

2.5

WASTE



Optimising waste management first of all involves reducing the quantity generated. Once waste has been produced, proper consideration must be given to the reuse of waste such as glass, which can be used more than once, meaning that much waste then ceases to be so, and in fact reuse is not strictly considered as a waste management operation.

Once waste has reached the end of its useful life, then recycling becomes the key issue, offering obvious environmental and economic advantages. Spain is on the way towards achieving respectable recycling rates for paper, glass and packaging waste. Other recyclable waste includes building materials, used tyres, aluminium and other metals, used oil, and sludge from sewage treatment facilities, etc. Recycling is a complex process, actively involving manufacturers, consumers (through selective separation), take-back firms and recyclers.

One specific form of recycling is composting, involving the selective separation (sorting) of non-organic materials, and the anaerobic decomposition of the remainder to produce compost. 32% of managed waste undergoes a sorting process, with a proportion being used for compost.

Some waste, because of its nature, lack of specific technology or financial viability, cannot be recycled. In this



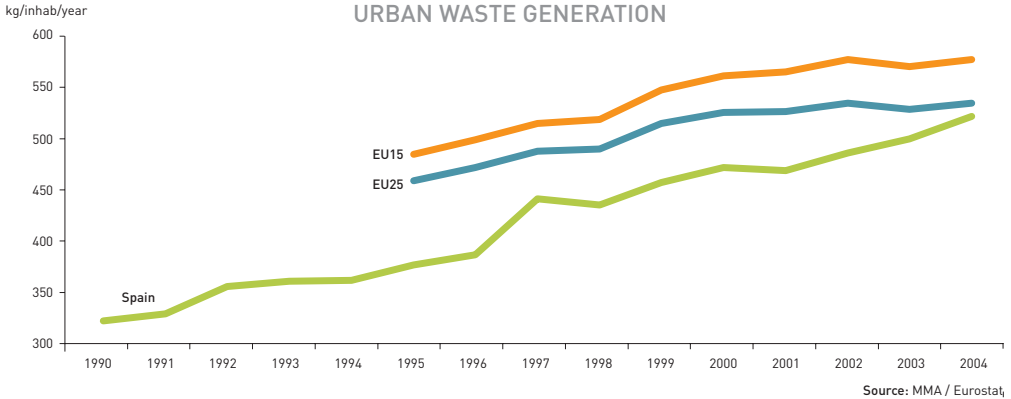
case, the preferred approach is to use it as a source of energy. Combustion with energy recovery is a growing option in Spain, now accounting for 7% of waste treatment.

Once waste cannot be used (as either a material or energy source), all that can be done is to dispose of it in a responsible manner. The task of landfill sites is to store waste (whether inert or not) in appropriate conditions and prevent it from interacting with the environment. 2004 was the first year in which less than half of waste was deposited in landfill sites, the result of an increase in the use of other waste management methods.

INDICATOR	GOAL	TREND
Urban waste generation	Minimise production	Urban waste production is increasing
Urban waste management	Increase recycling and reduce the quantity of waste ending up in landfill sites	The use of landfill is, for the first time, below 50%
Paper-cardboard recycling	Increase recycling rate	The collection rate is increasing but that of recycling remains steady
Glass recycling	Increase recycling rate	The recycling rate continues to rise
Packaging waste recycling and recovery	Increase recycling rate	Packaging waste recycling is close to 50%, while recovery is now above this figure
Sewage sludge production and use	Increase sewage sludge reuse	Sewage sludge production continues to rise, as does its reuse in agriculture

