nutrient-filled material; and reduces methane emissions from landfills; and lowers carbon footprint.

TABLE 24 WASTE MANAGEMENT MARKET FOR COMPOSTING & ANAEROBIC DIGESTION SERVICES, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	8.2	7.5	7.6	7.7	7.9	8.2	8.5	9.0	3.6%
Europe	16.0	14.6	14.7	15.0	15.4	15.9	16.6	17.7	3.7%
Asia Pacific	9.1	8.5	8.8	9.1	9.4	9.9	10.5	11.2	5.0%
Middle East & Africa	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	2.6%
South America	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	2.0%
Total	34.8	32.1	32.4	33.1	34.1	35.4	37.0	39.4	4.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8 WASTE MANAGEMENT MARKET, BY END USER

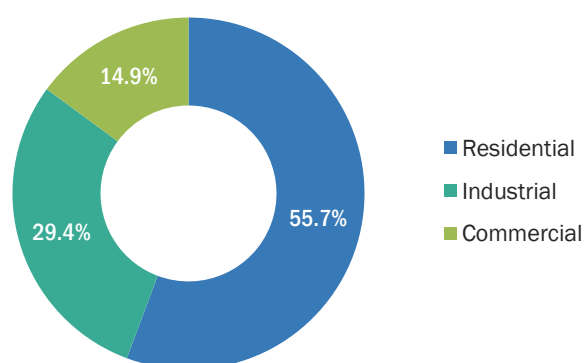
KEY FINDINGS

- The residential segment held the largest market share of 55.7% in 2020 because of the growing population and increasing need to properly dispose of waste.
- In Asia Pacific, the market for residential end users is projected to reach USD 130.5 billion by 2026, at a CAGR of 6.8% during the forecast period.
- Rapid urbanization and the thriving hospitality sector are likely to drive the demand for waste management services from commercial end users.
- In Asia Pacific, the industrial segment is projected to register a CAGR of 6.3% during the forecast period in the region.
- The growing need to increase the efficiency of manufacturing plants by focusing on toxic waste disposal is likely to drive the demand for waste management services.

8.1 INTRODUCTION

Based on end user, the waste management market has been segmented into residential, commercial, and industrial. This segment includes the study and analysis of waste generated and treated by the end user covered under this segment. The demand for waste management is driven by stringent environmental regulations, rapid industrialization and urbanization, and a strong focus on energy and resource recovery. The residential sector is estimated to be the largest generator of waste, followed by the industrial sector. The e-retailing boom in the emerging markets of Asia Pacific is projected to accelerate the growth of the packaging market, which, in turn, is expected to drive the waste management market during the forecast period.

FIGURE 30 WASTE MANAGEMENT MARKET SHARE, IN TERMS OF VALUE, BY END USER, 2020 (%)



Source: Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

TABLE 25 WASTE MANAGEMENT MARKET, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	248.5	231.5	236.8	244.6	255.2	268.8	285.8	309.6	5.5%
Commercial	67.2	61.8	62.5	63.8	65.8	68.4	71.9	77.0	4.2%
Industrial	132.1	122.2	124.2	127.3	131.7	137.7	145.2	156.1	4.7%
Total	447.8	415.6	423.4	435.7	452.7	474.9	502.9	542.7	5.1%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8.2 RESIDENTIAL

8.2.1 EVER-INCREASING POPULATION AND SIGNIFICANT SOLID WASTE GENERATION TO DRIVE DEMAND FOR WASTE MANAGEMENT SERVICES FROM RESIDENTIAL SEGMENT

The residential segment accounted for a share of 55.7% of the total waste management market in 2020. Waste collected from single- and multi-family dwellings comes under this category. Discarded plastic bags, consumer durables, Fast-moving Consumer Goods (FMCG) products, toys, e-waste products, household hazardous wastes, and other packaging materials collectively represent the waste generated by households. Also, increasing disposable income and shifting the preference of consumers toward e-shopping have significantly raised the quantity of plastic waste generated by the residential sector.

Residents from large housing units such as apartment complexes are more diligent about separating wastes before disposal than residents in areas of individual houses. According to the Government of Korea, wastes such as paper, waste metals, cans, and bottles, which are discarded separately for recycling purposes, are thoroughly treated by recycling agencies from the private sector. These agencies usually recycle 30–50% of the total volumes of these goods. Only 13% of plastics are collected due to the lack of plastic recycling facilities. Recyclable plastics are therefore stocked in collection sites of local governments and Korea Resource Recovery and Reutilization Corporation.

Waste generated from residential end users can be used for generating energy through waste-to-energy plants by burning solid waste to produce steam in a boiler and can also be is used to generate electricity. There are different types of waste-to-energy systems or technologies. The most common type used in the US is the mass-burn system, where unprocessed solid waste is burned in a large incinerator with a boiler and a generator for producing electricity.

TABLE 26 WASTE MANAGEMENT MARKET FOR RESIDENTIAL END USERS, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	75.2	69.5	70.4	72.1	74.5	77.7	81.9	87.9	4.5%
Europe	66.5	61.6	62.6	64.3	66.7	69.9	73.9	79.6	4.9%
Asia Pacific	96.3	90.8	94.0	98.3	103.8	110.6	119.0	130.5	6.8%
Middle East & Africa	4.2	3.9	3.9	4.0	4.1	4.2	4.4	4.7	3.7%
South America	6.2	5.8	5.8	6.0	6.1	6.3	6.6	6.9	3.4%
Total	248.5	231.5	236.8	244.6	255.2	268.8	285.8	309.6	5.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8.2.1.1 Households (direct to customer)

8.2.1.1.1 Growing need to recycle hazardous and non-hazardous waste generated through households to create considerable demand for waste management services

Stand-alone houses are considered in this segment. Recycling household waste has become essential as a circular economic policy has been implemented across the world to reflow waste into the economy through recycling. Household waste, also known as domestic waste, is disposable materials generated by households. This waste comprises non-hazardous waste and hazardous waste. Non-hazardous waste includes food scraps, papers, bottles, etc., which can be recycled or composted. Examples of hazardous waste include batteries and household cleaners. Hazardous waste must be handled safely to ensure that it is disposed of properly so it does not cause any harm.

8.2.1.2 Municipalities

8.2.1.2.1 Surging requirement to manage municipal waste as it is most pervasive and important contributor of waste

Municipal waste is defined as waste collected and treated by or for municipalities. It covers bulky waste, litter containers/bottles or sweepings, and cleansing waste collected from homes, gardens, streets, and public places, and many others. The municipal solid waste consists of disposable items used in everyday life, such as product packaging, grass clippings, bottles, clothing, food scraps, newspapers, appliances, paints, and batteries.

8.2.1.3 Societies/home associations

8.2.1.3.1 Rising demand for waste management services from societies and home associations as they are second-largest contributor of waste

This segment includes apartments and societies that generate bulk waste. This waste is usually collected through door-to-door services, collected from curbsides by the municipal corporation or authorized waste collection agencies. Then, everything is dumped in one garbage bag and sorted. It's difficult for waste collectors to manually segregate dry, wet, and toxic waste without hurting themselves.

8.2.1.4 Property management

8.2.1.4.1 Increasing number of construction projects makes waste management services imperative to keep environment safe and clean

In this segment, the waste generated and treated from the operation, control, maintenance, and construction of new buildings and oversight of real estate and physical properties is considered. Advanced Disposal Services offers property management waste and recycling solutions and recycling services, as well as conducts bulk collection and recycling education and training programs.

8.2.1.5 Others

Others include townhouses and multi-family homes. A townhome is a combination of a condominium (condo) and a single-family home. They often have multiple floors, with one or two shared walls, and some have a small yard space or rooftop deck. They are generally larger than a condo but smaller than a single-family home. Townhomes often have more privacy than a condo. Multi-family homes are the least common types of residential buildings. They are essentially homes that have been transformed into two or more units. They can be rowhouse-style or have multiple floors and range in sizes from a duplex to a four-plex;

anything more than four units is considered commercial. Some multi-family homes have a separate entrance for each unit, while some share the main entrance. The distinction between multi-family units and condos is that the units cannot be purchased individually; there is one owner for the whole building. Lots of waste is generated from townhouses and multi-family homes; for example, waste generation from the kitchen, renovation of homes, paper waste.

TABLE 27 WASTE MANAGEMENT MARKET FOR RESIDENTIAL END USERS, BY TYPE, 2019–2026 (USD BILLION)

Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Households	44.7	41.5	42.2	43.4	45.1	47.2	50.0	53.9	5.0%
Municipalities	99.4	93.3	96.1	100.0	105.1	111.5	119.4	130.3	6.3%
Societies/Home Associations	49.7	46.5	47.8	49.6	51.9	54.9	58.6	63.8	6.0%
Property Management	37.3	34.5	35.0	36.0	37.2	39.0	41.1	44.3	4.8%
Others	17.4	15.8	15.7	15.7	15.9	16.2	16.6	17.3	2.0%
Total	248.5	231.5	236.8	244.6	255.2	268.8	285.8	309.6	5.5%

Note: "Others" include townhouses and multi-family homes.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8.3 COMMERCIAL

8.3.1 DRAMATIC RISE OF URBANIZATION AND THRIVING HOSPITALITY SECTOR TO FUEL DEMAND FOR WASTE MANAGEMENT SERVICES

The commercial segment accounted for a share of 14.9% of the waste management market in 2020. Commercial waste is simply the waste and trash generated by companies and businesses. Commercial waste excludes household, agricultural, and industrial waste. It includes physical pickup and transfer of waste produced by businesses to a place where it can be treated or disposed of. Schools, offices, hotels and restaurants, stores, hospitals, prisons, and government centers fall under this category. The segment covers waste in the form of appliances, crockery products, FMCG products, stationery, consumer durables, and packaging materials. The waste management market in this sector is projected to witness moderate growth due to rapid urbanization and the booming hospitality sector.

The recycling of commercial waste includes collection, sorting, and recycling of waste, which can be done either by a municipality or a private recycling firm. Commercial waste recycling refers to the reclamation of scrap materials from small companies or businesses. For example, the manufacturing of paper products results in unused materials where shapes and dimensions do not fit the factory-produced rolls of raw papers or cardboards. Paper boxes or packages are designed to be efficient, but when millions of boxes, notebooks, or novelty items are cut, even small scraps add up to tons of unused papers. This waste can be reclaimed more cheaply than any post-consumer collection.

Moreover, the paper industry uses recycled paper, which has a high content of calcium carbonate, organic materials, and other minerals. Plastics are separated according to the polymer used and are extensively recycled into packaging products. Plastic waste can be recycled into packaging items such as containers, bottles, bags, films, and other protective packaging products.

Recycled plastics are used in containers for food & beverage applications. However, various guidelines and regulations are established globally to ensure the safety of recycled material for food packaging. For instance, the US Food and Drug Administration (FDA) has issued guidelines about the kinds of testing

required for ensuring the acceptable degree of confidence about the safety of materials. It has also issued “letters of non-objection” to various companies for specific processing methods and applications of recycled plastics that come in contact with food.

TABLE 28 WASTE MANAGEMENT MARKET FOR COMMERCIAL END USERS, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	20.3	18.5	18.5	18.7	19.1	19.7	20.5	21.7	3.2%
Europe	17.5	16.0	16.1	16.3	16.7	17.2	18.0	19.1	3.4%
Asia Pacific	26.5	24.7	25.3	26.2	27.3	28.8	30.6	33.2	5.6%
Middle East & Africa	1.2	1.1	1.1	1.1	1.1	1.1	1.2	1.2	3.2%
South America	1.7	1.5	1.5	1.6	1.6	1.6	1.7	1.7	2.2%
Total	67.2	61.8	62.5	63.8	65.8	68.4	71.9	77.0	4.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8.3.1.1 Offices and retail stores

8.3.1.1.1 Offices and retailers are major users of waste management services from commercial sector

The office and retail sector manages its day-to-day waste, whether it is a small convenience store in a rural village or a larger outfit in a shopping center, waste still needs to be managed effectively and economically. Retailers end up with various kinds of recyclable waste that could be harmful to their immediate surroundings, as well as the environment at large. Retailers handle various products, most of which include packaging. Retail stores tend to specialize in particular products; for instance, some deal with clothing, others may focus on foodstuffs, and a few may do both, depending on the size of the business. Waste generated at retail stores and offices includes packaging waste, plastic waste, cardboard waste, different fabric waste, clothes waste, and others.

8.3.1.2 Commercial property owners

8.3.1.2.1 Commercial spaces becoming aware of effective ways of trash removal and disposal

Any waste that a business produces on its premises is referred to as commercial property waste. Some examples of such waste include papers, retail packaging, food wrappers, cans, and cardboard. Commercial offices are becoming more conscious of the way they manage and reduce their waste. Some organizations provide a system of trash removal or disposal, while a few companies are more proactive in managing their waste.

8.3.1.3 Restaurants

8.3.1.3.1 Restaurants contribute significantly to commercial waste

Restaurants, as a division of the hospitality sector, contribute to the generation of commercial and institutional waste. According to the National Center for Biotechnology Information (NCBI), the total generated waste in restaurants includes food scraps of 28.2%, glass waste of 22.6%, paper/cardboard waste of 19.1%, and plastics of 17.1%. Approximately 1.3 billion tons of food gets wasted each year globally. Landfills are overflowing with food that could otherwise be donated to charity or given to employees. Next to food, other products such as paper (napkins, drawing papers for kids, etc.) and plastics are being tossed out instead of efficiently reused.

8.3.1.4 Government offices

8.3.1.4.1 Government offices usually generate paper waste, plastic waste, and e-waste

Government offices are places where government employees work. Government offices generate waste, including papers, cardboard, plastic products such as cans and bottles. In addition, it generates e-waste from laptops, desktops, refrigerators, and other electrical devices used in offices.

8.3.1.5 Education and healthcare facilities

8.3.1.5.1 Educational institutions and healthcare clinics dominate market for commercial users

Medical waste management involves collecting, transportation, storage, treatment, disposal, and recycling medical waste. This waste is generated from hospitals, clinics, diagnostic centers, and other healthcare facilities. Market growth is largely driven by the increasing volume of healthcare waste due to the outbreak of the COVID-19 pandemic.

TABLE 29 WASTE MANAGEMENT MARKET FOR COMMERCIAL END USERS, BY TYPE, 2019–2026 (USD BILLION)

Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Offices & Retail Stores	16.8	15.5	15.8	16.2	16.7	17.5	18.5	19.9	4.7%
Commercial Property Owners	14.6	13.4	13.5	13.7	14.1	14.7	15.4	16.4	4.0%
Restaurants	8.9	8.1	8.1	8.2	8.4	8.7	9.1	9.6	3.4%
Government Offices	11.9	10.8	10.8	11.0	11.2	11.5	12.0	12.7	3.2%
Education & Healthcare Facilities	15.1	14.0	14.3	14.7	15.3	16.1	17.0	18.4	5.2%
Total	67.2	61.8	62.5	63.8	65.8	68.4	71.9	77.0	4.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8.4 INDUSTRIAL

8.4.1 STRONG NEED FOR EFFECTIVE WASTE TREATMENT TO PRESERVE EARTH WOULD ACCELERATE MARKET GROWTH

The industrial segment accounted for a share of 29.4% of the waste management market in 2020. Industrial waste is defined as the waste generated during production or industrial processes. The industrial waste includes waste generated through cafeteria garbage, dirt and gravel, masonry and concrete, scrap metals, trash, oil, solvents, chemicals, weed grass and trees, wood and scrap lumber, and similar wastes. Industrial solid waste in the form of solid, liquid, or gases held in containers is divided into hazardous and non-hazardous waste. Hazardous waste is the output from manufacturing or other industrial processes. Non-hazardous industrial wastes are those that do not meet the Environmental Protection Agency (EPA) definition of hazardous waste and are not municipal waste. Industrial waste may be toxic, ignitable, corrosive, or reactive. If improperly managed, this waste can pose dangerous health and environmental consequences.

Recycling industrial by-products and waste can save a lot of money by decreasing disposal costs and material costs. Industrial recycling preserves the earth's natural resources by decreasing the demand for new materials. In addition, recycling conserves energy by reducing greenhouse gas emissions and decreasing the demand for products made from manufacturing processes that are very energy-intensive. For instance, scrap metal recycling reduces the energy requirements of manufacturing new tin and steel products by 60 to 70%.

A waste-to-energy (or energy-from-waste) plant converts industrial solid waste into electricity and/or heat for industrial processing and district heating systems, an ecologically sound, cost-effective means of energy recovery. The energy plant works by burning waste at high temperatures and using the heat to make steam. The steam then drives a turbine that creates electricity, and this generated electricity can be used in industries. Plastic wastes are used in the building & construction sector for the manufacturing of pipes, flooring, ceiling, frames, windowpanes, doors, walls, and insulations. Recycled plastics are used in the concrete mix as an environmentally friendly construction material. These are used in other applications, such as floor tiles, damp-proof membranes, drainage pipes, walkways, jetties, pontoons, bridges, and ducting. Companies, such as Continental Renewable Energy Co. Ltd (Kenya), are using recycled plastics for the manufacturing of roof tiles and fence posts for the development of affordable homes.

TABLE 30 WASTE MANAGEMENT MARKET FOR INDUSTRIAL END USERS, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	40.2	36.8	37.0	37.5	38.4	39.7	41.4	44.0	3.5%
Europe	36.9	33.8	34.1	34.7	35.7	37.0	38.7	41.3	3.9%
Asia Pacific	49.6	46.6	48.0	50.0	52.5	55.7	59.7	65.1	6.3%
Middle East & Africa	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3%
South America	3.3	3.0	3.0	3.1	3.2	3.2	3.3	3.5	2.7%
Total	132.1	122.2	124.2	127.3	131.7	137.7	145.2	156.1	4.7%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

8.4.1.1 Construction, renovation, and demolition sites

8.4.1.1.1 Construction, renovation, and demolition sites to lead waste management market for industrial segment in coming years

Construction, renovation, and demolition sites generate debris. EPA promotes a sustainable materials management (SMM) approach that identifies certain construction and demolition materials as commodities that can be used in new building projects, thereby avoiding the need to mine and process virgin materials. These materials often contain bulky, heavy materials such as wood, concrete, gypsum, asphalt, metals, bricks, glass, plastics, salvaged building components (doors, windows, and plumbing fixtures), trees, stumps, rocks, and soils.

8.4.1.2 Manufacturing facilities

8.4.1.2.1 Manufacturing facilities generate toxic waste that can be managed and disposed of according to government norms and guidelines

Manufacturing facilities rely on efficient and streamlined production methods. However, even the most efficient manufacturing plants are bound to generate some form of waste. Manufacturing plants not only focus on reducing the amount of materials discarded during the production process but also make sure to dispose of waste safely and responsibly. Toxic waste is an unavoidable by-product of many manufacturing methods. Toxic substances created in production plants are not allowed to contaminate the surrounding environment. Toxic waste disposal and management are regulated by governmental organizations.

Depending on the nature of the manufacturing process, certain facilities may generate large volumes of chemical waste. Unlike solid waste that can be placed in a bin for disposal, chemical waste must be contained using special disposal methods. Many types of chemicals can cause environmental harm when they are not disposed of properly.

TABLE 31 WASTE MANAGEMENT MARKET FOR INDUSTRIAL END USERS, BY TYPE, 2019–2026 (USD BILLION)

Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Construction, Renovation, & Demolition Sites	76.9	71.6	73.3	75.7	78.9	83.1	88.3	95.5	5.4%
Manufacturing Facilities	55.2	50.6	50.9	51.6	52.8	54.6	57.0	60.6	3.6%
Total	132.1	122.2	124.2	127.3	131.7	137.7	145.2	156.1	4.7%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9 GEOGRAPHIC ANALYSIS

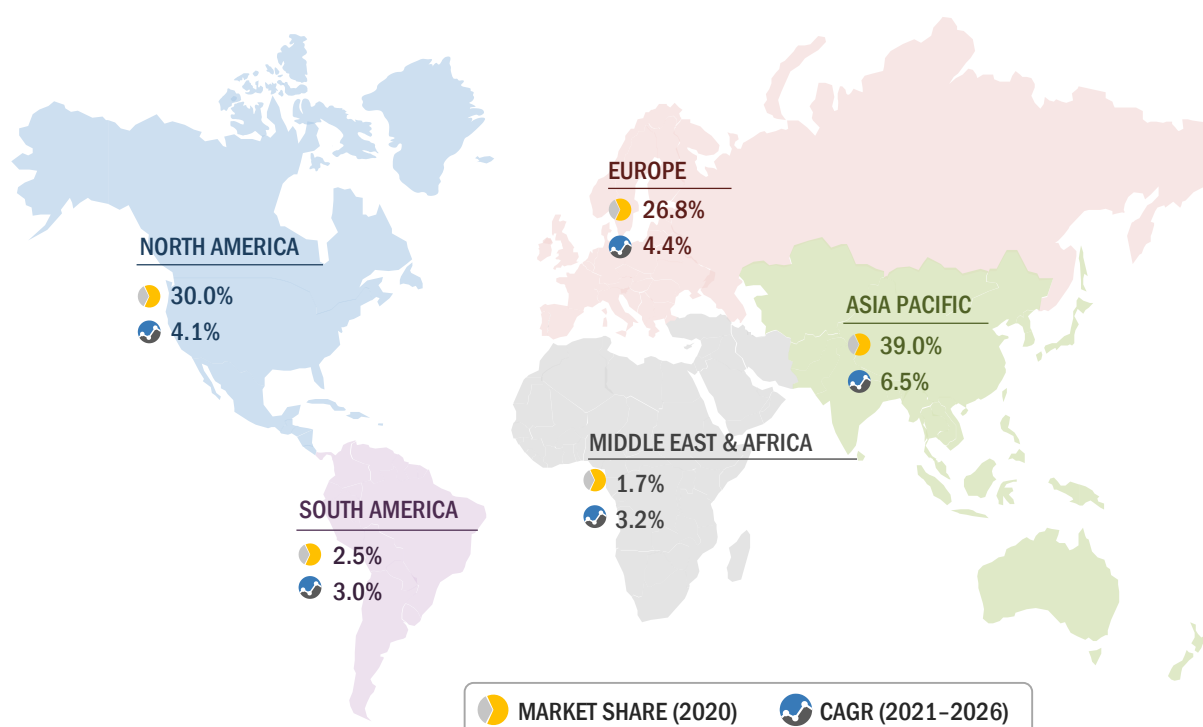
KEY FINDINGS

- The global waste management market is estimated to grow from USD 423.4 billion in 2021 to USD 542.7 billion by 2026, at a CAGR of 5.1%.
- The growth of the waste management market is expected to be driven by the growing focus on managing waste disposal across key regions such as North America, Europe, and Asia Pacific.
- The market in Asia Pacific is projected to reach USD 228.8 billion in 2026 from USD 167.3 billion in 2021, at a CAGR of 6.5%. The growth of the regional market can be attributed to the growing need to reduce carbon emissions and increasing focus on plastic recycling across countries such as China, Japan, and Australia.
- The waste management market in North America was valued at USD 124.7 billion in 2020 and is projected to reach USD 153.6 million by 2026; it is expected to grow at a CAGR of 4.1% from 2021 to 2026.
- The North American waste industry is booming owing to the rising spending capacity of consumers, along with rapid urbanization.

9.1 INTRODUCTION

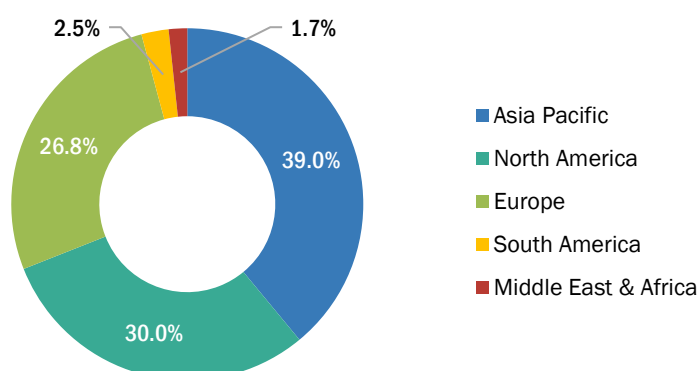
The global waste management market has been classified into five regions, namely, North America, South America, Europe, Asia Pacific, and the Middle East and Africa. The market has been studied further for key countries in each region. The global waste management market was valued at USD 415.6 billion in 2020 and is projected to reach USD 542.7 billion by 2026; it is expected to grow at a CAGR of 5.1% during the forecast period. Asia Pacific is expected to lead the waste management market with an increasing focus on plastic recycling by China, India, and Japan. North America and Europe are respectively the second- and third-largest markets for waste management services. Moreover, countries such as the US, Canada, and the EU countries focus on effective management of e-waste because of the growing electronics industry.

FIGURE 31 WASTE MANAGEMENT MARKET IN ASIA PACIFIC TO GROW AT HIGHEST CAGR FROM 2021 TO 2026



Source: Company Press Releases, Investor Presentations, Journals, Expert Interviews, and MarketsandMarkets Analysis

FIGURE 32 WASTE MANAGEMENT MARKET SHARE, IN TERMS OF VALUE, BY REGION, 2020



Note: The total may vary due to independent rounding off.

Source: Company Press Releases, Investor Presentations, Journals, Expert Interviews, and MarketsandMarkets Analysis

TABLE 32 GLOBAL WASTE MANAGEMENT MARKET, BY REGION, 2019–2026 (USD BILLION)

Region	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
North America	135.7	124.7	125.9	128.3	131.9	137.1	143.7	153.6	4.1%
Europe	120.9	111.5	112.9	115.4	119.1	124.1	130.6	140.0	4.4%
Asia Pacific	172.4	162.1	167.3	174.4	183.6	195.1	209.3	228.8	6.5%
Middle East & Africa	7.6	6.9	6.9	7.0	7.2	7.4	7.7	8.1	3.2%
South America	11.1	10.3	10.4	10.6	10.9	11.2	11.6	12.1	3.0%
Total	447.8	415.6	423.4	435.7	452.7	474.9	502.9	542.7	5.1%

Note: Table totals may vary due to independent rounding off.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 33 WASTE MANAGEMENT MARKET FOR TOP 5 COUNTRIES, BY SHARE (USD BILLION)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p
US	107.5	99.0	100.2	102.4	105.7	110.1	115.8	124.1
China	86.6	82.2	85.6	90.0	95.6	102.5	111.0	122.4
Germany	31.7	29.4	29.9	30.8	31.9	33.5	35.4	38.2
UK	28.1	26.0	26.4	27.1	28.0	29.3	31.0	33.3
Japan	27.5	25.9	26.9	28.1	29.7	31.7	34.2	37.5

Note: Table totals may vary due to independent rounding off.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 34 WASTE MANAGEMENT MARKET FOR TOP 5 FASTEST - GROWING COUNTRIES (2019–2026)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
China	86.6	82.2	85.6	90.0	95.6	102.5	111.0	122.4	7.4%
Japan	27.5	25.9	26.9	28.1	29.7	31.7	34.2	37.5	6.9%
India	23.8	22.1	22.6	23.3	24.3	25.5	27.1	29.3	5.3%
Germany	31.7	29.4	29.9	30.8	31.9	33.5	35.4	38.2	5.0%
Australia	12.4	11.5	11.7	12.0	12.5	13.1	13.8	14.9	4.9%

Note: Table totals may vary due to independent rounding off.

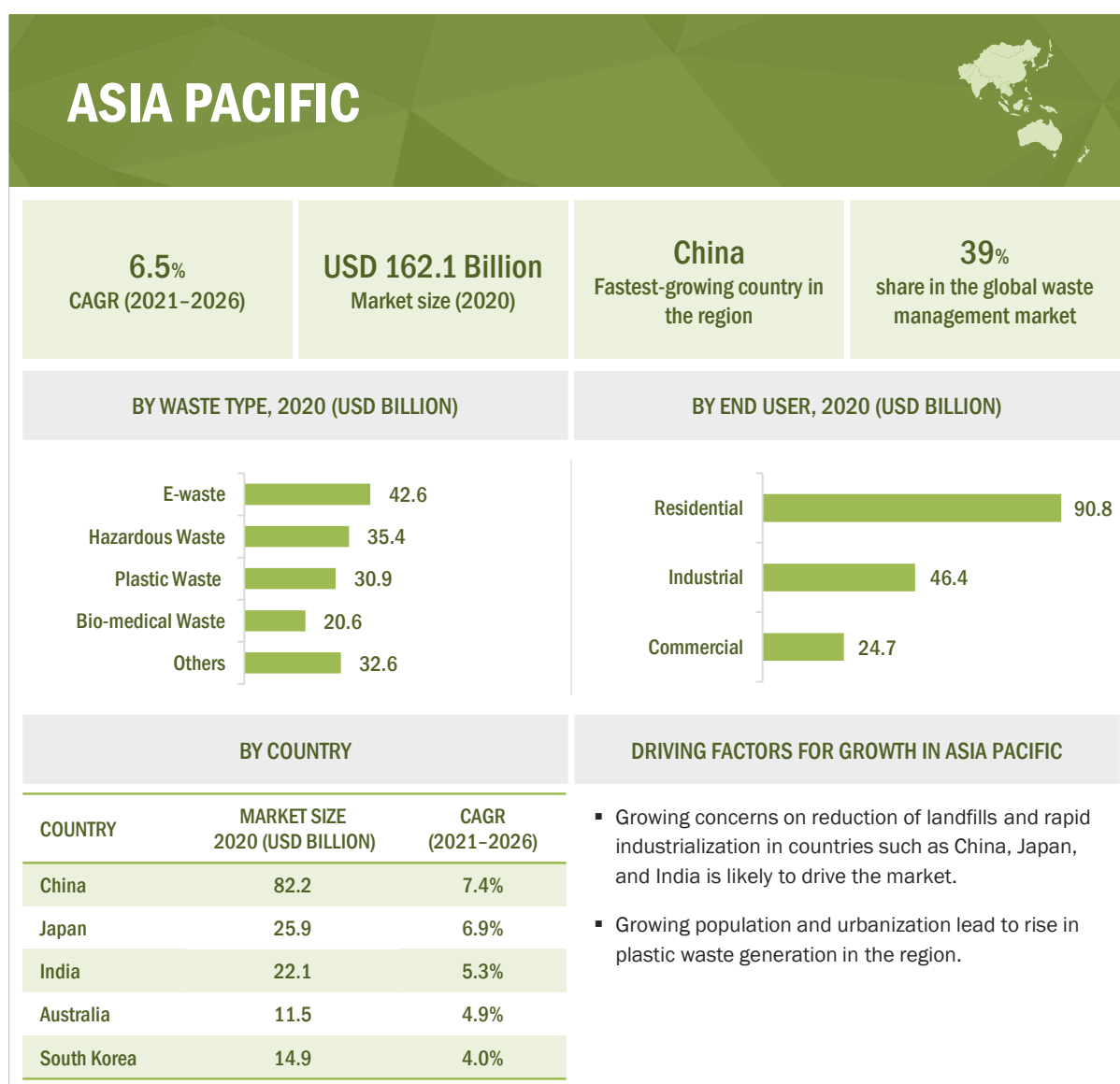
Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2 ASIA PACIFIC

Asia Pacific accounted for a share of 39% of the global waste management market in 2020 and is the largest and fastest-growing market during the forecast period. The market in this region has been further segmented into China, Japan, India, Australia, South Korea, and Rest of Asia Pacific. Rest of Asia Pacific mainly includes Singapore, Malaysia, Thailand, and Indonesia. The population growth in the region, the high disposable income of the people, and the increased demand for packaged food products are among a few major factors that drive the growth of waste management in the region. Asia Pacific is also a key contributor to marine plastic pollution. The materials involved include plastic bottles, plastic bags, single-use plastic items, and plastic packaging, among others. Key countries responsible for this kind of pollution include China, Indonesia, and Thailand.

Local and national governments in some countries in the region do not adequately support waste management recycling; also, some local governments do not impose strict regulations on the important aspects of recycling, such as source segregation. The lack of plastic waste management infrastructure and finance poses a challenge for plastic waste management in the region.

In addition, the rise in well-being and prosperity of urban residents is linked closely to increased consumption and production patterns with consequences for waste streams. Increased municipal solid waste is particularly noticeable in low- and middle-income countries. In these countries, the rate of waste generation has risen quickly and is expected to accelerate over the next decade and beyond. According to the United Nations' Economic and Social Commission for Asia and the Pacific (UNESCAP), between 50% and 65% of municipal solid waste in low- and middle-income countries is organic and can be turned into high-quality compost for use in agriculture, gardening, or landscaping or converted to biogas to produce heat and electricity. There are also significant opportunities for recycling inorganic materials, such as glass, plastic, and metal. Moreover, the manufacturing of new glass-based materials also has an ultimate opportunity for open-loop recycling and has more environmental benefits than that of landfilling. Between 25 and 35% of municipal solid waste is recyclable inorganic waste; this proportion will increase over the coming decades with further development of countries, leading to rising demand for waste management.

