2.8 INDUSTRY

The information concerning the industrial sector contained in this edition dates from 2007 as regards emissions and energy consumption. These data therefore still cover a period of economic growth and activity which will differ in the following year, with a decrease in activity that will affect the Spanish industrial sector and indeed the worldwide economy as a whole. Industrial policy in this new situation must therefore have twin aims: to moderate the readjustments on the one hand and to consolidate the change in manufacturing model, paying special attention to strategic sectors and promoting R&D&I and competitiveness, on the other.

However, the indicators analysed in this edition respond to a growth in industrial activity, greater even than that of the economy as a whole, with measureable environmental impact. CO_2 emissions due to the industrial sector decreased 2% in 2007 with respect to 2006, NO_x emissions dropped 0.93% and SO_2 and NMVOC emissions remained stable.

After the decrease observed in 2006, final energy consumption by the industrial sector once again increased in 2007, although without reaching the levels seen in 2005. Yet again the downward trend of the percentage of final energy consumed with respect to industrial energy consumption mirrors that seen in the

INDICATOR	GOAL	TREND
Industrial atmospheric emissions	Prevent and reduce pollution	Pollutant gas emissions remain relatively stable
Industrial energy consumption	Reduce consumption and improve efficiency in resource use	Final energy consumption by the industrial sector decreases with respect to total energy consumption, as is also the case in the EU as a whole.
Industrial waste generation	Prevent and reduce pollution	Hazardous and non-hazardous waste production by the industrial sector decreases
Total Material Requirement	Rational use of resources	Total Material Requirement grows very slowly in 2005, due above all to import growth.
Number of industrial enterprises with Environmental Management systems	Integrate the environment into manufacturing activity	Spain maintains its position as the country with the second highest number of manufacturing companies belonging to the Environmental Management System
Industrial eco-efficiency	Decouple industrial production from consumption of resources and pollution	The sector's GAV grows more than twice as fast as final energy consumption and CO_2 emissions between 1990 and 2007.

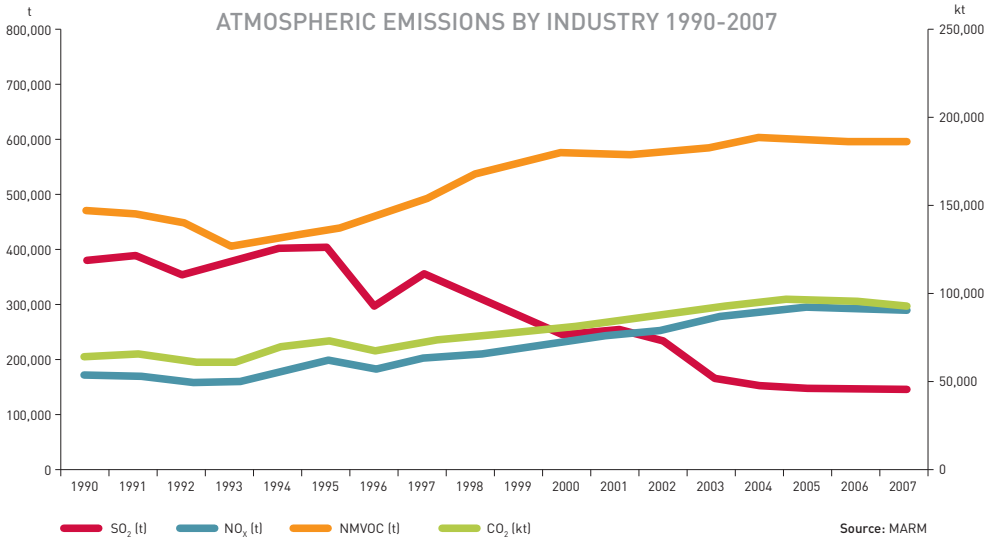
EU as a whole. This increase in industrial activity occurs at the same time as hazardous and non-hazardous waste production by this sector decreases. The amounts set aside by industry for environmental protection also increase, and do so more in terms of investment than in current expenses.

