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Environmental Profile of Spain 2008

Indicator-based Report

MINISTERIO
DE MEDIO AMBIENTE
Y MEDIO RURAL
Y MARINO

EDITION 2009

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PRESENTATION

In the "Environmental Profile of Spain 2008" edition, the Spanish Ministry of the Environment and Rural and Marine Affairs (Ministerio de Medio Ambiente, y Medio Rural y Marino) makes available to the general public accessible information, based on indicators, regarding various aspects of the environment and the productive sectors. A substantial number of the topics that constitute this Profile fall within the scope of this Ministry and, regarding these topics, I would first like to highlight the significant number of legislative proposals presented and approved by the Spanish Parliament during the past and the current session, as is reflected in this document, in order to imbue the sectors of economic activity with the guiding principles of environmental sustainability.

Given the diversity and extent of the responsibilities that fall within the scope of this Ministry, it would not be possible to conduct an assessment, in the reduced space provided by a presentation, regarding the ground covered by the departments of the Ministry since the beginning of the session, but it is actually possible to highlight the efforts made towards the mitigation of climate change, the improvement of air quality, waste management, control of chemicals, sustainable use of water resources, the fight against forest fires and the protection of biodiversity. Among the most significant advances, I would like to draw attention to the progress made regarding the sustainable development of rural and marine environments. These areas comprise all of our natural resources, and they therefore require that the public authorities pay special attention to them in order to reach a sustainable exploitation of said resources.

In order to achieve a greater involvement of all social agents and authorities for a proper coordination of actions, towards the end of last session the Congress passed Act 45/2007, of 13 December, for the sustainable development of the rural environment. The act sets forth the guidelines needed to implement a State policy capable not only of dealing with the continuity and renewal of production activities and the social and economic improvements needed by the rural population, but also with providing access to public services of sufficient scope and quality to mitigate the demographic deficit typical of rural areas. The act provided for the creation of organisations responsible for

drawing proposals to achieve the objectives on which this legislative initiative is based. The composition and operation of these organisations was set forth in Royal Decree 865/2008, of 23 May. Towards the end of last year, the composition and implementation of the organisational structure that will deploy, in a coordinated and progressive manner, the necessary measures to fulfil the established objectives, was finally completed. These organisations include representatives from the ministerial departments, the Autonomous Regions and, through the Sustainable Rural Development Association Committee (Mesa de Asociaciones de Desarrollo Rural Sostenible), the networks for rural development, agrarian and business organisations, trade unions, the confederation of agrarian cooperatives, organisations of women in the rural environment, ecologist associations and the representatives of people with disabilities.

In short, all the agents involved in sustainable rural development, and whose proposals, suggestions and demands will be considered for the development of the First Sustainable Rural Development Programme 2010-2014 (PDRS - Primer Programa de Desarrollo Rural Sostenible 2010-2014) have participated. The implementation of this programme is planned for the last half of this year, and it will help materialise and boost the policy that is being developed by the Ministry of the Environment and Rural and Marine Affairs.

It is worth noting that the development of the PDRS has been taken into account - as it should be - within the guidelines of the Common Agricultural Policy (Política Agraria Común) and, specifically, under the rural development policy for 2007-2013, which, broadly speaking, defines 3 objectives: improving the competitiveness of the agricultural sector, increasing the value of the rural landscape and environment by managing the land and, finally, improving the quality of life in rural areas by promoting the diversification of economic activities. Following these guidelines, as well as the schedule planned in Regulation (EC) 1698/2005, in 2007, the National Strategic Plan for Rural Development (Plan Estratégico Nacional de Desarrollo Rural) and the Rural Development Programmes (Programas de Desarrollo Rural) for the 17 Autonomous Regions were drawn up and were logically integrated within a National Framework for Rural Development.

Act 42/2007, of December 13, regarding Natural Heritage and Biodiversity (Patrimonio Natural y de la Biodiversidad) was passed on the same date as the Rural Environment Sustainable Development Act (Ley de Desarrollo Sostenible del Medio Rural). Both Acts make up a legislative set of rules and complement each other. The principles of

this Act are based on the sustainable use and maintenance of natural resources, the preservation of biological diversity, the genetic diversity of species and populations, and the landscape and geological diversity. This Act includes new instruments to deal with the loss of biodiversity, continues the new policies inspired by the United Nations Convention on Biological Diversity and responds to the new impetus generated by LIE with the "Communal Action Plan for 2010 and Beyond" (Plan de Acción Comunitario para 2010 y Más Adelante).

To achieve the objectives of Act 42/2007 –as described in the report presented to the Cabinet on 5 September 2008 –progress will continue to be made during 2009 regarding its legislative development, which considers the creation of the National Inventory (Inventario Nacional) and the State Plan for Natural Heritage and Biodiversity (Plan Estratégico Estatal del Patrimonio Natural y de la Biodiversidad), the National Catalogue of Habitats in Danger of Disappearance (Catálogo Nacional de Hábitats en Peligro de Desaparición), the Catalogue of Threatened Species (Catálogo de Especies Amenazadas) and the National Catalogue of Invasive Alien Species (Catálogo Nacional de Especies Exóticas Invasoras). In order to coordinate the several public administrations, the Natural Heritage and Biodiversity State Commission (Comisión Estatal para el Patrimonio Natural y la Biodiversidad) has been organised. Finally, as an instrument of co-financing aimed at ensuring territorial integrity, the Natural Heritage and Biodiversity Fund (Fondo para el Patrimonio Natural y la Biodiversidad) will have to contribute to the development, within 3 years, of the management instruments set forth by said Act, implementing those measures that provide support to forest sustainable management, the strategic prevention of forest fires, the custody of territory and the protection of forests and natural areas financed by the General State Administration (Administración General del Estado).

Sustainable Rural Development and the protection of the Natural Heritage and Biodiversity would not be possible without implementing a strict management of water resources that increases the availability of this resource, protects its quality, and rationalises and economises on its use. Within this context, mention should be made of Royal Decree 907/2007, of 6 July, which approved the Regulation of Water Planning (Reglamento de Planificación Hidrológica). This Decree regulates the Water Act (Ley de Aguas) and the Water Framework Directive (Directive 2000/60/EC). Within this legal framework, water planning will be carried out through the Water Basin Plans (Planes Hidrológicos de Cuenca) and the National Water Plan (Plan Hidrológico Nacional). The general goals of water planning focus on achieving the proper protection of Public Water Resources, satisfying the demand for the resource and harmonising regional and sector development. Among other innovations, this regulation incorporates the integration of inland, transitional and coastal waters; the importance of environmental

goals; cost-efficiency economic analysis for measurement programmes; and the setting up of a price policy for water services that encourages rational and sustainable resource management.

It would not be possible to develop sustainable rural activities, protect biodiversity, habitats and wildlife species, and efficiently manage water resources without demanding that those who harm the environment either through their actions or omissions be responsible towards the environment. Royal Decree 2090/2008, of 22 December, which recently came into effect approved the Partial Development Regulation of Act 26/2007, of 23 October, about Environmental Liability. The well-known principle "polluter pays" can be translated now as "polluter must repair". The regulation establishes the method by which those responsible will have to repair the damage done. The Act defines environmental damage as damage caused to wildlife species and habitats, surface or underground waters, shoreline and estuaries, and soil or subsoil, which may have a negative impact on human health and the environment.

Finally, I would like to highlight that the usefulness of the "Environmental Profile of Spain" surpasses that of a mere "handbook" used to look up data and get an outlook on the development of the different variables. Its objective is to contribute –in a specific yet global manner – to a better knowledge of our country's environment and to its connection with the elements that are part of it, a knowledge that is essential to help preserve and improve the environment for the generations of today and tomorrow.

Elena Espinosa Mangana
Minister for the Environment and Rural and Marine Affairs

FOREWORD

The 5th edition of the *Environmental Profile of Spain*: an Indicator-Based Report, for 2008, offers an acclaimed product, which has corrected certain deficiencies and has verified data for 2.5 years. This edition maintains the indicators' basic structure, which makes it possible to analyse trends in the status of the environment and the influence exerted by the several factors that condition it. Environmental and sectorial indicators are presented through 14 chapters together with an introduction which summarises the fundamental characteristics of their development. For the second year, environmental information is presented by Autonomous Regions, including basic data of each Community, both environmental and territorial, together with certain socioeconomic aspects.

As with previous editions, and as usual with this type of document, certain adjustments have been made: changes in methodology for certain figures, which prevent long annual series; introduction of a new indicator if there is relevant information (as is the case for the chapter on water); changes in the presentation of some data to offer more direct and real information (air quality in urban environments); elimination of an indicator if the source has not finished its calculations (as is the case for land cover in coastal areas). All of these changes are inevitable and reflect the vitality of a material that must adapt to different circumstances.

We are indebted to a great number of people for this new *Environmental Profile of Spain* publication, especially to the Spanish EIONET Network, as well as other ministerial departments, institutions, state agencies and Autonomous Regions. The help provided by the different departments of the Ministry of the Environment and Rural and Marine Affairs has been essential to the development and final revision of this document.

The year that has passed since the previous edition has been particularly intense: fundamental changes have taken place in certain areas of the environment, some of which can be seen in this edition already and others that will appear in future editions. Climate change policies have truly become State policies, focused on strategic lines of interaction among nine Ministries, and effectively coordinated by

territorial administrations, especially regarding the application of the emission allowance trading scheme and compliance with international obligations.

The actions are being centred on those areas which have the biggest emission reduction potential: mobility, construction, energy sustainability, together with suitable waste management and prevention, forest policy, drains, and important technical developments and innovations.

The following have been the main lines of work that have been developed: climate change awareness, and the adoption of mitigation and adaptation measures to reduce emissions at the sources and favour forest fixation. The National Integrated Waste Plan (Plan Nacional Integrado de Residuos), the Sustainable Mobility Strategy (Estrategia de Movilidad Sostenible) and the National R&D and Innovation Plan 2008-2011 (Plan Nacional de I+D+i 2008-2011) are an important part of recent actions.

The emissions data used in this edition of the Environmental Profile of Spain 2008 correspond to those from the Spanish National Atmospheric Emissions Inventory 2007 (Inventario de Emisiones Contaminantes a la Atmósfera de España 2007). This inventory showed an increase of 2.1% in greenhouse gas (GHG) emissions compared to 2006. This increase can be attributed mainly to the participation of the electricity generation sector, compared to the stabilisation of emissions from the industrial sectors. The fall in the price of emission allowances in the last phase of the 2005-2007 period, and the inability to keep allowances for the following phase, has certainly caused a lack of incentive to reduce emissions.

The 2008 Inventory is not available yet, but the review of data per sectors is. The outlook is moderately good: the total emissions for the sectors subject to the emission allowance trading decreased 12.4% in 2008 when compared to the previous year. During 2008, in industrial sectors, there was a decrease in emissions of 10.2%, although when production falls, the intensity of emissions grows worse. The electricity generation sector, responsible for over 50% of the emissions produced by the affected sectors, registered a decrease of 16.1% in emissions. It is important to take into account that carbon emissions have decreased 36.3%, while combined cycle emissions have increased by a similar amount: 32.9%. This represents a deviation in thermal generation towards technologies that emit less GHG.

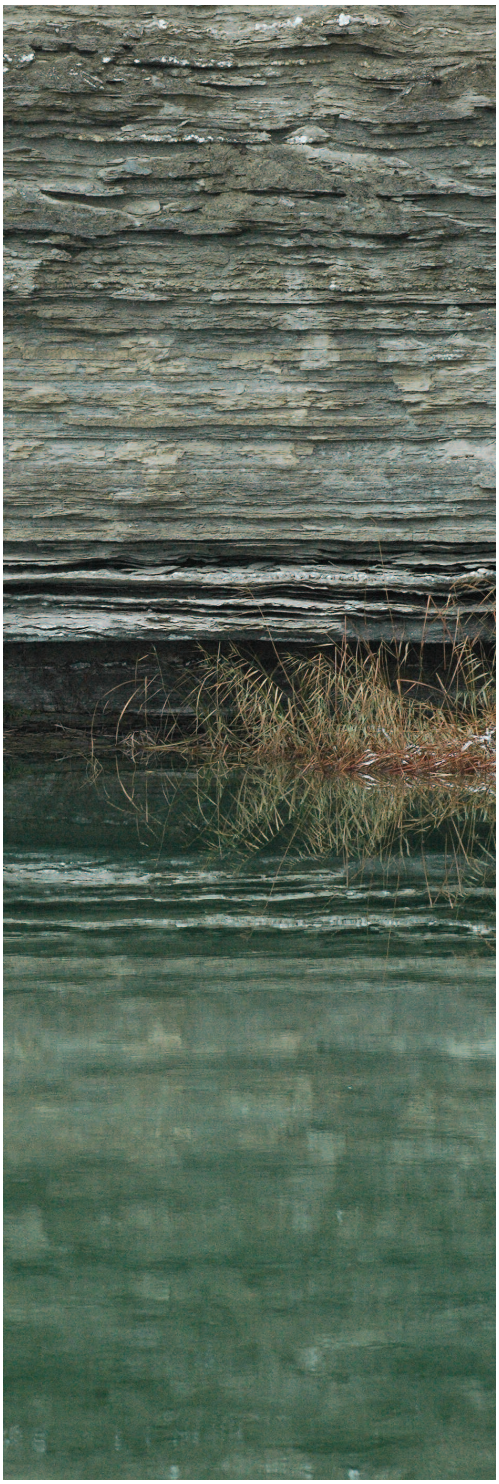
In the energy sector, the main causes for the decrease in emissions reduction were the high prices of energy material and of the tonne of CO_2 in the European market, besides

the continuous improvement of energy intensity and the increasing importance of renewable energies in the context of energy generation. This confirms the change in trend that started in 2005, and which ratifies the intention of the Spanish Administration to comply with commitments arising from the Kyoto Protocol.

This intention surpasses any international obligation, no matter how important. It is connected to the fact that climate change policies can effectively act as a catalyst for the new pattern of economic growth, based on new technologies, sustainable production models and international competitiveness.

This change is supported by the contribution of the administrations, but it is a multiple effort, with many facets, in which the private sector must also participate, with public opinion being particularly important, until the collaboration of every citizen can be obtained.

Teresa Ribera Rodríguez
State Secretariat for Climate Change







Summary

SUMMARY

Each of the indicators used in this document shows the temporary development of a specific aspect of the environment in Spain. There is no global index from which to quantify the general environmental situation or whose figures can be compared to last year's. This is why even the summary of indicators is multi-faceted. A detailed analysis of the average values for each sector allows for a global interpretation: Spain's environmental problems, like those of Europe and the rest of the world, require a continuous effort regarding the application of environmental policies.

Success is not immediate, but in certain cases it is significant and can be identified: atmospheric emissions grow more slowly, water consumption decreases, the state of forests improves, waste generation per inhabitant decreases and recycling increases, organic farmland increases, the use of renewable energies increases, industry emissions decrease, aquaculture increases, tourist pressure stabilises, the environmental efficiency of transport improves, household energy consumption decreases, development of noise maps begins, forest fires decrease, etc.

All in all, this outlook gives hope for a change in habits, in economic transformation and in a new model of production and consumption, all of which are essential for implemented environmental policies to yield positive results.

AIR

Among the main political actions in this field, the European system of emission allowance trading (Directive 2003/87/EC, implemented through Act 1/2005, of 9 March) should be highlighted. The II National Allocation Plan (NAP - II Plan Nacional de Asignación) 2008-2012 should also be noted: it entails an annual decrease of 16.2% when compared to Plan allocations for 2005-2007 and 20% when compared to the industry emissions for 2005. The Spanish Climate Change and Clean Energy Strategy 2007-2012-2020 (Estrategia Española de

Cambio Climático y Energía Limpia 2007-2012-2020), which was approved towards the end of 2007, includes 198 measures and 75 indicators to ensure reduction of greenhouse gas (GHG) emissions, thus becoming a point of reference for the coordination of climate change policies at the regional and municipal level. Act 34/2007, of 15 November, is also an essential legal framework in terms of air quality and atmospheric protection.

During 2007, greenhouse gas emissions (442,322 kt CO_2-eq) increased 2.1% when compared to the previous year; this increase can be attributed mainly to the participation of the electricity generation sector. The emissions which contributed the most were CO_2 (82.8%) followed by CH_4 (8.8%) and N_2O (6.9%). The ratio of GHG emissions per inhabitant in Spain (9.9 k CO_2-eq during 2006) puts us in 12th place in the EU-27, and below the European average. During that year, Spain was also below the European average in terms of emission intensity, i.e. CO_2 equivalent emissions per unit of generated GDP. According to national emission projections from MARM, the effect of the new macro-economic situation and the prospects of growth yield optimistic forecasts regarding GHG emissions, since it is possible to comply with Kyoto's commitments by applying additional measures.

Additional emissions of tropospheric ozone precursor gases decreased 4.6% in 2007 when compared to 2006. There was a slight decrease in the case of NO_x and CH_4, considerable in the case of COVNM (6.3%) and notable for CO (17.3%). With regard to particles, an increase of 2.4% can be seen during 2007 in the case of $PM_{2.5}$ and of 1.9% in the case of PM_{10}. Transport was responsible for most of the particles, followed by non-industrial combustion plants, and energy production and transformation.

The information gathered by the air background pollution monitoring network stations (EMEP/VAG/CAMP network) provides an overview of the status of air quality within a territory not affected by pollution sources. This shows a downward trend regarding SO_2, a stabilisation of PM_{10} and a growth of NO_2. In these cases, none of the pollutants exceeds the applicable limits allowed for health protection. Only in regards to ozone are the average values above the limit set for human health and vegetation protection. Spain's geographic and climatic conditions, together with the photochemistry of ozone and its nature as secondary pollutant, contribute to higher values being recorded in areas far from the main sources (urban or industrial areas).

WATER

This chapter presents a set of indicators that offer information on the status and quality of available water resources. This edition includes a new indicator named "natural water resources", which indicates the total water input through the hydrological cycle based on superficial input (fluvial network) plus groundwater input (aquifers). During the 1985-2005 period, there was a 5% decrease in water resources. For the last year of that period, available data shows an annual average of 153.36 litres per m^2. The effects of climate change are expected to cause a decrease in water input and an increase in irrigation demand, which means that resource management will be a determining factor in order to face the demands of the population.

Reservoir water data for 2008 (as of 2 January 2009) indicates an increase in most river basins (except for Guadiana and Guadalquivir basins), which is reflected in the total peninsular volume that shows an increase of over 15%. The biggest increases have taken place in the Ebro, Catalonia and Galicia basins. Duero basin improved compared to the previous year, but some areas remain at emergency levels. Segura and Júcar basins retain low values,, but their reserves have increased by 30%. The drought monitoring map shows an improvement in 2008, but there are significant deficits in several areas.

With regard to water consumption, the indicator shows a reduction in farms and household consumption. Water distributed through urban supply networks decreased 3.6% in 2006 when compared to the previous year. Average household water consumption was 160 litres per inhabitant per day, 3.6% less than the previous year. The compared evolution of the volume of water for urban supply and of the GDP shows that the growth of both variables was similar until 2004, when water consumption began to decrease, but the GDP continued to increase. This suggests a more efficient use of water.

Farm water consumption was 15,865 hm^3, with a decrease of 3.9% in 2006 when compared to 2005. Irrigation systems have evolved from drip irrigation to gravity-fed irrigation and sprinkler systems. Even though gravity-fed irrigation is still the most widely used system (45.2% of the total used volume), it suffered a decrease of 7.5% in 2006, while drip irrigation increased by 8.3%.

In order to improve water resources in areas with marked water scarcity, desalination of marine or brackish water is performed. In 2008, a significant number of desalination

plants were opened. These plants increased the installed capacity by 11% when compared to 2007. The regions which have increased the most their desalination capacity have been the Valencian Community (85,000 m^3/day) and Murcia (70,000 m^3/day). The Valdelentisco desalination plant, the biggest in Europe, is located in this last area and can reach 70 hm^3/year. Technological advances designed to reduce the energy consumption of desalination plants contribute to reduce the high cost of desalination, estimated at 50%-70% of real production costs.

Nitrate concentration is one of the key parameters used to assess the quality of groundwater masses. In order to control the quality of these waters, EU Directives set a series of indicators, including nitrate concentration expressed as mg/l. According to figures available in 2008 (from 8 of 16 districts), this indicator yields very variable values, from the 26.55% of stations in the Guadiana river basin district with concentrations above 50 mg/l, to the 0% of Basque Country Inland Basins and the Miño-Limia district. The main causes of this type of pollution are the excessive and improper use of nitrogen fertilisers and the slurry discharge from livestock related activities.

Moreover, there is salt intrusion in groundwater when chloride concentrations per milligram per litre (mg/l) are over 1,000. In 2007, only the districts from the Mediterranean basins were affected by salt intrusion: the Segura District showed that 43.75% of monitoring stations presented concentrations exceeding the one indicated; the Ebro District yielded 14.29% and the Júcar District 5.26%. According to the information available for 2008, the Júcar District shows the same salt intrusion percentage, but there is no data yet regarding Ebro and Segura.

Organic pollution of rivers –as a consequence of discharging urban wastewater– is measured using two indicators: ammonium concentration and Biological Oxygen Demand (BOD5). Regarding this last indicator, it should be mentioned that in 2008 there was a slight worsening of the situation: the percentage of monitoring stations showing a lower level of organic pollution fell and the percentage of those stations with bigger concentrations of organic material increased. The presence of ammonium brings about the increase of eutrophication. With regard to this indicator, the data available in 2008 shows a slight worsening of the situation compared to 2007, since stations registering the highest concentration went from 10.4% to 11.9%, while those recording the lowest concentration levels went from 49.7% to 53.2%. It is to be expected that the results of the application of the National Water Quality, Sewerage and

Treatment Plan 2007-2015 (Plan Nacional de Calidad de las Aguas: Saneamiento y Depuración, 2007-2015) bring about an improvement of this situation.

Royal Decree 134/2007, of 11 October, on the management of bathing water quality implemented Directive 2006/7/EC, of 15 February, thus classifying bathing water into four categories (poor, sufficient, good and excellent) and reducing the amount of analysed parameters. Regarding the "bathing water quality" indicator, it should be noted that in 2008 the percentage of good or very good quality coastal bathing water suitable for bathing increased, reaching 99.84% of sampling points. Regarding inland water quality, during 2002-2008 the percentage of "areas not suitable for bathing" decreased to 1.7% last year. 38.4% are areas of very good quality and 59.9% are areas of good quality.

LAND

Land is the upper layer of the Earth's crust, where most of the biosphere is and where human activities take place. It has a complex composition involving organic and mineral matter, and its formation is very slow. It has many functions (it stores, filters and transforms many substances) and it plays a central role as habitat and genetic resource, on top of being the biggest carbon store on Earth.

Land degradation is a serious problem either caused or stressed by human activities: industrial activities, urban sprawl, inappropriate agricultural and forestry practices, etc. The creation of artificial surfaces leads to a decline in habitats, fragmentation of landscapes and a reduction in the space vital to many species. In Spain, these artificial surfaces have expanded, mainly around large cities and along the coast.

The Corine Land Cover 2006 inventory addresses the changes that took place in Europe during 2000-2006, but, when this edition was closed, the data could not be used yet. For this reason, this chapter offers information from CLC 1990-2000, and compares the variations produced in Europe and Spain regarding the different types of land cover. During that decade, artificial surfaces increased by 5.38% (871,241 ha) in Europe and by 25.14% in Spain, and the population grew –respectively– by 2.13% and 15%. Another important change was that of water bodies, which in Europe meant only 1.96% but in Spain reached 12.25%. During this period, changes in agricultural areas, forests and semi-natural areas were quantitatively less important.

With updated data from 12 Autonomous Regions (National Soil Inventory 2002-2012 [Inventario Nacional de Suelos 2002-2012]), this chapter presents the indicator which shows the percentage of land area, in comparison with the regional total, affected by different levels of erosion. With high erosion levels (over 25 t/ha - year), Andalusia takes the first place (22.63%), followed by Catalonia (20.74%) and Cantabria (17.70%). Regarding annual (average) soil loss, Catalonia bears the highest percentage (23.67%), followed by Andalusia (23.17%) and Cantabria (21.23%).

Finally, the "area at risk of desertification" indicator is based on data provided (August 2008) by the Working Paper on the Spanish National Action Programme to Combat Desertification (PAND - Programa de Acción Nacional contra la Desertificación), which determines a series of areas on which policies need to be developed to combat this process based on different parameters (aridity index, soil loss due to erosion, accumulated land area affected by fires and aquifer over-exploitation). Percentages for this zoning are as follows: low risk of desertification: 37% of the national territory; intermediate risk: 19%; high risk: 16%; and very high risk: 2%.

NATURE & BIODIVERSITY

In an attempt to stop the loss of biodiversity, as a European aim for 2010, measures are being applied in Spain derived from Act 42/2007, of 13 December, on Natural Heritage and Biodiversity. The Marine Protected Area concept was added to the existing concepts of Protected Parks, Reserves, Natural Monuments and Landscapes.

The number of protected natural areas in 2008 climbed to 1,523, comprising an area of 6,229,585 ha (land and sea). Protected natural areas now represent 11.8% of the total terrestrial area; this number increases to 26.6% if the Natura 2000 Network is taken into account. The communities with a bigger percentage of territory included in the Natura 2000 Network are still the Canary Islands (46.8% of its territory), Madrid (39.9%) and La Rioja (33.2%).

During 2008, the trend towards forests improvement continues, especially regarding coniferous trees. Damage to forests was caused, among other factors, once again by insects (33% of the damages), abiotic damage (29%) and fungi (13%).

Forest areas continue to increase and will reach 27,747,680 ha in 2010 according to forecasts. The forest areas of all the Autonomous Regions in general have increased,

particularly in Extremadura and the Canary Islands, which have shown an increase of 19% and 16% respectively in the Third Spanish National Forestry Inventory (Tercer Inventario Forestal Nacional), in comparison to the second inventory. The wooded forest area grew in Castile-La Mancha by 57% and in the Balearic Islands by 52%.

Excluding terrestrial mammals, the percentage of endangered taxa included in the Spanish Catalogue of Threatened Species varies between 10 and 35%. In the case of vascular flora, the percentage is lower, about 10%. Figures for fish and amphibians (25 and 18% respectively) are low considering the conservation needs of these groups. Birds and reptiles present about a third of their threatened taxa catalogued, while for mammals the percentage of threatened species reaches 76%.

Communities of urban birds are stable, as has been the case for the last decade. The same can be said of birds connected to aquatic environments and regular sedentary and migratory birds. There has been an increase in bird communities from the Eurosiberian and Mediterranean forests. The trend, however, is not all that positive for bird communities connected to agricultural environments. Due to their diet, populations of insect-eating birds have remained stable, but communities of grain-eating birds are facing a slight fall.

The number of administrative offences reported by the Nature Protection Service of the Civil Guard (SEPRONA - Servicio de Protección de la Naturaleza de la Guardia Civil) has decreased by 12.4% between 2006 and 2007. The number of criminal offences increased in 2007, with forest fires at the top of the list, followed by land use offences and offences against pets.

WASTE

In Spain, and in other EU countries, there has been an increase in waste generation per inhabitant linked to economy growth. An adequate management of this avoids pressures on the environment as it transforms waste into resources that contribute to raw material and energy saving. Therefore, management best practices, along with waste reduction, are the two basic pillars of environmental policy.

In this respect, the new National Integrated Waste Plan 2008-2015 (PNIR - Plan Nacional Integral de Residuos) approved by the Cabinet in December 2008, aims at

setting guidelines for the development of specific policies in order to improve waste management, reducing its generation and encouraging its adequate treatment.

In Spain, during 2007, each inhabitant generated 588 kg of urban waste; this value was quite low compared to the 662 kg produced in 2000 (peak reached in the 1996-2007 period.) The main element of the current trend is that, after the initial growth, there has been a continuous reduction in the urban waste generated per inhabitant since 2003. Although the amount of urban waste per inhabitant is higher than the EU-27 (522 kg/inhab), in the 1996-2007 period, Spain has occupied the ninth position among the countries with the lowest increase in urban waste generation (only 9.7%), slightly higher than the EU-27 increase (7.6%).

Thanks to the extended use of landfill in Spain as a waste management system, the country occupies the sixth position among the EU-27 in relation to its growth. In the 1996-2007 period, total urban waste per inhabitant for landfills grew by 17.4%; at the same time, the EU-27 average fell by 26%. In 2007, about 350 kg/inhabitant was deposited in Spanish landfills. Incineration is another waste disposal system used which permits energy-value recovery. During 2007, a total of 58 kg/inhabitant was incinerated in Spain. This figure is not very high when compared to the average of the EU-27 (104 kg/inhab) and that of other North European countries

In terms of paper-cardboard recycling, the indicator presents an evolution until 2007, when 4.9 million tonnes were collected. The Spanish paper industry is the leader in recycling within the European Union, recycling not only paper used in Spain but also almost a million tonnes imported from other countries. In 2003, the collection rate was 50.5% while in 2007 it stood at 63.7% (close to the EU average). Moreover, the recycling rate in 2003 stood at 61.3% and has increased up to 73.7% in 2007, a value that is above the EU average. The reuse rate (total amount of recovered paper consumption in relation to paper-cardboard production) held very similar values in the 1997-2007 period, reaching a rate of 84.6%. The national paper-cardboard average collected in 2006 stood at 22.1 kg/inhabitant per annum. The highest values by Autonomous Regions (2006) were reached in the Balearic Islands (66.3 kg/inhabitant/year), followed by the Basque Country, Canary Islands and Navarre.

The characteristics of glass make it a material of particular interest in terms of recycling: in addition to eliminating waste, it reduces raw material extraction and saves energy in the manufacture of glass packaging. The total figure for glass

recycling in 2008 reached 716,204 tonnes, 9% higher than in 2007, which were directly deposited by citizens into containers intended for that purpose. This suggests that in the 2001-2008 period the glass recycling rate has almost doubled from 32.5% (2001) to 60.3% (2008), meeting - even exceeding - the European target value for this year, which was set at 60%. In terms of Autonomous Regions, significant increases between 2006 and 2007 have been recorded in Extremadura (35.8%), Murcia (25.8%) and Madrid (25.3%).

In 2006, Spain reached a packaging recovery rate of 60.7%, exceeding the aim set by Royal Decree 252/2006, of 3 March, which established a packaging recovery rate of 60% as a goal for 2009. In terms of its recycling, a 54.0% rate was reached, very close to the 55% established by the Royal Decree to be met in 2009. It is estimated that this rate will be reached in the near future, provided that the growth rate of the last 3 years remains the same.

In 2007, the Integrated Management System (IMS) operated by ECOEMBES recovered 1,312.886 packaging tonnes, 3.6% higher than in 2006. Of that figure, 88.4% was recycled and 11.6% was recovered. The IMS has recycled 56.1% of the packaging that affiliated companies put in the Spanish market during 2007. In that year, 167 new companies became affiliated companies; therefore, the total number amounts to 12,375 companies that manage 90% of the packaging put into the market.

Finally, as regards sewage sludge production and use, the indicator shows that its production increased 9.7% in 2007 in comparison with the previous year. This waste continued to be used mainly in the agricultural sector, accounting for 66.7% of all sludge produced (781,000 t). Landfill reached 168,000 tonnes of dry matter, 13.7% more than in the previous year, while the incinerated sludge reached a volume of 39,000 t of dry matter - a similar amount to the 3 previous years - which seems to indicate a stabilising trend.

AGRICULTURE

European agriculture ministers reached an agreement (20 November 2008) known as the “health check of the Common Agricultural Policy (CAP)” (Chequeo Médico de la PAC) in order to adjust the amendment of the 2003 Common Agricultural Policy for the 2009-2012 period, and face the new challenges imposed by the world economic situation. It concerns a revision that will modernise, simplify and streamline the

European Union agricultural policy, supporting rural development and eliminating some restrictions to farmers, thus helping them to respond better to market tendencies.

In terms of this revision, the European agriculture must manage, in a sustainable manner, natural resources used in productive processes and, particularly, land and water. Moreover, it must supply public-related services which are not directly repaid by the market, such as balanced territory distribution, rural landscape preservation, natural area protection and biodiversity. Within this new framework, the Ministry of the Environment and Rural and Marine Affairs is directing the Spanish agricultural policy.

The use of fertiliser and phytosanitary products to increase production yield and for disease and pest control is very significant due to their associated pollution risk. In 2007 there was an increase in the number of fertilisers used per hectare, from 118.3 kg/ha to 134.7 kg/ha, similar to 2004. This increment can be seen in the three types of fertilisers, but especially in both phosphate and potash fertilisers, which showed increases of 27.5% and 18.4% respectively. In absolute numbers, consumption in 2007 exceeded the 5 million tonnes, changing the stabilising trend of the two previous years. As regards the distribution of fertiliser consumption by Autonomous Regions, there exists a clear link to intensive agriculture, with a more elevated consumption in the Canary Islands, the Region of Murcia and the Valencian Community.

In 2007, however, there was a slight reduction of 0.8% in phytosanitary product (active ingredient) consumption per hectare compared with the previous year, showing a similar level of consumption as that recorded in 2005. The use of herbicides (31% of total) experienced a 3% increase in relation to last year, as opposed to the use of fungicides (25% of total) which fell by 3%. Insecticides kept the same figure in comparison with the previous year. The significant increase (34.3%) in phytosanitary products (both mollusc and rat poisons), probably as a response to the field mouse plague suffered in the same year, and affecting Castile-Leon in particular, must be highlighted.

Farmland devoted to organic farming continued to increase in 2007, when it reached almost a million hectares (988,320 ha), 6.9% more than in 2006. Although the number of workers had a lower increase (4.94%), its total number stood at 20,171 workers. The Organic Farming Area, in comparison with the Utilised Agricultural Area (UAA), reached around 4% at national level. Seven Autonomous Regions exceeded

this percentage, among them, Andalusia (12.1%), the Balearic Islands (9.6%), Canary Islands (8.8%), Navarre (6.0), Catalonia (5.8), Murcia (5.1%) and the Valencian Community (4.4%).

According to this indicator, only Aragon and Cantabria experienced a reduction in 2007 as compared with 2006. The distribution of crop types is similar to that in previous years; pasture, grassland and forage are those with a highest proportion of land cover, followed by forests and forest harvesting, cereals and legumes and olive groves. There was an increase in the area devoted to vegetable crops and root crops, and the area devoted to seed cultivation and nurseries decreased.

The irrigated area fell in 2008 compared to 2007 in relation to the utilised agricultural area, and is set at 13.2%, equivalent to the last five years' average. Eight Autonomous Regions are above this percentage: first the Valencian Community (44.0%), followed by Murcia (33.2%), Canary Islands (25.5%), Catalonia (23.3%) and La Rioja (20.8%). As regards irrigation techniques, in the 2002-2008 period, the area irrigated by localised systems has exceeded the gravity-fed area and the area irrigated by sprinkler systems. Currently, 45.9% of the irrigated area is served by localised systems, 32.1% by gravity systems and 21.5% by sprinkler systems.

In the 2000-2007 period, Gross Value Added (GVA) for agriculture reached a minimum value in 2006, similar to 2000, but it rose in 2007. Other variables had a different evolution; fertiliser and phytosanitary product consumption per hectare were the variables with the most irregular evolution. Likewise, the irrigation area has kept very similar values in the aforementioned period.

ENERGY

The development of a new energy model that reduces pressure on the environment and human health without halting economic activity is a gradual and fluctuating process. Some of these fluctuations are not a direct consequence of economic activity, such as emissions caused by forest fires or the weather; others are related to the introduction of new factors, for instance, the emission allowance trading.

The EU's aim of reducing total greenhouse gas emissions by 20% in 2020 is closely related to energy efficiency (energy consumption/GDP). In this respect, a visible parallel between the evolution of this indicator in the EU and in Spain can also be seen

this year. Although in both cases there is a downward trend, it is more significant in Spain due to the GDP increase. In the 2000-2006 period, primary energy consumption per unit of GDP fell by 4.6%. In 2007, compared to the previous year, this fall was of 1.9%. Final energy consumption by sector shows the following distribution in 2007, according to the IDAE: transport (39%), industry (30%), residential sector (17%), services (10%) and agriculture (4%).

The energy-related CO_2 intensity indicator allows the analysis of energy production in connection with the GDP. In 2007, it shows a moderate increment in comparison with 2006 (1.21%) The abovementioned fluctuations showed in the 1990-2007 series are largely due to variations in weather conditions, particularly in the case of cold winters, and to hydroelectric production. In the period under analysis, emissions intensity has fallen by 5.41%; however, this does not show a clearly defined trend.

In 2007, for the first time in Spain, renewable energies exceeded nuclear energy in terms of electricity generation. Nevertheless, fossil fuels continue to predominate in electricity generation, although there are some variations compared to the previous year: natural gas (31.7%), coal (24.2%), oil (6.5%), renewable energies (19.9%) and nuclear energies (17.7%). Renewable energies contribution in total primary energy consumption has risen from 5.87% in 2005 to 6.97% in 2007. The contribution of renewables in electricity generation has increased from 15.9% in 2002 to 19.9% in 2007. Hydroelectric energy represented 9.8% of electricity generation and wind power represented 8.7% in 2007.

INDUSTRY

In this edition, the situation analysed by the indicators (until 2007) reflects an increase in industry, which grew, even above national economy, as opposed to (as from 2008) the general decrease in production that affects Spain and the whole world economy.

Despite the increase in industry in 2007, a decrease in CO_2 emissions generated by the industrial sector (2% in comparison with the previous year) has been observed. Likewise, NO_x emissions show a downward trend (0.93%), while NMVOC remain almost stable (having a 0.19% increase). These variations must be analysed within the process that took place from 1990 up to 2007, including significant increases in CO_2 emissions (45.24%), NMVOC emissions (26.71%) and NO_x emissions (67.31%). It is also important to highlight that SO_2 emissions fell by 61.36% in the 2000-2007 period.

After the 2006 decrease, the sector's final energy consumption increased again in 2007, showing a 5.40% increase due to a greater consumption of coal (10.12%). Since 2004, the proportion of final energy consumption by industry has decreased in Spain compared to the total energy consumption, standing at 31.16% of the total in 2006 (according to Eurostat). This decrease is almost the same as the one in the EU-15 and more significant than the one in EU-27.

In terms of waste generated by industry, non-hazardous waste generation reached 57 million tonnes in 2007, with a decrease of 1.78% for the whole sector, but revealing major differences depending on each type of industry. While the manufacturing industry saw a non-hazardous waste increase of 14.73%, there was a decrease of 9.86% in the mining and quarrying industry, and of 14.75% in the case of the energy industry. Hazardous waste decreased in 2006 compared with the previous year (4.32%), reaching 2.1 million tonnes, a similar amount to 2003; however, it also reveals major differences depending on the subsector considered.

The aggregated Total Material Requirement (TMR) indicator (2000-2005) drawn up by the INE links GDP, population and consumption of natural resources, variables that have grown almost in parallel in Spain until 2004. In 2005, the TMR only had a 0.29% increase that can be attributed to imports, while other variables continue to rise. This stability seems to suggest greater efficiency in the consumption of resources in the economy, in line with the Sixth Community Environment Programme.

In terms of Spanish company expenditure on environmental protection, a 10.88% total increase can be observed in 2006 compared with the previous year, with significant investment expenditure, which has increased 17.05% and will bring about obvious environmental benefits over the next few years. The number of companies affiliated to EMAS (Eco-Management and Audit Scheme) reached between December 2007 and December 2008 a total figure of 1,038 (36.9% of which belong to the industrial sector, showing a 8.5% increase in comparison with the previous year), putting Spain in the second place of the EU-27 ranking, behind Germany and before Italy.

In 2007, the industrial sector showed a performance which consolidated previous trends, with a high level of growth in Gross Value Added (GVA) in the 2000-2007 period (36.28%), going from €103,415 million in 2000 to €140,937 million in 2007.

FISHING

The European Union fishing industry occupies the third position in the world ranking, even when its capacity to meet sustainability objectives for fishing grounds and species has been reduced. According to Eurostat figures, the fishing fleet of the EU-25 dropped from 88,467 vessels in 2005 to 85,332 in 2007. 10.5% of this decrease arose from reductions in the Spanish fleet.

The European Union fisheries policy is further extending its scope in order to integrate everything related to marine resources, by means of research, technology and innovation, for the purpose of ensuring that economic growth will not be achieved at the expense of sustainability. To achieve these goals, the Council Regulation (EC) 734/2008 of July 2008 on the protection of vulnerable marine ecosystems in the high seas was approved.

On 31/12/2007, the Spanish fishing fleet was made up of 13,006 vessels, of which 12,475 operated in national fishing grounds. Both in terms of vessel power and tonnage, Galicia heads the list of Autonomous Regions with a fishing fleet. Catches in waters adjacent to Spain fell by 3.2% in 2007, when compared with 2006, while total catches (in all fishing grounds: national and international) have increased 6.9%. Catches in waters adjacent to this country have been very irregular compared with the previous year. They decreased on the Bay of Biscay (11.5%), the Mediterranean, including the Black Sea (8.9%) and the Canary Islands (37.5%). On the other hand, they increased in the Gulf of Cadiz, including Portugal (13.0%).

Aquaculture has become a popular alternative to wild fish stocks used for human consumption. Global figures vary significantly in relation to mussel farming, which in 2007 reached 211,983 tonnes, showing almost a 30% decrease in comparison with the previous year.

In terms of fish production in marine aquaculture, a total of 39,995 t (compared with 37,738 t in the previous year) was reached, with an increase in the gilt-head sea-bream (11.32%) and European sea-bass (6.37%) production and a decrease in turbot production (2.88%). Fish production in continental aquaculture has also increased, particularly in the case of the rainbow trout (2.88%). Taking these figures into account, the future of aquaculture as a high-quality protein source is beyond any doubt;

however, it is important to bear in mind the subsequent impact it may have on the environment: eutrophication, use of antibiotics and other chemical products, wild fish consumption as foodstuffs, etc.

Regarding the profitability of this sector, it is worth noting that its Gross Value Added (GVA) (which presents fluctuations since 2000, partly due to the variations in mussel farming) has increased in 2007 in comparison with 2006, a year in which an upward trend was also observed.

TOURISM

In 2007, the number of foreign tourists reached 59.2 million, which represents a new historical record, but at the same time, it shows a slow growth (only 1.7% more than in 2006). Global tourist expenditure rose by 3.5%. Over 60% of international tourists come from three European countries (UK, Germany and France) and choose as their main destination six Autonomous Regions, which receive 90.5% of all tourists. At the same time, residents in Spain took a total of 93.58% journeys within the country and 6.42% journeys abroad.

From an environmental standpoint, tourism exerts significant pressure because of the increase in transport (mainly by air and road), massive tourist concentration on the coast and on accommodation facilities, and the seasonal nature of holiday periods. In addition, it also brings extra resource consumption, particularly of water, additional waste generation and an increase in pollutant emissions, among other factors. In this chapter there are indicators that show some of these environmental pressures. The number of foreign tourists per inhabitant in 2007 has remained at the same rate (1.31 tourists/inhabitant) than in the previous year, in spite of the increase in the total number of tourists due to the parallel population growth.

The pressure on the coast (the number of foreign tourists per kilometre of coast) reveals a slight increase at national level (0.5%) exceeded by five communities; Murcia is the most significant (16%) while the rest show a decrease, particularly on the Bay of Biscay and the Galician coast. From a different perspective, the "Tourist Population Equivalent (TPE) compared against resident population" shows us the pressure at national level (7.63%) and by Autonomous Regions, particularly the high figures of the Balearic Islands (27.63%) and the Canary Islands (16.26%).

Regarding the number of visitors to National Parks, there was a slight general decrease (1%) in 2007, which, together with the increase in area (Monfragüe National Park), put the final figure of visitors/ha at 31.3%, in comparison with last year's 33.6%. Finally (with data from 2008), rural tourism shows an increase in the number of accommodation and beds (almost 10%) but a decrease in the number of visitors (1.86%) and overnight stays (2.32%).