FIGURE 33 ASIA PACIFIC: SNAPSHOT, 2020

Note: Market size only for the top 5 countries are provided in the Asia Pacific market.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 35 WASTE MANAGEMENT MARKET IN ASIA PACIFIC, BY WASTE TYPE, 2019–2026 (USD BILLION)

Waste Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Hazardous Waste	37.4	35.4	36.8	38.7	41.0	43.9	47.4	52.2	7.2%
E-waste	45.2	42.6	44.0	46.0	48.5	51.7	55.6	60.9	6.7%
Plastic Waste	32.8	30.9	32.1	33.6	35.5	37.9	40.8	44.9	6.9%
Bio-medical Waste	22.2	20.6	20.9	21.5	22.3	23.3	24.7	26.5	4.9%
Others	34.8	32.6	33.5	34.7	36.3	38.3	40.9	44.4	5.8%
Total	172.4	162.1	167.3	174.4	183.6	195.1	209.3	228.8	6.5%

Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 36 WASTE MANAGEMENT MARKET IN ASIA PACIFIC, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	59.5	55.2	56.3	57.8	60.0	62.9	66.6	71.8	5.0%
Incineration/ Combustion	20.2	19.1	19.8	20.7	21.9	23.4	25.2	27.6	6.9%
Landfill	59.0	55.8	58.0	60.9	64.6	69.1	74.6	82.2	7.2%
Recycling	24.5	23.4	24.5	25.9	27.7	29.8	32.5	36.0	8.0%
Composting & Anaerobic Digestion	9.1	8.5	8.8	9.1	9.4	9.9	10.5	11.2	5.0%
Total	172.4	162.1	167.3	174.4	183.6	195.1	209.3	228.8	6.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 37 WASTE MANAGEMENT MARKET IN ASIA PACIFIC, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	96.3	90.8	94.0	98.3	103.8	110.6	119.0	130.5	6.8%
Commercial	26.5	24.7	25.3	26.2	27.3	28.8	30.6	33.2	5.6%
Industrial	49.6	46.6	48.0	50.0	52.5	55.7	59.7	65.1	6.3%
Total	172.4	162.1	167.3	174.4	183.6	195.1	209.3	228.8	6.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 38 WASTE MANAGEMENT MARKET IN ASIA PACIFIC, BY COUNTRY, 2019–2026 (USD BILLION)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
China	86.6	82.2	85.6	90.0	95.6	102.5	111.0	122.4	7.4%
Japan	27.5	25.9	26.9	28.1	29.7	31.7	34.2	37.5	6.9%
India	23.8	22.1	22.6	23.3	24.3	25.5	27.1	29.3	5.3%
Australia	12.4	11.5	11.7	12.0	12.5	13.1	13.8	14.9	4.9%
South Korea	16.2	14.9	15.0	15.3	15.7	16.3	17.1	18.3	4.0%
Rest of Asia Pacific	5.9	5.5	5.5	5.6	5.8	5.9	6.1	6.4	2.9%
Total	172.4	162.1	167.3	174.4	183.6	195.1	209.3	228.8	6.5%

Note: Rest of Asia Pacific mainly includes Singapore, Malaysia, Thailand, and Indonesia.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2.1 CHINA

9.2.1.1 Rising focus of government to reduce plastic pollution would drive market

China accounted for a share of 50.7% of the waste management market in Asia Pacific in 2020. The industrialization has enhanced urbanization in China through the migration of rural populations to urban areas and the development of towns into cities. Also, as a result of steady economic growth in the country, Chinese households are experiencing a continuous rise in their disposable income, which has eventually contributed to the demand for waste management services. The increasing awareness regarding the impact of non-eco-friendly packaging, such as plastic packaging and other plastic product materials, on the environment has had a major impact on the waste management market in this country.

The domestic plastic recycling rate in China is projected to increase in the next five years due to the stringent rules implemented in the government's next five-year plans. The largest organization that deals with plastic recycling in China is China Recycling Development Company Ltd., which has around 2,000 salvage stations and 32 sorting and cleaning centers. The guidelines implemented by the Chinese government regarding the collection of plastic waste, addressing environment-related issues. Also, reprocessing schemes are projected to have a positive impact on the collection and plastic recovery rate. The huge import of hazardous plastic waste was harming the environment. To reduce plastic pollution and facilitate better management of plastic waste, the Chinese government introduced the National Sword policy in January 2018. Under this policy, China banned 24 types of scraps and implemented stricter regulations on importing waste, with rigorous contamination standards. Therefore, a growing focus on reducing plastic pollution is likely to drive the demand for waste management services.

TABLE 39 WASTE MANAGEMENT MARKET IN CHINA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	30.1	28.2	29.0	30.1	31.5	33.3	35.6	38.7	6.0%
Incineration/ Combustion	10.4	9.9	10.3	10.9	11.6	12.5	13.6	15.1	7.8%
Landfill	29.9	28.5	29.9	31.7	33.9	36.6	39.9	44.3	8.2%
Recycling	12.6	12.1	12.7	13.6	14.6	15.9	17.4	19.5	8.8%
Composting & Anaerobic Digestion	3.6	3.5	3.6	3.8	4.0	4.2	4.5	4.9	6.4%
Total	86.6	82.2	85.6	90.0	95.6	102.5	111.0	122.4	7.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 40 WASTE MANAGEMENT MARKET IN CHINA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	48.3	46.0	48.0	50.7	54.0	58.0	63.0	69.7	7.7%
Commercial	13.3	12.5	12.9	13.5	14.2	15.1	16.2	17.8	6.6%
Industrial	25.0	23.7	24.7	25.9	27.5	29.4	31.8	35.0	7.3%
Total	86.6	82.2	85.6	90.0	95.6	102.5	111.0	122.4	7.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2.2 JAPAN

9.2.2.1 Growing emphasis of country on waste recycling to accelerate market growth

Japan accounted for a share of 16% of the waste management market in Asia Pacific in 2020. According to the United Nations Department of Economic and Social Affairs (UNDESA), the urban population of Japan is approximately 119.4 million in 2020, which comprised 94% of the total population of the country. This will result in increased demand for packaged goods, e-waste in the country, which, in turn, will generate waste.

One of the major drivers for the increase in demand for waste services in Japan is the lack of space for landfills close to metropolitan areas. Japan, being a small country in terms of landmass and with a large population, cannot afford to send plastic and other wastes into landfills. Moreover, the rise in environmental awareness has set limits on the amount of waste to be incinerated. These factors have promoted and encouraged the recycling of plastic and other wastes generated within the country. The recycled plastic material is used in the textiles industry as an industrial material and to manufacture household items such as egg boxes. The Japanese government is constantly trying to create awareness about the benefits of plastic recycling. For instance, Japan planned to make the medal podiums at the 2020 Tokyo Olympics from recycled plastic. Moreover, 24.5 tonnes of used plastic, equivalent to around 400,000 bottles of laundry detergent weighing 900 grams each, was collected in approximately 9 months, allowing the campaign to reach its collection goals by March 2020. All these initiatives help drive the demand for waste management services in the country.

TABLE 41 WASTE MANAGEMENT MARKET IN JAPAN, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	9.5	8.8	9.0	9.3	9.7	10.2	10.9	11.8	5.5%
Incineration/ Combustion	3.2	3.0	3.2	3.3	3.5	3.8	4.1	4.5	7.3%
Landfill	9.4	9.0	9.4	9.8	10.5	11.2	12.2	13.4	7.5%
Recycling	3.9	3.7	3.9	4.2	4.5	4.9	5.3	5.9	8.5%
Composting & Anaerobic Digestion	1.4	1.3	1.4	1.5	1.5	1.6	1.7	1.9	6.1%
Total	27.5	25.9	26.9	28.1	29.7	31.7	34.2	37.5	6.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 42 WASTE MANAGEMENT MARKET IN JAPAN, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	15.3	14.4	15.0	15.8	16.7	17.9	19.3	21.3	7.2%
Commercial	4.1	3.9	4.0	4.1	4.3	4.6	4.9	5.3	6.1%
Industrial	8.1	7.6	7.9	8.2	8.7	9.3	10.0	10.9	6.7%
Total	27.5	25.9	26.9	28.1	29.7	31.7	34.2	37.5	6.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2.3 INDIA

9.2.3.1 Increasing government investment in waste management and recycling to support market growth

India accounted for a share of 13.7% of the waste management market in Asia Pacific in 2020. India's growing plastics industry is projected to generate the demand for plastic waste management strategies. According to a report of the Plastindia Foundation (a conglomeration of associations and institutions dealing in plastics in India), in 2020, the country consumed an estimated 20 million metric tons of plastic. Furthermore, the growing population and rapid urbanization and industrialization have led to increased waste generation in the country. These factors are expected to create opportunities for the growth of the waste management market in the country. Availability of a massive skilled workforce and raw materials, lower cost of production, and favorable demographics in terms of waste generation have led to an increase in plastic manufacturing in the country, which is resulting in more waste, further creating opportunities for different methods of plastic waste management in the country.

India has the highest plastic recycling rate of 60% in the world, according to a report by the Global Environment Facility (US) in 2019. As per a domestic plastic manufacturer, there are around 20,000 plastic recycling industries in the country, each with a capacity of 1,500 tons per day. According to the International Trade Administration of 2019, the country generates about 62 million tons of municipal solid waste (MSW) every year, which includes 5.6 million tons of plastic waste, 0.17 million tons of biomedical waste, 7.9 million tons of hazardous waste, and 1.5 million tons electronic waste. India is also responsible for 60% of the plastic dumped into the world's oceans every year. Urban waste management services spend nearly USD 7–21 per ton of municipal solid waste. Out of this, 60–70% is spent on collection, 20–30% on transportation, and almost nothing on treatment and disposal. Short-term standardization is unlikely as a widespread informal recycling industry provides income to many of India's poorest households. The government has allocated approximately USD 1.11 billion in 2019 for solid waste management projects in urban areas, which will help drive the market for waste management.

TABLE 43 WASTE MANAGEMENT MARKET IN INDIA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	8.2	7.5	7.6	7.7	7.9	8.2	8.6	9.2	3.9%
Incineration/ Combustion	2.8	2.6	2.6	2.7	2.8	3.0	3.2	3.5	5.7%
Landfill	8.2	7.6	7.8	8.1	8.5	9.0	9.6	10.4	5.9%
Recycling	3.3	3.2	3.3	3.4	3.6	3.9	4.2	4.6	7.1%
Composting & Anaerobic Digestion	1.4	1.3	1.3	1.3	1.4	1.4	1.5	1.6	4.2%
Total	23.8	22.1	22.6	23.3	24.3	25.5	27.1	29.3	5.3%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 44 WASTE MANAGEMENT MARKET IN INDIA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	13.4	12.5	12.8	13.2	13.8	14.6	15.5	16.8	5.7%
Commercial	3.7	3.4	3.5	3.5	3.7	3.8	4.0	4.3	4.4%
Industrial	6.7	6.2	6.4	6.6	6.8	7.1	7.6	8.2	5.1%
Total	23.8	22.1	22.6	23.3	24.3	25.5	27.1	29.3	5.3%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2.4 AUSTRALIA

9.2.4.1 Increasing focus of government on recycling e-waste to promote market growth

Australia accounted for a share of 7.1% of the waste management market in Asia Pacific in 2020. E-waste recycling services are provided across metropolitan, regional, and remote areas of Australia as part of the Australian Government's National Television and Computer Recycling Scheme. This industry-funded scheme makes it easier for customers to have televisions, computers, printers, and computer parts and accessories recycled for free. The National Television and Computer Recycling Scheme (NCRS) provides around 98% of Australia's population with reasonable access to collection services for televisions and computer parts. Services may include a permanent collection site at a local waste transfer station or retail outlet or one-off recycling events. These may be operated through local councils or resource management centers. Services are free for households and small businesses, while charges may apply for larger businesses.

According to IBISWorld, the Medical Waste Services industry is expected to grow at an annualized rate of 5.9% from 2020 to 21, to reach USD 659.9 million. As the Australian population has been increasing and slowly aging, more people will require medical procedures, boosting medical waste services. Strict government regulation in the healthcare industry limits the companies operating and treating waste generated from the medical sector. Industrial processes and operations are strictly regulated due to the highly toxic and dangerous nature of medical waste. If not handled properly, it poses health risks to medical staff and waste handlers as there is potential for contamination. Government regulations and legislation that mandate the safe handling and treatment of medical waste are likely to drive the demand for waste management services.

TABLE 45 WASTE MANAGEMENT MARKET AUSTRALIA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	4.2	3.8	3.9	3.9	4.0	4.1	4.3	4.6	3.6%
Incineration/ Combustion	1.4	1.3	1.3	1.3	1.4	1.5	1.6	1.7	5.6%
Landfill	4.2	3.9	4.0	4.1	4.3	4.6	4.9	5.3	5.7%
Recycling	1.7	1.6	1.6	1.7	1.8	1.9	2.0	2.2	6.3%
Composting & Anaerobic Digestion	1.0	0.9	0.9	0.9	1.0	1.0	1.0	1.1	3.4%
Total	12.4	11.5	11.7	12.0	12.5	13.1	13.8	14.9	4.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 46 WASTE MANAGEMENT MARKET AUSTRALIA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	6.9	6.5	6.6	6.8	7.1	7.4	7.9	8.5	5.3%
Commercial	1.9	1.8	1.8	1.8	1.9	1.9	2.0	2.2	4.0%
Industrial	3.6	3.3	3.3	3.4	3.5	3.7	3.9	4.2	4.6%
Total	12.4	11.5	11.7	12.0	12.5	13.1	13.8	14.9	4.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2.5 SOUTH KOREA

9.2.5.1 Surging need to transform waste into energy to meet rising energy demand to stimulate market growth

South Korea accounted for a share of 9.2% of the waste management market in Asia Pacific in 2020. South Korea is a resource and land-limited country, so the proper handling of waste has been a priority for the government. Legislation focused on reducing municipal waste production has been highly successful in generating results. However, challenges remain with respect to hazardous waste, specifically nuclear waste, storage, largely due to South Korea's emphasis on nuclear power development to reduce high dependence on imported energy sources.

The SUDOKWON Landfill Corporation (SLC) developed an energy town to meet increasing energy demands in the country and lower the use of fossil fuels by creating energy from waste. Transforming waste into energy is part of South Korea's Resource Circulation and Green Growth development strategies. These facilities include a 2.4 MW biogas power plant, a food waste effluent to biogas facility, a sludge recycling facility, and a combustible waste to energy facility. These facilities enable waste to be transformed into valuable resource energy.

Food waste in South Korea is used for composting, animal feed, and food wastewater or effluent is used to create methane gas and subsequently electrical energy. In the sludge recycling facility, sewage sludge waste is dried, and the wastewater is used to produce biogas and then electrical energy, and the dried sludge is used as a waste cover in the landfill. Some non-recyclable wastes are converted to Solid Recovered Fuel (SRF) by performing combustion in the waste-to-energy facility. SRF is used to power many of the boilers in the SLC facility, as well as used outside of the facility. Therefore, growing energy demand and a key focus on hazardous waste are likely to drive the demand for waste management services.

TABLE 47 WASTE MANAGEMENT MARKET IN SOUTH KOREA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	5.5	5.0	5.0	5.0	5.1	5.2	5.4	5.6	2.4%
Incineration/ Combustion	1.8	1.7	1.7	1.8	1.8	1.9	2.0	2.1	4.4%
Landfill	5.4	5.0	5.1	5.2	5.4	5.7	6.0	6.5	4.9%
Recycling	2.3	2.1	2.1	2.2	2.3	2.5	2.6	2.9	6.2%
Composting & Anaerobic Digestion	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.2	2.0%
Total	16.2	14.9	15.0	15.3	15.7	16.3	17.1	18.3	4.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 48 WASTE MANAGEMENT MARKET IN SOUTH KOREA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	9.1	8.4	8.5	8.7	9.0	9.3	9.8	10.5	4.4%
Commercial	2.5	2.3	2.3	2.3	2.4	2.4	2.5	2.7	3.1%
Industrial	4.6	4.2	4.2	4.3	4.4	4.6	4.8	5.1	3.8%
Total	16.2	14.9	15.0	15.3	15.7	16.3	17.1	18.3	4.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.2.6 REST OF ASIA PACIFIC

Rest of Asia Pacific accounted for a 3.4% share of the waste management market in Asia Pacific in 2020. The market in this region is mainly studied for Singapore, Malaysia, Thailand, and Indonesia. The concept of waste management has been embraced by Thailand through the setting of a national master plan for Solid Waste Management (SWM). Several Waste-to-Energy (WTE) projects have been initiated. The anaerobic digestion WTE power plant in Rayong municipality was selected for performance evaluation. It is able to treat 70 tons of organic waste per day, but its actual throughput has decreased to 20 tons per day based on the limited amount of waste separation effected to isolate the organic waste. In addition, a better digester design is required for the actual organic waste generated. Thermal processes such as gasification and incineration in Hatyai have been applied for mixed waste.

According to World Economic Forum, Indonesia is focusing on a reduction in plastic pollution. The country aims to cut marine plastic waste by 70% within five years. By 2040, Indonesia plans to be entirely plastic pollution-free. The amount of plastic waste generated in Indonesia each year is growing at unsustainable levels. In cities, waterways, and coastlines, the accumulation of toxic plastic waste is harming food systems and the health of people. The booming fishing industry, the second-largest in the world, is under threat from rising levels of marine plastic debris. By 2025, the amount of plastic waste leaking into oceans could reach 800,000 tonnes. The country is planning to take various steps to achieve the target of reducing or substituting plastic usage, redesigning plastic products and packaging for reuse or recycling, doubling plastic waste collection to 80% by 2025, building or expanding safe waste disposal facilities, and double our current recycling capacity.

TABLE 49 WASTE MANAGEMENT MARKET IN REST OF ASIA PACIFIC, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	2.0	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.1%
Incineration/ Combustion	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7	3.6%
Landfill	1.9	1.8	1.8	1.9	1.9	2.0	2.1	2.2	3.9%
Recycling	0.8	0.7	0.8	0.8	0.8	0.9	0.9	0.9	4.2%
Composting & Anaerobic Digestion	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	2.9%
Total	5.9	5.5	5.5	5.6	5.8	5.9	6.1	6.4	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 50 WASTE MANAGEMENT MARKET REST OF ASIA PACIFIC, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	3.3	3.1	3.1	3.2	3.3	3.4	3.5	3.7	3.4%
Commercial	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.6%
Industrial	1.6	1.5	1.5	1.6	1.6	1.6	1.7	1.8	2.7%
Total	5.9	5.5	5.5	5.6	5.8	5.9	6.1	6.4	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.3 NORTH AMERICA

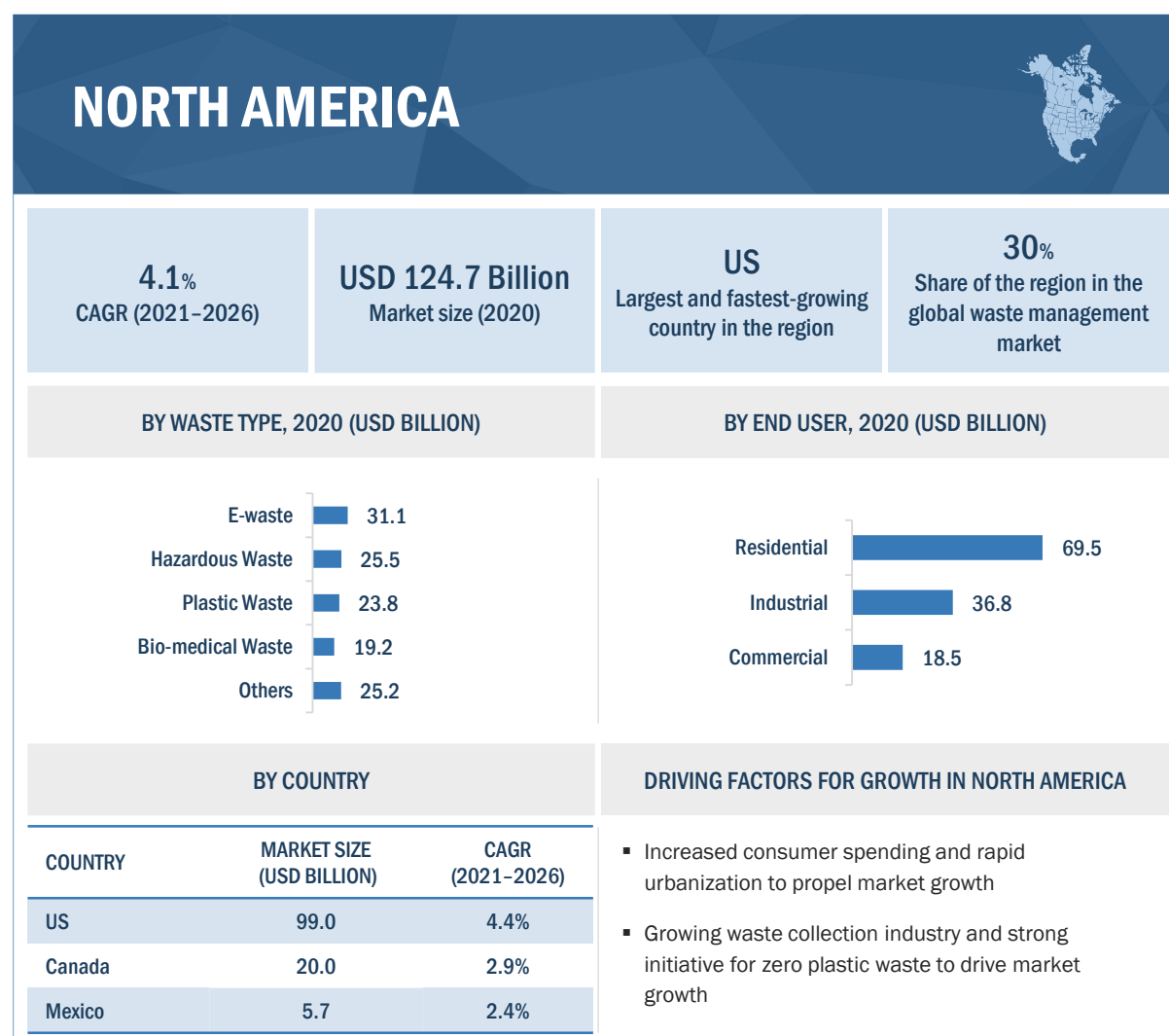
North America (the US, Canada, and Mexico) accounted for a 30% share of the global waste management market in 2020. Recently, e-waste in North America has been steadily rising owing to frequent disposals of electronic gadgets and appliances by various end users. North America has a higher percentage of educated, upper income, and technology-savvy population due to which gadgets get modified every six months; and the old electronic products are then sold off. In some cases, the accumulated waste is sent to the developing countries, such as China and Hong Kong, either recycle or reuse these electronic products. The Commission for Environmental Cooperation (CEC) was established under the 1994 North American Agreement on Environmental Cooperation (NAAEC) by the US, Canada, and Mexico to complement the North American Free Trade Agreement (NAFTA). The United States Environmental Protection Agency (EPA) has taken major steps with CEC in North America to enhance the management of electronic products throughout their life cycle.

The North American market has been further segmented into three countries, namely, the US, Canada, and Mexico. The market in this region is primarily driven by technological advancements in the waste management industry and laws governing waste collection, disposal, and recycling. The US is projected to be the largest consumer of waste management services offered by waste management companies and accounted for the largest market share in 2020, in terms of both value and volume, among all the countries in North America. The US is also projected to witness the fastest growth in the North American market for waste management. Canada is projected to be the second fastest-growing market in North America. For decades, the plastic waste generated in the US was sent to China; however, after the Chinese

National Sword Policy in 2017 on regulations pertaining to the import of solid wastes as raw materials, there has been an increase in local recycling and prices of different plastic waste management services in the US.

North American companies, such as Coca-Cola (US) and Wal-Mart Stores (US), have promised to use more recycled materials in their products. Coca-Cola used 40% recycled plastic in the manufacturing of beverage containers in 2020. Wal-Mart Stores targeted using recycled plastic worth USD 38.5 billion in the packaging in 2020.

FIGURE 34 NORTH AMERICA: MARKET SNAPSHOT, 2020



Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 51 WASTE MANAGEMENT MARKET IN NORTH AMERICA, BY WASTE TYPE, 2019–2026 (USD BILLION)

Waste Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Hazardous Waste	27.6	25.5	25.9	26.6	27.5	28.8	30.4	32.7	4.8%
E-waste	33.8	31.1	31.4	32.0	33.0	34.3	36.0	38.5	4.2%
Plastic Waste	25.8	23.8	24.1	24.7	25.5	26.5	27.9	30.0	4.5%
Bio-medical Waste	21.0	19.2	19.2	19.4	19.8	20.5	21.3	22.6	3.3%
Others	27.6	25.2	25.2	25.5	26.1	26.9	28.1	29.8	3.4%
Total	135.7	124.7	125.9	128.3	131.9	137.1	143.7	153.6	4.1%

Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 52 WASTE MANAGEMENT MARKET IN NORTH AMERICA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	46.6	42.6	42.7	43.2	44.2	45.6	47.5	50.4	3.4%
Incineration/ Combustion	15.6	14.3	14.5	14.8	15.2	15.8	16.6	17.8	4.2%
Landfill	46.4	42.7	43.3	44.2	45.6	47.5	50.0	53.6	4.4%
Recycling	18.9	17.6	17.9	18.4	19.1	20.0	21.1	22.8	5.0%
Composting & Anaerobic Digestion	8.2	7.5	7.6	7.7	7.9	8.2	8.5	9.0	3.6%
Total	135.7	124.7	125.9	128.3	131.9	137.1	143.7	153.6	4.1%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 53 WASTE MANAGEMENT MARKET IN NORTH AMERICA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	75.2	69.5	70.4	72.1	74.5	77.7	81.9	87.9	4.5%
Commercial	20.3	18.5	18.5	18.7	19.1	19.7	20.5	21.7	3.2%
Industrial	40.2	36.8	37.0	37.5	38.4	39.7	41.4	44.0	3.5%
Total	135.7	124.7	125.9	128.3	131.9	137.1	143.7	153.6	4.1%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 54 WASTE MANAGEMENT MARKET IN NORTH AMERICA, BY COUNTRY, 2019–2026 (USD BILLION)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
US	107.5	99.0	100.2	102.4	105.7	110.1	115.8	124.1	4.4%
Canada	22.0	20.0	20.0	20.1	20.5	21.0	21.8	23.0	2.9%
Mexico	6.2	5.7	5.7	5.8	5.8	6.0	6.1	6.4	2.4%
Total	135.7	124.7	125.9	128.3	131.9	137.1	143.7	153.6	4.1%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.3.1 US

9.3.1.1 Increasing purchasing power of consumers, along with rapid urbanization, to propel market growth

The US accounted for a 79.4% share of the waste management market in North America in 2020. The US is a largely populated country, with every house having at least 20 electronic products, such as computers, cell phones, refrigerators, washing machines, toasters, vacuum cleaners, coffee machines, and air conditioners. The efficient disposal of these electronic products raises a serious question. In the US, 23 states have laws and regulations pertaining to e-waste, which deal with the manufacturers taking the electronic products back and recycling them efficiently. There are regulations and laws that restrict the use of hazardous components such as mercury, lead, and other metals.

A US-based non-profit organization—the Center for Electronics Recycling (NCER)—is dedicated to enhancing national infrastructure for e-waste recycling. NCER states that nearly 43 lbs (20 kg) of e-waste is generated every year per person worldwide. The maximum amount of e-waste is generated in the US, and later, it is shipped to developing countries in Asia and West Africa. E-waste in these developing nations is usually disposed of or recycled, but the dumping of hazardous materials has led to severe health and environmental issues.

The increasing number of surgical procedures performed in the US is one of the major factors driving the demand for sterilization equipment in the country. According to the American Society of Plastic Surgeons, around 1.8 million surgical and minimally invasive cosmetic procedures were performed in 2019. Moreover, in 2018, the Preventing Surgical Site Infections report published by the Health Research & Educational Trust stated that each year, more than 15 million surgeries are performed in the US. This is indicative of the volume of waste generated in the US.

Growth in the elderly population and the subsequent increase in the demand for long-term healthcare services, acute care, and chronic care disease management services are also expected to contribute to the increased demand for medical waste management services in the US. According to the World Population Aging 2019 report, the geriatric population (aged 65 and above) in the US is projected to reach 70 million by 2030. This population base is susceptible to a number of chronic diseases. According to the National Council on Aging, ~92% of the aged population in the US has at least one chronic disease, such as heart disease, cancer, or diabetes. This indicates a significant expected surge in the number of surgical and nonsurgical procedures performed in US hospitals every year.

Additionally, stringent regulations to ensure effective handling of medical waste plays a crucial role in the market's growth. Regulatory authorities in the US continuously monitor the collection, storage, transportation, treatment, disposal, and recycling of generated medical waste. The Environmental Protection Agency (EPA) regulates the emission of particulate matter and gases from incinerators, while the

Department of Transportation (DOT) controls the transportation of waste from hospitals to the treatment facility. In addition, the Occupational Health and Safety Administration (OSHA) regulates medical waste at healthcare centers. Laws have been passed by these authorities to mandate the safe handling of hazardous waste, such as the Resource Conservation and Recovery Act (RCRA) to control the disposal of hazardous waste in the US. Such regulations will drive the need for waste management in the US.

TABLE 55 WASTE MANAGEMENT MARKET IN US, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	36.9	33.7	33.9	34.4	35.2	36.4	38.0	40.5	3.6%
Incineration/ Combustion	12.4	11.4	11.5	11.8	12.2	12.7	13.4	14.4	4.5%
Landfill	36.8	34.0	34.5	35.4	36.6	38.3	40.4	43.4	4.7%
Recycling	15.1	14.0	14.3	14.8	15.4	16.2	17.2	18.6	5.4%
Composting & Anaerobic Digestion	6.5	5.9	6.0	6.1	6.2	6.5	6.8	7.2	3.8%
Total	107.5	99.0	100.2	102.4	105.7	110.1	115.8	124.1	4.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 56 WASTE MANAGEMENT MARKET IN US, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	59.7	55.2	56.1	57.7	59.8	62.6	66.1	71.2	4.9%
Commercial	16.1	14.7	14.8	15.0	15.4	15.9	16.6	17.6	3.6%
Industrial	31.7	29.1	29.3	29.7	30.5	31.6	33.1	35.2	3.8%
Total	107.5	99.0	100.2	102.4	105.7	110.1	115.8	124.1	4.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.3.2 CANADA

9.3.2.1 Growing demand for waste collection services, coupled with country's zero plastic waste initiative, to boost market growth

Canada accounted for a 16% share of the waste management market in North America in 2020. Canada has been witnessing a growing need for waste collection services for the past five years. Collection services mainly include the collection and transport of waste, and the demand for such services primarily depends on the amount of waste produced by households and businesses. The demand from household markets tends to increase because of increased population size and, therefore, the per capita waste generation.

Waste collection service providers in Canada collect hazardous and nonhazardous wastes and recyclable materials. Nonhazardous waste includes municipal solid waste (household waste) and industrial and commercial waste. The service providers have transfer stations where waste is transferred from local vehicles to long-distance vehicles for transport to disposal facilities.

In November 2018, through the Canadian Council of Ministers of the Environment, the federal, provincial, and territorial governments approved in principle a Canada-wide Strategy on Zero Plastic Waste. Building on the Ocean Plastics Charter, the strategy takes a circular economy approach to plastics and provides a framework for action in Canada. The key focus areas of the strategy include single-use plastics, collection

systems, recycling capacity, consumer awareness, research and monitoring, and clean-up. This plan sets out tangible actions and clear timelines to prevent, reduce, reuse, recover, capture, and clean up plastic waste and pollution in Canada. These actions will help Canada reduce plastic pollution, create economic opportunities to recover the value of used plastics and achieve the goal of zero plastic waste by 2030, thereby fueling demand for waste management services.

According to the University of British Columbia, every year, Canada contributes exuberant amounts of waste to landfills. One of the largest global contributions to that waste comes from the electronics industry. The amount of e-waste increased by 17%, and the country created approximately 52.2 million metric tonnes of e-waste annually throughout the world in 2020. Canada generates a significant amount of e-waste.

TABLE 57 WASTE MANAGEMENT MARKET IN CANADA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	7.5	6.8	6.8	6.8	6.9	7.1	7.3	7.7	2.6%
Incineration/ Combustion	2.5	2.3	2.3	2.3	2.3	2.4	2.5	2.6	3.0%
Landfill	7.5	6.8	6.8	6.9	7.0	7.2	7.5	7.9	3.1%
Recycling	3.0	2.8	2.8	2.8	2.9	3.0	3.1	3.3	3.3%
Composting & Anaerobic Digestion	1.5	1.3	1.3	1.3	1.4	1.4	1.4	1.5	2.7%
Total	22.0	20.0	20.0	20.1	20.5	21.0	21.8	23.0	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 58 WASTE MANAGEMENT MARKET IN CANADA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	12.1	11.1	11.1	11.2	11.5	11.8	12.3	13.1	3.4%
Commercial	3.2	2.9	2.9	2.9	2.9	2.9	3.0	3.1	1.8%
Industrial	6.6	6.0	6.0	6.0	6.1	6.3	6.5	6.8	2.6%
Total	22.0	20.0	20.0	20.1	20.5	21.0	21.8	23.0	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.3.3 MEXICO

9.3.3.1 Increasing government focus on adopting zero waste strategy to spike demand for waste management services

Mexico accounted for a 4.6% share of the North American waste management market in 2020. Mexico's Ministry of Environment and Natural Resources (SEMARNAT) commenced a pilot carbon market to begin in 2019 at the Global Climate Action Summit (GCAS) in California, which will be transitioned to an Emissions Trading System (ETS) by 2022. Mexico is strongly focusing on forest preservation and restoration, promoting clean energy, and integrated urban planning. These are a few major factors that are expected to drive the waste management market in the coming years.

According to the National Institute of Ecology and Climate Change (INECC), Mexico produces more than 358,000 tons of electronic waste annually, from digital devices to electrical appliances, the equivalent of 3.2 kilos (7 lbs.) waste. In the Valley of Mexico Metropolitan Area alone, which includes the nation's capital, more than 13 million devices, such as televisions, sound equipment, telephones, computers, and electrical appliances, generated waste annually. Around 90% of this electronic trash has not been adequately put out of commission, representing a risk to human health and the environment. Only 10% of this waste material is estimated to be recycled, while 40% remains stored in homes, and the other 50% is left at waste transfer stations, scrap dealers, sanitary landfills, or uncontrolled open dumps.

Half of all the plastic produced worldwide is only used once. From 2021, the Government of Mexico prohibited the use of single-use plastic products, including plastic bags, forks, straws, and cups. In March 2019, the Environmental Ministry issued a proposal aiming to transform Mexico's mountains of garbage piled in open pit trash sites into a "zero waste" circular economy by establishing destinations where garbage could go to be reused, recycled, or turned into energy or compost.

In May 2020, mountains of infectious waste, including huge piles of discarded coffins and tons of hospital garbage, are popping up across Mexico amid the coronavirus pandemic, grisly problem authorities attribute to illegal dumping and unscrupulous operators. Authorities found 3.5 tons of hospital waste dumped in the woods on the outskirts of Mexico City and 6,000 cubic yards (meters) of medical waste piled ceiling-high at a clandestine warehouse in Puebla state, leaking out of over-crammed trailers and buildings. Teetering piles of coffins, meanwhile, are piling up outside Mexico city's overworked crematoriums.

