



Germany

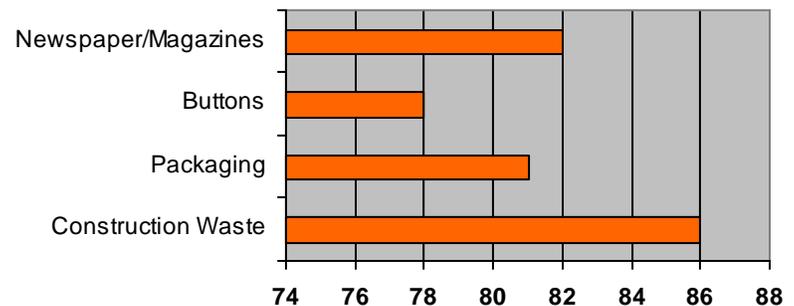
Recycling Equipment Market

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Summary

Long known for its environment-conscious attitude, it comes as no surprise that Germany has the highest waste recovery quotas worldwide. Employing over 240,000 people, the waste management sector reached sales of EUR 100 billion in 2006. Ever-increasing energy and raw materials prices have emphasized the economic benefit of recycled raw materials, helping to stimulate growth in some recycling sectors. Since 1993, over EUR 20 billion have been invested in modern machinery for waste disposal and recycling; about 366 million tons of waste were processed in 2003. However, strict legislation and an increasingly mature market dominated by a handful of companies have led to a decline in Germany's domestic demand for recycling equipment. Germany hosts leading international trade events in virtually every industry sector, attracting buyers from around the world. Over 90 % of products and technologies are introduced into the German market via trade fairs. U.S. exhibitors should be prepared to take full advantage of the business opportunities presented at these events. U.S. exhibitors and visitors can conclude transactions, and all attendees can use trade fairs to conduct market research, see what their worldwide competition is doing, and test pricing strategies. Upcoming trade fairs relevant for the recycling sector are listed on page 7 of this report.

Recovery Rates in Germany



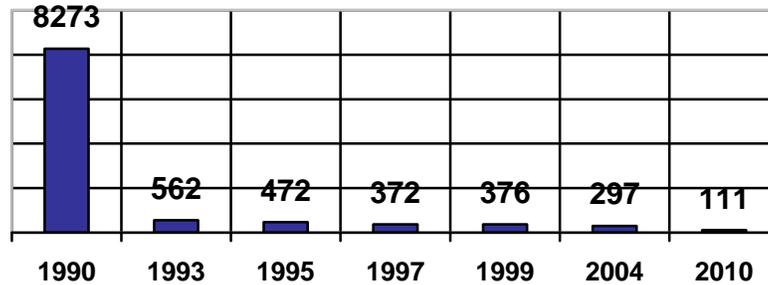
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Market Overview

Following the 1990 introduction of the DSD (Duales System Deutschland GmbH) "Green Dot"—a recycling system backed by the federal government and characterized by a green dot symbol prominently displayed on packaging materials—Germany has been able to recycle nearly 70 % of packaging materials. The system implements the 1990 German packaging law that obliges manufacturers, users, and distributors of packaging materials to reclaim and recycle packaging waste. Initiatives such as the Blue Angel label, used to designate products as environmentally friendly when compared with other products from that category, have also been successfully introduced to the market. Germany's recycling efforts have resulted in the highest recovery %ages worldwide, with 65 % of all municipal and 40 % of all production waste being recovered. Domestic waste accounts for only 13 % of the total. Costs for sorting, transporting, and disposing of waste continues to climb, with 1 ton of garbage in 2005 costing between EUR 180-200, about 3 times as much as in 2003. Because of legislation prohibiting the development of new landfills and the subsequent cost increase in operating existing ones, recycling has become a very attractive alternative. The waste management industry continues to receive support from the government, which is committed to ensuring environmental protection.

The number of landfills in Germany has fallen from over 8,000 in 1990 to less than 300 in 2004. At the same time, the number of waste management firms and recycling companies also decreased, leading to a higher concentration of waste treatment with a few large companies. As the amount of waste processed by recycling firms increases, high-volume waste sorting machines using precise, modern sorting technologies, such as sorting machines for PET bottles, remain in high demand. By increasing the purity of the used plastic materials, the total cost of recycling is falling. Newer, standard-setting machines obtain 92-99.9 % purity levels after conditioning.

