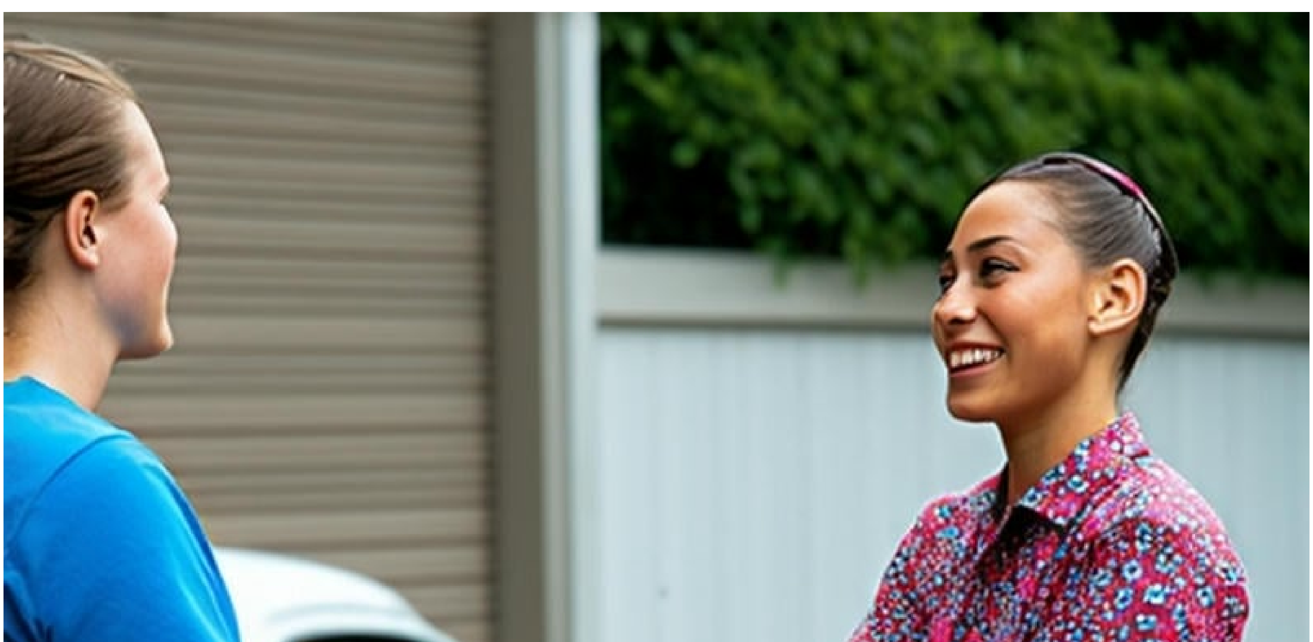
- **Understanding the Maintenance of Collection Vehicles**
  Understanding the Maintenance of Collection Vehicles Reviewing Inspection Procedures for Heavy Machinery Evaluating Fuel Efficiency Initiatives in Fleets Improving Reliability Through Preventive Maintenance Integrating GPS Tracking for Better Routing Comparing Various Fleet Management Software Solutions Determining Effective Vehicle Replacement Intervals Ensuring Proper Cleaning of Specialized Equipment Enhancing Safety With Regular Operator Training Monitoring Performance Metrics for Better Efficiency Selecting Appropriate Tires for Different Terrains Allocating Resources for Emergency Vehicle Repairs
- **Understanding the Value of Tracking Customer Interactions**
  Understanding the Value of Tracking Customer Interactions Exploring Methods for Prompt Support Response Improving Satisfaction Through Service Updates Implementing Automated Appointment Reminders Encouraging Customers to Share Service Feedback Selecting CRM Platforms for Small Operations Integrating Online Chat to Resolve Issues Quickly Measuring Engagement With Loyalty Programs Ensuring Data Privacy in Customer Communications Personalizing Offers Based on Past Service Usage Streamlining Complaint Resolution Steps Examining the Benefits of Real Time Support Channels
- **About Us**



In today's fast-paced world, efficiency is key, and businesses that can streamline their operations often find themselves ahead of the competition. Junk removal services, which play a crucial role in maintaining cleanliness and sustainability in our communities, are no exception. One technological advancement that has proven to be particularly beneficial for these services is the integration of GPS tracking systems. By leveraging GPS technology, junk removal companies can optimize their routing processes, leading to significant improvements in operational efficiency and customer satisfaction.

At its core, GPS tracking provides real-time location data, enabling junk removal services to plan and execute routes with precision. This capability is particularly advantageous in urban environments where traffic congestion can significantly delay service delivery. With GPS tracking, dispatchers can monitor road conditions and adjust routes on the fly to avoid traffic jams or construction zones. This flexibility ensures that trucks spend less time idling on the roads and more time completing pick-ups and deliveries.

Moreover, integrating GPS tracking into junk removal operations facilitates better resource allocation. Removing household junk is part of their core offerings **removal project** habitat for humanity. By analyzing historical route data, companies can identify patterns such as peak service hours or frequently serviced areas. Armed with this information, managers can allocate resources more efficiently-deploying additional vehicles during high-demand periods or adjusting staffing levels as needed. This proactive approach not only boosts productivity but also helps reduce fuel consumption and vehicle wear-and-tear, ultimately lowering operational costs.

Customer experience is another critical area where GPS tracking offers substantial benefits. In an era where consumers value transparency and timely service, knowing the exact whereabouts of a junk removal truck provides peace of mind.

Integrating GPS Tracking for Better Routing - box

1. box
2. 1-800-GOT-JUNK?
3. piano

Customers receive accurate estimated arrival times and can track the progress of their service in real time through mobile apps or web portals. Such features enhance trust and reliability-a crucial competitive edge in today's service-oriented economy.

Furthermore, GPS tracking contributes to improved accountability within junk removal teams. With detailed records of routes taken and time spent at each location readily available, management can ensure adherence to company protocols while identifying areas for improvement among staff members. This level of oversight encourages employees to perform optimally, knowing their performance is being monitored objectively.

In conclusion, integrating GPS tracking into junk removal services presents numerous advantages by enhancing route optimization efforts. The ability to dynamically adapt to changing conditions on the road leads not only to increased efficiency but also fosters better resource management and superior customer experiences-all while promoting accountability among team members. As technology continues to evolve rapidly across various industries worldwide-including waste management-those who embrace these innovations stand poised for success amidst ever-growing competition demands greater excellence from all facets involved throughout every operation conducted daily basis industry-wide alike globally beyond region-specific contexts alone previously thought possible before now indeed so!

Key Components of Vehicle Maintenance —

In the modern era of logistics and transportation, optimizing route efficiency has become a paramount objective for businesses striving to enhance their operational productivity and reduce costs. One pivotal strategy in achieving this goal is the integration of GPS tracking systems, which leverage real-time data to revolutionize routing processes. By harnessing the power of GPS technology, companies can navigate the complexities of transportation logistics with unprecedented precision and adaptability.

At its core, GPS tracking provides a comprehensive overview of vehicle locations, speeds, and routes in real time. This constant stream of data enables fleet managers to make informed decisions that directly impact route efficiency. Traditionally, route planning relied heavily on static maps and historical data, often resulting in suboptimal paths that failed to account for current traffic conditions or unexpected roadblocks. However, with real-time GPS data at their disposal, companies can dynamically adjust routes based on live traffic updates, weather conditions, and other unforeseen variables.

One significant advantage of integrating GPS tracking is the ability to minimize travel time and fuel consumption. By continuously analyzing traffic patterns and road conditions, GPS systems can suggest alternative routes that avoid congestion or road closures. This not only helps in reducing delivery times but also contributes to lowering fuel expenses-a major cost factor for any transport operation. Furthermore, efficient routing reduces wear and tear on vehicles by minimizing unnecessary mileage, thereby extending their lifespan and cutting down maintenance costs.

Real-time data from GPS tracking also enhances customer satisfaction through improved service reliability. In an age where consumers expect rapid deliveries with precise timing, being able to provide accurate estimated arrival times becomes a crucial differentiator for businesses. With GPS-enabled systems offering timely updates about potential delays or changes in delivery schedules, companies can communicate effectively with customers and manage expectations proactively.

Moreover, integrating GPS tracking fosters better resource management within organizations. Fleet operators gain insights into driver behavior patterns-such as excessive idling or speeding-that could lead to inefficiencies or safety concerns. By addressing these issues promptly through targeted training programs or policy adjustments facilitated by real-time monitoring data from GPS devices installed onboard vehicles themselves; not only does this improve overall operational efficiency but it also promotes safer driving practices among employees.

While there are undeniable benefits associated with incorporating GPS technology into routing strategies; challenges such as data privacy concerns must be addressed conscientiously when implementing these solutions across fleets operating globally today - ensuring compliance alongside technological advancement remains imperative moving forward too!

In conclusion: Integrating real-time data obtained via advanced global positioning systems (GPS) represents one transformative approach towards optimizing route efficiency within contemporary transportation networks worldwide today! Companies embracing these innovations stand poised not only achieve substantial cost savings increased competitiveness but ultimately deliver higher levels customer satisfaction than ever before possible previously without them either!

Posted by on

Scheduling and Record-Keeping for Fleet Maintenance

In today's fast-paced world, the quest for efficiency has become paramount, not only in terms of productivity but also concerning sustainable practices. One area where this dual objective is particularly relevant is in transportation logistics. Reducing fuel costs and mitigating environmental impact have emerged as critical goals for businesses aiming to streamline operations while embracing corporate responsibility. A promising solution lies in integrating GPS tracking systems to facilitate better routing-a technological advancement that holds the potential to revolutionize how we perceive and conduct transportation.

At the heart of efficient routing is the ability to determine the most effective path from point A to point B. Traditionally, drivers relied on experience or static maps, which often led to longer routes and increased fuel consumption. However, with the advent of GPS technology, a paradigm shift has occurred. These systems provide real-time data about traffic conditions, road closures, and optimal paths, allowing vehicles to navigate more intelligently and efficiently.

Integrating GPS tracking into fleet management systems offers myriad benefits. Firstly, it significantly reduces fuel costs by minimizing unnecessary mileage. With precise route planning derived from real-time data analytics, vehicles can avoid congested areas and take advantage of less-traveled roads. This optimization not only cuts down on travel time but also decreases fuel consumption-an economic boon for businesses facing fluctuating fuel prices.

Moreover, improved routing aids in lowering a fleet's environmental footprint. By reducing idling times and eliminating superfluous journeys through smart navigation choices, vehicles emit fewer greenhouse gases and pollutants into the atmosphere. In an era where environmental concerns are at the forefront of global discourse, adopting such technologies demonstrates a company's commitment to sustainability.

Additionally, GPS tracking facilitates proactive maintenance scheduling by monitoring vehicle performance metrics such as speed and engine health. Timely maintenance ensures vehicles operate at peak efficiency, further reducing unnecessary emissions and conserving energy-a win-win scenario for both businesses and the planet.

The implementation of GPS tracking systems also enhances safety for drivers by providing alerts about hazardous road conditions or accidents ahead in real time. Safer driving practices lead to fewer accidents and subsequently lower insurance costs-another financial benefit that cannot be overlooked.

While integrating GPS tracking for better routing requires an initial investment in technology infrastructure and training personnel to leverage these tools effectively, the long-term savings in reduced fuel use and minimized environmental impact make it an attractive proposition. Furthermore, as consumers increasingly favor companies that prioritize sustainability, adopting such measures can enhance brand reputation and customer loyalty.

In conclusion, harnessing the power of GPS tracking for optimized routing stands as a testament to how modern technology can drive both economic efficiencies and ecological stewardship within transportation logistics. Businesses willing to embrace this integration will find themselves at an advantageous intersection where cost savings meet ethical responsibility-a model for success in today's conscientious marketplace.

Common Challenges in Maintaining Junk Removal Vehicles

In today's fast-paced world, customer satisfaction is more crucial than ever for businesses striving to maintain a competitive edge. One of the key factors that significantly impacts customer satisfaction is service time. Long waiting times can lead to frustration and dissatisfaction, which can ultimately result in losing customers to competitors. However, by integrating GPS tracking technology into their operations, businesses can enhance their routing efficiency, leading to improved service times and higher customer satisfaction.

GPS tracking systems have revolutionized the way companies manage their fleets and delivery services. By offering real-time data on vehicle locations, routes, and traffic conditions, GPS technology enables businesses to optimize their logistics operations effectively.

Integrating GPS Tracking for Better Routing - 1-800-GOT-JUNK?

1. chemical substance
2. physical exercise
3. transport

This optimization ensures that deliveries are made more accurately and promptly, reducing waiting times for customers.

One of the primary benefits of GPS tracking is its ability to provide dynamic route optimization. Traditional routing methods often rely on static maps and schedules that do not account for real-time changes in traffic conditions or unexpected delays. With GPS tracking, businesses can receive live updates on road conditions and adjust routes accordingly. This adaptability means drivers can avoid congestion or accidents and take alternative routes that save time.

Moreover, GPS tracking facilitates better communication between dispatchers and drivers. Dispatchers can monitor the progress of each vehicle in real time and send updates or instructions as needed. This enhanced communication ensures that any issues encountered on the road are addressed promptly, minimizing delays. Additionally, it provides customers with accurate estimates of arrival times, allowing them to plan their schedules more effectively.

The implementation of GPS tracking also contributes to increased accountability among drivers. Knowing that their movements are being monitored encourages drivers to adhere strictly to assigned routes and schedules, reducing incidences of unnecessary detours or extended breaks. This accountability translates into faster service times for customers.

Furthermore, improved routing through GPS integration helps reduce operational costs for businesses by decreasing fuel consumption and vehicle wear-and-tear associated with longer travel distances or frequent stops due to poor route planning. These savings can be reinvested into other areas of customer service enhancement.