TABLE 59 WASTE MANAGEMENT MARKET IN MEXICO, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.2%
Incineration/ Combustion	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	2.4%
Landfill	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.5%
Recycling	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	2.7%
Composting & Anaerobic Digestion	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.5%
Total	6.2	5.7	5.7	5.8	5.8	6.0	6.1	6.4	2.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 60 WASTE MANAGEMENT MARKET MEXICO, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	3.4	3.1	3.2	3.2	3.2	3.3	3.4	3.6	2.5%
Commercial	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	2.2%
Industrial	1.9	1.7	1.7	1.7	1.8	1.8	1.9	2.0	2.4%
Total	6.2	5.7	5.7	5.8	5.8	6.0	6.1	6.4	2.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4 EUROPE

Europe accounted for a share of 26.8% of the global waste management market in 2020. The region was the third-largest market in 2020. The market has been studied for the key countries in the region, namely, the UK, Germany, France, Spain, Russia, and Rest of Europe. Rest of Europe primarily includes the Netherlands, Norway, Sweden, Austria, and Switzerland. PlasticsEurope (the Association of Plastics Manufacturers in Europe) and the European Association of Plastics Recycling and Recovery Organizations (EPRO) are the two major associations involved in plastic waste management in Europe. The European Union produced ~58 million metric tons of plastic in 2019, based on the data published by PlasticsEurope.

The European Commission is constantly trying to reduce and manage plastic waste in the region. Around 10 European countries have imposed restrictions on landfills, offering opportunities for the recycling of plastic. Plastics 2030 is a voluntary commitment that focuses on preventing the leakage of plastic into the environment. It further focuses on improving resource efficiency and the circularity of various applications of plastic packaging. The future of plastic waste management in the European economy is strongly influenced by environmental and governmental regulations and raw material prices. Headquarters of prominent waste management companies such as Veolia (France), SUEZ (France), Remondis SE & Co. KG (Germany), ALBA Group plc & Co KG (Germany), Fomento de Construcciones y Contratas SA (Spain), and Indaver (Netherlands) are located in Europe.

Europe focuses on recycling e-waste due to regulatory policies in the region according to which manufacturers must recycle at least 85% of what they produce. Growing e-waste has provided various opportunities to recycling companies in Europe. Therefore, it has become imperative for e-waste recycling companies to enhance and advance their waste collection and material recovery processes. The European Union is implementing strict legislations by escalating landfill prices and increasing the awareness about the environmental impact of Waste Electrical and Electronic Equipment (WEEE), which is fueling the demand for e-waste management services for electric and electronic equipment in Europe.

TABLE 61 WASTE MANAGEMENT MARKET IN EUROPE, BY WASTE TYPE, 2019–2026 (USD BILLION)

Waste Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Hazardous Waste	23.9	22.2	22.6	23.3	24.2	25.4	26.9	29.0	5.1%
E-waste	31.0	28.6	29.1	29.8	30.8	32.2	34.0	36.5	4.7%
Plastic Waste	22.2	20.6	21.0	21.5	22.3	23.4	24.7	26.6	4.9%
Bio-medical Waste	19.3	17.7	17.7	17.9	18.3	18.9	19.7	20.9	3.3%
Others	24.4	22.4	22.5	22.9	23.5	24.3	25.4	27.0	3.7%
Total	120.9	111.5	112.9	115.4	119.1	124.1	130.6	140.0	4.4%

Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 62 WASTE MANAGEMENT MARKET IN EUROPE, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	39.3	35.9	36.0	36.4	37.1	38.3	39.8	42.2	3.3%
Incineration/ Combustion	11.8	10.9	11.1	11.4	11.8	12.3	13.0	14.0	4.8%
Landfill	39.2	36.4	37.1	38.2	39.7	41.6	44.1	47.6	5.1%
Recycling	14.6	13.7	14.0	14.5	15.1	16.0	17.0	18.5	5.7%
Composting & Anaerobic Digestion	16.0	14.6	14.7	15.0	15.4	15.9	16.6	17.7	3.7%
Total	120.9	111.5	112.9	115.4	119.1	124.1	130.6	140.0	4.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 63 WASTE MANAGEMENT MARKET IN EUROPE, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	66.5	61.6	62.6	64.3	66.7	69.9	73.9	79.6	4.9%
Commercial	17.5	16.0	16.1	16.3	16.7	17.2	18.0	19.1	3.4%
Industrial	36.9	33.8	34.1	34.7	35.7	37.0	38.7	41.3	3.9%
Total	120.9	111.5	112.9	115.4	119.1	124.1	130.6	140.0	4.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 64 WASTE MANAGEMENT MARKET IN EUROPE, BY COUNTRY, 2019–2026 (USD BILLION)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
UK	28.1	26.0	26.4	27.1	28.0	29.3	31.0	33.3	4.8%
Germany	31.7	29.4	29.9	30.8	31.9	33.5	35.4	38.2	5.0%
France	18.7	17.3	17.5	18.0	18.6	19.4	20.4	22.0	4.6%
Spain	14.4	13.1	13.1	13.3	13.6	14.0	14.5	15.4	3.2%
Russia	16.7	15.4	15.5	15.9	16.4	17.0	17.9	19.2	4.3%
Rest of Europe	11.4	10.3	10.3	10.4	10.6	10.9	11.3	12.0	2.9%
Total	120.9	111.5	112.9	115.4	119.1	124.1	130.6	140.0	4.4%

Note: Rest of Europe mainly includes the Netherlands, Norway, Sweden, Austria, and Switzerland.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4.1 GERMANY

9.4.1.1 Thriving plastic packaging industry to create need for waste management

Germany accounted for a share of 26.4% of the European waste management market in 2020. According to Germany Trade & Investment (GTAI) 2018, the country is the largest market for the food & beverages industry in Europe. The plastic packaging sector in Germany is projected to remain stable and continue to expand. Additionally, the country's large consumer base, overall positive economic environment, flourishing manufacturing sector, and rise in domestic and international demand are expected to boost the growth of the plastic packaging industry. This will end up in a waste generation, further creating opportunities for different methods of waste management in the country. According to the IK Industrievereinigung Kunststoffverpackungen e. V. (Plastics Packaging Industry Association), in 2020, the production of plastic packaging films in Germany increased by 1.0%. The growing plastic packaging industry is likely to create opportunities for plastic recycling in the next few years.

A few private companies that make up for the 60% share of the waste handling industry in Germany are Remondis Industrie Service GmbH & Co. KG., Veolia, SUEZ, ALBA plc & Co. KGaA, Johannes Fehr Muellabfuhr und Grubenentleerung GmbH & Company KG, Nehlsen GmbH & Co. KG, Tonsmeier Entsorgung Niedersachsen GmbH & Company KG, and Schoenmackers Umweltdienste GmbH & Co. KG.

TABLE 65 WASTE MANAGEMENT MARKET IN GERMANY, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	10.6	9.7	9.8	9.9	10.2	10.6	11.0	11.8	3.8%
Incineration/ Combustion	3.4	3.1	3.2	3.3	3.4	3.6	3.8	4.1	5.2%
Landfill	10.6	9.9	10.1	10.5	11.0	11.6	12.3	13.4	5.7%
Recycling	4.0	3.8	3.9	4.1	4.3	4.5	4.9	5.3	6.4%
Composting & Anaerobic Digestion	3.1	2.8	2.9	3.0	3.1	3.2	3.4	3.6	4.6%
Total	31.7	29.4	29.9	30.8	31.9	33.5	35.4	38.2	5.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 66 WASTE MANAGEMENT MARKET IN GERMANY, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	17.5	16.3	16.7	17.3	18.0	19.0	20.2	21.9	5.5%
Commercial	4.7	4.3	4.4	4.4	4.6	4.8	5.0	5.4	4.2%
Industrial	9.5	8.7	8.8	9.1	9.3	9.7	10.3	11.0	4.4%
Total	31.7	29.4	29.9	30.8	31.9	33.5	35.4	38.2	5.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4.2 UK

9.4.2.1 Increasing focus on plastic recycling to boost demand for waste management services

The UK accounted for a share of 23.3% of the European waste management market in 2020. According to the British Plastic Federation, the UK uses over 5 million metric tons (5.5 million tons) of plastic each year, out of which 24% is currently recovered or recycled. In the last few years till 2020, the UK has observed rapid growth in the volume of plastic waste collected and separated for recycling. The increasing collection of waste poses a challenge to recyclers to convert the waste into valuable resources. Many manufacturers in the UK now operate on-site recycling facilities, which can be a threat to the waste management market.

The rise in food exports and an increase in demand for convenient or ready-to-eat food offer growth opportunities for the plastic packaging market, further creating demand for waste generation services. Consumers in the UK are well aware of the environmental benefits of recycling and reusing recovered plastic. Therefore, there is a growing preference for recycled plastic among consumers and manufacturers in the UK, further fueling the growth of the waste management market.

Out of the 5 million metric tons (5.5 million tons) of plastic used every year, 2.4 million metric tons (2.6 million tons) comprises plastics used for packaging. Increasing innovations and rapid advancements in plastic recycling, sorting, and other decontamination technologies have helped the country effectively recycle mixed rigid packaging plastic. Market growth in the UK is largely driven by the growing patient population and increasing surgical volumes in the country. For example, according to the National Health Service (NHS), the number of colonoscopies performed in England has risen from 348,344 in 2018 to 351,734 in 2019. Such growth in the overall number of colonoscopies, among other surgeries and procedures, is likely to create medical waste, favoring the market growth.

TABLE 67 WASTE MANAGEMENT MARKET IN UK, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	9.3	8.5	8.5	8.6	8.8	9.1	9.5	10.1	3.5%
Incineration/ Combustion	2.9	2.7	2.7	2.8	2.9	3.1	3.2	3.5	5.2%
Landfill	9.2	8.6	8.8	9.1	9.4	9.9	10.6	11.4	5.4%
Recycling	3.6	3.3	3.4	3.6	3.7	4.0	4.2	4.6	6.0%
Composting & Anaerobic Digestion	3.1	2.9	3.0	3.0	3.1	3.3	3.4	3.7	4.5%
Total	28.1	26.0	26.4	27.1	28.0	29.3	31.0	33.3	4.8%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 68 WASTE MANAGEMENT MARKET IN UK, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	15.5	14.4	14.7	15.2	15.8	16.6	17.6	19.0	5.3%
Commercial	4.2	3.8	3.8	3.9	4.0	4.1	4.3	4.6	3.8%
Industrial	8.4	7.7	7.8	8.0	8.2	8.6	9.0	9.6	4.2%
Total	28.1	26.0	26.4	27.1	28.0	29.3	31.0	33.3	4.8%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4.3 FRANCE

9.4.3.1 Growing waste generation from healthcare facilities to drive demand for waste management services

France accounted for a share of 15.5% of the European waste management market in 2020. A large amount of medical waste is generated by healthcare facilities with the growing geriatric population, thereby propelling the growth of the waste management market in France. The country's geriatric population was 13.45 million in 2020, which is expected to reach 16.09 million by 2030 (Source: World Population Aging Report 2019). Moreover, according to the ADEME (French Environment and Energy Management Agency), each year, 170,000 tons of medical waste is produced in France; healthcare centers account for 90% of the medical waste generated in France.

The recycling rate for municipal waste in France has seen a slight increase of 2.6% in 2019, according to Eurostat. In total, the recycling rate for municipal waste reached 46.3% in 2019 across France, a slight increase compared to 2018. However, France has been dragging down the EU average, with a recycling rate of 24.2% in 2018. Despite the slight EU-wide increase, the overall recycling rate remains far off the energy recovery rate, which stood at 42.6% of plastic waste (up 0.9% over the period) in 2019. In 2020, around 4.8 million metric tons of plastic waste was produced by France. It also stated that approximately 22% of the waste collected in the country was recycled. Leading French companies are trying to increase the recycling rate in France. For instance, to improve the low recycling rate for polystyrene, manufacturers such as Total, Citeo, Syndifrais, and Saint-Gobain have collaborated to start a polystyrene recycling channel in France by 2020.

According to a report in 2020 by PlasticsEurope, the post-consumer recycling rate of plastic in France in 2018 was approximately 24.2%. Energy recovery from plastic waste accounted for 43.3%, and the remaining 32.5% was deposited in landfills. SUEZ Environnement is one of the largest plastic waste recyclers in France; the waste is collected and sorted directly at the production site; recycled collection bags are marketed under SITA Négoce, a subsidiary of SUEZ Environnement. The other subsidiaries of the company involved in plastic recycling are SOPAVE (agricultural plastic), Next Polymeres (industrial plastic), Regene Atlantique and France Plastiques Recyclage (PET & HDPE recycling), and SITA Recycling Polymers (PVC recycling).

TABLE 69 WASTE MANAGEMENT MARKET IN FRANCE, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	6.0	5.5	5.5	5.6	5.7	5.9	6.1	6.5	3.3%
Incineration/ Combustion	1.8	1.6	1.7	1.7	1.8	1.9	2.0	2.1	5.1%
Landfills	6.0	5.6	5.7	5.9	6.1	6.5	6.9	7.4	5.4%
Recycling	2.2	2.1	2.1	2.2	2.3	2.5	2.7	2.9	6.2%
Composting & Anaerobic Digestion	2.7	2.5	2.5	2.6	2.6	2.7	2.8	3.0	3.9%
Total	18.7	17.3	17.5	18.0	18.6	19.4	20.4	22.0	4.6%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 70 WASTE MANAGEMENT MARKET IN FRANCE, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	10.3	9.6	9.8	10.1	10.4	11.0	11.6	12.5	5.1%
Commercial	2.7	2.5	2.5	2.5	2.6	2.7	2.8	3.0	3.4%
Industrial	5.7	5.2	5.3	5.4	5.5	5.7	6.0	6.5	4.2%
Total	18.7	17.3	17.5	18.0	18.6	19.4	20.4	22.0	4.6%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4.4 SPAIN

9.4.4.1 Changing consumer habits and strong government efforts to prevent food waste to achieve economic and environmental gain to promote market growth

Spain accounted for a share of 11.8% of the European waste management market in 2020. According to IMF, Spain was the fourteen-largest national economy in 2020, in terms of nominal GDP. Macroeconomic factors such as the recovery in the economy, the rise in domestic demand for convenient packaging, and an increase in consumer spending and exports are expected to accelerate the economic growth of Spain. The Bank of Spain revised its forecast for economic growth from 2.0% to 2.2% in 2020.

According to ANAIP (Spanish Association of Plastic Industries), in 2018, the country was among the 10 leading producers and consumers of plastic raw materials globally. The same source stated that the plastic production and transformation in Spain generates a yearly turnover of around USD 17.8 billion and creates approximately 69,000 jobs. The European Commission's strategy of plastic has boosted the circularity of plastics. It indicates an increase in the use of recycled plastic as a raw material for plastic production. Hence, Spanish plastic raw material manufacturers also invest in the plastic recycling sector to support the circular economy concept.

Changing consumer habits and strong government efforts to prevent food waste are likely to encourage innovations in packaging techniques. This is expected to create substantial growth opportunities for plastic packaging, which can help prevent food wastage. Growth in the packaging industry, in line with continuous innovation, is expected to generate waste in Spain in the next five years.

The increasing prevalence of diseases and the growing geriatric population are the major factors driving market growth in Spain. According to the World Population Aging Report 2019, the geriatric population (aged 65 years and above) increased by 1.7% in 2020 compared to 2019; this is expected to increase to 43.2% by 2030, thereby driving the demand for waste management.

TABLE 71 WASTE MANAGEMENT MARKET IN SPAIN, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	4.5	4.1	4.1	4.2	4.2	4.3	4.5	4.7	2.8%
Incineration/ Combustion	1.3	1.2	1.2	1.2	1.2	1.3	1.3	1.4	3.6%
Landfill	4.5	4.2	4.2	4.2	4.3	4.5	4.7	5.0	3.8%
Recycling	1.6	1.5	1.5	1.5	1.6	1.6	1.7	1.8	4.0%
Composting & Anaerobic Digestion	2.4	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.2%
Total	14.4	13.1	13.1	13.3	13.6	14.0	14.5	15.4	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 72 WASTE MANAGEMENT MARKET IN SPAIN, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	7.9	7.3	7.3	7.4	7.6	7.9	8.2	8.8	3.9%
Commercial	2.1	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0%
Industrial	4.3	3.9	3.9	4.0	4.0	4.1	4.3	4.5	2.6%
Total	14.4	13.1	13.1	13.3	13.6	14.0	14.5	15.4	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4.5 RUSSIA

9.4.5.1 Increasing awareness regarding positive impact of waste minimization and recycling on environment supporting market growth

Russia accounted for a 13.8% share of the waste management market in Europe in 2020. The Russian packaging industry is characterized by vast domestic reserves and considerable investments from foreign and domestic packaging players. In the current scenario, the increased shelf life of packaged foods and easy storage make plastic packaging an attractive option to modern consumers. Rising demand for high-quality and innovative packaging, coupled with a demanding customer base, is further expected to propel the growth of the plastic packaging industry in the country.

At RosUpack 2018, it was observed that Russian companies showed great interest in the environmental sustainability of the packaging products, comprising light-weighting, recyclability, and renewable materials. Recycled plastic, being renewable, gains a competitive advantage in Russia. Increased use of recycled plastic is creating demand for recycling services for plastic waste in Russia.

Tele2, one of the largest mobile operators in Russia, launched a unique environmental project named the Pereplavka in 2020. Throughout the year, anyone could hand over an old phone for recycling in one of 579 Tele2 retail outlets. This project contributes to the UN's SDG 12 of Responsible Consumption and Production and allows people to dispose of their phones without harming the environment while also increasing environmental awareness among Russian citizens.

TABLE 73 WASTE MANAGEMENT MARKET IN RUSSIA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	5.3	4.8	4.8	4.9	4.9	5.1	5.3	5.6	2.9%
Incineration/ Combustion	1.5	1.4	1.4	1.4	1.5	1.6	1.7	1.8	4.8%
Landfills	5.3	4.9	5.0	5.2	5.4	5.6	6.0	6.4	5.2%
Recycling	1.9	1.8	1.8	1.9	2.0	2.1	2.3	2.5	5.9%
Composting & Anaerobic Digestion	2.7	2.4	2.4	2.5	2.6	2.6	2.7	2.9	3.6%
Total	16.7	15.4	15.5	15.9	16.4	17.0	17.9	19.2	4.3%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 74 WASTE MANAGEMENT MARKET IN RUSSIA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	9.1	8.4	8.5	8.8	9.1	9.5	10.0	10.8	4.8%
Commercial	2.3	2.1	2.1	2.1	2.2	2.3	2.4	2.5	3.3%
Industrial	5.3	4.9	4.9	5.0	5.1	5.3	5.5	5.9	3.8%
Total	16.7	15.4	15.5	15.9	16.4	17.0	17.9	19.2	4.3%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.4.6 REST OF EUROPE

Rest of Europe accounted for a share of 9.3% of the waste management market in Europe in 2020. The market in Rest of Europe primarily includes the Netherlands, Norway, Sweden, Austria, and Switzerland. In the Netherlands, nearly all municipalities have a separate collecting system for chemical waste (paints, solvents, batteries, medicines, photo chemicals, pesticides, etc.). The purpose is to keep the normal municipal waste free of these materials. The normal municipal waste comprising domestic waste; coarse waste; office, shop, and services waste; and waste from the street, park, canal, and sewer cleaning are increasing day by day.

Sweden focuses on sustainable waste management and reduction in per capita carbon footprint. The country consistently works to lower its greenhouse gas emissions, improve energy efficiency, and increase public awareness. Over the past 10 years, Sweden has been focusing on developing methods of repurposing waste, so less than 1% of the total waste generated in the country makes it to landfills. To accomplish this, the country changed its perspective of garbage. In April 2020, over 50% of the waste generated in Sweden was burned in waste-to-energy facilities. The energy produced by these facilities is circulated to several homes across the country during the long winter months. Localized heating, known as district heating, has improved air quality throughout the nation. It is easier and more economical to control the emissions from several locations instead of multiple, smaller non-point sources.

TABLE 75 WASTE MANAGEMENT MARKET IN REST OF EUROPE, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	3.6	3.2	3.2	3.2	3.3	3.3	3.4	3.6	2.1%
Incineration/ Combustion	1.0	0.9	0.9	0.9	0.9	1.0	1.0	1.1	3.4%
Landfill	3.6	3.3	3.3	3.3	3.4	3.5	3.7	3.9	3.7%
Recycling	1.3	1.2	1.2	1.2	1.2	1.3	1.3	1.4	3.8%
Composting & Anaerobic Digestion	2.0	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.2%
Total	11.4	10.3	10.3	10.4	10.6	10.9	11.3	12.0	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 76 WASTE MANAGEMENT MARKET IN REST OF EUROPE, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	6.1	5.6	5.6	5.7	5.8	6.0	6.2	6.6	3.4%
Commercial	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.5	2.1%
Industrial	3.7	3.4	3.4	3.4	3.4	3.5	3.6	3.8	2.6%
Total	11.4	10.3	10.3	10.4	10.6	10.9	11.3	12.0	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.5 SOUTH AMERICA

South America accounted for a share of 2.5% of the global waste management market in 2020, and the region was the fourth-largest market for waste management in 2020. The market has been studied for key countries in the region, namely, Brazil, Argentina, Chile, and Rest of South America. Rest of South America primarily includes Venezuela, Ecuador, Peru, and Colombia. The South American region is characterized by a high rate of urban population and low availability of recycling infrastructure and services. A huge urban population offers immense opportunities to upsurge the recycling rates with labor-intensive waste management solutions. These solutions can generate jobs that ultimately support the development of a good urban environment. The increase in e-waste in this region resulted in damage to the environmental condition as e-waste contains some harmful contents responsible for many diseases. To manage this problem, a few telecom companies in South America, such as Telefónica Vivo (Spain) and Claro Telecom (Brazil), have voluntarily started collecting e-waste, including cell phones, from the society and sending that e-waste for the recycling process.

TABLE 77 WASTE MANAGEMENT MARKET IN SOUTH AMERICA, BY WASTE TYPE, 2019–2026 (USD BILLION)

Waste Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Hazardous Waste	2.3	2.1	2.1	2.2	2.3	2.3	2.4	2.6	3.6%
E-waste	2.8	2.6	2.6	2.7	2.7	2.8	2.9	3.1	3.2%
Plastic Waste	2.1	2.0	2.0	2.1	2.1	2.2	2.3	2.4	3.4%
Bio-medical Waste	1.7	1.5	1.5	1.6	1.6	1.6	1.6	1.7	2.1%
Others	2.3	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4%
Total	11.1	10.3	10.4	10.6	10.9	11.2	11.6	12.1	3.0%

Note: "Others" includes agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 78 WASTE MANAGEMENT MARKET IN SOUTH AMERICA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	3.8	3.5	3.5	3.5	3.6	3.6	3.7	3.8	1.5%
Incineration/ Combustion	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	3.5%
Landfills	3.6	3.4	3.5	3.6	3.7	3.8	4.0	4.2	3.9%
Recycling	1.6	1.5	1.5	1.6	1.6	1.7	1.8	1.9	4.3%
Composting & Anaerobic Digestion	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	2.0%
Total	11.1	10.3	10.4	10.6	10.9	11.2	11.6	12.1	3.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 79 WASTE MANAGEMENT MARKET IN SOUTH AMERICA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	6.2	5.8	5.8	6.0	6.1	6.3	6.6	6.9	3.4%
Commercial	1.7	1.5	1.5	1.6	1.6	1.6	1.7	1.7	2.2%
Industrial	3.3	3.0	3.0	3.1	3.2	3.2	3.3	3.5	2.7%
Total	11.1	10.3	10.4	10.6	10.9	11.2	11.6	12.1	3.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 80 WASTE MANAGEMENT MARKET IN SOUTH AMERICA, BY COUNTRY, 2019–2026 (USD BILLION)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Brazil	5.0	4.7	4.7	4.8	5.0	5.1	5.3	5.6	3.4%
Argentina	2.3	2.1	2.2	2.2	2.3	2.3	2.4	2.5	3.2%
Chile	2.1	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.4%
Rest of South America	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.8	2.5%
Total	11.1	10.3	10.4	10.6	10.9	11.2	11.6	12.1	3.0%

Note: Rest of South America mainly includes Venezuela, Ecuador, Peru, and Colombia.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.5.1 BRAZIL

9.5.1.1 Rising middle-class population, coupled with industrial development, to augment market growth

Brazil accounted for a share of 45.2% of the South American waste management market in 2020. Brazil is the largest country in South America, according to the United Nations Statistics Division. Due to its rising middle-class population, coupled with industrial development, the purchasing power of Brazilians is increasing. Being a largely unorganized and fragmented market, the region offers immense opportunities for growth to domestic and international plastic manufacturers. The rise in plastics and plastic product consumption of the country increases the waste generated, which will increase the demand for waste management services in the country. Private waste management companies rely on waste pickers for the recovery of recyclable material; they have built several depots around the city where the waste pickers separate the waste and weigh them. Brazil largely relies on landfills as incinerators are expensive to purchase, operate, and maintain, thereby driving the requirement for waste management services from the industrial sector.

TABLE 81 WASTE MANAGEMENT MARKET IN BRAZIL, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.9%
Incineration/ Combustion	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	3.6%
Landfill	1.6	1.5	1.6	1.6	1.7	1.8	1.8	1.9	4.2%
Recycling	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	4.8%
Composting & Anaerobic Digestion	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.2%
Total	5.0	4.7	4.7	4.8	5.0	5.1	5.3	5.6	3.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 82 WASTE MANAGEMENT MARKET BRAZIL, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	2.8	2.6	2.6	2.7	2.8	2.9	3.0	3.2	3.7%
Commercial	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	2.6%
Industrial	1.5	1.4	1.4	1.4	1.4	1.5	1.5	1.6	3.1%
Total	5.0	4.7	4.7	4.8	5.0	5.1	5.3	5.6	3.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.5.2 ARGENTINA

9.5.2.1 Booming food & beverages industry to spur demand for waste management services

Argentina accounted for a share of 20.8% of the South American waste management market in 2020. The food & beverages industry in Argentina suffered a slowdown in 2019 owing to sharp economic deceleration and a decline in disposable incomes. However, the imposition of stringent regulations pertaining to hazardous waste management is the major factor projected to create a growth opportunity in the country in the next five years. The Hazardous Waste Law states establishes a cradle-to-grave tracking system for hazardous wastes from generation to disposal. The food & beverages industry in the country is projected to grow at a fast pace, which has encouraged plastic packaging companies to establish in South America. Moreover, the growth in plastic packaging manufacturing in the country will result in growth in plastic waste generation.

The growth of the plastic packaging industry in the country is mainly attributed to the expansion of industries such as food & beverages, pharmaceuticals, cosmetics, and small electronic products & accessories. In 2017, the Government of Argentina passed its Strategic Industrial Plan 2020, which is focused on economic development through 11 sectors, including food & beverages, household appliances, and healthcare. It aims to double its trade value by increasing exports and reducing imports. These factors are projected to boost the demand for plastic packaging in the food & beverages, pharmaceuticals, and healthcare industries, which, in turn, is driving the generation of plastic waste in the country. The increased plastic waste generation will offer opportunities for the waste management market in the country. Currently, most of the plastic waste in Argentina is dumped into landfills. However, with the increase in awareness and development in recycling infrastructure, the recycling of plastic waste is expected to show considerable growth during the forecast period.

TABLE 83 WASTE MANAGEMENT MARKET IN ARGENTINA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	1.5%
Incineration/ Combustion	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	4.1%
Landfill	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	4.2%
Recycling	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	4.5%
Composting & Anaerobic Digestion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.7%
Total	2.3	2.1	2.2	2.2	2.3	2.3	2.4	2.5	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 84 WASTE MANAGEMENT MARKET IN ARGENTINA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	1.3	1.2	1.2	1.3	1.3	1.3	1.4	1.5	3.5%
Commercial	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	2.4%
Industrial	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7	2.8%
Total	2.3	2.1	2.2	2.2	2.3	2.3	2.4	2.5	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.5.3 CHILE

9.5.3.1 Growing municipal solid waste generation to spike demand for waste management services

Chile accounted for a share of 18.8% of the South American waste management market in 2020. The waste collection rate across Chile is almost 100%. Approximately 8 million tonnes of municipal solid waste is generated every year, showing an increasing trend, particularly in the metropolitan area of Santiago. According to PREVENT Waste Alliance, everyday household waste is collected door-to-door in plastic bags, with collection coverage of almost 100%. Recyclables are collected primarily at central collection points equipped with containers. Kerbside collection takes place in fewer than 10 local authority areas. Of these, only 2 have a comprehensive and extensive collection system.

In January 2020, the Plastics Pact Roadmap was launched, setting 18 targets, 35 solutions, and 81 concrete initiatives designed to encourage appropriate use of plastics in industry and reduce its impact on the environment. The Plastics Pact in Chile set four major targets for 2025, namely, take action to eliminate problematic single-use plastic containers and utensils through redesign and innovation, 100% of plastic containers should be recyclable, reusable, or compostable, and one-third of all plastic containers must be recycled, reused, or composted and various types of plastic containers should contain an average of at least 25% recycled material.

In August 2018, Chile published a law that eventually prohibited single-use plastic bags by businesses throughout the country. For the first six months after the law came into effect, a maximum of 2 plastic bags could be issued to customers for each purchase. After six months, large companies, including supermarkets and retailers, were banned from issuing them. By August 2020, the ban on issuing plastic bags will expand to cover micro, small, and medium-sized companies, effectively covering every business in the country by this law. This ban also affects biodegradable plastic bags as they are not subject to any official standards in Chile.

TABLE 85 WASTE MANAGEMENT MARKET IN CHILE, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.0%
Incineration/ Combustion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.8%
Landfill	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	3.2%
Recycling	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.3%
Composting & Anaerobic Digestion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9%
Total	2.1	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 86 WASTE MANAGEMENT MARKET IN CHILE, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.3	2.8%
Commercial	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.6%
Industrial	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.9%
Total	2.1	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.4%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.5.4 REST OF SOUTH AMERICA

Rest of South America (Venezuela, Ecuador, Peru, and Colombia) accounted for a share of 15.2% of the South American waste management market in 2020. These are developing economies with tremendous scope for the packaging industry, which gives them a high potential for growth in the waste management market. These countries present significant opportunities for investments as the governments are looking for new ways to modernize their economies and are helping in the reduction of waste pollution. Although this region does not have many renowned plastic waste management companies, several global players are operating in these countries as they have the opportunity to enter the untapped market. Low GDPs and limited investments are the key challenges for market growth in this region. This region is still in its early stage of development, and the waste management services show good potential for future growth. Population growth, rise of urbanization, and economic expansion are the major factors for the increasing food consumption and waste generation in Rest of South America. Thus, the factors will drive the need for waste management services in South America.

TABLE 87 WASTE MANAGEMENT MARKET REST OF SOUTH AMERICA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.1%
Incineration/ Combustion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.9%
Landfill	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	3.3%
Recycling	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	3.5%
Composting & Anaerobic Digestion	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.8%
Total	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.8	2.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 88 WASTE MANAGEMENT MARKET IN REST OF SOUTH AMERICA, BY END USER, 2019–2026 (USD BILLION)

Service	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	1.0	0.9	0.9	0.9	0.9	1.0	1.0	1.0	2.8%
Commercial	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.7%
Industrial	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.1%
Total	1.7	1.6	1.6	1.6	1.6	1.7	1.7	1.8	2.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.6 MIDDLE EAST & AFRICA

The Middle East & Africa collectively accounted for a 1.7% share of the global waste management market in 2020. The market in this region has been further classified into Saudi Arabia, the UAE, South Africa, and Rest of the Middle East and Africa. Rest of the Middle East and Africa primarily includes Turkey, Nigeria, Egypt, Israel, Morocco. This region has a significantly large population, which creates a significant demand for plastic packaging. The increase in demand for plastic packaging offers immense opportunities for waste management. The global players, to improve their presence in this region, have started expanding their businesses, particularly in Africa, due to the availability of cheap labor; low exchange rates; and lenient environmental, health, and safety laws. The geographic proximity of Africa and the Middle East with Asia Pacific and Europe has made this region an emerging destination for setting up plastic manufacturing facilities.

Landfills were filling with e-waste as the traditional method of burning e-waste was followed. Emirates Environmental Group (EEG) is taking a leading role in initializing electronic take-back programs for different electronic devices. Africa has a significant amount of IT equipment imports in the country; this makes the older IT equipment obsolete. The lawmaking authorities such as the e-Waste Association of South Africa (eWASA) in the African countries are not effective, and all e-waste is disposed of in landfills, which is overlooked. People in African countries are not aware of the concept of e-waste management. Companies need to make them understand about the effects of simply throwing away e-waste in the trash cans as opposed to getting them recycled efficiently. Manufacturing companies are organizing electronic take-back programs. The country also has many exports from various other regions, which adds to the already existing e-waste in the country, leading to rising demand for waste management.

TABLE 89 WASTE MANAGEMENT MARKET IN MIDDLE EAST & AFRICA, BY WASTE TYPE, 2019–2026 (USD BILLION)

Waste Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Hazardous Waste	1.5	1.3	1.4	1.4	1.4	1.5	1.5	1.6	3.8%
E-waste	1.9	1.8	1.8	1.8	1.8	1.9	2.0	2.1	3.3%
Plastic Waste	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.5	3.5%
Bio-medical Waste	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.3	2.8%
Others	1.6	1.4	1.4	1.4	1.4	1.5	1.5	1.6	2.6%
Total	7.6	6.9	6.9	7.0	7.2	7.4	7.7	8.1	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 90 WASTE MANAGEMENT MARKET MIDDLE EAST & AFRICA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	2.6	2.3	2.3	2.3	2.3	2.4	2.4	2.5	1.6%
Incineration/ Combustion	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	3.5%
Landfill	2.5	2.3	2.3	2.3	2.4	2.5	2.6	2.8	4.1%
Recycling	1.1	1.0	1.0	1.0	1.0	1.1	1.2	1.3	5.1%
Composting & Anaerobic Digestion	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	2.6%
Total	7.6	6.9	6.9	7.0	7.2	7.4	7.7	8.1	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 91 WASTE MANAGEMENT MARKET IN MIDDLE EAST & AFRICA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	4.2	3.9	3.9	4.0	4.1	4.2	4.4	4.7	3.7%
Commercial	1.2	1.1	1.1	1.1	1.1	1.1	1.2	1.2	3.2%
Industrial	2.2	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3%
Total	7.6	6.9	6.9	7.0	7.2	7.4	7.7	8.1	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 92 WASTE MANAGEMENT MARKET IN MIDDLE EAST & AFRICA, BY COUNTRY, 2019–2026 (USD BILLION)

Country	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Saudi Arabia	2.8	2.6	2.6	2.6	2.7	2.8	2.9	3.1	3.5%
UAE	2.0	1.8	1.8	1.9	1.9	1.9	2.0	2.1	3.2%
South Africa	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.4	2.9%
Rest of Middle East & Africa	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.6	3.0%
Total	7.6	6.9	6.9	7.0	7.2	7.4	7.7	8.1	3.2%

Note: Rest of the Middle East & Africa mainly includes Turkey, Nigeria, Egypt, Israel, and Morocco.