The consumption of resources, as measured by the Total Material Requirement indicator, was stable in 2005 (the last year for which figures are available) with respect to the previous year. Its growth in the past few years has kept in line with that of the population and is lower than the increase experienced by GDP. If a distinction is made between the origin of the resources (extracted nationally or imported), it can be seen that whereas nationally extracted resources remained relatively stable, imports increased, which results in an environmental impact outside Spain's borders as a result of Spanish industrial activity.

The number of companies belonging to the EC's Eco-Management and Audit System (EMAS) also increased (by 8.5%) in 2007. Spain therefore remains in second place in the EU in terms of both number of companies belonging to this system and number of companies per million inhabitants.

Atmospheric emissions due to the industrial sector

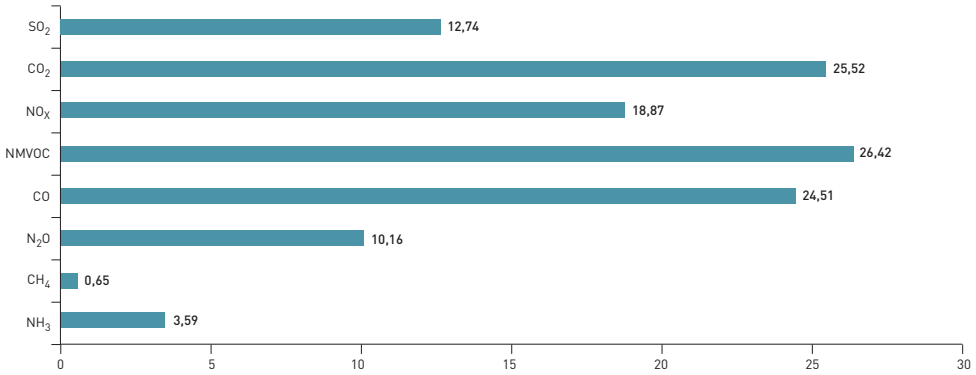
The emission of pollutant gases by the industrial sector has stabilized somewhat in the past three years



The above graph shows the evolution of the main pollutants emitted by the industrial sector. This evolution can be considered to be generally positive in 2007. Thus, CO_2 emissions dropped again (by 2%), from 95,399 kt in 2006 to 93,491 kt in 2007 (industrial emissions account for 25.5% of all emissions of this pollutant), and SO_2 emissions remained essentially unchanged, varying by only 0.28% (these emissions represent 12.74% of the total). NMVOC emissions, which represent 26.42% of the total, also remained stable, increasing by only 0.19%, whereas NO_x emissions, which account for 18.8% of the total, dropped by 0.93% in 2007.

These variations should, however, be considered in the context of the time period 1990 to 2007, where CO_2 emissions by the industrial sector have increased by 45.24%, NMVOC emissions by 26.71% and NO_x emissions by 67.31%. In contrast, SO_2 emissions decreased by 61.36% between 2000 and 2007. These increases are rather significant, although they have stabilized (or begun to decrease) over the past few years.

EMISSIONS BY INDUSTRY COMPARED WITH TOTAL EMISSIONS. 2007 (%)



Source: MARM

NOTES

- The following groups or sectors (SNAP classification) were considered to belong to the industrial sector when calculating the pollutant emissions: industrial combustion plants, non-combustion industrial processes and use of solvents and other products. The categories corresponding to combustion and energy transformation are omitted, since these emissions are covered by the chapter on energy, as are emissions generated by the extraction and distribution of fossil fuels and geothermal energy.
- For reasons of scale, the indicator does not include emissions of fluorinated gases, despite these being entirely industrial in origin. The evolution of emissions between 1990 and 2006 was as follows:

EMISSION OF FLUORINATED GASES (kg)

	1990	2004	2005	2006	2007
SF_6	2,800	10,628	11,365	13,541	14,225
HFC	205,400	2,076,945	2,266,280	2,416,454	2,586,117
PFC	131,825	40,073	35,943	36,324	36,514