Ultimately, enhancing customer satisfaction through improved service times is an achievable goal with the integration of GPS tracking technology for better routing solutions. As businesses continue to embrace this technology's potential benefits-such as dynamic route optimization, enhanced communication between dispatchers and drivers-and increased accountability-they position themselves not only as efficient service providers but also as organizations committed to meeting evolving consumer expectations in today's demanding market landscape.

By prioritizing efficient service delivery through innovative technologies like GPS tracking systems-businesses foster loyalty among existing clients while attracting new ones who value reliability alongside excellence in customer experience-a winning formula indispensable amid intensely competitive industries globally today!

Role of Technology in Streamlining Vehicle Maintenance

In today's rapidly evolving transportation landscape, the integration of GPS tracking technology has become a pivotal tool in enhancing driver performance and safety. By leveraging advanced satellite navigation systems, businesses can optimize routing strategies, leading to both increased efficiency and heightened safety measures for drivers on the road.

GPS tracking offers real-time insights into vehicle locations, allowing companies to monitor their fleets with unparalleled accuracy. This technology not only ensures that drivers are following the most efficient routes but also helps in identifying patterns that may indicate unsafe driving behaviors. For instance, abrupt stops or excessive speeding can be flagged by GPS systems, enabling fleet managers to address these issues promptly. As a result, drivers receive constructive feedback that can help them improve their habits behind the wheel.

Furthermore, integrating GPS tracking into fleet operations provides numerous benefits in terms of routing efficiency. By analyzing traffic patterns and road conditions in real time, GPS systems can suggest alternative routes that minimize fuel consumption and reduce travel time.

Integrating GPS Tracking for Better Routing - piano

1. barbecue grill
2. HVAC
3. finger

This not only cuts down on operational costs but also lessens the environmental impact of transportation activities. The ability to reroute quickly during unforeseen circumstances-such as accidents or severe weather-also enhances overall safety by reducing the potential for driver fatigue and stress.

In addition to improving routing and performance metrics, GPS tracking plays a crucial role in maintaining rigorous safety standards within a fleet. With access to comprehensive data analytics, companies can develop targeted training programs tailored to specific drivers or groups who may need additional support. This proactive approach ensures that drivers remain informed about best practices and are equipped with the knowledge they need to navigate safely across diverse road environments.

Moreover, having detailed records of each journey allows businesses to ensure compliance with legal regulations governing driving hours and rest periods. This oversight is critical in preventing overwork-related incidents and maintaining both driver well-being and public safety.

In conclusion, integrating GPS tracking into fleet management operations presents numerous advantages for monitoring driver performance and enhancing safety protocols. By providing real-time data on vehicle locations and driving behaviors, this technology empowers companies to make informed decisions that streamline routing processes while prioritizing driver welfare. As we continue to embrace technological advancements in transportation systems, it is evident that GPS tracking will remain an indispensable asset in fostering safer roads for everyone involved.

Cost-Benefit Analysis of Effective Fleet Maintenance Strategies

Integrating GPS tracking for better routing has revolutionized various industries by enhancing efficiency and accuracy in navigation. However, the implementation of GPS technology is not without its challenges. Addressing these hurdles requires innovative solutions to fully harness the potential of GPS systems.

One significant challenge in implementing GPS technology is signal interference. Urban areas with tall buildings, dense forests, or even adverse weather conditions can obstruct satellite signals, leading to inaccurate positioning. This can result in inefficient routing and delays, particularly for logistics companies that rely on precise navigation for timely deliveries. To mitigate this issue, companies are increasingly using multi-constellation GNSS (Global Navigation Satellite Systems), which utilize multiple satellite systems such as GPS, GLONASS, Galileo, and BeiDou to provide better coverage and accuracy even in challenging environments.

Another challenge is data privacy and security concerns. With the rise of cyber threats, protecting sensitive location data has become paramount. Unauthorized access to this information could lead to breaches of privacy or industrial espionage. Organizations must implement robust encryption protocols and secure data storage solutions to safeguard against such vulnerabilities. Additionally, adhering to regulations like GDPR ensures that user consent is obtained before collecting any location data.

The cost of implementing GPS technology can also be a barrier for smaller businesses. Hardware expenses for modern GPS devices and software development costs can be prohibitive. To overcome this financial hurdle, many companies are turning to cloud-based solutions that reduce upfront costs while providing scalable services tailored to their needs.

Despite these challenges, the benefits of integrating GPS tracking into routing processes are undeniable. Real-time vehicle tracking enables companies to optimize routes dynamically based on current traffic conditions, reducing fuel consumption and improving delivery times. It also enhances customer satisfaction by providing accurate ETAs and allowing customers to track their orders in real time.

In conclusion, while there are notable challenges in implementing GPS technology for better routing-such as signal interference, data privacy concerns, and cost-there are effective solutions available that make these obstacles surmountable. By leveraging advancements in satellite technology and adopting comprehensive security measures alongside cost-effective platforms, businesses can fully exploit the advantages offered by modern GPS systems to enhance operational efficiency and deliver superior service quality.

In recent years, the junk removal industry has seen a significant transformation driven by technological advancements. At the forefront of this evolution is the integration of GPS tracking systems into fleet management, which promises to enhance operational efficiency and customer satisfaction. As we look toward future trends in GPS tracking for junk removal fleets, it's clear that these innovations will play a pivotal role in optimizing routing processes.

The integration of GPS tracking for better routing is poised to become a fundamental component of fleet management strategies. In the past, route planning for junk removal fleets was largely dependent on manual input and static maps, which often led to inefficiencies such as increased fuel consumption and longer travel times. However, with real-time GPS tracking systems, companies can now dynamically adjust routes based on current conditions such as traffic congestion or road closures.

One of the most significant future trends in this area is the incorporation of artificial intelligence (AI) and machine learning algorithms into GPS systems. These technologies have the capability to analyze vast amounts of data swiftly, providing insights that can be used to predict traffic patterns and identify optimal routes. By leveraging AI-driven predictive analytics, junk removal companies can significantly reduce travel times and improve fuel efficiency, ultimately leading to cost savings and reduced environmental impact.

Another emerging trend is the use of integrated platforms that combine GPS tracking with other operational tools such as inventory management and customer relationship management (CRM) systems. This holistic approach not only streamlines operations but also enhances customer experiences by providing accurate arrival times and updates through automated notifications.

Moreover, with the increasing adoption of the Internet of Things (IoT), vehicles equipped with smart sensors are becoming more common within fleets. These sensors can monitor vehicle health in real-time and communicate data back to central systems via GPS technology. As a result, fleet managers can proactively maintain their vehicles, minimizing downtime due to unforeseen repairs and ensuring reliable service delivery.

As privacy concerns continue to grow among consumers, another crucial aspect of future trends in GPS tracking will be addressing data security issues. Companies will need to ensure robust measures are in place to protect sensitive information collected through these systems while maintaining transparency about how data is used.

Looking ahead, it's evident that integrating advanced GPS tracking technologies into junk removal fleets will bring about transformative changes in routing efficiency. Those companies that embrace these innovations are likely to gain a competitive edge through improved resource allocation and enhanced service quality. Ultimately, by investing in cutting-edge solutions today, businesses can position themselves at the forefront of an increasingly tech-driven industry landscape tomorrow.

About Home appliance

Home appliance

two electric kettles, a drip coffee maker, and a toaster on a table top

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Home appliances may be used in kitchens

Industry	Food and beverages, health care
Application	Kitchens and laundry rooms
Wheels	In some cases
Examples	Refrigerator, toaster, kettle, microwave, blender

A **home appliance**, also referred to as a **domestic appliance**, an **electric appliance** or a **household appliance**,[1] is a machine which assists in household functions[2] such as cooking, cleaning and food preservation.

The domestic application attached to home appliance is tied to the definition of appliance as "an instrument or device designed for a particular use or function".[3] *Collins English Dictionary* defines "home appliance" as: "devices or machines, usually electrical, that are in your home and which you use to do jobs such as cleaning or cooking".[4] The broad usage allows for nearly any device intended for domestic use to be a home appliance, including consumer electronics as well as stoves,[5] refrigerators, toasters[5] and air conditioners.

The development of self-contained electric and gas-powered appliances, an American innovation, emerged in the early 20th century. This evolution is linked to the decline of full-time domestic servants and desire to reduce household chores, allowing for more leisure time. Early appliances included washing machines, water heaters, refrigerators, and sewing machines. The industry saw significant growth post-World War II, with the introduction of dishwashers and clothes dryers. By the 1980s, the appliance industry was booming, leading to mergers and antitrust legislation. The US National Appliance Energy Conservation Act of 1987 mandated a 25% reduction in energy consumption every five years. By the 1990s, five companies dominated over 90% of the market.

Major appliances, often called white goods, include items like refrigerators and washing machines, while small appliances encompass items such as toasters and coffee makers.[6] Product design shifted in the 1960s, embracing new materials and colors. Consumer electronics, often referred to as brown goods, include items like TVs and computers.[7] There is a growing trend towards home automation and internet-connected appliances. Recycling of home appliances involves dismantling and recovering materials.

History

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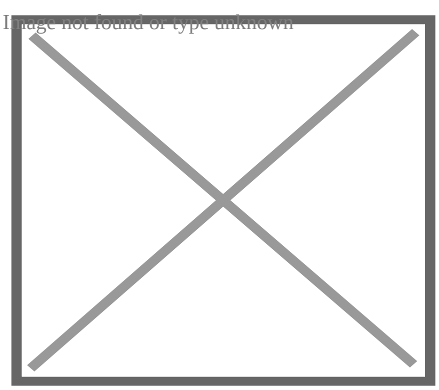


Early 20th century electric toaster

While many appliances have existed for centuries, the self-contained electric or gas powered appliances are a uniquely American innovation that emerged in the early twentieth century. The development of these appliances is tied to the disappearance of full-time domestic servants and the desire to reduce the time-consuming activities in pursuit of more recreational time. In the early 1900s, electric and gas appliances included washing machines, water heaters, refrigerators, kettles and sewing machines. The invention of Earl Richardson's small electric clothes iron in 1903 gave a small initial boost to the home appliance industry. In the Post–World War II economic expansion, the domestic use of dishwashers, and clothes dryers were part of a shift for convenience. Increasing discretionary income was reflected by a rise in miscellaneous home appliances.[8][9][*self-published*

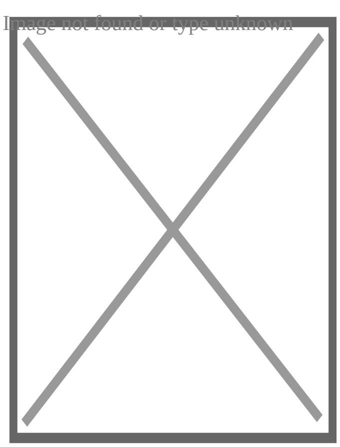
In America during the 1980s, the industry shipped $1.5 billion worth of goods each year and employed over 14,000 workers, with revenues doubling between 1982 and 1990 to $3.3 billion. Throughout this period, companies merged and acquired one another to reduce research and production costs and eliminate competitors, resulting in antitrust legislation.

The United States Department of Energy reviews compliance with the National Appliance Energy Conservation Act of 1987, which required manufacturers to reduce the energy consumption of the appliances by 25% every five years.[8]

In the 1990s, the appliance industry was very consolidated, with over 90% of the products being sold by just five companies. For example, in 1991, dishwasher manufacturing market share was split between General Electric with 40% market share, Whirlpool with 31%, Electrolux with 20%, Maytag with 7% and Thermador with just 2%.[8]

Major appliances

[edit]



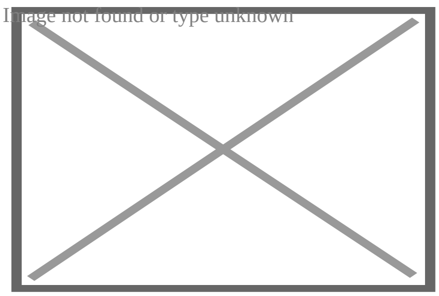
Swedish washing machine, 1950s

Main article: Major appliance

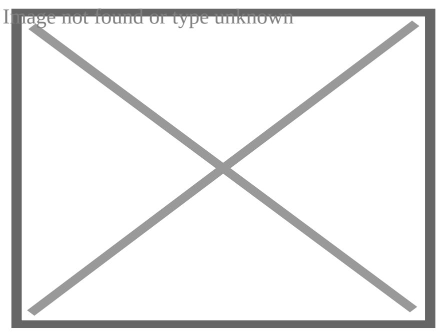
Major appliances, also known as white goods, comprise major household appliances and may include: air conditioners,[10] dishwashers,[10] clothes dryers, drying cabinets, freezers, refrigerators,[10] kitchen stoves, water heaters,[10] washing machines,[10] trash compactors, microwave ovens, and induction cookers. White goods were typically painted or enameled white, and many of them still are.[11]

Small appliances

[edit]
Main article: Small appliance



Small kitchen appliances



The small appliance department at a store

Small appliances are typically small household electrical machines, also very useful and easily carried and installed. Yet another category is used in the kitchen, including: juicers, electric mixers, meat grinders, coffee grinders, deep fryers, herb grinders, food processors,[12] electric kettles, waffle irons, coffee makers, blenders,[12] rice cookers,[5] toasters and exhaust hoods.

Product design

[edit]

In the 1960s the product design for appliances such as washing machines, refrigerators, and electric toasters shifted away from Streamline Moderne and embraced technological advances in the fabrication of sheet metal. A choice in color, as well as fashionable accessory, could be offered to the mass market without increasing production cost. Home appliances were sold as space-saving ensembles.[13]

Consumer electronics

[edit]

Main article: Consumer electronics

Consumer electronics or *home electronics*[10] are electronic (analog or digital) equipment intended for everyday use, typically in private homes. Consumer electronics include devices used for entertainment, communications and recreation. In British English, they are often called **brown goods** by producers and sellers, to distinguish them from "white goods" which are meant for housekeeping tasks, such as washing machines and refrigerators, although nowadays, these could be considered brown goods, some of these being connected to the Internet.[14][n 1] Some such appliances were traditionally finished with genuine or imitation wood, hence the name. This has become rare but the name has stuck, even for goods that are unlikely ever to have had a wooden case (e.g. camcorders). In the 2010s, this distinction is absent in large big box consumer electronics stores, which sell both entertainment, communication, and home office devices and kitchen appliances such as refrigerators. The highest selling consumer electronics products are compact discs.[16] Examples are: home electronics, radio receivers, TV sets,[5] VCRs, CD and DVD players,[5] digital cameras, camcorders, still cameras, clocks, alarm clocks, computers, video game consoles, HiFi and home cinema, telephones and answering machines.