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.6.1 SAUDI ARABIA

9.6.1.1 Increased government focus on solid waste management to promote market growth

Saudi Arabia accounted for a share of 36.9% of the waste management market in the Middle East and Africa in 2020. Saudi Arabia's ministries of investment, environment, water and agriculture, and the National Center for Waste Management on June 2021 joined to seek new solutions and investments in the solid waste management sector. As part of Vision 2030, the government would support recycling projects and increase water and energy preservation for sustainable development.

Saudi Arabia's Vision 2030 lays out a plan targeting 100% of municipal solid waste, 60% of construction/demolition waste, and 85% of industrial/hazardous waste to be diverted from landfills. Saudi Arabia aims for a circular economy based on giving back nutrients to the earth and looping recovered recyclables back to the industry. Saudi Arabia expects a USD 10-billion contribution from local GDP and a USD 1.75-billion contribution from FDI, intending to create 23,000 direct jobs while reducing CO2 emissions by 13 million tons. Saudi Arabia houses large petrochemical and oil companies (Aramco, Sabic) but cannot cover demand for the safe disposal of waste. Saudi Investment Recycling Company (SIRC) acquired Global Environmental Management Services (GEMS) in October 2019 to meet demand. However, the local capacity to treat hazardous petrochemical waste is still only 20% of the need.

TABLE 93 WASTE MANAGEMENT MARKET IN SAUDI ARABIA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.7%
Incineration/ Combustion	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	3.7%
Landfills	0.9	0.8	0.9	0.9	0.9	0.9	1.0	1.1	4.4%
Recycling	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	5.5%
Composting & Anaerobic Digestion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.9%
Total	2.8	2.6	2.6	2.6	2.7	2.8	2.9	3.1	3.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 94 WASTE MANAGEMENT MARKET IN SAUDI ARABIA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	1.6	1.4	1.4	1.5	1.5	1.6	1.6	1.8	3.9%
Commercial	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	3.8%
Industrial	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	2.4%
Total	2.8	2.6	2.6	2.6	2.7	2.8	2.9	3.1	3.5%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.6.2 UAE

9.6.2.1 Escalated need to generate clean energy to encourage adoption of waste management services

The UAE accounted for a share of 26.4% of the Middle Eastern and African waste management market in 2020. With the growing population and economic activities, most of the waste generated in the UAE is dumped in municipal landfills or dumpsites, where organic waste generates a large amount of methane, leading to greenhouse gas emissions. Currently, little of the waste is burnt, and the rate of municipal waste recycling has been rapidly rising. Waste management in the country is coordinated through local authorities. Waste issues are handled through recycling and converting waste to energy and clean energy resources, new technologies, and improved waste separation and collection systems.

In 2020, Dubai Municipality announced the establishment of the largest plant in the Middle East to convert solid waste into energy at USD 0.54 billion in the Warsan district. This move also comes in line with the National Agenda to reduce landfills by 75% by 2021, in addition to protecting the environment from methane gas emitted by the landfill. The implementation period took three years, and the plant started its operation in the second quarter of 2020 during which is estimated to receive 2,000 metric tons of municipal solid waste per day in the first phase to produce 60 megawatts. The waste incineration project is the first of the four projects to produce green energy. Dubai Municipality, in coordination with Dubai Supreme Council of Energy and Dubai Electricity and Water Authority, focused on achieving the strategy of Dubai for Clean Energy to produce 7% of Dubai's total energy from clean energy sources by 2020.

TABLE 95 WASTE MANAGEMENT MARKET IN UAE, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	1.3%
Incineration/ Combustion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.5%
Landfill	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	4.1%
Recycling	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	5.5%
Composting & Anaerobic Digestion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.5%
Total	2.0	1.8	1.8	1.9	1.9	1.9	2.0	2.1	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 96 WASTE MANAGEMENT MARKET IN UAE, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	1.1	1.0	1.0	1.0	1.1	1.1	1.2	1.2	3.7%
Commercial	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.2%
Industrial	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	2.3%
Total	2.0	1.8	1.8	1.9	1.9	1.9	2.0	2.1	3.2%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.6.3 SOUTH AFRICA

9.6.3.1 Elevated focus on recycling domestic waste to boost market growth

South Africa accounted for a share of 17.0% of the Middle Eastern and African waste management market in 2020. Waste management in South Africa faces numerous challenges, and the National Waste Management Strategy (NWMS) offers various plans to address them. The major challenges are the growing population and economy, which means increased volumes of waste generation and the high complexity of waste streams because of urbanization and industrialization. The complexity of the waste stream directly affects waste management, which is compounded by the mixing of hazardous wastes with general waste.

South Africa is estimated to generate a total of 12.7 million tonnes of waste per annum domestically. In the country, municipalities face increasing pressures and challenges to provide waste management services due to the growing waste generation. Every year approximately 3.67 million tonnes of this waste are not collected and treated through formal waste collection systems, resulting in large amounts dumped illegally. According to the UN Environment Programme, the total domestic waste generated by households in South Africa is usually 12.7 million tonnes per annum, and approximately 3.67 million tonnes of this waste is not collected and treated through formal waste collection systems, resulting in large illegal dumps of waste.

However, in August 2019, South Africa sent 95 million tonnes of waste to 826 landfill sites, and less than 40% of the materials are recycled. Plastic recycling in the country grew continuously, with more than 330,700 tonnes of waste was recycled. The country generated approximately 350,000 tonnes of electronic scrap, which is recycled. All these initiatives will drive the demand for waste management in South Africa.

TABLE 97 WASTE MANAGEMENT MARKET IN SOUTH AFRICA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service Type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.5%
Incineration/ Combustion	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	3.2%
Landfill	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	3.7%
Recycling	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	4.4%
Composting & Anaerobic Digestion	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.1%
Total	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.4	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 98 WASTE MANAGEMENT MARKET IN SOUTH AFRICA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	3.4%
Commercial	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.6%
Industrial	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	2.1%
Total	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.4	2.9%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

9.6.4 REST OF MIDDLE EAST & AFRICA

Rest of the Middle East & Africa accounted for a 19.7% share of the Middle Eastern and African waste management market in 2020. It includes countries such as Turkey, Nigeria, Egypt, Israel, and Morocco. According to an article published by the British Plastic Federation in 2019, the Turkish plastic industry is among the rapidly developing industries in the country, generating an economic growth of 17% in the past few years.

Turkey has a large number of material recycling facilities. However, it lacks material source segregation. It also has many improper waste disposal areas or open dumps or landfills, creating risks for human health and the environment. According to a report by the World Wide Fund (WWF), Turkey leaves around 159 tons of plastic litter in the Mediterranean Sea. Improper or open disposal of plastic litter is a concern for the Turkish government. Efforts are made to reduce the amount of plastic waste disposal into landfills and increase plastic recycling.

After the ban on plastic waste imports to China, Turkey observed an increase in imports of plastic waste and became an emerging destination for plastic waste management from developed countries, such as the UK, Germany, Belgium, and the US. According to UK's Environment Agency's (EA) export data, the UK exported 210,000 tons of plastic waste to Turkey in 2020, which is more than double of 13,250 tons exported in the same period.

Increasing population, urbanization, and industrialization are creating a major challenge for solid waste management in Nigeria. The National Environmental Standards and Regulations Enforcement Agency (NESREA) is responsible for waste management in Nigeria. Nigeria's waste collection industry is highly unorganized; most household waste is thrown on the roadside or burned openly. The overburdened municipality manages to collect only 40% of the waste generated, from which only 13% is recovered from landfills. Waste collection services in Nigeria are offered mostly by the private sector though public-private participation is not uncommon. The market for recycling in Nigeria is highly unorganized in many localities; however, private companies are investing in this country for recycling and energy recovery. The government plans to attract more private companies into this market and reduce the burden of municipalities by levying fees for the collection of waste on inhabitants.

According to a government source, in 2021, Egyptians consume approximately 12.0 billion plastic bags yearly. A majority portion of it is thrown into the Nile or the sea. According to the Egyptian Plastic Technology Centre, stated that out of the total plastic waste generated in the country, 45% is recycled, and 5% is reused. The increasing solid (including plastic) waste in the country is a key concern for environmental and human health. Governmental and private organizations are taking efforts to reduce plastic waste and promoting plastic recycling in the country. For instance, the Red Sea governorate has initiated a ban on single-use plastic (plastic bags, cutlery, and cups) to reduce plastic waste into the sea. Therefore, the increasing population and growing plastics industry are likely to drive the demand for waste management in these countries.

TABLE 99 WASTE MANAGEMENT MARKET IN REST OF MIDDLE EAST & AFRICA, BY SERVICE TYPE, 2019–2026 (USD BILLION)

Service type	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Open Dumping	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.6%
Incineration/ Combustion	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.1%
Landfills	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	3.8%
Recycling	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	4.2%
Composting & Anaerobic Digestion	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.8%
Total	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.6	3.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

TABLE 100 WASTE MANAGEMENT MARKET IN REST OF MIDDLE EAST & AFRICA, BY END USER, 2019–2026 (USD BILLION)

End User	2019	2020	2021-e	2022-p	2023-p	2024-p	2025-p	2026-p	CAGR (2021–2026)
Residential	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	3.5%
Commercial	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.6%
Industrial	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	2.2%
Total	1.5	1.4	1.4	1.4	1.4	1.4	1.5	1.6	3.0%

Source: Company Annual Reports, Press Releases, Expert Interviews, and MarketsandMarkets Analysis

10 COMPETITIVE LANDSCAPE

10.1 KEY PLAYERS STRATEGIES

This section of the report provides an overview of the current competitive scenario of the waste management market. A market share analysis of the players has been carried out based on the outcome of the qualitative and quantitative analyses of product portfolios, technological innovations, market presence, and revenues of companies, along with the opinion of primary respondents. This section also provides insights pertaining to the industry concentration, including shares of the top five players.

Contracts is the key growth strategy adopted by a few leading companies, including SUEZ (France), Veolia (France), FCC Environment (England), Hitachi Zosen (Japan), Covanta Holding (US), and URBASER (Spain). Companies operating in the waste management market also focus on partnerships to increase their market share and expand their geographic presence. Partnerships was the second-most strategy followed by the leading industry players to achieve growth in the waste management market.

TABLE 101 OVERVIEW OF KEY STRATEGIES ADOPTED BY TOP PLAYERS, JANUARY 2018–JUNE 2021

COMPANY	PRODUCT TYPE	DESCRIPTION	GEOGRAPHIC REACH	PRESENCE
Waste Management	Waste Management operates through two business segments, namely, Solid Waste and Others. The Solid Waste segment includes collection, transfer, disposal, along with recycling and resource recovery services. It also comprises recycling and landfill gas-to-energy operations. The Others segment includes waste management strategic business solutions (WMSBS), energy & environmental services, recycling brokerage & electronic recycling services, landfill gas-to-energy services, and expanded service offerings & solutions.	In October 2020, Waste Management acquired Advanced Disposal Services. This acquisition allowed to deliver unparalleled access to differentiated, sustainable waste management and recycling services to approximately 3 million new commercial, residential, and industrial customers located primarily in 16 states in the eastern half of the US.	Waste Management has a strong presence in the US, which accounted for a share of 95.3% of its total revenue in 2020.	The company has a head office in North America.

SUEZ	SUEZ operates through four business segments, namely, Water, Recycling and Recovery, Environmental Technology & Solutions (ETS), and Other. Waste management services are offered under the Recycling & Recovery segment. It is one of the main business segments of the company through which it offers waste and waste treatment services to local authorities and industrial clients.	In May 2021, SUEZ signed an agreement with Eramet to expand joint efforts to recycle end-of-life electric vehicle batteries. This partnership is intended to offer a high-performance, competitive, and sustainable recycling solution for the European market.	SUEZ generated 61.4% of its total revenue from Europe, in which France accounted for 28.1%.	The company has sales offices in North America, Asia Pacific, Europe, South America, and the Middle East & Africa.
Veolia	Veolia operates through three business segments, namely, Water, Waste, and Energy. The Waste segment deals with the collection, treatment, and recycling of municipal and industrial waste. Veolia is among the key global players who offer services to manage solid, liquid, non-hazardous, and hazardous waste. It is engaged in the entire lifecycle of waste management, from the collection to recovery of waste.	In May 2021, SUEZ, Veolia, and the Consortium of investors composed of Meridiam-GIP-CDC/CNP signed an agreement focusing on SUEZ' Water and Recycling and Recovery businesses, as well as international assets and growth prospects and development capacities internationally and in France. This agreement would generate revenues of nearly USD 8 billion.	Veolia has a strong foothold in the domestic European market, wherein it held a share of 56.9% in 2020.	The company has sales offices in North America, Asia Pacific, Europe, South America, and the Middle East & Africa.
Waste Connections	Waste Connections operates through six business segments, namely, Collection, Landfill, Transfer, Recycling, Exploration and Production (E&P), and Intermodal and Other. The Collection segment serves customers from the commercial, residential, industrial, and construction markets. The company offers waste management services through the Collection, Landfill, and Recycling segments.	In December 2019, Waste Connections announced the closure of acquisitions during the fourth quarter in annualized revenues. The completed acquisitions include a new market entry solid waste collection and recycling acquisition in South Central Pennsylvania and tuck-in acquisitions to existing operations in Alaska, Illinois, New York, and Tennessee.	Waste Connections has a strong business presence in North America.	The company has sales offices in North America.

Republic Services	Republic Services operates through five business segments, namely, Collection, Landfills, Transfer, Environmental Solutions, and Others. The company offers waste management solutions through the Collection, Landfills, and Others segment.	In April 2021, Republic Services expanded by opening a facility in Northern California for organics pre-processing, which helped Bay Area communities meet the requirements of a new state law mandating the diversion of food and yard waste from landfills.	The company has a strong presence in North America, specifically in the western US, which accounted for 49.8% of the total revenue in 2020.	The company has offices in North America.
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Source: Company Websites and Press Releases

Based on the parameters and information provided above, it has been concluded that different companies are deploying different strategies to increase their share in the waste management market. Waste Management has a strong presence in the US. Similarly, Veolia has a strong foothold in Europe, while Republic Services has a strong presence in North America. All these companies are exploring geographic diversification alternatives to expand their businesses.

Waste Management, SUEZ, Veolia, Waste Connections, and Republic Services have focused on enhancing their growth in the waste management market through product launches, acquisitions, expansions, and contracts over the past few years.

10.2 MARKET SHARE OF TOP FIVE PLAYERS

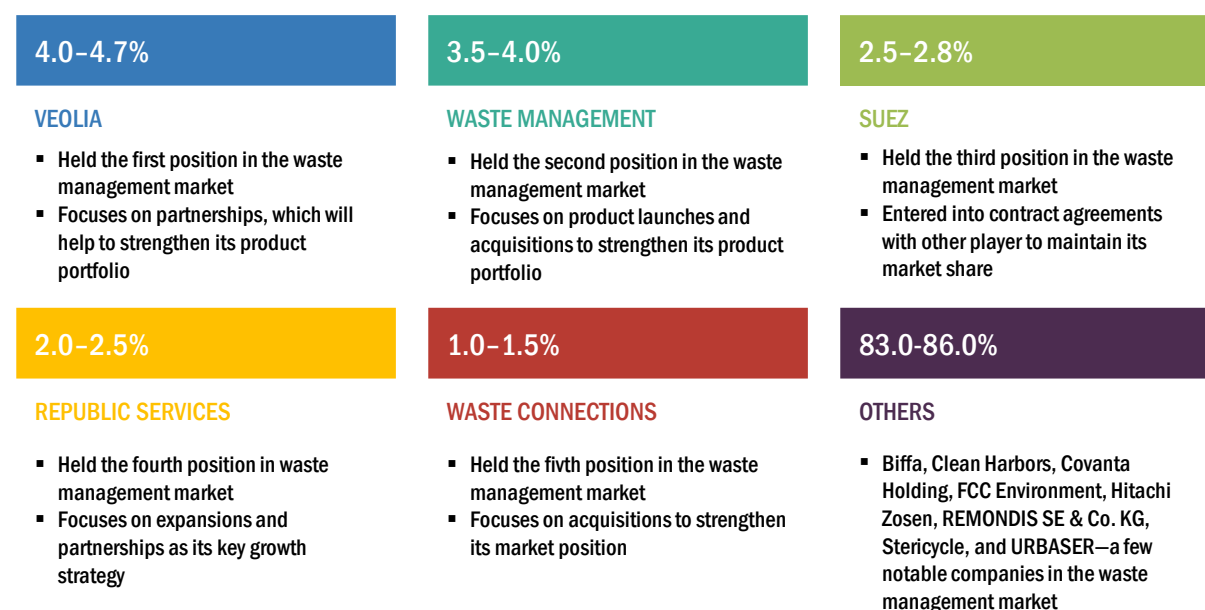
The waste management market is highly consolidated owing to the growing need to treat waste effectively. The cumulative share of the top five companies was not more than 14–20% of the market in 2020. Moreover, the individual share of these top five players ranged from 2.5–3.1% of the total revenue generated in 2020. The degree of competition has been defined as below:

- Fragmented: When the top five players account for a total market share of <25%
- Competitive: When the top five players hold a total market share of 25–50%
- Consolidated: When the top five players capture a total market share >50%

TABLE 102 UTILITY COMMUNICATION MARKET: DEGREE OF COMPETITION

DEGREE OF COMPETITION - 2020	FRAGMENTED
Total Market Share of Top Five Players	14–20%
Veolia	4.0–4.7%
SUEZ	2.5–2.8%
Waste Management	3.5–4.0%
Republic Services	2.0–2.5%
Waste Connections	1.0–1.5%

Source: Annual Reports, Press Releases, and MarketsandMarkets Analysis

FIGURE 35 WASTE MANAGEMENT MARKET SHARE, 2020

Source: Annual Reports, Press Releases, and MarketsandMarkets Analysis

Veolia held a share of 4.0–4.7% of the market in 2020. It focuses on the strategy of partnerships. SUEZ held a share of 2.5–2.8% of the waste management market in 2020. The company highly focuses on contracts. Waste Management accounted for a share of 3.5–4.0% of the waste management market in 2020. It focuses on product launches and acquisitions. Republic Services held a share of 2.0–2.5% of the market in 2020. It particularly focuses on expansions and partnerships. Waste Connections held a market share of 1.0–1.5% of the waste management market. It particularly focuses on acquisitions.

10.3 MARKET EVALUATION FRAMEWORK

As all markets follow a predictable lifecycle, understanding the present stage of the market after analyzing the market dynamics of the last 3–5 years becomes essential to forecast how the market will shape up in the future. This analysis involves assessing the consolidation in the market by identifying the number of market players that hold a share of 14–20% of the market. It also involves assessment of the expansions in terms of capacity additions to the existing production facilities and establishment of greenfield facilities, along with product launches, sales contracts, agreements, expansions, and collaborations undertaken in the market. The market evaluation framework of MarketsandMarkets is provided below, which has captured the key data from 2018 to 2021 for the waste management market.

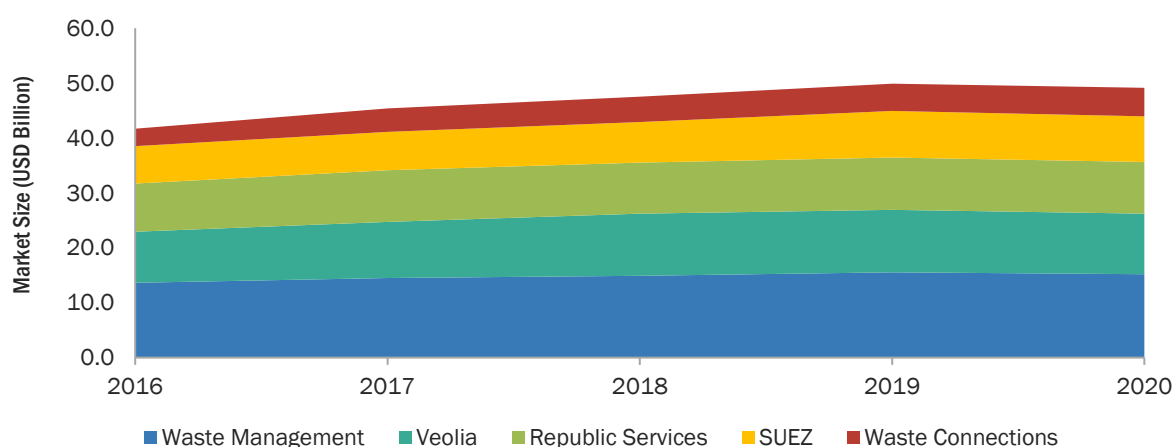
FIGURE 36 MARKET EVALUATION FRAMEWORK (2018–2021)

COMPANY NAME	AGREEMENT	CONTRACT	INVESTMENT	PARTNERSHIP	COLLABORATION	ACQUISITION	EXPANSION	PRODUCT LAUNCH	MERGER	TOTAL
Biffa		7	1	4	1	1	2			16
Clean Harbors						1				1
Covanta Holding	3			4						7
FCC Environment		9					3			12
Hitachi Zosen	3	6				1	1			11
REMONDIS SE & Co. KG					1	1	1	1		4
Republic Services				2			3			5
Stericycle	1									1
SUEZ	3	4		3	3	2	2		1	18
URBASER		5					1	2		8
Veolia	2	2		4		2	1		1	12
Waste Connections						1				1
Waste Management						1		1		2
Total	12	33	1	17	5	10	14	4	2	98

Source: Annual Reports, Press Releases, and MarketsandMarkets Analysis

10.4 REVENUE ANALYSIS OF TOP FIVE MARKET PLAYERS

Waste management is the efficient and safe collection, transportation, treatment, and disposal of sewage, garbage, and other waste products and substances. Waste management services include recycling, collection, landfilling, and other environmental services. The revenue analysis of the top five companies is provided for the last five years, and it includes the study of segments under which market players offer waste management services in.

FIGURE 37 TOP FIVE PLAYERS DOMINATED WASTE MANAGEMENT MARKET FROM 2016 TO 2020

Note: The market size mentioned above has been taken from the segmental revenue of the companies generated by offering waste management products and services.

Source: Annual Reports, Investor presentations, Expert Interviews, and MarketsandMarkets Analysis

Players in the waste management market have been identified through secondary research, and their market share, in terms of value, inferred from their annual reports, presentations, and secondary research. Primary research has been conducted with the key opinion leaders in the industry, including chief executive officers, directors, and other executives, to validate revenues and shares of leading companies.

The size of the waste management market, in terms of value (USD million), based on region and end user, has been derived using forecasting techniques considering end-user industry trends.

The first step in preparing this report has been to define the approach and methodology to estimate the market size. It also includes the class of variables that can be used to obtain estimates and projections. This has been followed by primary interviews and feature mapping on a regional basis from the MarketsandMarkets repository. The top-down and bottom-up approaches have been followed to derive the market size in terms of value. The market size has been validated by in-depth interviews with industry experts—excerpts of which are available in the discussion guide in the Appendix chapter—and secondary research.

10.5 COMPANY EVALUATION MATRIX

This section of the report provides an overview of the company evaluation scenario in the waste management market. The company evaluation has been carried out based on the outcome of the qualitative and quantitative analyses of product/service portfolios, technological innovations, market presence, and revenues of companies, along with the opinions of primary respondents.

10.5.1 STAR

Companies that fall in the star category generally receive high scores for most of the evaluation criteria. These players have established service/product portfolios, as well as a powerful market presence. They also devise effective business strategies. The companies falling under this category are SUEZ, Veolia, Waste Management, Republic Services, Waste Connections, and Biffa.

10.5.2 EMERGING LEADER

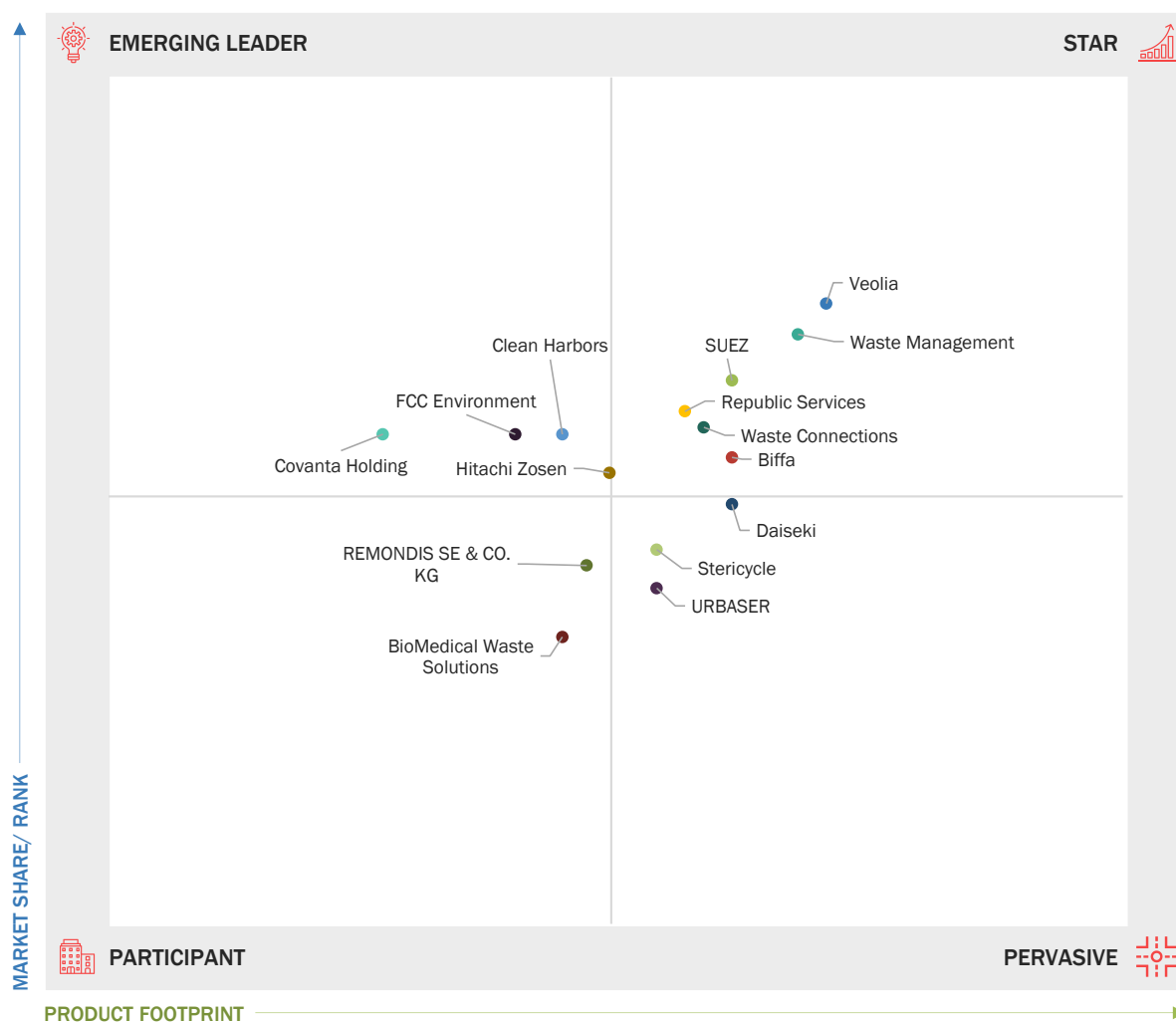
Emerging leaders are vendors that have demonstrated substantial service and product innovations compared to their competitors. They have a highly focused service and product portfolio. However, they lack in terms of growth strategies for their overall business enhancement. The companies falling under the emerging leader category are FCC Environment, Clean Harbors, Hitachi Zosen, and Covanta Holding.

10.5.3 PERVASIVE

Companies that fall under the pervasive category implement strong business strategies. However, their service/product/solution portfolios need improvement. These companies generally focus on a specific type of technology related to a specific product/service/solution. Daiseki, Stericycle, and URBASER are some players falling under this category.

10.5.4 PARTICIPANT

Companies that fall under the participant category are vendors who have started gaining momentum in the market with their niche product offerings. They lack in terms of business strategies compared with established vendors. They might be new entrants in the market and hence, would require some time to gain prominence. Companies falling under this category are REMONDIS SE & Co. KG and BioMedical Waste Solutions.

FIGURE 38 COMPETITIVE LEADERSHIP MAPPING: WASTE MANAGEMENT MARKET, 2020


Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

TABLE 103 COMPANY WASTE TYPE FOOTPRINT

COMPANY	OPEN DUMPING	INCINERATION/ COMBUSTION	LANDFILLS	RECYCLING	COMPOSITIONS & ANAEROBIC DIGESTION	OVERALL FOOTPRINT
Waste Management	N	N	Y	Y	N	1.6
Veolia	N	Y	Y	Y	Y	3.2
Republic Services	Y	Y	Y	Y	Y	4.0
SUEZ	Y	Y	Y	Y	Y	4.0
Waste Connections	Y	N	Y	Y	N	2.4
Biffa	N	Y	Y	Y	Y	3.2
Clean Harbors	N	Y	Y	Y	N	2.4
Covanta Holding	N	Y	Y	Y	Y	3.2
Daiseki	N	N	Y	Y	N	1.6
Hitachi Zosen	Y	Y	Y	Y	Y	4.0
Remondis SE & Co. KG	N	Y	Y	Y	Y	3.2
URBASER	N	Y	Y	Y	Y	3.2
FCC Environment	N	Y	Y	Y	Y	3.2
Stericycle	N	Y	Y	Y	Y	4.0

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

TABLE 104 COMPANY END USER FOOTPRINT

COMPANY	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	OVERALL FOOTPRINT
Waste Management	Y	Y	Y	4.0
Veolia	Y	Y	Y	4.0
Republic Services	Y	Y	Y	4.0
SUEZ	Y	Y	Y	4.0
Waste Connections	Y	Y	Y	4.0
Biffa	Y	Y	Y	4.0
Clean Harbors	Y	Y	Y	4.0
Covanta Holding	Y	Y	Y	4.0
Daiseki	N	N	Y	1.3
Hitachi Zosen	Y	Y	Y	4.0
REMONDIS SE & Co. KG	Y	Y	Y	4.0
URBASER	Y	N	Y	2.7
FCC Environment	Y	Y	Y	4.0
Stericycle	Y	Y	Y	4.0

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

TABLE 105 COMPANY REGION FOOTPRINT

COMPANY	NORTH AMERICA	ASIA PACIFIC	EUROPE	MIDDLE EAST & AFRICA	SOUTH AMERICA	OVERALL FOOTPRINT
Waste Management	Y	N	N	N	N	0.8
Veolia	Y	Y	Y	Y	Y	4.0
Republic Services	Y	N	N	N	N	0.8
SUEZ	Y	Y	Y	Y	Y	4.0
Waste Connections	Y	N	N	N	N	0.8
Biffa	N	N	Y	N	N	0.8
Clean Harbors	Y	N	N	N	N	0.8
Covanta Holding	Y	N	N	N	N	0.8
Daiseki	N	Y	N	N	N	0.8
Hitachi Zosen	Y	Y	Y	Y	N	3.2
REMONDIS SE & Co. KG	N	Y	Y	Y	N	2.4
URBASER	Y	Y	Y	Y	Y	4.0
FCC Environment	Y	Y	Y	Y	Y	4.0
BioMedical Waste Solutions	Y	NA	NA	NA	NA	0.8
Stericycle	Y	N	Y	N	Y	2.0

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

TABLE 106 COMPANY FOOTPRINT

COMPANY	INDUSTRY FOOTPRINT	WASTE TYPE FOOTPRINT	REGION FOOTPRINT	COMPANY FOOTPRINT
Weightage	33%	33%	33%	100%
Waste Management	4.0	1.6	0.8	2.1
Veolia	4.0	3.2	4.0	3.7
Republic Services	4.0	4.0	0.8	2.9
SUEZ	4.0	4.0	4.0	4.0
Waste Connections	4.0	2.4	0.8	2.4
Biffa	4.0	3.2	0.8	2.7
Clean Harbors	4.0	2.4	0.8	2.4
Covanta Holding	4.0	3.2	0.8	2.7
Daiseki	1.3	1.6	0.8	1.2
Hitachi Zosen	4.0	4.0	3.2	3.7
REMONDIS SE & Co. KG	4.0	3.2	2.4	3.2
URBASER	2.7	3.2	4.0	3.3
FCC Environment	4.0	3.2	4.0	3.7
BioMedical Waste Solutions	0.0	0.0	0.8	0.3
Stericycle	4.0	4.0	2.0	3.3

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

10.6 COMPETITIVE LEADERSHIP MAPPING OF START-UPS

10.6.1 PROGRESSIVE COMPANY

Progressive companies perform exceedingly well in product excellence and business excellence parameters. They have a substantial partner ecosystem and well-developed marketing channels and receive extensive funding to develop their product/service portfolio. These companies have been successful in achieving their growth goals, thereby attaining a high partner attractiveness. They also have strong business strategies. Recycling Technologies, Recycle Track Systems, and EcoMed Services are the major players in this category.

10.6.2 RESPONSIVE COMPANY

These companies are technology disruptors with highly innovative product offerings compared to their competitors. They focus on the constant development of their product/service portfolios and bringing innovations to the market. However, they lag in the business excellence parameter compared to other companies. With appropriate marketing activities, suitable partnerships, and VC funding, these start-ups have been categorized as responsive companies. Saahas Zero Waste, Gem Enviro Management, and RecyGlo are progressive companies in this market.