Source: MARM

SOURCES

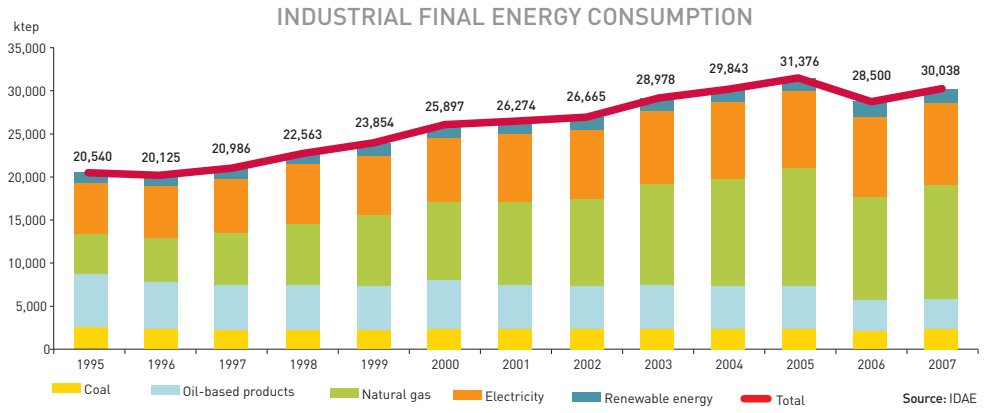
- Spain's Atmospheric Emissions Inventory, version 2009. Directorate General for Quality and Environmental Assessment. MARM.

MORE INFORMATION

- http://www.marm.es

Energy consumption by the industrial sector

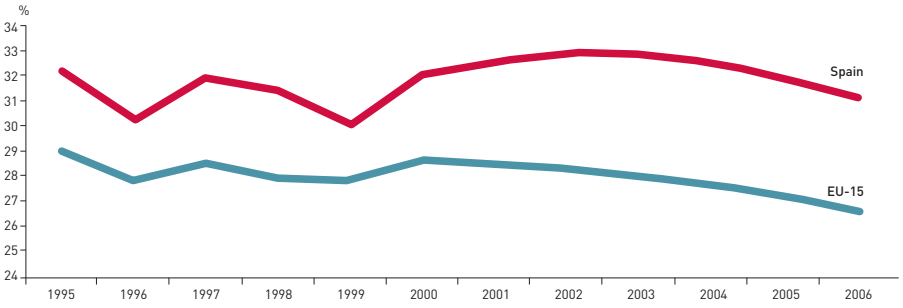
Final energy consumption by industrial processes increased again in 2007



After the inflection observed in 2006, final energy consumption by industry again increased in 2007 (by 5.40% with respect to 2006), as has been the case since 1996. This new increase is not as marked as that seen in 2005 in overall terms as regards oil-based products and natural gas, although the proportion of final energy consumption corresponding to coal increased (the figure for 2007 was 10.12% higher than that for 2006 and 3.01% higher than that for 2005). The final energy consumption due to renewable energies increased 15.90% in 2007 with respect to 2005, and that due to solar thermal energy increased by 14.29% with respect to 2006 and 32.90% with respect to 2005. Final energy consumption due to biomass remained stable, which means the increase observed in 2006 was maintained (to 1564 ktpe).

The proportion of final energy consumption by industry as compared to total energy consumption has fallen in Spain since 2004, and, according to Eurostat, represented 31.16% of the total in 2006. The decrease observed in Spain in 2006 with respect to the previous year was practically identical to that observed for the EU-15 although greater than that for the EU-27. The proportion of energy consumed by industrial processes evolved similarly to the EU average.

FINAL ENERGY CONSUMPTION BY THE INDUSTRIAL SECTOR WITH RESPECT TO TOTAL CONSUMPTION



Source: Eurostat

NOTES

- When calculating final energy consumption by industry, only figures corresponding to energy consumption are considered, without incorporating the petroleum products or natural gas used in industrial processes that do not produce energy directly.