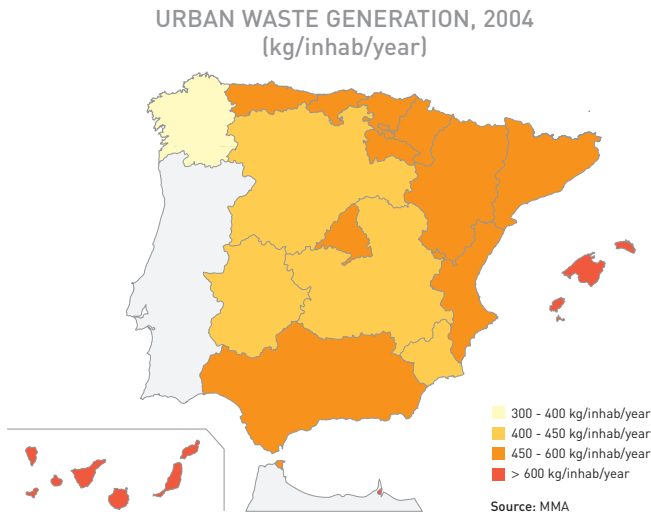
Urban waste generation

Urban waste generation is increasing in Spain



Urban waste generation continues to rise. Since the early 1990s there has been a year-on-year increase, with the figure reaching 524.5 kg per inhabitant per year in 2004. This upward trend applies both to Spain and the European average, which also reveals yearly increases above the Spanish level (567 kg/inhab/year for the EU15 and 525 kg/inhab/year for the EU25). However, the current rate of increase in urban waste generation in Spain is slightly above that of the EU, meaning that the country will shortly reach average European levels.

Industrialisation, economic development and widespread social well-being, with the corresponding trends in consumption, led urban waste generation per inhabitant to rise over the period 1990-2004 by 62.2%, with a total of 22,735,142 tonnes of waste being generated in 2004.



Urban waste generation is becoming more uniform across the various Autonomous Communities. While in the past there were major differences between the inland regions (except for Madrid) and those on the coast, these disparities have been reduced. Nonetheless, the five Autonomous Communities on the Mediterranean shoreline still produce half of all Spain's waste, while Galicia continues to generate a lower volume. As in previous years, the Canary and Balearic Islands and, to a lesser extent, Melilla, have remarkably high figures as a result of the influence of tourism in the first two, and individuals passing through Morocco in the case of the latter.

In these regions, tourism is apparently responsible for a higher proportion of waste generated per inhabitant, as the calculation includes all waste collected, but only takes into account the population recorded in the census.

NOTES

- According to the Waste Act 10/1998 (*Ley 10/1998, de Residuos*), urban or municipal waste is "waste generated in private households, shops, offices and service businesses, as well as all waste similar to that produced in the aforementioned places or activities and that is not classified as hazardous".
- Annual waste generation per person per year is calculated by dividing annual waste by the estimated population for each year according to the Spanish National Institute of Statistics (*INE - Instituto Nacional de Estadística, 1991 and 2001 population censuses and intercensal estimates for the remaining years*). The seasonal tourist population is not included
- The INE provides information drawn from its "Urban Waste Generation and Treatment Survey" (*"Encuesta sobre generación y tratamiento de residuos urbanos"*) for the years 1998-2004, with information broken down by Autonomous Community. For 2004, for example, the total estimated quantity of waste produced in Spain according to this survey was 21,207,615 tonnes. The Statistical Office of the European Union (EUROSTAT) also provides information on the urban waste generated per inhabitant per year within Europe. Its figures for Spain are higher than those presented in this report (662 kg/inhab/year for 2004).

SOURCES

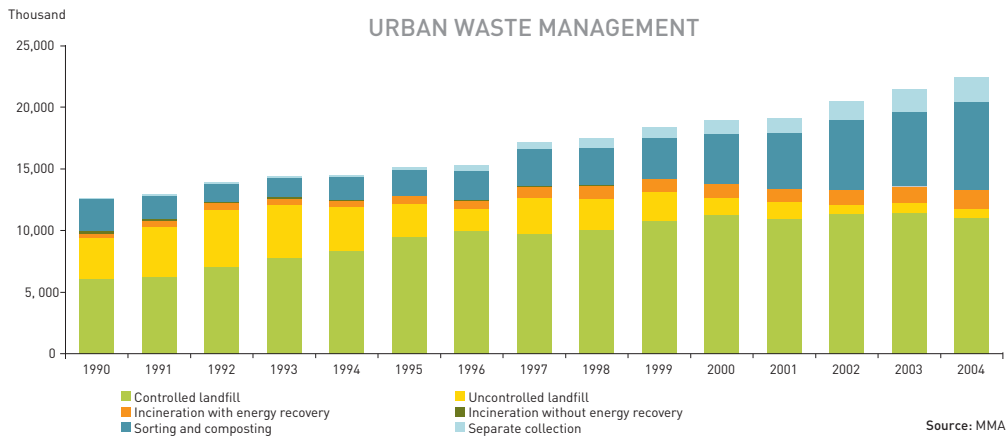
- The Environment in Spain (Medio Ambiente en España). Various years. Spanish Ministry of the Environment (*Ministerio de Medio Ambiente*).
- Statistical Office of the EU (Eurostat). Structural indicators.