TRANSPORT

In 2005, transport generated 4.6% of total Gross Value Added (GVA) in Spain. In 2007 this sector employed 693,000 people. If related activities, such as those performed by travel agencies, are taken into consideration, this sector employed almost a million people.

In Spain, modal distribution is dominated by road transport, which continues to generate the greatest demand for both passengers and goods. Passenger transport distribution in 2007 shows that transport by road accounted for 89.5% of the total, by air 5.3%, by rail 4.8% and by sea 0.4%. Freight transport distribution in 2007 was as follows: road 83.8%, sea 10.4%, pipeline 3.0% and rail 2.8%.

For passengers, air transport was the fastest growing mode of transport over the 1990-2007 period (270.7%), while in the case of goods, road transport had the highest increase (133.5%), followed by pipeline and sea transport.

Over the 1990-2007 period, greenhouse gas emissions by transport rose by 95.7%, while those of acidifying substances remain stable (with a slight fall of 0.2%). There was also a fall in emissions of tropospheric ozone precursor gases (28.7%). When compared with 2006, the situation in 2007 is characterised by an increase in emissions. This increase exceeds that of 2006 in comparison with the previous year. It is worth noting that despite the growth of emissions, a 0.5% decrease in final energy consumption for all modes of transport was observed.

In 2008, Spanish airports recorded a total of 203.8 million passengers, operated over 2,400,000 flights and transported 630,000 tonnes of goods. Compared with 2007, the number of passengers fell by 3.2%, while goods transport increased slightly. Only Alicante, Girona and North Tenerife airports showed increases in passenger transport in 2008, while at others the decrease was more or less significant, even though some

airports presented significant rises in international traffic, such as Barcelona's, which grew by 20%.

In 2007, air transport used 11.8% of the energy consumed by transport, occupying the third position behind road and sea transport. Regarding this transport mode, it is worth mentioning Directive 2008/1001/EC - which came into force in 2009 - and that includes air traffic activities in a scheme for greenhouse gas (GHG) emission allowance trading within the Community.

As regards waste generated by transport, in 2007 a total of 218,896 t of end-of-life tyres (ELTs) were recycled by means of the two existing integrated management systems. The Spanish National Integrated Waste Plan (PNIR – Plan Nacional Integrado de Residuos), of December 2008, establishes quantitative objectives in relation to prevention, recovery, energy recovery and recycling for this type of waste.

In 2008, total fuel consumption for motorisation climbed to 31.9 million tonnes, which shows a 3.3% decrease in comparison with the previous year. From that amount, diesel represented almost 80%, with a 3.9% decrease compared with 2007, which reveals that the trend towards greater consumption observed in recent years has come to a halt. In terms of bio-fuels, bio-diesel consumption stood at 586.4 kt, thus doubling the amount from last year. Fuel imports represented 71% of total consumption. Moreover, bio-ethanol consumption stood at 180.4 kt, even when production reached 273,377 t, 3.8% lower than last year's figure.

The number of traffic accident fatalities fell for four years running. In 2007, compared to the previous year, this fall was of 7%. In terms of absolute figures, the number of deaths stood at 3,823, but there were 19,295 serious injuries and 123,226 minor injuries as well. The number of accident fatalities has been higher on highways than in urban areas (81% as opposed to 19%). Road safety is a key factor within these figures, as there are fewer accidents on highways and road networks than in two-lane roads.

The relationship between the number of accidents with victims and the vehicle fleet gives us the accident rate. Since 1990, a 48.7% fall of this rate can be observed, standing at 3.32 accidents per 1,000 vehicles in 2007. In 2009, the Accident Concentration Treatment Plan in State Highways Networks (Red de Carreteras del

Estado) - which will be effective until 2012 - has been approved. This plan is aimed at improving accident prevention.

In terms of eco-efficiency in transport, quantified by means of the amount transported (passengers-km and tonnes-km) multiplied by unit of GDP, a continuous downward trend could be identified over the 1995-2007 period.

HOUSEHOLDS

The residential sector (households inhabited permanently) is analysed from the perspective of consumption and the pressure exerted on the environment.

The number of households has risen by approximately 21.5% in the 2001-2007 period, reaching 16.3 million units this year. This increase is due to population growth (10.8% in the same period), but also to the tendency towards the reduction of the number of people per household (in 2007, 46.22% of households was made up of just one or two members). The number of housing units (main and secondary) reached 24.5 million in 2007.

Households play a significant role in energy consumption, waste production, water consumption and CO_2 emissions. This consumption is financed through households' participation in the distribution of income, which has reached €39,443 per household in 2007 in absolute figures, showing an upward trend in the whole series.

Broadly speaking, one of the trends seen in the period under analysis is the relationship between the increase in the number of households and the increase in consumption. Regarding CO_2 emissions, there was an increase of 1.8% in 2007 in comparison with the previous year, when a significant decrease had been experienced. There was a slight decrease in energy consumption, more significant for electrical usage than for heating/air conditioning. Urban waste collected per household decreased from 1,888 t per household/year in 2005 to 1,821 t per household in 2006 according to the most updated figures published by the INE.

As regards water consumption per household, there has been a clearly favourable downward trend (with some fluctuations) since 2000. The awareness-raising campaigns and restrictions imposed in the context of generally low rainfall periods, and even droughts, are very likely to have contributed to this result. The INE calculates that

water consumption per household per year in 2006 stood at 168 m^3, whilst in 2000 the figure was 190 m^3 per household per year, which seems to reveal a consolidated downward trend in consumption.

The number of passenger cars per household has remained stable since 1998 at 1.3 passenger cars, although in 2007 there was a slight rise. In absolute terms, the number of passenger cars in the national vehicle fleet in 2007 stood at 21.8 million, representing a 34.5% increase since 1998, a figure fairly similar to the rise in the number of households in the same period.

URBAN ENVIRONMENT

The trend towards urban and periurban concentration of the population affects all of Europe and it is more evident in regions that offer employment and housing options for immigrant populations, such as several Autonomous Regions in Spain. This is reflected in the "urban pressure on land", quantified through an index that establishes a relationship between growth in towns of more than 10,000 inhabitants and the territory of the community. This index has increased by 13.29 percentage points in the 2001-2007 period in the national territory; the Balearic Islands (29.80%), the Canary Islands (23.96%), the Valencian Community (20.76%) and the Region of Murcia (19.21%) being the communities that showed higher increases in the period under analysis.

In 2007 this indicator shows significant updates. Although it continues to grow at national level (1.18%) and in some Autonomous Regions (Balearic Islands, Canary Islands, Castile-La Mancha, Murcia and Navarre), decreases can be seen in other Communities: Asturias (0.11%), Castile-Leon (3%), Extremadura (1.08%), Galicia (0.04%) and La Rioja (0.40%), which even when they are not very significant might be introducing a change in trend.

Closely related with economic and population growth, this chapter presents the most important data on the 16 metropolitan areas of public transport which reached the amount of 21.3 million inhabitants in 2006 and covered 33.2 million km^2, of which 3,243 km^2 belong to the main city. The public transport infrastructure (urban and metropolitan) within these areas shows a growing extension both in urban (about 9,000 km) and metropolitan (about 45,000 km) bus lines and railways (2,380 km). Also, it is worth noting a greater integration among modes of transport. Despite the fact that

public transport is of significant importance, a third of the urban transport occurs by means of private vehicles. Moreover, journeys on foot are important in medium-sized cities. Due to urban sprawl, private transport represents between 35% and 55% of total public transport in metropolitan areas.

Air quality in the urban environment is related to transport increase. The average situation of air quality in municipalities of more than 100,000 inhabitants shows differences for each pollutant and for each variable evaluated of said pollutant. Generally speaking and for every city with more than 100,000 inhabitants, there are some significant factors: the growth of ozone concentration excess levels up until 2005 and the decrease that started at that point; the slight decrease of particles (average annual concentration and excess levels) and the average annual NO_2 concentration; as well as the decrease until 2003 and the later growth of NO_2 exceed levels.

Regarding particles with a diameter of less than 10μ, for all population bands considered there is a decrease in the number of days per year when average daily concentration exceeds its limit. Regarding ozone, since 2005 there has been a decrease in the number of days that exceeded the concentration of 120 μg/m3 measured as the maximum daily 8-hour running average, for all the population bands analysed, changing this way the upward trend experienced since 2002.

In order to improve quality of life in cities, a wide range of initiatives with local impact have been launched, among which it is worth mentioning the Spanish Network of Cities for Climate (Red Española de Ciudades por el Clima) and the Network of Networks for Sustainable Local Development (Red de Redes de Desarrollo Local Sostenible). This is promoted by the Spanish Ministry of the Environment and Rural and Marine Affairs (Ministerio de Medio Ambiente y Medio Rural y Marino) in collaboration with the Spanish Federation of Municipalities and Provinces (Federación Española de Municipios y Provincias). The first includes 450 municipalities, with over 25 million inhabitants, that jointly and in a coordinated manner, develop policies to reduce CO_2 emissions locally and to have a positive role in climate change.

A relevant indicator in this chapter is related to environmental noise, which presents results from the first stage of the Noise Strategic Maps drawn up in accordance with Act 37/2003, of 17 November. This indicator reveals that 1,463,000 people are exposed to noise coming from main highways and roads, 78,100 from railways and

143,700 from large airports. The chapter also presents an indicator that monitors the number of Sites of Cultural Interest (immovable property category) that receive special protection under Spanish legislation. There are now 15,598 of these sites across Spain.

NATURAL AND TECHNOLOGICAL DISASTERS

In spite of the growing number of catastrophes taking place all around the globe, neither the number nor the magnitude of natural disasters in Spain can be compared with other events that have occurred in other regions of the Earth. Many times, these events can give rise to significant monetary damages and a great number of victims, a number which is usually higher in the case of developing countries. 750 disasters have taken place during 2008 in the entire world, causing at least 220,000 death casualties. Two great catastrophes hit Europe and resulted in significant economic losses but caused no casualties.

In the period 1995-2008, there were a total of 897 deaths in Spain due to natural disasters. 29.3% of that figure resulted from floods, 23.0% were due to maritime storms, 18.2% due to storms and the remaining 9.1% originated in forest fires.

During 2008, a total of 19 deaths were identified in Spain due to the above-mentioned reasons, one more than last year. Heatwaves, particularly important in previous years, did not result in fatal victims in 2007 or 2008. This has been due, in part, to the preventive campaigns developed by the Spanish Ministry of Health and Consumer Affairs.

Regarding rainfall (the lack of which may give rise to drought periods with serious economic and environmental consequences), the figures for the years measured in accordance with Average Rainfalls during 1941-2008 show us that 30.7% of the years within that period have been dry or very dry, 20.6% have been normal and 42.6% have been wet or very wet. Moreover, 3% of said years were extremely dry and the remaining 3% were extremely wet.

2008 saw a recovery in connection with the hydric deficits of the two previous years in spite of the irregular nature of rainfalls, which were lower than average during the first three months of the year (especially in the northern region) but were abundant by the

end of the year. For some Autonomous Regions (or in certain areas), the year has been dry or very dry. It is also worth noting a series of heavy rainfall that took place at the end of September in the Gibraltar Strait area, Murcia, the central region of the Valencian Community and some other areas within the communities of Madrid and Castile-La Mancha.

Forest fires are the cause of some of the most serious natural disasters within Spain, especially during the summer, and they usually result in significant environmental consequences and the loss of human lives. Although fire is a natural process (lightning is one of the typical causes), considering forest fires as natural disasters may seem controversial, as around 80% are of anthropic origin (deliberate or due to negligence). In 2008, the affected area fell to figures that were last recorded several decades ago, reaching a total of 7,636 ha of the wooded area in comparison with the ten-year average of 43,298 ha. This decrease was due, in part, to the preventive actions of the Ministry of the Environment and Rural and Marine Affairs of the Autonomous Regions, as well as to the dissuasive action of the Nature Protection Service of the Civil Guard (SEPRONA - Servicio de Protección de la Naturaleza de la Guardia Civil) and other security-related bodies.

Accidents arising during the road and rail transport of hazardous goods, maritime accidents causing oil spills, and accidents in industrial facilities result in severe environmental damages and are subject to strict regulations. Between years 1997 and 2007, there were over 570 accidents during the transport of hazardous goods, most of which (531) resulted from the road transport of hazardous goods while the rest occurred during rail transport (39). However, in recent years, this number has decreased: in 2007, there were 48 road accidents (as opposed to the 64 that occurred in 2004, a year with a high number of road accidents), while there were only two accidents recorded in connection with rail transport, as opposed to the 10 accidents that took place in 1997. Regarding the Autonomous Regions, Andalusia, Catalonia and Aragon were those with the highest number of this type of accidents during the period under analysis.

These accidents can cause environmental damages to the atmosphere and the hydric resources, as well as soil contamination, the last two being the most affected categories. Out of a total of 630 accidents, 78.8% were soil contamination accidents, 13.5% were water pollution accidents, and 10.3% were related to atmospheric pollution.

Over the period 1991-2007, there were 134 oil tanker accidents off Spanish coasts resulting in spills of over 7 tonnes. The coasts of Andalusia (Gibraltar Strait), Galicia, Canary Islands and Catalonia have been subject to the greatest number of accidents due to the intensity of the traffic and the extension of their coastline. In 2007 there were five oil tanker accidents as opposed to the two accidents of 2005.

In 2008, there has only been one accident in industrial facilities covered by the Seveso Directive, in comparison with the three accidents from 2007 and six from 2006. Therefore, a clearly decreasing trend can be seen, which would be very positive if it can be finally consolidated. In the 1987-2008 period, there were a total of 35 industrial accidents resulting in discharges of dangerous chemical substances. Catalonia has been the Autonomous Region with the greatest number of accidents (13), followed by the Basque Country (5) and Castile-Leon (4).







1. Background

- Social background
- Economic background
- Administrative background
- Environmental policy
- Environmental information

Comprising 17 Communities and two Autonomous Cities, Spain takes up the best part of the Iberian Peninsula in the southwest corner of Europe, very close to Africa. The country includes two cities in the north of Africa – Ceuta and Melilla – and the Balearic Islands in the Mediterranean and the Canary Islands in the Atlantic. Spain is characterised by great geographical, climatic and biological diversity (four of the 10 biogeographical regions that exist in Europe are represented in Spain), which together with other social, cultural, political and economic aspects makes the country plural and unique. Spain has approximately 10,099 km of coastline, which accounts for almost 15% of the coastline in the European Union (EU). The EU-27 has the second largest coastline in the world, behind Canada.

Spain is a constitutional monarchy with a Parliament (Cortes Generales in Spanish) made up of two chambers: the Congress and the Senate. The main basis for legislation is the 1978 Constitution. All Autonomous Regions have their own autonomous Parliaments and Governments. The respective Regional languages are co-official, alongside Castilian Spanish, the official Spanish language of the State.

Spain has a total surface area of approximately 506,000 km^2, making it one of the fifty largest countries in the world and the second largest in the EU-27, with 11.7% of total surface area. France is the largest (12.8%) and Malta the smallest. The surface area of continental Spain amounts to 493,514 km^2, while the Balearic and Canary Islands have a total surface area of 4,992 km2 and 7,492 km^2, respectively, and the cities of Ceuta and Melilla together have a surface area of 32 km^2.

Social background

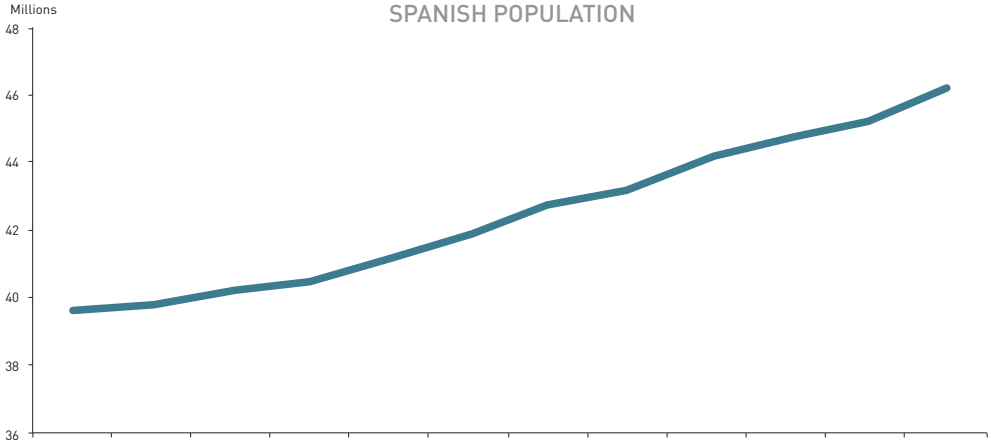
The population of Spain has recorded marked growth in recent years, exceeding the forecasts made in the 1990s by demographers who predicted it would not surpass 40 million in the short term. In 2008 Spain had 46,157,822 inhabitants, an increase of 16.4% over the period dating from 1996 to 2008. During that period, large Regional differences were observed in population growth, with the Balearic Islands recording a 41.1% rise and Asturias a 0.7% decrease.

The largest increases in population have been registered in the

Communities on the Mediterranean coast, in the Canary Islands and in Madrid.

In relation to Europe, Spain is the fourth largest country in terms of population, contributing 9.1% of the total. Only Germany (16.5%), France (12.8%), the United Kingdom (12.3%) and Italy (12.0%) are larger. In this sense, the EU-27 had a total of 497.5 million inhabitants in 2008, the third largest population in the world behind China and India. The increase in population is largely due to net migration (to which a considerable proportion of the increase in the birth rate must be attributed) and natural population growth. Population density in Spain in 2008 stood at 91.2 inhabitants per km^2, one of the lowest in the EU-27 (only eight countries are less densely populated).

SPANISH POPULATION



Source: INE

POPULATION GROWTH 1996-2008 (%)



Source: INE

According to the National Immigration Survey (NIS), the number of immigrants in Spain exceeded four and a half million in 2007 (4,526,522), which represents 10% of the total population of residents in the country. The NIS defines an immigrant as any given person over the age of 16 born abroad who has been living in Spain for at least a year or intends to do so. As regards the EU, in 2007 Germany contributed the largest number of foreign residents in absolute terms in 2007 (7.26 million), followed by Spain, the United Kingdom, France and Italy. These five countries account for 76.6% of the total, according to Eurostat. The situation in Spain in the last few years, characterised by sustained economic growth and an increasingly large labour market which is continuously expanding, together with Spain's strategic geographical location, explains why Spain has become an attractive point of arrival for immigrants.

Economic background

By analysing the standard of living in Spain using the total value of production in a year, Gross Domestic Product (GDP) per capita, we are able to obtain a reference of where the country stands in economic terms. Different standards of living among countries mean the goods that can be bought with the same amount of money vary from country to country. In order to compare standards of living, purchasing power differences must therefore be taken into account.

In order to do so, the price of a «basket» of comparable and representative goods and services is calculated, with the resulting price being expressed in a common conceptual currency called «purchasing power standard» (PPS). The PPS eliminates price differences among countries such that comparing GDP per capita makes it possible to compare the standards of living in the EU as a whole.

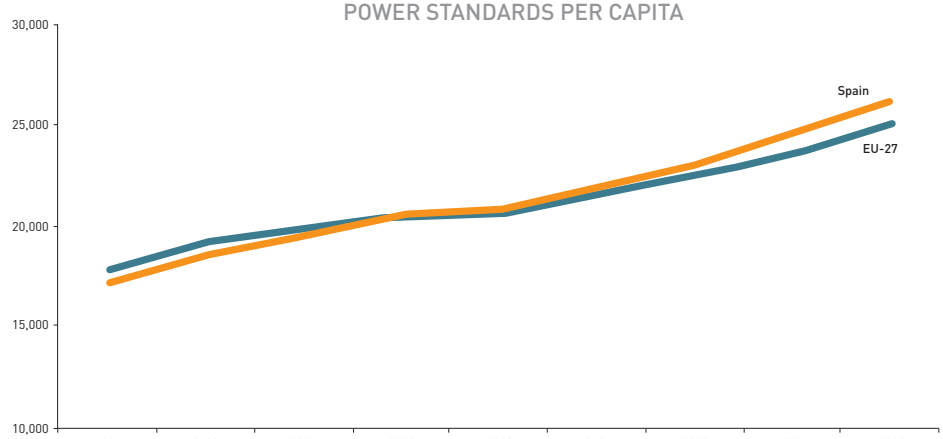
According to the EU Commission, the standard of living in Europe has improved remarkably over the last decade and is now among the highest in the world. Within Europe, Spain was ranked 12th in terms of GDP at market prices (current prices), measured in terms of purchasing power per capita, recording above average scores for Europe since 2002 (5.4% higher in 2007).

Spanish GDP (at market prices and measured in current prices) amounted to 1,095,163 million euros in 2008. GDP has risen constantly over the last few years, although a slowdown has been observed since 2006. In the period dating from 1995 to 2008 alone, net growth in GDP was 144.9%, while Gross Value Added rose by 143.2%. By market sector and over the same period, the largest economic growth rate was recorded in the construction sector (275.5%), followed by industry (96.3%)

and energy (74.1%). The lowest growth rate was registered agriculture, livestock and fishing, which only increased by 49.6% in the period.

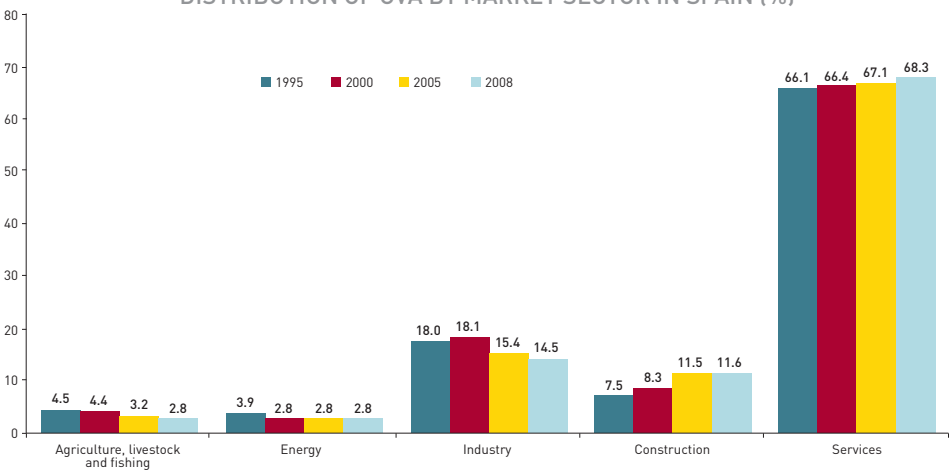
The distribution of GVA, with the constant rise in the services, which account for 68.3% of total GVA, clearly illustrates the enormous importance of this sector. This situation is common to all EU countries, where more than 60% of GDP is generated by the services sector (which includes activities such as banking, tourism, transport and insurance).

GDP AT MARKET PRICES (CURRENT PRICES) MEASURED IN PURCHASING POWER STANDARDS PER CAPITA



Source: Eurostat

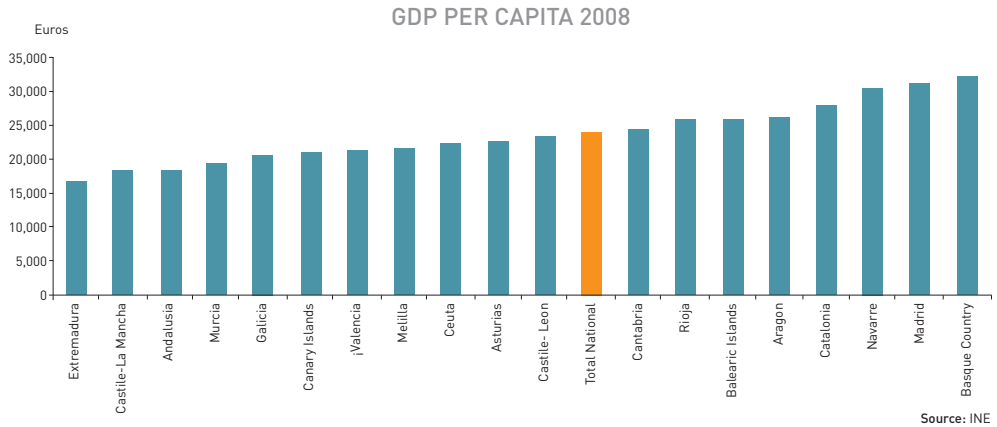
DISTRIBUTION OF GVA BY MARKET SECTOR IN SPAIN (%)



Source: NSI

National net disposable income per capita at market prices amounted to 18,941 euros in 2007 and, in keeping with overall economic development, has recorded constant growth over the last few years. Growth over the period dating from 1995 to 2007 stood at 92.3%, although a decrease in this ratio is observed since 2000, when an annual rise of 7.1% was recorded, to the 3.9% growth rate registered between 2006 and 2007.

The graph below displays GDP per capita by Community of Spain (at market prices and measured in current prices) for 2008 (preliminary data). Eight Communities record figures above the average for the country.



Source: INE

The economically active population in Spain totalled 22,189,900 people in 2007, the activity rate for persons aged between 16 and 64 standing at 72.8%. The economically active population in 2006 was 21,584,800, implying a growth rate of 2.8% between the two years, slightly lower than that observed between 2005 and 2006, which was 3.3%. In 2007, the Communities with the largest economically active populations were Catalonia, Andalusia and Madrid (with more than three million people in each) and the largest rises between 2006 and 2007 were recorded by Murcia and Aragon. The activity rate has risen by 10% over the last 20 years.

The unemployment rate has dropped over the last few years, from over 20% (23.9% in 1994) to 8.26% in 2007. However, this trend collapsed in 2008 when the unemployment rate rose to 13.9% in the fourth quarter.

According to the Spanish Economic and Social Council in its report on the

socioeconomic and employment situation in Spain in 2007, the Spanish economy was one of the most dynamic in Europe, recording GDP growth of 3.8% (nine decimal points higher than the average for the EU-27). However, this progress was slightly down on that recorded the previous year following a slowdown in economic activity as a result, among other external factors, of the downturn in the main driving forces behind economic growth: household consumption expenditure and construction (above all residential).

After the mortgage crisis in the United States in the summer of 2007, which spread to the international financial market, the panorama changed substantially and the Government (along with the main international organisations) was forced on several occasions to lower their forecasts for growth in the Spanish economy. Faced with the escalation of the recession at the beginning of 2008, the Royal Decree-Act 2/2008 of 21st April was passed with measures aimed at boosting economic activity. Among the objectives of this move, it is worth highlighting the following: stimulate household consumption and business activity, curb the deterioration of the real estate market and reduce the negative impact on employment by means of tax and financial measures.

Administrative background

España hoy 2008, published by the Spanish Ministry of Presidency, provides a synthetic and detailed analysis of the basic features of the administrative situation in Spain and how responsibilities are shared between the Central and Regional Governments, from which the points discussed below may be extracted.

The Constitution of 1978 acknowledged and guaranteed the right to autonomy of the nationalities and regions that Spain as a nation comprises and the solidarity among all of them. As a result of the regional organisation of the State, Spain is divided into 17 Autonomous Regions and two Autonomous Cities (Ceuta and Melilla), with political and administrative power being redistributed between the Central and Regional Governments. This process has made Spain one of the most decentralised countries in Europe.

Each Autonomous Region has its own Statute of Autonomy passed by Constitutional Law. This is the Community's basic institutional legislation and it regulates essential aspects such as the organisation and workings of the Regional Parliament and Regional Government, their responsibilities and administration, the Community's hallmarks or distinguishing features, such as the language or civil rights, and relations with the State and other Autonomous Regions. Responsibilities are shared on the

basis of distinguishing between competences exclusive to either the State or the Autonomous Regions, competences shared by both the State and Autonomous Regions and concurring competences in which both the State and Autonomous Regions may intervene.

Exclusive responsibilities – both those belonging to the State and those pertaining to the Autonomous Regions – include the power to legislate and enforce, whereas shared responsibilities may imply a different distribution of legislative and regulatory power between the State and Autonomous Regions, the latter normally retaining executive powers in such cases. Conflicts of responsibility are settled by the Constitutional Court.

Autonomous Regions have a parliamentary government system, its foremost institutions being the Parliament, the President of the Community and the Regional Government. From an economic and financial viewpoint, Autonomous Regions enjoy a great deal of independence, having the power to pass their own annual budgets and to determine their resources by means of taxes, tariffs and surcharges.

The general system for Autonomous Region financing, which also includes taxes transferred by the State and participation in State taxation, is established multilaterally by the State and the Autonomous Regions.

Environmental policy

The Spanish Ministry of Enviroment and Rural and Marine Environmental Affairs (hereafter referred to as MoE), was created in 2008 by Royal Decree 432/2008, of 12th April. This new ministry takes over the responsibilities held by the former Ministry of Agriculture, Fisheries and Food and the previous Ministry of Environment (the latter created in 1996), together with those related to marine protection issues, in close collaboration with the Spanish Ministry of Public Works.

The MoE is in charge of proposing and enforcing Government policy regarding issues such as combating climate change and protecting Spain's natural heritage, biodiversity and the sea, water, rural development, agricultural, livestock and fishing resources and food. One sole ministerial department encompasses all the State's responsibilities linked to the natural environment, with its twofold objective of protecting land and biodiversity, as well as the integral fostering and defending agricultural, fishing, forestry and food production factors; environmental protection policy that also generates wealth and food and rural environmental sustainability.

The Ministry is divided into the following higher and executive bodies directly under the authority of the Minister:

a) Secretary of State on Climate Change

b) Secretary of State for the Rural Environment and Water

c) Undersecretary of Environment and the Rural and Marine Environment

d) General Secretary of the Sea, with the same authority as an Undersecretary

The creation of the new Ministry of Environment and Rural and Marine Environmental Affairs has led to an array of policies that constitute a global development and conservation strategy, particularly where environmental issues are concerned, aimed at making progress in the fight against climate change, the integral management of water, promoting development in rural areas and protecting coasts and maritime resources. Environmental problems have become globalised problems that cannot be confined to city or rural level and which are part of an interrelationship between alterations in the environment and ecosystems, economic systems and the standard of living of citizens.

The steps and initiatives taken by the Ministry to combat climate change, considered authentic State policy, is based on the reduction of emissions, the search for energy savings and efficiency and increasing the importance of renewable energies, while maintaining competitiveness, employment and economic and budget stability. The National Emission Allocation Plan and the Spanish Climate Change and Clean Energy Strategy 2007-2012-2020 are key parts of this policy. The 2008-2012 National Emission Allocation Plan has set itself an ambitious goal: to reduce emissions by 19.3% with regard to the 2005-2007 Plan.

The Spanish Climate Change Strategy is working towards two important scenarios: 2012, when the first stage of the Kyoto Protocol ends and 2020, used by the European Union as a reference for strategic objectives. The Spanish strategy includes 198 measures and 75 indicators in two main areas: climate change and clean energy. The Energy Saving and Efficiency Plan 2008- 2012 establishes a series of measures quantified in terms of objectives, deadlines and cost. The National R&D+i Strategy, where it relates to energy and climate change issues, is another important area of horizontal measures.

Transforming current economic models in low carbon economies involves working in four main areas, which at the same time help to increase energy security and reduce

dependence; increase energy saving and efficiency; reduce fossil fuel consumption in favour of renewable energy sources; consolidate the implementation of new technologies and promote innovation in all production processes.

The Plan to Boost the Internationalisation of the Spanish Economy in sectors linked to Climate Change, made public in March 2009, aims to integrate Climate Change as a cross-sectional element of Spanish business internationalisation policy, setting three primary objectives:

1. Consolidate the presence of Spanish companies in renewable energy and high technology sectors and increase their international competitiveness to combat Climate Change by fostering and boosting their development through national R&D and increasing their technological capacity, thus contributing to create an image of Spain and its business sector associated to low carbon development.

2. Identify and develop new opportunities for Spanish companies abroad.

3. Help achieve the objectives of reducing emissions both on a global scale and also those referring to Spain, taking full advantage of opportunities so that Spain can set projects in motion under the Clean Development Mechanism of the Kyoto Protocol and accomplish the reductions in emissions they generate.

The Plan, designed jointly by the Secretary of State for Trade, the Secretary of State for Economic Affairs, the Secretary of State for Climate Change and the Secretary of State for Research, establishes a framework that must guide all steps taken to support the activity of Spanish companies in the sectors mentioned above.

Spain enjoys a high level of biodiversity with respect to Europe as a whole for biogeographical, cultural and historical reasons. Furthermore, apart from Spain's natural or wild biodiversity, the country is also rich in agrodiversity, not only where seeds and crops are concerned, but also local agricultural systems. Conserving and renovating such systems is vital for the conservation of many natural species.

In this context, the importance of two laws proposed by the MoE stands out in particular. The first initiative, the Natural Heritage and Biodiversity Act, urges people to maintain and conserve the country's natural heritage, biodiversity and resources by making orderly use of them, while the Sustainable Rural Development Act primarily aims to achieve a high level of environmental quality in rural areas by preventing

natural heritage, scenery or biodiversity from deteriorating or by recovering them by means of integrated regulating of the use of the land.

Another initiative on behalf of the Ministry of Environment and Rural and Marine Environmental Affairs that is worthy of mention is the Spanish Sustainable Mobility Strategy, which encompasses a series of proposals to trigger a change in the current model of mobility, making it more efficient and sustainable, reducing its impact and promoting economies that use less coal and consume less energy.

Environmental information

The Aarhus Agreement on access to information, public participation in decision making and access to justice in environmental matters, together with the regional regulations that derived from it, have given rise to a new concept of open and transparent public Administration. The general public has the right to access the environmental information held by public authorities.

International and regional commitments bind public authorities to release environmental information, such as information regarding legislation, the state of the environment, projects, plans and programmes or regarding decisions made that could affect the environment.

As a result of the above, a contribution is made towards complying with the constitutional right that everyone has to enjoy an environment that is suitable for the development of the person and also the obligation shared by all of conserving it.

Act 27/2006, of 18th July, which regulates the rights regarding access to information, public participation and access to justice in environmental matters (which includes Directives 2003/4/EC and 2003/35/EC), establishes in article 8 (referring to reports on the state of the environment) the obligation of public administrations to compile reports on the state of the environment. These reports will be national and regional and, where applicable, local and will include data on the quality of the environment and the pressure it is under, as well as a non-technical summary that can be understood by the general public. This is where this report plays a special role, contributing to compliance and therefore guaranteeing that environmental information reaches as many people as possible.

The European Environment Agency (EEA) is the EU authority devoted to providing sound, independent information on the environment and is designed to be the primary source of information in Europe for those involved in developing, adopting,

implementing and evaluating environmental policy. The purpose of the EEA is to support sustainable development and work towards achieving a demonstrable improvement in Europe's environment by making appropriate, specific, relevant and reliable information available to both political leaders and the general public.

Created along with the information network EIONET by (EEC) Regulation n° 1210/90 of the Council on 7th May, 1990, the EEA is one of the European agencies, with 32 members: the 27 EU Member States, Iceland, Liechtenstein, Norway, Turkey and Switzerland. Five other non-member countries also cooperate.

The EEA is structured as a series of information points differentiated by country and task. Through the EIONET, the EEA has a node in each member or collaborating country (National Focal Point), European Topic Centres (consortiums of prestigious and experienced organisations in one particular subject area that the Agency selects and contracts in order to compile part of its work programme) and Primary Contact Points (institutions that cooperate in each country including National Reference Centres and, in the case of Spain, Regional Focal Points, apart from other expert collaborators).

In Spain, the work of the EEA National Focal Point is carried out by the Directorate General of Environmental Quality and Evaluation at the MoE.

The creation of a shared system of environmental information has been one of the greatest challenges in recent years in this area. It is a reference system of environmental information in Europe, promoted by the EU Commission and in which the EEA plays an important role in coordination and development. The idea originated from the commitment of member States to agree to supply the European Commission with hundreds of pieces of information on all kinds of environmental issues.

The idea of a computer platform (Reportnet) was initially suggested as a tool to which the various people in charge of gathering each piece of required information from each member State could connect and update the information within the given deadlines. The European Commission has now proposed a review of the process by which environmental information is transferred by the member States. They are developing a telematic infrastructure, known as the Shared Environmental Information System (SEIS), which will be shared by EU members to integrate the current systems for European environmental information. This idea was previously considered to a certain extent in the Sixth EU Environment Action Programme.

This Shared Environmental Information System was conceived as a shared network for those providing environmental information, enabling environmental monitoring

throughout Europe, the creation of quality reports, circulation of information amongst National Administrations and European Institutions, and paving the way for the progressive participation of the private and public sectors in general. It is a network system capable of interconnecting information providers, who are responsible for managing data at different levels (locally to transnationally). It is hoped that SEIS will become the reference system for European environmental data. For that to happen it must first integrate the information corresponding to the various information requirements of the member States, ensuring these are made official, and in turn other information and additional services will be added.

In short, there are three stages in the development of European information systems that can be outlined as follows:

- Isolated information system: 1985 – 1995
- Data-transfer information system: 1995 – 2005
- Shared information system: 2005 – 2010

The first stage refers to national information systems, wherein each country was treated as a separate compartment. During the second stage, and through the founding of the European Environment Agency, efforts were focused on creating a metanational system in which national information systems could converge.

The third stage refers to the implementation of the EIONET Network, in which Spain has been a constant participant. The analysis of its results and its work is the foundation for the SEIS project.

SEIS was devised through the need to meet four major objectives:

- To comply with regional and international legal requirements
- A report on the status of the environment, by country, by European and international bodies (G4, OECD, United Nations…)
- Public information on environmental trends, the connection to socioeconomic pressure, the solutions being offered to mitigate environmental damage through political action and guidelines for citizens
- Investigative actions that are often hindered by a lack of access to available data in the countries

A Shared Environmental Information System must have a telematic infrastructure, tools enabling information to be managed, and a coordinated administrative organisation with specific responsibilities. Furthermore, the infrastructure and organisation should be at the service of the environmental content.

In order for SEIS to become a reality, bearing in mind that this is a project with an integrated infrastructure on a European scale, it is necessary to take a global view. In order for it to function in practice, the following are necessary as a minimum:

- A normative framework that covers a common implementation strategy and administrative structure, both in the member States and European institutions
- High-level political agreements and backing, both in the member States and European institutions, run by environmental policy managers

The COM(2008)46 EC Communication "Towards a Shared Environmental Information System (SEIS)" gives recommendations for modernising and simplifying European environmental information management and sets out a series of measures necessary in order to implement SEIS, among which the following should be highlighted:

- A need for political commitment on the principles established in the Communication
- The Commission will give priority to the application of the INSPIRE Directive and to the continued development of the GMES initiative, as a basis for improving the sharing of information and data related to the environment in Europe
- Modernisation of legal provisions regarding the way in which information is provided that must be notified in virtue of environmental legislation. This is expected to come about through a revision of Directive 91/692/EC on the normalisation of reports, which must be updated and amended to meet the SEIS system's principles.

This proposal must be fixed legally, by the Commission, which will give normative support to a telematic system for sending and accessing environmental information.

Lastly, it is important to point out that the development of new technologies has boosted the development of interconnected systems on a European level. SEIS is closely linked to two of these initiatives, also currently in development:

- GMES (Global Monitoring for Environment and Security): Consists of a series of systems for observing the land and environment focused on providing a variety of services related to the environment and safety. It gathers data from land, sea and air stations as well as information from satellites.
- INSPIRE (Infrastructure for Spatial Information in the European Community): This is a directive (currently in the incorporation stage) which establishes an Infrastructure of spatial data for Europe, in which all kinds of geographical information from the member States can be integrated. It provides a cartographical basis on which the rest of the systems that manage georeferenced data can rest.

The three initiatives (SEIS, GMES e INSPIRE) will constitute a major technological impetus in the way environmental data is managed in Europe. Once developed they will allow information to be managed more quickly and with a greater number of variables, which enables reaction time to be reduced and more efficient environmental policies to be created.

Basic information

In this general context, the environmental situation in Spain, generally speaking, is presented loosely through the following descriptive record, similar to that used in the third chapter referencing Autonomous Regions. It compiles territorial, administrative, socioeconomic and environmental information. Most of the subjects are covered further and in greater detail in the corresponding chapters, although the opportunity of presenting them all here together allows for a useful, general overview.

The sources of information are listed at the end of the third chapter as they are practically the same as those used for the records of each of the Autonomous Regions. The only differences are in the information relating to the treatment of waste water, which comes from the Directorate General for Water, and in the information on species of flora and fauna, which comes from the Directorate General for the Natural Environment and Forestry Affairs, both from the Ministry of the Environment and Rural and Marine Affairs.



SPAIN
BASIC INFORMATION



Basic rule: Spanish Constitution of 1978 (Official Gazette 29-12-1978)
Reformed in Official Gazette 28-08-92
Year of entry in EU: 1986
Area: 505,990 km^2
Length of coastline: 7,905 km. Length of maritime terrestrial public domain: 10,099 km (includes ports and river estuaries)
Capital: Madrid **Autonomous Regions:** 17 (and 2 Autonomous Cities)
Provinces: 52 **Municipalities:** 8,110
Population (2008): 46,157,822 inhab.
Population density (2008): 91.2 inhab./km^2
Population increase (2000-2008): 14.0%

DISTRIBUTION OF POPULATION IN % (2008)

By size of municipality

< 2,001 inhabitants: 6.1
2,001-10,000 inhabitants: 15.2
10,001-100,000 inhabitants: 38.7
100,001-500,000 inhabitants: 23.5
> 500,000 inhabitants: 16.4

By age group

< 15 years: 14.4
15-64 years: 69.0
> 64 years: 16.5

ACTIVE POPULATION (THOUSANDS)
23,064.7 (fourth quarter of 2008)

UNEMPLOYMENT RATE
13.91% (fourth quarter of 2008)

AIR

NO. OF AIR QUALITY MONITORING STATIONS IN CA (2007)
Urban: 223 / Suburban: 188 / Rural: 148

AMOUNTS EXCEEDING LEGAL VALUES AT URBAN STATIONS IN MADRID (2007)

- Average annual concentration of NO_2 in µg/m^3 (limit value since 2010: 40 µg/m^3): 60
- Number of days in a year with an average daily PM_{10} concentration of 50 µg/m^3 (limit value since 2005: 35 days a year): 51

WATER

AVERAGE HOUSEHOLD WATER CONSUMPTION (2006)
160 litres/inhab/day. Between 2000 and 2006, this has reduced by 4.8%

DISTRIBUTED WATER BY SECTOR IN % (2006)
Households: 66.8 / Municipal consumption: 8.4 Economic sectors: 23.3 / Others: 1.5

LOSS IN DISTRIBUTION (2006)
16.7%

UNEMPLOYMENT RATE 15 AND OLDER (EU-27= 7.2%) (2007)
8.3%

EMPLOYMENT SECTOR STRUCTURE IN % (2008)
Agriculture: 4.0 / Industry: 15.3
Construction: 11.0 / Services: 69.6

GDP MP (2007)
23,412 €/inhab. Growth 2006-2007: 5.0%

GROSS DISPOSABLE INCOME PER INHABITANT (2006)
14,192 €/inhab. Growth 2000-2006: 37.4%

GVA BREAK-DOWN BY SECTOR (2007)
Agriculture: 2.9 / Industry: 18.0
Construction: 12.2 / Services: 66.8

WASTE-WATER TREATMENT (2006)
77% of population equivalent provided with waste- water treatment compliant with Directive 91/271/EEC (91% under construction)

LAND

LAND-USE BREAK-DOWN, % (2000)
Artificial: 1.7 / Agriculture: 50.2 / Forest: 47.3 / Wetlands: 0.2 / Water bodies: 0.6

INCREASE IN ARTIFICIAL SURFACES, 1990-2000 (%)
25.5

AREA AT RISK OF DESERTIFICATION, % (2008)
Low: 36.99 / Intermediate: 19.20 / High: 15.82 / Very high: 2.03

NATURE AND BIODIVERSITY

PROTECTED AREA (2008)
5,973,158.1 ha of terrestrial area and 256,429.9 ha of marine area (a total of 1,513 declared areas). Protected terrestrial areas represent 11.8% of the total area.

THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES (2008)

	FISH	AMPHIBIANS	REPTILES	BIRDS	TERRESTRIAL MAMMALS	FLORA
Critically endangered (CR)	2	0	5	15	3	308
Endangered (EN)	11	4	9	39	4*	278
Vulnerable (VU)	22	7	9	45	14	610
TOTAL Threatened	35	11	23	99	21	1,196

TAXA INCLUDED IN THE CNEA (2008)

	FISH	AMPHIBIANS	REPTILES	BIRDS	TERRESTRIAL MAMMALS	FLORA
Endangered	4	1	5	21	6	112*
Vulnerable	6	1	1	12*	14	9*
Sensitive to Habitat	0	0	3	3	0	7*
TOTAL	10	2	9	36* 34 taxa	20	128* 126 taxa

*Taxa with population in more than one threatened category.

NATURA 2000 NETWORK (2008)

14,284,177 ha (13,486,994 ha terrestrial and 797,184 ha marine), which represent 26.7% of the total terrestrial area. More specifically, 1,434 SICs, which occupy 12,386,991 ha (11,605,544 ha terrestrial and 781,447 ha marine) and 569 SPAs, which occupy 9,831,544 ha (9,604,863 ha terrestrial and 226,681 ha marine)

BIOSPHERE RESERVES (2008)

39 reserves, 3,323,495.64 ha of terrestrial area and 111,198 ha of marine area. BR terrestrial area represents 6.58 % of the total Spanish area.

RAMSAR WETLANDS (2008)

63 wetlands (281,964.4 ha)

WETLANDS INCLUDED IN THE SPANISH NATIONAL WETLANDS INVENTORY (March, 2009)

140 wetlands (118,253.6 ha [only includes Andalusia and Madrid wetlands])

FOREST FIRES (2007)

10,932 fires which affected 86,112.53 ha. An average of 20,672 annual fires occurred during the decade comprised between 1997-2006, which affected 132,690.07 ha.

WASTE

URBAN WASTE PER INHABITANT (2006)

- Total: 553.3 kg/inhab. Variation 2000-2006: -11.0%
- Mixed: 500 kg/inhab. Variation 2000-2006: -15.0%
- Paper/cardboard: 22.1 kg/inhab. Variation 2000-2006: 52.4%
- Glass: 12.6 kg/inhab. Variation 2000-2006: -16.6%
- Packaging: 18.6 kg/inhab. Variation 2000-2006: 376.9%

AGRICULTURE

ORGANIC FARMLAND (2007)

988,322.7 ha. Growth 2001-2007: 103.7%

IRRIGATED AREA (2007)

3,398,738 ha (13.52% of total agriculture area).

ENERGY

INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS (2007)

Total: 2.00 / Hydraulic: 0.41 / Thermal: 1.07
Nuclear: 0.17 / Wind: 0.31 / Other renewable: 0.04

ELECTRICITY CONSUMPTION PER INHABITANT IN MWH (2007)

6.0 MWh/inhab. Growth 2000-2007: 24.8%

TOURISM

NO. OF TOURISTS PER INHABITANT (2007)

Total tourists: 4.56 / Foreign tourists: 1.31

HOTEL CAPACITY (2007)

1,642,417 beds (36.3 beds/1,000 inhab) and 103,455 beds in rural accommodation (2.3 beds/1,000 inhab)

TRANSPORT

VEHICLE FLEET (2007)

30,318,457 vehicles. Growth (2000-2007): 30.2%
670.8 vehicles/1,000 inhab

PASSENGER CAR FLEET (2007)

21,760,174 passenger cars. Growth (2000-2007): 24.7%
481.4 passenger cars/1,000 inhab

TRANSPORT NETWORK DENSITY (2007)

Roads: 32.8 km/100 km^2 / Rail: 3.0 km/100 km^2
Roads: 3.7 km/1,000 inhab / Rail: 0.3 km/1,000 inhab

AIR TRANSPORT (2007)

210,498.760 passengers. Growth (2000-2007): 49.3%

GOODS PORT TRAFFIC (2007)

495.49 million tonnes. Growth (2000-2007): 42.2%

URBAN AND INVESTMENT POLICY

MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21 (2007)

More than 4,300 municipalities, of which 650 already have an approved Action Plan. Moreover, more than 830 municipalities have completed the A21L diagnosis.

INTERNAL EXPENSES IN R+D (2007)

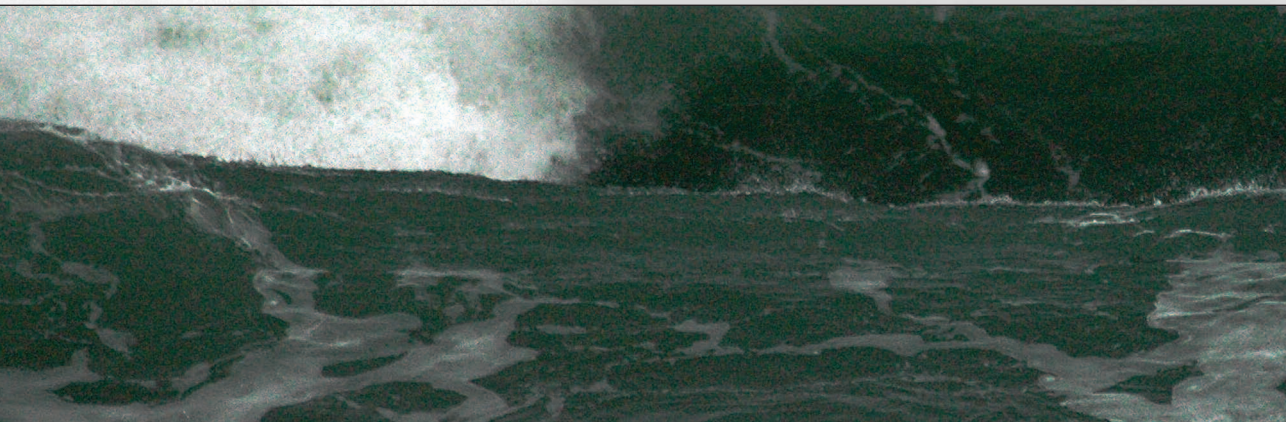
13,342.4 million € (1.27% of GDP).
Growth 2000-2007: 133.30%

RECOMMENDED WEBSITES

- http://www.marm.es
- http://www.ine.es/
- http://www.sostenibilidad-es.org/
- http://www.eea.europa.eu/
- http://epp.eurostat.ec.europa.eu

FURTHER READING

- MARM. *Environmental Profile of Spain. Indicator-based Report*. Year 2004 - 2007
- MARM. *The Environment in Spain*. Years 1989 - 2007
- Spanish Sustainability Monitoring Centre. *Informe de Sostenibilidad en España (Spain Sustainability Report)*. Years 2005 - 2007
- INE. *Anuario Estadístico de España (Spain Statistics Yearbook)* (since 1858) and *España en cifras (Spain in Numbers)* (since 1999)
- Ministerio de la Presidencia (Ministry of the Presidency), 2009. *España hoy 2008 (Spain Today 2008)*





1. Background

- Social background
- Economic background
- Administrative background
- Environmental policy
- Environmental information

Comprising 17 Communities and two Autonomous Cities, Spain takes up the best part of the Iberian Peninsula in the southwest corner of Europe, very close to Africa. The country includes two cities in the north of Africa – Ceuta and Melilla – and the Balearic Islands in the Mediterranean and the Canary Islands in the Atlantic. Spain is characterised by great geographical, climatic and biological diversity (four of the 10 biogeographical regions that exist in Europe are represented in Spain), which together with other social, cultural, political and economic aspects makes the country plural and unique. Spain has approximately 10,099 km of coastline, which accounts for almost 15% of the coastline in the European Union (EU). The EU-27 has the second largest coastline in the world, behind Canada.

Spain is a constitutional monarchy with a Parliament (Cortes Generales in Spanish) made up of two chambers: the Congress and the Senate. The main basis for legislation is the 1978 Constitution. All Autonomous Regions have their own autonomous Parliaments and Governments. The respective Regional languages are co-official, alongside Castilian Spanish, the official Spanish language of the State.

Spain has a total surface area of approximately 506,000 km^2, making it one of the fifty largest countries in the world and the second largest in the EU-27, with 11.7% of total surface area. France is the largest (12.8%) and Malta the smallest. The surface area of continental Spain amounts to 493,514 km^2, while the Balearic and Canary Islands have a total surface area of 4,992 km2 and 7,492 km^2, respectively, and the cities of Ceuta and Melilla together have a surface area of 32 km^2.

Social background

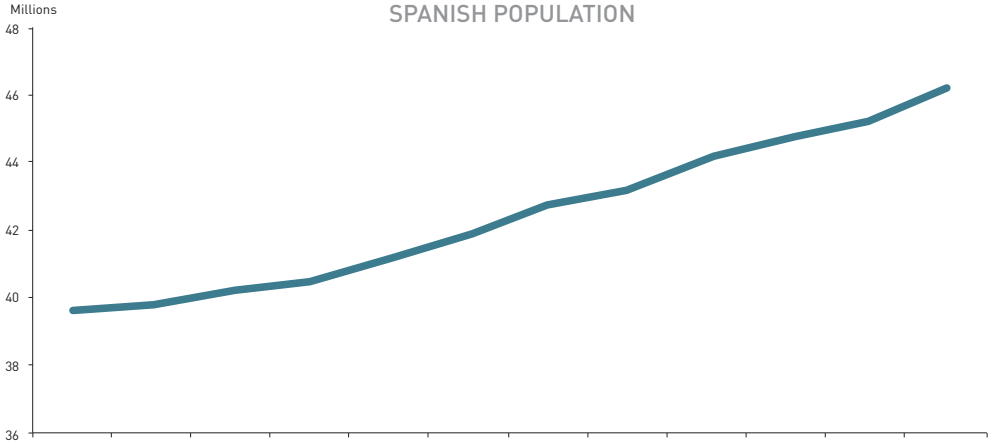
The population of Spain has recorded marked growth in recent years, exceeding the forecasts made in the 1990s by demographers who predicted it would not surpass 40 million in the short term. In 2008 Spain had 46,157,822 inhabitants, an increase of 16.4% over the period dating from 1996 to 2008. During that period, large Regional differences were observed in population growth, with the Balearic Islands recording a 41.1% rise and Asturias a 0.7% decrease.

The largest increases in population have been registered in the

Communities on the Mediterranean coast, in the Canary Islands and in Madrid.

In relation to Europe, Spain is the fourth largest country in terms of population, contributing 9.1% of the total. Only Germany (16.5%), France (12.8%), the United Kingdom (12.3%) and Italy (12.0%) are larger. In this sense, the EU-27 had a total of 497.5 million inhabitants in 2008, the third largest population in the world behind China and India. The increase in population is largely due to net migration (to which a considerable proportion of the increase in the birth rate must be attributed) and natural population growth. Population density in Spain in 2008 stood at 91.2 inhabitants per km^2, one of the lowest in the EU-27 (only eight countries are less densely populated).

SPANISH POPULATION



Source: INE

POPULATION GROWTH 1996-2008 (%)



Source: INE

According to the National Immigration Survey (NIS), the number of immigrants in Spain exceeded four and a half million in 2007 (4,526,522), which represents 10% of the total population of residents in the country. The NIS defines an immigrant as any given person over the age of 16 born abroad who has been living in Spain for at least a year or intends to do so. As regards the EU, in 2007 Germany contributed the largest number of foreign residents in absolute terms in 2007 (7.26 million), followed by Spain, the United Kingdom, France and Italy. These five countries account for 76.6% of the total, according to Eurostat. The situation in Spain in the last few years, characterised by sustained economic growth and an increasingly large labour market which is continuously expanding, together with Spain's strategic geographical location, explains why Spain has become an attractive point of arrival for immigrants.

Economic background

By analysing the standard of living in Spain using the total value of production in a year, Gross Domestic Product (GDP) per capita, we are able to obtain a reference of where the country stands in economic terms. Different standards of living among countries mean the goods that can be bought with the same amount of money vary from country to country. In order to compare standards of living, purchasing power differences must therefore be taken into account.

In order to do so, the price of a «basket» of comparable and representative goods and services is calculated, with the resulting price being expressed in a common conceptual currency called «purchasing power standard» (PPS). The PPS eliminates price differences among countries such that comparing GDP per capita makes it possible to compare the standards of living in the EU as a whole.

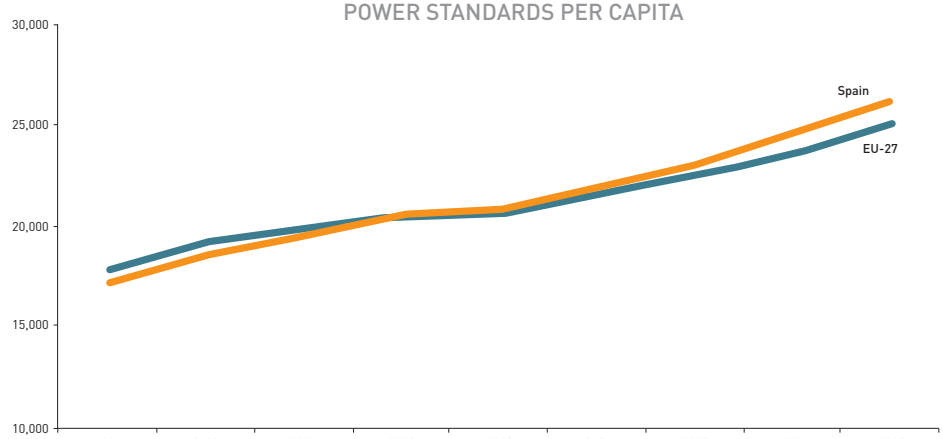
According to the EU Commission, the standard of living in Europe has improved remarkably over the last decade and is now among the highest in the world. Within Europe, Spain was ranked 12th in terms of GDP at market prices (current prices), measured in terms of purchasing power per capita, recording above average scores for Europe since 2002 (5.4% higher in 2007).

Spanish GDP (at market prices and measured in current prices) amounted to 1,095,163 million euros in 2008. GDP has risen constantly over the last few years, although a slowdown has been observed since 2006. In the period dating from 1995 to 2008 alone, net growth in GDP was 144.9%, while Gross Value Added rose by 143.2%. By market sector and over the same period, the largest economic growth rate was recorded in the construction sector (275.5%), followed by industry (96.3%)

and energy (74.1%). The lowest growth rate was registered agriculture, livestock and fishing, which only increased by 49.6% in the period.

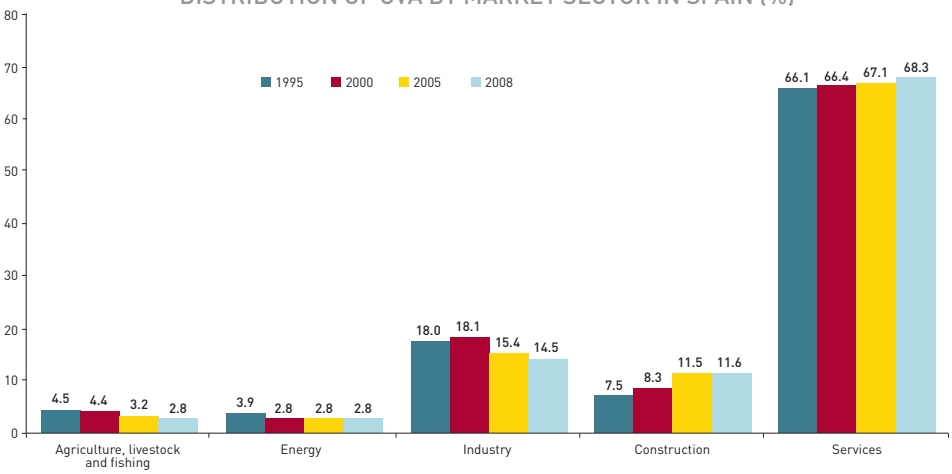
The distribution of GVA, with the constant rise in the services, which account for 68.3% of total GVA, clearly illustrates the enormous importance of this sector. This situation is common to all EU countries, where more than 60% of GDP is generated by the services sector (which includes activities such as banking, tourism, transport and insurance).

GDP AT MARKET PRICES (CURRENT PRICES) MEASURED IN PURCHASING POWER STANDARDS PER CAPITA



Source: Eurostat

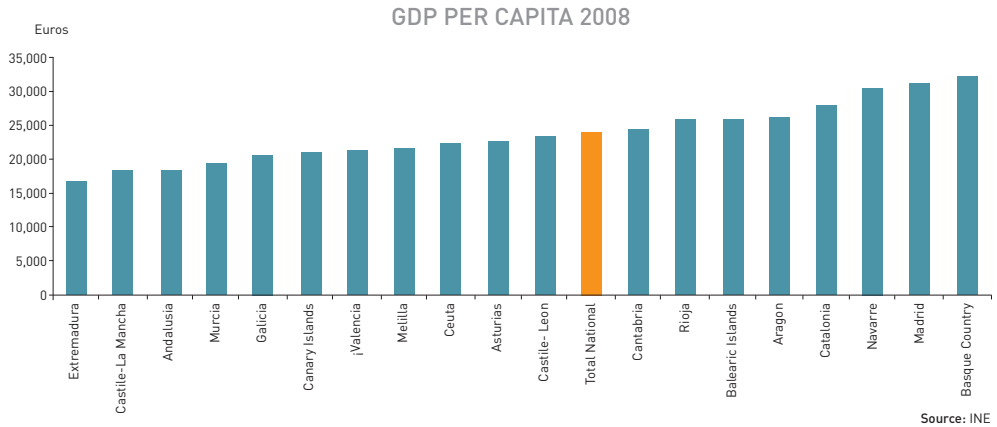
DISTRIBUTION OF GVA BY MARKET SECTOR IN SPAIN (%)



Source: NSI

National net disposable income per capita at market prices amounted to 18,941 euros in 2007 and, in keeping with overall economic development, has recorded constant growth over the last few years. Growth over the period dating from 1995 to 2007 stood at 92.3%, although a decrease in this ratio is observed since 2000, when an annual rise of 7.1% was recorded, to the 3.9% growth rate registered between 2006 and 2007.

The graph below displays GDP per capita by Community of Spain (at market prices and measured in current prices) for 2008 (preliminary data). Eight Communities record figures above the average for the country.



Source: INE

The economically active population in Spain totalled 22,189,900 people in 2007, the activity rate for persons aged between 16 and 64 standing at 72.8%. The economically active population in 2006 was 21,584,800, implying a growth rate of 2.8% between the two years, slightly lower than that observed between 2005 and 2006, which was 3.3%. In 2007, the Communities with the largest economically active populations were Catalonia, Andalusia and Madrid (with more than three million people in each) and the largest rises between 2006 and 2007 were recorded by Murcia and Aragon. The activity rate has risen by 10% over the last 20 years.

The unemployment rate has dropped over the last few years, from over 20% (23.9% in 1994) to 8.26% in 2007. However, this trend collapsed in 2008 when the unemployment rate rose to 13.9% in the fourth quarter.

According to the Spanish Economic and Social Council in its report on the

socioeconomic and employment situation in Spain in 2007, the Spanish economy was one of the most dynamic in Europe, recording GDP growth of 3.8% (nine decimal points higher than the average for the EU-27). However, this progress was slightly down on that recorded the previous year following a slowdown in economic activity as a result, among other external factors, of the downturn in the main driving forces behind economic growth: household consumption expenditure and construction (above all residential).

After the mortgage crisis in the United States in the summer of 2007, which spread to the international financial market, the panorama changed substantially and the Government (along with the main international organisations) was forced on several occasions to lower their forecasts for growth in the Spanish economy. Faced with the escalation of the recession at the beginning of 2008, the Royal Decree-Act 2/2008 of 21st April was passed with measures aimed at boosting economic activity. Among the objectives of this move, it is worth highlighting the following: stimulate household consumption and business activity, curb the deterioration of the real estate market and reduce the negative impact on employment by means of tax and financial measures.

Administrative background

España hoy 2008, published by the Spanish Ministry of Presidency, provides a synthetic and detailed analysis of the basic features of the administrative situation in Spain and how responsibilities are shared between the Central and Regional Governments, from which the points discussed below may be extracted.

The Constitution of 1978 acknowledged and guaranteed the right to autonomy of the nationalities and regions that Spain as a nation comprises and the solidarity among all of them. As a result of the regional organisation of the State, Spain is divided into 17 Autonomous Regions and two Autonomous Cities (Ceuta and Melilla), with political and administrative power being redistributed between the Central and Regional Governments. This process has made Spain one of the most decentralised countries in Europe.

Each Autonomous Region has its own Statute of Autonomy passed by Constitutional Law. This is the Community's basic institutional legislation and it regulates essential aspects such as the organisation and workings of the Regional Parliament and Regional Government, their responsibilities and administration, the Community's hallmarks or distinguishing features, such as the language or civil rights, and relations with the State and other Autonomous Regions. Responsibilities are shared on the

basis of distinguishing between competences exclusive to either the State or the Autonomous Regions, competences shared by both the State and Autonomous Regions and concurring competences in which both the State and Autonomous Regions may intervene.

Exclusive responsibilities – both those belonging to the State and those pertaining to the Autonomous Regions – include the power to legislate and enforce, whereas shared responsibilities may imply a different distribution of legislative and regulatory power between the State and Autonomous Regions, the latter normally retaining executive powers in such cases. Conflicts of responsibility are settled by the Constitutional Court.

Autonomous Regions have a parliamentary government system, its foremost institutions being the Parliament, the President of the Community and the Regional Government. From an economic and financial viewpoint, Autonomous Regions enjoy a great deal of independence, having the power to pass their own annual budgets and to determine their resources by means of taxes, tariffs and surcharges.

The general system for Autonomous Region financing, which also includes taxes transferred by the State and participation in State taxation, is established multilaterally by the State and the Autonomous Regions.

Environmental policy

The Spanish Ministry of Enviroment and Rural and Marine Environmental Affairs (hereafter referred to as MoE), was created in 2008 by Royal Decree 432/2008, of 12th April. This new ministry takes over the responsibilities held by the former Ministry of Agriculture, Fisheries and Food and the previous Ministry of Environment (the latter created in 1996), together with those related to marine protection issues, in close collaboration with the Spanish Ministry of Public Works.

The MoE is in charge of proposing and enforcing Government policy regarding issues such as combating climate change and protecting Spain's natural heritage, biodiversity and the sea, water, rural development, agricultural, livestock and fishing resources and food. One sole ministerial department encompasses all the State's responsibilities linked to the natural environment, with its twofold objective of protecting land and biodiversity, as well as the integral fostering and defending agricultural, fishing, forestry and food production factors; environmental protection policy that also generates wealth and food and rural environmental sustainability.

The Ministry is divided into the following higher and executive bodies directly under the authority of the Minister:

a) Secretary of State on Climate Change

b) Secretary of State for the Rural Environment and Water

c) Undersecretary of Environment and the Rural and Marine Environment

d) General Secretary of the Sea, with the same authority as an Undersecretary

The creation of the new Ministry of Environment and Rural and Marine Environmental Affairs has led to an array of policies that constitute a global development and conservation strategy, particularly where environmental issues are concerned, aimed at making progress in the fight against climate change, the integral management of water, promoting development in rural areas and protecting coasts and maritime resources. Environmental problems have become globalised problems that cannot be confined to city or rural level and which are part of an interrelationship between alterations in the environment and ecosystems, economic systems and the standard of living of citizens.

The steps and initiatives taken by the Ministry to combat climate change, considered authentic State policy, is based on the reduction of emissions, the search for energy savings and efficiency and increasing the importance of renewable energies, while maintaining competitiveness, employment and economic and budget stability. The National Emission Allocation Plan and the Spanish Climate Change and Clean Energy Strategy 2007-2012-2020 are key parts of this policy. The 2008-2012 National Emission Allocation Plan has set itself an ambitious goal: to reduce emissions by 19.3% with regard to the 2005-2007 Plan.

The Spanish Climate Change Strategy is working towards two important scenarios: 2012, when the first stage of the Kyoto Protocol ends and 2020, used by the European Union as a reference for strategic objectives. The Spanish strategy includes 198 measures and 75 indicators in two main areas: climate change and clean energy. The Energy Saving and Efficiency Plan 2008- 2012 establishes a series of measures quantified in terms of objectives, deadlines and cost. The National R&D+i Strategy, where it relates to energy and climate change issues, is another important area of horizontal measures.

Transforming current economic models in low carbon economies involves working in four main areas, which at the same time help to increase energy security and reduce

dependence; increase energy saving and efficiency; reduce fossil fuel consumption in favour of renewable energy sources; consolidate the implementation of new technologies and promote innovation in all production processes.

The Plan to Boost the Internationalisation of the Spanish Economy in sectors linked to Climate Change, made public in March 2009, aims to integrate Climate Change as a cross-sectional element of Spanish business internationalisation policy, setting three primary objectives:

1. Consolidate the presence of Spanish companies in renewable energy and high technology sectors and increase their international competitiveness to combat Climate Change by fostering and boosting their development through national R&D and increasing their technological capacity, thus contributing to create an image of Spain and its business sector associated to low carbon development.

2. Identify and develop new opportunities for Spanish companies abroad.

3. Help achieve the objectives of reducing emissions both on a global scale and also those referring to Spain, taking full advantage of opportunities so that Spain can set projects in motion under the Clean Development Mechanism of the Kyoto Protocol and accomplish the reductions in emissions they generate.

The Plan, designed jointly by the Secretary of State for Trade, the Secretary of State for Economic Affairs, the Secretary of State for Climate Change and the Secretary of State for Research, establishes a framework that must guide all steps taken to support the activity of Spanish companies in the sectors mentioned above.

Spain enjoys a high level of biodiversity with respect to Europe as a whole for biogeographical, cultural and historical reasons. Furthermore, apart from Spain's natural or wild biodiversity, the country is also rich in agrodiversity, not only where seeds and crops are concerned, but also local agricultural systems. Conserving and renovating such systems is vital for the conservation of many natural species.

In this context, the importance of two laws proposed by the MoE stands out in particular. The first initiative, the Natural Heritage and Biodiversity Act, urges people to maintain and conserve the country's natural heritage, biodiversity and resources by making orderly use of them, while the Sustainable Rural Development Act primarily aims to achieve a high level of environmental quality in rural areas by preventing

natural heritage, scenery or biodiversity from deteriorating or by recovering them by means of integrated regulating of the use of the land.

Another initiative on behalf of the Ministry of Environment and Rural and Marine Environmental Affairs that is worthy of mention is the Spanish Sustainable Mobility Strategy, which encompasses a series of proposals to trigger a change in the current model of mobility, making it more efficient and sustainable, reducing its impact and promoting economies that use less coal and consume less energy.

Environmental information

The Aarhus Agreement on access to information, public participation in decision making and access to justice in environmental matters, together with the regional regulations that derived from it, have given rise to a new concept of open and transparent public Administration. The general public has the right to access the environmental information held by public authorities.

International and regional commitments bind public authorities to release environmental information, such as information regarding legislation, the state of the environment, projects, plans and programmes or regarding decisions made that could affect the environment.

As a result of the above, a contribution is made towards complying with the constitutional right that everyone has to enjoy an environment that is suitable for the development of the person and also the obligation shared by all of conserving it.

Act 27/2006, of 18th July, which regulates the rights regarding access to information, public participation and access to justice in environmental matters (which includes Directives 2003/4/EC and 2003/35/EC), establishes in article 8 (referring to reports on the state of the environment) the obligation of public administrations to compile reports on the state of the environment. These reports will be national and regional and, where applicable, local and will include data on the quality of the environment and the pressure it is under, as well as a non-technical summary that can be understood by the general public. This is where this report plays a special role, contributing to compliance and therefore guaranteeing that environmental information reaches as many people as possible.

The European Environment Agency (EEA) is the EU authority devoted to providing sound, independent information on the environment and is designed to be the primary source of information in Europe for those involved in developing, adopting,

implementing and evaluating environmental policy. The purpose of the EEA is to support sustainable development and work towards achieving a demonstrable improvement in Europe's environment by making appropriate, specific, relevant and reliable information available to both political leaders and the general public.

Created along with the information network EIONET by (EEC) Regulation n° 1210/90 of the Council on 7th May, 1990, the EEA is one of the European agencies, with 32 members: the 27 EU Member States, Iceland, Liechtenstein, Norway, Turkey and Switzerland. Five other non-member countries also cooperate.

The EEA is structured as a series of information points differentiated by country and task. Through the EIONET, the EEA has a node in each member or collaborating country (National Focal Point), European Topic Centres (consortiums of prestigious and experienced organisations in one particular subject area that the Agency selects and contracts in order to compile part of its work programme) and Primary Contact Points (institutions that cooperate in each country including National Reference Centres and, in the case of Spain, Regional Focal Points, apart from other expert collaborators).

In Spain, the work of the EEA National Focal Point is carried out by the Directorate General of Environmental Quality and Evaluation at the MoE.

The creation of a shared system of environmental information has been one of the greatest challenges in recent years in this area. It is a reference system of environmental information in Europe, promoted by the EU Commission and in which the EEA plays an important role in coordination and development. The idea originated from the commitment of member States to agree to supply the European Commission with hundreds of pieces of information on all kinds of environmental issues.

The idea of a computer platform (Reportnet) was initially suggested as a tool to which the various people in charge of gathering each piece of required information from each member State could connect and update the information within the given deadlines. The European Commission has now proposed a review of the process by which environmental information is transferred by the member States. They are developing a telematic infrastructure, known as the Shared Environmental Information System (SEIS), which will be shared by EU members to integrate the current systems for European environmental information. This idea was previously considered to a certain extent in the Sixth EU Environment Action Programme.

This Shared Environmental Information System was conceived as a shared network for those providing environmental information, enabling environmental monitoring

throughout Europe, the creation of quality reports, circulation of information amongst National Administrations and European Institutions, and paving the way for the progressive participation of the private and public sectors in general. It is a network system capable of interconnecting information providers, who are responsible for managing data at different levels (locally to transnationally). It is hoped that SEIS will become the reference system for European environmental data. For that to happen it must first integrate the information corresponding to the various information requirements of the member States, ensuring these are made official, and in turn other information and additional services will be added.

In short, there are three stages in the development of European information systems that can be outlined as follows:

- Isolated information system: 1985 – 1995
- Data-transfer information system: 1995 – 2005
- Shared information system: 2005 – 2010

The first stage refers to national information systems, wherein each country was treated as a separate compartment. During the second stage, and through the founding of the European Environment Agency, efforts were focused on creating a metanational system in which national information systems could converge.

The third stage refers to the implementation of the EIONET Network, in which Spain has been a constant participant. The analysis of its results and its work is the foundation for the SEIS project.

SEIS was devised through the need to meet four major objectives:

- To comply with regional and international legal requirements
- A report on the status of the environment, by country, by European and international bodies (G4, OECD, United Nations…)
- Public information on environmental trends, the connection to socioeconomic pressure, the solutions being offered to mitigate environmental damage through political action and guidelines for citizens
- Investigative actions that are often hindered by a lack of access to available data in the countries

A Shared Environmental Information System must have a telematic infrastructure, tools enabling information to be managed, and a coordinated administrative organisation with specific responsibilities. Furthermore, the infrastructure and organisation should be at the service of the environmental content.

In order for SEIS to become a reality, bearing in mind that this is a project with an integrated infrastructure on a European scale, it is necessary to take a global view. In order for it to function in practice, the following are necessary as a minimum:

- A normative framework that covers a common implementation strategy and administrative structure, both in the member States and European institutions
- High-level political agreements and backing, both in the member States and European institutions, run by environmental policy managers

The COM(2008)46 EC Communication "Towards a Shared Environmental Information System (SEIS)" gives recommendations for modernising and simplifying European environmental information management and sets out a series of measures necessary in order to implement SEIS, among which the following should be highlighted:

- A need for political commitment on the principles established in the Communication
- The Commission will give priority to the application of the INSPIRE Directive and to the continued development of the GMES initiative, as a basis for improving the sharing of information and data related to the environment in Europe
- Modernisation of legal provisions regarding the way in which information is provided that must be notified in virtue of environmental legislation. This is expected to come about through a revision of Directive 91/692/EC on the normalisation of reports, which must be updated and amended to meet the SEIS system's principles.

This proposal must be fixed legally, by the Commission, which will give normative support to a telematic system for sending and accessing environmental information.

Lastly, it is important to point out that the development of new technologies has boosted the development of interconnected systems on a European level. SEIS is closely linked to two of these initiatives, also currently in development:

- GMES (Global Monitoring for Environment and Security): Consists of a series of systems for observing the land and environment focused on providing a variety of services related to the environment and safety. It gathers data from land, sea and air stations as well as information from satellites.
- INSPIRE (Infrastructure for Spatial Information in the European Community): This is a directive (currently in the incorporation stage) which establishes an Infrastructure of spatial data for Europe, in which all kinds of geographical information from the member States can be integrated. It provides a cartographical basis on which the rest of the systems that manage georeferenced data can rest.

The three initiatives (SEIS, GMES e INSPIRE) will constitute a major technological impetus in the way environmental data is managed in Europe. Once developed they will allow information to be managed more quickly and with a greater number of variables, which enables reaction time to be reduced and more efficient environmental policies to be created.

Basic information

In this general context, the environmental situation in Spain, generally speaking, is presented loosely through the following descriptive record, similar to that used in the third chapter referencing Autonomous Regions. It compiles territorial, administrative, socioeconomic and environmental information. Most of the subjects are covered further and in greater detail in the corresponding chapters, although the opportunity of presenting them all here together allows for a useful, general overview.

The sources of information are listed at the end of the third chapter as they are practically the same as those used for the records of each of the Autonomous Regions. The only differences are in the information relating to the treatment of waste water, which comes from the Directorate General for Water, and in the information on species of flora and fauna, which comes from the Directorate General for the Natural Environment and Forestry Affairs, both from the Ministry of the Environment and Rural and Marine Affairs.



SPAIN
BASIC INFORMATION



Basic rule: Spanish Constitution of 1978 (Official Gazette 29-12-1978)
Reformed in Official Gazette 28-08-92
Year of entry in EU: 1986
Area: 505,990 km^2
Length of coastline: 7,905 km. Length of maritime terrestrial public domain: 10,099 km (includes ports and river estuaries)
Capital: Madrid **Autonomous Regions:** 17 (and 2 Autonomous Cities)
Provinces: 52 **Municipalities:** 8,110
Population (2008): 46,157,822 inhab.
Population density (2008): 91.2 inhab./km^2
Population increase (2000-2008): 14.0%

DISTRIBUTION OF POPULATION IN % (2008)

By size of municipality

< 2,001 inhabitants: 6.1
2,001-10,000 inhabitants: 15.2
10,001-100,000 inhabitants: 38.7
100,001-500,000 inhabitants: 23.5
> 500,000 inhabitants: 16.4

By age group

< 15 years: 14.4
15-64 years: 69.0
> 64 years: 16.5

ACTIVE POPULATION (THOUSANDS)
23,064.7 (fourth quarter of 2008)

UNEMPLOYMENT RATE
13.91% (fourth quarter of 2008)

AIR

NO. OF AIR QUALITY MONITORING STATIONS IN CA (2007)
Urban: 223 / Suburban: 188 / Rural: 148

AMOUNTS EXCEEDING LEGAL VALUES AT URBAN STATIONS IN MADRID (2007)

- Average annual concentration of NO_2 in µg/m^3 (limit value since 2010: 40 µg/m^3): 60
- Number of days in a year with an average daily PM_{10} concentration of 50 µg/m^3 (limit value since 2005: 35 days a year): 51

WATER

AVERAGE HOUSEHOLD WATER CONSUMPTION (2006)
160 litres/inhab/day. Between 2000 and 2006, this has reduced by 4.8%

DISTRIBUTED WATER BY SECTOR IN % (2006)
Households: 66.8 / Municipal consumption: 8.4 Economic sectors: 23.3 / Others: 1.5

LOSS IN DISTRIBUTION (2006)
16.7%

UNEMPLOYMENT RATE 15 AND OLDER (EU-27= 7.2%) (2007)
8.3%

EMPLOYMENT SECTOR STRUCTURE IN % (2008)
Agriculture: 4.0 / Industry: 15.3
Construction: 11.0 / Services: 69.6

GDP MP (2007)
23,412 €/inhab. Growth 2006-2007: 5.0%

GROSS DISPOSABLE INCOME PER INHABITANT (2006)
14,192 €/inhab. Growth 2000-2006: 37.4%

GVA BREAK-DOWN BY SECTOR (2007)
Agriculture: 2.9 / Industry: 18.0
Construction: 12.2 / Services: 66.8

WASTE-WATER TREATMENT (2006)
77% of population equivalent provided with waste- water treatment compliant with Directive 91/271/EEC (91% under construction)

LAND

LAND-USE BREAK-DOWN, % (2000)
Artificial: 1.7 / Agriculture: 50.2 / Forest: 47.3 / Wetlands: 0.2 / Water bodies: 0.6

INCREASE IN ARTIFICIAL SURFACES, 1990-2000 (%)
25.5

AREA AT RISK OF DESERTIFICATION, % (2008)
Low: 36.99 / Intermediate: 19.20 / High: 15.82 / Very high: 2.03

NATURE AND BIODIVERSITY

PROTECTED AREA (2008)
5,973,158.1 ha of terrestrial area and 256,429.9 ha of marine area (a total of 1,513 declared areas). Protected terrestrial areas represent 11.8% of the total area.

THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES (2008)

	FISH	AMPHIBIANS	REPTILES	BIRDS	TERRESTRIAL MAMMALS	FLORA
Critically endangered (CR)	2	0	5	15	3	308
Endangered (EN)	11	4	9	39	4*	278
Vulnerable (VU)	22	7	9	45	14	610
TOTAL Threatened	35	11	23	99	21	1,196

TAXA INCLUDED IN THE CNEA (2008)

	FISH	AMPHIBIANS	REPTILES	BIRDS	TERRESTRIAL MAMMALS	FLORA
Endangered	4	1	5	21	6	112*
Vulnerable	6	1	1	12*	14	9*
Sensitive to Habitat	0	0	3	3	0	7*
TOTAL	10	2	9	36* 34 taxa	20	128* 126 taxa

*Taxa with population in more than one threatened category.

NATURA 2000 NETWORK (2008)

14,284,177 ha (13,486,994 ha terrestrial and 797,184 ha marine), which represent 26.7% of the total terrestrial area. More specifically, 1,434 SICs, which occupy 12,386,991 ha (11,605,544 ha terrestrial and 781,447 ha marine) and 569 SPAs, which occupy 9,831,544 ha (9,604,863 ha terrestrial and 226,681 ha marine)

BIOSPHERE RESERVES (2008)

39 reserves, 3,323,495.64 ha of terrestrial area and 111,198 ha of marine area. BR terrestrial area represents 6.58 % of the total Spanish area.

RAMSAR WETLANDS (2008)

63 wetlands (281,964.4 ha)

WETLANDS INCLUDED IN THE SPANISH NATIONAL WETLANDS INVENTORY (March, 2009)

140 wetlands (118,253.6 ha [only includes Andalusia and Madrid wetlands])

FOREST FIRES (2007)

10,932 fires which affected 86,112.53 ha. An average of 20,672 annual fires occurred during the decade comprised between 1997-2006, which affected 132,690.07 ha.

WASTE

URBAN WASTE PER INHABITANT (2006)

- Total: 553.3 kg/inhab. Variation 2000-2006: -11.0%
- Mixed: 500 kg/inhab. Variation 2000-2006: -15.0%
- Paper/cardboard: 22.1 kg/inhab. Variation 2000-2006: 52.4%
- Glass: 12.6 kg/inhab. Variation 2000-2006: -16.6%
- Packaging: 18.6 kg/inhab. Variation 2000-2006: 376.9%

AGRICULTURE

ORGANIC FARMLAND (2007)

988,322.7 ha. Growth 2001-2007: 103.7%

IRRIGATED AREA (2007)

3,398,738 ha (13.52% of total agriculture area).

ENERGY

INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS (2007)

Total: 2.00 / Hydraulic: 0.41 / Thermal: 1.07
Nuclear: 0.17 / Wind: 0.31 / Other renewable: 0.04

ELECTRICITY CONSUMPTION PER INHABITANT IN MWH (2007)

6.0 MWh/inhab. Growth 2000-2007: 24.8%

TOURISM

NO. OF TOURISTS PER INHABITANT (2007)

Total tourists: 4.56 / Foreign tourists: 1.31

HOTEL CAPACITY (2007)

1,642,417 beds (36.3 beds/1,000 inhab) and 103,455 beds in rural accommodation (2.3 beds/1,000 inhab)

TRANSPORT

VEHICLE FLEET (2007)

30,318,457 vehicles. Growth (2000-2007): 30.2%
670.8 vehicles/1,000 inhab

PASSENGER CAR FLEET (2007)

21,760,174 passenger cars. Growth (2000-2007): 24.7%
481.4 passenger cars/1,000 inhab

TRANSPORT NETWORK DENSITY (2007)

Roads: 32.8 km/100 km^2 / Rail: 3.0 km/100 km^2
Roads: 3.7 km/1,000 inhab / Rail: 0.3 km/1,000 inhab

AIR TRANSPORT (2007)

210,498.760 passengers. Growth (2000-2007): 49.3%

GOODS PORT TRAFFIC (2007)

495.49 million tonnes. Growth (2000-2007): 42.2%

URBAN AND INVESTMENT POLICY

MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21 (2007)

More than 4,300 municipalities, of which 650 already have an approved Action Plan. Moreover, more than 830 municipalities have completed the A21L diagnosis.

INTERNAL EXPENSES IN R+D (2007)

13,342.4 million € (1.27% of GDP).
Growth 2000-2007: 133.30%

RECOMMENDED WEBSITES

- http://www.marm.es
- http://www.ine.es/
- http://www.sostenibilidad-es.org/
- http://www.eea.europa.eu/
- http://epp.eurostat.ec.europa.eu

FURTHER READING

- MARM. *Environmental Profile of Spain. Indicator-based Report*. Year 2004 - 2007
- MARM. *The Environment in Spain*. Years 1989 - 2007
- Spanish Sustainability Monitoring Centre. *Informe de Sostenibilidad en España (Spain Sustainability Report)*. Years 2005 - 2007
- INE. *Anuario Estadístico de España (Spain Statistics Yearbook)* (since 1858) and *España en cifras (Spain in Numbers)* (since 1999)
- Ministerio de la Presidencia (Ministry of the Presidency), 2009. *España hoy 2008 (Spain Today 2008)*

2.1 AIR



The emission of pollutant gases into the atmosphere alters its natural balance and reduces air quality, thereby affecting the health of all living things. Climate change should be considered a global and complex environmental threat that is a direct consequence of our current developmental model (based on the burning of fossil fuels as the principal energy source). The emission of greenhouse gases (GHG) in Spain has been increasing due to increased energy demand and a lack of measures aimed at preventing these emissions. The EU considers climate change to be one of the greatest challenges facing humanity in light of its serious consequences, which are predictable and increasingly visible: increasing temperatures, glacial retreat, droughts, floods, etc. The risks for the planet and future generations are enormous, therefore we must act urgently. In our country, as well as political action from the government, the role of the Autonomous Regions and local bodies, which together with NGOs and other interest groups form the action framework contained in a new non-carbon-intensive growth model, should be highlighted.