Life spans

[edit]

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A survey conducted in 2020 of more than thirteen thousand people in the UK revealed how long appliance owners had their appliances before needing to replace them due to a fault, deteriorating performance, or the age of the appliance.

Appliance	Longest average estimated lifespan	Shortest average estimated lifespan
Washing machine	21 years	13 years
Tumble dryer	24 years	17 years
Dishwasher	22 years	13 years
Built-in oven	29 years	23 years
Fridge freezer	24 years	14 years
Fridge	29 years	18 years

Home automation

[edit]

Main article: Home automation
See also: Internet of things

There is a trend of networking home appliances together, and combining their controls and key functions.[18] For instance, energy distribution could be managed more evenly so that when a washing machine is on, an oven can go into a delayed start mode, or vice versa. Or, a washing machine and clothes dryer could share information about load characteristics (gentle/normal, light/full), and synchronize their finish times so the wet laundry does not have to wait before being put in the dryer.

Additionally, some manufacturers of home appliances are quickly beginning to place hardware that enables Internet connectivity in home appliances to allow for remote control, automation, communication with other home appliances, and more functionality enabling connected cooking.[18][19][20][21] Internet-connected home appliances were especially prevalent during recent Consumer Electronics Show events.[22]

Recycling

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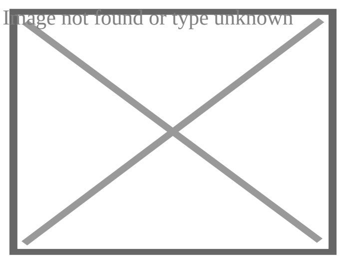

New Orleans, Louisiana, United States after Hurricane Katrina: mounds of trashed appliances with a few smashed automobiles mixed in, waiting to be scrapped

Main article: Appliance recycling

Appliance recycling consists of dismantling waste home appliances and scrapping their parts for reuse. The main types of appliances that are recycled are T.V.s, refrigerators, air conditioners, washing machines, and computers. It involves disassembly, removal of hazardous components and destruction of the equipment to recover materials, generally by shredding, sorting and grading.[23]

See also

[edit]

- icon Image not found or type unknown Technology portal
- Image not found or type unknown Housing portal
- Domestic technology – Usage of applied science in houses
- Home automation – Building automation for a home

Notes

[edit]

1. **^** "Brown" from the bakelite and wood-veneer finishes typical on 1950s and 1960s radio and TV receivers, and in contrast to "white goods".[15]

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External links

[edit]

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Look up ***household appliance*** in Wiktionary, the free dictionary.

- v
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Home appliances

- Air conditioner
- Air fryer
- Air ioniser
- Air purifier
- Barbecue grill
- Blender
  - Immersion blender
- Bread machine
- Bug zapper
- Coffee percolator
- Clothes dryer
  - combo
- Clothes iron
- Coffeemaker
- Dehumidifier
- Dishwasher
  - drying cabinet
- Domestic robot
  - comparison
- Deep fryer
- Electric blanket
- Electric drill
- Electric kettle
- Electric knife
- Electric water boiler
- Electric heater
- Electric shaver
- Electric toothbrush
- Epilator
- Espresso machine
- Evaporative cooler
- Food processor
- Fan
  - attic
  - bladeless
  - ceiling
  - Fan heater
  - window

Types

- Freezer
- Garbage disposer
- Hair dryer
- Hair iron
- Humidifier
- Icemaker
- Ice cream maker
- Induction cooker
- Instant hot water dispenser
- Juicer
- Kitchen hood
- Kitchen stove

See also

- Appliance plug
- Appliance recycling

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- France
- BnF data
- Czech Republic
- Israel
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About Waste management

For the company, see **Waste Management (corporation)**. For other uses, see **Waste management (disambiguation)**.
"Waste disposal" redirects here. For the kitchen device, see **Garbage disposal unit**.
Not to be confused with **Sanitary engineering**.

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Find sources: **"Waste management"** – **news** · **newspapers** · **books** · **scholar** · **JSTOR** *(May 2011)* *(**Learn how and when to remove this message**)*

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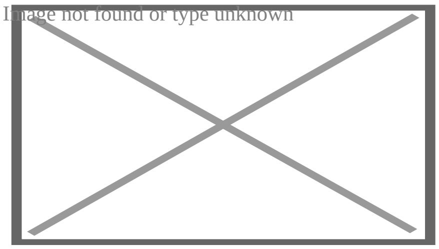
Part of a **series** on

Pollution



Air pollution from a factory

Air

- Acid rain
- Air quality index
- Atmospheric dispersion modeling
- Chlorofluorocarbon
- Combustion
- Exhaust gas
- Haze
- Global dimming
- Global distillation
- Indoor air quality
- Non-exhaust emissions
- Ozone depletion
- Particulates
- Persistent organic pollutant
- Smog
- Soot
- Volatile organic compound

Biological

- Biological hazard
- Genetic
- Illegal logging
- Introduced species
  - Invasive species

Digital

- Information

Electromagnetic

- Light
  - Ecological
  - Overillumination
- Radio spectrum

Natural

- Ozone
- Radium and radon in the environment
- Volcanic ash
- Wildfire

Noise

- Transportation
- Health effects from noise
- Marine mammals and sonar
- Noise barrier
- Noise control
- Soundproofing

Radiation

- Actinides
- Bioremediation
- Depleted uranium
- Nuclear fission
- Nuclear fallout
- Plutonium
- Poisoning
- Radioactivity
- Uranium
- Radioactive waste

Soil

- Agricultural
- Land degradation
- Bioremediation
- Defecation
- Electrical resistance heating
- Illegal mining
- Soil guideline values
- Phytoremediation

Solid waste

- Advertising mail
- Biodegradable waste
- Brown waste
- Electronic waste
- Foam food container
- Food waste
- Green waste
- Hazardous waste
- Industrial waste
- Litter
- Mining
- Municipal solid waste
- Nanomaterials
- Plastic
- Packaging waste
- Post-consumer waste
- Waste management

Space

- Space debris

Thermal

- Urban heat island

Visual

- Air travel
- Advertising clutter
- Overhead power lines
- Traffic signs
- Urban blight
- Vandalism

War

- Chemical warfare
- Herbicidal warfare
    - Agent Orange
- Nuclear holocaust
    - Nuclear fallout
    - Nuclear famine
    - Nuclear winter
- Scorched earth
- Unexploded ordnance
- War and environmental law

Water

- Agricultural wastewater
- Biosolids
- Diseases
- Eutrophication
- Firewater
- Freshwater
- Groundwater
- Hypoxia
- Industrial wastewater
- Marine
- Monitoring
- Nonpoint source
- Nutrient
- Ocean acidification
- Oil spill
- Pharmaceuticals
- Freshwater salinization
- Septic tanks
- Sewage
- Shipping
- Sludge
- Stagnation
- Sulfur water
- Surface runoff
- Turbidity
- Urban runoff
- Water quality
- Wastewater

Topics

- History
- Pollutants
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  - Paint

Misc

- Area source
- Brain health and pollution
- Debris
- Dust
- Garbology
- Legacy
- Midden
- Point source
- Waste
    - Toxic

Lists

- Diseases
- Law by country
- Most polluted cities
- Least polluted cities by PM2.5
- Treaties
- Most polluted rivers

Categories

- By country

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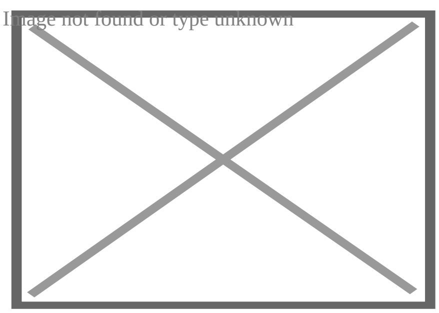
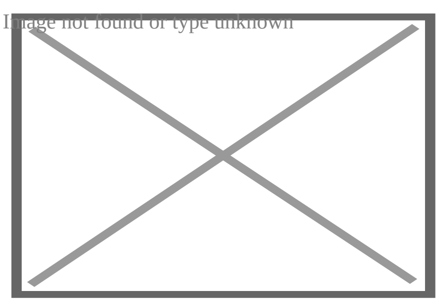
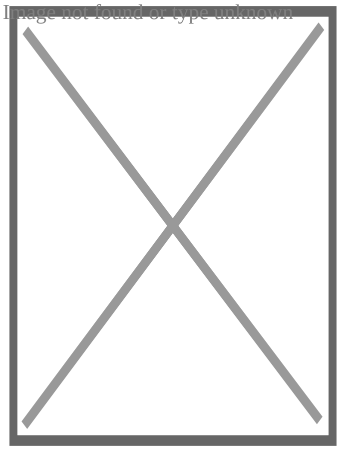
- Image not found or type unknown icon Ecology portal



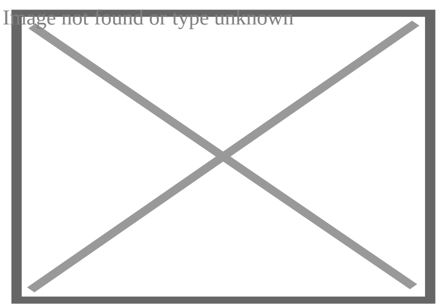
A specialized trash collection truck providing regular municipal trash collection in a neighborhood in **Stockholm**, **Sweden**



Waste pickers burning **e-waste** in **Agbogbloshie**, a site near Accra in Ghana that processes large volumes of international electronic waste. The pickers burn the plastics off of materials and collect the metals for recycling, However, this process exposes pickers and their local communities to toxic fumes.



Containers for consumer waste collection at the **GdaÃƒâ€¦Ã¢â,¬Å¾sk University of Technology**



A recycling and waste-to-energy plant for waste that is not exported

Waste management or **waste disposal** includes the processes and actions required to manage **waste** from its inception to its final **disposal**.**[1]** This includes the **collection**, **transport**, **treatment**, and disposal of waste, together with monitoring and regulation of the waste management process and waste-related **laws**, technologies, and economic mechanisms.

Waste can either be **solid**, **liquid**, or **gases** and each type has different methods of disposal and management. Waste management deals with all types of waste, including **industrial**, **biological**, household, municipal, organic, **biomedical**, **radioactive wastes.** In some cases, waste can pose a threat to human health.**[2]** Health issues are associated with the entire process of waste management. Health issues can also arise indirectly or directly: directly through the handling of solid waste, and indirectly through the consumption of water, soil, and food.**[2]** Waste is produced by human activity, for example, the extraction and processing of raw materials.**[3]** Waste management is intended to reduce the adverse effects of waste on human **health**, the **environment**, planetary resources, and **aesthetics**.

The aim of waste management is to reduce the dangerous effects of such waste on the environment and human health. A big part of waste management deals with **municipal solid waste**, which is created by industrial, commercial, and household activity.[4]

Waste management practices are not the same across countries (**developed** and **developing nations**); regions (**urban** and **rural areas**), and **residential** and **industrial** sectors can all take different approaches.[5]

Proper management of waste is important for building sustainable and liveable cities, but it remains a challenge for many developing countries and cities. A report found that effective waste management is relatively expensive, usually comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported.[6] A large portion of waste management practices deal with **municipal solid waste** (MSW) which is the bulk of the waste that is created by household, industrial, and commercial activity.[7] According to the **Intergovernmental Panel on Climate Change** (IPCC), municipal solid waste is expected to reach approximately 3.4 Gt by 2050; however, policies and lawmaking can reduce the amount of waste produced in different areas and cities of the world.[8] Measures of waste management include measures for integrated techno-economic mechanisms[9] of a **circular economy**, effective disposal facilities, export and import control[10][11] and optimal **sustainable design** of products that are produced.