SOURCES

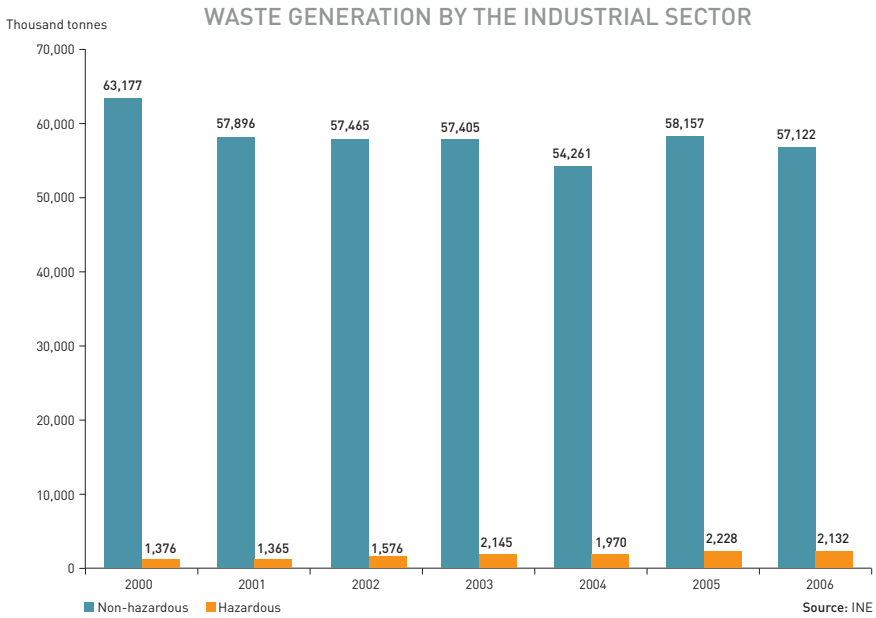
- Energy in Spain 2007. Spanish Ministry of Industry, Tourism and Trade.
- Energy Efficiency and Renewable Energies. IDAE. Ministry of Industry, Tourism and Trade.

MORE INFORMATION

- http://www.mityc.es
- http://www.idae.es
- http://epp.eurostat.cec.eu.int/

Waste generation by the industrial sector

The amount of waste generated by the industrial sector dropped



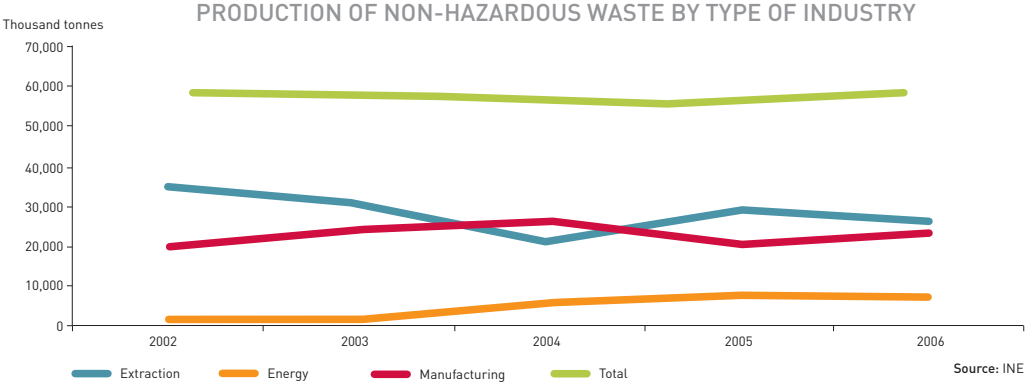
The amount of waste generated by the industrial sector decreased in 2006. The industrial sector produced more than 57 million tonnes of non-hazardous waste in 2006, some 1.78% less than in 2005 for the sector as whole, although with major differences depending on the type of industry. Thus, extractive industries produced 9.86% less non-hazardous waste and the energy industry produced 14.57% less, whereas manufacturing industry increased non-hazardous waste generation by 14.73%.