FURTHER INFORMATION

- www.mma.es
- www.ine.es
- www.epp.eurostat.ec.europa.eu

Urban waste management

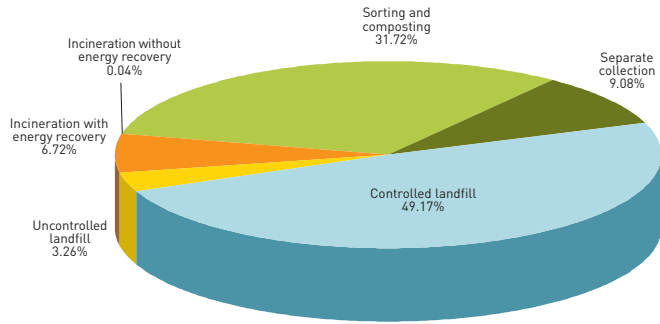
Increases in separate collection and incineration with energy recovery mean that less and less waste ends up in landfill



Urban waste management has evolved towards increasingly environmentally-friendly practices: sorting and composting are gaining ground, as is incineration with energy recovery, while uncontrolled landfill has been practically abandoned, and the quantity of waste being incinerated without energy recovery is insignificant. For the first time in the last ten years, the most regularly used system, controlled landfill, accounts for less than half of all waste.

The most significant change over recent years is the continuing increase in the quantity of waste handled by sorting and composting facilities. Over a decade these have gone from receiving 12% of waste to 32% in 2004, with three times as many plants now involved in the process. In 2004, Spain had some 77 sorting and composting plants, processing more than seven million tonnes of waste to produce 811,184 tonnes of compost. Andalusia, Murcia and to a greater extent Valencia and Cantabria are the regions which made greatest use of composting, all recording levels above 50% of treated waste.

URBAN WASTE MANAGEMENT, 2004



Source: MMA

NOTES

- See note for the previous indicator regarding the Waste Act 10/1998.

SOURCES

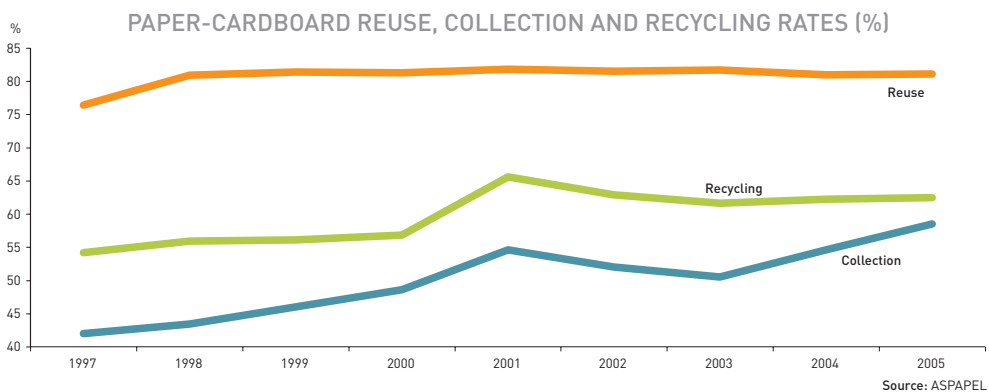
- The Environment in Spain. Various years. Spanish Ministry of the Environment.

FURTHER INFORMATION

- www.mma.es
- www.ine.es
- www.epp.eurostat.ec.europa.eu/

Paper-cardboard recycling

The paper-cardboard recycling rate has stabilised at above 60% in recent years



Cellulose fibre obtained from wood is the main raw material used in the paper industry. It is renewable in origin and recyclable, although the fibre deteriorates after successive recycling. Given that part of the paper used every year is preserved in the form of documents, books, magazines, etc., and that a further proportion has uses which prevent recovery (toilet and sanitary paper), the reuse rate cannot reach 100% and fresh cellulose fibre must be added during each papermaking cycle. In general, for every 10 kg of recycled paper manufactured in Spain, used paper accounts for 8 kilograms of the raw materials employed.