In the first **systematic review** of the scientific evidence around global waste, its management, and its impact on human health and life, authors concluded that about a fourth of all the municipal solid terrestrial waste is not collected and an additional fourth is mismanaged after collection, often being burned in open and uncontrolled fires – or close to one billion tons per year when combined. They also found that broad priority areas each lack a "high-quality **research** base", partly due to the absence of "substantial **research funding**", which motivated scientists often require.[12][13] Electronic waste (ewaste) includes discarded computer monitors, motherboards, mobile phones and chargers, compact discs (CDs), headphones, television sets, air conditioners and refrigerators. According to the Global E-waste Monitor 2017, India generates ~ 2 million tonnes (Mte) of e-waste annually and ranks fifth among the e-waste producing countries, after the **United States**, the **People's Republic of China**, **Japan** and **Germany**.[14]

Effective 'Waste Management' involves the practice of '7R' - 'R'efuse, 'R'educe', 'R'euse, 'R'epair, **'R'epurpose**, 'R'ecycle and 'R'ecover. Amongst these '7R's, the first two ('Refuse' and 'Reduce') relate to the non-creation of waste - by refusing to buy non-essential products and by reducing consumption. The next two ('Reuse' and 'Repair') refer to increasing the usage of the existing product, with or without the substitution of certain parts of the product. 'Repurpose' and 'Recycle' involve maximum usage of the materials used in the product, and 'Recover' is the least preferred and least efficient waste management practice involving the recovery of embedded energy in the waste material. For example, burning the waste to produce heat (and electricity from heat). Certain non-biodegradable products are also dumped away as 'Disposal', and this is not a "waste-'management'" practice.[15]

Principles of waste management

[edit]

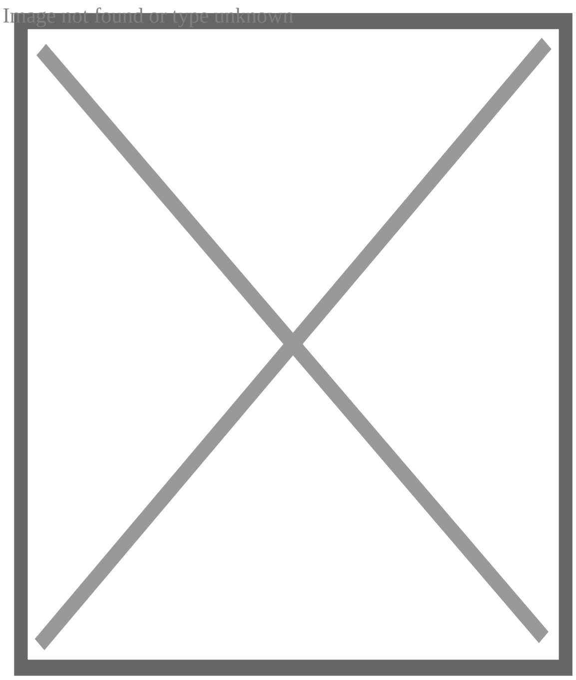


Diagram of the waste hierarchy

Waste hierarchy

[edit]

The **waste hierarchy** refers to the "3 Rs" **Reduce**, **Reuse** and **Recycle**, which classifies waste management strategies according to their desirability in terms of **waste minimisation**. The waste hierarchy is the bedrock of most waste minimization strategies. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of end waste; see: **resource recovery**.[16][17] The waste hierarchy is represented as a pyramid because the basic premise is that policies should promote measures to prevent the generation of waste. The next step or preferred action is to seek alternative uses for the waste that has been generated, i.e., by re-use. The next is recycling which includes composting. Following this step is material recovery and **waste-to-energy**. The final action is disposal, in landfills or through incineration without **energy recovery**. This last step is the final resort for waste that has not been prevented, diverted, or recovered.[18][*page needed*] The waste hierarchy represents the progression of a product or material through the sequential stages of the pyramid of waste management. The hierarchy represents the latter parts of the life-cycle for each product.[19]

Life-cycle of a product

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The life-cycle of a product, often referred to as the **product lifecycle**, encompasses several key stages that begin with the design phase and proceed through manufacture, distribution, and primary use. After these initial stages, the product moves through the waste hierarchy's stages of reduce, reuse, and recycle. Each phase in this lifecycle presents unique opportunities for policy intervention, allowing stakeholders to rethink the necessity of the product, redesign it to minimize its waste potential, and extend its useful life.

During the design phase, considerations can be made to ensure that products are created with fewer resources, are more durable, and are easier to repair or recycle. This stage is critical for embedding sustainability into the product from the outset. Designers can select materials that have lower environmental impacts and create products that require less energy and resources to produce.

Manufacturing offers another crucial point for reducing waste and conserving resources. Innovations in production processes can lead to more efficient use of materials and energy, while also minimizing the generation of by-products and emissions. Adopting cleaner production techniques and improving manufacturing efficiency can significantly reduce the environmental footprint of a product.

Distribution involves the logistics of getting the product from the manufacturer to the consumer. Optimizing this stage can involve reducing packaging, choosing more sustainable transportation methods, and improving supply chain efficiencies to lower the overall environmental impact. Efficient logistics planning can also help in reducing fuel consumption and greenhouse gas emissions associated with the transport of goods.

The primary use phase of a product's lifecycle is where consumers interact with the product. Policies and practices that encourage responsible use, regular maintenance, and the proper functioning of products can extend their lifespan, thus reducing the need for frequent replacements and decreasing overall waste.

Once the product reaches the end of its primary use, it enters the waste hierarchy's stages. The first stage, reduction, involves efforts to decrease the volume and toxicity of waste generated. This can be achieved by encouraging consumers to buy less, use products more efficiently, and choose items with minimal packaging.

The reuse stage encourages finding alternative uses for products, whether through donation, resale, or repurposing. Reuse extends the life of products and delays their entry into the waste stream.

Recycling, the final preferred stage, involves processing materials to create new products, thus closing the loop in the material lifecycle. Effective recycling programs can significantly reduce the need for virgin materials and the environmental impacts associated with extracting and processing those materials.

Product life-cycle analysis (LCA) is a comprehensive method for evaluating the environmental impacts associated with all stages of a product's life. By systematically assessing these impacts, LCA helps identify opportunities to improve environmental performance and resource efficiency. Through optimizing product designs, manufacturing processes, and end-of-life management, LCA aims to maximize the use of the world's limited resources and minimize the unnecessary generation of waste.

In summary, the product lifecycle framework underscores the importance of a holistic approach to product design, use, and disposal. By considering each stage of the lifecycle and implementing policies and practices that promote sustainability, it is possible to significantly reduce the environmental impact of products and contribute to a more sustainable future.

Resource efficiency

[**edit**]
Main article: **resource efficiency**

Resource efficiency reflects the understanding that global economic growth and development can not be sustained at current production and consumption patterns. Globally, humanity extracts more resources to produce goods than the planet can replenish. Resource efficiency is the reduction of the environmental impact from the production and consumption of these goods, from final raw material extraction to the last use and disposal.

Polluter-pays principle

[**edit**]

The **polluter-pays principle** mandates that the polluting parties pay for the impact on the environment. With respect to waste management, this generally refers to the requirement for a waste generator to pay for appropriate disposal of the unrecoverable materials.[20]

History

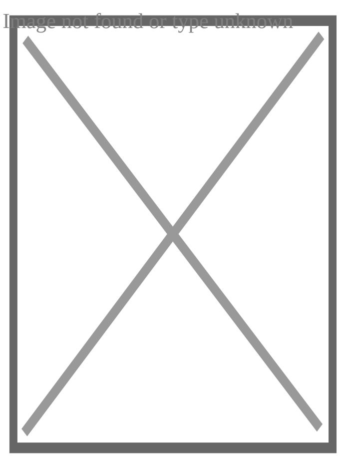
[**edit**]
Main article: **History of waste management**

Throughout most of history, the amount of **waste** generated by humans was insignificant due to low levels of **population density** and **exploitation of natural resources**. Common waste produced during pre-modern times was mainly ashes and human **biodegradable waste**, and these were released back into the ground locally, with minimum **environmental impact**. Tools made out of **wood** or **metal** were generally reused or passed down through the generations.

However, some civilizations have been more profligate in their waste output than others. In particular, the **Maya** of **Central America** had a fixed monthly ritual, in which the people of the village would gather together and burn their rubbish in large dumps.[21][*irrelevant citation*]

Modern era

[**edit**]



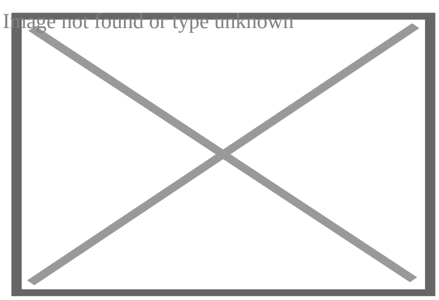
Edwin Chadwick's 1842 report *The Sanitary Condition of the Labouring Population* was influential in securing the passage of the first legislation aimed at waste clearance and disposal.

Following the onset of the **Industrial Revolution**, industrialisation, and the sustained urban growth of large population centres in **England**, the buildup of waste in the cities caused a rapid deterioration in levels of **sanitation** and the general quality of urban life.

The streets became choked with filth due to the lack of waste clearance regulations.[22] Calls for the establishment of municipal authority with waste removal powers occurred as early as 1751, when **Corbyn Morris** in London proposed that "... as the preservation of the health of the people is of great importance, it is proposed that the cleaning of this city, should be put under one uniform public management, and all the filth be...conveyed by the **Thames** to proper distance in the country".[23]

However, it was not until the mid-19th century, spurred by increasingly devastating **cholera** outbreaks and the emergence of a public health debate that the first legislation on the issue emerged. Highly influential in this new focus was the report *The Sanitary Condition of the Labouring Population* in 1842[24] of the **social reformer**, **Edwin Chadwick**, in which he argued for the importance of adequate waste removal and management facilities to improve the health and wellbeing of the city's population.

In the UK, the Nuisance Removal and Disease Prevention Act of 1846 began what was to be a steadily evolving process of the provision of regulated waste management in London.[25] The **Metropolitan Board of Works** was the first citywide authority that centralized sanitation regulation for the rapidly expanding city, and the **Public Health Act 1875** made it compulsory for every household to deposit their weekly waste in "moveable receptacles" for disposal—the first concept for a **dustbin**.[26] In the **Ashanti Empire** by the 19th century, there existed a Public Works Department that was responsible for sanitation in **Kumasi** and its suburbs. They kept the streets clean daily and commanded civilians to keep their compounds clean and weeded.[27]



Manlove, Alliott & Co. Ltd. 1894 destructor furnace. The use of **incinerators** for waste disposal became popular in the late 19th century.

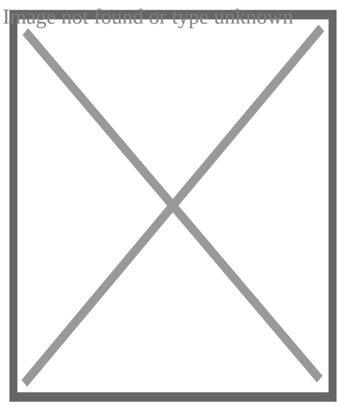
The dramatic increase in waste for disposal led to the creation of the first **incineration** plants, or, as they were then called, "destructors". In 1874, the first incinerator was built in **Nottingham** by **Manlove, Alliott & Co. Ltd.** to the design of Alfred Fryer.[23] However, these were met with opposition on account of the large amounts of ash they produced and which wafted over the neighbouring areas.[28]

Similar municipal systems of waste disposal sprung up at the turn of the 20th century in other large cities of **Europe** and **North America**. In 1895, **New York City** became the first U.S. city with public-sector garbage management.[26]

Early **garbage removal trucks** were simply open-bodied **dump trucks** pulled by a team of horses. They became motorized in the early part of the 20th century and the first closed-body trucks to eliminate odours with a dumping lever mechanism were introduced in the 1920s in Britain.[29] These were soon equipped with 'hopper mechanisms' where the scooper was loaded at floor level and then hoisted mechanically to deposit the waste in the truck. The **Garwood Load Packer** was the first truck in 1938, to incorporate a hydraulic compactor.

Waste handling and transport

[**edit**]
Main articles: **Waste collection vehicle**, **Waste collector**, and **Waste sorting**



Moulded plastic, wheeled waste bin in **Berkshire**, England

Waste collection methods vary widely among different countries and regions. Domestic waste collection services are often provided by local government authorities, or by private companies for industrial and commercial waste. Some areas, especially those in less developed countries, do not have formal waste-collection systems.

Waste handling and transport

[**edit**]

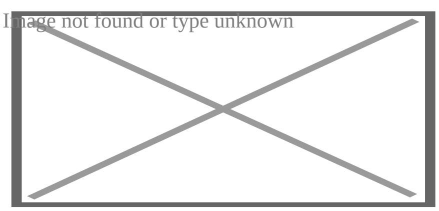
Curbside collection is the most common method of disposal in most European countries, Canada, New Zealand, the United States, and many other parts of the developed world in which waste is collected at regular intervals by specialised trucks. This is often associated with curb-side waste segregation. In rural areas, waste may need to be taken to a transfer station. Waste collected is then transported to an appropriate disposal facility. In some areas, vacuum collection is used in which waste is transported from the home or commercial premises by vacuum along small bore tubes. Systems are in use in Europe and North America.

Main article: **Automated vacuum collection**

In some jurisdictions, unsegregated waste is collected at the curb-side or from waste transfer stations and then sorted into recyclables and unusable waste. Such systems are capable of sorting large volumes of solid waste, salvaging recyclables, and turning the rest into bio-gas and soil conditioners. In **San Francisco**, the local government established its *Mandatory Recycling and Composting Ordinance* in support of its goal of "Zero waste by 2020", requiring everyone in the city to keep recyclables and compostables out of the landfill. The three streams are collected with the curbside "Fantastic 3" bin system – blue for recyclables, green for compostables, and black for landfill-bound materials – provided to residents and businesses and serviced by San Francisco's sole refuse hauler, Recology. The city's "Pay-As-You-Throw" system charges customers by the volume of landfill-bound materials, which provides a financial incentive to separate recyclables and compostables from other discards. The city's Department of the Environment's Zero Waste Program has led the city to achieve 80% diversion, the highest diversion rate in North America.[30] Other businesses such as **Waste Industries** use a variety of colors to distinguish between trash and recycling cans. In addition, in some areas of the world the disposal of municipal solid waste can cause environmental strain due to official not having benchmarks that help measure the **environmental sustainability** of certain practices.[31]

Waste segregation

[**edit**]
Further information: **Waste separation**



Recycling point at the GdaÃƒâ€¦Ã¢â‚¬Å¾sk University of Technology

This is the separation of wet waste and dry waste. The purpose is to recycle dry waste easily and to use wet waste as compost. When segregating waste, the amount of waste that gets landfilled reduces considerably, resulting in lower levels of air and water pollution. Importantly, waste segregation should be based on the type of waste and the most appropriate treatment and disposal. This also makes it easier to apply different processes to the waste, like composting, recycling, and incineration. It is important to practice waste management and segregation as a community. One way to practice waste management is to ensure there is awareness. The process of waste segregation should be explained to the community.[32]

Segregated waste is also often cheaper to dispose of because it does not require as much manual sorting as mixed waste. There are a number of important reasons why waste segregation is important such as legal obligations, cost savings, and protection of human health and the environment. Institutions should make it as easy as possible for their staff to correctly segregate their waste. This can include labelling, making sure there are enough accessible bins, and clearly indicating why segregation is so important.[33] Labeling is especially important when dealing with nuclear waste due to how much harm to human health the excess products of the nuclear cycle can cause.[34]

Hazards of waste management

[edit]

There are multiple facets of waste management that all come with hazards, both for those around the disposal site and those who work within waste management. Exposure to waste of any kind can be detrimental to the health of the individual, primary conditions that worsen with exposure to waste are **asthma** and **tuberculosis**.[35] The exposure to waste on an average individual is highly dependent on the conditions around them, those in less developed or lower income areas are more susceptible to the effects of waste product, especially though chemical waste.[36] The range of hazards due to waste is extremely large and covers every type of waste, not only chemical. There are many different guidelines to follow for disposing different types of waste.[37]

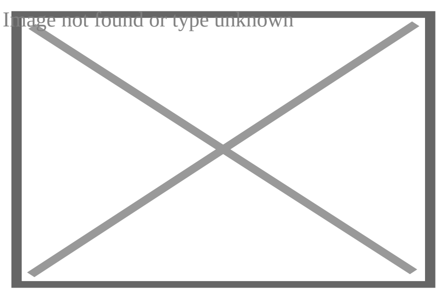


Diagram showing the multiple ways that incineration is hazardous to the population

The hazards of **incineration** are a large risk to many variable communities, including underdeveloped countries and countries or cities with little space for landfills or alternatives. Burning waste is an easily accessible option for many people around the globe, it has even been encouraged by the **World Health Organization** when there is no other option.[38] Because burning waste is rarely paid attention to, its effects go unnoticed. The release of hazardous materials and CO_2 when waste is burned is the largest hazard with incineration.[39]

Financial models

[edit]

In most developed countries, domestic waste disposal is funded from a national or local tax which may be related to income, or property values. Commercial and industrial waste disposal is typically charged for as a commercial service, often as an integrated charge which includes disposal costs. This practice may encourage disposal contractors to opt for the cheapest disposal option such as landfill rather than the environmentally best solution such as re-use and recycling.