The main lines of political action include:

Development of the **European Emissions Trading Scheme**, established by the Directive 2003/87/EC of the European Parliament and of the Council, dated



13 October 2003, in force as of 1 January 2005. This Directive establishes a GHG emission rights trading scheme, which aims to reduce these emissions in an economically advantageous manner in order to meet the GHG emissions reduction commitments established in the framework of the Kyoto Protocol. It was transposed into Spanish law by Act 1/2005, dated 9 March, which regulates the GHG emission

INDICATORS	GOALS	TREND
Greenhouse Gas Emissions	To reduce GHG emissions to meet Kyoto targets (115% of the 1990 level) by 2012	Although GHG emissions have increased with respect to last year, national emissions forecasts suggest that the Kyoto commitments can be met by applying additional measures
Emissions of acidifying and eutrophying gases and tropospheric ozone precursors	To achieve Directive targets for national emission ceilings by 2010	Although total emissions of acidifying and eutrophying substances have fallen and emissions of ozone precursors have stabilised, it will not be easy to meet the established targets
Particulate emissions to the atmosphere	To achieve Directive targets for national PM precursor emission ceilings by 2010	Particulate emissions between 2000 and 2007 increased unevenly; with PM2.5 emissions increasing by 6.6% and PM10 emissions by 3.4%
Regional background air quality for health and vegetation protection	To achieve the ambient air quality targets derived from this legislation, as re-established in Directive 2008/50/EC dated 21 May 2008.	Ozone is the only pollutant whose mean concentration exceeds the target values established for 2010

rights trading scheme and promotes the efficient and economic reduction in the emission of these gases (modified by Royal Decree 5/2005 dated 11 March).

II National Assignment Plan (NAP) 2008–2012, based on the EU GHG emission rights trading scheme and which is in force during the Kyoto Protocol's commitment period. This Plan provides for a 16.2% annual reduction with respect to the 2005–2007 Assignment Plan and 20% with respect to industrial emissions in 2005. In total, the emission rights awarded to companies are reduced from 182.175 million tonnes per year for the period 2005–2007 to 152.659 million tonnes (Royal Decree 1370/2006 dated 24 November, which established the National GHG Emission Rights Assignment Plan 2008–2012, and subsequent modifications).

Spanish Climate Change and Clean Energy Strategy (EECCEL) 2007–2012–2020. Approved by the Council of Ministers in late 2007, this defines the actions to be taken to combat climate change and achieve cleaner energy. It covers two relevant scenarios: 2012 (when the Kyoto Protocol's first commitment period comes to an end) and 2020 (reference for strategic objectives). It includes an Urgent Action Plan in response to the main proposals received during the public consultation period and those from the National Climate Council and the Climate Change Policy Coordination Commission. This Strategy reinforces Spain's commitment to the Kyoto Protocol whilst preserving the competitiveness of the Spanish economy, employment, economic and budgetary stability and the energy supply. It presents 198 measures and 75 indicators with the aim of ensuring a reduction in GHG emissions, and is a reference text around which climate change policies at a regional (Autonomous Region) and local level are based. The Urgent Action Plan itself includes more than 80 measures, which account for 65% of the mitigation measures included in the Strategy as a whole.

Voluntary Commitment Scheme for the reduction of GHG emissions. This initiative forms part of the Spanish Climate Control and Clean Energy Strategy's Urgent Action Plan and aims to encourage an annual reduction of at least the equivalent of 1 million tonnes of CO_2 spread over various sectors (transport, residential, commercial and institutional, waste and farming) through voluntary emission-reducing actions by companies and the private sector.

Act 34/2007 dated 15 November, concerning air quality and protection of the atmosphere, was designed as a new tool for managing air quality, replacing the previous legislative framework (Act 38/1972 and Royal Decree 833/1975). This Act lays the foundations in the field of prevention, monitoring and reduction of atmospheric pollution with the aim of avoiding, or minimising, the damage that it can cause to people, the environment and other assets. It establishes a series of

obligations for towns and cities with more than 100,000 inhabitants, including the elaboration of plans and programmes to comply with air-quality targets. Likewise, this Act establishes that if certain pollution levels are exceeded, the Autonomous Regions and town councils must develop concrete measures to prevent and avoid any adverse effects on public health. The main pollution source in major cities is traffic, which generates particles in suspension and nitrogen oxides. It is therefore vital to take decisions in this respect at a local level.

The Autonomous Regions and local bodies, when required to do so by current legislation, are responsible for taking measurements and assessing the concentration of regulated pollutants in their region. In the event that the maximum and/or target values are exceeded in any district or region, they are also responsible for drawing up plans to improve the air quality in that district or region. For its part, the Ministry of the Environment and Rural and Marine Affairs (MARM) is responsible for providing the European Commission with the data and information derived from community legislation and adopting the necessary coordination measures to fulfil this purpose. This includes the harmonisation of criteria and the collection, verification and storage of the information required to appropriately characterise the air quality status in compliance with current legislation and to elaborate the countrywide plans and programmes needed to prevent and reduce air pollution and its trans-boundary effects.

Besides consolidating the regulatory framework as regards air quality, it introduces new aspects such as land zoning and air-quality assessment in the drawing-up and approval of town and land-use plans as well as in the processing of authorisation procedures for potentially polluting activities and installations, the use of environmental indicators to gain an understanding of the effects of atmospheric pollution and its preventative measures, and the development of the Spanish Atmospheric Pollution Information, Monitoring and Prevention System, which will allow a fluid exchange of information between the different administrations and the general public.

The EU's policy directives are based around making energy consumption more efficient and ensuring that it is less polluting, the development of a clean and balanced transport system, involving the business sector to make it more competitive, integrating the environment in land-use planning and agriculture, and promoting research and innovation. The climate strategy in the framework of the European Climate Change Programme (ECCP) includes specific measures to limit the temperature increase to 2 °C above pre-industrial levels. The initiatives to be adopted include reducing GHG emissions as the main objective (this involves monitoring emissions and the development of an emission rights trading system)

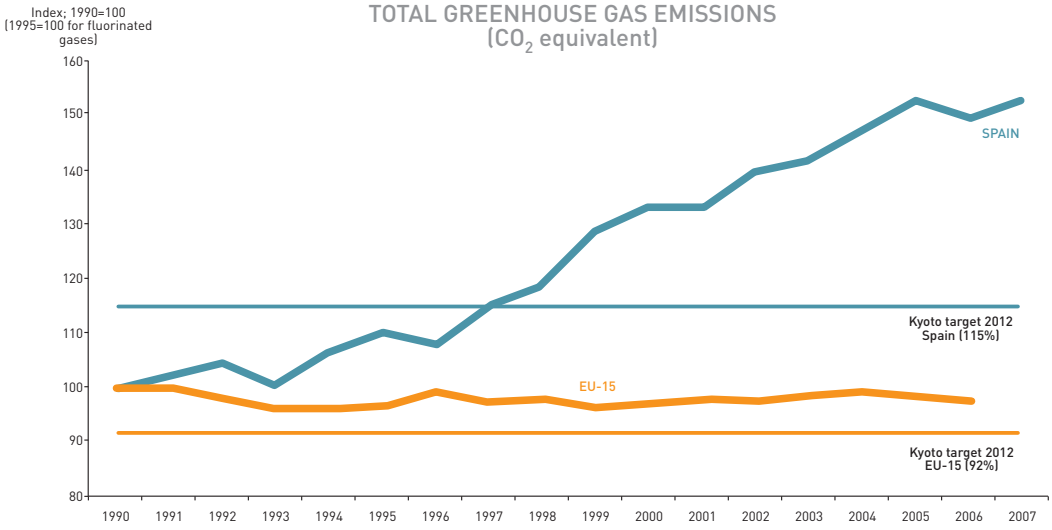
and the monitoring of, and adaptation to, the inevitable consequences of climate change.

In January 2008 the European Commission presented a new package of proposals aimed at compliance with the objectives set by the European Council in March 2007 — a reduction in GHG emissions of at least 20% and an increase in the proportion of the electricity consumed generated from renewable sources to 20% by 2020.

As was the case in previous editions, this chapter groups acidifying and eutrophying emissions and those of tropospheric ozone precursors into a single indicator. It also presents an overview of the background pollution present in Spain obtained from an analysis of the air quality at EMEP stations in the EMEP/GAW/CAMP network, and includes a new indicator regarding particulate emissions to the atmosphere.

Greenhouse gas (GHG) emissions

After the drop recorded the year before, GHG emissions in 2007 grew 2.7% with respect to the previous year.



Source: MARM and Eurostat

Estimated GHG emissions for 2007 were 442,322 kilotonnes of CO_2 equivalents (CO_2-eq), which is a 52.6% increase with respect to the Kyoto Protocol's base year (289,773 kt CO_2-eq); the target for 2012 is not to exceed this value by more than 15%. Emissions in 2007 grew by 2.1% with respect to those in 2006, mainly due to the contribution of the energy sector.

The dominance of CO_2, which accounted for 82.8% of total emissions in 2007, should be highlighted. This gas is followed by CH_4, with 8.8%, and N_2O, which accounted for 6.9% of total emissions. Fluorinated gases only made up 1.5% of emissions.

CO_2 emissions have increased by 60.4% since the Kyoto Protocol's base year, whereas those of CH_4 have increased by 36.6% and N_2O by 9.8%. The increase in 2007 with respect to 2006 ranged from 2.2% for CO_2 to 1.5% for N_2O and 1.4% for CH_4.

Although with a lower proportion of total emissions, as mentioned above, SF_6 emissions in the same period increased by 213.8% while HFC emissions increased by 25.7%. The 70.1% drop in PFC emissions should be noted.

In the sector-based analysis, the contribution of the energy processing sector (including transport) should be highlighted, followed by agriculture, industrial processes, waste treatment and elimination and, finally, solvent use. With the exception of an occasional year, the contribution from energy treatment and waste processing has increased since 1990, whereas the other sectors have reduced or stabilised their contributions. Energy processing has increased by 2.4% with respect to 2006, solvent use 10.3%, waste treatment and elimination 3.1% and agriculture 1.3%. In contrast, industrial processes have reduced by 0.4%.

Total emissions in the EU-27 dropped by 7.7% between 1990 and 2006, although the decrease in the EU-15 was only 2.7%; the target for the five-year period 2008–2012 is an 8% reduction. Spain's commitment under the Kyoto Protocol is not to exceed its base year emissions by more than 15%. Despite this, emissions in 2007 were 37.6% above this value (2006 emissions were 49.5% above target), which means that the mechanisms established to achieve the Kyoto target must be applied.

In 2006, Spain was responsible for 8.4% of total GHG emissions in the EU-27, below countries such as France (10.5%), Italy (11.0%), the UK (12.7%) and Germany (19.5%).

GHG emissions per person in Spain in 2006 were 9.9 tonnes CO_2-eq, a figure which places Spain in twelfth position in the EU-27 and below the European average (10.4 tonnes CO_2-eq/pers in the EU-27 and 10.7 tonnes CO_2-eq/pers in the EU-15). However, as is the case in eight other countries in the EU-27, emissions have risen with respect to 1990, when they were 7.4 tonnes CO_2-eq/pers.

In 2006, Spain was the sixth lowest emitter in the EU-27 (measured as the ratio between GHG emissions and GDP), behind Sweden, France, Austria, the UK and Italy. In that year, Spain emitted 398 g CO_2-eq per unit GDP (measured in terms of purchasing power parity). The EU-27 as a whole emitted 442 g CO_2-eq per unit GDP generated into the atmosphere (402 g CO_2-eq for the EU-15).

However, in agreement with national emissions forecasts prepared by MARM on the basis of the 1990–2006 inventory, the effect of the new macroeconomic climate and growth perspectives should prove beneficial as regards GHG emissions. The three current scenarios (without measures, with measures and with additional measures) lead to the following forecasts. Compliance with the third scenario and the estimated emissions data for 2008 suggest that Spain will meet its Kyoto commitments.

Greenhouse gases	Year	CO_2 equivalents (kt)		
		Trend scenario (without measures)	Baseline scenario (with measures)	Target scenario (with additional measures)
GHG (kt $CO_{2\text{-eq}}$)	Average 2008–2012	492,611	405,018	395,785
GHG (% vs. base year)	Average 2008–2012	70.00%	39.77%	36.58%

Source: MARM

NOTES

- This indicator presents total emissions of the six main greenhouse gases, expressed jointly as CO_2 equivalents (index: 1990=100 and 1995=100 for fluorinated gases).
- The United Nations Framework Convention on Climate Change (1992) and, specifically, the Kyoto Protocol (1997) set out the commitments of developed countries to reduce emissions of these gases and regulate emissions trading among countries whilst also establishing mechanisms to help less developed countries meet their emissions reduction commitments. Within this framework, the EU has undertaken to reduce its greenhouse gas emissions by 8% from 1990 levels within the period 2008-2012. Each EU member state has different obligations in relation to the overall EU commitment to reduce emissions. Spain must stabilise its GHG emissions at 115% of 1990 levels.

SOURCES

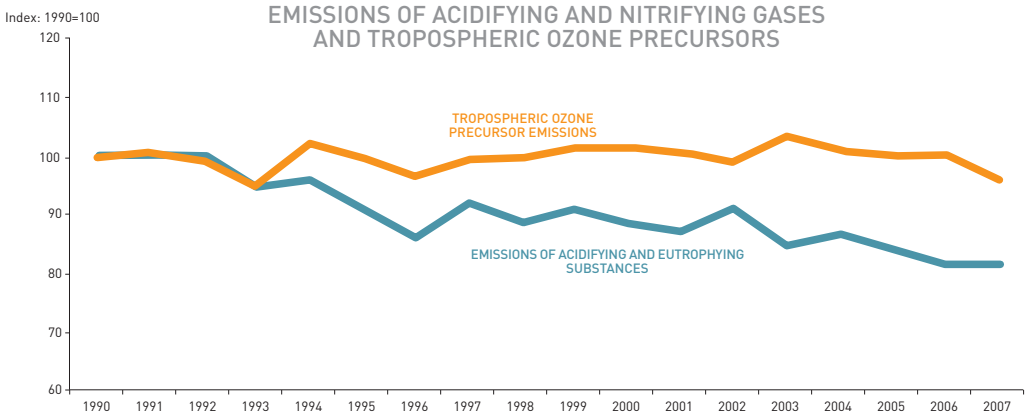
- Spain's Atmospheric Emissions Inventory. Edition 2009 (series 1990–2007), Summary of GHG results. Directorate General for Quality and Environmental Assessment. MARM
- EU Data: Eurostat. Consultation performed via the web page http://epp.eurostat.ec.europa.eu/ (Environmental/Air pollution and climate change/air pollution indicators and climate change data)
- EEA, 2008. *Greenhouse gas emission trends and projections in Europe 2008. Tracking progress towards Kyoto targets.* European Environmental Agency

MORE INFORMATION

- **http://www.marm.es**
- **http://www.eea.europa.eu/**
- **http://cdr.eionet.eu.int/es/eu**

Acidifying and eutrophying gas and tropospheric ozone precursor emissions

Combined emissions of acidifying and eutrophying substances have decreased since 1990 whereas emissions of ozone precursors have stabilised



Source: MARM

Combined emissions of acidifying and eutrophying substances decreased by 18.5% in the period 1990–2007 in a clear downward trend, although they increased slightly in two of these years (1997 and 2002). Combined emissions of tropospheric ozone precursors remained steady, although they increased in 1994, 2000 and 2003. Emissions in 2007 dropped by 4.6% with respect to the previous year, which is the greatest decrease for the whole period.

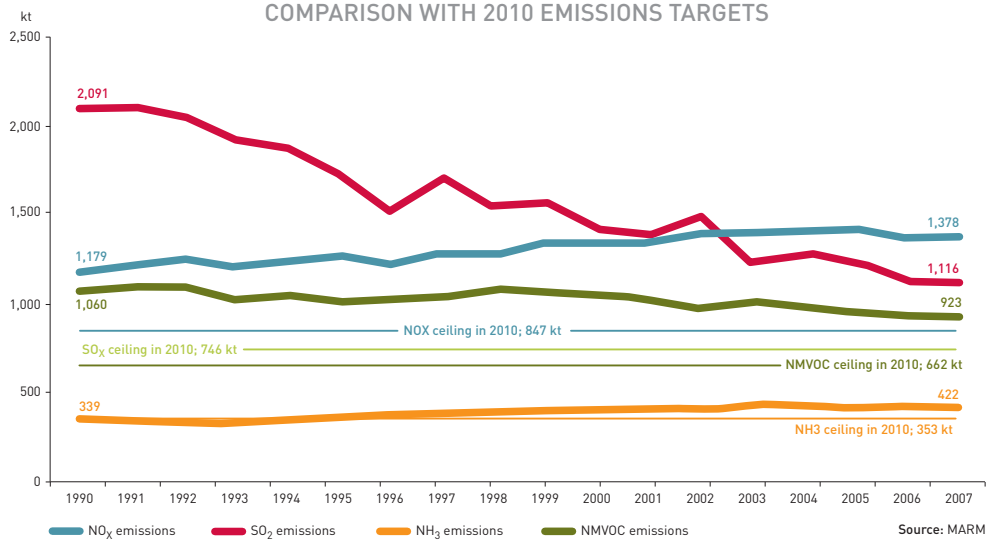
Only SO_2 of the acidifying and eutrophying substances showed a drop in emissions (of 46.7%) — NO_X and NH_3 emissions increased by 18.8% and 23.9%, respectively. Only NH_3 emissions increased with respect to the previous year, with emissions of the other two dropping slightly. As for ozone precursors, CO emissions in the same period (1990–2007) dropped by 37.1% and NMVOC emissions by 13.0%. These reductions are in contrast to the 34.0% increase in CH_4 emissions and the 18.8% increase in NO_X emissions mentioned above. A comparison between 2007 and 2006 shows a drop in emissions for all pollutants, with this drop being very small for NO_X and CH_4 (0.23% and 0.55%, respectively), somewhat larger for NMVOC (6.3%) and significantly larger for CO (17.3%).

Directive 2001/81/EC of the European Parliament and of the Council, dated 23 October 2001, concerning national emissions ceilings for certain atmospheric pollutants, enshrines each country's efforts to reduce its pollutant emissions. "National emissions ceilings" are the maximum amount of a substance, in kilotonnes, which a member state can emit in a calendar year. The ceilings established for Spain for 2010 are as follows: 847 kt of NO_X, 662 kt of NMVOC, 746 kt of SO_X and 353 kt of NH_3.

An analysis of the distance between pollutant emissions and their emissions ceilings reveals a situation which will require a major effort to ensure that the targets established for 2010 are met. Thus, the decreases in SO_X and NMVOC emissions need to be increased by 33.2% and 28.3%, respectively, with respect to 2007 emissions, values which are particularly high when compared with the mean annual reduction for the period 1990–2007. In the case of NMVOC, the reduction observed since 2005 suggests a more positive outlook, with mean annual reductions of 1.5%.

In contrast, NO_X emissions have increased continuously from 1179 kt in 1990 to 1378 kt in 2007, a long way from the emission ceiling of 847 kt. Similarly, NH_3 emissions, which interrupted their downward trend in 1994, need to be reduced by 16.4% from their 2007 levels.

CHANGES IN SO_2, NO_X, NH_3 AND NMVOC EMISSIONS UNDER DIRECTIVE 2001/81/EC ON NATIONAL EMISSIONS CEILINGS. COMPARISON WITH 2010 EMISSIONS TARGETS



In 2003, Spain drew up its first National Emissions Reduction Programme. Its review led to the II Programme (published in the OG of 29/01/2008), which is based on a series of Sector-Based Action Plans in the framework of the "Action Plan for application of the National Emissions Reduction Programme in light of the National Emissions Ceiling Directive".

Nevertheless, as was the case with GHGs, in agreement with national emissions forecasts prepared by MARM on the basis of the 1990–2006 inventory, the effect of the new macroeconomic climate and growth perspectives should prove beneficial as regards emissions of these pollutants. The three current scenarios (without measures, with measures and with additional measures) lead to the following forecasts:

Acidifying and eutrophying gases and tropospheric ozone precursors	Year	Scenarios		
		Trend scenario (without measures)	Baseline scenario (with measures)	Target scenario (with additional measures)
SO_X (t)	2010	1,833,545	400,846	399,584
SO_X (% vs. ceiling)	2010	145.78%	-46.27%	-46.44%
NO_X (t)	2010	1,715,288	1,144,836	1,008,958
NO_X (% vs. ceiling)	2010	102.51%	35.16%	19.12%
COVNM (t)	2010	1,307,158	761,426	745,530
COVNM (% vs. ceiling)	2010	97.46%	15.02%	12.62%
NH_3 (t)	2010	477,984	388,180	406,768
NH_3 (% vs. ceiling)	2010	35.41%	9.97%	15.23%

Source: MARM

NOTES

- The graph for this indicator presents the evolution of the total annual combined emissions of acidifying and eutrophying substances (SO_2, NO_x and NH_3) and tropospheric ozone precursors (NO_x, NMVOC, CO and CH_4) with respect to 1990 as base year (1990 = 100).
- The emissions of acidifying and eutrophying substances are presented as acid equivalents (hydrogen ion generation potential), adding the XXX emissions using the following weighting factors: 31.25 acid equivalents/kg for SO_2 (2/64 acid equivalents/g), 21.74 acid equivalents/kg for NO_x, expressed as NO_2 (1/46 acid equivalents/g) and 58.82 acid equivalents/kg for NH_3 (1/17 acid equivalents/g). Emissions of tropospheric ozone precursors were estimated using the tropospheric ozone depletion potential (expressed as NMVOC equivalents). The weighting factors employed were as follows: 1.22 for NO_x, 1.00 for NMVOC, 0.11 for CO and 0.014 for CH_4.
- The aim of Directive 2001/81/EC of the European Parliament and of the Council, dated 23 October 2001, regarding national emissions ceilings for certain pollutants, is to restrict the emissions of acidifying and eutrophying pollutants and ozone precursors in order to protect human health and the environment. The directive applies to all anthropogenic sources of ammonia (NH_3), nitrogen oxides (NO_x), volatile organic compounds (NMVOC) and sulphur dioxide (SO_2). It should be noted, however, that its territorial scope excludes emissions from the Canary Islands and does not cover all sectors. It should therefore not be confused with total emissions estimated by the inventory, which includes all sectors and all of Spain's national territory.

SOURCES

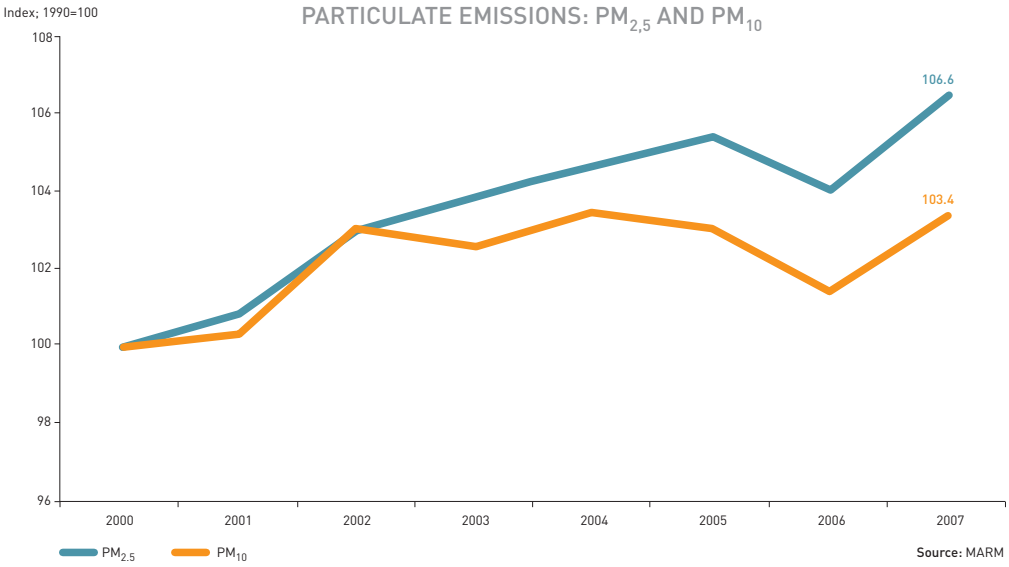
- Spain's Atmospheric Emissions Inventory. Edition 2009 (series 1990–2007). Directorate General of Environmental Quality and Assessment. MARM.

MORE INFORMATION

- http://www.marm.es
- http://www.eea.europa.eu

Particulate emissions to the atmosphere

Particulate emissions again increased in 2007 after the drop seen in 2006



Particulate emissions in the period 2000–2007 increased by 6.6% for $PM_{2.5}$ and 3.4% for PM_{10}. Both dropped strongly in 2006 but increased significantly again in 2007 (2.4% and 1.9% respectively).

By sectors, transport was responsible for the highest particulate emissions in 2007 (60.1% of $PM_{2.5}$ and 49.8% of PM_{10} emissions), followed by non-industrial combustion plants (16.5% and 13.7% respectively) and combustion for energy production and transformation (9.9% and 12.6% respectively). The remainder (industrial combustion plants, combustion-free industrial processes and agriculture, extraction and distribution of fossil fuels and waste treatment and elimination) represent only 13.5% of $PM_{2.5}$ and 23.9% of PM_{10} emissions.

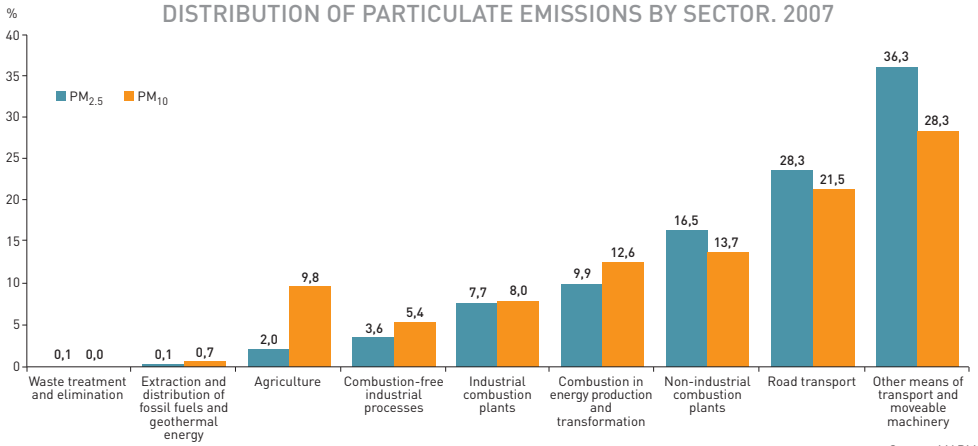
In the 32 countries which make up the European Environmental Agency, particulate emissions (primary, of PM_{10}, and secondary, including these from NO_x, SO_2 and NH_3) dropped by 44% between 1990 and 2006, above all due to the reduction in emissions from the energy industry, due to the replacement of coal as a fuel, and technological improvements. By country, Luxembourg and the Czech Republic,

both of whom have reduced emissions by more than 70%, should be highlighted. It is

estimated that Spain reduced its emissions by 10%, as did Portugal, which places the former in 26th place out of 32 countries.

According to Eurostat, in 2006 Spain occupied fourth place in the EU-27 in terms of PM_{10} emissions, behind France, Poland and Germany.

DISTRIBUTION OF PARTICULATE EMISSIONS BY SECTOR. 2007



Source: MARM

NOTES

- The indicator includes the emission of primary particulate material smaller than 10 and 2.5 m (PM_{10} and $PM_{2.5}$) and secondary particulate material precursors: nitrogen oxides (NO_x), ammonia (NH_3), sulphur dioxide (SO_2), weighted by their corresponding particle-formation factors.
- The EU has not yet established specific limits for primary particle emission, although limits do exist for 2010 for their precursors (NO_x, SO_x and NH_3) in the National Emissions Ceilings Directive (2001/81/EC) and in the Gothenburg Protocol of the Convention on long-range trans-boundary air pollution (Council Decision 81/462/EEC dated 11 June 1981).

SOURCES

- National Atmospheric Pollutants Emissions Inventory. Subdirectorate General of Industrial Air Quality and Environment. MARM.

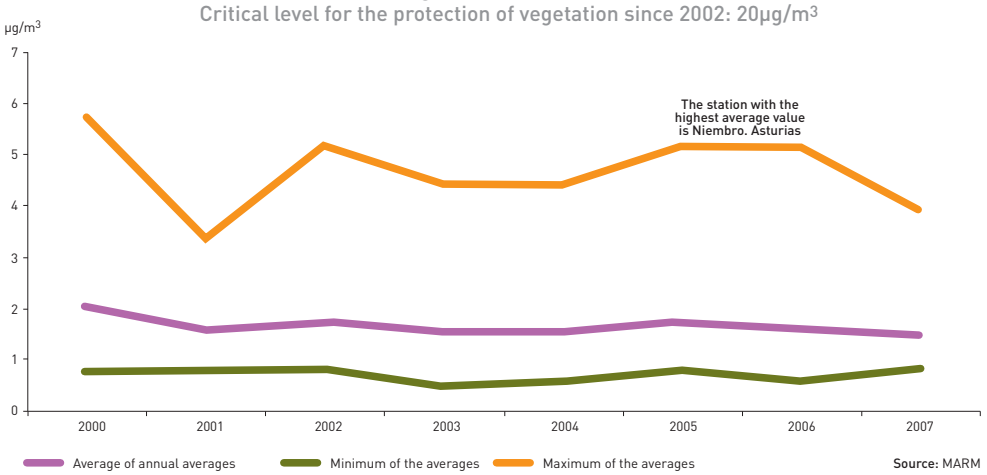
MORE INFORMATION

- http://www.marm.es
- http://www.eea.europa.eu
- http://ims.eionet.europa.eu/IMS/ISpecs/ISpecification20081014123025/IAssessment1226322448209/view_content#
- http://dataservice.eea.europa.eu/atlas/viewdata/viewpub.asp?id=3852

Regional background air quality for the protection of human health and vegetation

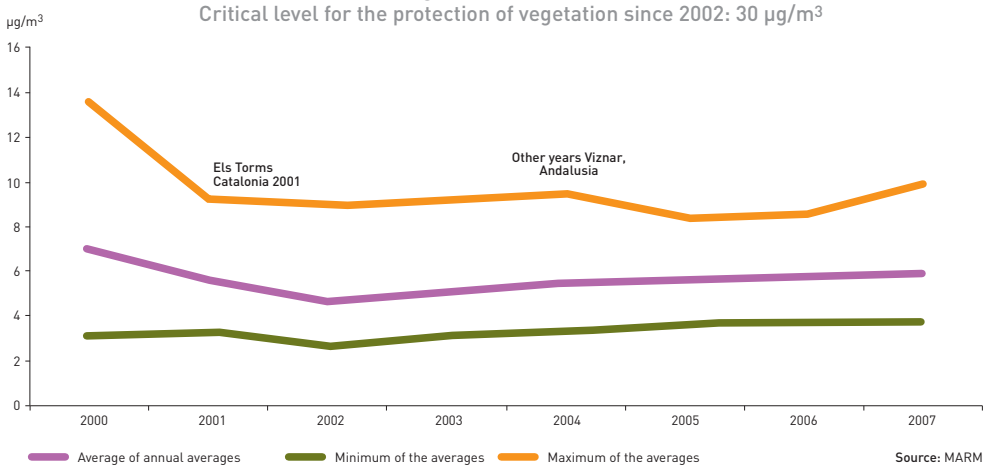
Spanish background pollution shows high values for PM10 and ozone, with the latter exceeding legally established limits

BACKGROUND POLLUTION IN SPAIN: SO_2
(average annual concentration)
Critical level for the protection of vegetation since 2002: 20µg/m³



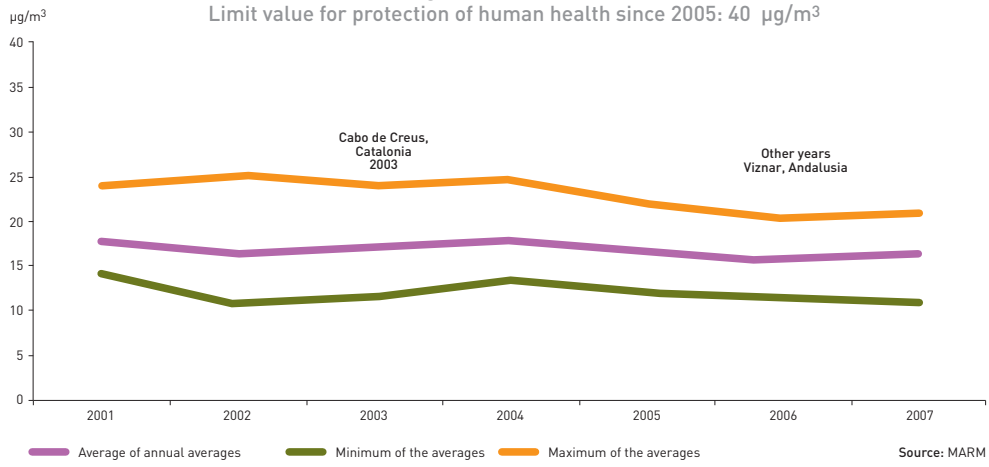
Source: MARM

BACKGROUND POLLUTION IN SPAIN: NO_2
(average annual concentration)
Critical level for the protection of vegetation since 2002: 30 µg/m³



Source: MARM

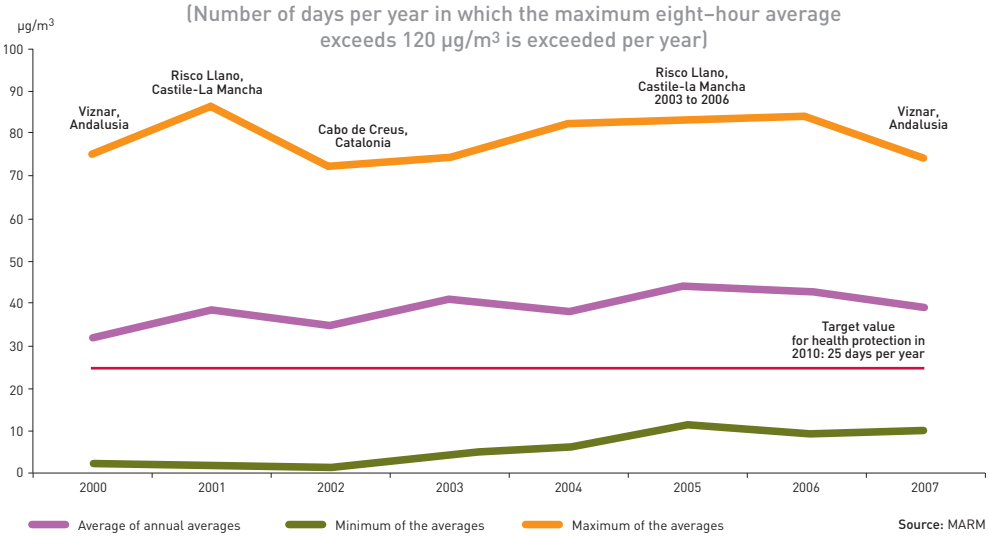
BACKGROUND POLLUTION IN SPAIN: PM_{10}
(average annual concentration)
Limit value for protection of human health since 2005: 40 µg/m³



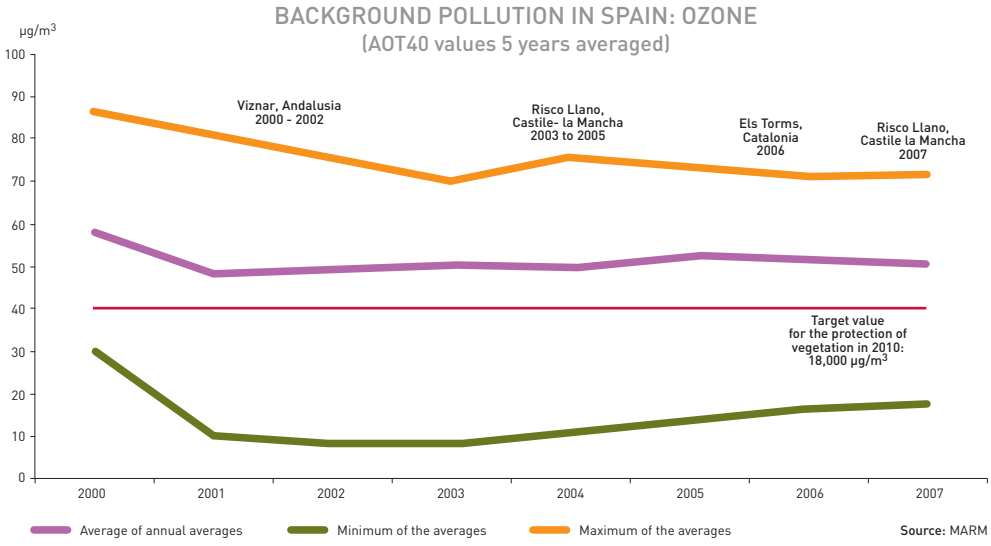
Source: MARM

One way of obtaining a more general impression of the overall air quality in a region not directly affected by pollution sources could be obtained from the information provided by the network of background atmospheric pollution monitoring stations, or EMEP/GAW/CAMP network. The information available from these stations is very wide ranging, and one way of getting some idea of overall air quality is to look at the mean, minimum and maximum of the mean concentrations measured at each of these stations each year.

BACKGROUND POLLUTION IN SPAIN: OZONE
(Number of days per year in which the maximum eight–hour average exceeds 120 µg/m³ is exceeded per year)



Source: MARM



As can be seen from the graphs, the means of the mean annual SO_2, NO_2 and particulate (PM_{10}) values follow different trends, although none of them can be considered to be negative. The trend for SO_2, for example, is to decrease, whereas that for PM_{10} indicates a stabilisation. The trend for NO_2, on the other hand, shows an increase from 2002 onwards after the decreases observed in 2000 and 2001. However, it should be noted that, as would be expected for stations distant from emission sources, current maximum health-protection limits are not exceeded in any case. Similarly, the maximum of the means also remains below these limits.

In the case of ozone, in contrast, analysis of the background pollution shows a mean of mean values above the legally established target values for both human health (determined from the three-yearly average of the number of days per year when the eight-hour maximum of 120 g/m^3 was exceeded) and protection of vegetation (AOT 40). It is important to highlight Spain's geographical and climatic characteristics which, together with those of ozone itself and the fact that it is a secondary pollutant, mean that the levels of this pollutant are higher in regions distant from primary emission sources than those found in urban (due to traffic) or industrial areas.

NOTES

- The intention is to assess the background pollution existing in Spain. For this reason, the average of the average concentrations at all stations is given for each pollutant and year. The minimum and maximum of the averages are also given, along with the name of the station where the latter occurred. The range within which all stations fall is therefore given.
- AOT40 stands for Amount Over Threshold. This index is defined as the sum of the difference between hourly concentrations above 80 µg/m^3 (= 40 parts per billion or ppb) and 80 µg/m^3 over a given period (which, in the case of vegetation protection, is that comprising the months of May, June and July), using only 1-hour values measured between 8:00 and 20:00 each day, Central European Time. (Royal Decree 1796/2003, which transposes Directive 2002/3/EC into Spanish law).
- To obtain the AOT40 figure from the hourly ozone concentrations at each of the stations covered, figures are taken for those years in which 90% or more of the available data are valid, corrected to standardise all at 100% of possible data. Averages are calculated over five years (rolling averages) or, in the absence of a complete consecutive series of annual AOT40 figures, a minimum 3-year average is used (Annex I of Royal Decree 1796/2003, which transposes Directive 2002/3/EC into Spanish law).
- The European Monitoring Evaluation Programme (EMEP), created within the framework of the Geneva Convention, measures background air pollution. The Global Atmosphere Watch (GAW) is a project of the World Meteorological Organisation (WMO). The Comprehensive Atmospheric Monitoring Programme (CAMP), established under the Oslo-Paris agreements, is intended to determine the atmospheric contributions in the NE Atlantic and to study their effects on the marine environment. The EMEP/GAW/CAMP network, which complies with the goals of the three previous programmes, monitors the tropospheric levels of residual (background) air pollution, and its sedimentation onto the earth's surface, in order to protect the environment. The location of the stations in the EMEP network used for the index are shown in the map below:



With the entry into force of the new air-quality directive (Directive 2008/50/EEC) of the European Parliament and of the Council, dated 21 May 2008, on ambient air quality and cleaner air for Europe, the current "upper limits for the protection of vegetation" of SO2 and NOx will be called "critical levels for the protection of vegetation"

SOURCES

- Air-Quality Database. Directorate General for Environmental Quality and Assessment. MARM.

MORE INFORMATION

- http://www.marm.es
- http://www.eea.europa.eu/

2.2 WATER



EC policy developed over the past few years has tended to unify directives concerning water under the Water Framework Directive. Spanish law has begun to adapt to this Directive highlighting, as is the case with other environmental policies, public participation as one of the fundamental elements.

The water-related legislation approved in 2008 includes Order ARM/2656/2008, of 10 September, which approves the procedures for hydrological planning and which adapts the instructions and recommendations approved in 1992 to the new Hydrological Planning Regulations set out in RD/907/2007. This order regulates the technical content of future basin-based hydrological plans.

Public consultation periods concerning the provisional schemes concerning important water-management topics in the river basin districts of the Guadalquivir and Segura, and the Spanish sections of the river basin districts of the Cantabrian region, Miño-Limia, Duero, Tagus, Guadiana and Ebro were opened in 2008. These schemes involve the description and assessment of the water-related problems in each demarcation and their possible solutions. Once the consultation period has ended, the results will serve as a basis for the drawing up of projects for the new Hydrological Plans.



INDICATOR	GOAL	TREND
Water consumption	Reduce and optimise consumption	Consumption has fallen in agricultural and urban zones
Reservoir water levels	Have sufficient reserves to guarantee supplies	Overall increase in reserves in the majority of hydrographic basins in 2008
Natural water resources	Achieve a sufficient level of water resources, established by hydrological planning, to maintain bodies of water in a good state	Naturally available water resources decrease on average
Brackish and sea water desalination	Increase available resources	Important increase in installed desalination capacity
Nitrate pollution of groundwater	Minimise pollution	Situation unequal in the different river basin districts
Salinisation of groundwater bodies	Reduce salinisation and preserve catchments	The Mediterranean river basin districts are particularly affected
Organic pollution of rivers	Achieve "good ecological status" in rivers	Slight worsening of organic pollution in rivers
Coastal bathing-water quality	Maintain the "good health status" of coastal bathing waters to ensure they remain suitable for bathing	Unfit coastal and inland bathing waters continue to decrease in number

The indicators described in this chapter analyse water from the viewpoint of available resources, water quality and basic management aspects. These indicators show a decrease in water consumption in both homes and agriculture, together with an overall improvement in available water reserves. However, a decrease in naturally available water resources, which could be interpreted as being due to climate change, has been observed over the past few years in Spain. This improvement in reserves is combined with the effort made to increase the production of desalinated water by using new technologies that allow energy costs to be reduced.

As regards quality, groundwater presents different levels of nitrate pollution depending on which river basin district it is found in. Salinisation of groundwater is limited to the Mediterranean river basin districts. On the other hand, river-based monitoring stations indicate a slight increase in organic pollution with respect to the previous year.