Number of Landfills in Germany



Sources: Remondis, Ministry for the Environment, Nature Conservation & Nuclear Safety, Federal Office of Statistics

**Six Largest Waste Management Firms by Revenue
(in EUR million)**



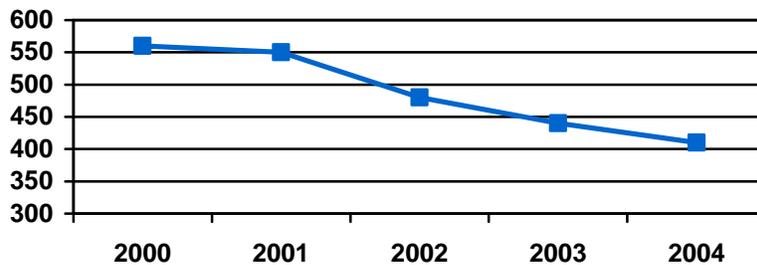
Trends and Best Prospects

Recycling Equipment - Trends

The German market for recycling equipment totaled EUR 1.2 billion in 2003. However, due to an increasingly saturated domestic market, the number of small and medium-sized enterprises that once dominated the recycling equipment manufacturing industry continues to decline. There is strong growth in the exportation of waste from Germany to eastern European countries such as Poland. German landfills continue to fill up and as the total number of landfills has declined drastically since reunification, it has become a more economically viable solution to send trash eastward, due to cheaper storage, processing and labor costs. Due to increased export of waste, German recycling equipment manufacturers' exports rose from 50 % of total production to 68 % between 2000 and 2004. Revenue during the same period climbed by 25 % due to export growth. However, domestic demand for recycling equipment fell by 17 %. The trend of declining domestic growth is not forecast to change in the near future, even as new legislation requiring stricter recycling standards is introduced.

Some areas of the recycling machinery industry show promising growth. Due to the implementation of the Ordinance on 'Waste from Electrical and Electronic Equipment' (WEEE), an additional 1.1 million tons of electronic equipment will be recycled each year. Demand for electronic scrap recycling equipment including shredders, special plastics recyclers, and machines capable of reclaiming metal from cables are expected to increase significantly. Other best prospects include machines for high accuracy waste separation, paper recycling, vehicle recycling and recovery, and for the treatment of hazardous waste.

Domestic Turnover of German Recycling Manufacturing Firms (in EUR million)



Landfills / Thermal Combustion Systems - Trends

The problem of dealing with high waste volumes in one of Europe's most densely populated countries has left planners looking less for storage solutions and more towards energy recovery solutions. In the past 15 years, the number of thermal combustion systems has grown by nearly 50 %. During that same time period, the number of landfills in Germany has decreased by over 90 %. Incinerators use a variety of biomass materials such as sand dust, medium density fiberboard, particleboard, bark, agricultural by-products, and other forms of clean biomass waste to produce clean, hot combustion gases for energy recovery through hot air, hot water, steam, and cogeneration. Ranging from 750,000 to 60,000,000 BTU (British Thermal Unit), these combustion gases power not only electric turbine generators but also heat thousands of homes. As of 2002, 56 high efficiency thermal combustion plants were in operation.

Best Prospects

Although the construction of waste incineration plants nearly came to a halt in the mid to late 1980s as a result of environmental concerns, new technologies making thermal combustion systems a clean and environmentally sound form of waste management have mostly subdued the opposition, resulting in a slate of new construction projects. The market exhibits positive growth and, including the projected capacity of current construction projects, waste incineration capacity is expected to increase by one to two million tons in the next two years. The growth of untreatable waste will further increase the role of thermal combustion plants in Germany.

Electronic Equipment Recycling - Trends

Germany's federal legislation implementing the European Union's (EU) "Waste from Electrical and Electronic Equipment" (WEEE) called the "ElektroGesetz" was introduced in February 2005. The legislation governing the sale, return, and environmentally sound disposal of electronic equipment makes producers responsible for the take-back, recycling and disposal of their products. While the Information Technology (IT) sector is one of the largest industries affected by the new law, producers of products such as small and large household appliances, lighting equipment, electronic tools, toys, sports and leisure equipment, medical products, monitoring and control instruments, and automatic dispensers are also affected.

The equipment producers must provide the local authorities with containers in which to collect waste equipment at over 2500 municipal collection points. The producers are also then responsible to take the waste away for disposal. Unlike the "Green Dot" system, there is no monopoly over the recycling of

WEEE products, leaving the producers to choose a recycler of their choice. Once the legislation goes into effect in July 2006, recycling quotas will range from 50-80 %, depending on the type of equipment.