Financing solid waste management projects can be overwhelming for the city government, especially if the government see it as an important service they should render to the citizen. Donors and grants are a funding mechanism that is dependent on the interest of the donor organization. As much as it is a good way to develop a city's waste management infrastructure, attracting and utilizing grants is solely reliant on what the donor considers important. Therefore, it may be a challenge for a city government to dictate how the funds should be distributed among the various aspect of waste management.[40]

An example of a country that enforces a waste tax is **Italy**. The tax is based on two rates: fixed and variable. The fixed rate is based on the size of the house while the variable is determined by the number of people living in the house.[41]

The World Bank finances and advises on solid waste management projects using a diverse suite of products and services, including traditional loans, results-based financing, development policy financing, and technical advisory. World Bank-financed waste management projects usually address the entire lifecycle of waste right from the point of generation to collection and transportation, and finally treatment and disposal.[6]

Disposal methods

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Landfill

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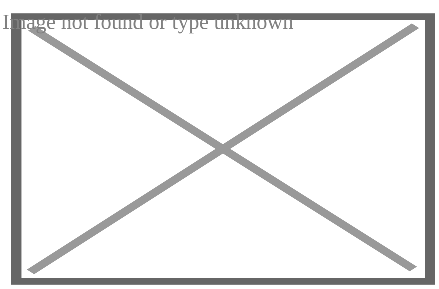
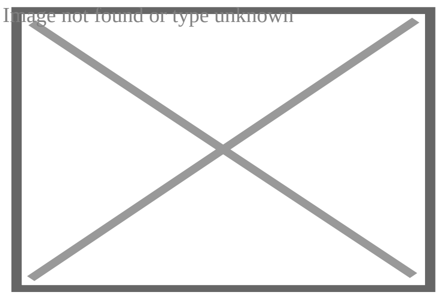


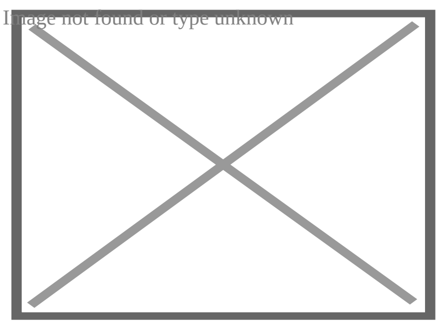
A landfill in **Ãƒâ€¦Ã‚Â•ubna**, Poland in 1999

A **landfill[a]** is a site for the disposal of **waste** materials. It is the oldest and most common form of **waste disposal**, although the systematic burial of waste with daily, intermediate and final covers only began in the 1940s. In the past, waste was simply left in piles or thrown into pits (known in **archeology** as **middens**).

Landfills take up a lot of land and pose environmental risks. Some landfill sites are used for waste management purposes, such as temporary storage, consolidation and transfer, or for various stages of processing waste material, such as sorting, treatment, or recycling. Unless they are stabilized, landfills may undergo severe shaking or **soil liquefaction** of the ground during an **earthquake**. Once full, the area over a landfill site may be **reclaimed** for other uses.



A **landfill compaction vehicle** in action.



Spittelau incineration plant in **Vienna**

Incineration

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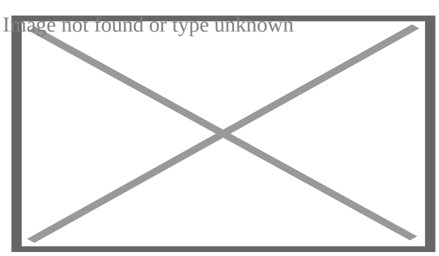
Main article: **Incineration**



Tarastejärvi Incineration Plant in **Tampere**, Finland

Incineration is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into residue and gaseous products. This method is useful for the disposal of both **municipal solid waste** and solid residue from wastewater treatment. This process reduces the volume of solid waste by 80 to 95 percent.**[42]** Incineration and other high-temperature waste treatment systems are sometimes described as "**thermal treatment**". Incinerators convert waste materials into **heat**, **gas**, **steam**, and **ash**.

Incineration is carried out both on a small scale by individuals and on a large scale by industry. It is used to dispose of solid, liquid, and gaseous waste. It is recognized as a practical method of disposing of certain **hazardous waste** materials (such as biological **medical waste**). Incineration is a controversial method of waste disposal, due to issues such as the emission of gaseous **pollutants** including substantial quantities of **carbon dioxide**.

Incineration is common in countries such as **Japan** where land is more scarce, as the facilities generally do not require as much area as landfills. **Waste-to-energy** (WtE) or energy-from-waste (EfW) are broad terms for facilities that burn waste in a furnace or boiler to generate heat, steam, or electricity. Combustion in an incinerator is not always perfect and there have been concerns about pollutants in gaseous emissions from incinerator stacks. Particular concern has focused on some very persistent **organic compounds** such as **dioxins**, **furans**, and **PAHs**, which may be created and which may have serious environmental consequences and some heavy metals such as **mercury[43]** and **lead** which can be volatilised in the combustion process..

Recycling

[**edit**]
Main article: **Recycling**

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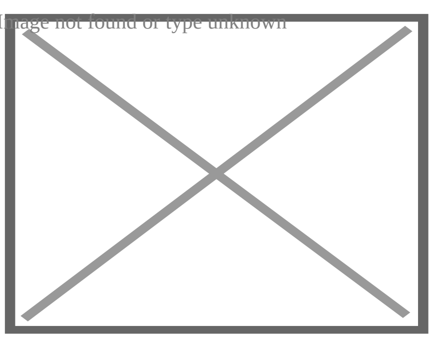
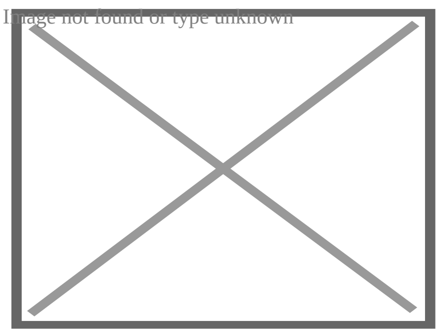


Steel crushed and baled for recycling

Recycling is a **resource recovery** practice that refers to the collection and reuse of waste materials such as empty beverage containers. This process involves breaking down and reusing materials that would otherwise be gotten rid of as trash. There are numerous benefits of recycling, and with so many new technologies making even more materials recyclable, it is possible to clean up the Earth.[44] Recycling not only benefits the environment but also positively affects the economy. The materials from which the items are made can be made into new products.[45] Materials for recycling may be collected separately from general waste using dedicated bins and collection vehicles, a procedure called **kerbside collection**. In some communities, the owner of the waste is required to separate the materials into different bins (e.g. for paper, plastics, metals) prior to its collection. In other communities, all recyclable materials are placed in a single bin for collection, and the sorting is handled later at a central facility. The latter method is known as "**single-stream recycling**".[46][47]



A recycling point in **Lappajärvi**, **Finland**

The most common consumer products recycled include **aluminium** such as beverage cans, **copper** such as wire, **steel** from food and aerosol cans, old steel furnishings or equipment, rubber **tyres**, **polyethylene** and **PET** bottles, **glass** bottles and jars, **paperboard cartons**, **newspapers**, magazines and light paper, and **corrugated fiberboard** boxes.

PVC, **LDPE**, **PP**, and **PS** (see **resin identification code**) are also recyclable. These items are usually composed of a single type of material, making them relatively easy to recycle into new products. The recycling of complex products (such as computers and electronic equipment) is more difficult, due to the additional dismantling and separation required.

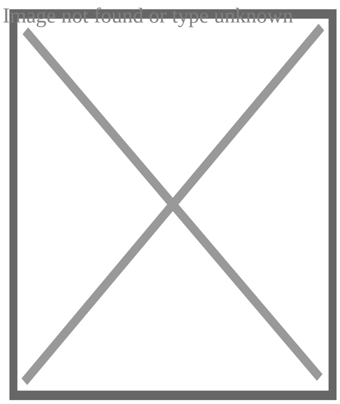
The type of material accepted for recycling varies by city and country. Each city and country has different recycling programs in place that can handle the various types of recyclable materials. However, certain variation in acceptance is reflected in the resale value of the material once it is reprocessed. Some of the types of recycling include waste paper and cardboard, **plastic recycling**, **metal recycling**, electronic devices, **wood recycling**, **glass recycling**, cloth and textile and so many more.[48] In July 2017, the Chinese government announced an import ban of 24 categories of recyclables and **solid waste**, including **plastic**, textiles and mixed paper, placing tremendous impact on developed countries globally, which exported directly or indirectly to China.[49]

Re-use

[**edit**]

Biological reprocessing

[edit]
Main articles: **Composting**, **Home composting**, **Anaerobic digestion**, and **Microbial fuel cell**



An active **compost** heap

Recoverable materials that are organic in nature, such as **plant material**, food scraps, and paper products, can be recovered through **composting** and digestion processes to **decompose** the organic matter. The resulting organic material is then recycled as **mulch** or **compost** for agricultural or landscaping purposes. In addition, waste gas from the process (such as methane) can be captured and used for generating electricity and heat (CHP/cogeneration) maximising efficiencies. There are different types of composting and digestion methods and technologies. They vary in complexity from simple home compost heaps to large-scale industrial digestion of mixed domestic waste. The different methods of biological decomposition are classified as aerobic or anaerobic methods. Some methods use the hybrids of these two methods. The anaerobic digestion of the organic fraction of solid waste is more environmentally effective than landfill, or incineration.[50] The intention of biological processing in waste management is to control and accelerate the natural process of decomposition of organic matter. (See **resource recovery**).

Energy recovery

[edit]
Main article: **Waste-to-energy**

Energy recovery from waste is the conversion of non-recyclable waste materials into usable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolyzation, anaerobic digestion, and **landfill gas** recovery.[51] This process is often called waste-to-energy. Energy recovery from waste is part of the non-hazardous waste management hierarchy. Using energy recovery to convert non-recyclable waste materials into electricity and heat, generates a renewable energy source and can reduce carbon emissions by offsetting the need for energy from fossil sources as well as reduce methane generation from landfills.[51] Globally, waste-to-energy accounts for 16% of waste management.[52]

The energy content of waste products can be harnessed directly by using them as a direct combustion fuel, or indirectly by processing them into another type of fuel. Thermal treatment ranges from using waste as a fuel source for cooking or heating and the use of the gas fuel (see above), to fuel for **boilers** to generate steam and electricity in a **turbine**. **Pyrolysis** and **gasification** are two related forms of thermal treatment where waste materials are heated to high temperatures with limited **oxygen** availability. The process usually occurs in a sealed vessel under high **pressure**. Pyrolysis of solid waste converts the material into solid, liquid, and gas products. The liquid and gas can be burnt to produce energy or refined into other chemical products (chemical refinery). The solid residue (char) can be further refined into products such as **activated carbon**. Gasification and advanced **Plasma arc gasification** are used to convert organic materials directly into a synthetic gas (**syngas**) composed of **carbon monoxide** and **hydrogen**. The gas is then burnt to produce electricity and **steam**. An alternative to pyrolysis is high-temperature and pressure supercritical water decomposition (hydrothermal monophasic oxidation).