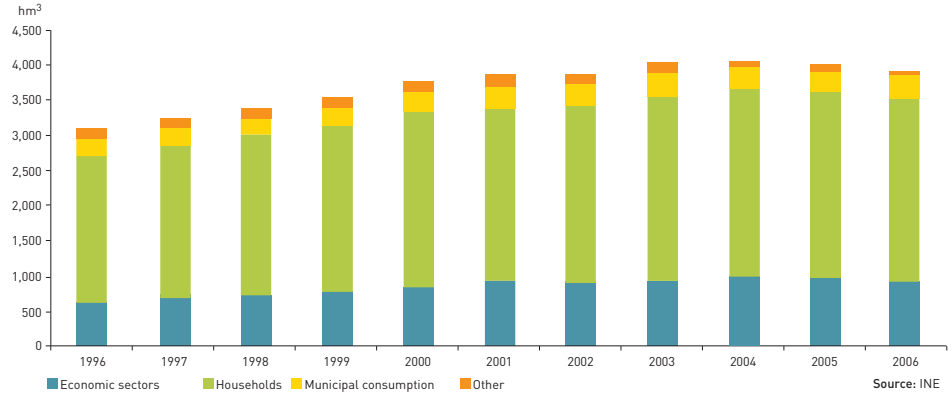
As for bathing water quality, the proportion of both inland and coastal bathing waters considered unfit has dropped and the proportion of bathing waters considered to be of good quality has increased, although mostly to the detriment of waters of very good quality.

The indicator "purification of urban waste water" has not been included due to methodological changes currently being implemented which have prevented data being updated. The National Water Quality Plan is being implemented by the Ministry of the Environment and Rural and Marine Affairs (MARM) via collaboration agreements with different Autonomous Regions. In 2008, Spain's degree of compliance with Directive 91/271/EEC, regarding urban waste water treatment, was 80%.

Water consumption

The volume of water consumed in both urban supplies and for agricultural use continued to drop in 2006

DISTRIBUTION OF WATER FROM THE PUBLIC SUPPLY NETWORK BY SECTOR

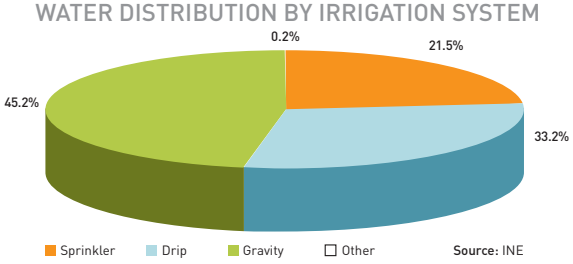


The volume of water distributed by urban supply networks in Spain in 2006 decreased by 3.6% with respect to the previous year, to 4698 hm^3. This confirms the downward trend started in 2005. Domestic consumption and that by various economic sectors (industry, services and livestock farming) and municipal uses accounted for 83.3% of this amount.

Average water consumption in the home was 160 litres per person per day in 2006, which represents a decrease on the 166 litres recorded in 2005.

Agricultural water use reached 15,865 hm^3, a decrease of 3.9% with respect to 2005. The decrease in the amount of water used for irrigation continued, due above all to the modernisation programme undertaken over the past few years. The amount of water used for sprinkler and gravity irrigation continued to decrease (by 11.9% and 7.5% respectively), whereas the volume of water applied to crops by drip irrigation increased by 8.3%.

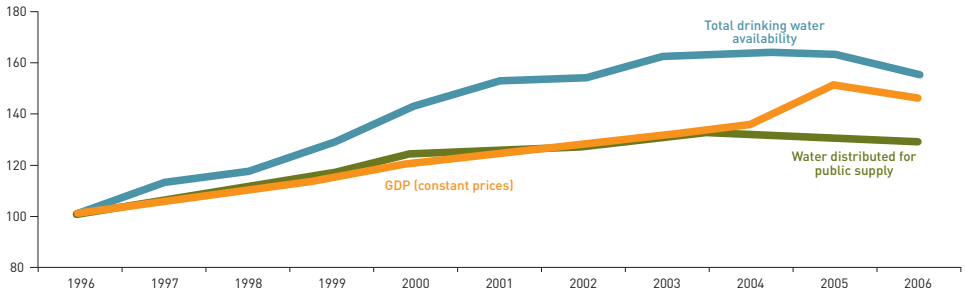
WATER DISTRIBUTION BY IRRIGATION SYSTEM



A comparison of GDP evolution (at constant prices) and water consumption, expressed as "total drinking water availability" and "water distributed for public supply" shows that, after several years when both variables increased in a similar way, in late 2004 water consumption began to decrease whilst GDP continued to increase.

The upward trend in GDP, which contrasts with the stability of the water availability values, suggests a more efficient use of the water available, which allows economic growth without the need to increase water consumption.

COMPARISON BETWEEN PUBLIC SUPPLY WATER DISTRIBUTION AND GDP
(Index: 1996=100)



Source: INE

NOTES

- Water distributed includes all water available in the public distribution network, plus any losses from this network. It is based on total water abstraction by the supply company plus the net balance of water sales and purchases by and from other companies and local authorities.

SOURCES

- Water consumption figures: National Institute of Statistics. Environmental Statistics. Environmental Statistics on Water. In INEbase (http://www.ine.es/inebase/cgi)
- Survey on Water Supply and Treatment (1996-2006).
- Survey on Water Use in the Agricultural Sector (1999-2006).
- Water consumption figures in industry:
- GDP figures: Secretariat general for energy, 2008. *Energy in Spain 2007*. Ministry of Industry, Tourism and Trade.

MORE INFORMATION

- http://www.ine.es
- http://hispagua.cedex.es
- http://www.marm.es

Reservoir water levels

Water reserves increased in 2008 in the majority of hydrographic basins, with an increase of more than 15% in total national reserves

HYDROLOGICAL TREND REPORT. Data as of 2 January 2009
CAPACITY (hm) AND RESERVES (%) IN NATIONAL RESERVOIRS

RIVER BASIN	Total reservoir capacity	Reserves	Reserves compared to total capacity (%)				
	hm^3	hm^3	2008	2007	2006	5-year average	10-year average
Galicia-Coast	684	471	68.9	32.9	71.5	56.5	61.5
Miño-Sil	3,030	1,684	55.6	44.1	79.2	59.4	62.4
Cantabrian	625	491	78.6	60.8	69.9	70.4	70.6
North III (1)	0	0	0	0	0	0	0
Basque Country Inland Basins	21	20	95.2	71.4	47.6	76.2	77.6
Duero	7,463	4,051	54.3	50.3	77.5	59.1	60.5
Tagus	11,012	4,944	44.9	40.8	58.9	50.1	53.3
Guadiana	8,630	3,963	45.9	54.4	59.3	63.9	61.9
Andalusian Atlantic Basin	1,878	713	38	35.8	44.1	55.7	59.5
Guadalquivir	7,306	2,621	35.9	35.3	40.2	51.9	54.9
Andalusian Mediterranean Basin	1,041	352	33.8	25.4	29.6	35.7	39.2
Segura	1,129	228	20.2	15.1	11.8	13.9	16.4
Jucar	3,346	932	27.9	20.3	14.3	24.2	24.2
Ebro	7,403	4,950	66.9	41.6	59.3	61.1	65.3
Catalonian Inland Basins	740	495	66.9	24.7	48.1	50.5	47.8
Atlantic watershed	40,649	18,958	46.6	44.7	60.3	56.4	58.1
Mediterranean watershed	13,659	6,957	50.9	32.1	41.5	44.9	47.4
Entire Peninsula	54,308	25,915	47.7	41.5	55.6	53.6	55.5

(1) Due to the separation of the Northern Hydrographic Confederation, the data for the North II and North III basins are included in those for the Cantabrian basin.

Source: MARM

The water reserve figures for 2008 (as of 2 January 2009) show an overall increase in the majority of hydrographic basins, except those of the Guadiana and the Guadalquivir, with total national reserves increasing by 15% with respect to the previous year. This could indicate a certain upward trend in water reserves, particularly for the Mediterranean watershed (above the 10-year average). In contrast, although the Atlantic watershed improved with respect to the previous year, it remains far below the 5- and 10-year averages.

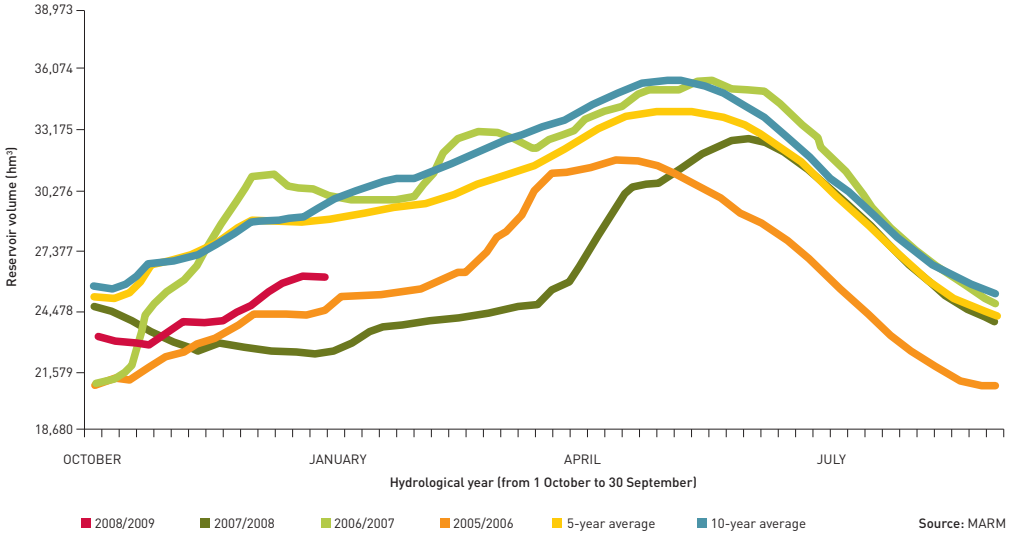
The greatest increases occurred in the Ebro, Catalonian and Galician basins. The Segura and Jucar basins increased their reserves by 30% with respect to 2007, although overall levels remained very low. Despite showing an improvement on the

previous year, some regions in the Duero basin are still at emergency levels.

Although reserves reached their lowest levels for a number of years in winter of the hydrological year 2007-08, levels began to rise in the spring due to the significant rainfall experienced, and this increase continued into autumn 2008 (first quarter of the 2008-09 hydrological year).

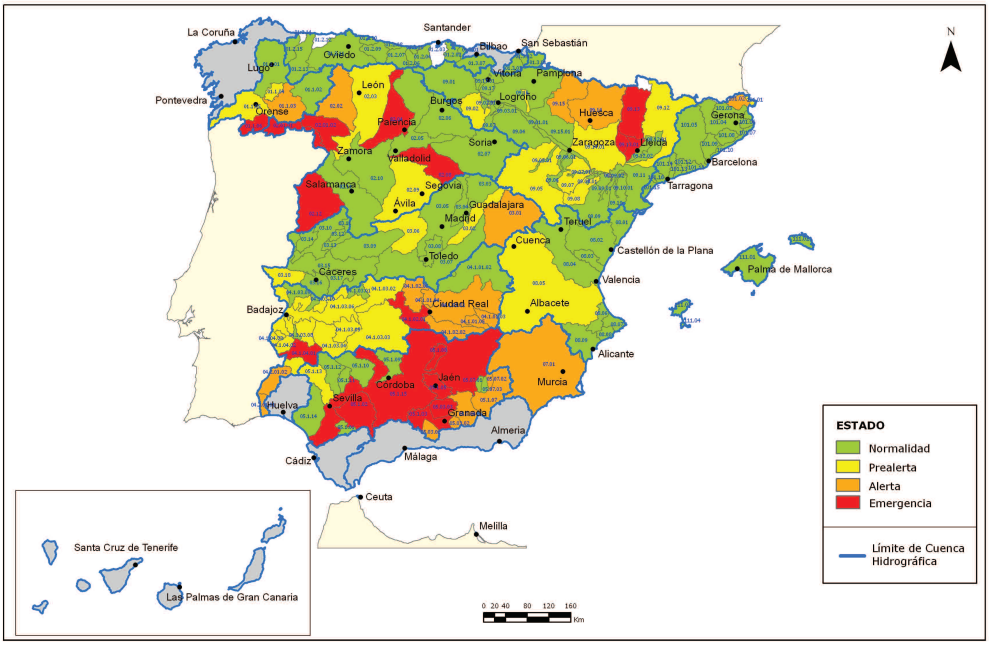
The system of hydrological indicators put in place by the Directorate General for Water, which classifies the status of each exploitation system as normal, pre-alert, alert or emergency, highlights the improvements which have occurred in 2008 in numerous exploitation systems, although some regions are still in emergency status, as can be seen from the drought monitoring map for December 2008.

PENINSULAR WATER RESERVES



Source: MARM

DROUGHT MONITORING MAP. DECEMBER 2008
RESOURCE EXPLOITATION SYSTEM (RES) STATUS



Fuente: MARM

NOTES

- The Directorate General for Water has developed a national hydrological indicator system which allows drought situations to be forecast based on the volume of water stored in reservoirs, the piezometric levels of aquifers, natural precipitation and precipitation in representative seasons. This system of indicators provides an objective characterisation of drought in each exploitation system and enables timely measures and actions to be applied at the pre-alert, alert or emergency stages.
- The hydrological year runs from 1 October to 30 September of the following year.

SOURCES

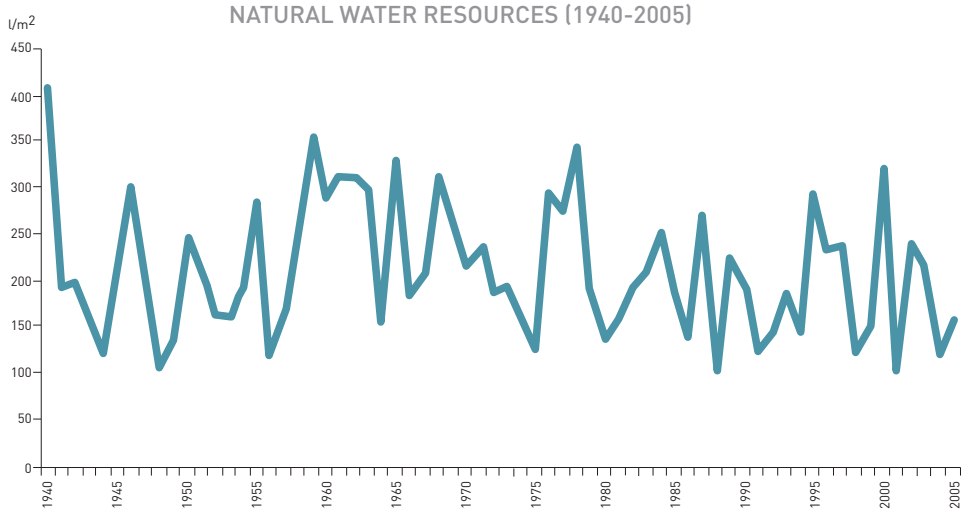
- Figures provided by the Sub-Directorate General for Water Planning and Sustainable Water Use. Directorate General for Water. MARM.

MORE INFORMATION

- http://www.marm.es
- http://www.hispagua.cedex.es

Natural water resources

Natural water resources have varied enormously from year to year over the past 20 years, although they have dropped by 5% overall



Source: CEDEX

The natural water resources indicator shows the total amount of water contributed by the hydrological cycle in a region. It considers the surface contribution in the river network and the underground contribution, which leaves a region via aquifers. A lack of precipitation and water resources leads to drought.

This indicator enables water resource management as it becomes possible to estimate the resources available in a region over a certain time period based on the amount of natural water resources. This availability is reflected in the amount of water in reservoirs and influences its various uses, expressed in terms of water consumption, bearing in mind environmental needs.

The mean annual value in 2005 was 153.36 l/m^2. Meteorological changes result in large variations in each hydrological year, although in general terms total natural water resources have dropped by 5% in the last 20 years.

This decrease is common to all basins, except Galicia Coast and the Andalusian Atlantic Basin, where the value has remained essentially unchanged, and in the Jucar and Internal Catalonian Basin, where it has increased slightly. These exceptions are found because, although the whole country was affected by the drought of the early nineties, it was not distributed evenly.

The effects of climate change in Spain, especially higher temperatures and lower rainfall, are likely to lead to decreased water contributions and increased demand from irrigation systems. The system of available water resources and their management are therefore a key factor for the administration of excess or lack of water in the face of human demand.

NOTES

- The average annual natural water resources figure is calculated based on the average monthly values produced by the Precipitation-Contribution Simulation model (SIMPA), developed by the Public Works Study and Experimental Centre (CEDEX), which models the hydrological cycle for the country as a whole (the figures are included on a national scale and by river basin district), with a cell size of 1 km^2.
- Based on the precipitation, potential evapotranspiration and hydrological parameters, the model produces a map showing the various reserves, soil humidity and aquifer volume and on the hydrological cycle's exit variables, especially evapotranspiration and total runoff, the latter of which is obtained by summing the surface and underground runoffs. The indicator is expressed in units of litres per square metre (l/m^2).

SOURCES

- Subdirectorate General for Water Planning and Sustainable Use. Directorate General for Water. MARM.
- Centre for Public Works Studies and Experimentation (CEDEX).
- Monitoring Centre for Sustainability in Spain, 2008. *Water and sustainability: Functionality of river basins.*

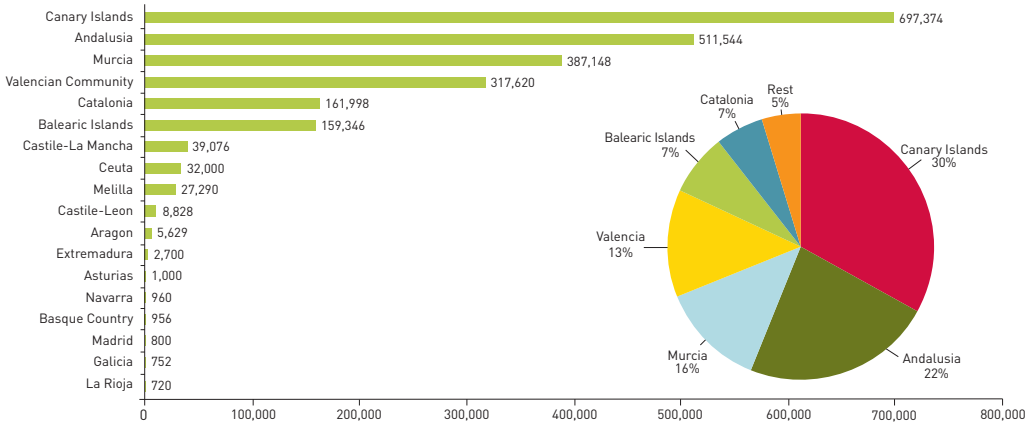
MORE INFORMATION

- **http:// www.sostenibilidad-es.org**
- Ministry of the Environment, 2000. *White Book for Water in Spain.*

Desalination of brackish water and sea water

The new desalination plants have increased installed capacity by more than 11% in 2008 with respect to 2007

INSTALLED DESALINATION CAPACITY (m^3/day of desalinated water) OPERATIONAL IN 2008. TOTAL 2,355,741 m^3/day



Source: Own creation using data from CEDEX

Together with the treatment and recycling of waste waters, one of the best ways of increasing water resources in Spain is desalination of brackish waters, both seawater and salinised groundwater. Plants which use this latter system (salinised groundwater) make up 30% of the total in Spain.

A large number of desalination plants were inaugurated in 2008, including that at Valdelentisco, Murcia. This is the largest desalination plant in Europe and the third largest in the world, with a maximum annual production of 70 hm^3. These new desalination plants have contributed to the increase in installed capacity, which has grown by 11% with respect to 2007, and now has an operational desalination capacity of 2.4 hm^3/day. The performance of each plant varies, however, and the actual estimated total production of desalinated water in 2008 was 1.9 hm^3/day. The regions which have increased their capacity most in the past year are Valencia, with 85,000

DESALINATED WATER OUTPUT IN SPAIN

Year	1990	2000	2004	2007	2008	2009 (Forecast)
hm^3/day	0.1	0.7	1.4	1.7	1.9	3.4

Source: Centre for Applied Technology Studies. CEDEX.

m^3/day, and Murcia, with 70,000 m^3/day. The Canary Islands, Andalusia and Murcia remain in the top spots in terms of desalinating capacity.

Energy consumption during the desalination process can account for between 50% and 70% of actual production costs. However, new technologies, such as the use of pressure exchangers instead of Pelton turbines, mean that more of the energy previously lost with the brine can now be recovered. These advances have led to a reduction in energy consumption of between 0.3 and 0.4 kWh per cubic metre of desalinated water produced. Improved water pre-treatment processes have also led to an overall improvement in the process as a whole.

The impact caused by brine discharges can be reduced significantly by controlling its concentration and varying the outlet point.

SOURCES
- Centre for Applied Technology Studies. CEDEX.

MORE INFORMATION
- http://www.igme.es
- http://www.hispagua.es
- http://www.marm.es

Nitrate pollution of groundwater

Nitrate pollution varies widely depending on the river basin district concerned

PERCENTAGE OF MONITORING STATIONS RECORDING NITRATE CONCENTRATIONS ABOVE 50 mg/l (2008)

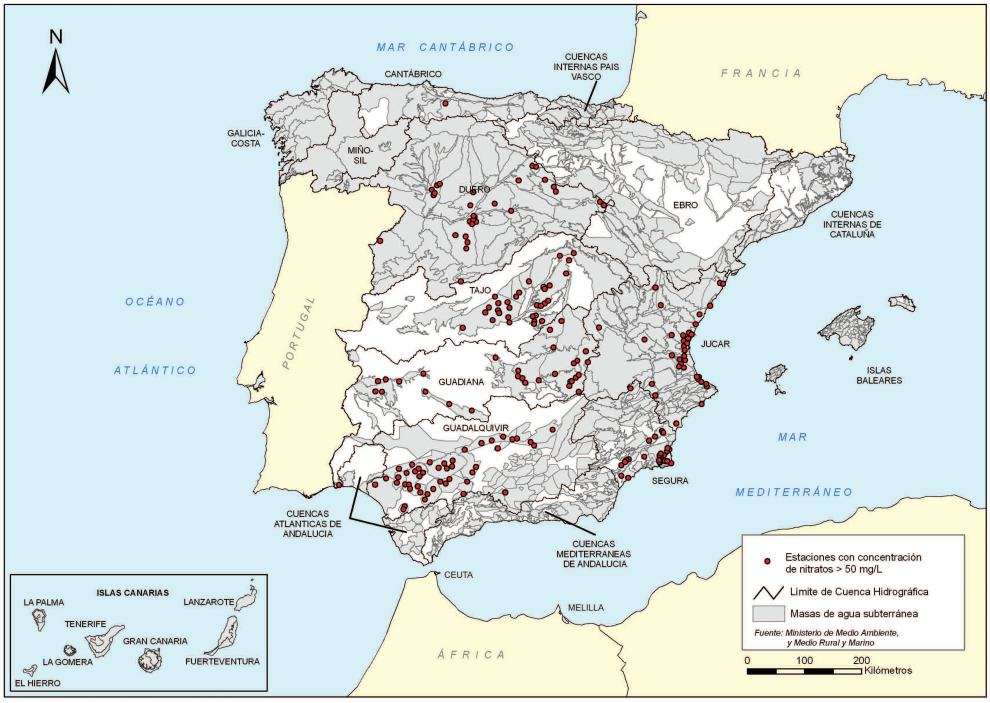
River Basin District	2006	2007	2008	River Basin District	2006	2007	2008
Galicia-Coast	SD	0%	2.44%	Guadalquivir	29.76%	27.54%	SD
Miño-Sil	SD	9%	0%	Guadiana	27.65%	29.16%	26.55%
Cantabrian	0%	0%	1.88%	Segura	22.68%	26.88%	SD
Basque Country Inland Basins	0%	0%	0%	Júcar	20.13%	20.20%	19.27%
Duero	12.78%	10.19%	12.17%	Ebro	18.70%	20.47%	SD
Tagus	25.32%	25.62%	23.66%				

Source: MARM. 2009

For the control of groundwater quality, the Water Framework Directive 2000/60/EC and Directive 2006/118/EC, on the protection of groundwater against pollution and deterioration, establish a series of indicators, including the nitrate concentration in milligrams per litre (mg/l). The proportion of control points with nitrate concentrations higher than 50 mg/l was again highly variable in 2008 and depended on the river basin district concerned.

The main causes of this type of groundwater pollution are agricultural, especially the excessive or inappropriate use of nitrogenated fertilisers, and livestock-related (discharge of slurries and other waste). High nitrate concentrations in water can affect its drinkability. The map below shows monitoring stations in the groundwater quality control network that recorded nitrate concentrations above 50 mg/l in 2008.

MONITORING STATIONS RECORDING NITRATE CONCENTRATIONS ABOVE 50 mg/l (2008)



Source: MARM

NOTES

- The definition of vulnerable zones is set out in Directive 91/676/EEC and is established according to nitrate pollution and run-off.
- Directive 2000/60/EC, which establishes the European framework for action in the field of water policy, establishes as one of its objectives the need to prevent groundwater pollution. In order to meet these objectives, rafts of measures should be established that, among other aspects, include those set out in Directive 91/676/EEC. In addition, the vulnerable zones established in accordance with Directive 91/676/EEC are also included in a register of protected areas under Directive 2000/60/EC.
- Directive 91/676/EEC, on the protection of waters against pollution caused by nitrates from agricultural sources, transposed into Spanish law by Royal Decree 261/1996, defines groundwater as being affected by this type of pollution if the nitrate concentration is above 50 mg/l, or could potentially reach this level.
- As a consequence of the work undertaken whilst preparing the four-yearly report 2004-2007 required by Directive 91/676/EEC, new monitoring stations were incorporated into both the control network for this Directive and the chemical-status monitoring network established under Directive 2000/60/EC.
- A row has been included for the Miño-Sil river basin district and another for the Cantabrian river basin district; these were both previously included in the row labelled North and Miño-Limia.
- Data for 2008 for the Guadalquivir, Segura and Ebro river basin districts are not available.
- The 2008 data for the Duero and Júcar river basin districts are calculated on the basis of data available for the first half of the year.

SOURCE

- Data provided by the Sub-Directorate General for Integrated Public Water Resource Management. Directorate General for Water. MARM.

MORE INFORMATION

- http://www.marm.es
- http://www.eea.europa.eu

Salinisation of groundwater bodies

Salt intrusion is particularly important in the Mediterranean river basin districts

A body of coastal groundwater is considered to be affected by salt intrusion when its chloride concentration in milligrams per litre (mg/l) is higher than 1000. The indicator for groundwater body salinisation is determined from the proportion of control points with a chloride concentration higher than that indicated above.

PERCENTAGE OF COASTAL GROUNDWATER MONITORING STATIONS RECORDING CHLORIDE CONCENTRATIONS HIGHER THAN 1000 mg/l

River Basin District	2006	2007	2008	River Basin District	2006	2007	2008
Galicia-Coast	SD	0%	0%	Segura	35.71%	43.75%	SD
Cantabrian	0%	0%	0%	Júcar	5.88%	5.26%	5.26%
Basque Country Inland Basins	0%	0%	0%	Ebro	0%	14.29%	SD
Guadiana	0%	0%	0%	Guadalquivir	0%	0%	SD

Source: MARM. 2009

The Mediterranean river basin districts are most affected by salt intrusion, with the Segura basin district having the highest values in 2007. The Ebro basin district exceeded 14%, whereas the value for the Jucar remained essentially the same between 2006 and 2008.

The map below shows groundwater quality control network stations monitoring coastal groundwater bodies in which chloride levels of over 1,000 mg/l were recorded in 2006.

MAPA ESTACIONES CON CONCENTRACIÓN DE CLORUROS SUPERIORES A 1000 mg/l (2008)



Fuente: MARM

NOTES

- As a consequence of the work undertaken whilst preparing the four-yearly report 2004-2007 required by Directive 91/676/EEC, new monitoring stations were incorporated into both the control network for this Directive and the chemical-status monitoring network established under Directive 2000/60/EC.
- Data for 2008 for the Guadalquivir, Segura and Ebro river basin districts are not available.
- The 2008 data for the Júcar river basin district are calculated on the basis of data available for the first half of the year.

SOURCES

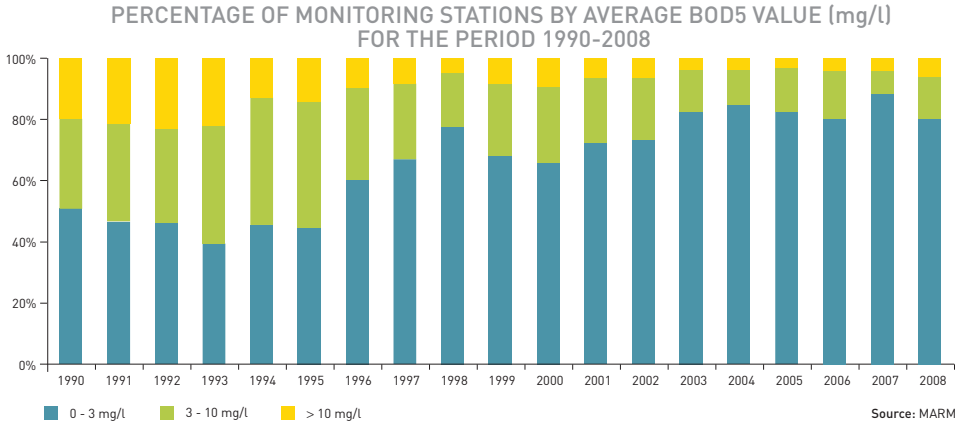
- Data provided by the Sub-Directorate General for Integrated Public Water Resource Management. Directorate General for Water. MARM.
- *Europe's water: An indicator-based assessment.* European Environment Agency, 2003.

MORE INFORMATION

- http://www.marm.es
- http://www.eea.europa.eu

Organic pollution of rivers

Organic pollution in rivers in 2008 was slightly worse than in the previous year



Organic pollution in rivers is a direct consequence of urban waste water discharges. The indicators used to measure this pollution are biological oxygen demand (BOD) and ammonium concentration.

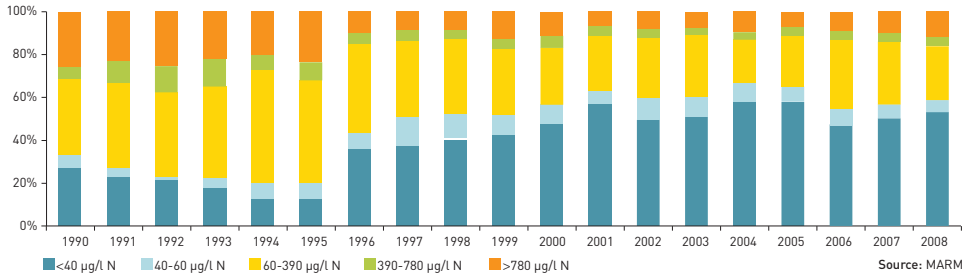
BOD_5 is the amount of oxygen dissolved in water required to degrade the organic matter present in it under certain conditions and is expressed as milligrams of O_2 per litre (mg/l). This indicator covers those monitoring stations whose average BOD_5 value lies in one of three ranges: 0 to 3 mg/l, 3 to 10 mg/l and more than 10 mg/l.

A slight worsening was observed in 2008, with the proportion of control points with low organic pollution decreasing to 80% and those with higher amounts of organic matter increasing. This change can clearly be seen in the graph below.

The presence of ammonium in rivers, the majority of which comes from sewage networks, leads to an increase in nitrogen concentration, which in turn speeds up eutrophication processes.

The proportion of control points with high ammonium concentrations, measured in micrograms per litre (g/l), increased in 2008. Thus, the proportion of control points with an ammonium concentration of less than 40 g/l increased from 49.7% to 53.2%, whereas the proportion with a concentration of more than 780 g/l increased from 10.4% to 11.9%.

AMMONIUM IN RIVERS: PROPORTION OF STATIONS IN TERMS OF MEAN AMMONIUM CONCENTRATION (µg/l) 1990-2008



Source: MARM

The new infrastructures associated with the application of the National Water Quality Plan: Sewerage and Treatment 2007-2015 is likely to reduce the pollution resulting from discharges and lead to improved river quality.

NOTES

- The National Water Quality Plan: Sewerage and Treatment 2007-2015 was approved by the Council of Ministers in June 2007.
- Biological oxygen demand, also referred to as biochemical oxygen demand (BOD), is used as a parameter to measure the quantity of matter liable to be consumed or oxidised by biological means within a liquid sample, and is used to establish the degree of pollution. This is normally measured after 5 days (BOD_5), and is stated in mg O_2/litre. It should not be confused with chemical oxygen demand (COD), the parameter used to measure the quantity of organic matter liable to be oxidised by chemical means within a liquid sample.
- Ammonium (NH_4+) is the monovalent cation formed from ammonia. It is one of the components of urine, together with urea, sodium and chlorine.
- Ammonia (NH_3) is a colourless gas produced naturally by decomposing organic material. It is also produced industrially to make fertilisers, textiles, plastics, explosives, paper, foodstuffs, beverages, cleaning products and coolants, amongst others.

SOURCES

- Data provided by the Sub-Directorate General for Integrated Public Water Resource Management. Directorate General for Water. MARM.

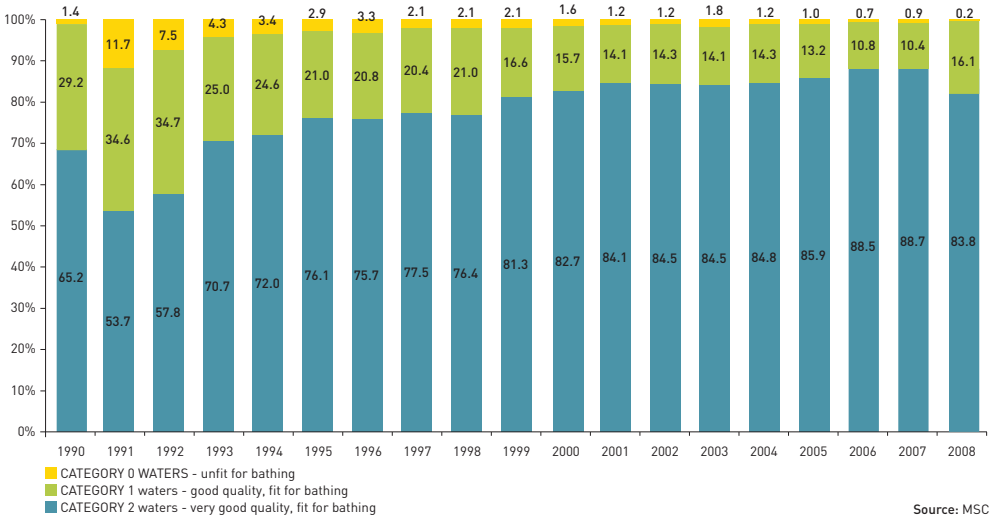
MORE INFORMATION

- http://www.mma.es
- http://www.eea.europa.eu

Coastal bathing-water quality

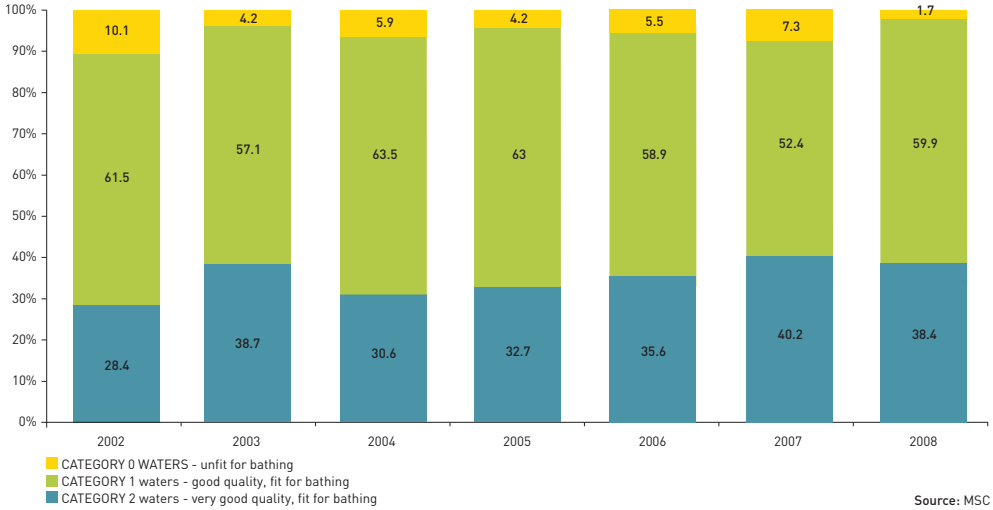
The proportion of sites unfit for bathing dropped to 0.2% for coastal sites and 1.7% for inland ones

COASTAL BATHING-WATER QUALITY
PERCENTAGE OF SAMPLING POINTS BY CATEGORY



Source: MSC

INLAND BATHING-WATER QUALITY
PERCENTAGE OF SAMPLING POINTS BY CATEGORY



Source: MSC

In this edition the indicator provides information concerning the quality of coastal and inland bathing waters. The annual health classification of bathing water quality into three categories is maintained: “unfit”, “good quality” and “very good quality”, as

stipulated in Royal Decree 734/88 of 1 July. This assessment is performed at the end of the bathing season by monitoring a series of microbiological and physicochemical parameters analysed at sampling points for the different coastal and inland bathing sites.

The proportion of coastal bathing sites fit for bathing (good or very good quality) was 99.84% of the sampling points. The proportion of very good quality bathing waters decreased by around 5% in favour of waters with good quality. However, the proportion of bathing waters considered unfit for bathing continued to decrease, dropping below 0.2%.

As regards the quality of inland bathing waters, the proportion of bathing sites considered unfit for bathing has decreased over the past six years to 1.7% in 2008. The proportion of inland bathing waters of very good quality has decreased somewhat to 38.4%, whereas the proportion of good quality bathing waters increased to 59.9%.

Royal Decree 1341/2007, of 11 October 2007, on the management of bathing-water quality, transposed Directive 2006/7/EC, of 15 February, classifying bathing waters into four categories: “Poor”, “Sufficient”, “Good” and “Excellent”. This new classification was accompanied by a reduction in the number of parameters analysed to the measurement of intestinal *Enterococci* and *Escherichia coli*, indicators of waste-water treatment levels and animal-related pollution, which are the main risk factors for human health. This classification began to be applied in some Autonomous Regions in 2008.

NOTES

- Classification of the quality of these waters is based on microbiological criteria: presence/absence of faecal and total coliforms. Category 2 is allocated to the best quality water, whereas water at the other end of the scale is classified as category 0.
- The most frequent sources of pollution are direct discharge of untreated waste water and temporary breakdown in waste-water treatment infrastructure.
- The Hygiene Classification of Bathing Water at Sampling Point was undertaken on the basis of the following criteria:

  CATEGORY 2 WATERS: Water suitable for bathing, very good quality. These waters simultaneously meet the following conditions:

  1) At least 95% of samples must not exceed the required values for: Total Coliforms, Faecal Coliforms, Salmonella, Enteroviruses, pH, Colour, Mineral Oils, Surfactants, Phenols and Transparency.
  2) At least 80% of samples must not exceed the guideline values for: Total Coliforms and Faecal Coliforms.
  3) At least 90% of samples must not exceed the guideline values for: Faecal Streptococci, Transparency, Dissolved Oxygen and Floating Materials.

  CATEGORY 1 WATERS: Water suitable for bathing, good quality. These waters comply with condition 1) of Category 2, but not conditions 2) and/or 3).

  CATEGORY 0 WATERS: Waters unfit for bathing. These waters do not meet condition 1) of Category 2.

- In accordance with the provisions of Directive 76/160/EEC, regarding bathing water quality, the Ministry of Health and Consumer Affairs sends an Annual Summary Report of the Bathing Water Quality in Spain to the European Commission.

SOURCES

- Data provided by the Sub-Directorate General for Environmental Health and Health and Safety at Work. Ministry of Health and Consumer Affairs.

MORE INFORMATION

- http://www.msc.es
- http://ec.europa.eu



2.3 LAND



The upper layer of the earth's crust, more commonly known as the land, is made up of mineral particles, organic matter, water, air and living organisms. The majority of the biosphere lives on it. Its formation is such an extremely slow process that it could be considered a non-renewable resource. Human activity is undertaken on it, it plays a central role as a genetic habitat and heritage, and it stores, filters and transforms a multitude of substances; it is therefore the planet's largest carbon "store".

The damage which its (complex and variable) structure can suffer affects natural environments and ecosystems directly. It suffers numerous degradation processes and threats: erosion, loss of organic material, local and widespread pollution, coverage, sealing, reduction in biological diversity, salinisation, flooding, etc. Some of these processes can be accelerated by, or are a direct consequence of, human actions. In arid or sub-arid conditions, the combination of some of these threats can lead to desertification.

Land degradation is a serious problem in Europe that is provoked or accentuated by human activities: inappropriate agricultural and forestry practices, industrial activity, tourism, urban and industrial expansion, infrastructure construction. These activities can reduce the land's fertility, its carbon content,



biological diversity, water-retention ability, gas and nutrient cycles and can slow down the degradation of pollutants.

Land use by agriculture, for infrastructures and, in particular, urban sprawl has serious and often irreversible consequences for the environment. The creation of artificial surfaces leads to a decline in habitats, fragmentation of landscapes and a reduction in the space vital to many species. In Spain, these artificial surfaces have become particularly widespread around large cities and along the coast, as discussed in previous editions.

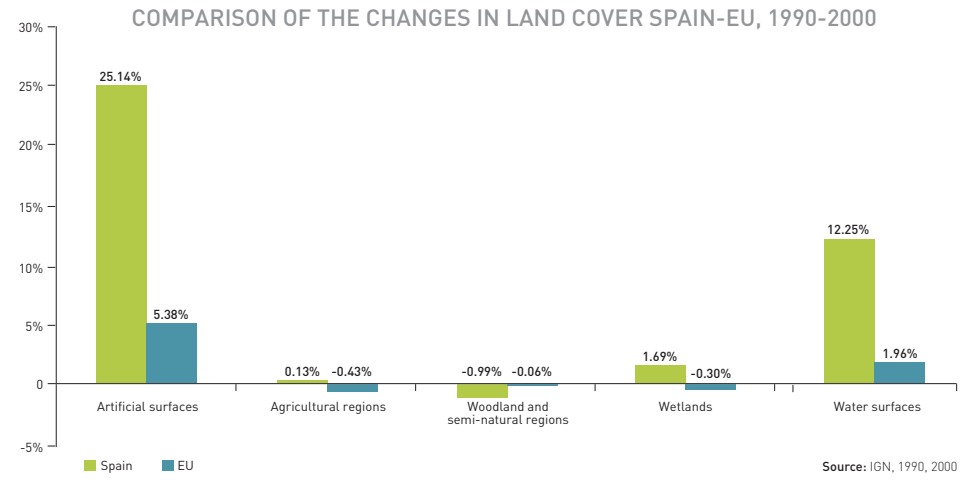
The European Corine Land Cover 2006 project was in its final stages as this edition was being prepared, therefore as its findings are still provisional, we limit ourselves to a comparison of the changes in land cover which occurred in Spain and Europe between 1990 and 2000, using data from the two previous Corine Land Cover surveys.