There are an estimated 900 million electronic devices in German households, including approximately 40 million color TVs. Each year, two million computers, three million fax machines and more than six million telephones and cell phones are disposed of in Germany. An estimated 400,000 tons of electric scrap are recycled each year. In addition to the valuable steel and copper remaining in these products, many contain hazardous substances such as lead and cadmium that must be treated in an environmentally safe manner. Treatment of such hazardous substances has driven the cost of recycling a refrigerator to around EUR 15 and a TV to almost EUR 10. With the additional 1.1 million tons of electrical product waste to be recycled yearly under the ElektroGesetz, nearly a half a billion Euros extra per year will be infused into the recycling sector according to the ZVEI (German Electrical and Electronics Industry Association). A defined increase in the demand for electronic scrap recycling equipment is forecast, including shredders, sorters, separators and hazardous waste treatment.

Waste Oil Recycling – Trends

The reprocessing of waste oil to obtain new lubricants, oil products, and heating oil plays a major role in the recycling sector in Germany. Over 75 % of waste oil collected is recycled and used for new products, while the remaining 25 % is used for energy and heating purposes. The German Federal Government provides financial assistance to firms involved in waste oil recycling in the form of grants, subsidies, and financing for new processing plants. Germany's "Waste Oil Ordinance" requires oil to be separated and sorted by type. In addition, all providers of oil to consumers are required to set up collection facilities. Of the 120 million tons of oil used yearly in Germany, approximately 700,000 tons end up as hazardous waste, incapable of being recycled due to their high content of metal particles: sulfur, chlorine, and heavy metal compounds. The inefficiency of waste oil recycling has Germany's Environmental Ministry focusing on the development of more efficient and cleaner technologies such as using propane for the separation of oil from its contaminants. 356,000 tons of mineral oil products are produced annually from waste oil. Of that amount, 116,000 tons are made into specialty lubricants.

According to the BVSE (Bundesverband Sekundärrohstoffe und Entsorgung e.V. / Association of the German secondary raw material and waste management industry) the amount of collected waste oil decreased significantly by 4% in the first half of 2006. There is a strong competition among collectors in this industry sector - for both quantity and quality - which is expected to increase. For the second half of 2006 the decreasing trend is expected to continue. On the other hand, waste oil recycling companies benefit from the rising prices for crude oil.

Paper – Trends

The recycling of paper, which is recyclable up to eight times, has long been known as one of the most efficient and cost effective methods of recycling. The production of paper from waste paper products (recycled paper, paperboard, cardboard) continues to grow in Germany. With respect to recovered paper the first half of 2006 showed a high demand combined with a high collection rate. Between January and April 2006, consumption of recovered paper in German paper mills grew by 7.2 % or 334,000 tons. For the second half of 2006, the industry does not expect the overall market situation to change. Newspapers, other printed material, office papers and graphic paper consumption amounted to 8 million tons in 2005. Additionally, some 6.3 million tons of sales packs, transport packaging, environmental packaging and other products made from packaging paper are consumed annually. Since the "Packaging Ordinance" was enacted in 1991, the amount of paper used in packaging has dropped by one million tons compared to 1991 levels. The amount of paper package products in Germany recycled rose to 89 % in 2002. However, the overall recycling rate remains at about 65 %. The best prospects for paper-recycling products include shredders, and de-inking process equipment.

Glass Recycling & PET Bottles – Trends

Germany has a widely accepted system of multiple use deposit bottles. Bottles are returned to the retailer for a refund of the deposit. Glass and PET bottles can be reused up to 50 times and are sent back to producers for cleaning and refilling. However, non-refillable bottles are quickly filling up landfills and producers are turning to cheaper and more efficient methods of recycling single-use PET and glass bottles, which also often require a deposit.

Recycling non-reusable PET bottles uses only 65 % of the energy of creating a new one. Using waste glass for the production of new glass also reduces energy requirements by 0.3 % for each %age point of waste glass used. Because glass manufacturing is such an energy intensive process, energy costs can amount to 30 % or more of total production costs. The cost benefit of recycling glass has helped to fuel the sector's growth and overall profitability. Since the introduction of waste glass collection bins in the early 1970s, the %age of waste glass used in production of new glass in Germany has increased to 90 %, resulting in the reuse of over 3,000,000 tons of glass per year.

According to the BVSE, demand for recovered glass in Germany could be much better than it actually was in the first half of 2006. Compared to 2005, there are some minor cyclical improvements of the market situation as the glass producing industry could increase its production slightly. These positive impulses need, however, to be seen against the background of a strong decline of production capacity of the German glass industry over the past years.