Pyrolysis

[**edit**]
Main article: **Pyrolysis**

Pyrolysis is often used to convert many types of domestic and industrial residues into a recovered fuel. Different types of waste input (such as plant waste, food waste, tyres) placed in the pyrolysis process potentially yield an alternative to fossil fuels.[53] Pyrolysis is a process of thermo-chemical decomposition of organic materials by heat in the absence of stoichiometric quantities of **oxygen**; the decomposition produces various hydrocarbon gases.[54] During pyrolysis, the molecules of an object vibrate at high frequencies to the extent that molecules start breaking down. The rate of pyrolysis increases with **temperature**. In industrial applications, temperatures are above 430 °C (800 °F).[55]

Slow pyrolysis produces gases and solid charcoal.[56] Pyrolysis holds promise for conversion of **waste biomass** into useful liquid fuel. Pyrolysis of waste wood and plastics can potentially produce fuel. The solids left from pyrolysis contain metals, glass, sand, and pyrolysis coke which does not convert to gas. Compared to the process of incineration, certain types of pyrolysis processes release less harmful by-products that contain alkali metals, sulphur, and chlorine. However, pyrolysis of some waste yields gases which impact the environment such as HCl and SO_2.[57]

Resource recovery

[edit]
Main article: Resource recovery

Resource recovery is the systematic diversion of waste, which was intended for disposal, for a specific next use.[58] It is the processing of recyclables to extract or recover materials and resources, or convert to energy.[59] These activities are performed at a resource recovery facility.[59] Resource recovery is not only environmentally important, but it is also cost-effective.[60] It decreases the amount of waste for disposal, saves space in landfills, and conserves natural resources.[60]

Resource recovery, an alternative approach to traditional waste management, utilizes life cycle analysis (LCA) to evaluate and optimize waste handling strategies. Comprehensive studies focusing on mixed municipal solid waste (MSW) have identified a preferred pathway for maximizing resource efficiency and minimizing environmental impact, including effective waste administration and management, source separation of waste materials, efficient collection systems, reuse and recycling of non-organic fractions, and processing of organic material through anaerobic digestion.

As an example of how resource recycling can be beneficial, many items thrown away contain metals that can be recycled to create a profit, such as the components in circuit boards. Wood chippings in pallets and other packaging materials can be recycled into useful products for horticulture. The recycled chips can cover paths, walkways, or arena surfaces.

Application of rational and consistent waste management practices can yield a range of benefits including:

1. Economic – Improving economic efficiency through the means of resource use, treatment, and disposal and creating markets for recycles can lead to efficient practices in the production and consumption of products and materials resulting in valuable materials being recovered for reuse and the potential for new jobs and new business opportunities.
2. Social – By reducing adverse impacts on health through proper waste management practices, the resulting consequences are more appealing to civic communities. Better social advantages can lead to new sources of employment and potentially lift communities out of poverty, especially in some of the developing poorer countries and cities.
3. Environmental – Reducing or eliminating adverse impacts on the environment through reducing, reusing, recycling, and minimizing resource extraction can result in improved air and water quality and help in the reduction of greenhouse gas

emissions.
4. Inter-generational Equity – Following effective waste management practices can provide subsequent generations a more robust economy, a fairer and more inclusive society and a cleaner environment.[18][*page needed*]

Waste valorization

[edit]

This section is an excerpt from Waste valorization.[edit]

Waste valorization, beneficial reuse, beneficial use, value recovery or waste reclamation[61] is the process of waste products or residues from an economic process being valorized (given economic value), by reuse or recycling in order to create economically useful materials.[62][61][63] The term comes from practices in sustainable manufacturing and economics, industrial ecology and waste management. The term is usually applied in industrial processes where residue from creating or processing one good is used as a raw material or energy feedstock for another industrial process.[61][63] Industrial wastes in particular are good candidates for valorization because they tend to be more consistent and predictable than other waste, such as household waste.[61][64]

Historically, most industrial processes treated waste products as something to be disposed of, causing industrial pollution unless handled properly.[65] However, increased regulation of residual materials and socioeconomic changes, such as the introduction of ideas about sustainable development and circular economy in the 1990s and 2000s increased focus on industrial practices to recover these resources as value add materials.[65][66] Academics focus on finding economic value to reduce environmental impact of other industries as well, for example the development of non-timber forest products to encourage conservation.

Liquid waste-management

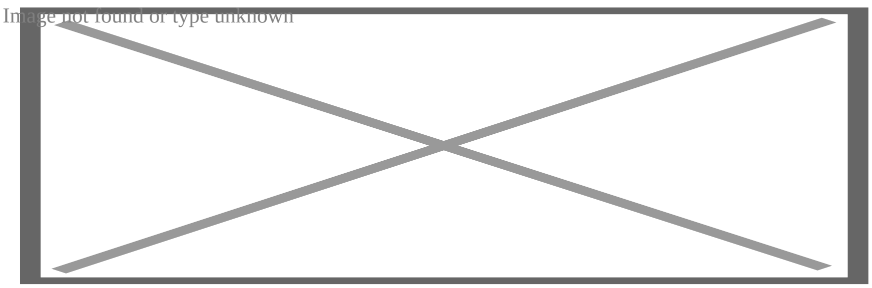
[edit]

Liquid waste is an important category of waste management because it is so difficult to deal with. Unlike solid wastes, liquid wastes cannot be easily picked up and removed from an environment. Liquid wastes spread out, and easily pollute other sources of liquid if brought into contact. This type of waste also soaks into objects like soil and groundwater. This in turn carries over to pollute the plants, the animals in the ecosystem, as well as the humans within the area of the pollution.[67]

Industrial wastewater

[edit]

This section is an excerpt from Industrial wastewater treatment.[edit]



Wastewater from an industrial process can be converted at a treatment plant to solids and treated water for reuse.

Industrial wastewater treatment describes the processes used for treating wastewater that is produced by industries as an undesirable by-product. After treatment, the treated industrial wastewater (or effluent) may be reused or released to a sanitary sewer or to a surface water in the environment. Some industrial facilities generate wastewater that can be treated in sewage treatment plants. Most industrial processes, such as petroleum refineries, chemical and petrochemical plants have their own specialized facilities to treat their wastewaters so that the pollutant concentrations in the treated wastewater comply with the regulations regarding disposal of wastewaters into sewers or into rivers, lakes or oceans.[68]:ÃƒÂ¢Ã¢â€šÂ¬Ã…Â 1412ÃƒÂ¢Ã¢â€šÂ¬Ã…Â This applies to industries that generate wastewater with high concentrations of organic matter (e.g. oil and grease), toxic pollutants (e.g. heavy metals, volatile organic compounds) or nutrients such as ammonia.[69]:ÃƒÂ¢Ã¢â€šÂ¬Ã…Â 180ÃƒÂ¢Ã¢â€šÂ¬Ã…Â Some industries install a pre-treatment system to remove some pollutants (e.g., toxic compounds), and then discharge the partially treated wastewater to the municipal sewer system.[70]:ÃƒÂ¢Ã¢â€šÂ¬Ã…Â 60ÃƒÂ¢Ã¢â€šÂ¬Ã…Â

Most industries produce some wastewater. Recent trends have been to minimize such production or to recycle treated wastewater within the production process. Some industries have been successful at redesigning their manufacturing processes to reduce or eliminate pollutants.[71] Sources of industrial wastewater include battery manufacturing, chemical manufacturing, electric power plants, food industry, iron and steel industry, metal working, mines and quarries, nuclear industry, oil and gas extraction, petroleum refining and petrochemicals, pharmaceutical manufacturing, pulp and paper industry, smelters, textile mills, industrial oil contamination, water treatment and wood preserving. Treatment processes include brine treatment, solids removal (e.g. chemical precipitation, filtration), oils and grease removal, removal of biodegradable organics, removal of other organics, removal of acids and alkalis, and removal of toxic materials.

Sewage sludge treatment

[edit]

This section is an excerpt from Sewage sludge treatment.[edit]

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Sludge treatment in anaerobic digesters at a sewage treatment plant in Cottbus, Germany

Sewage sludge treatment describes the processes used to manage and dispose of sewage sludge produced during sewage treatment. Sludge treatment is focused on reducing sludge weight and volume to reduce transportation and disposal costs, and on reducing potential health risks of disposal options. Water removal is the primary means of weight and volume reduction, while pathogen destruction is frequently accomplished through heating during thermophilic digestion, composting, or incineration. The choice of a sludge treatment method depends on the volume of sludge generated, and comparison of treatment costs required for available disposal options. Air-drying and composting may be attractive to rural communities, while limited land availability may make aerobic digestion and mechanical dewatering preferable for cities, and economies of scale may encourage energy recovery alternatives in metropolitan areas.

Sludge is mostly water with some amounts of solid material removed from liquid sewage. Primary sludge includes settleable solids removed during primary treatment in primary clarifiers. Secondary sludge is sludge separated in secondary clarifiers that are used in secondary treatment bioreactors or processes using inorganic oxidizing agents. In intensive sewage treatment processes, the sludge produced needs to be removed from the liquid line on a continuous basis because the volumes of the tanks in the liquid line have insufficient volume to store sludge.[72] This is done in order to keep the treatment processes compact and in balance (production of sludge approximately equal to the removal of sludge). The sludge removed from the liquid line goes to the sludge treatment line. Aerobic processes (such as the activated sludge process) tend to produce more sludge compared with anaerobic processes. On the other hand, in extensive (natural) treatment processes, such as ponds and constructed wetlands, the produced sludge remains accumulated in the treatment units (liquid line) and is only removed after several years of operation.[73]

Sludge treatment options depend on the amount of solids generated and other site-specific conditions. Composting is most often applied to small-scale plants with aerobic digestion for mid-sized operations, and anaerobic digestion for the larger-scale operations. The sludge is sometimes passed through a so-called pre-thickener which de-waters the sludge. Types of pre-thickeners include centrifugal sludge thickeners,[74] rotary drum sludge thickeners and belt filter presses.[75] Dewatered sludge may be incinerated or transported offsite for disposal in a landfill or use as an agricultural soil amendment.[76]

Energy may be recovered from sludge through **methane** gas production during anaerobic digestion or through incineration of dried sludge, but energy yield is often insufficient to evaporate sludge water content or to power blowers, pumps, or centrifuges required for dewatering. Coarse primary solids and secondary sewage sludge may include toxic chemicals removed from liquid sewage by **sorption** onto solid particles in clarifier sludge. Reducing sludge volume may increase the **concentration** of some of these toxic chemicals in the sludge.[77]

Avoidance and reduction methods

[**edit**]
Main article: **Waste minimization**

An important method of waste management is the prevention of waste material being created, also known as **waste reduction**. Waste Minimization is reducing the quantity of hazardous wastes achieved through a thorough application of innovative or alternative procedures.[78] Methods of avoidance include reuse of second-hand products, repairing broken items instead of buying new ones, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using **disposable products** (such as disposable **cutlery**), removing any food/liquid remains from cans and packaging,[79] and designing products that use less material to achieve the same purpose (for example, lightweighting of beverage cans).[80]

International waste trade

[**edit**]

This section is an excerpt from **Global waste trade**.[**edit**]

The **global waste trade** is the **international trade** of **waste** between countries for further **treatment**, **disposal**, or **recycling**. Toxic or **hazardous wastes** are often imported by **developing countries** from developed countries.

The **World Bank** Report *What a Waste: A Global Review of Solid Waste Management*, describes the amount of solid waste produced in a given country. Specifically, countries which produce more solid waste are more economically developed and more industrialized.[81] The report explains that "Generally, the higher the economic development and rate of urbanization, the greater the amount of solid waste produced."[81] Therefore, countries in the **Global North**, which are more economically developed and urbanized, produce more solid waste than **Global South** countries.[81]

Current international trade flows of waste follow a pattern of waste being produced in the Global North and being exported to and disposed of in the Global South. Multiple factors affect which countries produce waste and at what magnitude, including geographic location, degree of **industrialization**, and level of integration into the global economy.

Numerous scholars and researchers have linked the sharp increase in waste trading and the negative impacts of waste trading to the prevalence of **neoliberal economic policy**.[82][83][84][85] With the major economic transition towards neoliberal economic policy in the 1980s, the shift towards **"free-market"** policy has facilitated the sharp increase in the global waste trade. **Henry Giroux**, Chair of Cultural Studies at McMaster University, gives his definition of neoliberal economic policy:

> "Neoliberalism ...removes economics and markets from the discourse of social obligations and social costs. ...As a policy and political project, neoliberalism is wedded to the privatization of public services, selling off of state functions, deregulation of finance and labor, elimination of the welfare state and unions, liberalization of trade in goods and capital investment, and the marketization and **commodification** of society."[86]

Given this economic platform of privatization, neoliberalism is based on expanding free-trade agreements and establishing open-borders to international trade markets. **Trade liberalization**, a **neoliberal** economic policy in which trade is completely **deregulated**, leaving no tariffs, quotas, or other restrictions on international trade, is designed to further developing countries' economies and integrate them into the global economy. Critics claim that although free-market trade liberalization was designed to allow any country the opportunity to reach economic success, the consequences of these policies have been devastating for Global South countries, essentially crippling their economies in a servitude to the Global North.[87] Even supporters such as the **International Monetary Fund**, “progress of integration has been uneven in recent decades.”[88] Specifically, developing countries have been targeted by trade liberalization policies to import waste as a means of **economic expansion**.[89] The guiding neoliberal economic policy argues that the way to be integrated into the global economy is to participate in trade liberalization and exchange in international trade markets.[89] Their claim is that smaller countries, with less infrastructure, less wealth, and less manufacturing ability, should take in hazardous wastes as a way to increase profits and stimulate their economies.[89]

Challenges in developing countries

[**edit**]

Areas with developing economies often experience exhausted waste collection services and inadequately managed and uncontrolled dumpsites. The problems are worsening.[18][*page ne* [90] Problems with governance complicate the situation. Waste management in these countries and cities is an ongoing challenge due to weak institutions, chronic under-resourcing, and rapid urbanization.[18][*page needed*] All of these challenges, along with the lack of understanding of different factors that contribute to the hierarchy of waste management, affect the treatment of waste.[91][*full citation needed*]

In developing countries, waste management activities are usually carried out by the poor, for their survival. It has been estimated that 2% of the population in Asia, Latin America, and Africa are dependent on waste for their livelihood. Family organized, or individual manual scavengers are often involved with waste management practices with very little supportive network and facilities with increased risk of health effects. Additionally, this practice prevents their children from further education. The participation level of most citizens in waste management is very low, residents in urban areas are not actively involved in the process of waste management.[92]

Technologies

[edit]
See also: **Environmental monitoring**, **Border control**, and **Materials recovery facility**