INDICATOR	GOAL	TREND
Soil cover	Achieve sustainable land use	Between 1990 and 2000, the artificial surfaces in Spain grew five times more than in Europe
Area affected by erosion	Hydrological and forest restoration	The majority of the land in the Autonomous Regions studied suffers from "moderate" erosion
Area at risk of desertification	Hydrological and forest restoration	Of the Autonomous Regions studied so far, Catalonia has the highest percentage of land affected by erosion

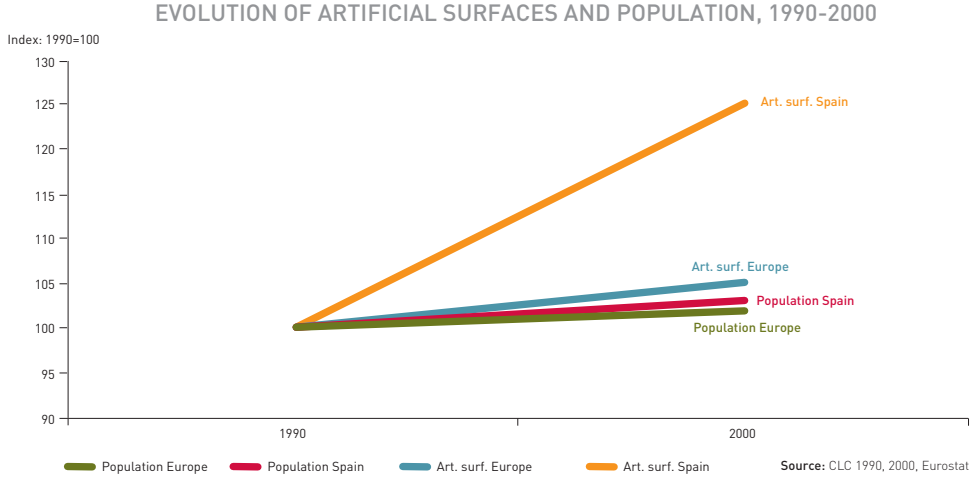
The National Soil Erosion Inventory continues to monitor the situation in Spain's various Autonomous Regions. On this occasion data for the Autonomous Region of Andalusia are added to those provided in the previous edition. The National Programme to Combat Desertification (August 2008) working document provides an overview of the proportion of land in danger of desertification for all Spain's Autonomous Regions.

Changes in land cover

The increase in artificial surfaces in Spain was five times greater than that in Europe



In the time period between the 1990 and 2000 Corine Land Cover (CLC) surveys, artificial surfaces in Europe increased by 5.38% (871,241 ha) from the value of 16,185,955 ha found in 1990. During the same period, artificial surfaces in Spain increased by 168,460 ha (25.14%) from the 669,993 ha found in 1990. Thus, slightly more than one out of every five hectares of new artificial surfaces created in Europe in that period was created in Spain.



The population of Europe increased from 462.3 to 472.2 million inhabitants between the first two CLC surveys, an increase of 2.13%. Artificial surfaces increased by 5.38% in the same period, slightly more than twice the population growth. The situation in Spain is significantly different: the population increased from 38.8 million in 1990 to 40.1 million in 200 (an increase of 3.15%), whereas artificial surfaces increased by 25.1%, almost eight times the population growth.

NOTES

- The CLC projects do not cover the entirety of some linear elements with a width of less than 100 m, such as roads and railways, despite their undeniable environmental impact.

The artificial surfaces considered as such in CLC 2000 were those in the following categories:

- urban regions
  - continuous urban networks
  - discontinuous urban networks
- commercial, industrial and transport-related zones
  - industrial or commercial zones
  - roads, railways and associated land
  - port zones
- mining and construction zones
  - mining zones
  - rubbish tips
  - zones under construction
- artificial green zones
  - urban green zones
  - sporting and recreational installations

- The following countries participated in Corine Land Cover 2000: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, San Marino, Slovenia, Slovakia, Spain, United Kingdom.

SOURCES

- National Geographic Institute, Ministry of Development. Corine Land Cover 1990 and 2000

MORE INFORMATION

- **http://www.ign.es**
- **http://europa.eu**

Areas affected by erosion

Erosion reduces the soil's ability to absorb and accumulate atmospheric carbon

Autonomous Regions	"Moderate" erosive processes (%)	"Medium" erosive processes (%)	"High" erosive processes (%)
Cantabria	59.91	22.39	17.70
Asturias	61.92	21.67	16.42
Navarra	65.64	18.79	15.57
Murcia	66.41	18.13	15.46
La Rioja	65.84	20.43	13.72
Galicia	74.34	13.06	12.61
Balearic Islands	76.62	13.69	9.70
Madrid	81.28	10.89	7.83
Catalonia	54.41	24.86	20.74
Extremadura	83.75	9.81	6.44
Canay Islands	69.25	21.86	8.89
Andalusia	57.61	19.76	22.63

Source: MARM



Soil erosion, in all its manifestations, can be considered one of the main processes contributing to the degradation of ecosystems in Spain, and has important environmental, social and economic implications. Erosion is also one of the main causes of desertification on both a regional and national scale. The indicator

expresses the proportion of land surface with respect to the total surface area in each Autonomous Region affected by different degrees of erosion.

This edition provides updated information for the twelve Autonomous Regions in which the National Soil Erosion Inventory, which is being drawn up by the Spanish Ministry of the Environment and Rural and Marine Affairs, has been published. This inventory is drawn up continually on a cyclical basis, every 10 years, with an accuracy equivalent to a scale of 1:50,000. Its execution period covers the years between 2002 and 2012 (when the second National Soil Erosion Inventory will be started). The information concerning land affected by sheet and rill erosion in these 12 Autonomous Regions is taken from studies performed between 2002 and 2008.

Soil erosion is defined as the removal of material from the land, on the surface or at shallow depths, through the action of water or wind. In any case a distinction must be made between soil erosion on a geological scale, a natural phenomenon which takes part in landscape modelling and which, on a human scale, is usually compensated by the rate of natural soil formation, and anthropic, or accelerated, erosion, which occurs due to the inappropriate use of natural resources by humans and has detrimental environmental, economic and social consequences and should therefore always be taken into consideration when planning the exploitation and management of these resources.

The following five factors are involved in water-based erosion: precipitation, soil, relief, plant cover and its management by man. The effects of soil erosion in one region have an impact on others. Eroded soils filter fewer pollutants and are less able to absorb the water needed to top up underground aquifers. Erosion also reduces the soil's ability to absorb and accumulate atmospheric carbon.

The presence of eroded soil in suspension in waterways can significantly affect aquatic flora and fauna. Its accumulation can block river beds, with a subsequent increase in the risk of flooding, or reduce the storage capacity of reservoirs, silting them up and reducing their hydraulic potential and their ability to generate hydroelectric power.

The proposed EU Directive on soil protection (which would modify Directive 2004/35/EC) proposes that States should identify those risk areas where conclusive proof or sufficient evidence is available to suggest that they are, or soon will be, at increased risk of soil degradation, such as erosion. After this identification process, the States should prepare a programme of risk-reduction measures, with an execution timetable and an estimate of the financing needed to undertake them.

NOTES

- The erosion considered here is that known as "sheet" and "rill". The percentages of land provided refer to the total geographic area of the Autonomous Region. The erodable area is that susceptible to erosion processes and is calculated by subtracting artificial surfaces, surface-water bodies and wetlands from the geographical area.

- The National Soils Inventory groups together the calculated soil loss by sheet and rill erosion into the following erosion levels:

1: 0-5 t/ha/yr	5: 50-100 t/ha/yr
2: 5-10 t/ha/yr	6: > 100-200 t/ha/yr
3: 10-25 t/ha/yr	7: > 200 t/ha/yr
4: 25-50 t/ha/yr	

- In this indicator, the soil-loss interval termed "moderate" is from 0 to 10 t/ha/yr, "medium" is from 10 to 25 t/ha/yr and "high" is more than 25 t/ha/yr.

- The difference with respect to the data contained in previous editions is the grouping of the area affected by erosion into three categories (high, medium and moderate erosive processes) rather than only two in the previous editions.

- The inventory is structured into five modules corresponding to different types of erosion:
  - Sheet and rill erosion (quantitative estimate of soil loss obtained by applying the RUSLE (Revised Universal Soil Loss Equation) model).
  - Gully and ravine erosion (identification and demarcation of affected areas).
  - Deep erosion (bulk movements) (identification of potential risk areas and their qualitative classification)
  - Stream erosion (qualitative classification of hydrological units according to their susceptibility to suffer flooding in their drainage network).
  - Wind erosion (identification and classification of potential risk areas).

SOURCES

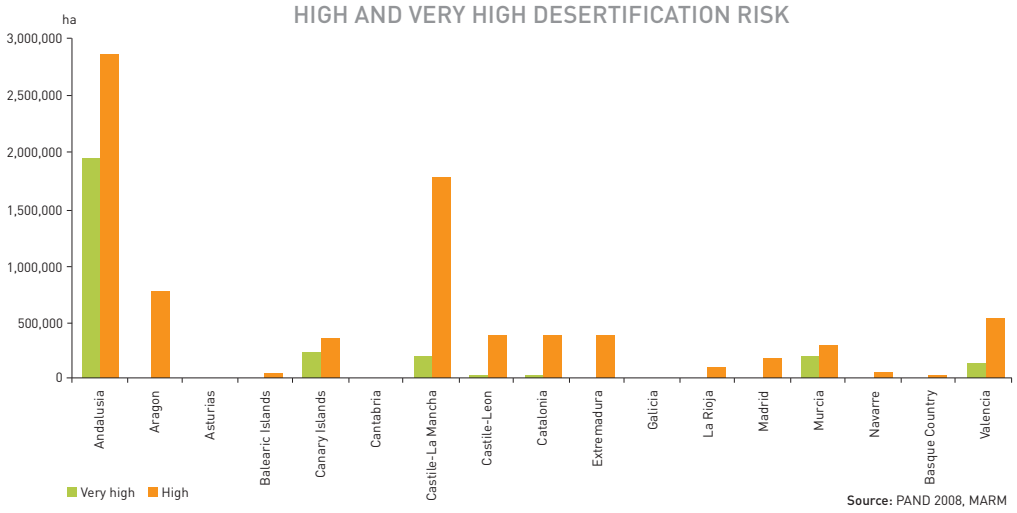
- National Soil Erosion Inventory 2002–2012. Secretariat General for Rural Affairs, Directorate General of the Environment and Forestry Policy. MARM.

MORE INFORMATION

- **http://www.marm.es**

Areas at risk of desertification

The National Programme to Combat Desertification has established both short- and long-term monitoring indicators



In arid or sub-arid climates, the combination of some of the threats to soil (erosion, loss of organic matter, local or widespread pollution, sealing, compaction, salinisation, etc.) can lead to desertification. The United Nations Convention to Combat Desertification (UNCCD) defines risk of desertification as the degradation of arid, semi-arid and dry sub-wetland regions as a result of factors such as climate change and human activity. Desertification has its origins in complex interactions between physical, biological, political, social, cultural and economic factors. Although land degradation has been noted all over the world, it is only considered to be "desertification" when it occurs in dry regions.

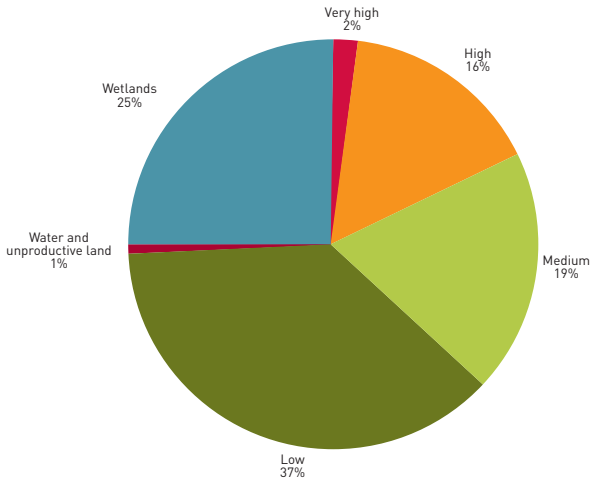
Desertification can also have a significant impact beyond the borders of those countries directly affected. Spain, like all EU member states, is a signatory to the United Nations Convention to Combat Desertification, and like Spain, most Mediterranean countries have begun to approve regional and national action plans. The Ministry of the Environment and Rural and Marine Affairs has incorporated the demarcation of areas at risk of desertification into the working document of the National Programme to Combat Desertification (PAND), August 2008. By identifying these areas, it will be possible to define the physical and socio-economic units in which policies need to be developed to combat desertification. The diagnosis of the situation in Spain considers qualitative aspects and provides a first approximation of

the distribution of desertification in this country. The following indicators have been used:

- Aridity index.
- Erosion: soil loss.
- Fires: percentage of accumulated land area affected by fire over 10 years.
- Over-exploitation of aquifers: the existence of over-exploitation problems.

The National Programme to Combat Desertification proposes two fundamental questions: to determine which areas are at risk of desertification, and what measures should be applied in these areas. The first of these goals shows that areas at serious risk (high or very high) of desertification cover 17.95% of Spain's surface.

DESERTIFICATION RISK, NATIONAL TOTAL



Source: MARM

The set of measures considered are taken from the following action groups:

- Agricultural activity, land use, regulation of water resources, soil conservation and forestry.
- Policy coordination (Spanish Sustainable Development Plan, Rural Development Programmes; Forestry Plan; National Hydrological and Forest Recovery Plan; Spanish Biological Diversity Conservation and Sustainable Use Plan; Irrigation Plan; National Climate Change Adaptation Plan).)

PAND has selected a series of environmental, social, economic and institutional indicators to identify and monitor desertification trends in Spain. Some of these allow

short-term trends to be detected (aridity and fires), whereas others, such as those related to erosion, over-exploitation of aquifers and soil coverage, require data to be collected over much longer time periods.

SOURCES

- Spanish National Action Programme to Combat Desertification. Directorate General for the Environment and Forestry Policy. MARM (Order ARM/2444/2008 of 12 August, BOE 19.08.08).

MORE INFORMATION

- http://www.marm.es



2.4 NATURAE & BIODIVERSITY



In 2002, the Strategic Plan from the Convention on Biological Diversity established 2010 as the target date for reducing the global loss of biodiversity. The EU had already committed to stopping this loss in its own territory in 2001. During this period Spain has begun to adopt measures to meet this goal, some of which can be assessed using the indicators discussed herein.

One very important initiative was the approval of Act 42/2007, of 13 December, on Natural Heritage and Biodiversity, which includes several instruments that are currently being developed.

The developments introduced by this Act include the concept of Marine Protected Area, the creation of the Catalogue of Habitats in Danger of Disappearance, the List of Wild Species under Special Protection and the Spanish Catalogue of Endangered Species (SCES). Other important instruments created by this Act include the Spanish Natural Heritage and Biodiversity Inventory and the Spanish Strategic Plan for Natural Heritage and Biodiversity.

In light of the results of the indicators considered herein, it should be noted that wooded areas continue to increase year after year and the phytosanitary status of these areas continues to improve.



INDICATOR	META	TREND
Protected nature areas	Increase and conserve the area protected to preserve Spain's natural wealth	Spain's protected area and the size of the Natura 2000 Network are increasing
Forest defoliation	Quantify forest defoliation and identify its causes	Damage to forests appears to be starting to decrease
Woodland surface area	Increase the surface area and quality of woodlands and other forest formations	Forest area is increasing in all Spain's Autonomous Regions
Cataloguing of endangered species in Spain	Include in the SCES those endangered species in greatest need for action to be taken	Taxons of groups containing the most emblematic species, such as mammals and birds, have largely been catalogued. Others (fish, amphibians and flora) have not yet received sufficient attention.
Trends in common bird populations	Determine trends in Spanish bird populations	Populations of common birds in woodlands are increasing, whereas those in agricultural environments are decreasing
Environmental monitoring	Prevent damage to the environment and reduce environmental offences	A decrease in the number of administrative offences has been noted

The area covered by the Natura 2000 Network increased slightly in 2007, mainly due to an increase in marine protected areas. Internationally, the inclusion of the Atlantic Islands of Galicia National Park in the network of Marine Protected Areas established by the OSPAR Convention (1992) for the protection of the NE Atlantic marine environment should be noted. As regards the inclusion of marine areas as Specially Protected Areas of Mediterranean Importance (ZEPIM), nine of the 21 such areas belong to Spain.

Seventy six percent of endangered mammal species are included in the SCES, which means that active measures are being taken to conserve them. The proportion for flora, invertebrates and other vertebrates, such as fish and amphibians, is lower. It has been noted that bird populations in agricultural environments have decreased, due above all to loss of habitat as increased agricultural use leads to more homogeneous surroundings.

As for the progress of the Spanish National Wetlands Inventory, it was established in 2006 with 23 wetlands in the Community of Madrid (BOE no. 275, of 17 November 2006) and in 2009 a further 117 wetlands from Andalusia were included (BOE no. 39, of 14 February 2009), which means that it currently contains 140 wetlands (118,253.59 ha). Inclusion proposals submitted by La Rioja (50 wetlands), the Basque Country (30 wetlands) and Extremadura (248 wetlands) are currently being considered, although it should be noted that the effective inclusion of these sites in the National Inventory is not immediate and various technical aspects must be agreed upon before inclusion.

Protected natural areas

Protected nature areas accounted for 11.63% of Spain's total land area in 2008

PNA'S AS A PROPORTION OF SPAIN'S TOTAL AREA (%)

1990	1994	1998	2001	2003	2004	2005	2007	2008
4.38	5.75	7.34	7.90	8.80	8.93	9.16	9.22	11.63

Source: Directorate General for the Environment and Forestry Policy. MARM.

PROTECTED SURFACE AREAS ACCORDING TO PROTECTION CATEGORY, 2008

PROTECETED AREA	PNA AND NATURA NETWORK 2000	PNA	NATURA NETWORK
Protected surface area [land] (ha)	13,767,118.64	5,888,346.19	13,490,396.74
Protected surface area [sea] (ha)	835,042.47	255,610.24	793,780.67
Total protected surface area (ha)	14,602,161.11	6,143,956.43	14,284,177.41
% Protected surface area [land]	27.20	11.63	26.65

Source: MARM.

The number of Protected Nature Areas (PNA) reached 1513 in 2008, covering a total area (land and marine) of 6,143,956 ha. This means that the proportion of PNA's with respect to total land area increased to 11.6%, although it should be noted that regions not included in previous years, such as the PNA's belonging to Catalonia's Areas of Natural Interest Plan (PEIN), have been included this year.

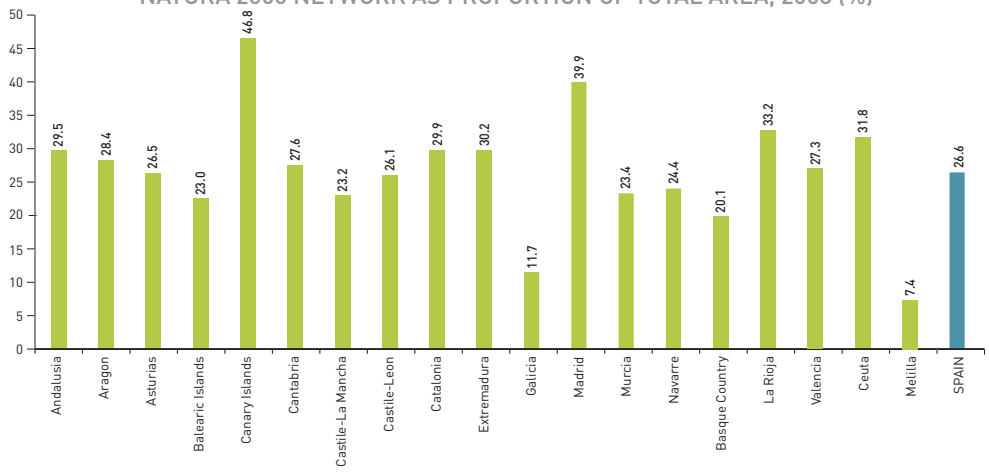
In 2008 27.2% of Spain's land area was protected as either a PNA or by inclusion in the Natura 2000 network. It should be noted, however, that a large part of the area declared as PNA also forms part of the Natura 2000 network, therefore the total protected area cannot be calculated simply by adding the two figures. It is also important to note that the area of the Natura 2000 network also does not correspond to the sum of the areas of the sites of community importance (SCI) and the special bird protection areas (SBPA) as there is also some overlap between these regions.

Thus, in 2008 the number of SCI's reached 1434, with a total surface area of 12,386,991 ha (11,605,544 on land and 781,447 at sea), with the land area accounting for 22.93% of the total for Spain; these figures are similar to those for the previous year.

Several new zones were designated as SBPA's in 2008 and the area of others was increased, thus making an important contribution to compliance with the requisites of the Birds Directive. In 2008 there were a total of 569 SBPA's covering 9,831,544 ha (9,604,863 on land and 226,681 at sea), which is 18.97% of the total land area.

A breakdown by Autonomous Region shows that those with the highest proportion of their territory included in the Natura 2000 network are, once again, the Canaries, with 46.8%, followed by Madrid (39.9%) and the Rioja (33.2%), whereas Galicia, with 11.65%, the Basque Country (20.10%), the Balearics (22.95%) and Castilla-La Mancha (23.16%) have the least.

NATURA 2000 NETWORK AS PROPORTION OF TOTAL AREA, 2008 (%)



Source: Subdirectorate General for Biodiversity. Directorate General for the Environment and Forestry Policy. MAR M

Note: The SBPA "ES0000085, RIBADEO" is shared by Galicia and Asturias, with Galicia being assigned 28% of the total surface area and Asturias the rest (72%).

NOTES

- The Natura 2000 Network is a European network of biodiversity conservation areas. It includes Special Areas of Conservation (SAC), designated in accordance with the Habitat Directive (Dir. 92/43/EEC), in addition to Special Bird Protection Areas (SBPA) established under the terms of the Birds Directive (Dir. 79/409/EEC). Its purpose is to ensure the long-term survival of Europe's most endangered species and habitats, thereby helping to halt biodiversity loss resulting from adverse human impact. Establishment of SACs requires an administrative process which begins with proposal of Sites of Community Importance (SCIs) by Member States, which, following assessment by the EU, may then be declared SACs.

- Under Spanish legislation, the Natural Heritage and Biodiversity Act 42/2007, of 13 December 2007, defines Protected Areas as "...any areas within Spain's national territory, including inland and marine waters (...) that meet at least one of the following requirements and are declared as such:
  a) Contain natural elements or systems that are representative, unique, fragile, endangered or of special ecological, scientific, natural, geological or educational interest.
  b) Are specifically intended to protect and maintain biological diversity, geodiversity and associated natural and cultural resources."

SOURCES

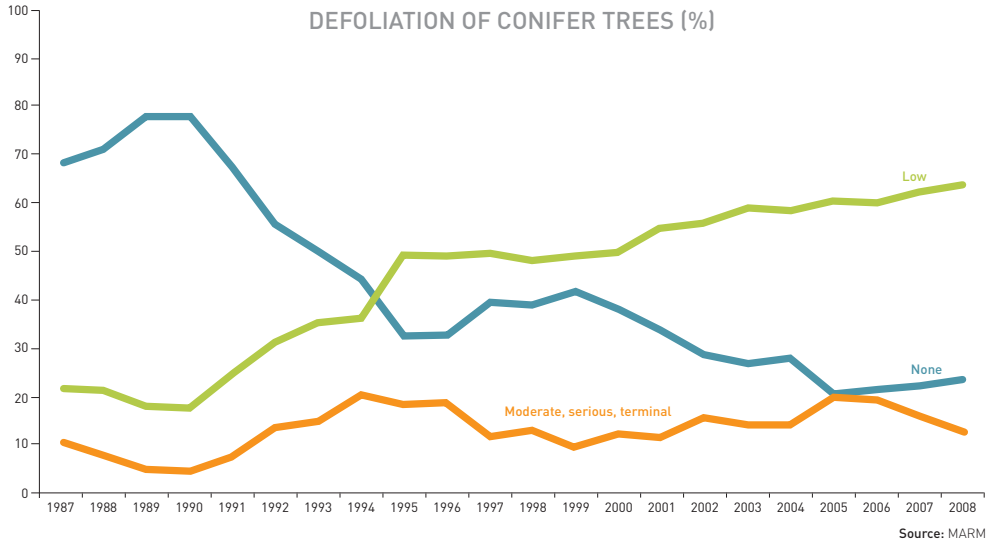
- PNA: Biodiversity Database. Subdirectorate General for the Natural Heritage and Biodiversity Inventory. Directorate General for the Environment and Forestry Policy. MARM.
- Natura 2000 network: Subdirectorate General for Biodiversity. Directorate General for the Environment and Forestry Policy. MARM.

MORE INFORMATION

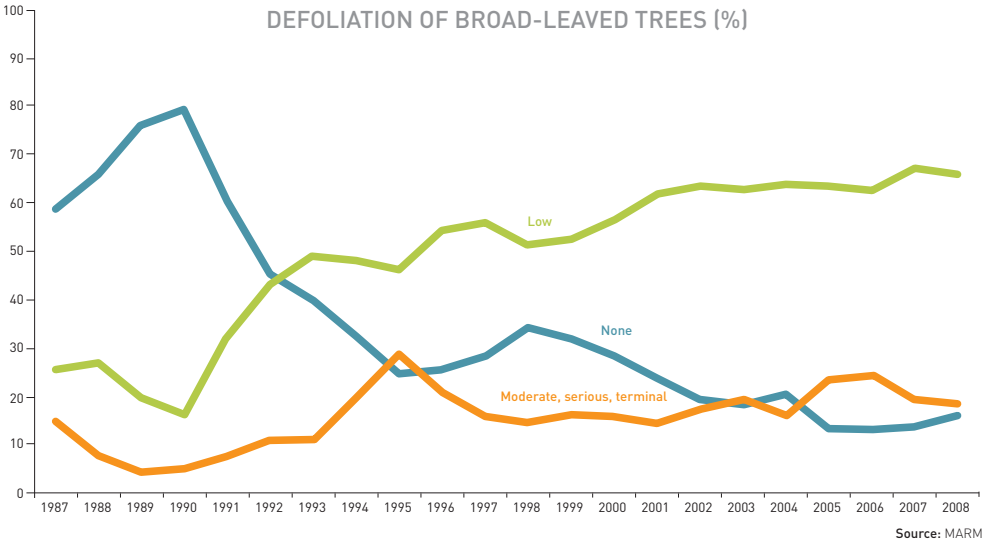
- **http://www.marm.es**

Woodland defoliation

The recent improvement in the general state of woodlands continues



Source: MARM

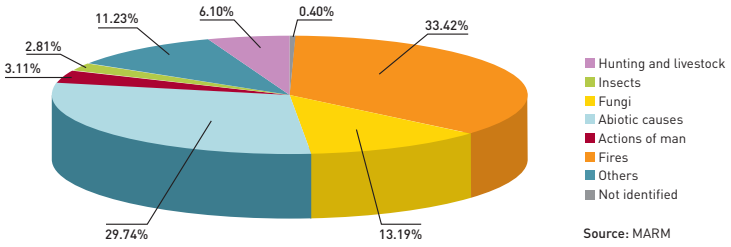


Source: MARM

An analysis of the data for Spain from the European Forest Monitoring Network shows that the state of those forests at points belonging to the Level I network continued to improve. This improvement was particularly evident in 2008 in coniferous woodland, with the proportion of measurements showing no or only slight defoliation increasing at the expense of those measurements showing moderate, severe or terminal defoliation,

which were at their lowest levels since 2002. For broad-leaved trees, the proportion of measurements showing no defoliation has increased and those showing moderate, severe or terminal defoliation have decreased.

CAUSES OF FOREST DAMAGE (2008)



Source: MARM

The causes of forest damage in 2008 were similar to those observed in 2007 and were found in the same order of importance, with insect damage accounting for 33%, abiotic causes 29% and fungal attack 13%.

NOTES

- Forest defoliation is the process by which a plant species loses its leaves as a result of pathological or climatic stress that provokes the premature or abnormal fall of its leaves. The degree of forest defoliation indicates a forest's state of health. It is analysed in terms of foliage loss from the tree crown at a series of sampling points, with the results being classified into the following categories:

Loss of needles/leaves	Degree of defoliation
0 – 10%	None
10-25%	Low
> 25%	Moderate, serious or terminal

- Under the International Co-operative Programme on the Assessment and Monitoring of Air Pollution Effects on Forests, the European ICP Forests (Level I) network is an international large-scale systematic network consisting of more than 5700 monitoring points distributed on a 16 x 16 km grid covering all of Europe which was begun in 1986 from a randomly chosen starting point. This network analyses the health status of woodlands, and the main factors that act negatively on it, on an annual basis. The Spanish network currently includes 620 sampling points. Furthermore, and within the framework of the previous Forest Focus EC Regulation and the current Life+ financial instrument, its design allows for monitoring of other issues, such as the effects of climate change on forests, sustainable management and preservation of forest biodiversity.

SOURCES

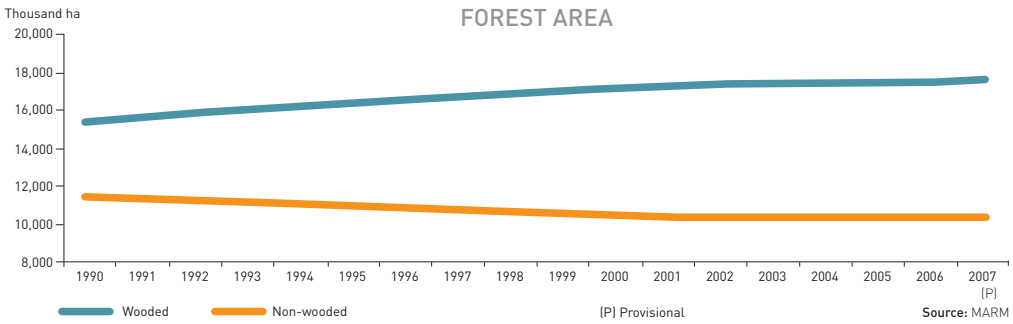
Protection Against Harmful Agents Service Data Centre (CENDANA). Directorate General for the Environment and Forestry Policy. MARM.

MORE INFORMATION

- Forest Health Yearbook 2007. Protection of Mountains Against Harmful Agents Service. Directorate General for the Environment and Forestry Policy. MARM, 2008.
- **http://www.marm.es**
- **http://www.icp-forests.org**

Woodland surface area

Spanish woodland continues to increase. The wooded surface area, which consists of forests and unforested mountains, could account for 56% of Spanish territory by 2010

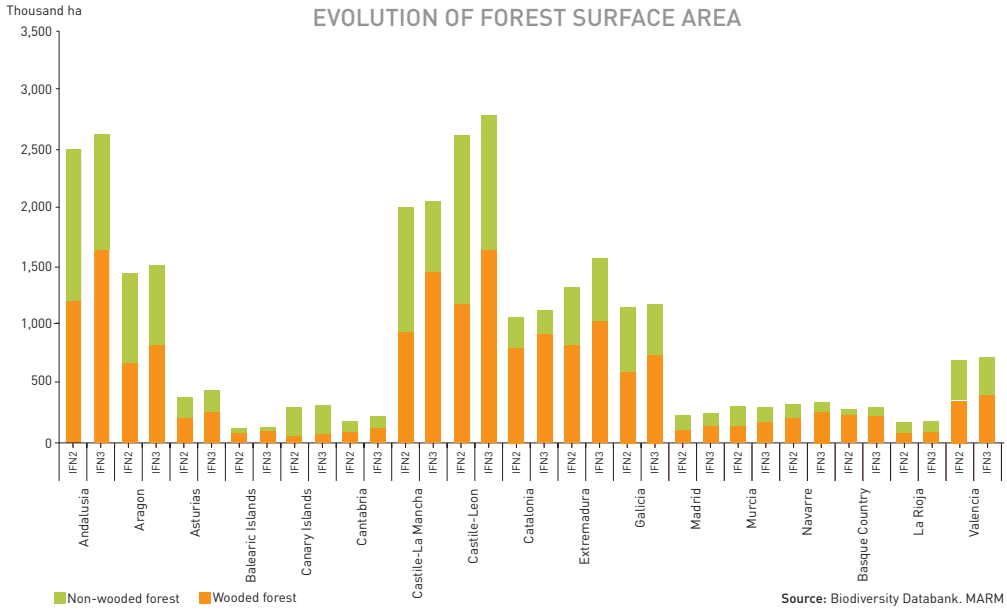


The forested surface area in Spain covered by forests and other woodland formations is estimated to reach 27,747,680 ha by 2010, according to the methodology used by the Ministry of the Environment and Rural and Marine Affairs to calculate the forested surface area year on year. This methodology uses both the Forest Map of Spain and the National Forest Inventory along with the annual repopulation and forest fire figures.

In 15 years (1995-2010), the forested surface area or that covered by woodland has increased by 6.55% at the expense of both unforested mountains, whose surface area decreased by 2.86%, and the surface area dedicated to agriculture and livestock farming.

According to the results of the Third National Forest Inventory (IFN 3), all Autonomous Regions experienced an increase in their forested surface area, with this increase being particularly significant in Extremadura (19%) and the Canaries (16%) with respect to the Second National Forest Inventory (IFN 2). Only Murcia showed a decrease in forest surface area, particularly non-wooded forest. As for the wooded forest area, the increases observed in Castilla-La Mancha (57%) and the Balearics (52%) in IFN 3 with respect to IFN 2 are significant.

EVOLUTION OF FOREST SURFACE AREA



Source: Biodiversity Databank. MARM

NOTES

- The Spanish National Forest Inventory is a statistical survey intended to obtain the maximum amount of information possible about the status, ownership, protection, nature, legal circumstances, probable evolution and productive capacity of Spain's forests. It operates at a provincial level and, as it is a continuous inventory, the same measurements are taken across the whole country every 10 years.
- The First Spanish National Forest Inventory (IFN 1) was taken over the period 1966-1975. The Second Spanish National Forest Inventory (IFN 2) was taken between 1986 and 1996 and produced higher quality, more extensive and more user-friendly results than its predecessor. The Third Spanish National Forest Inventory (IFN 3) 1997-2007 is almost complete, with provisional figures available for all of Spain's Autonomous Regions except Andalusia.

SOURCES

- Spanish National Forest Inventory. Subdirectorate General for the Natural Heritage and Biodiversity Inventory.
- Directorate General for the Environment and Forestry Policy. MARM.

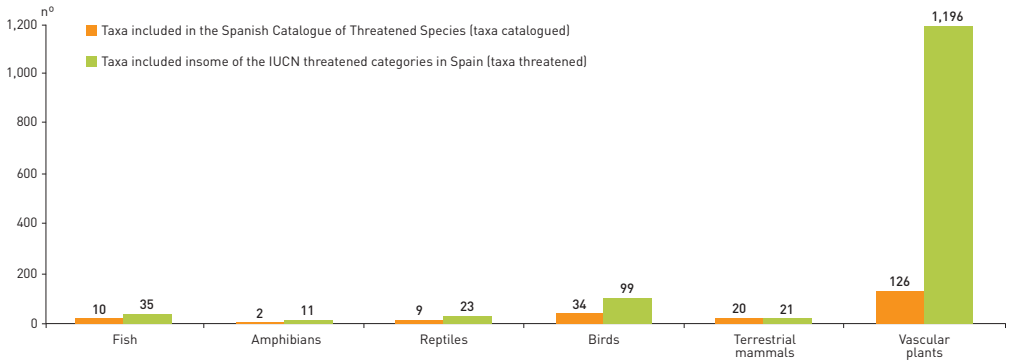
MORE INFORMATION

- **http://www.mma.es/portal/secciones/biodiversidad/inventarios/ifn**

Cataloguing of threatened species in Spain

Of the taxa considered to be endangered, 76% of the mammals, 25% of the fish, 18% of the amphibians and 10% of the flora are now included in the SCES

THREATENED AND CATALOGUED TAXONS (2008)

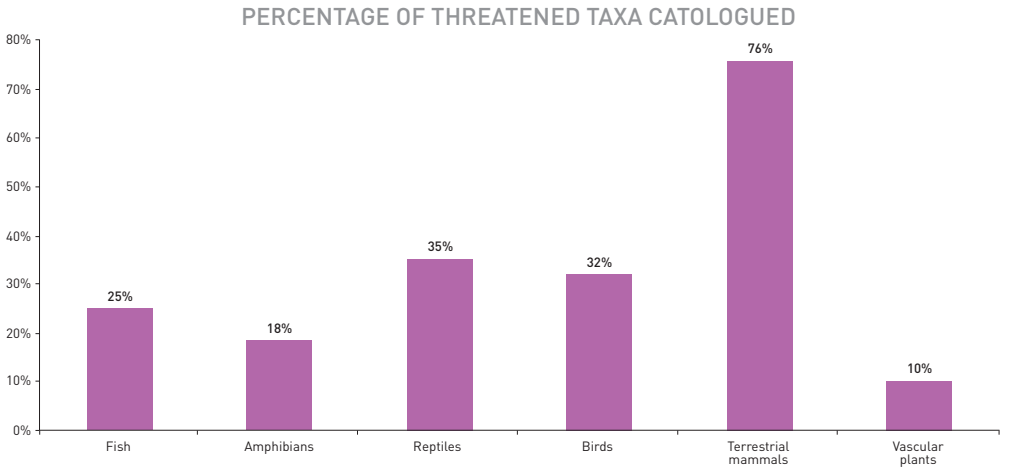


Source: MARM

THREATENED VERTEBRATE TAXA IN SPAIN (2007)

	NO. THREATENED TAXA	NO. THREATENED AND CATALOGUED TAXA
Fish	35	9
Amphibians	11	2
Reptiles	23	8
Birds	99	32
Terrestrial mammals	21	16
Vascular plants	1,196	123
TOTAL	1,385	190

Threatened taxa: Threatened taxa according to IUCN category (2001).
Threatened and catalogued taxa (2008) Threatened taxa according to IUCN category (2001) also included in the SCES.
Spanish catalogue of Threatened Species
Source: MARM.



Source: MARM

The Act 42/2007, of 13 December, regarding Natural Heritage and Biodiversity, established the legal framework to ensure the conservation of wild native species in Spain and the specific protection measures for those wild species which require special attention and protection, which are to be included in the List of Wild Species Under Special Protection. This list establishes the Spanish Catalogue of Threatened Species, which puts the taxa or populations in two categories: "In danger of extinction" or "Vulnerable". The aim of including a taxon in this catalogue is to be able to adopt active measures to help it overcome the threat to it.

Other instruments of a more scientific nature also provide information regarding conservation status. The most relevant of these are the Red Lists and Books. These are drawn up on the basis of internationally recognized and used quantitative criteria proposed by the International Union for the Conservation of Nature (IUCN), which allow the different threat levels to taxa to be classified. These criteria have been applied to the different taxonomic groups in Spain at a national level and the results published in the form of Red Books by the Ministry for the Environment and Rural and Marine Affairs as part of the National Biodiversity Inventory.

This indicator jointly considers the conservation status and cataloguing of vertebrate and vascular plant taxa in Spain and notes the percentage of those threatened species, sub-species and populations (in other words those included in any of the IUCN categories "critically endanger", "endanger" or "vulnerable) which are included in the Catalogue in any of the three categories still in force in 2008, namely "in danger of extinction", "sensitive to habitat change" and "vulnerable".

The results obtained allow a superficial assessment of the actual protection status of threatened species to be made at a national level. Excluding the terrestrial mammals,

the percentage of threatened taxa included in the Spanish Catalogue varies between 10% and 35% This figure is very low for vascular plants (10%), as are the figures for fish and amphibians (25% and 18% respectively), especially considering the need to conserve these groups due to the large number of endemisms. Birds and reptiles account for approximately one third of the threatened taxa catalogued. Finally, the percentage of threatened species catalogued is the most satisfactory for mammals (76%). The above clearly shows that, for the most part, those taxonomic groups containing emblematic species (mammals and birds) have been catalogued more than others such as vascular plants or amphibians.

Knowledge concerning the conservation status of invertebrates is still very patchy, therefore it has not proved possible to assess this status despite the Spanish Catalogue of Threatened Species currently including 42 species of invertebrates.

NOTES

- When interpreting this indicator it should be noted that some species are included in the SCES but not in the Red Lists or Books, and vice versa.
- Furthermore, when including taxa in the different threat categories on the basis of IUCN criteria, all taxonomic groups contain taxa that have not been assessed, as assessments have always been performed on those taxa for which evidence exists that they are the most threatened.
- The Red Lists and Books are drawn up on the basis of the IUCN categories 2001, version 3.1, which can be found at http://www.iucnredlist.org

SOURCES

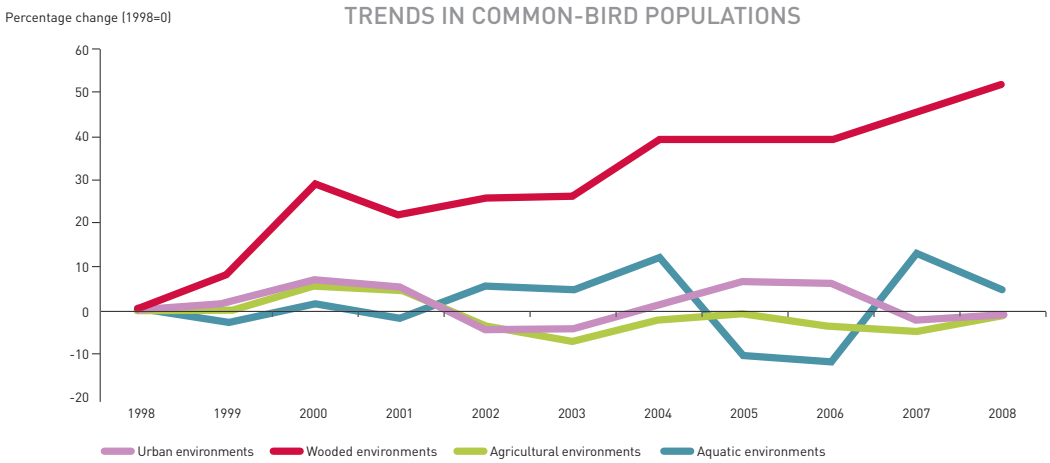
- Spanish National Biodiversity Inventory. Subdirectorate General for Biodiversity. Directorate General for the Environment and Forestry Policy. MARM.
- Spanish Catalogue of Threatened Species. Subdirectorate General for Biodiversity. Directorate General for the Environment and Forestry Policy. MARM.

MORE INFORMATION

- Atlas and Red Books for the flora and fauna in Spain. **http://www.mma.es/portal/secciones/biodiversidad/inventarios/inb/index.htm**
- IUCN World Red List. **http://www.iucnredlist.org**
- Spanish Catalogue of Threatened Species. **http://www.mma.es/portal/secciones/biodiversidad/especies_amenazadas/catalogo_especies/**

Trends in common-bird populations

The trend in bird populations in a forest environment shows a moderate increase, whereas those in agricultural environments have suffered a moderate decrease



Source: MARM and SEO/Birdlife

The trends in common-bird populations in Spain have been monitored for the past 10 years. Demographic data for more than a hundred breeding bird species are obtained for most of the country using a standardized census methodology. Detailed results are available for each species, which allows those species which share characteristics, such as presence in a certain type of habitat, migratory behaviour or trophic ecology, to be grouped together. This gives trend indicators which allow the conservation status of bird communities to be assessed and provide valuable information regarding the environments they inhabit.

Therefore, as shown in the graph below, the trend observed during the past decade can be summarized, depending on the type of environment where the birds live, using aggregate indices. Thus, it can be seen that urban bird populations have remained stable during this decade.

Woodland bird communities, however, have experienced a statistically significant increase in both Mediterranean (sclerophyllous) and Euro-Siberian (deciduous) woodland. This could be due to better forestry management together with their recovery in many regions due to the abandonment of agricultural land.

In contrast, the trend is negative for birds linked to agricultural environments, which have experienced a small but statistically significant decrease. It is interesting to note that this downward trend is also observed when the bird communities from the Mediterranean steppes (cereal crops), northern pasturelands and wooded agricultural environments (olive groves) are considered separately. These trends arise especially due to the intensification which has taken place in the agricultural world to increase the sector's competitiveness. This manifests itself as a homogenization of the environment and the loss of traditional land uses, with the subsequent increase in *inputs* (herbicides and fertilizers) to the fields. Thus, the birds lose habitat and trophic resources. Fragmentation has had a significant effect on the communities living on natural steppes.

Bird populations which live in aquatic environments have remained stable, which is a sign that the new guidelines and uses are correcting past mistakes which affected these environments and birds negatively.

Finally, it should be noted that the analysis of other aggregate indices shows that the populations of non-migratory and migratory (both pre- and trans-Saharan) have also remained stable. Analysis of the communities by feed type shows that insectivorous birds have remained stable, whereas granivorous birds have experienced a moderate but significantly significant decline.