The industrial sector generated 2,131,629 tonnes of hazardous waste in 2006, 4.32% less than in 2005. As above, the differences according to type of industry were significant. Thus, extractive industries produced 5,326 tonnes of hazardous waste, 19.34% less than in 2006, manufacturing industry produced 2,058,958 tonnes, 5.30% less than in 2006, whereas the energy industry generated 67,345 tonnes, an increase of 43.21% on 2006.

Environmental protection spending by Spanish companies maintained its upward

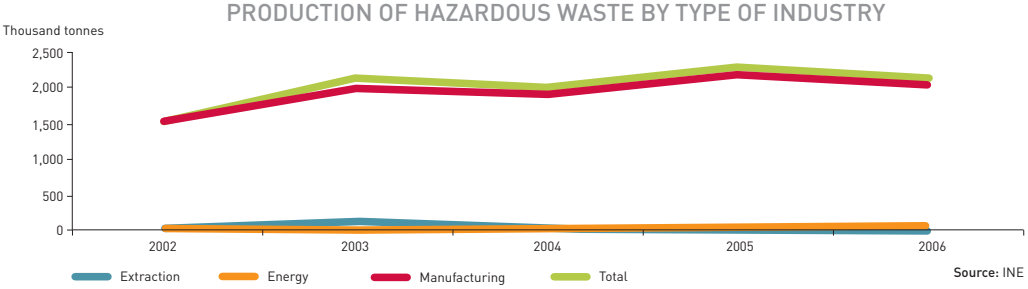
trend in 2006, with a 17.05% increase in investment spending, a 6.08% increase in current spending and a 10.88% increase in total company spending related to environmental protection. The greater increase in investment, which is likely to have an environmental impact in the near future, should be noted here.

PRODUCTION OF NON-HAZARDOUS WASTE BY TYPE OF INDUSTRY



Source: INE

PRODUCTION OF HAZARDOUS WASTE BY TYPE OF INDUSTRY



Source: INE

NOTES

- Figures for the energy industry have been maintained in this indicator. The first INE survey aimed to quantify waste generated in economic activities classified as industrial (CNAE C, D and E, branch 40). The second INE survey aimed to evaluate expenditure by industrial-sector companies on reducing or eliminating pollutant emissions into the atmosphere and noise pollution, on treatment of waste-water and solid waste, and on use of less polluting raw materials or the same materials in lesser quantities.

SOURCES

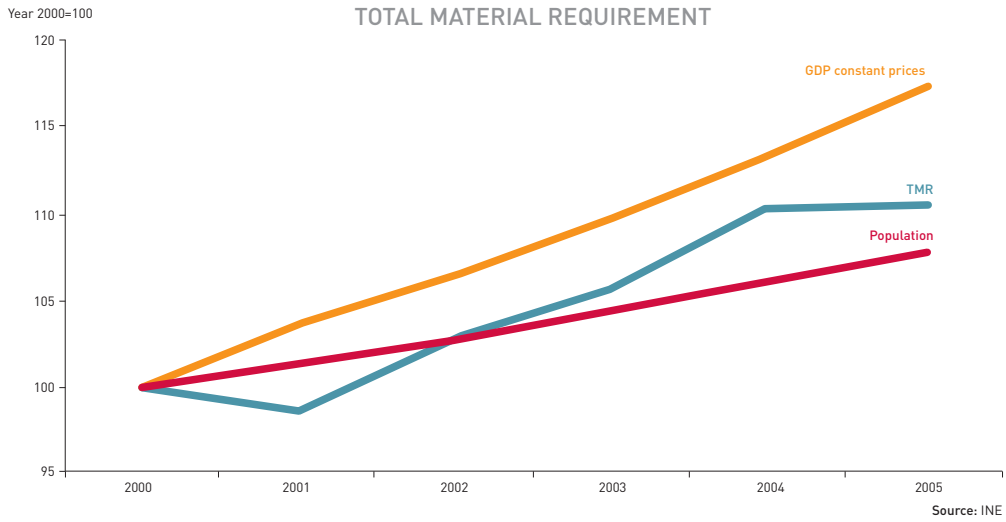
- Waste generation survey. Spanish National Institute of Statistics (INE). In: Environmental Statistics (December 2008).