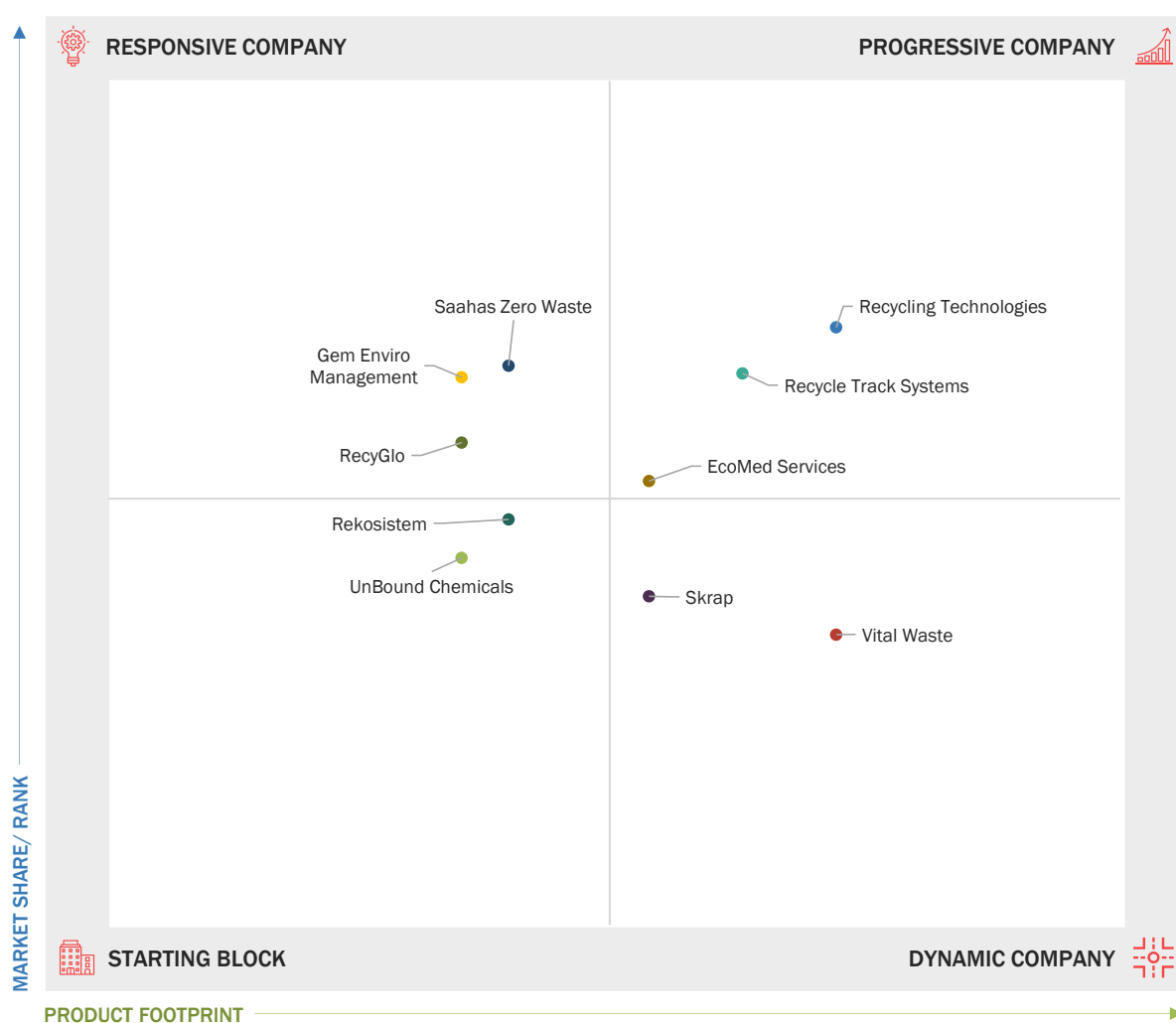
10.6.3 STARTING BLOCK

Starting blocks are companies that are starting to gain traction in the market with niche offerings. They lack in terms of business excellence and product excellence compared to other established start-ups. They are usually new entrants in the market. Rekosistem and UnBound Chemicals are the players that lie in the category of starting blocks.

10.6.4 DYNAMIC COMPANY

Dynamic companies show exceptional performance in the business excellence parameter. However, they are lagging behind progressive and responsive companies slightly in product excellence parameters. They generally focus on a specific type of technology related to a particular product or service offering. Skrap and Vital Waste are among a few key players considered in this category.

FIGURE 39 COMPETITIVE LEADERSHIP MAPPING OF START-UPS, 2020



Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

10.7 COMPETITIVE SCENARIO

Contracts is the key strategy adopted by market players to strengthen their global presence and offerings. This strategy was the key revenue-generating tool for market players such as Veolia, FCC Environment, SUEZ, and Biffa. Partnerships also proved to be a successful approach for companies such as Veolia and SUEZ.

TABLE 107 WASTE MANAGEMENT MARKET: PRODUCT LAUNCHES AND DEVELOPMENTS, JANUARY 2018–JUNE 2021

MONTH & YEAR	COMPANY NAME	SERVICE TYPE	PRODUCT NAME	DESCRIPTION
October 2018	Veolia (France)	NA	NA	Veolia Australia & New Zealand was selected to maintain and operate the first energy recovery facility in the country under the Kwinana Project. The plant generated approximately 40 MW of clean energy, i.e., enough to power 50,000 households. This new plant provided a more sustainable solution for the effective management of waste and will bolster local energy supply to drive energy security and affordability.
June 2018	Waste Management (US)	Recycling	NA	Waste Management unveiled the technology at its outer loop recycling and disposal facility, turning waste from landfills into usable, renewable natural gas (RNG). This innovative facility captures methane produced by the landfill and converts it to pipeline quality natural gas.
May 2018	REMONDIS SE & Co. KG (Germany)	NA	NA	REMONDIS SE & Co. KG launched a comprehensive raw material initiative. The company is focused on the ecodesign directive, increased investments, and a system of incentives for the industrial sector while investing in more and better recycling.

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

TABLE 108 WASTE MANAGEMENT MARKET: DEALS, JANUARY 2018–JUNE 2021

MONTH- YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
May 2021	Agreement	SUEZ (France)	Eramet (France)	SUEZ signed an agreement with Eramet, a key player in the extraction and valorization of metals, to expand joint efforts in the area of recycling end-of-life electric vehicle batteries. This partnership is intended to offer a high-performance, competitive and sustainable battery recycling solution for the European market.	NA
May 2021	Agreement	Veolia (France)	SUEZ (France)	Veolia, SUEZ, and the Consortium of investors composed of Meridiam–GIP–CDC/CNP signed an agreement with a focus on SUEZ' Water and Recycling and Recovery businesses, as well as international assets and growth prospects and development capacities internationally and in France. This agreement would generate revenues of nearly USD 8 billion.	
August 2020	Partnership	Republic Services (US)	Nikola	Republic Services partnered with Nikola, a designer and manufacturer of battery-electric and hydrogen-electric vehicles, electric vehicle drivetrains, vehicle components, energy storage systems, and hydrogen fueling station infrastructure, to develop and purchase 2,500 electric waste and recycling collection trucks. The zero-emission vehicles, having a range of 150 miles and recharge overnight, are expected to be integrated into Republic Services' fleet beginning in 2023. The deal is expandable to 5,000 vehicles over the life of the agreement.	
2019 December	Acquisition	Waste Connections	NA	Waste Connections announced the closure of acquisitions during the fourth quarter in annualized revenues. The completed acquisitions include a new market entry solid waste collection and recycling acquisition in South Central Pennsylvania and tuck-in acquisitions to existing operations in Alaska, Illinois, New York, and Tennessee.	USD 130 million

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

TABLE 109 WASTE MANAGEMENT MARKET: OTHERS, JANUARY 2018–JUNE 2021

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
March 2021	Contract	SUEZ (France)	SYCTOM (Paris)	SUEZ won three major waste collection and sorting contracts to serve local communities in France. SUEZ supports the SYCTOM, and the local communities of Neuilly-sur-Seine and Reims, which helped to optimize the management of household waste while preserving the environment. SYCTOM is a public administrative establishment that focuses on treating the household waste of 85 municipalities in the Ile-de-France region with approximately 6 million inhabitants.	USD 163 million
March 2021	Contract	Biffa (England)	ALPLA Group (Austria)	Biffa and ALPLA Group are working together to ensure more plastic is being recycled used to manufacture UK homecare products.	NA

Source: Company Websites, Press Releases, Company Annual Reports, Expert Interviews, and MarketsandMarkets Analysis

11 COMPANY PROFILES

11.1 KEY COMPANIES

11.1.1 WASTE MANAGEMENT

11.1.1.1 Business and financial overview

Waste Management offers several waste management services, including collection, transfer, recycling, resource recovery, and disposal services, and operates waste-to-energy facilities. The company serves municipal, residential, commercial, and industrial customers across North America. The company operates through two business segments, namely, Solid Waste and Others. Through the Solid Waste segment, the company offers collection, transfer, disposal, recycling, and resource recovery services. This business unit is also involved in recycling projects. The Others segment offers waste management strategic business solutions (WMSBS), energy and environmental services, recycling brokerage waste and electronic recycling services, landfill gas-to-energy services, and expanded service offerings & solutions.

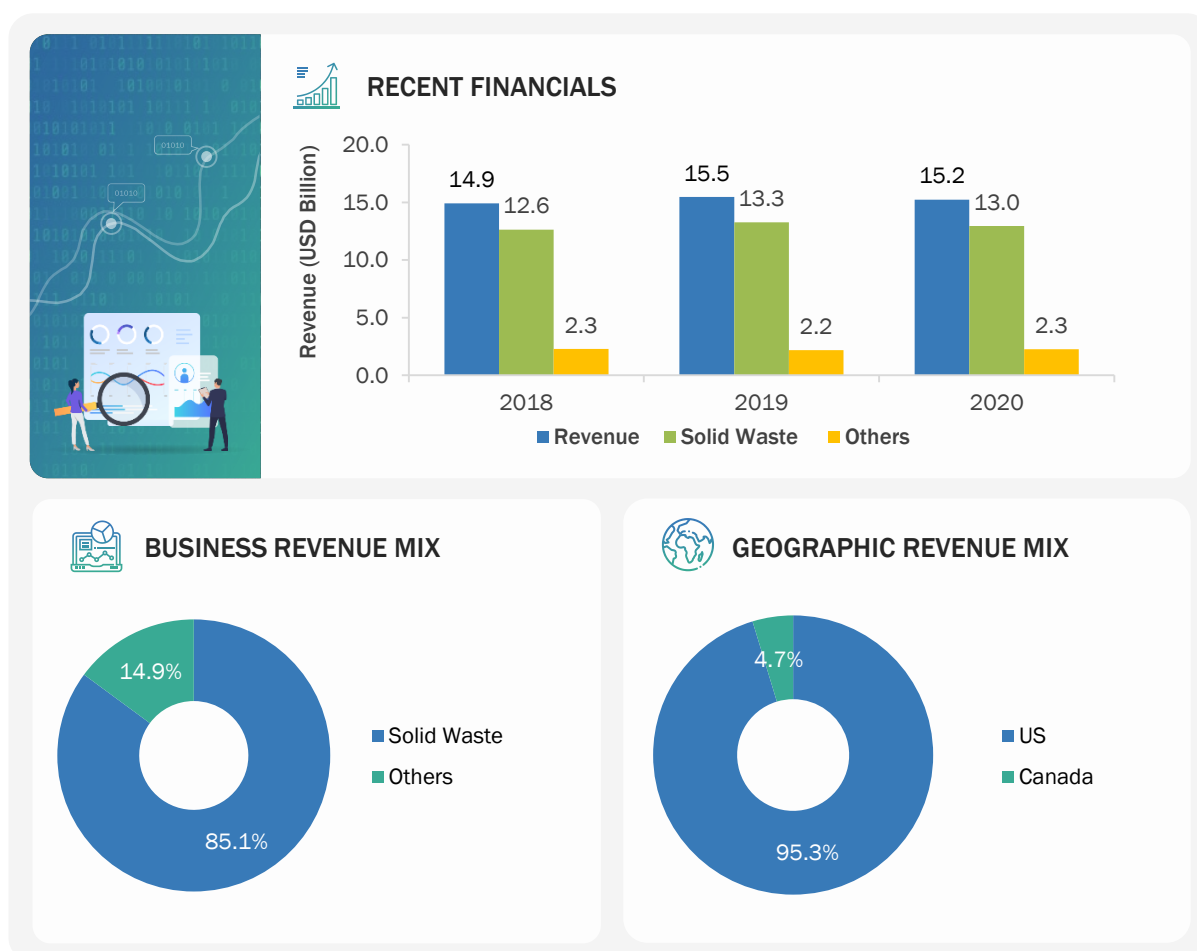
As of December 31, 2020, Waste Management operated 263 solid waste landfills and 5 secure hazardous-waste landfills in North America. It functions primarily in the US and Canada. As of December 31, 2020, the company had 146 landfill gas destruction and beneficial use projects producing commercial methane gas at operated landfills.

TABLE 110 WASTE MANAGEMENT: COMPANY OVERVIEW

Year Founded	1968
Country	US
City	Houston
Employee	48,250
Ownership	Public (NYSE: WM)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management services or products.

Source: Company Website

FIGURE 40 WASTE MANAGEMENT: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

The "Others" segment includes strategic business solutions (WMSBS) business; elements of landfill gas-to-energy operations and third-party subcontract and administration revenues managed by Energy and Environmental (EES) and WM Renewable Energy businesses that are not included in the operations of reportable segments; recycling brokerage services; and certain other expanded service offerings and solutions.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.1.2 Products/solutions/services offered

TABLE 111 WASTE MANAGEMENT: PRODUCTS/SOLUTIONS/SERVICES OFFERED

SERVICE	SERVICE TYPE	END USER
Residential Services – Residential Waste & Recycling Pickup Services	Recycling	Residential
Residential Services – Bagster Bag	Recycling	Residential
Residential Services – Temporary Dumpster Rental	- Recycling - Landfills	Residential, Commercial, and Construction
Business Services – Business Waste & Recycling Pickup	Recycling	Commercial, Business, and Industrial
Business Services – Roll-Off Dumpster Rental	- Recycling - Landfills	Residential, Commercial, and Construction

Business Services – Specialized Waste Streams	NA	Manufacturing and Industrial
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Source: Company Website

11.1.1.3 Recent developments

11.1.1.3.1 Product launches and developments

TABLE 112 WASTE MANAGEMENT: PRODUCT LAUNCHES AND DEVELOPMENTS

MONTH & YEAR	COMPANY NAME	SERVICE TYPE	PRODUCT NAME	DESCRIPTION
June 2018	Waste Management (US)	Recycling	NA	Waste Management unveiled the technology at its outer loop recycling and disposal facility, turning waste from landfills into usable, renewable natural gas (RNG). This innovative facility captures methane produced by the landfill and converts it to pipeline quality natural gas.

Source: Company Website and Press Releases

11.1.1.3.2 Deals

TABLE 113 WASTE MANAGEMENT: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
October 2020	Acquisition	Waste Management (US)	Advanced Disposal Services (US)	Waste Management acquired Advanced Disposal Services, a solid waste management company. This acquisition allowed Waste Management to deliver unparalleled access to differentiated, sustainable waste management and recycling services to approximately 3 million new commercial, residential, and industrial customers, primarily located in 16 states in the eastern half of the US.	USD 4.6 billion

Source: Company Website and Press Releases

11.1.1.4 MnM view

11.1.1.4.1 Key strengths/right to win

Waste Management is one of the leading providers of waste management services, focusing on ensuring environmental sustainability by recovering more waste. The company targets to serve customers, the environment, and the communities. In addition, the company is a major solid waste company focussing on residential single-stream recycling, which allows customers to recycle clean bottles, cans, papers, and cardboard in one bin.

Waste Management has a strong foothold in the domestic market of North America, specifically in the US, which accounted for 95.3% of the total revenue in 2020. Additionally, the company has been successful in expanding its geographic presence in the fast-growing markets of North America, which would enable it to create a more balanced revenue stream.

11.1.1.4.2 Strategic choices made

Waste Management focuses on organic and inorganic growth strategies for business expansions. It believes in growing its business through disciplined acquisitions. This helps the company to expand its business in the waste management and recycling sectors. For instance, in October 2020, it acquired Advanced Disposal Services to enhance its presence in the US plastic waste management market.

11.1.1.4.3 Weaknesses and competitive threats

The waste management market is highly competitive with the presence of several global and local players; hence, there is a requirement for continuous innovation. The company has a limited presence in emerging markets of Asia Pacific and Africa. Moreover, the internal revenue growth performance measure has fallen below threshold performance criteria as the company experienced revenue declines at landfills in 2020, as well as witnessed decreased demand for waste management from industrial and commercial sectors because of the COVID-19 pandemic.

11.1.2 SUEZ

11.1.2.1 Business and financial overview

SUEZ provides environmental services in the water management, wastewater treatment, and waste management sectors. The company helps municipalities, industries, and healthcare professionals involved in waste management by offering services such as collection and transportation of domestic and hazardous waste, as well as treatment and storage, and decontamination and marketing of recycled-secondary raw materials. The company also supplies container bins, including wheelie bins; specialized packaging for hazardous waste; and underground containers to manage industrial waste.

The company operates through four business segments, namely, Water, Recycling and Recovery, ETS (Environmental Technology & Solutions), and Other. Waste management services are offered under the Recycling & Recovery segment, which is one of the main business segments of the company, accounting for 41.0% of the total revenue in 2020. Through this segment, the company offers waste treatment services, including collection, recycling, sorting, composting, energy recovery, and landfilling of non-hazardous waste, to local authorities and industrial clients.

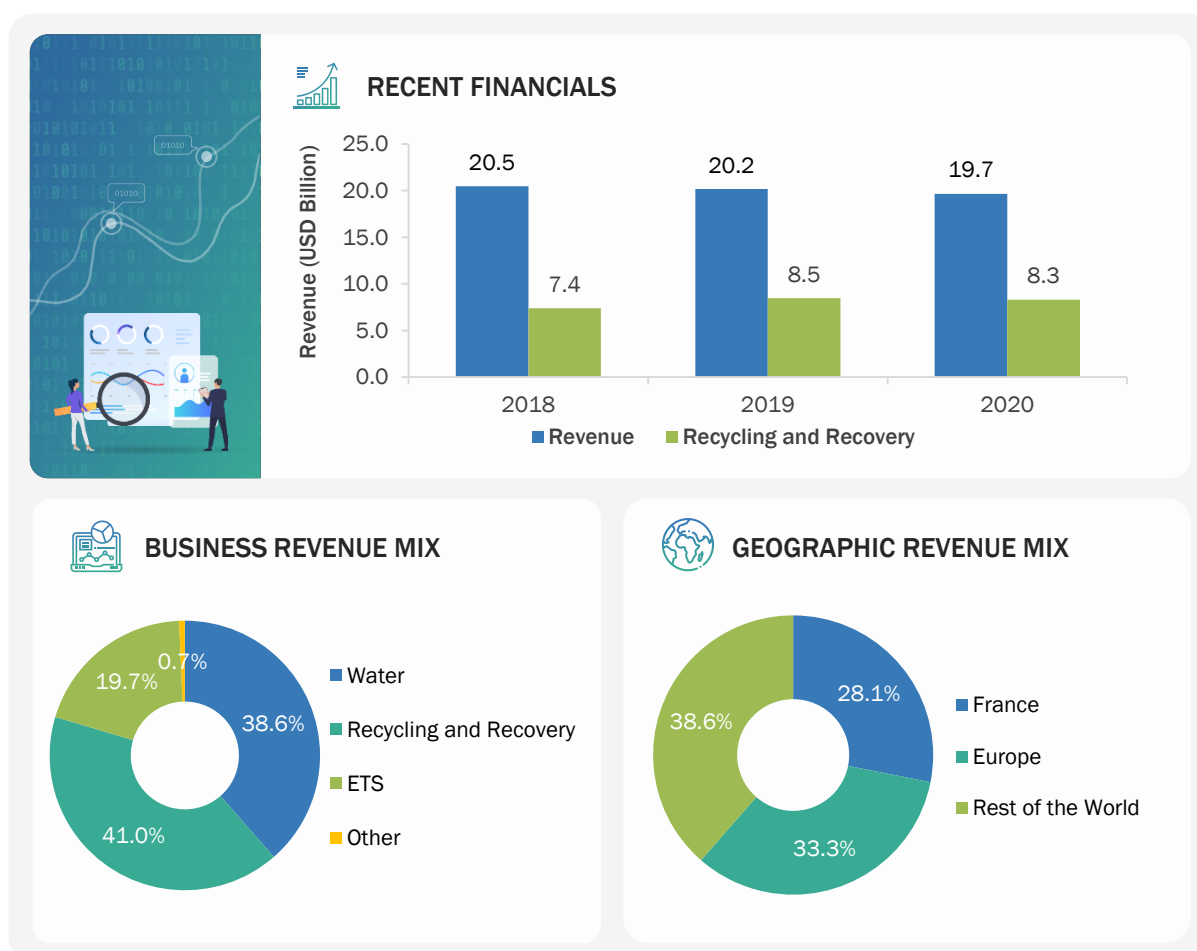
The company has a strong geographic presence in Europe, specifically in France, accounting for 28.1% of the total revenue in 2020.

TABLE 114 SUEZ: COMPANY OVERVIEW

Year Founded	1822
Country	France
City	Paris
Employee	89,352
Ownership	Public (EPA: SEV)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management services and products.

Source: Company Website

FIGURE 41 SUEZ: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 3

The "Other" segment mainly includes holdings such as SUEZ SA. The currency conversion rates considered for 2018, 2019, and 2020 are EUR1 = USD 1.181011, EUR 1 = USD 1.120129, and EUR 1 = USD 1.142203, respectively.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.2.2 Products/solutions/services offered

TABLE 115 SUEZ: PRODUCTS/SOLUTIONS/SERVICES OFFERED

SERVICE	SERVICE TYPE	END USER
Recovery and Waste Management	Recycling	Residential (Municipal Waste)
Hazardous Waste Management	Incineration	Industrial
Waste Treatment and Disposal	Landfills	Industrial
Recycling and Waste Management	- Incineration, - Compositions & Anaerobic Digestion, - and Recycling	NA

Source: Company Website

11.1.2.3 Recent developments

11.1.2.3.1 Deals

TABLE 116 SUEZ: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
May 2021	Agreement	SUEZ (France)	Eramet (France)	SUEZ signed an agreement with Eramet, a key player in the extraction and valorization of metals, to expand joint efforts in the area of recycling end-of-life electric vehicle batteries. This partnership is intended to offer a high-performance, competitive and sustainable battery recycling solution for the European market.	NA
May 2021	Acquisition	SUEZ (France)	Citroën (France)	SUEZ accelerated green mobility by acquiring Citroën My Ami Cargo, the new electric mobility vehicle designed for professional users. SUEZ tested My Ami Cargo at the Hydreaulys wastewater treatment and recovery plant in Saint-Cyr-L'Ecole (France) and ordered 10 more vehicles for rollout in France. The onsite production of electricity from the recovery of wastewater is used to power vehicles.	NA
April 2021	Collaboration	SUEZ (France)	LyondellBasell (Netherlands) and Samsonite (Hong Kong)	SUEZ and LyondellBasell, one of the largest plastics, chemicals, and refining companies globally, collaborated with Samsonite, a luggage manufacturer and retailer, to produce a new range of suitcases using recycled plastics. This new range leverages quality circular polymers (QCP) expertise in recycling high-quality polymers. It focuses on giving post-consumer plastics a second life while reducing the use of virgin materials.	NA
April 2021	Mergers	SUEZ (France)	Veolia (France)	SUEZ merged with Veolia, a global leader in optimized resource management, focusing on municipal water and solid waste activities of SUEZ in France, as well as its activities particularly in the following geographies: Italy, the Czech Republic, Africa (including Lydec), Central Asia, India, China, Australia, and the global digital and environmental activities (SES).	24.7

February 2021	Collaboration	SUEZ (France)	SIPEnR (France)	SUEZ and SIPEnR, a subsidiary of SIPPERE collaborated to develop the first green hydrogen production solution on an Energy-from-Waste (EfW) plant in France. This innovation provided a carbon-free energy solution to all green mobility in the areas of Paris Est Marne et Bois, Grand Paris Sud Est Avenir, Grand-Orly Seine Bièvre territories, and Paris.	NA
November 2020	Agreement	SUEZ (France)	Bp plc. (UK)	SUEZ and bp, an oil and petrochemicals company that produces oil and natural gas, refines, markets, and supplies petroleum products, generates solar energy, and manufactures and markets chemicals, signed an agreement to explore the feasibility of the UK's first carbon capture and storage project from energy-from-waste.	NA
October 2020	Agreement	SUEZ (France)	A2A Group (Italy)	SUEZ and A2A Group, an energy company offering production and distribution of electricity, supply and distribution of gas, waste collection, waste treatment, and disposal, signed an agreement with a growing focus on becoming the large hazardous waste player in Italy.	NA
September 2020	Partnership	SUEZ (France)	Vauban Infrastructure Partners (France)	SUEZ partnered with Vauban Infrastructure Partners, a company that structures and manages equity funds that are invested into the design, construction, maintenance, financing, and operation of essential infrastructure assets in the transportation, social, digital, and utilities sectors, focusing on financing projects in the water and waste industries, targeting initial funding by 2025.	USD 602 million
September 2020	Partnership	SUEZ (France)	PreZero (Germany)	SUEZ signed a partnership with PreZero, a recycling solutions and environmental services company, to develop innovative waste management solutions to accelerate the development of the circular economy in Europe.	NA
September 2020	Partnership	SUEZ (France)	Loop Industries (Canada)	SUEZ partnered with Loop Industries, a technology company with a focus to accelerate the shift toward a more circular economy utilizing sustainable, renewable plastics, to build the first infinite Loop facility producing 100% recycled and infinitely recyclable plastic in Europe.	NA

February 2020	Collaboration	SUEZ (France)	Shanghai Chemical Industry Park (SCIP) (China) and SAIC Motor (China)	SUEZ collaborated with Shanghai Chemical Industry Park (SCIP) and SAIC Motor, a Chinese state-owned multinational automotive design and manufacturing company, to recover hazardous waste from the automotive sector and clients based in the industrial park. This contract addressed the increasing demand for hazardous waste treatment while supporting them toward environmental growth.	NA
November 2020	Acquisition	SUEZ (France)	Environment Development Company (EDCO) (Saudi Arabia)	SUEZ, Itochu Corporation, a company engaged in domestic trading, import /export, and overseas trading of various products such as textile, machinery, metals and minerals, and chemicals, and Five Capital Fund I, a Saudi Capital Market Authority (CMA)-regulated fund, together successfully completed the acquisition of a majority stake in Environment Development Company (EDCO), a Saudi hazardous waste management company. This acquisition will help the companies to rapidly expand their presence in the hazardous waste market in Saudi Arabia, where major petrochemical industrial projects are in progress.	NA

Source: Company Website and Press Releases

11.1.2.3.2 Others

TABLE 117 SUEZ: OTHERS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
March 2021	Contract	SUEZ (France)	SYCTOM (Paris)	SUEZ won three major waste collection and sorting contracts to serve local communities in France. Suez supports the SYCTOM, and the local communities of Neuilly-sur-Seine and Reims, which helped to optimize the management of household waste while preserving the environment. SYCTOM is a public administrative establishment that focuses on treating the household waste of 85 municipalities in the Ile-de-France region with approximately 6 million inhabitants.	USD 163 Million

February 2021	Contract	SUEZ (France)	Industrial Services of Geneva (SIG) (Switzerland)	SUEZ won the biological treatment extension contract through biofiltration for the Aïre wastewater treatment plant in Geneva (Switzerland). The contract focuses on the first stages of the Aïre 2+ project, aiming at transforming the facility into a comprehensive environmental tool.	
February 2021	Contract	SUEZ (France)	Arab Contractors (Egypt)	SUEZ, along with Arab contractors, won the operation and maintenance contract for the Gabal El Asfar ¹ wastewater treatment plant in Cairo for four years with an overall amount of USD 48 million, of which USD 34 million will be attributed to SUEZ.	USD 48 Million
July 2020	Contract	SUEZ (France)	Authorities of Huaibei City (China)	SUEZ entered into a contract with the Authorities of Huaibei City to build and operate a facility specialized in industrial hazardous waste management.	

Source: Company Website and Press Releases

TABLE 118 SUEZ: OTHER DEVELOPMENTS

MONTH & YEAR	COMPANY NAME	DEVELOPMENT TYPE	DESCRIPTION
January 2021	SUEZ (France)	Expansion	SUEZ expanded its hazardous waste treatment and recovery capacities in Europe. The group focuses on the industrials sector, guaranteeing safety and regulatory compliance through solutions favoring the circular economy.
December 2020	SUEZ (France)	Expansion	SUEZ expanded its footprint by opening its first recycling plant in Thailand, dedicated to reversing the plastic pollution crisis in Asia.

Source: Company Website and Press Releases

11.1.2.4 MnM view

11.1.2.4.1 Key strengths/right to win

SUEZ has a strong foothold in the European market and accumulated 61.4% of its total revenue from the region in 2020. Europe, led by countries such as France, is likely to be one of the largest markets for waste management products and services during the forecast period. The company has a robust portfolio of market-oriented products and services. SUEZ offers services for the management of hazardous and non-hazardous waste from the residential and industrial sectors. The company also provides services such as recycling, incineration, landfill, and compositions & anaerobic digestion, which helps maintain its competitive position in the market.

11.1.2.4.2 Strategic choices made

SUEZ made several investments in the past to develop new plants in the UK, Sweden, and Germany to strengthen its waste management activities and make the company more accommodating to attractive and high-potential markets. For instance, the company announced the construction of new energy-waste plants in the UK to manage the household and commercial waste in North East of the country from 2021 with an investment of approximately USD 177 million. The company works collaboratively with LyondellBasell (Netherlands), Samsonite (Hong Kong), and others to find sustainable, innovative, and market-driven solutions that not only ensure environmental safety but also comply with waste management regulations. It has also developed improved methods of waste collection and water distribution as it plans to expand its services to customers from the public and industrial domains.

SUEZ has identified Thailand, China, India, Africa, the Middle East, and South America as emerging economies with strong demographic and economic growth. For instance, in June 2019, it started building a plastic recycling plant in Thailand to grab wide opportunities in Southeast Asia and increase its market presence in the plastic recycling market. The company is also engaged in managing water, waste, and transport services in Egypt, Africa, China, and Myanmar. This states that the company has a wide presence, in terms of operations and services, across the world.

11.1.2.4.3 Weaknesses and competitive threats

SUEZ has limited offerings for the commercial sector. Global players, including Waste Management, Biffa, CLEAN HARBORS, Veolia, which compete with SUEZ in the waste management market, generate a sizeable amount of their revenues from high-growth markets such as North America. Therefore, there is intense competition in the waste management market. In addition, the company witnessed a decline in segmental and overall revenue in 2020 compared to 2019 because of the significant impact on the economies of the countries such as France and other European countries, where SUEZ operated during the year and especially during the second quarter. Also, many waste pre-treatment and treatment sites were closed during the same period.

11.1.3 VEOLIA

11.1.3.1 Business and financial overview

Veolia is a global provider of environmental management services. It is engaged in the management of waste, water supply, and distribution systems. The company mainly operates through three business segments: Waste, Water, and Energy. The Waste segment is engaged in the collection, treatment, and recycling of municipal and industrial waste. This segment accounted for a share of 37.2% of the total revenue in 2020. Veolia is among the key global players in the management of solid, liquid, non-hazardous, and hazardous waste. It is engaged in managing the entire lifecycle of waste from collection to recovery of waste. This segment also includes the waste-to-energy recovery facility, in which non-hazardous waste that cannot be recycled is transported to incineration plants or landfill sites. The incineration process produces energy in the form of steam that can either be used to power urban or industrial heating networks or converted to energy using turbines.

Veolia actively takes part in the recycling services of recovered plastic. The company provides logistic services, from waste collection, processing, maintenance of production equipment to the management of waste discharge at industrial sites. The company has approximately 685 waste-processing facilities. As of December 2020, it provided waste collection services to around 40 million people globally. In the same year, it treated around 47 million metric tons of waste.

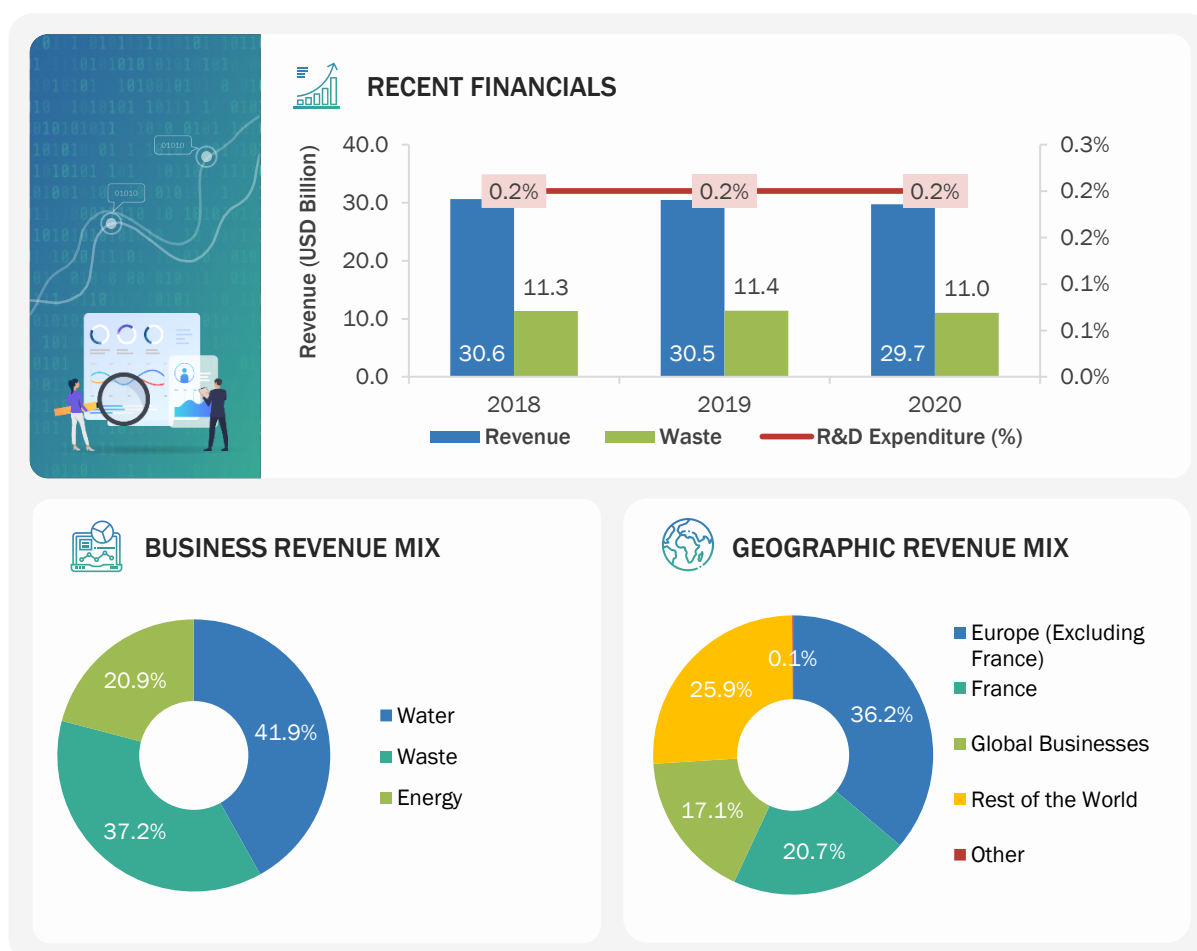
The company has a presence in Europe, North America, Asia Pacific, South America, the Middle East, and Africa.