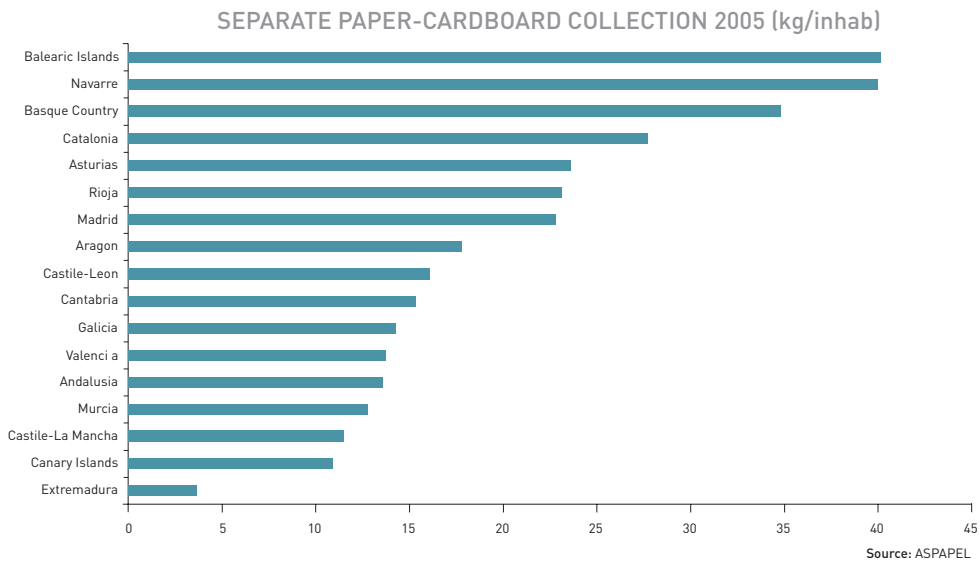
In 2005, 59% of used paper was collected in Spain, with the quantity of used paper surpassing 4 million tonnes for the first time (4,322,600 tonnes). These figures, the highest for the period considered, bring Spain close to the European average (60%). The saving in landfill storage space is noteworthy: used paper could have filled 40 football stadia were it not for recycling.

Through the use of separate collection (blue bins, recycling points and door-to-door collection at small retailers and offices), almost 850,000 tonnes were recovered in 2005, 19% more than the previous year. The collection and recycling rates for paper reveal an upward trend broken only in the years 2002 and 2003, although it should be remembered that as the established targets are met, the margin for improvement diminishes.

It is worth mentioning that from 2004 onwards, the collection rate once again experienced an upturn through improvements in the collection system following route optimisation and a greater focus on paper and cardboard from small retailers and offices.

The recycling rate has stabilised over the last three years analysed, reaching a figure of 62.5%. The upward trend in separate collection suggests that the recycling rate will increase over the coming years.

By Autonomous Community, the Balearic Islands and Navarre devote the greatest efforts to selective paper separation, collecting more than 40 kg per inhabitant in 2005, compared with a national average of 19.23 kg/inhab.



NOTES

- The reuse rate refers to consumption of recovered paper expressed as a percentage of paper and cardboard production.
- The collection rate refers to the collection of recovered paper expressed as a percentage of paper and cardboard consumption. Used paper and cardboard is recovered for recycling by various means: industrial collection (at companies, publishing houses and printers and major retail outlets), separate collection (through blue bins and "door-to-door" collection from small retailers) and specific collection (in offices, in public authority buildings, at recycling points, etc.). Once cleaned and classified into different grades, the recovered paper is used as a raw material by the papermaking industry to produce new paper. Recovered paper is thus used paper which has been collected to be used as the raw material for the manufacture of new paper, in other words to be recycled. Around 50% of the paper consumed in Spain is collected for recycling (collection rate).
- The recycling rate for waste paper and cardboard refers to the percentage ratio between recovered paper consumption (recycled paper) and apparent consumption of paper and cardboard. Apparent consumption is calculated by adding the quantity imported to the quantity produced and then deducting exports.