MORE INFORMACIÓN

- http://www.ine.es
- http://epp.eurostat.ec.europa.eu

Total Material Requirement

Materials consumption in Spain grew more slowly than GDP, although imports continued to rise



The efficient use of natural resources is one of the goals of the EU's Sixth Environment Action Programme. The relationship between this indicator and GDP and population size allows the use of natural resources to be analysed as a function of demographic changes and production and consumption criteria.

The Total Material Requirement (TMR) indicator reflects extraction, consumption, transformation and final disposal of chemicals, raw materials and products (in tonnes) used in economic activity in Spain. As cross-border flows, especially imports, are also considered, the environmental pressures outside Spain's borders resulting from Spanish economic activity are taken into account.

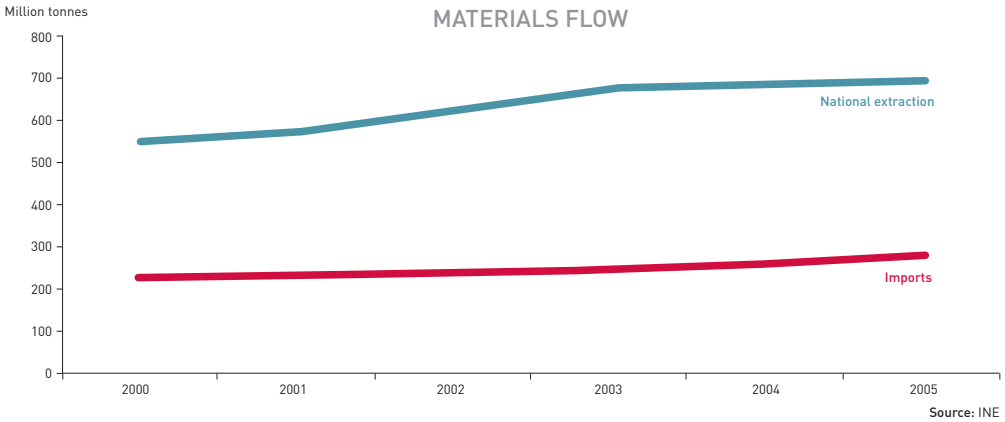
TMR increased slightly in 2005 (0.29%), due above all to import growth, which was 5.34% in 2005 with respect to 2004.

Material flows are normally classified into three categories: input of materials extracted from nature, end products and waste. Nationally sourced components include fossil fuels, minerals (metallic, non-metallic and construction materials) and biomass. Those materials which are extracted nationally but are converted into unused resources (mining, crop biomass and land excavation) are also included, as are the indirect flows associated with imports. Besides those extracted from domestic sources,

imported materials are also taken into account. These can be, according to degree of processing, raw materials, semi-manufactured products, finished products and other products.

In total, the TMR indicator increased by 10.59% over five years (2000-2005), a figure which includes an 8.12% increase in local extraction of materials and, above all, a 22.30% increase in imports.

The extraction of metal ores in Spain decreased by 93.62% between 2000 and 2005, whereas the use of industrial and construction minerals increased by 19.64%. The material flow accounts shows that the extraction of fossil fuels dropped by 17.01% between 2000 and 2005. The use of biomass also dropped by 16.16% in the same period.



Source: INE

NOTES

- Modification of some coefficients by the INE in the calculation of this indicator prevents comparison with years prior to 2000. The modifications were made to incorporate changes introduced in European methodology. These changes include a change in the presentation of the mineral breakdown, with the non-metallic and mined minerals categories being replaced by industrial and construction minerals. They also include a new breakdown in waste types adapted to modifications in the Waste Statistics.