TABLE 119 VEOLIA: COMPANY OVERVIEW

Year Founded	1853
Country	France
City	Aubervilliers
Employee	178,894
Ownership	Public (EPA: VIE)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and services.

Source: Company Website

FIGURE 42 VEOLIA: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

Rest of the World includes North America, Latin America, Asia, Pacific, and Africa and the Middle East.

Other includes various group holding companies.

The currency conversion rates considered for 2018, 2019, and 2020 are EUR1 = USD 1.181011, EUR 1 = USD 1.120129, and EUR 1 = USD 1.142203, respectively.

In the Recent Financials block, R&D expenditures are expressed as a percentage of total revenue devoted to research and development expenses in that particular year.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.1.3.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Waste Management	▪ Landfill ▪ Incineration	Industrial
Industrial Waste Optimization	Recycling	Industrial
Hazardous Waste Management - Radioactive Waste, High-pressure Management	NA	Industrial
Hazardous Waste Management - Special Treatment for Hazardous Medical Waste	Incineration	Industrial
Hazardous Waste Management - Solvents: Hazardous Chemicals Treated with Care and Recovered	Recycling	▪ Pharmaceutical ▪ Automotive ▪ Cosmetic ▪ Coating and Cleaning Activities
Hazardous Waste Management - Recycling Electric Car Batteries	Recycling	Industrial
Hazardous Waste Management - Recycling Photovoltaic Panels	Recycling	▪ Photovoltaic Panel Manufacturers, ▪ Industry and ▪ Local Authorities
Fighting Plastic Pollution - Plastics Recycling	Recycling	Industry and Local Authorities
Micropollutants in Water, Toxic Residues Requiring Treatment	NA	Cities, Industry, Tertiary

Source: Company Website

11.1.3.3 Recent developments

11.1.3.3.1 Deals

TABLE 120 VEOLIA: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
May 2021	Agreement	Veolia (France)	SUEZ (France)	Veolia, SUEZ, and the Consortium of investors composed of Meridiam-GIP-CDC/CNP signed an agreement with a focus on SUEZ' Water and Recycling and Recovery businesses, as well as international assets and growth prospects and development capacities internationally and in France. This agreement would generate revenues of nearly USD 8 billion.	
April 2021	Mergers	Veolia (France)	SUEZ (France)	Veolia merged with SUEZ to focus on municipal water and solid waste activities of SUEZ in France, as well as the activities of SUEZ particularly in the following geographies: Italy, the Czech Republic, Africa (including Lydec), Central Asia, India, China, Australia, as well as the global digital and environmental activities (SES).	
March 2021	Partnership	Veolia (France)	Groupe Renault (France), Solvay (Belgium)	Veolia partnered with Groupe Renault, an automobile manufacturer producing a range of cars and vans, and Solvay, a manufactures of chemicals and plastics, to enable the circular economy	

				of EV battery metals in Europe through closed-loop recycling.
October 2020	Acquisition	Veolia (France)	SUEZ (France)	Veolia acquired Suez shares representing 29.9% of the capital of Suez from Engie to focus on ecological transformation in France. This will help the company strengthen its geographic position and broaden expertise and expand the portfolio of commercial offerings.
February 2020	Agreement	Veolia (France)	Alcoa (US)	Veolia, through its subsidiary Veolia North America, signed an agreement to take over Alcoa USA Corporation's hazardous waste treatment site located in Gum Springs, Arkansas (US). With this, Veolia continues expanding its hazardous waste treatment and recycling activities, a step further in North America.
November 2019	Partnership	Veolia (France)	Reckitt Benckiser (RB) (UK)	Veolia partnered with Reckitt Benckiser (RB), a consumer goods company and a producer of health, hygiene, and nutrition products, to drive the shift to a circular plastics economy. The partnership is focused on making 100% of its plastic packaging recyclable and contains at least 25% recycled content by 2025.

March 2019	Partnership	Veolia (France)	Nestlé (Switzerland)	Veolia partnered with Nestlé, a food and drink processing conglomerate, to establish viable models of recycling in different countries. This includes chemical recycling technologies such as pyrolysis, which is capable of producing virgin quality plastic. These technologies are expected to help Nestlé to increase the recycled content of its bottled water packaging to 35% and its overall product packaging to 15% by 2025.		
June 2018	Partnership	Veolia (France)	EDF (France)	Veolia partnered with Électricité de France S.A. (EDF), a French multinational electric utility company owned by the French state, to co-develop remote control solutions for dismantling gas-cooled reactors (natural uranium graphite gas or UNGG in French), as well as for vitrifying radioactive waste, in France and worldwide.		
January 2018	Acquisition	Veolia (France)	Clean Harbors (US)	Clean Harbors acquired Veolia North America's US Industrial Cleaning Services Division, which offers industrial vacuuming, hydro-blasting, tank cleaning and separations, and many other cleaning and maintenance services to industrial customers.	USD 120 million	January 2018

Source: Company Website and Press Releases

11.1.3.3.2 Product launches and developments

TABLE 121 VEOLIA: PRODUCT LAUNCHED AND DEVELOPMENTS

MONTH & YEAR	COMPANY NAME	PRODUCT TYPE	PRODUCT NAME	DESCRIPTION
October 2018	Veolia (France)	NA	NA	Veolia Australia & New Zealand was selected to maintain and operate the first energy recovery facility in the country under the Kwinana Project. The plant generated approximately 40 MW of clean energy, i.e., enough to power 50,000 households. This new plant provided a more sustainable solution for the effective management of waste and will bolster local energy supply to drive energy security and affordability.

Source: Company Website and Press Releases

11.1.3.3.3 Others

TABLE 122 VEOLIA: OTHERS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
September 2019	Contract	Veolia (France)	Bordeaux Métropole (France)	Veolia signed the contract with Bordeaux Métropole to delegate public services to recover and treat household and assimilated waste.	
June 2018	Contract	Veolia (France)	SMEDAR (France)	Veolia renewed its contract with SMEDAR, a waste management service provider, to operate the VESTA, the waste-to-energy plant in Rouen, for six and a half years.	USD 140 million

Source: Company Website and Press Releases

11.1.3.4 MnM view

11.1.3.4.1 Key strengths/right to win

Veolia has a strong geographical presence in Europe and offers a well-diversified service portfolio. The company has a strong focus on research and innovation and invested USD 65 million in 2020. Veolia focuses on four major goals: protecting resources, reducing any impact on the natural environment, curbing greenhouse gas emissions, and ensuring sustainable management of urban development. The company offers hazardous and non-hazardous waste management services. In addition, it also offers solutions for recycling wastewater and bio-medical and plastic waste. Veolia offers a wide range of waste management services to industry and local authorities.

11.1.3.4.2 Strategic choices made

Veolia holds a strong market position by providing services to diversified markets. It has built a strong reputation in the market through its efficient operations for more than a century. Strategic partnerships, expansions, and agreements have enabled the company to reach out to fast-growing markets in Europe where the concern for environmental services is of paramount interest. Industrial and service sector companies are placing contracts or are partnering with Veolia to offer tailor-made services suitable for different industries. Veolia is engaged in public-private and private-private partnerships to deliver comprehensive solutions to grave environmental and economic issues. One such contract is the Design, Finance, Build, Operate, Maintain (DFBOM) contract in partnership with Canadian Infrastructure Fund Fengate Capital Management. This enables Veolia to make the best of these partnerships by providing clients with sustainable environmental solutions.

11.1.3.4.3 Weaknesses and competitive threats

Worldwide competition in waste management services is relatively high. Thus, there is an intense competitive business environment. The company also depends highly on the European market to generate more than 50% of its overall revenue. In 2020, the decline in the overall revenue was mainly due to the impact of the crisis on industrial activities in the Nordic Countries, mainly offset by stabilization of recycled plastic activities in the Netherlands and also the flexibility of the energy and water distribution segments in Germany. In the UK and Ireland, the company's operations were impacted due to a drop in commercial and industrial collection volumes and landfill volumes.

11.1.4 WASTE CONNECTIONS

11.1.4.1 Business and financial overview

Waste Connections is a company formed by the merger of Waste Connections (earlier named as Progressive Waste Solutions) and Waste Connections US (previously named as Waste Connections "Old Waste Connections"). Waste Connections provides non-hazardous solid waste collection, transportation, recycling, and landfill disposal services. The company mainly operates through six business segments: Collection, Landfill, Transfer, Recycling, E&P, and Intermodal and Other. Under the Collection segment, the company offers services to customers from the residential, commercial, and industrial sectors. The majority of the company's revenue is derived from its commercial and residential waste management services. The company generated 63.4% of the total revenue from the Collection segment in 2020. The company offers waste management services also through the Landfill and Recycling segments. Landfill and Recycling segments accounted for a share of 18.3% and 1.5%, respectively, of the total revenue in 2020.

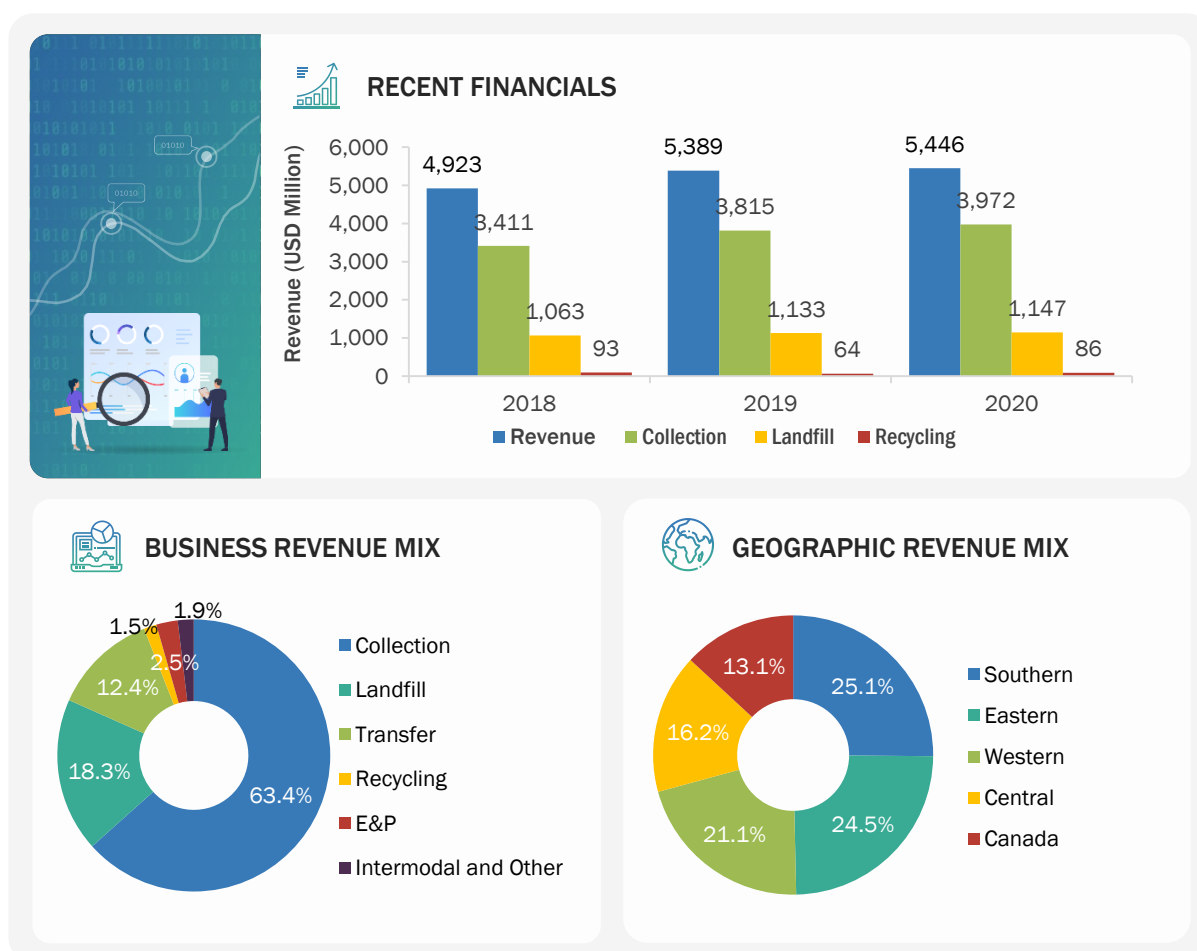
As of December 2020, it owned/operated 66 municipal solid waste (MSW) landfills, 12 E&P (exploration and production) waste landfills, and 13 non-MSW landfills (for construction, demolition, industrial, and other non-putrescible waste). Its key subsidiaries include Waste Connections of Canada (Canada), R360 Environmental Solutions (US), Waste Connections of Washington (US), and American Disposal Services (US). It has its major presence in the US (with 43 states) and Canada (with 6 provinces).

TABLE 123 WASTE CONNECTIONS: COMPANY OVERVIEW

Year Founded	1997
Country	US
City	Texas
Employee	18,933
Ownership	Public (NYSE: WCN)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and services.

Source: Company Website

FIGURE 43 WASTE CONNECTIONS: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.4.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Commercial Waste Collection Services - Roll-off Dumpster Rentals	NA	Commercial
Commercial Waste Collection Services -Commercial Trash Compactors	NA	Commercial
Commercial Waste Collection Services -Commercial Dumpsters	NA	Commercial
Commercial Waste Collection Services -Commercial Recycling	Recycling	Commercial
Commercial Waste Collection Services -Commercial Shredding	NA	Commercial
-Residential Garbage Collection Services	NA	Residential
Residential Recycling	Recycling	Residential
Yard Waste Removal	NA	Residential
Residential Dumpster removal	NA	Residential

Landfill and Transfer Station - Landfills	Landfills	NA
Landfill and Transfer Station - Special Waste Disposal	Landfills	NA
Landfill and Transfer Station - Green Waste Processing & Composting Services	Landfills	NA
Landfill and Transfer Station - Household Hazardous Waste	Landfills	NA
Landfill and Transfer Station - E-waste	Landfills	NA
Landfill and Transfer Station - Wood Waste Processing	Landfills	NA
Industrial and Manufacturing	Recycling	Industrial

Source: Company Website

11.1.4.3 Recent developments

11.1.4.3.1 Deals

TABLE 124 WASTE CONNECTIONS: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
2019 December	Acquisition	Waste Connections	NA	Waste Connections announced the closure of acquisitions during the fourth quarter in annualized revenues. The completed acquisitions include a new market entry solid waste collection and recycling acquisition in South Central Pennsylvania and tuck-in acquisitions to existing operations in Alaska, Illinois, New York, and Tennessee.	USD 130 million

Source: Company Website and Press Releases

11.1.4.4 MnM view

11.1.4.4.1 Key strengths/right to win

Waste Connections is an integrated solid waste services company and a key provider of non-hazardous oilfield waste management services. It offers waste collection, disposal, transfer, and recycling services. Along with them, it also offers intermodal services. It also has a large consumer base in the US and Canada. It caters to the needs of various end users from the residential, commercial, industrial, and exploration and production (E&P) sectors.

11.1.4.4.2 Strategic choices made

Waste Connections has emerged as a key player in the waste management market. The company focuses on strengthening its core businesses and consolidating its market position by increasing its presence in North America. For instance, in December 2019, Waste Connections announced the closure of acquisitions during the fourth quarter with approximately USD 130 million in annualized revenues. The completed acquisitions include a new market entry solid waste collection and recycling acquisition in South Central Pennsylvania and tuck-in acquisitions to existing operations in Alaska, Illinois, New York, and Tennessee.

11.1.4.4.3 Weaknesses and competitive threats

Revenue of the Southern segment decreased by 5.5% to reach USD 79 million. The overall revenue decreased to USD 1.4 billion in 2020 from USD 1.5 billion in 2019. The components of the USD 29.6 million increase in revenue at solid waste operations consisted of net price increases of USD 54 million. Moreover, there is a net revenue growth from acquisitions of USD 13 million, partially offset by solid waste volume decreases of USD 36.0 million attributable primarily because of COVID-19-related economic disruptions. All these factors drive the decline in commercial collection, roll-off the collection, and municipal solid waste landfill volumes that exceeded increases in landfill special waste volumes.

11.1.5 REPUBLIC SERVICES

11.1.5.1 Business and financial overview

Republic Services, along with its subsidiaries, is primarily engaged in the collection, transfer, recycling, and disposal of solid waste. In terms of revenue, it is one of the largest providers of non-hazardous solid waste collection, recycling, transfer, disposal, and energy services in the US. It provides services to commercial, industrial, municipal, and residential customers in the US and Puerto Rico. The company mainly operates through five business segments, namely, Collection, Landfills, Transfer, Environmental Solutions, and Others.

The company offers waste management services through the Collection, Landfills, and Others segments. Collection segment accounts for the major revenue generation segment accounting for 75.0% in 2020. Landfills accounted for 12.6% of the total revenue in 2020. The Others segment includes recycling processing and commodity sales, accounting for 5.2% of the total company's revenue in 2020.

In the transfer services category, Republic operates through 220 transfer stations. As of December 31, 2020, it operates 186 active solid waste landfills in the landfill services category. The company has around 76 recycling centers. The recycled material was used to manufacture plastic bottles, cardboard, glass, newspaper, and metal cans). The company operates 75 landfill gas & renewable energy projects and has 186 active modern-day landfills.

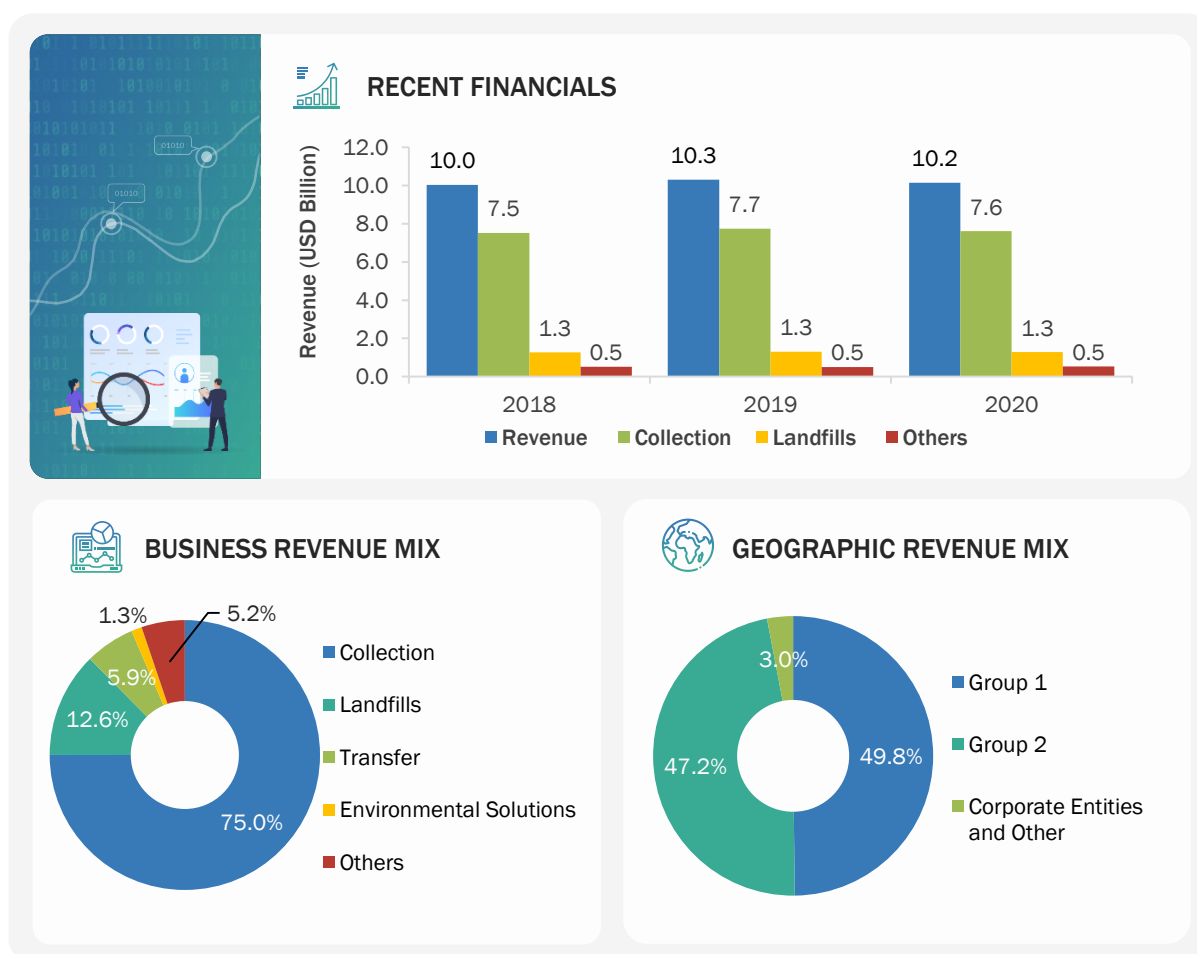
The company operates through two geographical segments, namely, Group 1 and Group 2. Group 1 includes geographic areas in the western US, and Group 2 includes geographic areas located in the eastern seaboard of the US and south-eastern and mid-western US.

TABLE 125 REPUBLIC SERVICES: BUSINESS OVERVIEW

Year Founded	1928
Country	US
City	Arizona
Employee	35,000
Ownership	Public (NYSE: RSG)

Note: The employee count in the table above is for the entire company in 2020 and not specifically for the business segment that provides waste management.

Source: Company Website

FIGURE 44 REPUBLIC SERVICES: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.5.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Household Hazardous Waste Disposal	NA	Residential
Special Waste & Asbestos Disposal	Landfills	NA
Commercial Waste Disposal & Recycling Services	NA	Commercial

Source: Company Website

11.1.5.3 Recent developments

11.1.5.3.1 Others

TABLE 126 REPUBLIC SERVICES: OTHERS

MONTH & YEAR	COMPANY NAME	DEVELOPMENT TYPE	DESCRIPTION
April 2021	Republic Services (US)	Expansion	Republic Services expanded its reach by opening a facility in Northern California for organics pre-processing, which helped Bay Area communities meet the requirements of a new state law mandating the diversion of food and yard waste from landfills.
December 2020	Republic Services (US)	Expansion	Republic Services and Aria Energy, a renewable energy company that developed or constructed more than 50 projects, together announced an expansion of the landfill gas-to-energy (LFGTE) project at the County Line Landfill. The facility was expanded to 7.6 megawatts from 6 megawatts, increasing its use of biogas by 25%. The project expansion directly supports Republic's commitment to divert 50% more landfill gas to beneficial re-use by 2030.
October 2019	Republic Services (US)	NA	Republic Services unveiled a new landfill gas-to-energy project at Blue Ridge Landfill. Replacing an older renewable energy project at the site, the new facility was designed to collect landfill gas generated at Blue Ridge Landfill and yield a clean, renewable fuel.

Source: Company Website and Press Releases

11.1.5.3.2 Deals

TABLE 127 REPUBLIC SERVICES: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
August 2020	Partnership	Republic Services (US)	Aria Energy (US) and bp (UK)	Republic Services, Aaria Energy, and bp announced the start-up of a landfill-gas-to-renewable-natural-gas (RNG) project at the south Shelby landfill. Republic Services sent 50% landfill gas to beneficial re-use by 2030.	
August 2020	Partnership		Republic Services (US)	Nikola	Republic Services partnered with Nikola, a designer and manufacturer of battery-electric and hydrogen-electric vehicles, electric vehicle drivetrains, vehicle components, energy storage systems, and hydrogen

fueling station infrastructure, to develop and purchase 2,500 electric waste and recycling collection trucks. The zero-emission vehicles, having a range of 150 miles and recharge overnight, are expected to be integrated into Republic Services' fleet beginning in 2023. The deal is expandable to 5,000 vehicles over the life of the agreement.

Source: Company Website and Press Releases

11.1.5.4 MnM view

11.1.5.4.1 Key strengths/right to win

Republic Services is a diversified service provider to commercial, industrial, municipal, and residential customers in the US. Experience and expertise through many years in the waste management industry, combined with its solutions, have guaranteed consistency in the company's high-quality standards.

11.1.5.4.2 Strategic choices made

The company actively participates in promotional programs and makes several developments to expand its capacities to improve its waste management business. For instance, in April 2021, Republic Services expanded its reach in Northern California by opening organics pre-processing facility. In addition, in August 2017, the company acquired ReCommunity Holdings II, Inc. (US), the largest independent recycling-processing player in the US, to increase recycling activities and reduce the need for landfills. Such development will help the company to optimize its capabilities in North America.

11.1.5.4.3 Weaknesses and competitive threats

Republic Services' revenue for 2020 decreased by 3.1% from 2019 due to a decline in volumes of waste in the Collection segment, as well as a decrease in special waste volumes in the Landfill line of business. Such falls were partially offset by an increase in average yield in all lines of businesses, an increase in construction and demolition and municipal solid waste volumes in the company's Landfill line of business, and one additional workday during 2020.

11.1.6 BIFFA

11.1.6.1 Business and financial overview

Biffa is a key integrated waste management service provider in the UK. Its wide range of services includes collection, recycling, treatment, and incineration of waste. It operates through two business segments, namely, Collections and Resources & Energy. The Collections segment offers waste collection and recycling and related services to industrial, commercial, municipal, and residential customers. Through the Resources & Energy segment, the company offers waste recycling and treatment and energy generation services.

The historical Municipal and Industrial & Commercial divisions have been merged into the Collections division. The Resource Recovery & Treatment and Energy divisions have been merged into the Resources & Energy division. The Hazardous Waste business has been transferred from the Resource Recovery & Treatment division into the new Collections division.

The company owns or operates through 70 industrial and commercial (I&C) collection facilities, 38 I&C transfer stations, 4 material recycling facilities, and 9 active landfills, with a fleet of around 2,800 vehicles. The company has a strong presence in Europe.

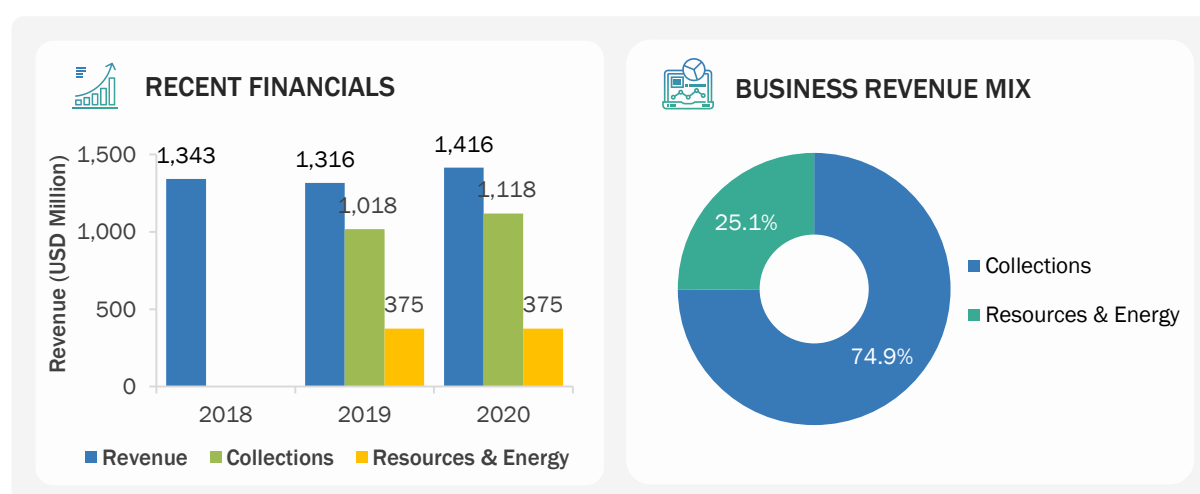
TABLE 128 BIFFA: COMPANY OVERVIEW

Year Founded	1912
Country	England
City	Buckinghamshire
Employee	8,188
Ownership	Public (LON: BIFF)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and services.

Source: Company Website

FIGURE 45 BIFFA: COMPANY SNAPSHOT



Note: The financial year of the company ends on March 27.

Biffa reorganized its operational reporting segment effective from 2019, so segmental revenue for 2018 is not given.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.6.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
General Waste Collection	Recycling	Commercial and Industrial
Dry Mixed Recycling (DMR)	Recycling	Commercial
Commercial Food Waste Collection & Food Recycling	Anaerobic Digestion	Commercial and Industrial
Single Stream Recycling	Recycling	NA
Hazardous Waste Collection & Treatment		NA
Construction Waste Management	Landfills	Industrial
Retail Waste Management	Recycling	Commercial (Supermarkets To Leading High Street Retailers)
Plastic Recycling	Recycling	Industrial
Food Waste Recycling	Anaerobic Digestion	NA
Commercial Composting	Compositions	Commercial
Landfill Waste Management	Landfills	Industrial

Source: Company Website

11.1.6.3 Recent developments

11.1.6.3.1 Deals

TABLE 129 BIFFA: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
March 2021	Investment	Biffa (England)	NA	Biffa is increasing high-density polyethylene (HDPE) plastic recycling capacity by 50% with a new investment in its facility in Washington, Sunderland. This investment will help the company to recycle 14,000 tonnes of HDPE, a type of resin commonly used for fresh milk bottles.	USD 18 million

November 2020	Collaboration	Biffa (England)	University of Manchester	Biffa entered into a collaborative venture led by the University of Manchester, aiming to develop simpler methods of plastic recycling. The venture focuses on collecting plastic waste, as well as improving recycling infrastructure in the UK so that more recycled material can be fed back into a plastic circular economy.	USD 2 million
November 2020	Collaboration	Biffa (England)	IoT Solutions Group (IoTSG) (England)	Biffa collaborated with Northern and IoT Solutions Group (IoTSG) for a phased trial of 12 smart bins at locations on the Northern network. This is the first trial within the rail industry that targets specific waste management areas to road test IoTSG's smart bin monitoring solution suitable for challenging conditions and locations.	
November 2020	Partnership	Biffa (England)	Suntory Beverage and Food GB and Ireland (SBF GB&I)	Biffa partnered with Suntory Beverage and Food GB and Ireland (SBF GB&I), soft drinks manufacturers and owners of iconic brands including Lucozade Energy, Lucozade Sport, and Ribena, to help increase the recyclability of its Ribena bottles. The partnership supports developing a new and more	

					sustainable design of the classic 500 ml ready-to-drink Ribena. This will be achieved by changing the size of the label on the bottle significantly, leaving the 100% recycled PET plastic exposed for sorting devices at recycling plants to be easily able to detect.
October 2020	Acquisition	Biffa (England)	Simply Waste Solutions (Buckinghamshire)	Biffa acquired Simply Waste Solutions, an industrial and commercial (I&C) waste collection business in the south of England. The acquisition earned accretive for Biffa from the outset and will deliver synergies from operational benefits.	
September 2020	Partnership	Biffa (England)	Nestlé Waters (Paris)	Biffa partnered with Nestlé Waters UK, the food & beverage company, to accelerate a circular economy for plastics in the UK. Biffa offered support in making BUXTON bottles from 100% recycled PET (recycled polyethylene terephthalate or rPET) by collecting recyclable PET bottles and reprocessing them into rPET in the UK.	

April 2019	Partnership	Biffa (England)	WasteAid (UK)	Biffa partnered with a UK-based charity WasteAid to help communities in developing countries improve the management of waste. By partnering with WasteAid, Biffa will be able to bring financial support and its extensive experience in addressing complex waste issues in the UK to areas with no previous access to waste management.
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Source: Company Website and Press Releases

11.1.6.3.2 Others

TABLE 130 BIFFA: PRODUCT LAUNCHES AND DEVELOPMENTS

MONTH & YEAR	COMPANY NAME	PRODUCT TYPE	PRODUCT NAME	DESCRIPTION
April 2021	Biffa (England)	NA	NA	Biffa expanded by doubling the amount of recycling at its Aldridge facility to 80,000 tonnes per year. The company focuses on improving recycling capabilities to ensure more materials can be recycled in the UK. The extra capacity of the Aldridge site will enable the recycling of more plastic waste.
January 2020	Biffa (England)	NA	NA	Biffa expanded its presence by opening a new PET (polyethylene terephthalate) plastic bottle recycling facility in Seaham, County Durham, which was worth USD 38 million. The plant is capable of converting 57,000 tonnes of PET plastic per year. PET is a commonly used material to package soft drinks; it is a popular material as it is lightweight, durable, and highly recyclable, producing significantly lower carbon emissions.

11.1.6.3.3 Others

TABLE 131 BIFFA: OTHERS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
March 2021	Contract	Biffa (England)	ALPLA Group (Austria)	Biffa and ALPLA Group are working together to ensure more plastic is being recycled used to manufacture UK homecare products.	NA
February 2021	Contract	Biffa (England)	City of Edinburgh (Scotland)	Biffa entered into a three-year contract extension with the City of Edinburgh to help Scotland's capital recycle more. The partnership will ensure that Biffa uses knowledge and expertise in recycling to support the City of Edinburgh in achieving its target of a 78% recycling rate.	NA
February 2021	Contract	Biffa (England)	Winchester City Council (England)	Biffa entered into an eight-year contract with Winchester City Council to offer a new waste strategy for the area including lower emission vehicles and free waste collection of electrical items.	
February 2020	Contract	Biffa (England)	MÜLLER UK & IRELAND (England)	Biffa won a contract from MÜLLER UK & IRELAND to supply food-grade recycled high-density polyethylene (rHDPE) plastic to be used in its milk bottles.	
February 2020	Contract	Biffa (England)	Mitchells & Butlers (UK)	Biffa announced a new three-year waste management contract with Mitchells & Butlers, one of the operators of restaurants, pubs, and bars in the UK. Biffa supported Mitchells & Butlers to improve its recycling efficiencies.	
January 2020	Contract	Biffa (England)	Winchester City Council (England)	Biffa won an 8-year household waste and recycling contract from Winchester City Council. The contract included a free household collection of small electrical items, such as kettles, unwanted toasters, or clocks, for recycling.	

January 2020	Contract	Biffa (England)	Cornwall Council (UK)	Biffa was awarded the waste collection contract from Cornwall Council. The contract for waste and recycling collection, street and public open space cleansing started on October 3, 2020 and run for eight years with an option to extend it for another two years.
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Source: Company Website and Press Releases

11.1.7 CLEAN HARBORS

11.1.7.1 Business and financial overview

Clean Harbors is the provider of environmental, energy, and industrial services and the hazardous waste disposal company in North America. The company operates through two business segments: Environmental Services and Safety-Kleen. Its Environmental Services segment includes technical services, industrial services, and field services, along with oil, gas, and lodging businesses. This business segment provides a wide range of hazardous material management and disposal services and mechanisms including collection, packaging, transportation, recycling, treatment, and waste disposal. It also provides a wide variety of environmental clean-up services on customer sites or other locations as an emergency response.