Traditionally, the **waste management industry** has been a late adopter of new technologies such as **RFID** (Radio Frequency Identification) tags, GPS and integrated software packages which enable better quality data to be collected without the use of estimation or manual data entry.[93] This technology has been used widely by many organizations in some industrialized countries. Radiofrequency identification is a tagging system for automatic identification of recyclable components of municipal solid waste streams.[94]

Smart waste management has been implemented in several cities, including San Francisco, Varde or Madrid.[95] Waste containers are equipped with **level sensors**. When the container is almost full, the sensor warns the pickup truck, which can thus trace its route servicing the fullest containers and skipping the emptiest ones.[96]

Statistics and trends

[edit]

The "Global Waste Management Outlook 2024," supported by the Environment Fund - **UNEP**'s core financial fund, and jointly published with the **International Solid Waste Association** (ISWA), provides a comprehensive update on the trajectory of global waste generation and the escalating costs of waste management since 2018. The report predicts municipal solid waste to rise from 2.3 billion tonnes in 2023 to 3.8 billion tonnes by 2050. The direct global cost of waste management was around USD 252 billion in 2020, which could soar to USD 640.3 billion annually by 2050 if current practices continue without reform. Incorporating life cycle assessments, the report contrasts scenarios from maintaining the status quo to fully adopting **zero waste** and **circular economy** principles. It indicates that effective waste prevention and management could cap annual costs at USD 270.2 billion by 2050, while a circular economy approach could transform the sector into a net positive, offering a potential annual gain of USD 108.5 billion. To prevent the direst outcomes, the report calls for immediate action across multiple sectors, including development banks, governments, municipalities, producers, retailers, and citizens, providing targeted strategies for waste reduction and improved management practices.[97]

Waste generated by country, 2020[98]

Country	GDP (USD)	Population	Total waste generated (t)	Share of population living in urban areas	Waste generated per capita (kg/person)
Aruba	35,563	103,187	88,132	44%	854
Afghanistan	2,057	34,656,032	5,628,525	26%	162
Angola	8,037	25,096,150	4,213,644	67%	168
Albania	13,724	2,854,191	1,087,447	62%	381
Andorra	43,712	82,431	43,000	88%	522
United Arab Emirates	67,119	9,770,529	5,617,682	87%	575
Argentina	23,550	42,981,516	17,910,550	92%	417
Armenia	11,020	2,906,220	492,800	63%	170
American Samoa	11,113	55,599	18,989	87%	342
Antigua and Barbuda	17,966	96,777	30,585	24%	316
Australia	47,784	23,789,338	13,345,000	86%	561
Austria	56,030	8,877,067	5,219,716	59%	588
Azerbaijan	14,854	9,649,341	2,930,349	56%	304
Burundi	840	6,741,569	1,872,016	14%	278
Belgium	51,915	11,484,055	4,765,883	98%	415
Benin	2,227	5,521,763	685,936	48%	124
Burkina Faso	1,925	18,110,624	2,575,251	31%	142
Bangladesh	3,196	155,727,056	14,778,497	38%	95
Bulgaria	22,279	7,025,037	2,859,190	76%	407
Bahrain	47,938	1,425,171	951,943	90%	668
Bahamas	35,400	386,838	264,000	83%	682
Bosnia and Herzegovina	12,671	3,535,961	1,248,718	49%	353

Belarus	18,308	9,489,616	4,280,000	79%	451
Belize	7,259	359,288	101,379	46%	282
Bermuda	80,982	64,798	82,000	100%	1,265
Bolivia	7,984	10,724,705	2,219,052	70%	207
Brazil	14,596	208,494,896	79,069,584	87%	379
Barbados	15,445	280,601	174,815	31%	623
Brunei	60,866	423,196	216,253	78%	511
Bhutan	6,743	686,958	111,314	42%	162
Botswana	14,126	2,014,866	210,854	71%	105
Central African Republic	823	4,515,392	1,105,983	42%	245
Canada	47,672	35,544,564	25,103,034	82%	706
Switzerland	68,394	8,574,832	6,079,556	74%	709
Channel Islands	46,673	164,541	178,933	31%	1,087
Chile	20,362	16,829,442	6,517,000	88%	387
China	16,092	1,400,050,048	395,081,376	61%	282
Côte d'Ivoire	3,661	20,401,332	4,440,814	52%	218
Cameroon	3,263	21,655,716	3,270,617	58%	151
Democratic Republic of the Congo	1,056	78,736,152	14,385,226	46%	183
Republic of the Congo	4,900	2,648,507	451,200	68%	170
Colombia	12,523	46,406,648	12,150,120	81%	262
Comoros	2,960	777,424	91,013	29%	117
Cape Verde	6,354	513,979	132,555	67%	258
Costa Rica	18,169	4,757,575	1,460,000	81%	307
Cuba	12,985	11,303,687	2,692,692	77%	238
Curaçao	27,504	153,822	24,704	89	161
Cayman Islands	66,207	59,172	60,000	100%	1,014
Cyprus	39,545	1,198,575	769,485	67%	642
Germany	53,785	83,132,800	50,627,876	77%	609
Djibouti	6,597	746,221	114,997	78%	154
Dominica	11,709	72,400	13,176	71%	182
Denmark	57,821	5,818,553	4,910,859	88%	844
Dominican Republic	15,328	10,528,394	4,063,910	83%	386

Algeria	11,826	40,606,052	12,378,740	74%	305
Ecuador	11,896	16,144,368	5,297,211	64%	328
Egypt	10,301	87,813,256	21,000,000	43%	239
Eritrea	1,715	4,474,690	726,957	41%	162
Spain	40,986	47,076,780	22,408,548	81%	476
Estonia	36,956	1,326,590	489,512	69%	369
Ethiopia	1,779	99,873,032	6,532,787	22%	65
Finland	48,814	5,520,314	3,124,498	86%	566
Fiji	10,788	867,086	189,390	57%	218
France	46,110	67,059,888	36,748,820	81%	548
Faroe Islands	44,403	48,842	61,000	42%	1,249
Federated States of Micronesia	3,440	104,937	26,040	23%	248
Gabon	18,515	1,086,137	238,102	90%	219
United Kingdom	46,290	66,460,344	30,771,140	84%	463
Georgia	12,605	3,717,100	800,000	59%	215
Ghana	3,093	21,542,008	3,538,275	57%	164
Gibraltar	43,712	33,623	16,954	100%	504
Guinea	1,623	8,132,552	596,911	37%	73
Gambia	2,181	1,311,349	193,441	63%	148
Guinea-Bissau	1,800	1,770,526	289,514	44%	164
Equatorial Guinea	24,827	1,221,490	198,443	73%	162
Greece	30,465	10,716,322	5,615,353	80%	524
Grenada	13,208	105,481	29,536	37%	280
Greenland	43,949	56,905	50,000	87%	879
Guatemala	8,125	16,252,429	2,756,741	52%	170
Guam	59,075	159,973	141,500	95%	885
Guyana	9,812	746,556	179,252	27%	240
Hong Kong	57,216	7,305,700	5,679,816	100%	777
Honduras	5,396	9,112,867	2,162,028	58%	237
Croatia	28,829	4,067,500	1,810,038	58%	445
Haiti	2,953	10,847,334	2,309,852	57%	213
Hungary	32,643	9,769,949	3,780,970	72%	387
Indonesia	10,531	261,115,456	65,200,000	57%	250

Isle of Man	44,204	80,759	50,551	53%	626
India	6,497	1,352,617,344	189,750,000	35%	140
Ireland	83,389	4,867,316	2,910,655	64%	598
Iran	14,536	80,277,424	17,885,000	76%	223
Iraq	10,311	36,115,648	13,140,000	71%	364
Iceland	55,274	343,400	225,270	94%	656
Israel	37,688	8,380,100	5,400,000	93%	644
Italy	42,420	60,297,396	30,088,400	71%	499
Jamaica	9,551	2,881,355	1,051,695	56%	365
Jordan	10,413	8,413,464	2,529,997	91%	301
Japan	41,310	126,529,104	42,720,000	92%	338
Kazakhstan	22,703	16,791,424	4,659,740	58%	278
Kenya	3,330	41,350,152	5,595,099	28%	135
Kyrgyzstan	4,805	5,956,900	1,113,300	37%	187
Cambodia	3,364	15,270,790	1,089,000	24%	71
Kiribati	2,250	114,395	35,724	56%	312
Saint Kitts and Nevis	25,569	54,288	32,892	31%	606
South Korea	42,105	51,606,632	20,452,776	81%	396
Kuwait	58,810	2,998,083	1,750,000	100%	584
Laos	6,544	6,663,967	351,900	36%	53
Lebanon	16,967	5,603,279	2,040,000	89%	364
Liberia	1,333	3,512,932	564,467	52%	161
Libya	8,480	6,193,501	2,147,596	81%	347
Saint Lucia	14,030	177,206	77,616	19%	438
Liechtenstein	45,727	36,545	32,382	14%	886
Sri Lanka	12,287	21,203,000	2,631,650	19%	124
Lesotho	1,979	1,965,662	73,457	29%	37
Lithuania	37,278	2,786,844	1,315,390	68%	472
Luxembourg	114,323	619,896	490,338	91%	791
Latvia	30,982	1,912,789	839,714	68%	439
Macau	117,336	612,167	377,942	100%	617
Morocco	6,915	34,318,080	6,852,000	64%	200
Monaco	43,712	37,783	46,000	100%	1,217
Moldova	10,361	3,554,108	3,981,200	43%	1,120
Madagascar	1,566	24,894,552	3,768,759	39%	151
Maldives	17,285	409,163	211,506	41%	517

Mexico	19,332	125,890,952	53,100,000	81%	422
Marshall Islands	3,629	52,793	8,614	78%	163
North Macedonia	16,148	2,082,958	626,970	58%	301
Mali	2,008	16,006,670	1,937,354	44%	121
Malta	43,708	502,653	348,841	95%	694
Myanmar	1,094	46,095,464	4,677,307	31%	101
Montenegro	20,753	622,227	329,780	67%	530
Mongolia	10,940	3,027,398	2,900,000	69%	958
Northern Mariana Islands	60,956	54,036	32,761	92%	606
Mozambique	1,217	27,212,382	2,500,000	37%	92
Mauritania	4,784	3,506,288	454,000	55%	129
Mauritius	20,647	1,263,473	438,000	41%	347
Malawi	999	16,577,147	1,297,844	17%	78
Malaysia	23,906	30,228,016	12,982,685	77%	429
Namibia	6,153	1,559,983	256,729	52%	165
New Caledonia	57,330	278,000	108,157	72%	389
Niger	1,038	8,842,415	1,865,646	17%	211
Nigeria	4,690	154,402,176	27,614,830	52%	179
Nicaragua	4,612	5,737,723	1,528,816	59%	266
Netherlands	56,849	17,332,850	8,805,088	92%	508
Norway	64,962	5,347,896	4,149,967	83%	776
Nepal	2,902	28,982,772	1,768,977	21%	61
Nauru	11,167	13,049	6,192	100%	475
New Zealand	41,857	4,692,700	3,405,000	87%	726
Oman	30,536	3,960,925	1,734,885	86%	438
Pakistan	4,571	193,203,472	30,760,000	37%	159
Panama	28,436	3,969,249	1,472,262	68%	371
Peru	11,877	30,973,354	8,356,711	78%	270
Philippines	7,705	103,320,224	14,631,923	47%	142
Palau	18,275	21,503	9,427	81%	438
Papua New Guinea	3,912	7,755,785	1,000,000	13%	129
Poland	33,222	37,970,872	12,758,213	60%	336
Puerto Rico	34,311	3,473,181	4,170,953	94%	1,201

Portugal	34,962	10,269,417	5,268,211	66%	513
Paraguay	11,810	6,639,119	1,818,501	62%	274
Palestine	5,986	4,046,901	1,387,000	77%	343
French Polynesia	60,956	273,528	147,000	62%	537
Qatar	96,262	2,109,568	1,000,990	99%	475
Romania	29,984	19,356,544	5,419,833	54%	280
Russia	26,013	143,201,680	60,000,000	75%	419
Rwanda	1,951	11,917,508	4,384,969	17%	368
Saudi Arabia	48,921	31,557,144	16,125,701	84%	511
Sudan	4,192	38,647,804	2,831,291	35%	73
Senegal	3,068	15,411,614	2,454,059	48%	159
Singapore	97,341	5,703,600	1,870,000	100%	328
Solomon Islands	2,596	563,513	179,972	25%	319
Sierra Leone	1,238	5,439,695	610,222	43%	112
El Salvador	7,329	6,164,626	1,648,996	73%	267
San Marino	58,806	33,203	17,175	97%	517
Somalia	1,863	14,317,996	2,326,099	46%	162
Serbia	18,351	6,944,975	2,347,402	56%	338
South Sudan	1,796	11,177,490	2,680,681	20%	240
São Tomé and Príncipe	3,721	191,266	25,587	74%	134
Suriname	16,954	526,103	78,620	66%	149
Slovakia	31,966	5,454,073	2,296,165	54%	421
Slovenia	39,038	2,087,946	1,052,325	55%	504
Sweden	52,609	10,285,453	4,618,169	88%	449
Eswatini	8,321	1,343,098	218,199	24%	162
Seychelles	23,303	88,303	48,000	58%	544
Syria	8,587	20,824,892	4,500,000	55%	216
Chad	1,733	11,887,202	1,358,851	24%	114
Togo	1,404	7,228,915	1,109,030	43%	153
Thailand	16,302	68,657,600	26,853,366	51%	391
Tajikistan	2,616	8,177,809	1,787,400	28%	219
Turkmenistan	11,471	5,366,277	500,000	53%	93
Timor-Leste	3,345	1,268,671	63,875	31%	50
Tonga	5,636	104,951	17,238	23%	164