SOURCES

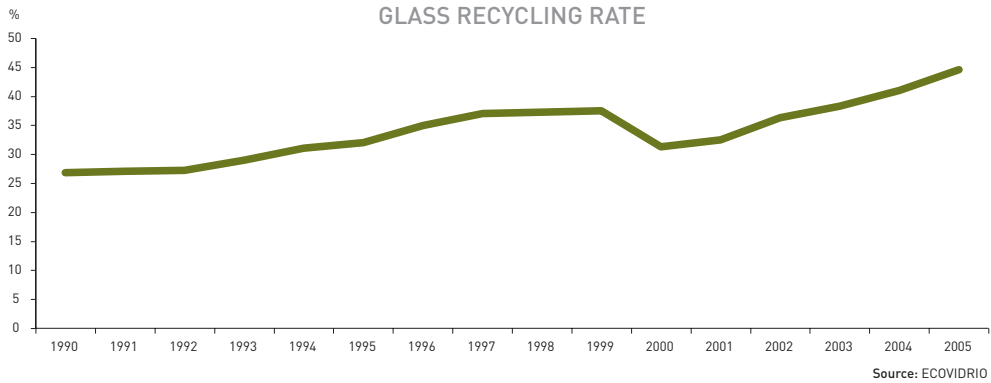
- Spanish Association of Pulp, Paper and Cardboard Manufacturers (*Aspapel - Asociación Española de Fabricantes de Pasta, Papel y Cartón*).

FURTHER INFORMATION

- www.mma.es
- www.aspapel.es

Glass recycling

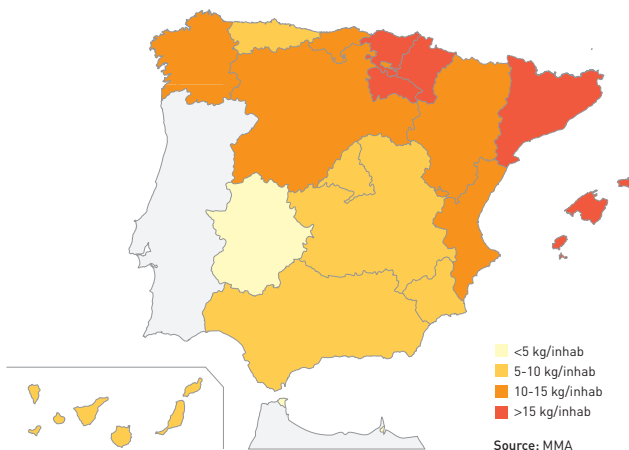
The glass recycling rate continues to rise, reaching a level of 45% in 2005



Glass is a 100% recyclable material, and can be recycled several times without losing its qualities. Moreover, the fact that it does not degrade makes it a perfect packaging medium for almost any product. Glass recycling avoids the extraction of materials and consequent erosion, reduces saturation of landfill sites (glass takes thousands of years to degrade naturally), saves energy and eliminates around 20% of the gases released during the process of manufacturing new glass.

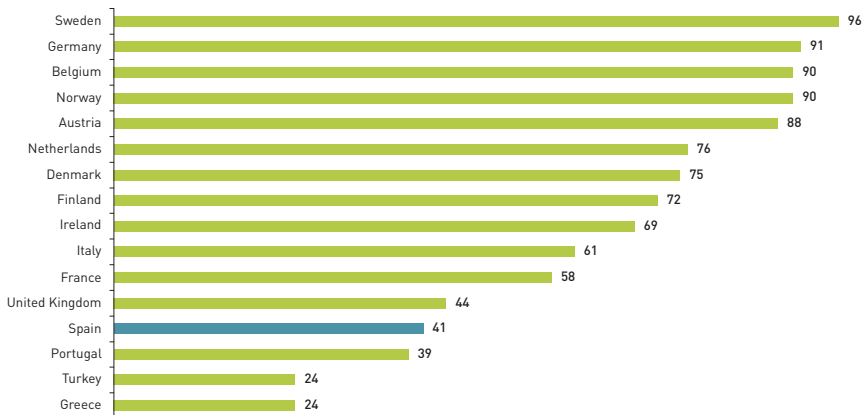
Glass recycling in Spain is growing steadily if slowly. Over the 16-year period 1990-2005, for example, the recycling rate rose by barely 18 points, although during the last six years the yearly rate of increase has been above 2%. In 2005, glass recycling reached a level of 45%, with 744,600 tonnes of glass packaging waste being recycled, an increase of 10% on the previous year.