The share of drinks bottled in PET bottles has increased constantly within past years. In Germany, over 9 billion litres of drinks have been bottled in non-refillable and over 5 billion litres in refillable PET bottles in 2005. 58.9% of soft drinks bottled in Germany in 2005 were bottled in PET bottles (18.1% refillable / 40.8% non-refillable) compared to 20.1% in 2000 (13.0% refillable / 7.1% non-refillable). Consumption of PET bottles in Germany was at 12 billion in 2005 (2000: 3 billion). Today, there is virtually no product which is not packaged in PET anymore. Nowadays collection and recycling of PET products is state of the art throughout Europe. According to Petcore, the European trade association for PET container recycling (www.petcore.org), European post-consumer PET collection rates reached 796,000 tons in 2005, a 15.1% increase over the previous year. The increase in PET collection continues, by far, to exceed growth in consumption. The largest boost came from Germany where collection shot up 32% to reach over 200,000 tonnes. 17.6% (or 140,000 tonnes) of PET collected in Europe in 2005 were exported to Asia. Most of the collected PET containers in Europe were recycled into polyester fibre products (57%), down from 65% in 2004 and 70% in 2003. In contrast, the market for polyester sheet rapidly gained share (16.2%) in a range of thermoformed applications where the use of recycled PET tripled over the past two years. Re-use back into PET bottles (15.2%) has also steadily increased whereas other outlets such as strapping (7.8%) remained relatively flat.

Car Recycling – Trends

The recycling of automobiles, including overhauling and resale of spare parts, has become a major sector of the overall recycling industry. Over 3.5 million cars are removed from service each year. The law on the 'Disposal of End-of-life Vehicles', enacted in 2002, forces manufacturers and importers to take back end-of-life vehicles for recovery and recycling. From 2006 onward, at least 85 % of the end-of-life vehicle weight by average must be recovered and at least 80 % recycled or reused. These figures are expected to increase by 2015 to 95 % and 90 % respectively. Of all the cars disposed of in Germany, approximately three-quarters are recycled or reused, while the remaining quarter generally ends up in landfills, is incinerated, or exported. Since April of 1998, a nationwide return network of around 15,000 collection points, over 1000 recycling businesses, and 65 shredder plants have been created to aid vehicle recovery and recycling.

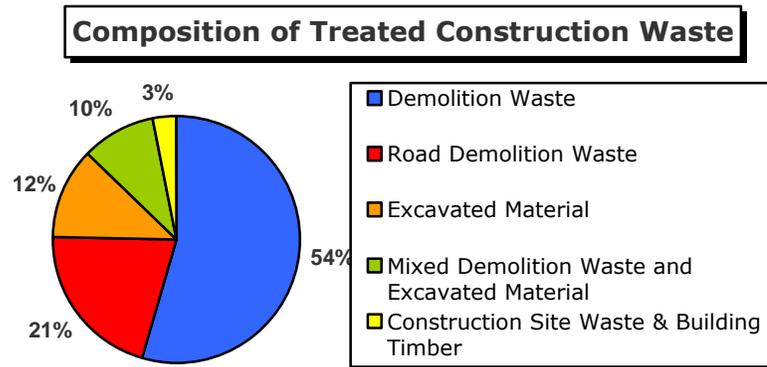
In order to comply with impending legislation, automakers themselves are taking the "green approach" by developing cars that will be nearly completely recyclable. Moreover, since July 2003, it has been prohibited to place vehicles on the market that contain the heavy metals cadmium, mercury, lead and hexavalent chromium.

Furthermore, nearly 99 % of all car batteries collected are recycled. Other highly recycled or recoverable materials include used tires, which are shredded for road building, steel and aluminum from the chassis, and copper wiring. Analysts estimate that by 2015, automobiles will be over 95 % recoverable.

According to the BVSE, the spirit in the car recycling industry is currently rather tense. This is due to an ongoing decrease in the number of end-of-life vehicles available for recycling as well as in the quality of the available vehicles and the resulting price increase leading to strong competition in this sector.

Construction Waste

Construction waste, which includes excavated road building and construction site material, mining waste, demolition waste, and building rubble, accounts for the largest portion, by tonnage, of waste generated annually totaling 223 million tons in 2003. The majority of the excavated material is later reused for refilling, but a large remaining portion is either recycled or reused. The recycling rate for excavated material stands at nearly 87 % (186 million tons) and 70 % for construction waste (51 million tons). The amount of construction and demolition waste treated in construction waste treatment plants fell by 8.7 million tons or 13% from 2000 to 59.8 million tons in 2004.