Trinidad and Tobago	28,911	1,328,100	727,874	53%	548
Tunisia	10,505	11,143,908	2,700,000	70%	242
Turkey	28,289	83,429,616	35,374,156	76%	424
Tuvalu	3,793	11,097	3,989	64%	360
Tanzania	2,129	49,082,996	9,276,995	35%	189
Uganda	1,972	35,093,648	7,045,050	25%	201
Ukraine	11,535	45,004,644	15,242,025	70%	339
Uruguay	20,588	3,431,552	1,260,140	96%	367
United States of America	61,498	326,687,488	265,224,528	83%	812
Uzbekistan	5,164	29,774,500	4,000,000	50%	134
Saint Vincent and the Grenadines	11,972	109,455	31,561	53%	288
Venezuela	14,270	29,893,080	9,779,093	88%	327
British Virgin Islands	24,216	20,645	21,099	49%	1,022
United States Virgin Islands	30,437	105,784	146,500	96%	1,385
Vietnam	5,089	86,932,496	9,570,300	37%	110
Vanuatu	3,062	270,402	70,225	26%	260
Samoa	6,211	187,665	27,399	18%	146
Yemen	8,270	27,584,212	4,836,820	38%	175
South Africa	12,667	51,729,344	18,457,232	67%	357
Zambia	3,201	14,264,756	2,608,268	45%	183
Zimbabwe	3,191	12,500,525	1,449,752	32%	116

Waste management by region

[edit]

China

[edit]

Municipal solid waste generation shows spatiotemporal variation. In spatial distribution, the point sources in eastern coastal regions are quite different. Guangdong, Shanghai and Tianjin produced MSW of 30.35, 7.85 and 2.95 Mt, respectively. In temporal distribution, during 2009–2018, Fujian province showed a 123% increase in MSW generation while Liaoning province showed only 7% increase, whereas Shanghai special zone had a decline of ?11% after 2013. MSW composition characteristics are complicated. The major components such as kitchen waste, paper and rubber & plastics in different eastern coastal cities have fluctuation in the range of 52.8–65.3%, 3.5–11.9%, and 9.9–19.1%, respectively. Treatment rate of consumption waste is up to 99% with a sum of 52% landfill, 45% incineration, and 3% composting technologies, indicating that landfill still dominates MSW treatment.[99]

Morocco

[edit]

Morocco has seen benefits from implementing a $300 million sanitary landfill system. While it might appear to be a costly investment, the country's government predicts that it has saved them another $440 million in damages, or consequences of failing to dispose of waste properly.[100]

San Francisco

[edit]

San Francisco started to make changes to their waste management policies in 2009 with the expectation to be zero waste by 2030.[101] Council made changes such as making recycling and composting a mandatory practice for businesses and individuals, banning Styrofoam and plastic bags, putting charges on paper bags, and increasing garbage collection rates.[101][102] Businesses are fiscally rewarded for correct disposal of recycling and composting and taxed for incorrect disposal. Besides these policies, the waste bins were manufactured in various sizes. The compost bin is the largest, the recycling bin is second, and the garbage bin is the smallest. This encourages individuals to sort their waste thoughtfully with respect to the sizes. These systems are working because they were able to divert 80% of waste from the landfill, which is the highest rate of any major U.S. city.[101] Despite all these changes, Debbie Raphael, director of the San Francisco Department of the Environment, states that zero waste is still not achievable until all products are designed differently to be able to be recycled or compostable.[101]

Turkey

[edit]

This section is an excerpt from **Waste management in Turkey**.[edit]

This article needs to be **updated.** Please help update this article to reflect recent events or newly available information. *(January 2022)*

Turkey generates about 30 million tons of solid **municipal waste** per year; the annual amount of waste generated per capita amounts to about 400 kilograms.[103] According to **Waste Atlas**, Turkey's waste collection coverage rate is 77%, whereas its unsound waste disposal rate is 69%.[103] While the country has a strong legal framework in terms of laying down common provisions for waste management, the implementation process has been considered slow since the beginning of 1990s.

United Kingdom

[edit]
See also: **Food waste in the United Kingdom**

Waste management policy in England is the responsibility of the **Department of the Environment, Food and Rural Affairs** (DEFRA). In England, the "Waste Management Plan for England" presents a compilation of waste management policies.[104] In the devolved nations such as Scotland Waste management policy is a responsibility of their own respective departments.

Zambia

[edit]

In **Zambia**, ASAZA is a community-based organization whose principal purpose is to complement the efforts of the Government and cooperating partners to uplift the standard of living for disadvantaged communities. The project's main objective is to minimize the problem of indiscriminate littering which leads to **land degradation** and pollution of the environment. ASAZA is also at the same time helping alleviate the problems of unemployment and poverty through income generation and payment of participants, women, and unskilled youths.[105]

E-waste

[edit]

A record 53.6 million metric tonnes (Mt) of electronic waste was generated worldwide in 2019, up 21 percent in just five years, according to the UN's Global E-waste Monitor 2020, released today. The new report also predicts global e-waste – discarded products with a battery or plug – will reach 74 Mt by 2030, almost a doubling of e-waste in just 16 years. This makes e-waste the world's fastest-growing domestic waste stream, fueled mainly by higher consumption rates of electric and electronic equipment, short life cycles, and few options for repair. Only 17.4 percent of 2019's e-waste was collected and recycled. This means that gold, silver, copper, platinum, and other high-value, recoverable materials conservatively valued at US$57 billion – a sum greater than the Gross Domestic Product of most countries – were mostly dumped or burned rather than being collected for treatment and reuse.[106] E-wasteis predicted to double by 2050.[107][108]

Transboundary movement of e-waste

[edit]

The Transboundary E-waste Flows Monitor quantified that 5.1 Mt (just below 10 percent of the total amount of global e-waste, 53.6 Mt) crossed country borders in 2019. To better understand the implication of transboundary movement, this study categorizes the transboundary movement of e-waste into controlled and uncontrolled movements and also considers both the receiving and sending regions.[109]

Scientific journals

[edit]
See also: **Category: Waste management journals**

Related scientific journals in this area include:

- ***Environmental and Resource Economics***
- ***Environmental Monitoring and Assessment***
- ***Journal of Environmental Assessment Policy and Management***
- ***Journal of Environmental Economics and Management***

See also

[edit]
- **Biomedical waste**

- Burning
- Co-processing
- Curb mining
- Electronic waste recycling
- Extended producer responsibility
- Food loss and waste
- Food rescue
- International Waste Working Group – IWWG
- Landfarming
- Leaf Bank
- List of waste disposal incidents
- List of waste management acronyms
- List of waste types
- Milorganite
- National Cleanup Day
- Pallet crafts
- Refill (scheme)
- Reuse of bottles
- Solid waste policy in India
- Solid waste policy in the United States
- Timber recycling
- Upcycling
- Waste management in Turkey
- Waste minimisation
- Zabbaleen
- Zero waste

Notes

[edit]

1. ^ Also known as a tip, dump, rubbish tip, rubbish dump, garbage dump, trash dump, or dumping ground.

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[edit]

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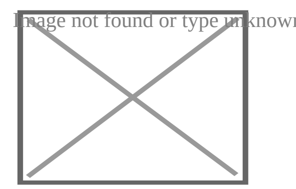
Biosolids, **waste**, and **waste management**

Major types

- Agricultural wastewater
- Biodegradable waste
- Biomedical waste
- Brown waste
- Chemical waste
- Construction waste
- Demolition waste
- Electronic waste
  - by country
- Food waste
- Green waste
- Hazardous waste
- Heat waste
- Industrial waste
- Industrial wastewater
- Litter
- Marine debris
- Mining waste
- Municipal solid waste
- Open defecation
- Packaging waste
- Post-consumer waste
- Radioactive waste
- Scrap metal
- Sewage
- Sharps waste
- Surface runoff
- Toxic waste



Processes

- Anaerobic digestion
- Balefill
- Biodegradation
- Composting
- Durable good
- Ecological design
- Garden waste dumping
- Illegal dumping
- Incineration
- Landfill
- Landfill mining
- Mechanical biological treatment
- Mechanical sorting
- Photodegradation
- Reclaimed lumber
- Recycling
  - appliance recycling
  - battery recycling
  - bottle recycling
  - fluorescent lamp recycling
  - land recycling
  - plastic recycling
  - textile recycling
  - timber recycling
  - tire recycling
  - water heat recycling
  - water recycling shower
- Repurposing
- Resource recovery
- Reusable packaging
- Right to repair
- Sewage treatment
- Urban mining
- Waste collection
- Waste sorting
- Waste trade
- Waste treatment
- Waste-to-energy

Countries	- Afghanistan - Albania - Armenia - Australia - Belgium - Bangladesh - Brazil - Bosnia and Herzegovina - Egypt - Georgia - Hong Kong - India - Israel - Japan - Kazakhstan - New Zealand - Russia - South Korea - Sri Lanka - Switzerland - Syria - Tanzania - Taiwan - Thailand - Turkey - United Kingdom - United States

Agreements	- Bamako Convention
	- Basel Convention
	- EU directives
	  - batteries
	    - Recycling
	  - framework
	  - incineration
	  - landfills
	  - RoHS
	  - vehicles
	  - waste water
	  - WEEE
	- London Convention
	- Oslo Convention
	- OSPAR Convention

Occupations

- Sanitation worker
- Street sweeper
- Waste collector
- Waste picker

Other topics

- Blue Ribbon Commission on America's Nuclear Future
- China's waste import ban
- Cleaner production
- Downcycling
- Eco-industrial park
- Extended producer responsibility
- High-level radioactive waste management
- History of waste management
- Landfill fire
- Sewage regulation and administration
- Upcycling
- Waste hierarchy
- Waste legislation
- Waste minimisation
- Zero waste

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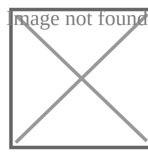
Recycling

Materials

- Aluminium
- Asphalt
- Concrete
- Copper
- Cotton
- Energy
- Glass
- Gypsum
- Paper
- Plastic
- Refrigerant
- Scrap
- Timber
- Cooking oil
- Water

Products

- Appliances
- Automotive oil
- Batteries
- Bottles
    - PET bottles
- Computers
- Drugs
- Fluorescent lamps
- Lumber
- Mobile phones
- Paint
- Ships
- Textiles
- Tires
- Vehicles



Apparatus

- Bins
- Blue bags
- Blue boxes
- Codes
- Collection
- Materials recovery facility
- Waste sorting

Countries

- Rate by country
- Australia
- Brazil
- Canada
- Ireland
- Israel
- Japan
- Malaysia
- Mongolia
- The Netherlands
- Switzerland
- Taiwan
- United Kingdom
  - Northern Ireland
- United States

Concepts	○ Circular economy ○ Dematerialization ○ Downcycling ○ Durable good ○ Eco-industrial park ○ Ecological design ○ Extended producer responsibility ○ Green economy ○ Industrial ecology ○ Industrial metabolism ○ Interchangeable parts ○ Land recycling ○ Material flow analysis ○ Precycling ○ Product stewardship ○ Recycling (ecological) ○ Refill (campaign) ○ Repairability ○ Resource recovery ○ Reusable packaging ○ Reuse of bottles ○ Reuse of human excreta ○ Repurposing ○ Reuse ○ Right to repair ○ Symbol (Green Dot) ○ Upcycling ○ Urban lumberjacking ○ Waste hierarchy ○ Waste minimisation ○ Waste picking ○ Wishcycling ○ Zero waste

See also

- Bottle cutting
- Cogeneration
- Composting
- Container-deposit legislation
- Dumpster diving
- Ethical consumerism
- Freeganism
- Pallet crafts
- Reverse vending machine
- Simple living
- Waste
- Waste-to-energy
- Waste collection
- Waste management law
- Waste management
- Water heat recycling
- Water recycling shower

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About New Hanover County

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Driving Directions in New Hanover County

Driving Directions From Tavern 14 to The Dumpo Junk Removal & Hauling

Driving Directions From Kornerstone Bistro to The Dumpo Junk Removal & Hauling

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Driving Directions From Cape Fear Museum of History and Science to The Dumpo Junk Removal & Hauling

Driving Directions From Bluethenthal Wildflower Preserve to The Dumpo Junk Removal & Hauling

Driving Directions From Wilmington Railroad Museum to The Dumpo Junk Removal & Hauling

Driving Directions From Cameron Art Museum to The Dumpo Junk Removal & Hauling

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Jennifer Davidson

(5)

Great work! Bryce and Adrian are great!

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Howard Asberry

(5)

The manager was very helpful, knowledgeable and forthright. He definitely knew what he was talking about and explained everything to me and was very helpful. I'm looking forward to working with him

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I highly recommend Dumpo Junk Removal. Very professional with great pricing and quality work.

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They are great with junk removal. Highly recommend them

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Great service with professionalism. You can't ask for more than that!

Integrating GPS Tracking for Better Routing**View GBP**

Frequently Asked Questions

How can GPS tracking improve the efficiency of junk removal fleet routing?

GPS tracking enhances route efficiency by providing real-time location data, allowing fleet managers to optimize routes based on current traffic conditions, reduce fuel consumption, and increase the number of jobs completed per day.

What are the key features to look for in GPS tracking systems for junk removal fleets?

Key features include real-time location tracking, route optimization capabilities, geofencing alerts, historical trip data analysis, and integration with existing dispatch software to streamline operations.

Can GPS tracking help in reducing operational costs for a junk removal fleet?

Yes, by optimizing routes to minimize idle time and unnecessary mileage, GPS tracking reduces fuel expenses and vehicle wear-and-tear. It also helps in preventing unauthorized use of vehicles, thereby cutting down on overall operational costs.

How does integrating GPS tracking benefit customer service in junk removal operations?

Integrating GPS tracking allows for more accurate arrival time estimates and improved communication with customers regarding delays or changes. This leads to enhanced customer satisfaction through reliable and timely services.

What are potential challenges when implementing GPS tracking in a junk removal fleet?

Challenges may include initial setup costs, training staff to use new technology effectively, ensuring system compatibility with existing tools, managing data privacy concerns, and addressing any resistance from employees accustomed to traditional methods.

The Dumpo Junk Removal

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State : NC

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