SOURCES

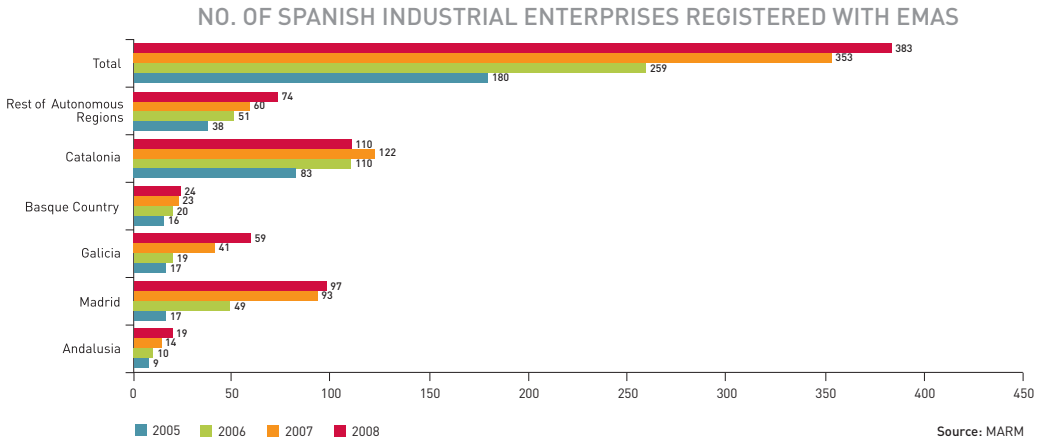
- Total Material Requirement: INE. Material flow accounts. Inebase. In Environment: Environmental accounts.

MORE INFORMATION

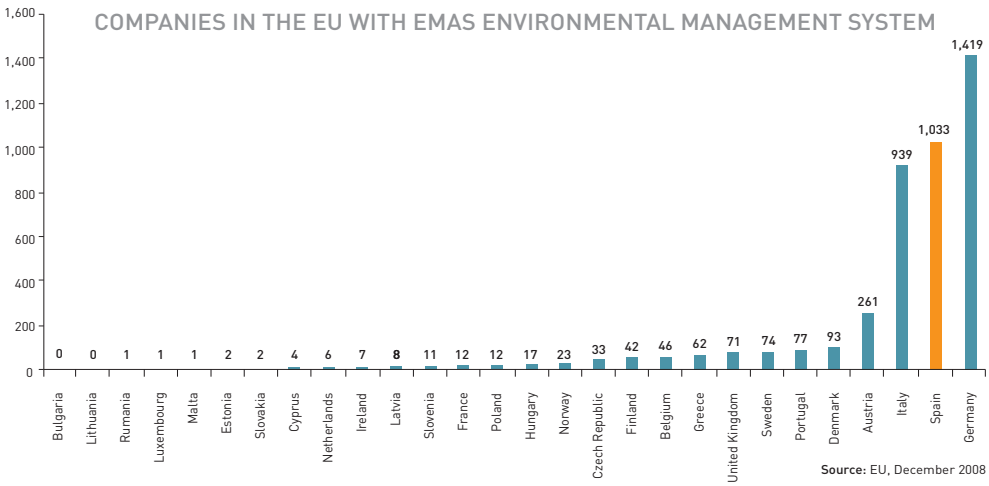
- http://www.ine.es
- http://epp.eurostat.ec.europa.eu

Number of industrial enterprises with Environmental Management Systems

Spain remains in second place in the EU in terms of the number of companies belonging to the EMAS Environmental Management System



Within Europe, and bearing in mind the total number of companies, Spain lies in second place (behind Germany) in terms of number of EMAS-registered companies. Spain also lies in second place (behind Austria) in terms of proportion of EMAS-registered companies per million inhabitants. EMAS (Eco-Management and Audit Scheme) is the European Union's environmental management system. It is a voluntary scheme enabling enterprises and organisations to assess and improve their environmental practices.



Between December 2007 and December 2008, the number of Spanish industrial companies registered with the EMAS Environmental Management System increased by 8.5%. Of the 1038 enterprises registered with EMAS in December 2008, 383 (36.9%) belonged to the industrial sector.