GLASS RECYCLED FROM BOTTLE BANKS, 2005 (kg/inhab)



The regional profile reveals that Rioja and the Basque Country are the Autonomous Communities with the highest quantity of glass collected in green bottle banks (more than 20 kg per inhabitant), followed by Catalonia, Navarre and the Balearic Islands. The national average stands at 11.6 kg of glass per inhabitant.

GLASS RECYCLING RATE, 2004 (%)



Source: ECOVIDRIO / FEVE

Despite the efforts reflected in the steady rise in the glass recycling rate, Spain continues to find itself towards the bottom of the EU15 ranking as regards glass recycling, having been overtaken by the United Kingdom since last year. The nation still lags a long way behind Sweden, where practically all glass consumed is recycled.

NOTES

- The glass recycling rate is defined as the ratio between the quantity of glass collected and apparent glass consumption. The latter is calculated by adding domestic production to glass imports and then subtracting exports. Ecodrio conducts the entire process of glass recycling for subsequent manufacture of glass packaging (collection, treatment and final recycling, a process which takes place within the same year). This refers only to packaging glass (hollow glass), and does not include other types of glass, such as window panes, car windows, laminated glass, etc. (flat glass).
- The figures for Denmark are estimates.

SOURCES

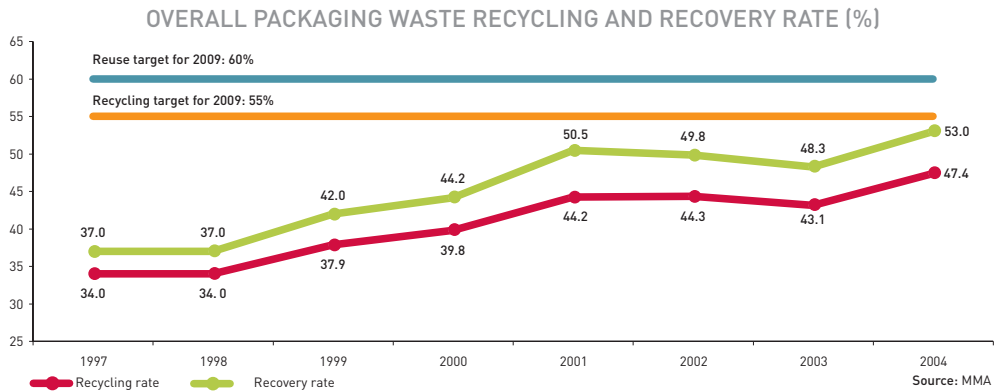
- Ecodrio
- European Container Glass Federation (FEVE).

FURTHER INFORMATION

- www.mma.es
- www.ecovidrio.es

Packaging waste recycling and recovery

After the fall in 2003, packaging waste recycling and recovery rates resumed the upward trend of recent years



Packaging makes up 26% of urban waste generated, and includes all kinds of materials: plastic, wood, metal, paper, glass, etc. Packaging includes all products used to contain, protect, handle, distribute and display goods, at any stage of manufacture, distribution or consumption (Act 11/1997 (*Ley 11/1997*)).

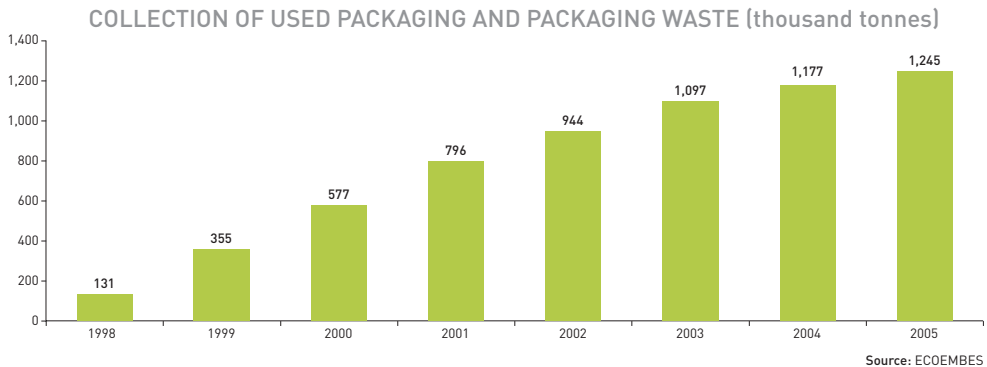
Spain produces more than one million tonnes of packaging waste every year. This quantity and variety demand a range of actions to ensure proper management, and reuse as raw materials in the production of new packaging is one of the most efficient options.