Safety-Kleen offers environmental services and complementary products to a diverse range of customers, including car and truck dealers; automobile repair shops; metal fabricators; machine manufacturers; fleet maintenance shops; and other automotive, industrial, and retail customers. The company provides pickup and transportation services pertaining to hazardous and non-hazardous containerized waste for recycling or disposal, primarily through the company's network of recycling, treatment, and disposal facilities.

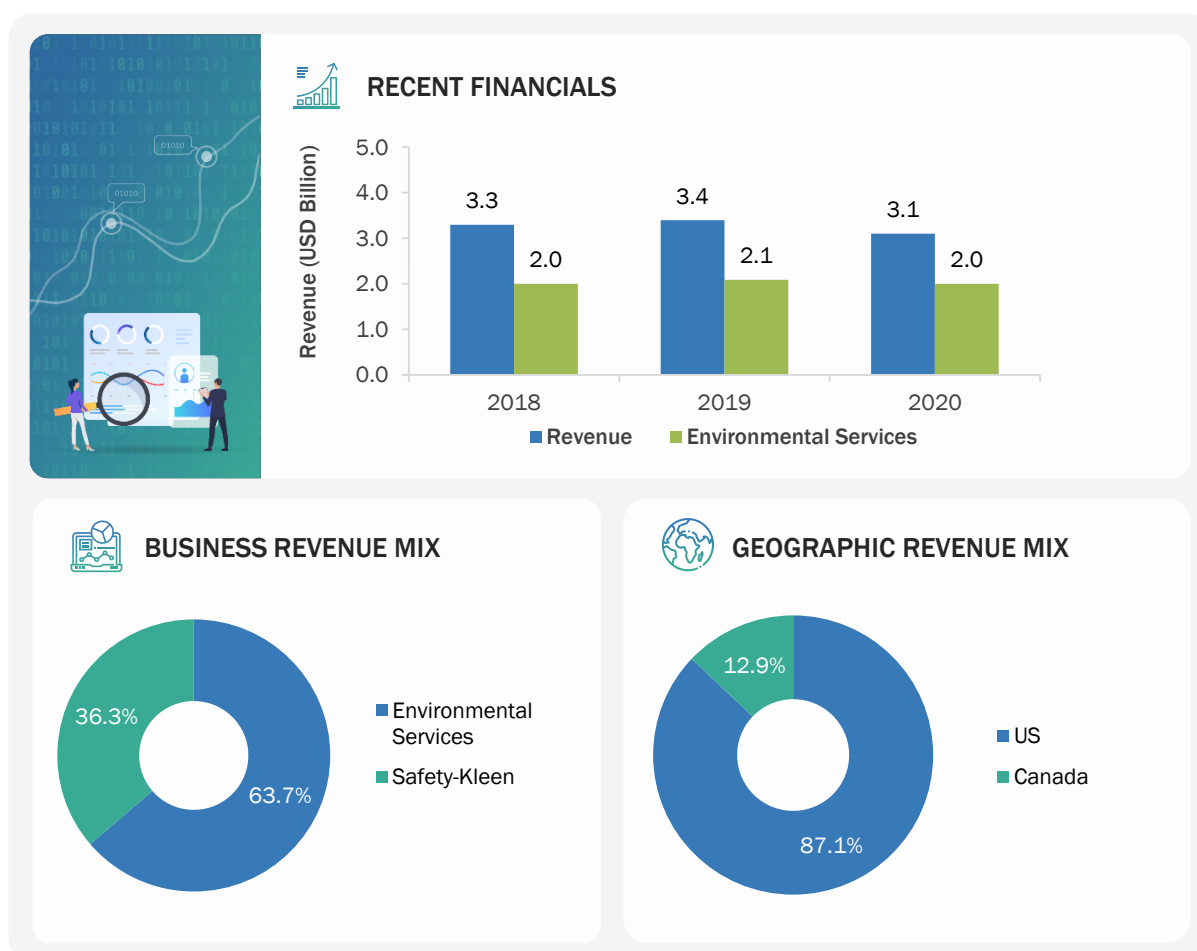
It operates in the US, Canada, Mexico, and Puerto Rico. As of December 2020, it had 9 active incinerators in its five incinerator facilities in North America. As of December 2020, the company operated 7 commercial landfills, 6 of which are designed and permitted to dispose of hazardous waste. One is operated for the disposal of non-hazardous industrial waste. The company has a strong geographic presence in North America.

TABLE 132 CLEAN HARBORS: BUSINESS OVERVIEW

Year Founded	1980
Country	US
City	Massachusetts
Employee	13,500
Ownership	Public (NYSE: CLH)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and services.

Source: Company Website

FIGURE 46 CLEAN HARBORS: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.7.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Bulk Waste Disposal	- Incineration - Recycling - Landfill	NA
Incineration Facilities	Incineration	Industrial
Industrial Wastewater Treatment	Incineration	Industrial
Landfill Facilities	Landfills	NA
Airbag Disposal	NA	NA
Medical Waste Management and Destruction	Incineration	NA
Polychlorinated Biphenyl (PCB) Disposal	- Landfills - Recycling - Incineration	NA

Explosives Management	NA	Commercial and Industrial
Medical Waste Management and Destruction	Incineration	NA
Waste Transportation Services	NA	NA

Source: Company Website

11.1.7.3 Recent developments

11.1.7.3.1 Deals

TABLE 133 CLEAN HARBORS: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
February 2018	Acquisition	Clean Harbors (US)	Veolia (France)	Clean Harbors acquired Veolia's US Industrial Cleaning division. Working at more than 60 locations, the company is an expert in offering industrial vacuuming, hydro-blasting, tank cleaning, chemical cleaning, total waste management programs, decontamination, and transportation services.	USD 120 million

Source: Company Website and Press Releases

11.1.8 COVANTA HOLDING

11.1.8.1 Business and financial overview

Covanta Holding is a provider of sustainable waste and energy solutions. Incineration services are its core business (converting waste to energy, also known as energy-from-waste or EfW). This business includes the disposal of waste, electricity generation, and recovered metals. The company operates in 4 business segments—Waste and Service Revenue, Energy Revenue, Recycled Metals Revenue, and Other Operating Revenue. The Waste and Service Revenue segment includes revenue generated from the sales of services, energy, and recycled metals. The company offers waste management services through its Waste and Service Revenue segment, which accounted for 74.2% of the total revenue in 2020. The company also offers recycled metals through the Recycled Metals Revenue segment, which accounted for a share of 4.3% of the total revenue in 2020.

The company has 41 major waste-to-energy facilities, which provide environmental solutions that dispose of municipal solid waste and consume municipal waste to generate renewable energy. The energy from municipal waste facilities complements recycling and reduces greenhouse gases, which are some of the critical components for sustainable solid waste management. Also, it addresses unique non-hazardous waste disposal needs with sustainable and secure solutions.

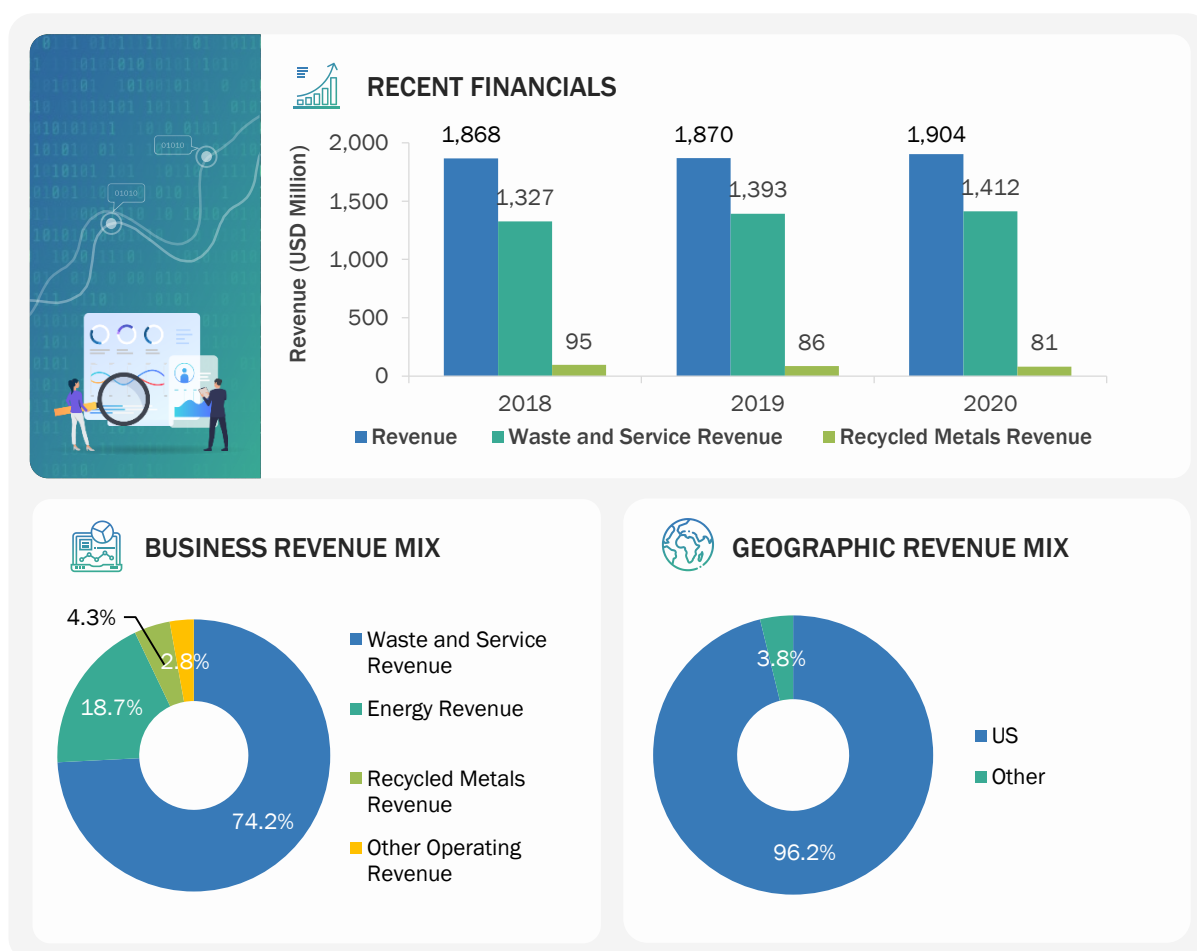
Covanta Holding's modern energy-from-waste facilities consume approximately 21 million tons of waste annually and produce 10 million megawatt-hours of electricity per annum. As of 2020, it owned 41 waste-from-energy facilities currently in commercial operation; 39 of these plants are in North America. It has 20 material processing facilities, 13 transfer stations, two wood waste (biomass) energy projects, four landfills, one regional metal-recycling plant, and one under-construction ash-processing facility. The company has a strong presence in North America.

TABLE 134 COVANTA HOLDING: COMPANY OVERVIEW

Year Founded	1983
Country	US
City	New Jersey
Employee	4,000
Ownership	Public (NYSE: CVA)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and solutions.

Source: Company Website

FIGURE 47 COVANTA HOLDING: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.8.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Total Waste & Materials Management	- Landfills Recycling - Compositions & Anaerobic Digestion	Industrial and Logistics
Liquid Waste Management	Recycling	Manufacturing and Production
Pharmaceutical Waste	NA	Commercial
Transportation & Logistics	NA	Hauling, Logistics, Water and Wastewater, and Industrial
Electronic Waste Recycling	Recycling	Residential (Household)

Source: Company Website

11.1.8.3 Recent developments

11.1.8.3.1 Deals

TABLE 135 COVANTA HOLDING: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
January 2021	Agreement	Covanta Holding (US)	Town of North Hempstead (US)	Covanta Holding entered into an agreement with the Town of North Hempstead for sustainable waste disposal. Instead of landfilling approximately 140,000 tons of waste annually, the town utilizes the Covanta Hempstead waste-to-energy facility located in Westbury, New York.	
December 2019	Agreement	Covanta Holding (US)	Zhao County (China)	Covanta Holding entered into a concession agreement with Zhao County, China, to construct and operate a new energy-from-waste (EfW) facility. This facility will provide a sustainable waste solution to the county and nearby jurisdictions.	
April 2019	Partnership	Covanta Holding (US)	Town of Babylon (US)	Covanta extended its partnership with the Town of Babylon for sustainable waste management services at the Babylon resource recovery facility in West Babylon, New York.	
January 2019	Partnership	Covanta Holding (US)	Wreaths Across America (US)	Covanta expanded its partnership with Wreaths Across America to sustainably recycle and dispose of wreaths laid on gravestones of military veterans at cemeteries across the US.	
November 2018	Partnership	Covanta Holding (US)	Town of Huntington (US)	Covanta Holding extended its partnership with the Town of Huntington to operate the Huntington resource recovery facility. The continuation of the partnership with Covanta provides the community with a waste management solution that preserves valuable natural resources in the town while generating clean energy.	
March 2018	Partnership	Covanta Holding (US)	New York Red Bulls (US)	The New York Red Bulls, one of 22 teams in Major League Soccer (MLS), partnered with Covanta. The agreement designates the Morristown, New Jersey-based company as the official energy partner of the New York Red Bulls. Covanta provides renewable energy to power Red Bull Arena from its energy-from-waste facility in nearby Newark, New Jersey.	

January 2018	Agreement	Covanta Holding (US)	Lancaster County Solid Waste Management Authority (LCSWMA) (US)	Covanta and Lancaster County Solid Waste Management Authority (LCSWMA) entered into an agreement for the operation and maintenance of LCSWMA's two energy-from-waste facilities, namely, the Susquehanna Resource Management Complex (SRMC), located in Harrisburg, and Lancaster Waste-to-Energy (WTE) Facility, located in Bainbridge. Together these two facilities process around 700,000 tons of waste annually. The new, improved agreement, which was finalized at the end of 2017, extended a successful long-term collaboration between LCSWMA and Covanta through 2032.
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Source: Company Website and Press Releases

11.1.9 DAISEKI

11.1.9.1 Business and financial overview

Daiseki is engaged in the treatment and recycling of waste oil, wastewater, sludge, and other related businesses. The company is focused on industrial waste management to address environmental issues. Daiseki strives to prevent environmental pollution and creates a cleaner environment using cutting-edge technology-based solutions. Daiseki aims to contribute to the development of a sustainable society by promoting recycling-oriented social structures. The company's key focus includes the treatment and recycling of industrial waste.

Subsidiaries of the company include Daiseki Eco. Solution Co., Ltd., in which Daiseki holds a 54% stake; Daiseki MCR; and System Kikou. Daiseki Eco. Solution focusses on soil decontamination and plasterboard recycling; Daiseki MCR is a provider of refining and selling lead recovered from used batteries; and System Kikou provides cleanup services for large oil tanks and also industrial piping installation/maintenance services. The company has a significant presence in Asia Pacific.

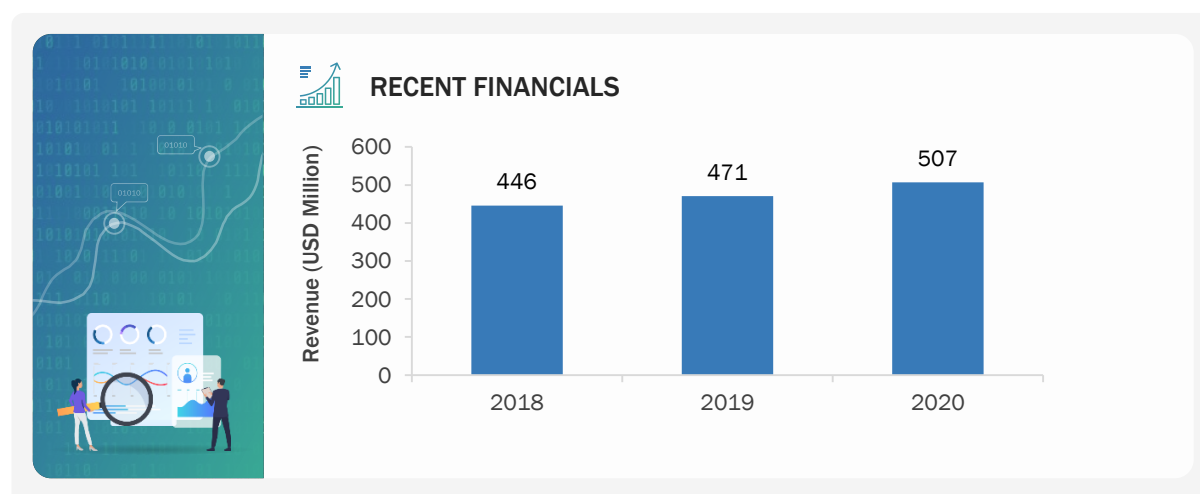
TABLE 136 DAISEKI: COMPANY OVERVIEW

Year Founded	1958
Country	Japan
City	Nagoya
Employee	949
Ownership	Public (TYO: 9793)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and solutions.

Source: Company Website

FIGURE 48 DAISEKI: COMPANY SNAPSHOT



Note: The financial year of the company ends on February 29.

The currency conversion rates considered for 2018, 2019, and 2020 are YEN 1 = USD 0.009059, YEN 1 = USD 0.009176, and YEN 1 = USD 0.009, respectively.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.1.9.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Treatment and Recycling of Industrial Waste -Treatment and Recycling of Waste Oil	Recycling	Industrial
Treatment and Recycling of Industrial Waste -Treatment and Recycling of Wastewater	Recycling	Industrial
Treatment and Recycling of Industrial Waste -Treatment and Recycling of Sludge	Recycling	Industrial

Source: Company Website

11.1.10 HITACHI ZOSEN

11.1.10.1 Business and financial overview

Hitachi Zosen is a producer of waste treatment plants, industrial plants, industrial machinery, construction machinery, precision machinery, steel mill process equipment, steel structures, tunnel boring machines, and power plants. The company designs, constructs, and manufactures energy-from-waste plants, desalination plants, marine diesel engines, water and sewage treatment plants, press machines, process equipment, bridges, precision machinery, shield tunneling machines, hydraulic gates, and equipment for use in disaster prevention/mitigation. The company offers services such as recycling, composition, landfill, and incineration for residential and industrial sectors.

The company operates through four major segments: Environmental Systems & Industrial Plants, Machinery, Infrastructure, and Other. Under the Environmental Systems & Industrial Plants segment, the company offers engineering, procurement, and construction (EPC) services for energy-from-waste plants and builds various energy-related facilities, including biomass plants, and water-related facilities, including sludge recycling centers and desalination plants, in Japan and overseas.

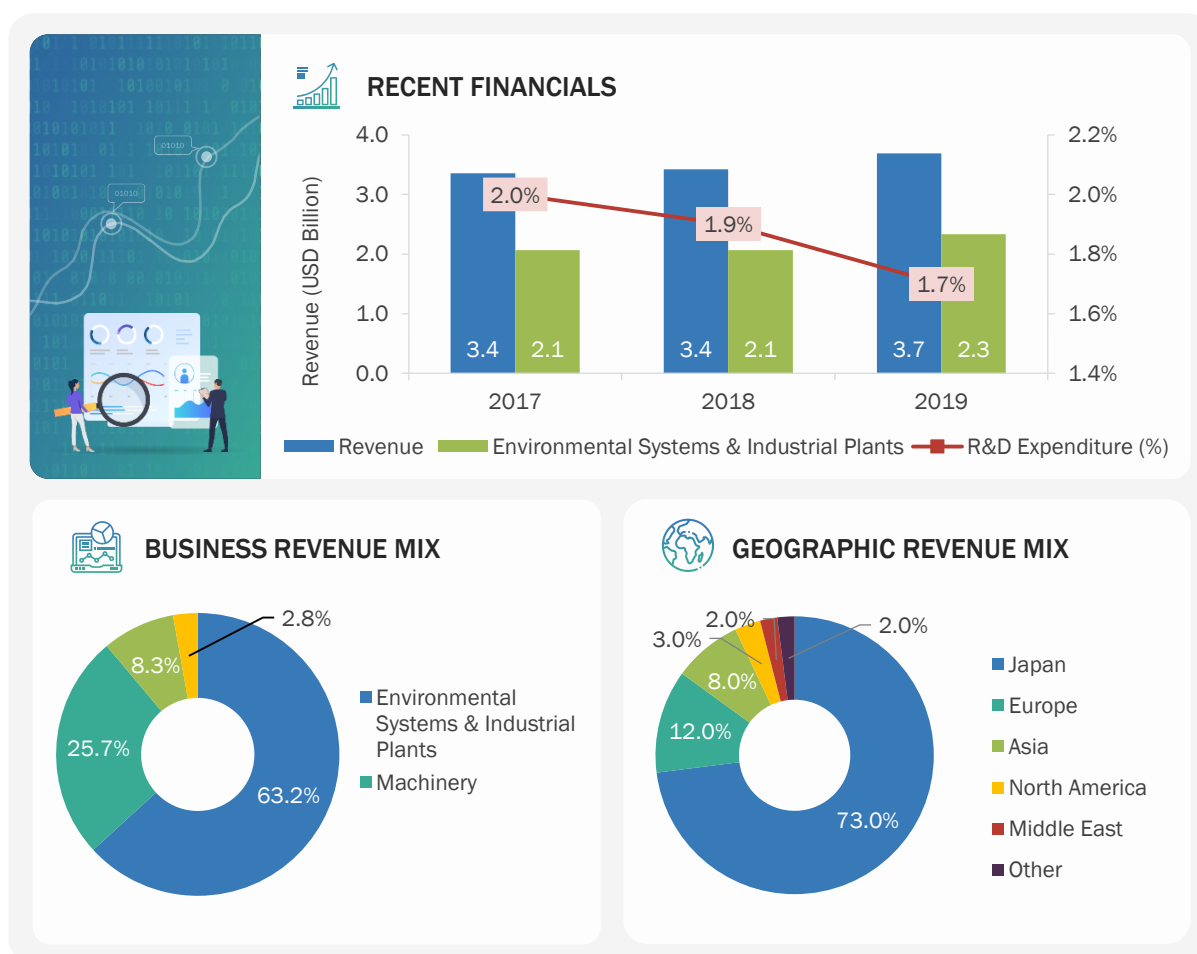
The company has a presence in Asia Pacific, North America, Europe, and the Middle East.

TABLE 137 HITACHI ZOSEN: COMPANY OVERVIEW

Year Founded	1881
Country	Japan
City	Osaka
Employee	10,707
Ownership	Public (TYO: 7004)

Note: The employee count in the table provided above is for the entire company in 2019 and not specifically for the business segment that provides waste management products and solutions.

Source: Company Website

FIGURE 49 HITACHI ZOSEN: COMPANY SNAPSHOT

Note: The financial year of the company ends on March 31.

The currency conversion rates considered for 2017, 2018, and 2019 are YEN 1 = USD 0.008919, YEN 1 = USD 0.009059, and YEN 1 = USD 0.009176, respectively.

In the Recent Financials block, R&D expenditures are expressed as a percentage of total revenue devoted to research and development expenses in that particular year.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.10.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Energy-from-waste Plants	Incineration/Combustion	Domestic Industry
Material Recycling Systems	Recycling	Residential (Municipal Waste)
Methane Fermentation System	Compositions	Residential
Liquid Organic Waste Treatment System	NA	NA
Recycling Systems	Recycling	NA
Landfill Leachate Treatment System	Landfill	NA
Water, Sewage, and Industrial Wastewater Treatment System	Recycling	Industrial

Source: Company Website

11.1.10.3 Recent developments

11.1.10.3.1 Product launches

TABLE 138 HITACHI ZOSEN: PRODUCT LAUNCHES

MONTH & YEAR	COMPANY NAME	PRODUCT TYPE	PRODUCT NAME	DESCRIPTION
April 2018	Hitachi Zosen (Japan)	NA	NA	Hitachi Zosen Inova built Scandinavia's second Kompogas facility in Jönköping, Sweden. It uses a dry fermentation process to convert around 40,000 metric tons of organic waste a year into high-grade fertilizers and fuel for buses and cars. This new installation will replace an existing wet fermentation facility, assuring the future of organic waste treatment and renewable fuel production.

Source: Company Website and Press Releases

11.1.10.3.2 Deals

TABLE 139 HITACHI ZOSEN: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
November 2020	Acquisition	Hitachi Zosen (Japan)	Deep Isolation, Inc.	NAC International, Hitachi Zosen's subsidiary in the US, acquired Deep Isolation, a company that is focused on offering optimal solutions for geological disposal of spent fuel and high-level nuclear waste (HLW). This acquisition will focus on innovative solutions for the disposal of spent fuel and HLW.	
October 2020	Agreement	Hitachi Zosen (Japan)	ZiO-Podolsk (Russia)	Hitachi Zosen Inova AG (HZI) and PJSC ZiO-Podolsk, a Russian engineering company, formed a consortium and received equipment orders from Alternative Generating Company-1 LLC (AGC1). For two EfW plants in Moscow, Russia (power generation output: approximately 70MW, stoker type incinerator: 700,000 t/year). This consortium is responsible for supplying and designing main equipment such as grates, waste cranes, and exhaust gas treatment equipment.	

Source: Company Website and Press Releases

11.1.10.3.3 Others

TABLE 140 HITACHI ZOSEN: OTHERS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
February 2021	Contract	Hitachi Zosen (Japan)	KPC Gas Power Corporation Limited (KPCGPCL) (India)	Hitachi Zosen India Private Limited, Hitachi Zosen's wholly owned subsidiary located in Haryana, India, received a contract from KPC Gas Power Corporation Limited (KPCGPCL), a wholly owned subsidiary of Karnataka Power Corporation Ltd., for the construction of an energy-from-waste (EfW) plant.	
February 2020	Contract	Hitachi Zosen (Japan)	Abiko City, Chiba	Hitachi Zosen received a contract to construct and operate an energy-from-waste plant from Abiko City, Chiba. The project is focused on establishing a stable and safe waste treatment system in Abiko City and embodying the New Clean Center Development Basic Policy.	
December 2020	Contract	Hitachi Zosen (Japan)	SSE (UK)	Hitachi Zosen Inova AG (HZI), a wholly owned subsidiary of Hitachi Zosen, received a contract from a British major energy group—SSE—to construct a new energy-from-waste plant near London (stoker type incinerator: 480,000 t/a, power generation output: 49.9MW).	
September 2020	Contract	Hitachi Zosen (Japan)	China National Electric Apparatus Research Institute (CEI)	Hitachi Zosen received a contract from the China National Electric Apparatus Research Institute (CEI) for a combined sewer overflow (CSO) fiber filtration system for a wastewater treatment plant (WWTP) in Changsha City, China.	
July 2019	Contract	Hitachi Zosen (Japan)	Jurong Engineering (Singapore)	Hitachi Zosen was awarded a contract from Jurong Engineering Limited (Singapore), a company offering a full range of services in engineering, procurement, construction, and maintenance, to build and install a stoker-type waste incinerator (1 unit, 300 tons/day, power output: 9.8 MW) in an energy-from-waste plant, which was built in Rayong Province, Thailand.	
April 2019	Contract	Hitachi Zosen (Japan)	Xuzhou Xinshengrun Environmental Protection Energy (China)	Hitachi Zosen received a contract from Xuzhou Xinshengrun Environmental Protection Energy for the energy-from-waste (EfW) plant in Xuzhou city, Jiangsu province, China. According to the contract, Hitachi Zosen will be responsible for the supply of main equipment, engineering, and supervisory services on the grate combustion system in the EfW plant.	

November 2018	Contract	Hitachi Zosen (Japan)	Hangzhou Linjiang Environment Energy (China)	Hitachi Zosen received a contract from Hangzhou Linjiang Environment Energy for the energy-from-waste (EfW) plant in Hangzhou City, China. This EfW plant was built by Hangzhou Linjiang Environment Energy, and Hitachi Zosen was responsible for supplying main equipment and supervisory services on the grate combustion system for this project with a large capacity of 5,220 tons/day.
August 2018	Contract	Hitachi Zosen (Japan)	Nogata City (Japan)	Hitachi Zosen received a contract from Nogata City, Fukuoka, to construct Nogata Municipal Sludge Recycling Center. Nogata City administered and operated the Nogata Municipal Mukaizuru Joen Sludge Treatment Plant and strived to maintain appropriate sewage treatment through repeated improvements in the existing sewage treatment facility.

Source: Company Website and Press Releases

11.1.11 REMONDIS SE & CO. KG

11.1.11.1 Business overview

Remondis SE & Co. KG is among the key recycle, service, and water companies offering a comprehensive range of business activities to provide a sustainable supply of raw materials and water. It also provides facilities such as sewage treatment, hazardous waste processing, paper sorting, composting/anaerobic digestion, landfill, construction waste processing, residual waste processing, and commercial waste processing.

The company collects and processes around 30 million metric tons of raw materials and recyclables. It has a presence in 30 countries (in 4 continents) with more than 500 business locations serving around 30 million customers. The company has subsidiaries located in Melsdorf, Kloster Lehnin, Munich, Mannheim, Bochum, and Cologne. The logistics network of the company comprises approximately 8,000 vehicles.

Its main markets are Europe, Asia, and Oceania. It offers recycling services to the public and industrial sectors in almost all EU member states, with a presence in 700 European locations. It is a recycling market leader in Poland. In Asia Pacific, it has a presence in Russia, China, Taiwan, Australia, India, and Singapore. Remondis Australia has over 1,000 employees, 600 trucks at 32 business locations, and 27 recycling plants. Apart from these, it also operates in North Africa and the Arabian Peninsula. Yearly, it recovers around 400,000 tons of recycled raw materials.

TABLE 141 REMONDIS SE & CO. KG: COMPANY OVERVIEW

Year Founded	1934
Country	Germany
Ownership	Private

Note: This is a privately held company. Hence, no financial information is available in the public domain.

Source: Company Website

11.1.11.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Recycling	Recycling	- Residential - Commercial - Industrial

Source: Company Website

11.1.11.3 Recent developments

11.1.11.3.1 Product launches and developments

TABLE 142 REMONDIS SE & CO. KG: PRODUCT LAUNCHES AND DEVELOPMENTS

MONTH & YEAR	COMPANY NAME	SERVICE TYPE	NAME	DESCRIPTION
June 2019	REMONDIS SE & Co. KG (Germany)	NA	NA	REMONDIS SE & Co. KG opened a state-of-the-art C&D recycling plant in Chester-le-Street, County Durham. In November 2016, this site was gained by the acquisition of JBT Waste Services Limited. The re-development of the site has taken 18 months from the initial design stages. The site utilizes the latest sorting technology to process construction, demolition, and commercial waste streams focusing on improving THE company's recycling and recovery rates.
May 2018	REMONDIS SE & Co. KG (Germany)	NA	NA	REMONDIS SE & Co. KG launched a comprehensive raw material initiative. The company is focused on the ecodesign directive, increased investments, and a system of incentives for the industrial sector while investing in more and better recycling.

Source: Company Website and Press Releases

11.1.11.3.2 Deals

TABLE 143 REMONDIS SE & CO. KG: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
July 2019	Acquisition	REMONDIS SE & Co. KG (Germany)	Reym B.V.(Amersfoort)	REMONDIS SE & Co. KG acquired the Dutch firm—Reym B.V. This acquisition enabled REMONDIS to extend and further round off its comprehensive range of industrial services. Reym B.V. specializes in industrial cleaning work and is particularly well-known for the industrial and environmental services delivered onshore and offshore to the oil and gas industry.	
June 2018	Collaboration	REMONDIS SE & Co. KG (Germany)	GVG Rhein-Erft (Germany), Zukunft ERDGAS (Germany) and IVECO (Italy)	REMONDIS SE & Co. KG, GVG Rhein-Erft, Zukunft ERDGAS, and IVECO joined forces to test biogas-fueled vehicles, an initiative to protect the environment. This collaboration emphasizes on climate-neutral waste collection trucks run on biogas. Compared to diesel-fueled trucks, these eco-friendly vehicles help improve air quality and reduce noise pollution in cities.	

Source: Company Website and Press Releases

11.1.12 URBASER

11.1.12.1 Business and financial overview

URBASER is a provider of recycling services focused on street cleaning, waste removal and transportation, and water management services. The company cleans over two million kilometers of streets in various cities across the world and manages more than 57 million sq. m. (m²) of green areas. This helps avoid the emission of more than 1.9 million tonnes of CO₂ into the atmosphere and collect more than 9 million tonnes of municipal domestic waste. In addition, the company treats and recovers 20 million tonnes of urban waste per year. The company manages a sewer network of 2,568 kilometers and fully or partially handles urban services of 670 cities globally.

URBASER is a sustainability-oriented company, serving more than 50 million people in 30 countries through a huge network of more than 35,000 employees and over 160 subsidiary companies.

TABLE 144 URBASER: COMPANY OVERVIEW

Year Founded	1990
Country	Spain
City	Madrid
Ownership	Private

Note: This is a privately held company. Hence, no financial information is available in the public domain.

Source: Company Website

11.1.12.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Municipal Waste Treatment	NA	Residential (Municipal waste)
Waste Collection	NA	Urban or industrial waste

Source: Company Website

11.1.12.3 Recent developments

11.1.12.3.1 Product launches and developments

TABLE 145 URBASER: PRODUCT LAUNCHES AND DEVELOPMENTS

MONTH & YEAR	COMPANY NAME	SERVICE TYPE	NAME	DESCRIPTION
March 2021	URBASER (Spain)	NA	NA	URBASER announced a new fleet of electric waste and recycling collection, street cleansing, and grounds maintenance vehicles.

Source: Company Website and Press Releases

11.1.12.3.2 Others

TABLE 146 URBASER: OTHERS

MONTH & YEAR	COMPANY NAME	DEVELOPMENT TYPE	DESCRIPTION
March 2021	URBASER (Spain)	Expansion	URBASER Ltd. Commercial Services (ULCS) expanded its portfolio with the addition of new local authority trade waste collection services, which include Eden District, and the management of Household Waste and Recycling Centres (HWRCs) located across Northamptonshire and Central Bedfordshire.
June 2020	URBASER (Spain)	Expansion	URBASER launched the commercial waste management and recycling collection division, URBASER Ltd. Commercial Services (ULCS), which incorporated paperless in-cab technology and bin-weighing systems to monitor collections and help customers improve their green credentials.