NOTES

- Trend indicators are used internationally in the framework of the Biological Diversity Agreement and have been adopted by the EU in its SEBI 2010 programme to assess compliance with the 2010 target date (in other words, to stop loss of biodiversity within the EU and reduce this loss on a global scale by 2010).
- In this case it is a multi-species indicator regarding the size evolution of bird populations associated with urban, woodland, agricultural and aquatic environments expressed in terms of relative abundance.
- Within each group, the annual relative abundance index is calculated for each species, which allows its population between 1998 and 2008 to be determined. The multi-species index is obtained from the average of the relative abundances of the species weighted according to the frequency of their appearance during sampling.
- This sampling is performed annually on the basis of 10x10 km UTM grids for both the mainland and Balearics. There are currently more than 800 such grids, which cover 7-8% of the country's surface area.
- Grouping of bird communities whose population trends are monitored using this indicator:

By habitat	Urban	
	Woodland	Eurosiberian
		Mediterranean
	Agricultural	Grain
		Northern
		Arboreal
	Aquatic	
By migratory behaviour	Non-migratory birds	
	Migratory birds	Pre-Saharan
		Trans-Saharan
By food type	Granivorous birds	
	Insectivore birds	

SOURCES

- Subdirectorate General for Biodiversity. Directorate General for the Environment and Forestry Policy.
- SEO/Birdlife.

MORE INFORMATION

- **http://www.seo.org**
- **http://www.marm.es**

Environmental surveillance

In 2008 there were a reduction in the number of administrative offences was reported, although criminal offences increased by 7,9% in relation to the previous year

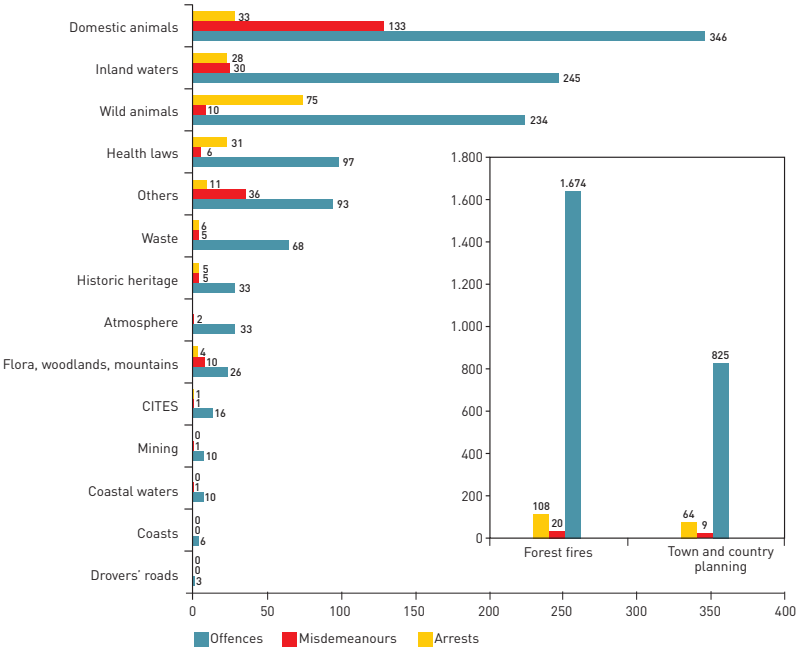
ENVIRONMENTAL OFFENCES REPORTED BY THE CIVIL GUARD

		2003	2004	2005	2006	2007
Offences	Criminal	3,047	3,358	5,028	3,701	3,993
	Administrative	150,218	164,118	157,492	150,151	131,472
Arrests		386	465	883	930	366

Source: Produced on the basis of data obtained from SEPRONA
Note: Only actions related to the environment are included.

The number of administrative offences reported by the Civil Guard's Nature Protection Service (SEPRONA) has been dropping since 2004, with the decrease between 2006 and 2007 being 12.4%. Criminal offences increased slightly in 2007 with respect to 2006.

ENVIRONMENTAL CRIMES AND ARRESTS, 2006



Note: "Others" refers to environmental actions not undertaken by SEPRONS.
Source: Produced on the basis of data obtained from SEPRONA

Forest fires continue to head the list of most committed offences, a long way ahead of land-use planning offences in second place. Third place is occupied by offences against domestic animals, just ahead of those committed in inland waters and against wild animals.

When assessing these figures it should be noted that inspection campaigns are occasionally undertaken in certain areas, which inevitably leads to an increase in offences recorded in these areas.

The number of arrests made in 2007 decreased by 60% with respect to 2006. This significant decrease is due in large part to the drop in arrests due to land-use planning offences, which have decreased from 337 in 2006 to 64 in 2007.

NOTES
- To calculate this indicator, in this edition only those actions by the Civil Guard related to the environment have been included; SEPRONA's actions unrelated to the environment have been omitted.

SOURCES
- Civil Guard Public Information Office. Directorate General for the Police and Civil Guard. Ministry of the Interior.
- Nature Protection Service (SEPRONA). Directorate General for the Police and Civil Guard. Ministry of the Interior.

MORE INFORMATION
- http://www.guardiacivil.org

2.5 WASTE



Waste generation and management is a serious environmental problem in modern society. Decreased waste generation and its appropriate management are necessary to avoid serious environmental impacts, which lead to pollution of ecosystems and affect human health. When waste is managed correctly, however, it becomes a resource which contributes to the preservation of raw materials and the conservation of natural resources, and therefore sustainable development.

Spain has approved several National Plans covering different waste categories and contaminated land over the past few years. The new National Integrated Waste Plan 2008-2015 (PNIR, Plan Nacional Integral de Residuos), approved by the Council of Ministers in December 2008, is intended to serve as a guide for the development of specific policies to improve waste management by reducing its generation and promoting its correct treatment.

This Plan establishes specific waste reduction, reuse, recycling, assessment and elimination targets and covers the treatment of household waste, specific waste, contaminated land and some non-hazardous agricultural and industrial waste. It also includes a Biodegradable Waste Discharge Reduction Strategy, which in compliance with legal requirements, will help to prolong the life of landfill sites, reduce their environmental



impact and, in particular, reduce the emission of greenhouse gases. As well as taking into account the contribution of waste to climate change, reducing the proportion of Spanish waste that ends up in landfill sites is also an important goal of the NIWP. To achieve this, it proposes measures to promote waste reuse as well as the implementation of selective collection.

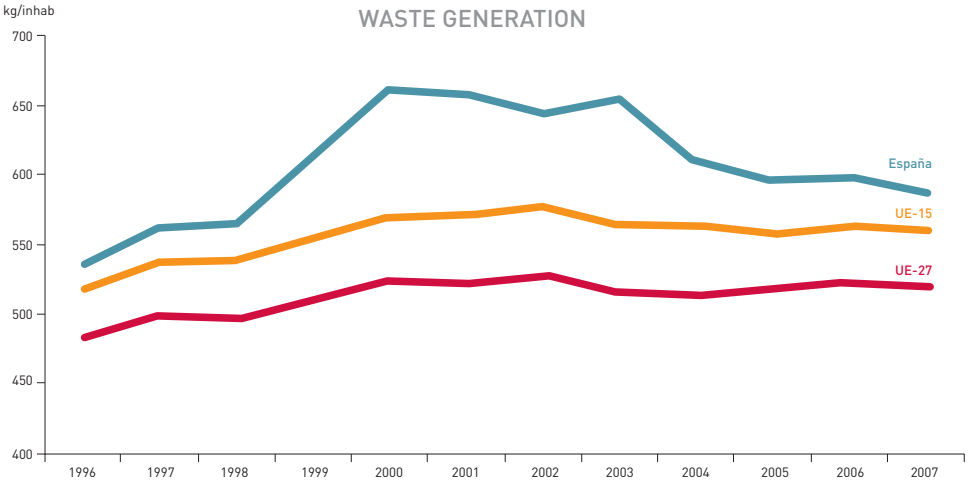
In Spain, as in other European countries, waste generation has increased alongside economic growth. Information regarding the generation and management of waste is

INDICATOR	GOAL	TREND
Urban waste generation	Minimise production	The amount of urban waste produced per person has decreased since 2003
Urban waste management: landfill and incineration	Increase recycling and reduce the quantity of waste ending up in landfill sites	The amount of waste per person reaching landfill sites decreased in 2007. Incineration is continuing to increase
Paper-cardboard recycling	Increase recycling rate	Collection and recycling of paper-cardboard waste continues to increase
Glass recycling	Increase recycling rate	Glass recycling continues to increase
Packaging waste recycling and recovery	Increase recycling rate	The recycling and recovery rate is approaching the targets set by Royal Decree 252/2006
Sewage sludge production and disposal	Increase sewage sludge reuse	67.7% of sludge is used by the agricultural sector

particularly important for planning both treatment infrastructure needs and for setting realistic targets for improving waste management. This chapter presents a series of indicators that help progress towards such a quantification of waste in Spain and contribute to the greater knowledge and awareness required to enable effective responses to the issues raised.

Urban waste generation

According to Eurostat, urban waste generation in Spain began to trend downwards in 2003



Source: Eurostat (provisional data for 2007)

The provisional 2007 data from Eurostat indicate that Spain generated 588 kg of urban waste per person, a much lower amount than the average for 2000 (662 kg/person), which was the highest value for the period 1996-2007. The most significant aspect of the overall trend is that, after an initial increase, a continual decrease in the amount of urban waste generated per person was initiated in 2003.

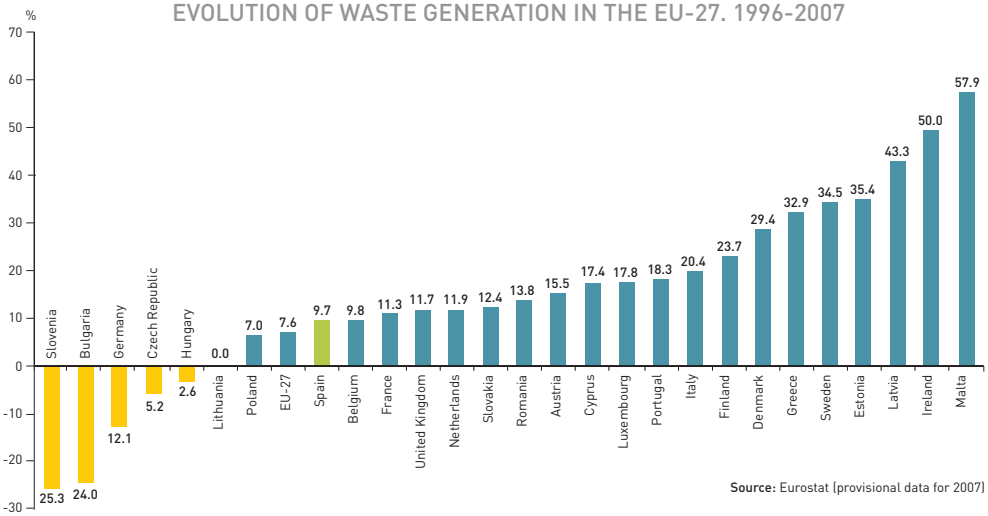
In comparison with the EU, during the period under consideration both the EU-15 and the EU-27 produced less urban waste per person, although without significant decreases in the past few years. The absolute figures show that in the period 1996-2007, Spain appears in ninth place in the list of countries with the smallest increases in urban waste generation (only 9.7%), a figure that is slightly higher than the EU-27 average (7.6%). Only five countries (Slovenia, Bulgaria, Germany, Czech Republic and Hungary) reduced their urban waste production in this period, whereas it increased in the other 21 countries (waste production in Lithuania did not change between these two dates).

A comparison of the amount of urban waste generated per person in Spain with that generated in other EU countries shows that in 2007 Spain was in 8th position in the EU-27, behind Denmark (801 kg/person), Ireland (786 kg), Cyprus (754 kg),

Luxembourg (694 kg), Malta (652 kg), Holland (630 kg) and Austria (597 kg). The average for the EU-27 in 2007 was 522 kg/person.

According to figures from the National Institute of Statistics (INE), in 2006 urban waste management companies collected 28.4 million tonnes of waste, 1.3% more than in the previous year. The majority of this amount (21.8 million tones) corresponded to mixed waste, whereas the remaining 6.6 million tonnes were selective collection. According to the same source, the Balearic Islands and Ceuta and Melilla (together) had the highest values, with 630 and 609 kg/person, respectively. At the other extreme, Catalonia and Galicia generated only 441 kg/person.

EVOLUTION OF WASTE GENERATION IN THE EU-27. 1996-2007



Source: Eurostat (provisional data for 2007)

As discussed in previous editions, the Ministry of the Environment and Rural and Marine Affairs (MARM) also collects information concerning urban waste generation, although its figures are notably different to those provided by the NIS compiled from "waste collection and treatment surveys", which is the source used by Eurostat. It should be stressed, however, that the INE uses a completely different statistical methodology to that used by MARM, which obtains information on domestic urban waste and excludes flows of some specific waste. However, both institutions are working together to establish joint criteria to avoid such differences. The figures for urban waste generated per person from both sources are given below:

COMPARISON OF URBAN WASTE GENERATION DATA (kg/person)

	2005	2006	2007
MARM	507	529	521
Eurostat	597	599	588

Source: Eurostat and MARM

NOTES

- The indicator shows municipal waste generation, expressed in kilograms per person (kg/person) and refers to waste collected by municipal services, or by similar services contracted by local councils, destined for the waste management system. The majority of this waste flow comes from homes, although waste from related sources, such as shops, offices and public institutions, are also included.
- According to the Waste Act 10/1998, 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 above-mentioned places or activities and that is not classified as hazardous".
- Mixed waste is defined as waste and household fittings generated by private households, shops, offices and service businesses, or during cleaning of public highways.
- Selectively collected waste is the result of differential collection of fermentable organic matter and recyclable material, as well as any other differential collection system which allows the separation of recoverable material contained in waste.
- Annual waste generation per person per year is calculated by dividing annual waste collected by the estimated population for each year according to NIS data (1991 and 2001 population censuses and intercensal estimates for the remaining years). The seasonal tourist population is not included.

SOURCES

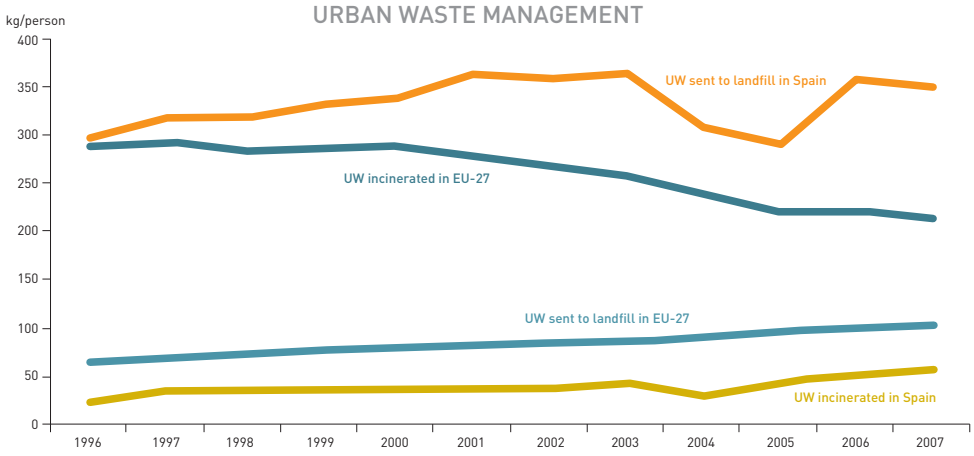
- National Institute of Statistics. Press release of 28 December 2008, regarding the "Survey on Waste Collection and Treatment. Year 2006".
- Eurostat. See web page: Eurostat/ Statistics/ Environment/ Main tables/Waste statistics. http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/introduction

MORE INFORMATION

- **http://www.marm.es**
- **http://www.ine.es**
- **http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes**

Urban waste management: landfill and incineration

The amount of waste per person sent to landfill sites decreased once again in 2007 after the increase seen in 2006, and waste incineration continued to rise



Source: Eurostat

The amount of urban waste per person sent to landfill sites grew from 1996 to 2001, stabilised between 2001 and 2003 (at around 360 kg/person) and decreased sharply between 2003 and 2005 from 364 kg/person to 292 kg. However, 2006 saw a significant increase to 358 kg/person, although the amount decreased again in 2007.

The use of landfill sites as a waste management system places Spain in sixth position in the EU-27 in the ranking of countries where landfill use is increasing the most. Between 1996 and 2007 the amount of urban waste per person sent to landfill grew 17.4%, whereas the EU-27 average decreased by 26%. In this context, the decrease observed in Germany (98.7%) and other countries such as Holland, Belgium and Sweden (more than 80%) during the same period is notable. In 2007 Spain was seventh in the ranking of EU-27 countries that send the most urban waste per person to landfill (350 kg/person). The EU-27 average was 214 kg/person, with Germany, Belgium, Sweden and Denmark sending less than 50 kg/person to landfill.

Waste incineration is another means of eliminating waste that also provides a benefit in terms of energy generation. A total of 58 kg/person were incinerated in Spain in 2007, which is rather low when compared with the EU-27 average (104 kg/person) and the figures for countries such as Denmark (427 kg/person) or Luxembourg,

Sweden and Holland (more than 200 kg/person). Nevertheless, use of this elimination method has increased faster in Spain than essentially any other EU country, with Spain's growth of 132.0% bettered only by Austria (233.3%) and Italy (148.1%).

The results of the waste collection and treatment survey undertaken by the NIS show that in 2006 6.8% of mixed was sent for recycling, 16.7% was sent for composting and 76.5% was eliminated.

URBAN WASTE TREATMENT 2006 (%)

Type of waste	Recycling	Composting	Elimination
Mixed	6.8	16.7	76.5
Selectively collected	49.5	20.2	30.3

Source: INE

According to the same source, the amount of selectively collected urban waste increased in Spain in 2006 to 22.1 kg/person of paper and cardboard, an increase of 18.9% with respect to the previous year, and 12.6 kg/person of glass, an increase of 11.7% with respect to 2005.

By Autonomous Region, the largest amounts of selectively collected paper and cardboard were obtained in the Balearic Islands (66.3 kg/person), the Basque Country (39.3 kg) and the Canary Islands (39.3 kg), whereas the highest amounts of glass were collected in the Balearic Islands (23.3 kg/person), Navarra (21.9 kg), the Basque Country (19.7 kg) and La Rioja (19.1 kg).

As is the case with information regarding urban waste generation, MARM also makes figures available concerning this waste's final destination. As discussed for the previous indicator, the differences between the estimates from INE (sent to Eurostat) and MARM are due above all to methodological considerations such as the fact that MARM takes into account household urban waste and excludes other specific waste flows. As can be seen in the table below, the amounts of urban waste sent for landfill and incinerated are rather different, although work is underway to homogenise the two systems (INE and MARM) in order to provide a single figure.

COMPARISON OF URBAN WASTE MANAGEMENT DATA (KG/PERSON)

		2005	2006	2007 (provisional)
Landfill	MARM	333.2	358	356.1
	Eurostat	292	358	350
Incineration	MARM	43.4	45.3	42.3
	Eurostat	44	54	58

Fuente: Eurostat y MARM

NOTES

- This indicator indicates the relationship between the amount of waste treated in the different destinations and the population of Spain each year, which must be taken into account to interpret this indicator correctly. A combination of moderate increases in the amount of waste treated and higher increases in population can lead to a decrease in this ratio, whereas a decrease in the amount of waste treated together with a large population decrease can lead to an increase in the ratio.
- See notes for the previous indicator.

SOURCES

- National Institute of Statistics. Press release of 28 December 2008, regarding the "Survey on Waste Collection and Treatment. 2006".
- Eurostat. See web page: Eurostat/ Statistics/ Environment/ Main tables/Waste statistics. http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/introduction

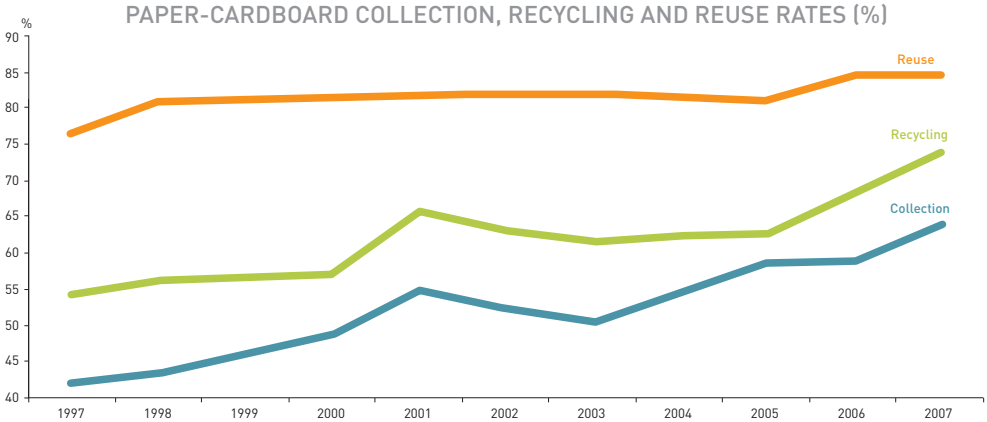
MORE INFORMATION

- **http://www.marm.es**
- **http://www.ine.es**
- **http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes**

Paper-cardboard recycling

Recovery of paper-cardboard increased to 4.9 million tonnes in 2007 with respect to the 4.6 million tonnes in the previous year

PAPER-CARDBOARD COLLECTION, RECYCLING AND REUSE RATES (%)



Source: ASPAPEL

In 2007 Spain was the sixth largest paper manufacturer in the EU behind Germany, Finland, Sweden, Italy and France. Furthermore, paper consumption in Spain went down along with the overall economic situation. According to the Spanish Association of Pulp, Paper and Cardboard Manufacturers (ASPAPEL), in 2006 Spain was in 24th position in the worldwide list of paper consumers (176 kg/year), far behind other countries such as Luxembourg (480 kg/year), Belgium (361 kg/year), Finland (330 kg/year) and the USA (301 kg/year).

The Spanish paper industry leads the EU in terms of recycling by recycling all the used paper recovered in Spain and importing almost one million tonnes more from other countries. Around 19% of the paper used cannot be recovered for recycling as it is either saved or its use means that it degrades or is destroyed.

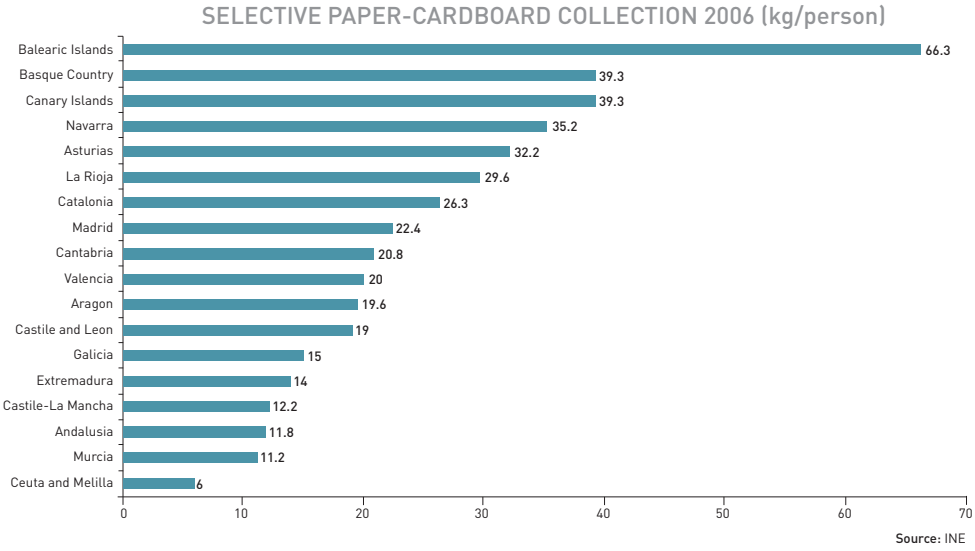
Recycling allows a better use of natural resources and means less waste, less landfill sites and a reduction in greenhouse gas emissions.

According to ASPAPEL, the recovery rate of 50.5% in 2003 has increased steadily to reach 63.9% in 2007, close to the EU average. In the period 2004-2007 the amount of paper recovered increased by 34.9% from 3.6 million tonnes to 4.9 million.These 4.9 million tonnes per year of used paper and cardboard collected for recycling in Spain signify a saving in landfill volume equivalent to 49 large football grounds and

avoid the emission of 4.1 million tonnes of CO_2 from landfill sites (more than 1% of Spain's total emissions).

The recycling rate of 61.6% in 2003 increased between 2004 and 2007 to 73.7%. These figures place Spain above the EU average and as one of the leading countries alongside Austria, Sweden and Germany. The volume of paper recycled in 2007 reached 5.7 million tonnes, 5.7% more than in 2006. The large amounts of money invested in new installations have allowed this increased recycling capacity over the past few years. The reuse rate (84.6% in 2007) has remained steady over the last decade.

According to the INE, the breakdown by Autonomous Region for 2006 shows the highest amounts of paper and cardboard for recycling were collected in the Balearic Islands (66.3 kg/person), followed by the Basque Country (39.3 kg), the Canary Islands (39.3 kg) and Navarra (35.2 kg), whereas the lowest amounts were collected in Ceuta and Melilla (6.0 kg/person), Murcia (11.2 kg) and Andalusia (11.8 kg). The increase observed in the national average for selective collection from 17.9 kg/person in 2005 to 22.1 kg/person in 2006 is a sign of increasing public interest and awareness in recycling and environmental conservation.



Source: INE

NOTES

- The reuse rate is calculated as the ratio between the amount of paper recovered and the paper produced and is expressed as a percentage.
- The collection rate is estimated from the ratio between the amount of paper recovered and the paper and cardboard consumed and is expressed as a percentage. Used paper and cardboard are recovered for recycling by various means: industrial collection (companies, publishing houses, printers and large retail outlets), selective collection (blue containers and door-to-door collection from small retailers) and special collection (offices, public buildings, recycling points, etc.). After being cleaned and sorted into different grades, the recovered paper is used as a raw material by the paper- making 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.
- The recycling rate for paper-cardboard waste is calculated as the ratio between recovered paper and apparent consumption of paper and cardboard. Apparent consumption is calculated by adding the amount imported to the amount produced and then deducting exports.

SOURCES

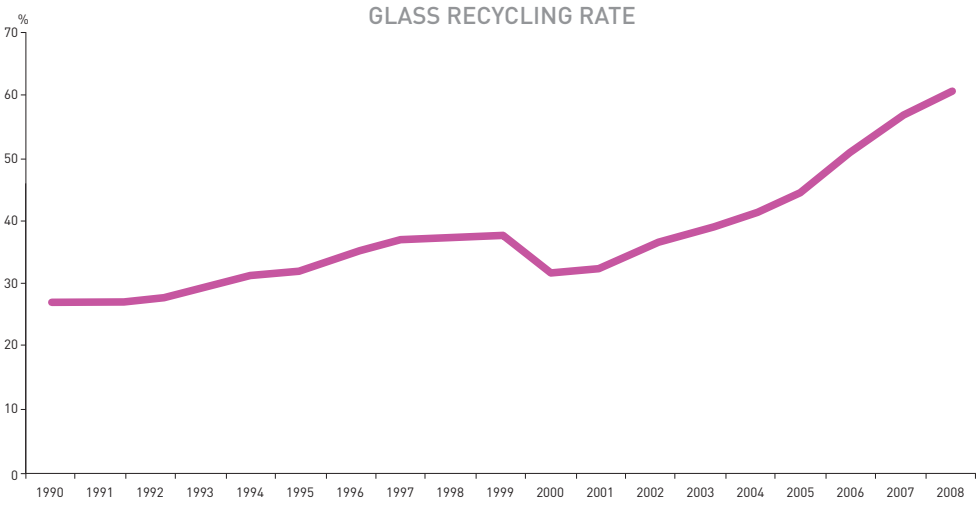
- Spanish Association of Pulp, Paper and Cardboard Manufacturers (ASPAPEL). "Sustainability Report". Various years.
- ASPAPEL, 2008: Summary of the latest statistics on the sector (see website).
- REPACAR. Spanish Paper and Cardboard Recycling Association. Activities Report 2007.

MORE INFORMATION

- http://www.marm.es
- htpp://www.aspapel.es
- htpp://www.ine.es
- htpp://www.repacar.org

Glass recycling

The glass recycling rate in 2008 (60.3%) exceeded the target established by Directive 94/62/EC



Source: Ecovidrio

The advantages of glass recycling can be seen in both the benefits derived from conserving the environment and the fact that the properties of glass mean that it can be recycled completely (thereby reducing the need to extract raw materials), it maintains these properties after recycling, and therefore can be recycled continually, and saves the energy that would otherwise be used to manufacture new packaging.

In 2008, the total amount of glass recycled reached 972,658 tonnes, an increase of more than 9% on the previous year, with a recycling rate of 60.3%. This means that the minimum 60% recycling rate established by the Directive 94/62/EC of the European Parliament and the Council, on packaging and packaging waste, has been exceeded.

Spending on raising consciousness and the ever-increasing public awareness mean that, according to data from Ecovidrio's Integrated Management System, 14% more glass packaging was recycled in 2007. A further 80,362 tonnes were deposited in containers (576,968 tonnes in 2006 vs. 657,330 tonnes in 2007), in other words the amount recycled has increased to 14.5 kg/person from the 12.9 kg recorded in 2006.

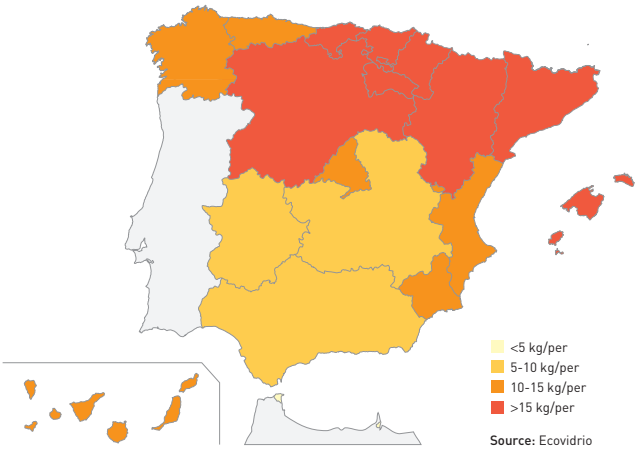
An analysis of the evolution of glass recycling over the past five years shows that almost 50% more glass is now recycled (10.1 kg/person in 2003 vs. 14.5 kg in 2007).

This is a sign that the public has assumed glass recycling as an everyday occurrence.

In 2006, the number of containers in Spain stood at 136,689, or one container for every 327 people. In 2007, these figures rose slightly to 151,000 containers, or one container for every 299 people. This latter figure means that Spain is still the European country with most containers per person.

The Autonomous Regions which increased their collection rates most with respect to 2006 are Extremadura (35.8% increase), Murcia (25.8%) and Madrid (25.3%), with the latter two going from being two of the communities with the lowest increases to two of those with the largest increases. In overall terms, the Basque Country remains the Autonomous Region with the highest recycling rate (24.0 kg/person), followed by Navarra (22.7 kg) and the Balearic Islands (21.5 kg).

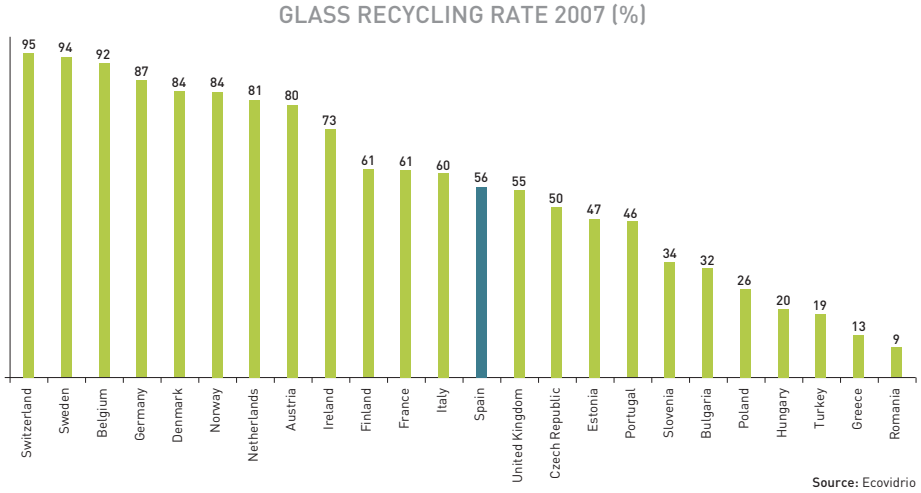
GLASS RECYCLED, 2007 (KG/PERSON)



Source: Ecovidrio

According to figures from the European Glass Packaging Federation (FEVE), Spain's recycling rate in 2006 stood at 56%, slightly lower than the European average (62%) and some distance from leading countries like Switzerland (95%), Sweden (94%) and Belgium (92%), which have a long-standing recycling tradition.

In 2007, twelve European countries had already surpassed the target 60% recycling rate for 2008 established by the EU Directive. The current challenge is for the remaining countries to increase their recycling rates to meet this target.



Source: Ecovidrio

NOTES

- The glass recycling rate is the ratio between glass collected and its apparent consumption. The latter is calculated by subtracting exports from the sum of the glass produced and imports. ECOVIDRIO oversees the entire glass recycling process for the manufacture of new packaging (collection, treatment and final recycling, which is undertaken in the same year). It refers only to packaging glass (hollow glass) and does not include other types of glass such as window panes, car windows, laminated glass, etc. (sheet glass).
- The glass collected comes from two sources: glass collected by the public, in other words glass deposited in containers (green igloos) located in the street, and glass from other sources, such as packaging plants, waste selection and recovery plants in the HORECA (hotel and catering) sector and other public and private bodies.

SOURCES

- Ecovidrio. "Annual Report 2007".
- European Glass Packaging Federation (FEVE).

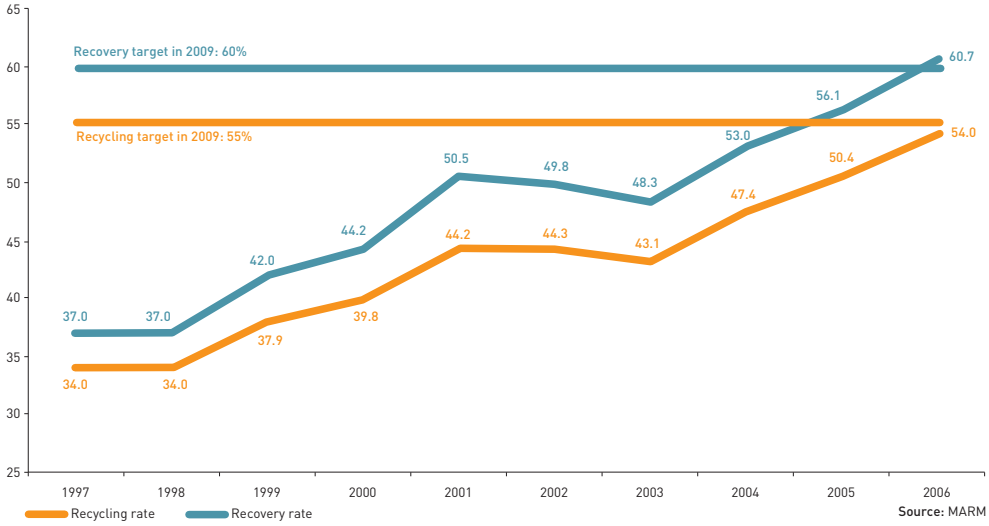
MORE INFORMATION

- http://www.marm.es
- http://www.ecovidrio.es
- http://www.anfevi.com/
- http://www.feve.org

Packaging waste recycling and recovery

The target for packaging waste recovery established by RD 252/2006 (60%) was exceeded in 2006

OVERALL PACKAGING WASTE RECYCLING AND RECOVERY RATE (%)



Source: MARM

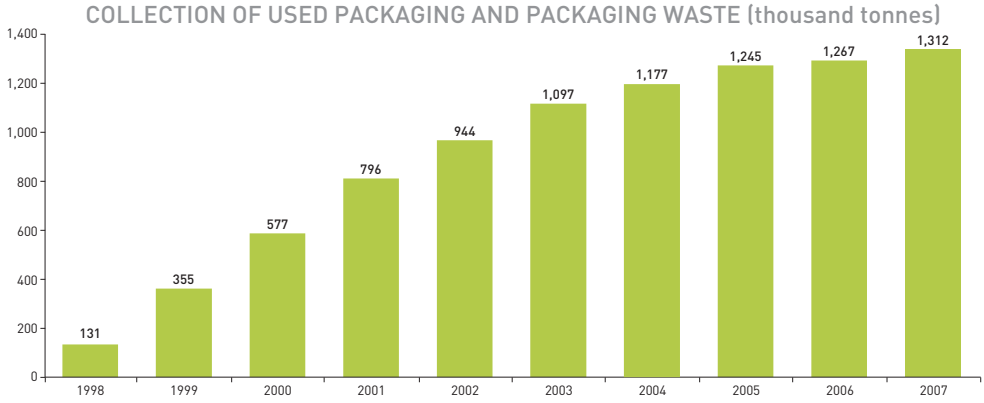
In 2006 Spain achieved a recovery rate of 60.7%, thereby exceeding the target established by RD 252/2006, of 3 March, which set a packaging recovery rate target of 60% for 2009.

This Royal Decree, which transposed Directive 2004/12/EC and modified the targets set by Act 11/1997 for packaging and packaging waste, also establishes a recycling rate target of 55%. Spain achieved a recycling rate of 54.0% in 2007. However, if the current growth rate of 3.5 percentage points per year for the past few years continues, the recycling targets established by this Royal Decree are likely to be met before 2009.

Public awareness of packaging recovery and recycling has increased. According to information provided by Ecoembes in its Annual Report 2007, more than 43.7 million people had access to selective packaging collection, 900,000 more than in 2006. Around 1.4 million more people had access to selective collection of small packaging than in 2006, with the total reaching 42.9 million. The average amount of incorrectly deposited waste continues to decrease as a result of the numerous advertising campaigns.

The igloo-type containers are the most widely used by towns participating in Ecoembes' Integrated Management System (SIG: Sistema Integrado de Gestión), accounting for 40.18% of the total population with selective collections, and are also chosen by the majority of semi-urban and rural towns.

COLLECTION OF USED PACKAGING AND PACKAGING WASTE (thousand tonnes)



Source: Ecoembes

According to Ecoembes' annual report, 1,312,886 tonnes of packaging were collected in 2007, 45,817 tonnes more than in 2006, and 1,160,616 tonnes were recycled, 94,273 tonnes more than the previous year. Furthermore, 152,270 tonnes were recovered for their energy value. This means that in 2007 the IMS overseen by Ecoembes managed to recycle 56.1% of the packaging put onto the Spanish market by companies belonging to the IMS. These results mean that the targets established by the European Directive 2004/12/EC for December 2008, as set out in RD 252/2006, have already been met.

In 2007 167 new companies joined the SIG, which represents an increase of 1.4% on the previous year and makes a total of 12,375 companies managing 90% of the packaging placed on the market.

Catalonia, with 2633 (21.28% of the total), is the Autonomous Region with the highest number of companies belonging to the SIG, followed by Valencia, with 1781 (14.39% of the total). These two are followed by Madrid, with 1490 companies (12.04%), and Andalusia, with 1408 (11.28%); Castile-La Mancha, Castile and León, Galicia, Murcia and Aragon come next.

A sector-based breakdown shows that the food sector, with 6,362 companies (51.41% of the total), is the largest representative, followed by the drinks sector (961 companies, 7.77%), health and beauty (910 companies, 7.35%), and cleaning and maintenance (577 companies, 4.66%). The remaining 3565 companies belong to various other sectors.

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 recover used packaging and packaging waste in order to ensure compliance with the reduction, recycling and recovery targets defined in the Packaging and Packaging Waste Act 11/1997, of 24 April 1997.
- Recycling and recovery rates are calculated from the amount of material (in tonnes) recycled and recovered for energy value (measured at the point of entry into the recycling and recovery process) compared with total packing waste generated. This figure is estimated as the total quantity of packaging placed on the market. 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 which continue to be reused.

SOURCES

- MARM. *"The Environment in Spain"* (various years).
- Ecoembalajes España, S.A. (Ecoembes). Annual Report.

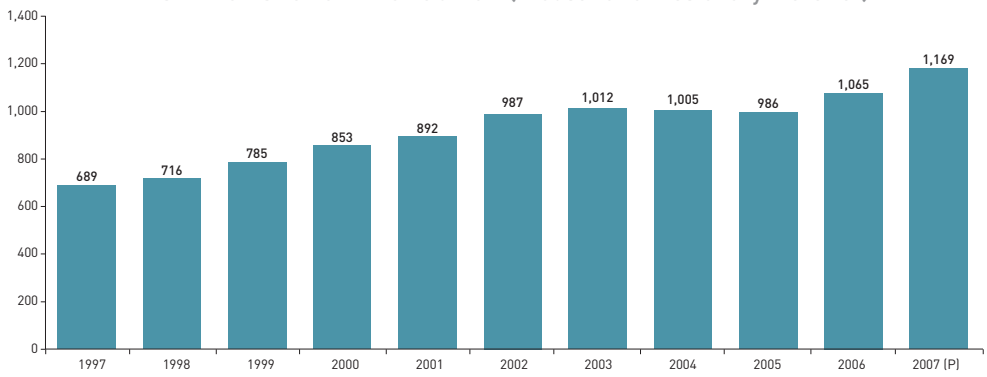
MORE INFORMATION

- **http://www.MARM.es**
- **http://www.ecoembes.com**

Sewage sludge production and disposal

Sludge production increased by 9.7% over the past year; 67.7% of sludge is used by the agricultural sector

SEWAGE SLUDGE PRODUCTION (thousand tonnes of dry material)



Source: MARM. (P) Provisional

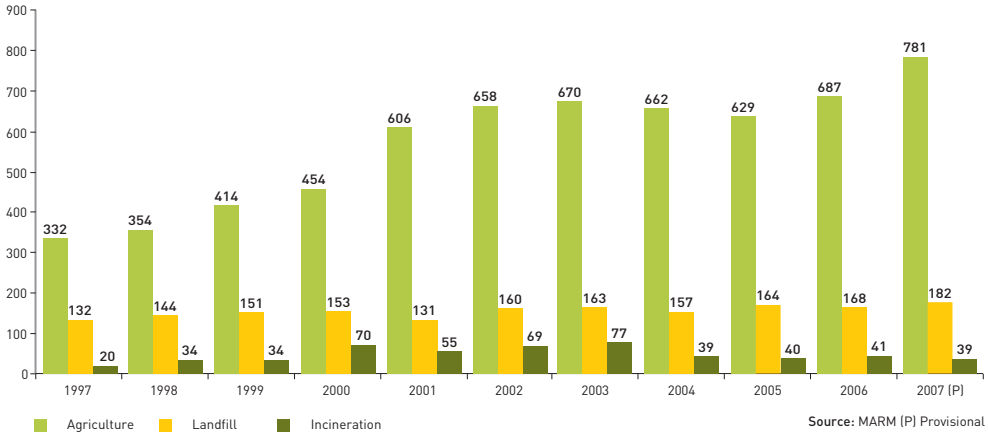
Sludge production in Spain has grown constantly over the last few years, with provisional figures for 2007 suggesting that production has reached 1,169,000 tonnes of dry material. The increasing production of sludge from household and/or urban waste-water treatment is leading to problems arising from its correct management, treatment and, above all, elimination. With the aim of solving these problems, the National Water Quality Plan 2007-2015 contemplates a raft of measures that aim to ensure full compliance with Directive 91/271/EEC. This Plan anticipates the construction of new waste-water treatment plants and the correct exploitation, maintenance and management of existing installations.