The packaging waste recycling rate stood at 47.4% in 2004, moving closer to the 55% target set for 2009 in Royal Decree 252/2006 (*Real Decreto 252/2006*), which reviewed the recycling and reuse targets established in Act 11/1997. Like the recycling rate, the packaging waste recovery rate also rose compared with the previous year, also reaching a level close to the 60% target for 2009.

Both rates have experienced an upward trend, except for 2002 and 2003, when the inclusion in the calculations of wooden pallets used for transporting goods caused a fall in the percentage rates. Every year, Spain recycles and recovers a greater quantity of packaging waste and a greater proportion of all packaging in circulation.

More than 39 million Spanish citizens have access to a separate collection system for

lightweight packaging (plastic containers, tins, TetraPaks), with 88% of Spanish municipalities of more than 5,000 inhabitants having a lightweight packaging collection service. Most municipalities belonging to the Integrated Management System (IMS) operated by ECOEMBES have opted for the specific separate collection system for lightweight packaging. The igloo-shaped container is the most widely used in Spain (almost 40% of the total), and the first choice for semi-urban and rural areas.



In 2005, the Integrated Management System recovered 1,245,188 tonnes of packaging out of the 1,950,778 tonnes managed by the system, in other words 63% of the packaging placed on the market by the member companies. For the first time more than one million tonnes of packaging were recycled, representing 51.5% of all packaging managed. The remainder (240,904 tonnes) was used for energy generation.



By the end of 2005, ECOEMBES had 12,000 member companies, an increase of 1.4% on the previous year. Food is the best represented sector, with 6,106 companies, 50.88% of the total, while the drinks industry accounts for 7.57% (908 companies in all). Hygiene and beauty product manufacturers make up 7.33% of IMS member companies (880)

while cleaning and maintenance product makers account for 4.70% (564) of packaging managed. Other sectors make up the remaining 29.52%.

NOTES

- Ecoembalajes España, S.A. (Ecoembes) is a not-for-profit public limited company whose purpose is to design and manage systems to separate and recycle used packaging and packaging waste in order to ensure compliance with the reduction, recycling and recovery targets defined in the Packaging Act 11/1997, of 24 April (*Ley 11/1997, de 24 abril, de envases y residuos de envases*).
- Recycling and reuse rates are calculated from the tonnes of material recycled and recovered for energy generation (measured at the point of entry into the recycling and recovery process), compared with total packaging waste generated. This figure is estimated as the total quantity of packaging placed on the market, since it is assumed that the quantity of reusable containers from previous years which become waste will balance out the reusable containers placed on the market in that year and then subsequently reused.