11.1.12.3.3 Others

TABLE 147 URBASER: OTHERS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
January 2021	Contract	URBASER (Spain)	Amey (UK)	URBASER won six waste management contracts from Amey (UK), an infrastructure support service provider. The contracts involve the provision of waste and recycling collection, street cleansing, and grounds maintenance services.	USD 41 million
May 2019	Contract	URBASER (Spain)	Welwyn Hatfield Borough Council (UK)	URBASER won a 9-year waste recycling and street cleansing contract from Welwyn Hatfield Borough Council. The company is keen on introducing a number of service improvements, including weekly food waste collections and a weekly collection of small electrical items, textiles, and household batteries.	NA
March 2019	Contract	URBASER (Spain)	Waltham Forest Council (UK)	URBASER won a contract from Waltham Forest Council. The new 8-year contract provided neighborhood services, including waste collection, and can renew the contract for eight years.	NA

March 2019	Contract	URBASER (Spain)	Dartford Borough Council (UK)	URBASER has been awarded the waste collection and street cleansing 5-year contract from Dartford Borough Council. URBASER is focused on providing fortnightly recycling and garden waste collections and weekly residual waste collections to 47,000 properties, as well as an efficient street cleansing service to the borough's 98,000 residents.	NA
October 2018	Contract	URBASER (Spain)	Tunbridge Wells Borough Council (UK) and Tonbridge & Malling Borough Council (UK)	URBASER won an 8-year contract from Tunbridge Wells Borough Council and Tonbridge & Malling Borough Council for a new recycling and waste collection and street cleansing services.	NA

Source: Company Website and Press Releases

11.1.13 FCC ENVIRONMENT

11.1.13.1 Business overview

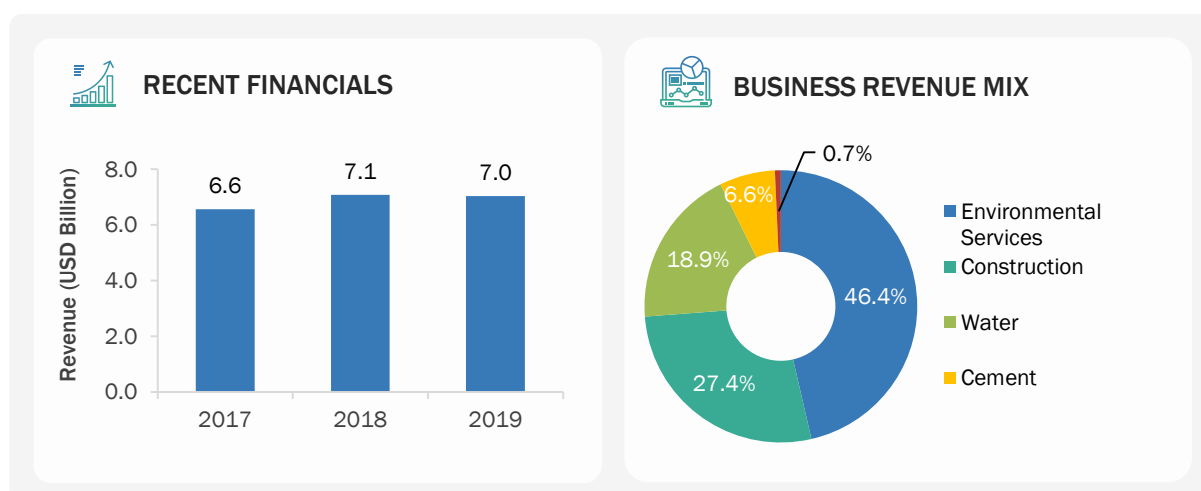
FCC Environment is a provider of a broad spectrum of services to municipalities, industrial, commercial, and retail customers, as well as individuals in the field of urban and environmental services. The company concentrates on minimizing the environmental impact by investing in clean technologies that enable sustainable quality of life for the present and future generations. The company operates through 5 business divisions, namely, Environmental Services, Construction, Water, Cement, and Corporate Services and Adjustments. The company offers waste management services through its Environmental Services business segment, which accounted for 46.4% of the total revenue in 2019.

FCC Environment collects and treats waste from more than 5.1 million residents and more than 36,500 industrial and commercial customers in 8 countries in Central and Eastern Europe (CEE) (the Czech Republic, Slovakia, Austria, Hungary, Poland, Bulgaria, Romania, Serbia).

TABLE 148 FCC ENVIRONMENT: COMPANY OVERVIEW

Year Founded	1988
Country	Austria
Ownership	Private

FIGURE 50 FCC ENVIRONMENT: COMPANY SNAPSHOT



Note: The financial year of the company ends on March 31.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.13.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Recycling	Recycling	NA
Waste Processing	NA	- Commercial - Industrial

Source: Company Website

11.1.13.3 Recent developments

11.1.13.3.1 Others

TABLE 149 FCC ENVIRONMENT: OTHERS

MONTH & YEAR	COMPANY NAME	DEVELOPMENT TYPE	DESCRIPTION
May 2021	FCC Environment (England)	Expansion	FCC Environment (FCC) and Provectus Soils Management Ltd. (Provectus), a provider of turnkey contaminated land remediation solutions for over 20 years to the regeneration industry, announced the opening of a new hazardous soil treatment facility to the south of Leeds on a site known as Welbeck. The treatment facility has an annual capacity of 50,000 tonnes and supported the recovery of contaminated soils for use in a large restoration scheme for the site.
June 2020	FCC Environment (England)	Expansion	Provectus Soils Management (Provectus), along with its strategic partner—FCC Environment (FCC), expanded its presence by opening a new hazardous soil treatment facility to the north of Crewe on a site known as Maw Green.
September 2019	FCC Environment (England)	Expansion	The company expanded its reach by opening its Millerhill Recycling and Energy Recovery Centre, boosting the zero-waste targets of Edinburgh and Midlothian Councils.

11.1.13.3.2 Others

TABLE 150 FCC ENVIRONMENT: OTHERS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
May 2021	Contract	FCC Environment (England)	East Lothian Council (Scotland)	FCC Environment signed a contract with East Lothian Council to provide all food waste and recycling collections from May 1, 2021.	
February 2021	Contract	FCC Environment (England)	Buckinghamshire Council (England)	FCC Environment signed a 5-year contract with Buckinghamshire Council to provide services for the transfer, management, and treatment of green, bulky, food and wood waste with immediate effect.	
February 2021	Contract	FCC Environment (England)	East Lothian Council (Scotland)	FCC Environment won a contract from East Lothian Council to provide all food waste and recycling collection from May 1, 2021. The company collected food waste and recycling from some 54,000 properties in East Lothian.	

October 2020	Contract	FCC Environment (England)	Kent County Council (UK)	FCC Environment won a contract from Kent County Council to provide the management and operation of 12 Household Waste Recycling Centers (HWRCs) in the Mid and East Kent area and for the haulage of waste from the HWRC sites.	
September 2019	Contract	FCC Environment (England)	Jerez (Cádiz, Spain)	FCC Environment won a 9-year contract for solid urban waste collection and street cleaning in Jerez (Cádiz, Spain).	
September 2019	Contract	FCC Environment (England)	Omaha City Council (US)	FCC Environmental won a contract from Omaha City Council for solid waste collection services of the city. FCC provided the seasonal selective collection of yard waste for 12 weeks per year.	USD 560 million
May 2019	Contract	FCC Environment (England)	Suffolk County Council (England)	FCC Environment won an 8-year contract from Suffolk County Council to operate 11 recycling centers in Suffolk. The contract aimed at driving up recycling in Suffolk with a customer focus, which improved the experience for people visiting the sites while maximizing the amount of materials re-used and recycled across the county.	
March 2019	Contract	FCC Environment (England)	South Hams District (England) and West Devon Borough Councils (UK)	FCC Environment won a contract from South Hams District Council and West Devon Borough Council to provide all waste recycling, collection, and street and toilet cleaning services from April 1, 2019.	
January 2019	Contract	FCC Environment (England)	Suffolk County Council (England)	FCC Environment was awarded a contract from Suffolk County Council to operate its countywide network of 11 recycling centers. The contract covers the period from May 16, 2019, to September 30, 2027.	

Source: Company Website and Press Releases

11.1.14 BIOMEDICAL WASTE SOLUTIONS

11.1.14.1 Business overview

BioMedical Waste Solutions provides medical and biohazardous waste management services to large and small healthcare facilities. The medical waste disposal services offered by the company are tailored to suit its customers' needs. BioMedical Waste Solutions also provides Occupational Safety and Health Administration (OSHA) medical compliance packages to educate hospital staff. The company provides prescheduled medical waste collection services and pickup services according to its customers' needs.

The company has a prominent presence in North America.

TABLE 151 BIOMEDICAL WASTE SOLUTIONS: COMPANY OVERVIEW

Year Founded	1981
Country	Israel
City	Tel Aviv-Yafo
Ownership	Private

Note: This is a privately held company. Hence, no financial information is available in the public domain.

Source: Company Website

11.1.14.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Biohazardous Waste Management	NA	NA

Source: Company Website

11.1.15 STERICYCLE

11.1.15.1 Business and financial overview

Stericycle provides waste management and regulatory services to the healthcare and commercial sectors. It offers medical waste management services, pharmaceutical waste services, and disposal and hazardous waste management services. The company also provides regulated recall and return management services, patient communication services, as well as medical safety products. The company operates through three business segments—Regulated Waste and Compliance Services, Secure Information Destruction Services, and Communication and Related Services. The Regulated Waste and Compliance Services segment offers medical waste management services (including reusable sharps container disposal management services), hazardous waste management and compliance solutions, pharmaceutical waste services (including controlled substances (CsRX, Kiosk, and Seal/Send)), compliance programs under the Steri-Safe, Clinical Services, and First Practice Management brand names, and maritime waste services. This segment accounted for a 67.5% share of the total revenue in 2020.

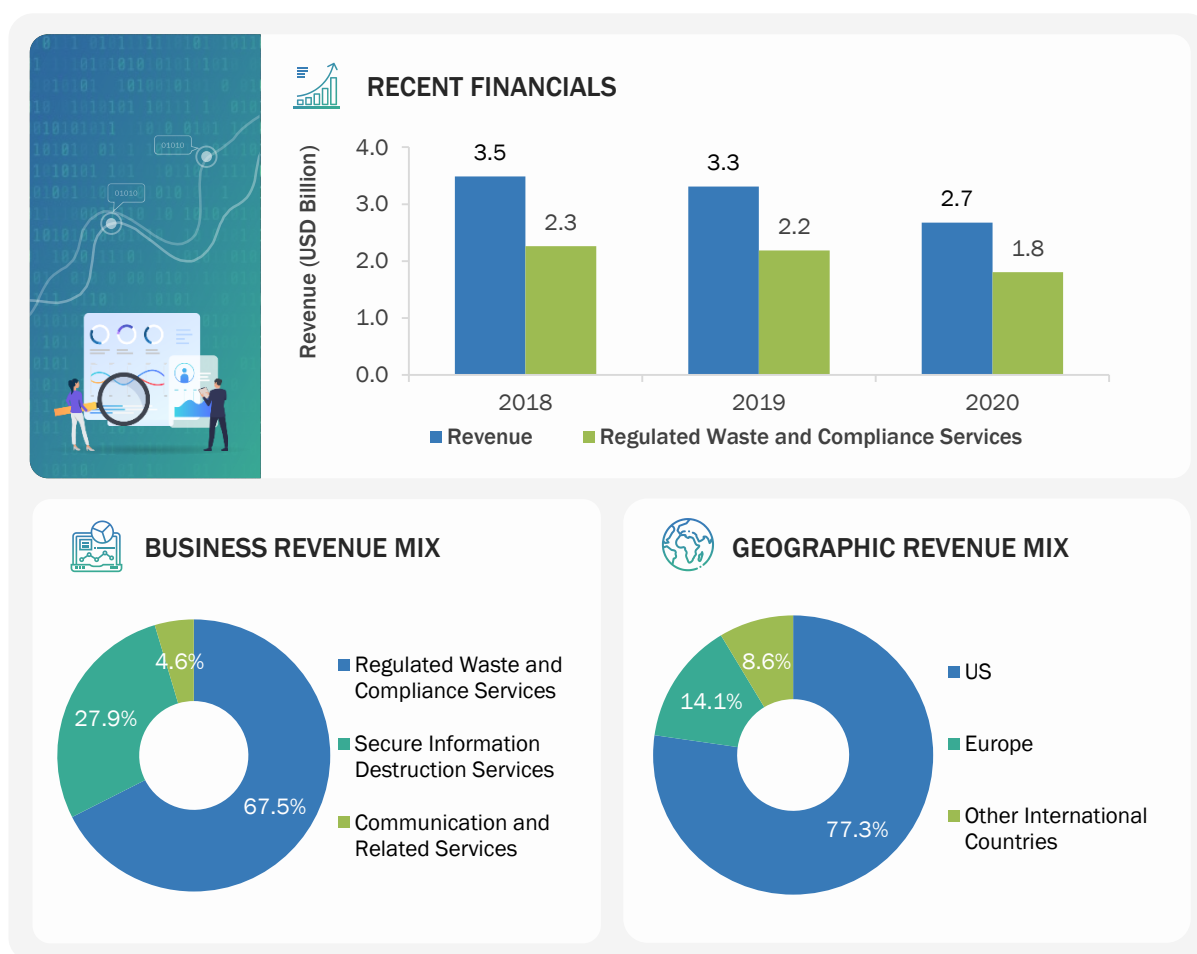
Its subsidiaries include Stericycle International, LLC (Delaware); Stericycle Environmental Solutions (US); Stericycle Specialty Waste Solutions, Inc. (Delaware); and Stericycle of Puerto Rico, Inc. (Puerto Rico). The company has a presence in North America and Europe.

TABLE 152 STERICYCLE: COMPANY OVERVIEW

Year Founded	1989
Country	US
City	Lake Forest
Employee	15,000
Ownership	Public (NASDAQ: SRCL)

Note: The employee count in the table provided above is for the entire company in 2020 and not specifically for the business segment that provides waste management products and services.

Source: Company Website

FIGURE 51 STERICYCLE: COMPANY SNAPSHOT

Note: The financial year of the company ends on December 31.

Source: Company Website, Press Releases, and Company Annual Reports

11.1.15.2 Products/solutions/services offered

SERVICE	SERVICE TYPE	APPLICATION/END USER
Biohazardous Medical Waste	Incineration	Industrial
Pharmaceutical Waste Disposal	NA	NA

Source: Company Website

11.1.15.3 Recent developments

11.1.15.3.1 Deals

TABLE 153 STERICYCLE: DEALS

MONTH & YEAR	DEAL TYPE	COMPANY 1	COMPANY 2	DESCRIPTION	DEAL SIZE
July 2020	Agreement	Stericycle (US)	Harsco (US)	Stericycle entered into a definitive agreement to sell its Domestic Environmental Solutions business, excluding the healthcare customer and unused consumer pharmaceutical take-back services, to Harsco Corporation. The transaction included Stericycle's Domestic Environmental Solutions business, including manufacturing and industrial services and the retail portion of hazardous waste services.	USD 462.5 million

Source: Company Website and Press Releases

11.2 SME PLAYERS

11.2.1 ECOMED SERVICES

Founded	2015
Headquarters	Washington, US
Ownership	Private
Business Overview	EcoMed Services is an innovative medical waste disposal and recycling company that provides environmental and healthcare waste treatment and disposal solutions. The company provides advanced, comprehensive, and integrated medical waste solutions designed to help medical waste generators, healthcare providers, and service partners.
Products/Solutions/Services Offered	▪ Offsite Medical Waste Management and Disposal ▪ Onsite Turnkey Solutions
Geographic Presence	North America

11.2.2 SKRAP

Founded	2017
Headquarters	Mumbai, India
Ownership	Sole Proprietorship
Business Overview	Skrp is an environmental sustainability firm, which helps organizations, brands, events, and individuals to adopt sustainable practices and zero-waste solutions. In India, the company generated over 62 million tonnes of trash annually. Through the company's projects, it focuses on achieving zero-waste-to-landfill. This is implemented through a host of waste reduction and waste management measures, coupled with sustainability workshops and campaigns to inch toward developing a pro-sustainability mindset.
Products/Solutions/Services Offered	Zero-waste Offices
Geographic Presence	Asia Pacific

11.2.3 RECYGLO

Founded	2017
Headquarters	Yangon, Myanmar
Ownership	Private
Business Overview	Recyglo is the provider of innovative recycling service solutions in Myanmar. The company focuses on processing recyclable materials safely and responsibly. The company provides recyclable waste pickup and recycling services to responsible corporations and organizations, in addition to waste audit and secure document disposal services. Currently, Recyglo provides recycling services to two high-end office towers, one international school, and a few INGO offices and companies.
Products/Solutions/Services Offered	Waste Management and Recycling Service
Geographic Presence	Asia Pacific

11.2.4 SAAHAS ZERO WASTE

Founded	2013
Headquarters	Karnataka, India
Ownership	Private
Business Overview	Saahas Zero Waste is a socio-environmental enterprise that focuses on a circular economy where all waste is converted to resources. The company specializes in designing and executing customized solutions for the goal of zero-waste-to-landfill, especially for bulk waste generators such as technology parks, residential complexes, educational institutions, hotels, and others.
Products/Solutions/Services Offered	▪ E-Waste Management and Recycling Services ▪ Waste Management Services
Geographic Presence	Asia Pacific

11.2.5 RECYCLE TRACK SYSTEMS

Founded	2014
Headquarters	New York, US
Ownership	Private
Business Overview	Recycle Track Systems (RTS) is a provider of ways to manage waste and recycling. RTS combines digital solutions with high-touch services to make waste disposal easier, smarter, and more responsible. From on-demand removal through a mobile app to fully integrated waste management solutions, RTS helps companies easily track and optimize their pickups.
Products/Solutions/Services Offered	▪ Recycle Cardboard ▪ E-waste ▪ Commercial Food Waste Collection
Geographic Presence	North America

11.2.6 GEM ENVIRO MANAGEMENT PVT LTD.

Founded	2013
Headquarters	Delhi, India
Ownership	Private
Business Overview	The company collects a chain of all kinds of plastic waste, such as polyethylene terephthalate (PET), high-density polyethylene (HDPE), low-density polyethylene (LDPE), and polypropylene (PP), for recycling. It ensures a greener and safer environment for the present and future generations. The company collects/recycles both pre- and post-consumer waste all over India for the last four years.
Products/Solutions/Services Offered	PET (Polyethylene Terephthalate) Recycling
Geographic Presence	Asia Pacific

11.2.7 RECYCLING TECHNOLOGIES

Founded	2011
Headquarters	Swindon, England
Ownership	Private
Business Overview	The company offers modular technology solutions that can be mass-produced to recycle plastic waste into feedstock for new plastic production. This solution can be installed at existing waste sites anywhere across the world to divert plastic waste away from landfills, incineration, and leaking into the environment. The company focuses on the evolution of plastic into a more sustainable material through innovation and technical excellence.
Products/Solutions/Services Offered	Chemical Recycling
Geographic Presence	Europe

11.2.8 VITAL WASTE

Founded	2016
Headquarters	West Bengal, India
Ownership	Private
Business Overview	Vital Waste provides convenient, affordable, and genuine recycling solutions to residential communities and corporate offices in Kolkata. The company helps reduce waste, re-use what is generated, and recycle the rest. To achieve this, it consistently adopts new and innovative ways.
Products/Solutions/Services Offered	▪ Paper ▪ Cardboard ▪ Plastic-PET ▪ E-waste ▪ Metal
Geographic Presence	Asia Pacific

11.2.9 REKOSISTEM

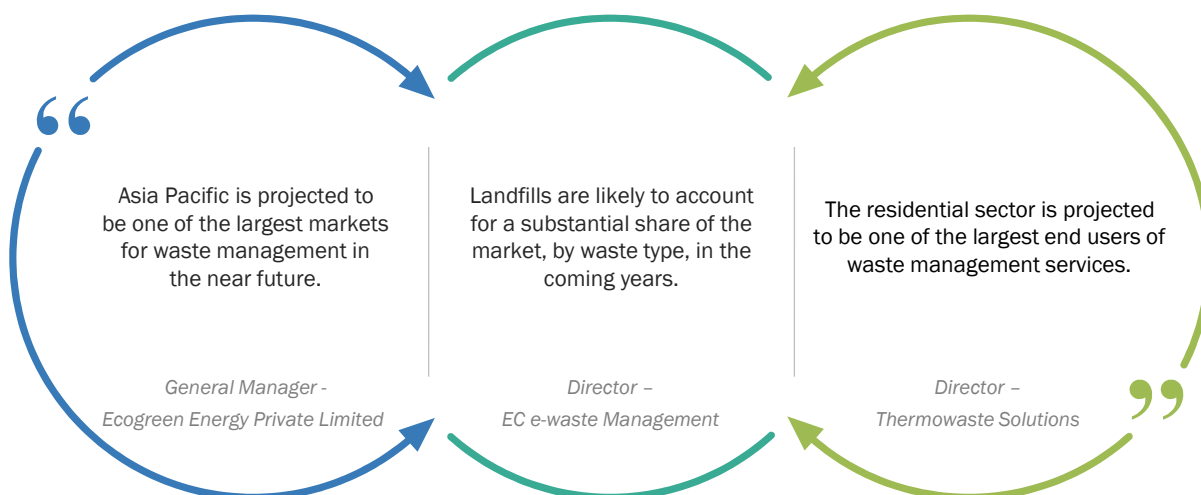
Founded	2018
Headquarters	Jakarta, Indonesia
Ownership	Private
Business Overview	Rekosistem is an end-to-end zero-waste management start-up that strives for a sustainable ecosystem. The company improves how the waste value chain works to be more productive and efficient with minimal behavioral changes. Rekosistem redefines an end-to-end zero-waste ecosystem.
Products/Solutions/Services Offered	▪ Transfer Waste ▪ Composter
Geographic Presence	Asia Pacific

11.2.10 UNBOUND CHEMICALS

Founded	2019
Headquarters	Canada
Ownership	Private
Business Overview	The company develops technology and equipment to become the world's leader in pharmaceutical ingredient recovery. The company's research is developing a process to efficiently unlock the valuable ingredients from pharmaceutical waste. The company developed processes to capture and rework products back into raw materials that can be re-used by the pharmaceuticals industry. This reduces the environmental impact of the manufacturing sector and also stabilizes the supply chain of pharmaceutical materials that have been dominated by producers in China and India.
Products/Solutions/Services Offered	Pharmaceutical Manufacturing Waste Recovery
Geographic Presence	North America

12 APPENDIX

12.1 INSIGHTS OF INDUSTRY EXPERTS



12.2 DISCUSSION GUIDE

Q. 1. What are your views on the growth prospects of the waste management market? What is the current scenario, and how is it expected to grow in the future?

Your comments: _____

Q. 2. After thorough analysis and in-depth study via published sources and interviews with experts, we have formulated the following key drivers, restraints, opportunities, and challenges. Please incorporate your insights, highlighting any other existing market barriers in your country.

DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES OF THE WASTE MANAGEMENT MARKET

Drivers	▪ Stringent regulations of governments worldwide for better management of waste and initiate environmental protection ▪ Strong focus of several governments to conduct awareness programs showcasing importance of waste segregation and waste management ▪ Technological advances and shortened life cycle of electronic products help in increasing e-waste
Restraints	▪ Absence of necessary framework for collection and segregation of waste ▪ Requirement for huge capital investment to discard bio-medical waste
Opportunities	▪ Rising demand for waste management services from emerging economies due to rapid industrialization ▪ Growing adoption of construction and demolition (C&D) materials in urban areas with rising number of construction projects
Challenges	▪ Controlling environmental pollution caused by illegal export of e-waste in developing countries such as China, India, and Middle East ▪ Recycling plastic is costlier than producing new plastic ▪ Impact of COVID-19 on waste management

Your comments: _____

- Q. 3.** The waste management market has been segmented, by waste type, into hazardous waste, e-waste, plastic waste, bio-medical waste, and others. Which segment held the largest market share, in terms of value (USD), in 2020? Which segment is likely to be the fastest-growing market during the forecast period (2021–2026)? Please share your insights.

WASTE TYPE	MARKET SHARE (2020)	CAGR (2021–2026)
Hazardous Waste		
E-waste		
Plastic Waste		
Bio-medical Waste		
Others (Agriculture waste, paper waste, food waste, yard trimmings, wood, and nuclear waste.)		

Your comments: _____

- Q. 4.** The waste management market has been segmented, by service type, into open dumping, incineration/combustion, landfill, recycling, and composting & anaerobic digestion. Which segment held the largest market share, in terms of value (USD), in 2020? Which segment is likely to be the fastest-growing market during the forecast period (2021–2026)? Please share your insights.

SERVICE TYPE	MARKET SHARE (2020)	CAGR (2021–2026)
Open Dumping		
Incineration/Combustion		
Landfill		
Recycling		
Composting & Anaerobic Digestion		

Your comments: _____

- Q. 5.** The waste management market has been segmented, by end user, into residential, commercial, and industrial. Which segment held the largest market share, in terms of value (USD), in 2020? Which segment is likely to be the fastest-growing market during the forecast period (2021–2026)? Please share your insights.

END USER	MARKET SHARE (2020)	CAGR (2021–2026)
Residential		
Commercial		
Industrial		

Your comments: _____

RESIDENTIAL TYPE	MARKET SHARE (2020)	CAGR (2021–2026)
Households (Direct to Customer)		
Municipalities		
Societies/Home Associations		
Property Management		
Others (Townhouses and Multi-Family Homes)		

Your comments: _____

COMMERCIAL TYPE	MARKET SHARE (2020)	CAGR (2021–2026)
Offices & Retail Stores		
Commercial Property Owners		
Restaurants		
Government Offices		
Education & Healthcare Facilities		

Your comments: _____

INDUSTRIAL TYPE	MARKET SHARE (2020)	CAGR (2021–2026)
Construction, Renovation, & Demolition Sites		
Manufacturing		

Your comments: _____

Q. 6. What was the value of the global waste management market in 2020? What will be the year-on-year CAGR (%) at which the market is expected to grow annually until 2026 (by value)?

Your comments: _____

- Q. 7.** According to you, which geography is likely to contribute most (USD) to the waste management market in the future (2026)? Also, mention the market share of each region for 2020 and the CAGR at which the market from each region is likely to grow from 2021 to 2026.

GEOGRAPHY	MARKET SHARE (%) (2020)	CAGR (2021-2026)
Asia Pacific		
Europe		
North America		
South America		
Middle East & Africa		
Total		

Your comments: _____

- Q. 8.** Which companies will be the major/key players in the waste management market based on their revenue and market presence, along with a broad and versatile product/service portfolio? Please rank them in descending order of market share. Suggest whether this trend is likely to continue in the future or if any other player is expected to emerge as the winner in the competition.

COMPANY	MARKET SHARE (%), 2020
Biffa	
CLEAN HARBORS	
Covanta Holding	
Daiseki	
Hitachi Zosen	
REMONDIS SE & Co. KG	
Waste Management	
Advanced Disposal Services	

Your comments: _____

- Q. 9.** What will be the revenue pockets for the market players in the next five years? Where do you see the maximum growth potential?

Your comments: _____

- Q. 10.** According to you, what will be the impact of COVID-19 on the waste management market? How much growth can be expected in the market during the forecast period?

Your comments: _____

12.3 KNOWLEDGE STORE: MARKETSandMARKETS' SUBSCRIPTION PORTAL

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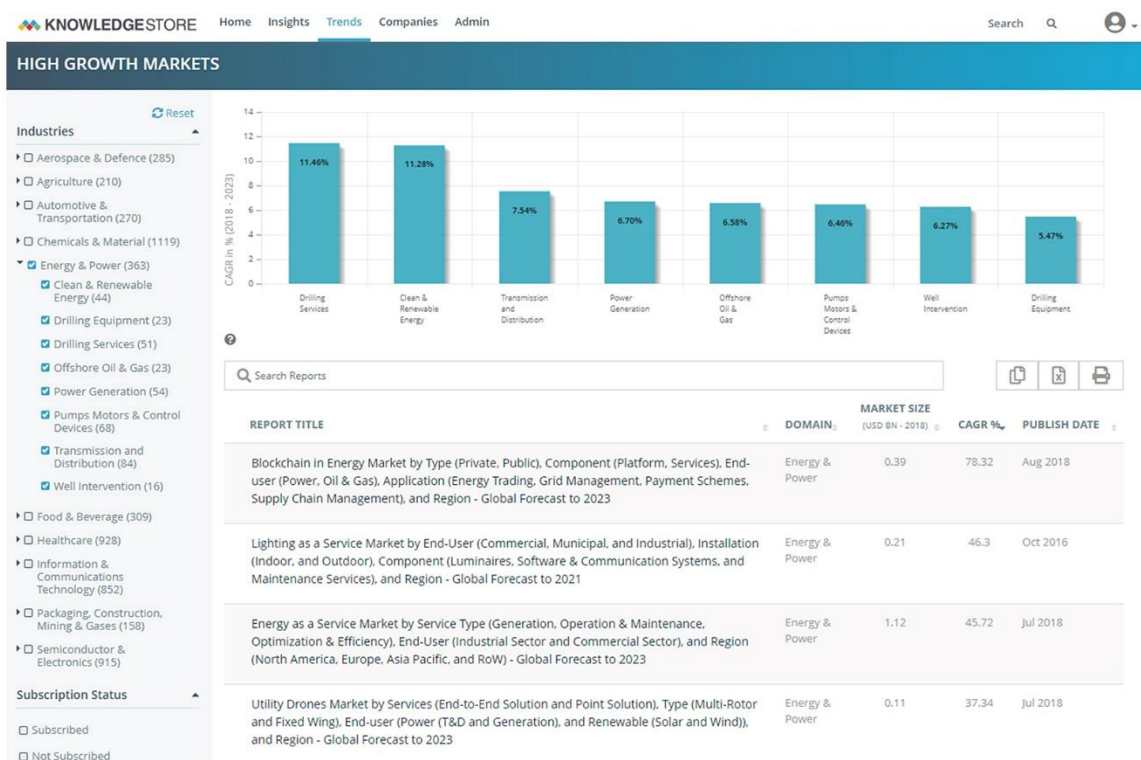
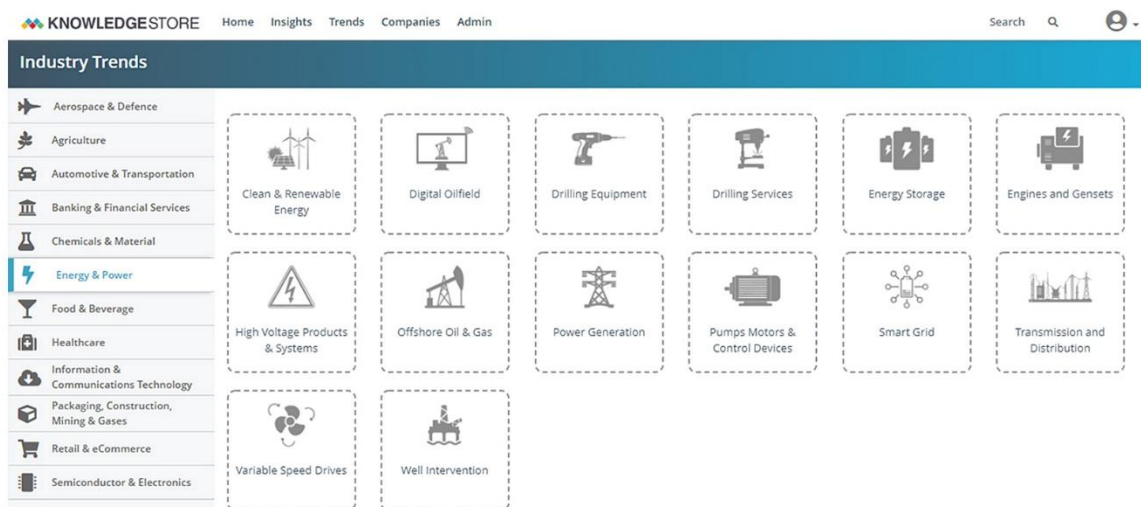
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12.4 AVAILABLE CUSTOMIZATIONS

With the given market data, MarketsandMarkets offers customizations according to a company's specific needs. The following customization options are available for the report:

PRODUCT ANALYSIS

- Product Matrix, which provides a detailed comparison of the product portfolio of each company

COMPANY INFORMATION

- Detailed analyses and profiling of additional market players

12.5 RELATED REPORTS

SR. NO.	REPORT TITLE	PUBLISHED DATE
1	MEDICAL WASTE MANAGEMENT MARKET - GLOBAL FORECAST TO 2025 By Service (Collection, Treatment, Disposal, Incineration, Recycling), Type of Waste ((Non-Hazardous, Infectious, Pharmaceuticals), Treatment Site (Offsite, Onsite), Waste Generator (Hospitals) https://www.marketsandmarkets.com/Market-Reports/medical-waste-management-market-1256.html	FEB, 2020
2	PLASTIC WASTE MANAGEMENT MARKET - GLOBAL FORECAST TO 2024 By Service (Collection, Recycling), By Polymer Type (PP, LDPE), By Source (Residential, Commercial, Industrial), By End-Use Applications (Packaging, Building & Construction), Region https://www.marketsandmarkets.com/Market-Reports/plastic-waste-management-market-80259244.html	SEP, 2019
3	MINING WASTE MANAGEMENT MARKET - GLOBAL FORECAST TO 2022 By Mining Method (Surface, and Underground), Metals/Minerals (Thermal Coal, Coking Coal, Iron Ore, Gold, Copper, Nickel), Waste Type (Overburden/Waste Rock, Tailings, and Mine Water), and Region https://www.marketsandmarkets.com/Market-Reports/mining-waste-management-market-104930371.html	JAN, 2018

12.6 AUTHOR DETAILS

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Vipul has more than 9 years of the overall experience, most of which are in the consulting, strategy, and market research industry pivoting around power and oil & gas domain, with due focus on allied industry verticals like industrial equipment including automation & electronics, environment & building technologies and general engineering. He has a proven track record of leading large, diverse teams to excellence and selling strategic, impactful solutions throughout complex, multi-layered environments. He also has vast experience in handling OEM projects across the product lifecycle with a broad knowledge of consulting, research and forecasting methodologies, with a high degree of direction setting & panoramic perspective of business

He holds a Post Graduate in Management from the Great Lakes Institute of Management in Energy & Finance. Earlier, he graduated as an Electrical Engineer from Uttar Pradesh Technical University.

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