SPANISH INDUSTRIAL COMPANIES REGISTERED WITH EMAS

2003	2007	2008	Increase 2008/2007
136	353	383	8.5 %

Source: MARM

NOTES

- For the purpose of calculating this indicator, the enterprises included are those in categories 10 to 41 of the National Classification of Economic Activities (CNAE). This therefore excludes arable and livestock farming and forestry, as well as the construction and service industries.
- The EMAS system is regulated by Regulation 761/2001 of 19 March 2001, which includes the basic provisions of the previous Regulation (1836/93 of 29 June 1993), while further extending the scope to achieve greater participation. EMAS is currently being extended to cover all enterprises, irrespective of sector. Actions derived from its application include:
  - The setting-up and application of environmental management systems in companies and systematic, objective and regular assessment of their operation.
  - Dissemination of information on environmental behaviour.
  - The active involvement of employees in the programme, achieved through continuous vocational training.

SOURCES

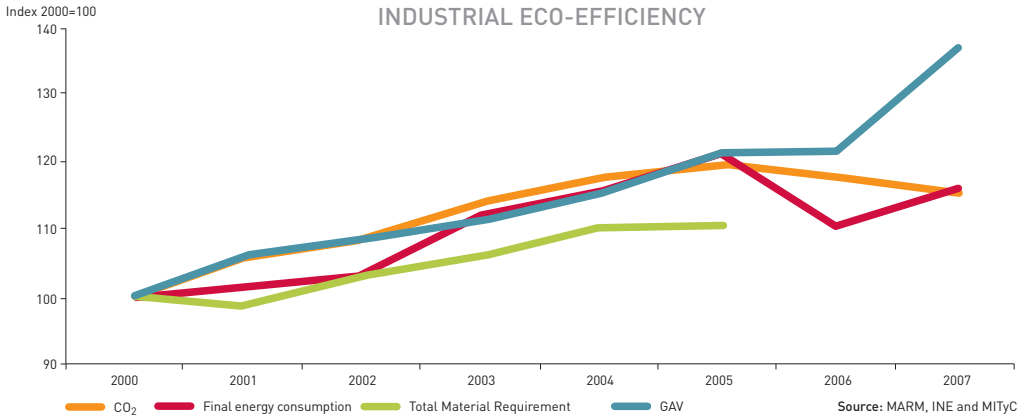
- European EMAS data: EMAS website, European Commission.
- Data for Spain: Directorate General for Quality and Environmental Assessment, MARM.

MORE INFORMATION

- http://www.europa.eu.int/comm/environment/emas
- http://www.mma.es/calid_amb/ma_ind/index.htm

Industrial eco-efficiency

The sector's GAV grew more than twice as fast as final energy consumption and CO_2 emissions between 1990 and 2007



When compared with the previous year, the behaviour of the industrial sector in 2007 consolidates previous trends. The rapid growth of GAV and final energy consumption (although this does not reach the levels of 2005), and a 2% decrease in CO_2 emissions (from 95,399 kilotonnes in 2006 to 93,491 kt in 2007), should be highlighted. The TMR indicator suffered a significant slowdown in its previous growth rate (data for 2006 and 2007 are not yet available).

These changes accompany that experienced by GAV a current market prices, as the 103,415 million euros for 2000 become 140,937 million euros in 2007, an increase of 36.28% during this period. The growth experienced by GAV is therefore twice that of the sector's CO_2 emissions (15.29%) and final energy consumption (15.99%) over the same period. The TMR indicator grew by 10.56% between 2000 and 2005 (the only years for which data are available), with the value for 2005 being practically identical to that for 2004 (2156 and 2150 million tonnes, respectively).

SOURCES

- Gross added value at current prices by branch of activity. INE. Spanish National Accounts. Economic Accounts. Base 2000.
- Institute for Energy Saving and Diversification (IDAE), Ministry of Industry, Tourism and Trade.
- Energy in Spain 2007. Ministry of Industry, Tourism and Trade.
- Data on emissions of atmospheric pollutants from the Spanish National Atmospheric Emissions Inventory. Directorate General for Quality and Environmental Assessment. MARM.

MORE INFORMATION

- http://www.ine.es
- http://www.mityc.es
- http://www.mma.es
- http://www.eea.eu.int