SOURCES

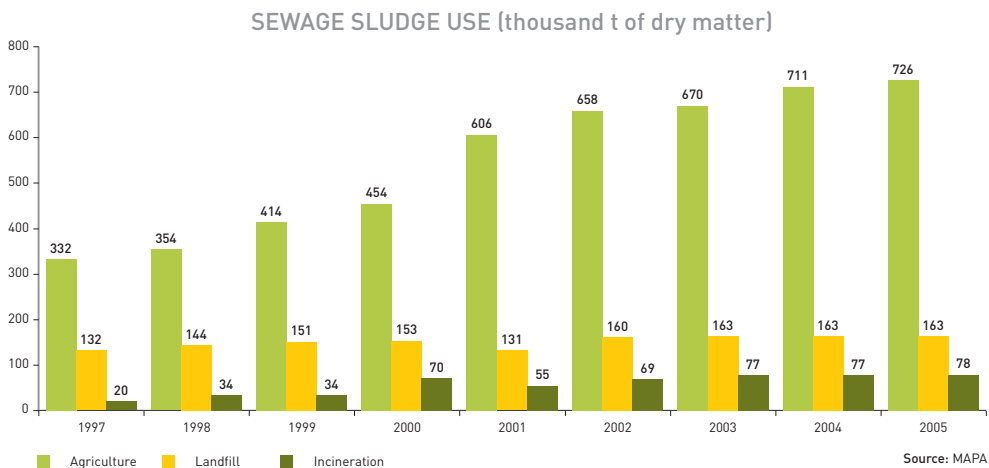
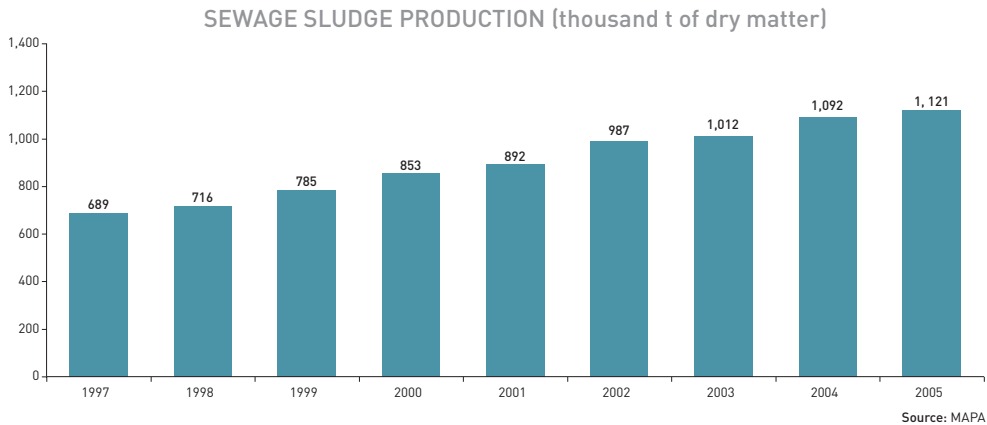
- The Environment in Spain. Various years. Spanish Ministry of the Environment.
- Ecoembalajes España S.A. (Ecoembes). Annual report.

FURTHER INFORMATION

- www.mma.es
- www.ecoembes.com

Sewage sludge production and use

Sludge production is increasing, as is its use in agriculture



The increase in wastewater treatment is creating a major rise in sewage sludge production, which requires proper management as waste in order to recover material and prevent it becoming a problem for the environment.

Sewage sludge production in Spain is experiencing constant growth, rising by 2.6% in 2005 compared with 2004, and by 62.6% since 1997. This increase in sewage sludge production is a result of the rise in the number of treatment plants and their capacity. In 2006, Spain's Waste Water Treatment Plants (WWTPs) had the capacity to serve a population equivalent to 73 million inhabitants.

The agricultural sector continues to be the main recipient of sewage sludge, employing

more than 726,000 tonnes in 2005. Landfill maintained a similar position to recent years, while there was a slight increase in the volume of sludge incinerated.

Agricultural use of sewage sludge is governed by Directive 86/278/EEC on the protection of the environment, and in particular of the soil. Its use is conditioned by the requirement to ensure that the concentration of heavy metals in sewage sludge and in the soil to which it is applied does not exceed certain limits and that the accumulation of metals in the land being treated is controlled. This use clearly benefits the soil by recycling nutrients and organic matter and improving soil structure. Furthermore, anaerobic digestion of sewage sludge can be used to produce biogas, which is a potential energy source.

NOTES

- This indicator shows the generation of sewage sludge from wastewater and other sewage sludge treatment plants referred to in Directive 86/278/EEC, of 12 June, on the "protection of the environment and in particular of the soil, when sewage sludge is used in agriculture". It also analyses the use of such sludge, classified into the three treatment categories established by the Directive: agricultural use, landfill and incineration.
- The Directive includes:
 - "residual sludge from sewage plants treating domestic or urban wastewater and from other sewage plants treating wastewaters of a composition similar to domestic and urban wastewater"
 - "residual sludge from septic tanks and other similar installations for the treatment of sewage"
 - "residual sludge from sewage plants other than those referred to above"
- The figures for 2004 and 2005 are provisional.

SOURCES

- National Sewage Sludge Register (*Registro Nacional de Lodos*). Sub-Directorate General for Means of Agricultural Production (*Subdirección General de Medios de Producción Agraria*). Spanish Ministry of Agriculture, Fisheries and Food (*Ministerio de Agricultura, Pesca y Alimentación*). (Specific query).

FURTHER INFORMATION

- www.mma.es
- www.mapya.es
- www.eea.europa.eu