Market Access

Federal Grants and Funding for Recycling

The Federal Ministry of Education and Research provides funding for research and development in the following areas:

- The reduction and avoidance of organic chemical emissions associated with the firing process and process water
- Primary avoidance of inorganic emissions of fluorine, chlorine and sulphur dioxide
- Energy saving methods
- Recirculation of process water, with a view to achieving the highest possible level of recycling

Certification and Permits

Since 1997, all electrical equipment exports to members of the European Union must bear the CE (“conformité européenne”) mark, which indicates compliance with European Union standards. Import permits are only necessary for specific categories or certain countries not listed on the Import List. Those products that require permits are typically those subject to quotas, for example steel products. The import of industrial goods to Germany, however, is almost completely liberalized, and no import permit or declaration is typically required.

Products that require import permits (and some that do not) also require a certificate of origin if stipulated in the Import List or in the import permit. Such certificates must be issued by an official body of the country of origin.

EU-wide patents can be obtained by filing an application with European Patent Office in Munich. Patents in the European Union are valid for 20 years, but extensions can be granted for products that require long periods of time for approval.

Duties

As a EU Member state, Germany applies the "Common Customs Tariffs of the EU" (CCT), which is supplemented by the German Customs Tariff Ordinance. The Common Customs Tariffs of the EU generally takes the form of *ad valorem* duty rates, where there are six methods for determining the value of a product. The most typical method used is the "transaction value" method, which uses the actual price paid or payable for the goods. Because Germany uses the Harmonized System (HS) to classify internationally traded goods, all products must have an HS number in order to determine the duty. Imports from EU or EFTA countries enter the German market duty-free. An import-turnover tax is applied but is passed on to the final consumer as a value-added tax (VAT). The VAT, currently 16% in Germany, applies equally to European and German competitors. A general overview of customs issues can also be obtained at: www.export.gov/td/tic

Standards

German requirements for safety and reliability of equipment, plants, technology and products are set by more than 200 technical standards and rules. Important marks include the "Verband Deutscher Elektrotechniker" (VDE) mark for electrical components and the "Geprüfte Sicherheit" (GS) mark for mechanical products. Conformity with GS mark requirements is tested by the TÜEV Rheinland Group, which provides a variety of international certification services for machinery and electrical equipment, including the CE ("conformité européenne") mark and Environmental Management Systems (EMS) certification (ISO services for machinery and electrical equipment, including the CE services for machinery and electrical equipment, and the CE mark and Environmental Management Systems (EMS) certification (ISO 14001); their North American offices can be found online at <http://www.us.tuv.com/>. Underwriters Laboratories (UL), a global company based in the United States, also tests conformity with CE requirements and can be found online at <http://www.ul.com>. German agencies responsible for standardization include the Deutsches Institut für Normung e.V. (all products) and the Deutsche Vereinigung des Gas- und Wasserfaches e.V. (specifically for water and gas).

Trade Promotion Opportunities

Trade Shows

Germany hosts leading international trade events in virtually every industry sector, attracting buyers from around the world. Over 90 % of products and technologies are introduced into the German market via trade fairs. U.S. exhibitors should be prepared to take full advantage of the business opportunities presented at these events. U.S. exhibitors and visitors can conclude transactions, and all attendees can use trade fairs to conduct market research, see what their worldwide competition is doing, and test pricing strategies. Upcoming trade fairs include:

Entsorga-Enteco 2006 – International Trade Fair for Waste Management and Environmental Technology October 24 – 27, 2006, Cologne

The trade fair's concept has been reworked for Entsorga-Enteco 2006, and, as a result of the conceptual sponsorship by the VDMA, will focus even more on environmental technology. This change is reflected in the addition of the word "Enteco" (short for "environmental technology") to the fair's name.

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IFAT – International Trade Show for Water, Wastewater, Waste, Recycling
May 5-9, 2008
Neue Messe Munich
US representative: Anke Gruening
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Key Contacts - Useful Links

BDE - Federation of the German Waste Management Industry
<http://www.bde.org/>

VDMA (German Federation of Machines and Plant Engineering) – largest recycling machine industry group
<http://www.vdma.org>

RENE Recycling Network Europe – Large organization for recycling of WEEE's components
<http://www.rene-europe.com/>

BVSE - Bundesverband Sekundärrohstoffe und Entsorgung e.V.
(Association of the German secondary raw material and waste management industry)
www.bvse.de

Federal Ministry of Environmental Protection, Nature Conservation and Nuclear Safety
<http://www.bmu.de/>

Federal Environmental Agency
<http://www.umweltbundesamt.de/>

For More Information

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