The National Sewage Sludge Plan established 2007 as the deadline for recovering 80% of WWTP (waste-water treatment plant) sludge and a 20% reduction in sludge sent to landfill. The increase in WWTP sludge production due to application of both Directive 91/271/EEC and the National Sewage Sludge Plan brings with it the need to manage this sludge correctly. One of the solutions selected to achieve environmentally friendly sludge management is to use this sludge as agricultural fertiliser.

Composition of the sludge, although somewhat variable, makes it a valuable source of organic material and fertilising elements for use in agricultural activities, which appears to be the most appropriate route for its elimination as it allows its incorporation into natural material and energy cycles. This brings a twofold

–environmental and agricultural– benefit due on the one hand to its elimination with no significant effects on the ecological balance and on the other to the effect of its application to soil, which increases in organic matter and nutrient content.

SEWAGE SLUDGE USE (thousand tonnes of dry material)



Source: MARM (P) Provisional

In 2007, sewage sludge production increased by 9.7% on the previous year. Agriculture continues to be the main destination for this kind of waste, accounting for 781,000 tonnes (66.7%) of all sludge produced.

The amount of sludge sent for landfill has increased by 13.7% in the last year to a total of 168,000 tonnes of dry material, and the amount sent for incineration appears to have stabilised at around 39,000 tonnes of dry material in 2007. The volume of waste incinerated in 2007 amounted to 3.3% of the total.

NOTES

- 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", makes use of the following terms:
  - "residual sludge from sewage plants treating domestic or urban waste-water and from other sewage plants treating waste-waters of a composition similar to domestic and urban waste-water"
  - "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"

SOURCES

- National Sewage Sludge Register. Sub-Directorate General for Agricultural Production Methods. MARM (specific query).

MORE INFORMATION

- http://www.marm.es

2.6 AGRICULTURE



Agricultural activity is of major importance in the production system. Thus, as well as being one of the main economic sectors, it plays a key role as a land-planning element which also fixes the population, maintains and promotes employment in the countryside and is a basic component in the production system as a whole as a supplier of raw materials for the agrifood industry.

Agricultural activity in Spain is one of the sectors with the greatest impact on the environment. Due to the large amount of land dedicated to agriculture in Spain, which accounts for almost half the country's area, agriculture has become a diverse and strategic sector that is also an essential element for maintaining rural life.

The rural environment, and therefore agriculture, has undergone profound sociological, cultural, technological, economic and institutional changes, and has progressed by taking on board a commitment to quality and safety with the aim of achieving a sustainable, responsible and competitive agricultural sector.

Over the past 20 years, Spanish agriculture, due to its integration into the Common Agricultural Policy (CAP) and its continual and ever more frequent reforms, has come through this adaptation process with reasonably satisfactory results, although with widely differing sector-based and territorial impacts.



INDICATOR	GOAL	TREND
Fertiliser consumption	Reduce fertiliser consumption	Increased fertiliser consumption with respect to 2006 to levels similar to those in 2004
Plant-protection product consumption	Reduce plant-protection product consumption	Plant-protection product consumption decreased slightly in 2007 with respect to 2006 to levels similar to those in 2005
Organic farming	Increase proportion of organic farmland with respect to total farmland	The area dedicated to organic farming increased by 6.9% in 2007 to 988,320 hectares
Irrigated area	Promote the use of more efficient irrigation systems	42.7% of irrigated farmland now uses localised irrigation systems and 21.3% uses sprinkler systems
Eco-efficiency in agriculture	Increase the economic value of agricultural production, reducing pressure on the environment	Consumption of fertilisers, irrigated area and GAV all increased, whereas plant-protection product consumption decreased slightly

The most recent CAP reform (Agenda 2000 and the 2003 reform) decoupled agricultural production subsidies and farm intensification in favour of a multifunctional agriculture linked to rural development.

Climate change, the demand for bioenergy, a lack of water and the economic crisis have arisen as new challenges to the agricultural sector and the rural environment in this new scenario.

In November 2007 the EC set out its thinking for the "CAP medical check-up", which aims to respond to these new challenges and reinforce Rural Development policy. The most relevant factors highlighted therein are environmental sustainability, market globalisation and food safety, as agriculture must compete effectively on open markets, providing quality food obtained through safe and reliable production methods. On the other hand, agriculture has to manage the natural resources used in production processes, especially land and water, in a sustainable manner. Furthermore, it should supply common benefits that are not directly compensated by the market, such as balanced land occupation, conservation of the countryside and the maintenance of natural spaces and biodiversity.

One of the special circumstances which arose in 2008 was the creation of the Ministry of the Environment and Rural and Marine Affairs from its predecessors the Ministry of the Environment and the Ministry of Agriculture, Fisheries and Food. The priorities of this new ministry include continuing the actions resulting from the National Strategic Plan for Rural Development 2007-2013, which contains the basic guidelines for Spanish rural development policy. These guidelines are based around the following three thematic axes: increasing the competitiveness of the agricultural and forestry sector; diversifying economic activity; and improving the environment and countryside and quality of life.

This chapter analyses the environmental impact of the agricultural sector by updating selected indicators, including those which analyse this sector's characteristics and progress. The use of fertilisers and plant-protection products to increase production yields and control pests and disease is a key indicator due to their pollution risk, or rather the risk resulting from their incorrect application. The use of plant-protection products decreased slightly in 2007 to a level similar to that seen in 2005, whereas fertiliser use, after the decreases seen in 2005 and 2006, increased slightly.

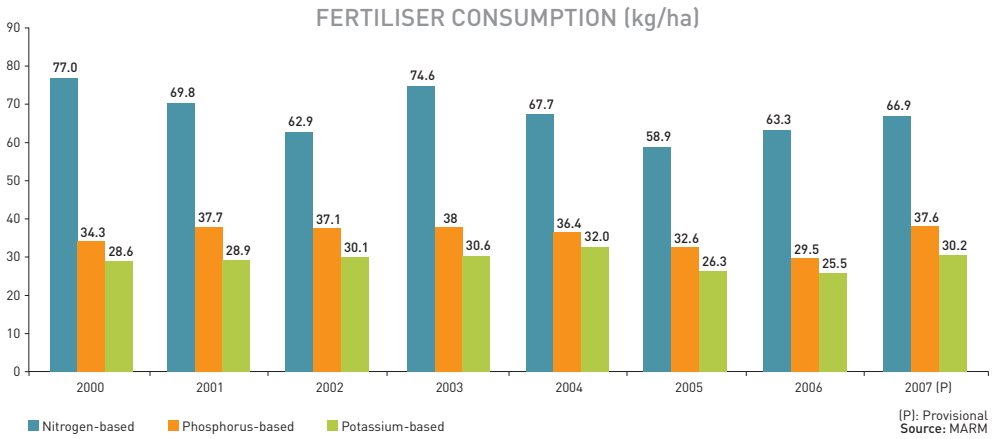
The area dedicated to irrigation farming, which consumes 80% of available water resources, plays a key role in agricultural economy, therefore irrigation is at the centre of water-use and environmental policy. The area dedicated to irrigation farming increased slightly in 2007 to 13.5% of the total, although the use of localised

irrigation, which is much more efficient than traditional gravity systems, increased significantly; use of the latter decreased yet again.

As for the area dedicated to organic farming, Spain has not been oblivious to the positive evolution of this sector in Europe, and this year the area and number of operators increased once more. The main asset of organic farming is its sustainability due to the incorporation of environmental targets into agricultural production. To this end the Comprehensive Action Plan to Promote Organic Farming 2007-2010, which defines a comprehensive strategy for political action in the field of organic farming, has been designed.

Fertiliser consumption

Fertiliser consumption increased in 2007 to levels similar to those in 2004



The amount of fertiliser applied per hectare in 2007 increased to 134.7 kg/ha from the 118.3 kg recorded in 2006; this level is similar to that seen in 2004 (136.7 kg/ha). This increase was found for all three main fertiliser types, although it was particularly notable for phosphorus- and potassium-based fertilisers, which increased by 27.5% and 18.4%, respectively; nitrogen-based fertilisers increased by only 5.7%.

The provisional data regarding the amount of mineral fertiliser consumed during 2007 point to an upturn in total consumption. In absolute figures, consumption during 2007 increased with respect to 2006 to more than 5 million tonnes, thereby interrupting the trend towards stabilisation of the previous two years. When this consumption is expressed in terms of fertiliser components, it can be seen that consumption of all three types increased with respect to the previous year, with nitrogen-based fertilisers increasing by 1.6%, phosphorus-based fertilisers increasing by 22.4% and potassium-based fertilisers increasing by 14.1%.

If the type of fertiliser used (as a commercial product) is analysed, a slight decrease in the consumption of simple nitrogen-based fertilisers (4.7%) can be seen. In contrast, the consumption of simple phosphorus-based fertilisers increased by 39.9% with respect to 2006 to 249,000 tonnes, and the consumption of simple potassium-based fertilisers increased by around 6.1% to 263,000 tonnes.

The distribution of fertiliser consumption by Autonomous Region is strongly linked to

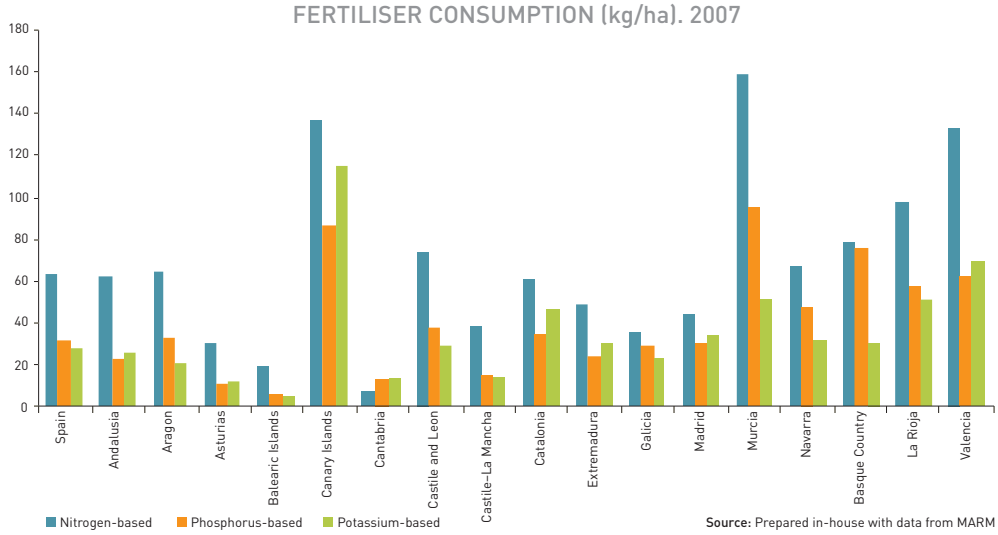
FERTILISER CONSUMPTION

Commercial product (thousand tonnes)	2004	2005	2006	2007
Simple nitrogen-based	2.566	2.277	2.515	2.397
Simple phosphorus-based	219	210	178	249
Simple potassium-based	325	221	248	263
Complex	2.460	2.136	1.901	2.285
Total fertilisers	**5.570**	**4.844**	**4.842**	**5.194**
Fertilising elements (thousand tonnes)	**2004**	**2005**	**2006**	**2007**
Total N	1.080	927	970	986
Total P_2O_5	589	513	452	554
Total K_2O	518	414	390	445

Source: MARM with data from ANFFE

the intensity of their agricultural sectors and follows a similar pattern to previous years, with higher consumption per hectare in the Canary Islands, Murcia and Valencia.

FERTILISER CONSUMPTION (kg/ha). 2007



Source: Prepared in-house with data from MARM

National legislation regarding fertilisers is contained in Royal Decree 824/2005, of 8 July, on fertilisers, which has been partially modified by RD 1769/2007, of 28 December. The future approval and application of the National Plan for Agricultural and Livestock Environmental Quality will complete the national legislation concerning fertilisers by developing a Plan whose overriding objective will be to promote the development of eco-efficient agriculture by taking an environmentally friendly approach to intensive agricultural production. This Plan will also include sub-programmes aimed at the sustainable use of plant-protection products and agricultural fertilisers and will promote the use of renewable energies and biofuels.

NOTES

Fertilisable area is defined as arable land (excluding fallow and other unoccupied land) and natural grasslands, in accordance with the Agrifood Statistical Yearbook, 2007. MARM.

Royal Decree 824/2005 of 8 July and RD 1767/2007 of 28 December, on fertilisers, include the following definitions:

- Fertilisers are products used in agriculture or gardening which, due to their nutrient content, encourage plant growth, increase yield and improve harvest quality, or which, due to their specific action, modify soil fertility or its physical, chemical or biological characteristics as desired. Fertilisers, special products and conditioners are included in this category.
- Inorganic or mineral fertiliser: fertiliser obtained by extraction or physical or chemical industrial processes whose declared nutrients are present in mineral form.
- Simple fertiliser: nitrogen-, phosphorus- or potassium-based fertiliser with a declared content of a single main nutrient.
- Compound fertiliser: fertiliser obtained chemically or by mixing, or a combination of the two, with a declared content of at least two main nutrients.
- Complex fertiliser: compound fertiliser obtained from a chemical reaction, in solution or solid form as granules, and with a declared content of at least two main nutrients. In its solid state, each granule contains all the nutrients in its declared content.

SOURCES

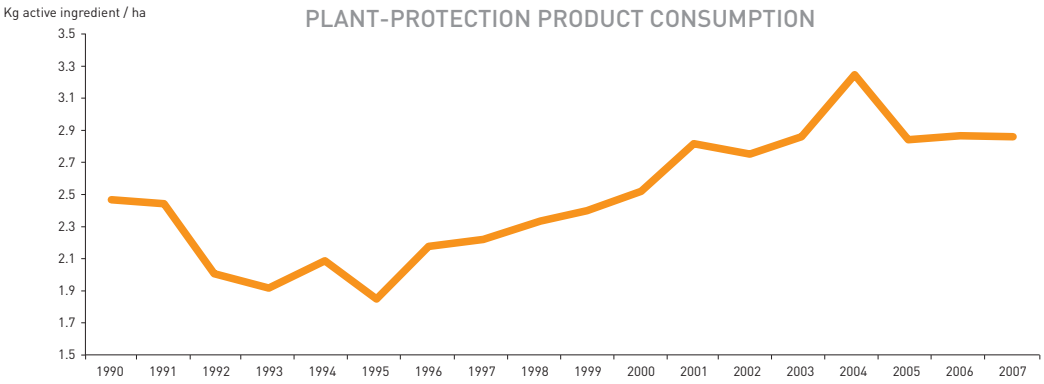
- Spanish Association of Fertiliser Manufacturers (ANFFE).
- Agrifood Statistical Yearbook, 2007. MARM.
- Crop Area and Yield Survey (ESYRCE), 2007. MARM.
- "Agriculture, Fisheries and Food in Spain, 2007". MARM.

MORE INFORMATION

- **http://www.marm.es**
- **http://www.anffe.com**
- **http://epp.eurostat.ec.europa.eu/portal/**
- **http://themes.eea.europa.eu**

Plant-protection product consumption

Plant-protection product consumption decreased slightly in 2007 with respect to 2006 to a similar level to that seen in 2005



Source: Compiled in-house from AEPLA and MARM data

The interannual variation in the consumption of plant-protection products is clearly influenced by climatic factors, especially rainfall, which determine the expected harvest and therefore the consumption of these products.

The consumption of plant-protection products (active ingredients) per hectare decreased slightly (0.8%) in 2007 with respect to the previous year to a level last seen in 2005 and preceding years.

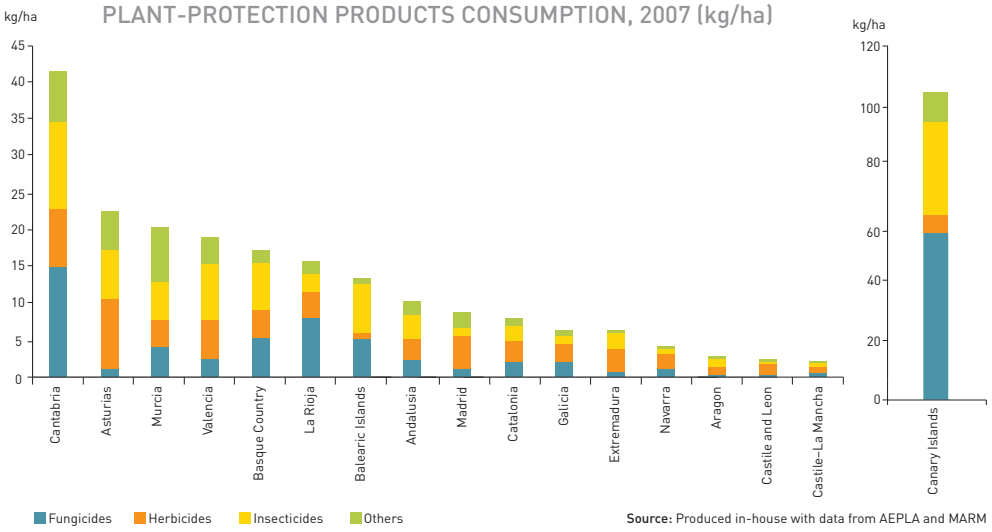
As for the types of plant-protection product used most in 2007, herbicide consumption increased by 3% with respect to the previous year to 31%, whereas fungicide consumption decreased slightly (by 3%) to 25% and insecticide consumption remained at the same level as the previous year (17%). The spectacular increase in the consumption of molluscicides and rodenticides (34.3%) due to the plague of voles (*Microtus arvalis*), which began in 2006 and escalated in the summer of 2007, especially in regions of Castile and León, should be noted.

In January 2009 the European Parliament approved a regulation concerning the placing of plant-protection products on the market, which replaces Directive 91/414, and a Directive on the sustainable use of pesticides. The former establishes the publication of a list of active substances which can be used for the formulation of plant-protection products and the elimination of those active substances which are either toxic or harmful to health. The Directive for the sustainable use of pesticides

establishes that member states should adopt national action plans "to set up targets, measures and timetables" to reduce "the risks of pesticide use".

Likewise, the reports required by the programme for monitoring the placing of plant-protection products on the market are drawn up by the Autonomous Regions.

PLANT-PROTECTION PRODUCTS CONSUMPTION, 2007 (kg/ha)



Source: Produced in-house with data from AEPLA and MARM

The Autonomous Regions which use the most plant-protection products per hectare are the Canary Islands, with102.98 kg/ha, followed by Cantabria (41.41 kg), Asturias (22.74 kg), Murcia (20.31 kg), Valencia (19.20 kg) and the Basque Country (17.34 kg).

NOTES

When calculating the indicator, "area treated with plant-protection products" is taken as the total area of arable land, excluding fallow and other unoccupied land (in other words, the area devoted solely to herbaceous and ligneous crops).

SOURCES

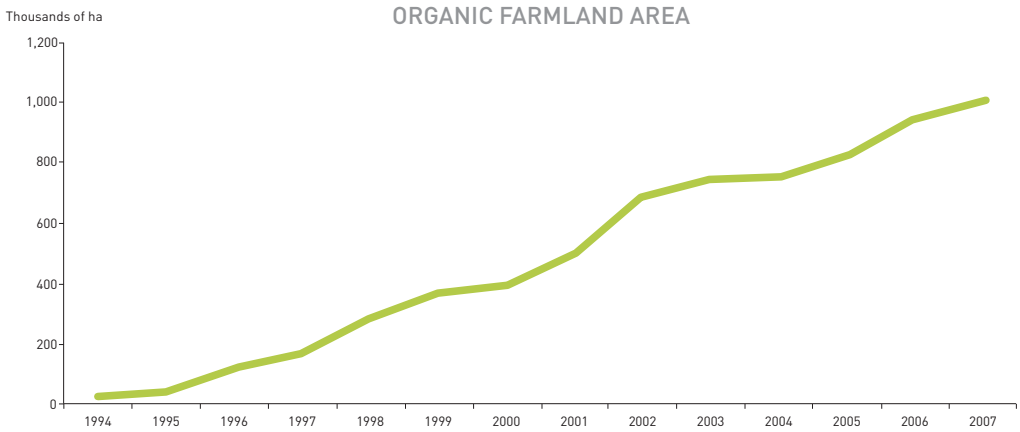
- Plant-protection products: Spanish Plant Protection Association (AEPLA).
- Treated areas:
  - Crop Area and Yield Survey (ESYRCE), 2007. MARM.
  - Agrifood Statistical Yearbook, 2007. MARM.
- "Agriculture, Fisheries and Food in Spain, 2007". MARM.

MORE INFORMATION

- http://www.marm.es
- http://www.aepla.es
- http://europa.eu
- http://themes.eea.europa.eu

Organic farming

The area dedicated to organic farming continued to increase in 2007, especially that dedicated to vegetables and tubers



Source: MARM

Organic farming is an agricultural system whose chief goal is to obtain foods of the highest quality, whilst respecting the environment and conserving soil fertility, by the optimal use of natural resources, excluding the use of chemically synthesised products and achieving sustainable agricultural development.

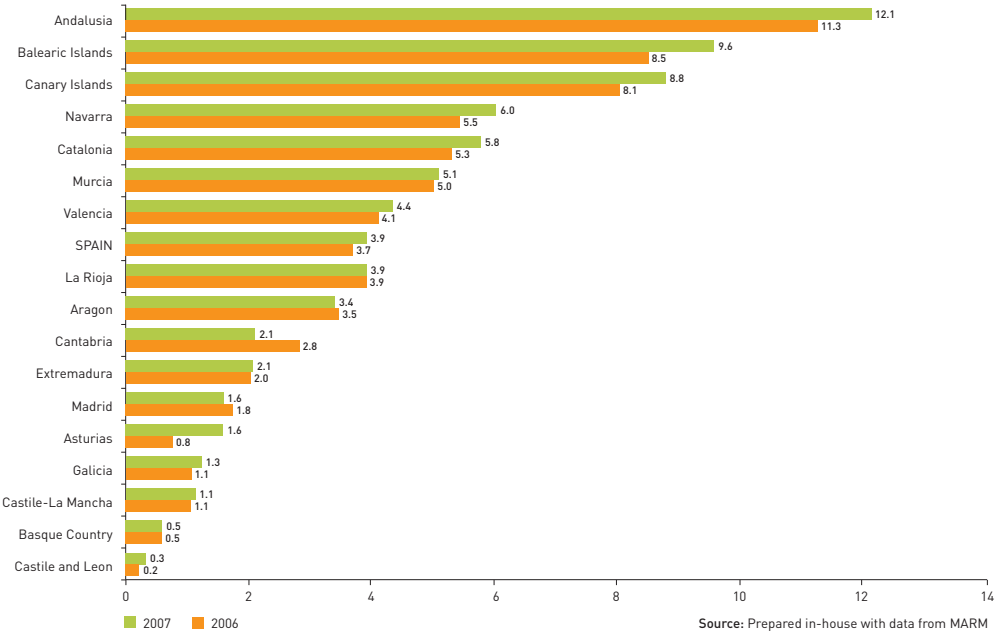
Spain has experienced a continual increase in the area dedicated to organic farming as an alternative to more traditional methods. Growth in 2007 was 6.9% with respect to 2006 to give a total of 988,320 hectares. Despite this increase being smaller than that seen in the previous year (14.7%), the general trend since 1991, when Regulation 2092/91/EEC came into force, has been positive.

Although the number of organic farms increased by 4.94% this year from 19,221 to 20,171, this increase was lower than that seen in 2006 (9.27%). This figure is particularly significant for sustainable rural development as it is a means of quantifying the social benefits provided by organic farming.

The breakdown by Autonomous Region shows that only Aragon and Cantabria experienced a decrease in the area dedicated to organic farming with respect to utilised agricultural area. However, whereas the decrease in Aragon was minimal, the proportion of farmland dedicated to organic farming in Cantabria with respect to UAA

decreased rather more substantially, from 2.8% (6967 ha) in 2006 to 2.1% (5148 ha) in 2007. The Autonomous Regions with the largest amount of organic farmland as a proportion of UAA are Andalusia (12.1%, 582,745 ha) and the Balearic Islands (9.6%, 19,285 ha), followed by Navarra (6.0%), Catalonia (5.8%), Murcia (5.1%) and Valencia (4.4%).

AREA DEDICATED TO ORGANIC FARMING WITH RESPECT TO UTILISED AGRICULTURAL AREA (UAA) (%)



Source: Prepared in-house with data from MARM

The breakdown by crop type is similar to that in previous years. Thus the main use, which is still pasture, grassland and forage, with an area of 429,134 ha in 2007, increased by 13.3% with respect to 2006, and, as in 2006, this is followed by forests and forest harvesting (183,438 ha), cereals and legumes (120,593 ha) and olive groves (94,250 ha).

The area dedicated to seed production and the nursery sector decreased by 16.6% with respect to the previous year. One of the main increases occurred in the area devoted to vegetable and tuber cultivation, which increased from 5039 ha in 2006 to 7044 ha in 2007, an increase of 39.8%.

The organic farming sector in the EU grew very rapidly in the late 1990s, with annual average increases in the area dedicated to organic farming of around 20%. The approval of Regulation 2092/91/EEC on organic production of agricultural products

allowed the harmonisation of organic production methods and meant that this growth slowed somewhat, in line with demand.

In terms of area with respect to UAA, Eurostat data show that organic farming is important in countries such as Austria, where it makes up 10% of the total. Likewise, organic production accounts for between 5% and 10% in countries such as Finland, Italy, Sweden, Greece, Denmark and the Czech Republic, whereas in Spain and France it accounts for 3.2% and 2%, respectively.

NOTES

- Utilised Agricultural Area (UAA): Sum total of arable land, grassland and permanent pasture. Figures are taken from the "Crop Area and Yield Survey (ESYRCE)". MARM.
- Since 1989, the legal framework governing organic farming in Spain is made up of the Generic Organic Agriculture Designation Regulations and, at a European level, by Regulation 834/2007/EC of 28 June 2007, regarding production and labelling of organic products, which repealed Regulation 2092/91/EEC [Official Journal of the EU of 20.07.2007]

SOURCES

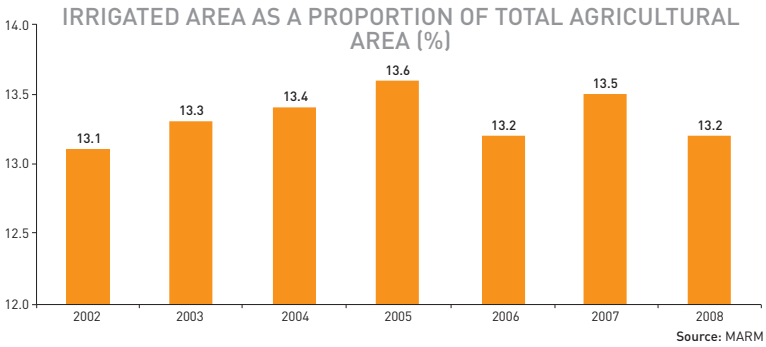
- Crop Area and Yield Survey (ESYRCE), 2006 and 2007. MARM.
- Comprehensive Action Plan for the promotion of organic farming 2007-2010. MARM
- Eurostat: Sustainable consumption and production. Area under organic farming (%) 2000-2005.

MORE INFORMATION

- **http://www.marm.es**
- **http://ec.europa.eu/agriculture/organic/eu-policy/data-statistics_es**
- **http://www.mapa.es/alimentacion/pags/ecologica/pdf/plan_integral.pdf.**

Irrigated area

Localised irrigation grew by 29.3% between 2004 and 2008

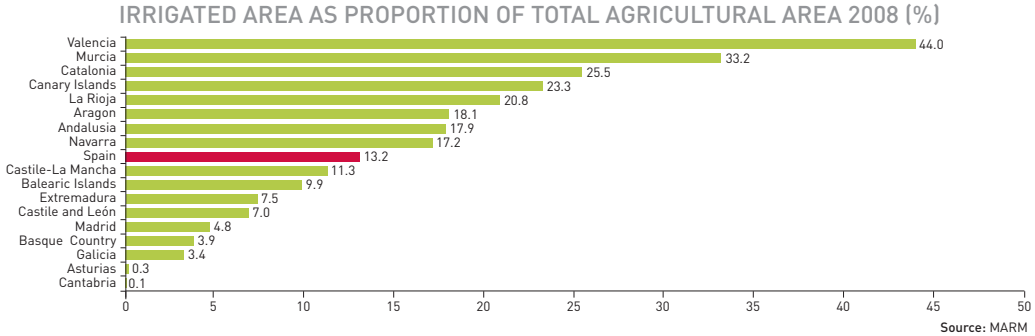


The proportion of irrigated agricultural area with respect to total agricultural area was 13.2% in 2008, a decrease of 0.3% with respect to 2007. Furthermore, this figure is essentially identical to the proportion of mean irrigated area with respect to UAA of 13.25% over the past five years.

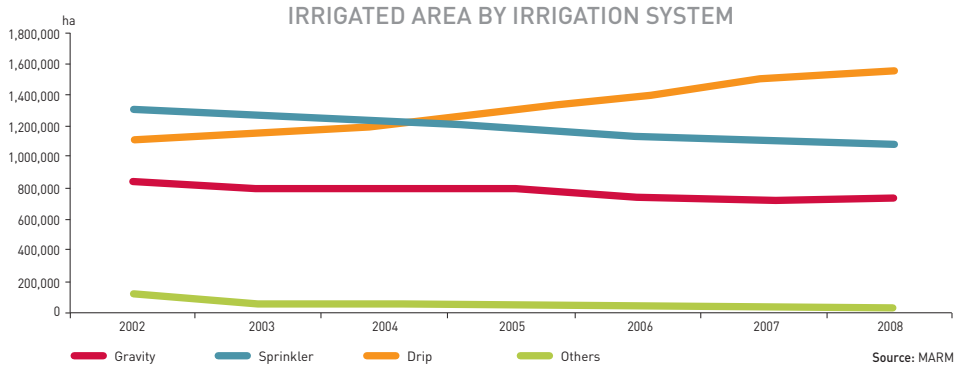
Irrigation has played a vital role in Spanish agriculture as it is seen as a traditional response to the climatic limitations inherent to the majority of the country. The Horizon 2008 National Irrigation Plan is managed in a multifunctional manner characterised by the need to fix population, order land use and preserve the countryside, and is a fundamental part of the new European sustainable agricultural model defined in Agenda 2000.

The breakdown by Autonomous Region shows that Valencia (44%), the Canary Islands (25.3%) and Murcia (33.2%) have the highest proportion of irrigated land with respect to total agricultural area, whereas Cantabria (0.1%) and Asturias (0.3%) have the lowest proportion.

As regards the water-distribution techniques, the downward trend in the area irrigated by gravity systems, which consume much more water, lose more to evaporation and are therefore much less efficient, has continued, whereas the use of more efficient systems such as localised (drip) irrigation has increased substantially. The slight decrease in the area irrigated by sprinklers in the past few years should be highlighted.



The area irrigated using drip irrigation increased by 39.9% between 2002 and 2008, whereas the area irrigated using sprinkler and gravity techniques decreased by 13.6% and 17.3%, respectively. Currently, 45.9% of irrigated area is served by drip systems, 32.1% by gravity systems and 21.5% by sprinkler systems.



NOTES

- Irrigated area refers to the area devoted to crop production or pasture improvement which is supplied with water, irrespective of the number of times irrigation is performed per year.
- Utilised agricultural area is the sum total of arable land, grassland and permanent pasture. Arable land includes herbaceous and ligneous crops, fallow land and family smallholdings.

SOURCES

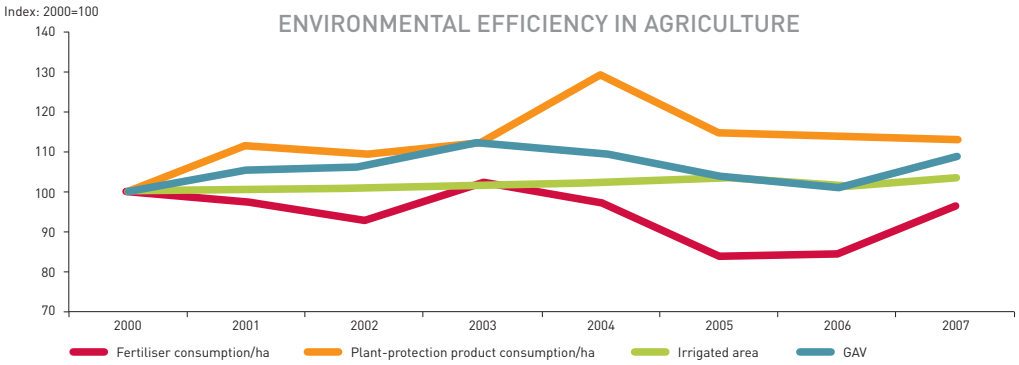
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MORE INFORMATION

- http://www.marm.es/es/desarrollo/pags/pnr/introduccion.htm

Environmental efficiency in agriculture

Economic growth in this sector in 2007 was accompanied by a small increase in irrigated area and fertiliser use



Source: Compiled in-house from MAPA, AEPLA and INE data

The environmental efficiency of the sector, as measured by comparing the evolution of its economic growth with that of the most important pressures generated by it, differs widely. Thus, agriculture's gross added value (GAV) increased in 2007, interrupting the downward trend which had been present since 2003 and increasing from the low point reached in 2006. GAV grew by 7.9% between 2000 and 2007.

An ideal environmental efficiency would involve a clear decoupling between the sector's economic growth (GAV show an upwards trend) and resource consumption (which show a downwards trend); the behaviour of the three variables considered above is as follows:

Irrigated area remained relatively stable during the whole study period, increasing by only 3.7%, a figure lower than that seen for GAV. The sector's economic growth has therefore occurred at the expense of a slight increase in irrigated area, as seen clearly in 2007.

Fertiliser consumption per hectare has evolved in parallel with GAV since 2002. However, its growth over this period is clearly lower, with an overall decrease of 3.7%. This could therefore be interpreted as a sign of environmental efficiency as economic growth has been higher than growth in fertiliser consumption. Furthermore, since 2004 each unit of GAV has been achieved with a lower consumption of fertilisers per hectare. This trend reversed in 2007, however, when fertiliser consumption increased more than the sector's GAV.

The consumption of plant-protection products has shown a more unfavourable environmental behaviour as it has grown faster than GAV almost every year. This situation was particularly severe in 2004, when GAV decreased and plant-protection product consumption increased considerably. Plant-protection product consumption dropped very slightly (essentially stabilised) between 2006 and 2007 and GAV increased, a positive event which should be monitored closely in the coming years.

NOTES
- The sector's gross added value refers to agriculture, livestock farming, hunting and forestry (fisheries are not included).
- To calculate the indicator we assume that environmental efficiency is positive when the trend in the evolution of the sector's economic growth is decoupled (opposite and diverging) from that of the pressures generated on the environment.

SOURCES
- National Institute of Statistics. Spanish National Accounts. Base 2000. Accounting series 1995-2007. GDP at market prices (GAV for agriculture).
- Fertiliser consumption: Agrifood Statistical Yearbook, 2007. MARM. Data for 2007 are provisional.
- Plant-protection product consumption:
  – Spanish Plant Protection Association (AEPLA).
  – Agrifood Statistical Yearbook, 2006. MARM.
  – Crop Area and Yield Survey (ESYRCE), various years. MARM.
- Irrigated area: Crop Area and Yield Survey (ESYRCE), various years. MARM.

MORE INFORMATION
- **http://www.marm.es**
- **http://www.anffe.com**
- **http://www.aepla.es**
- **http://www.ine.es**

2.7 ENERGY



The goal of achieving a new energy model which reduces pressure on the environment and human health without halting all economic activity is a long and gradual process with numerous ups and downs. Some of these variations, such as climatic conditions or emissions due to forest fires, which were particularly significant in the latter part of 2007, are not a direct consequence of economic activity, whereas others are due to the introduction of new factors, such as emissions rights trading.

The EU has proposed a fixed objective in terms of energy efficiency, namely a 20% reduction in greenhouse gas emissions with respect to the 1990 levels (or 30% if other developed countries agree to equivalent emissions reductions and developing countries make as great a contribution as possible) by 2020. Energy efficiency in Spain is increasing significantly. Thus, the final energy intensity dropped 0.7% and primary energy intensity 2.1% with respect to GDP in 2007 despite a 3.3% increase in final energy demand. By end-user sector, there was a greater increase in energy demand by industry and a moderate growth in transport, whereas domestic and tertiary demand was stable.

Once again a certain similarity between the evolution of primary energy intensity (in other words primary energy



consumption divided by GDP) in Spain and the EU average was noted. This dropped in both cases, although to a somewhat larger extent in Spain due to the greater increase in GDP.

The intensity of energy-derived CO_2 emissions usually varies a great deal, and in 2007 it grew again, although less quickly than in previous years.

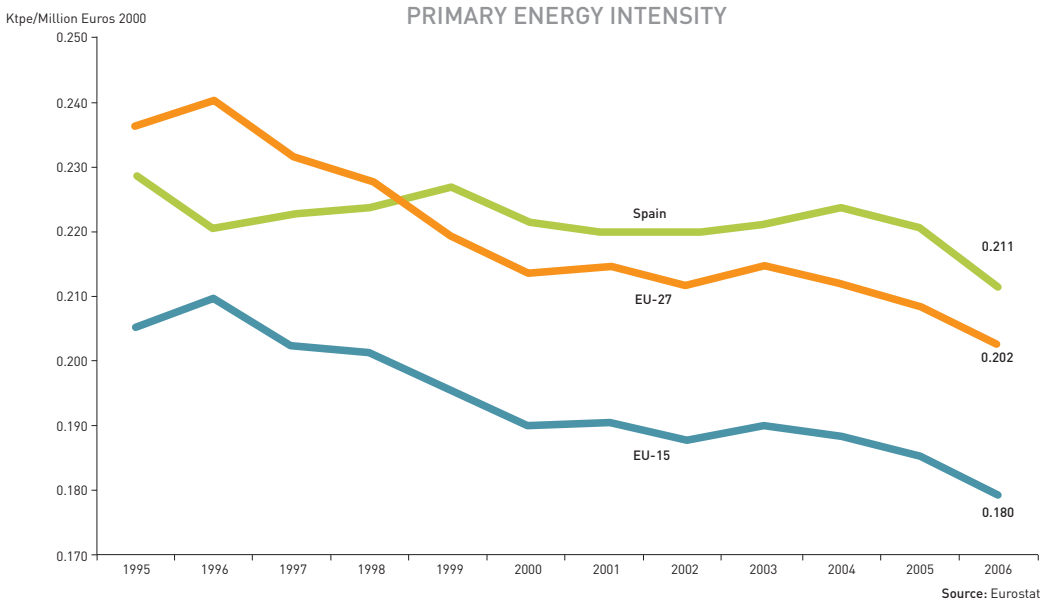
The most important measures adopted by Spain in 2007 include government approval of the Spanish Climate Change and Clean Energy Strategy 2007-2012-2020. The lines of action set out in this plan include energy efficiency and the promotion of renewable energy. The drawing up of a new Renewable Energies Plan 2011-202 will contribute to the above-mentioned European goal of renewable energy accounting for 20% of

INDICATOR	GOAL	TREND
Primary Energy Intensity	Weaken the link between energy consumption and GDP	Confirms its drop for a second successive year
Intensity of energy-derived CO_2 emissions	Decouple economic growth from CO_2 emissions	Intensity of energy-based emissions increased slightly
Renewable energy	Achieve a renewable energy production level of 12.1% of all primary energy by 2010.	In 2007 renewables produced more electricity than nuclear energy for the first time
Eco-efficiency in the energy sector	Decouple economic growth from the pressures of this sector on the environment	A greater energy efficiency has been noted in 2007

energy production by 2020. As well as the Spanish Air Quality Strategy, other significant measures were approved in this field. The National Greenhouse Gas Emission Rights Assignment Plan 2008-2010 (PNA2) contemplates a 19.3% reduction in emission rights with respect to the average assignment in the 2005-2007 Plan, mainly in the electricity production sector.

Primary energy intensity

After rising and then stabilising, energy intensity is now decreasing in Spain



Source: Eurostat

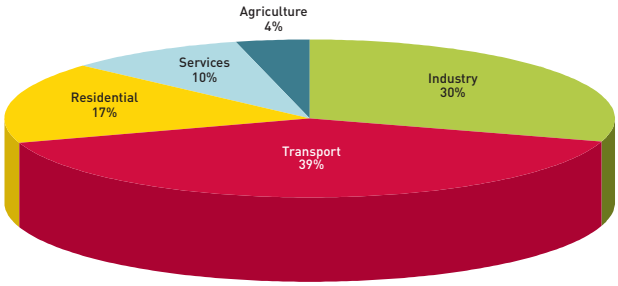
Primary Energy Intensity (PEI) is defined as the ratio of primary energy consumption to Gross Domestic Product (GDP). PEI allows the degree of energy efficiency to be analysed as it links economic growth for primary energy consumption (primary energy is the energy contained in natural sources which has not been altered anthropogenically). Primary energy consumption is calculated on the basis of five sources: coal, oil, natural gas, nuclear energy and renewable energies. GDP is considered at constant prices to avoid the impact of inflation (base year, 2000).

Growth in primary energy consumption in 2007 was accompanied by an economic growth of 3.8%, which resulted in a reduction in energy intensity per unit GDP of 1.9%. This improvement was due both to the slowdown in energy consumption and the continual growth in GDP (up to 2007).

The decrease in primary energy intensity in Spain, which began in 2004 and increased in 2006, is thus confirmed. After the stabilization experienced in previous years, 2005 saw a decrease which was more notable in 2006, in line with the trends observed in the other countries of the European Union. Between 2000 and 2006, the

decrease in primary energy consumption per unit GDP in Spain was 4.6% (5.5% between 2004 and 2006). This points to ever-greater economic efficiency, and therefore increasing economic efficiency and improved sustainability.

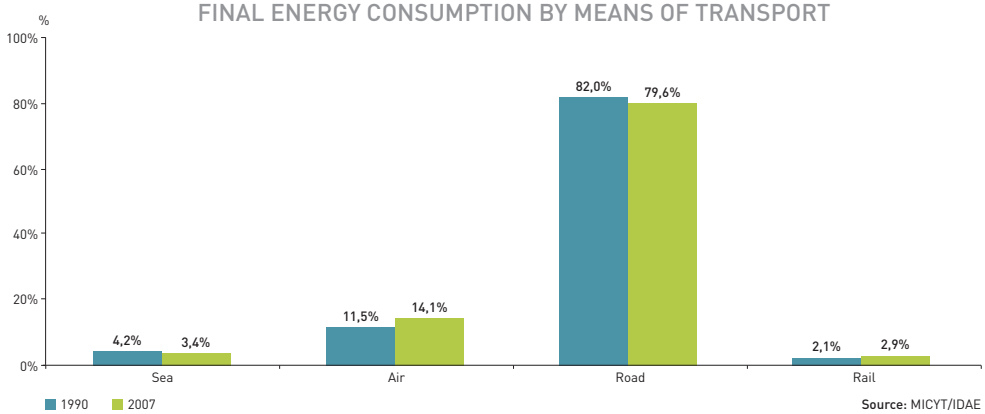
FINAL ENERGY CONSUMPTION BY SECTOR 2007



Source: IDAE

The analysis of final energy consumption by sector in 2007 highlights transport, with a consumption of 40,795 ktpe, followed by industry (30,038 ktpe), the residential sector (16,868 ktpe), the service sector (9,764 ktpe) and agriculture (3,878 ktpe). Road transport consumes most energy, although the amount dropped slightly between 1990 and 2007. In the same period consumption due to air transport increased and that due to maritime transport decreased.

FINAL ENERGY CONSUMPTION BY MEANS OF TRANSPORT



Source: MICYT/IDAE

SOURCES

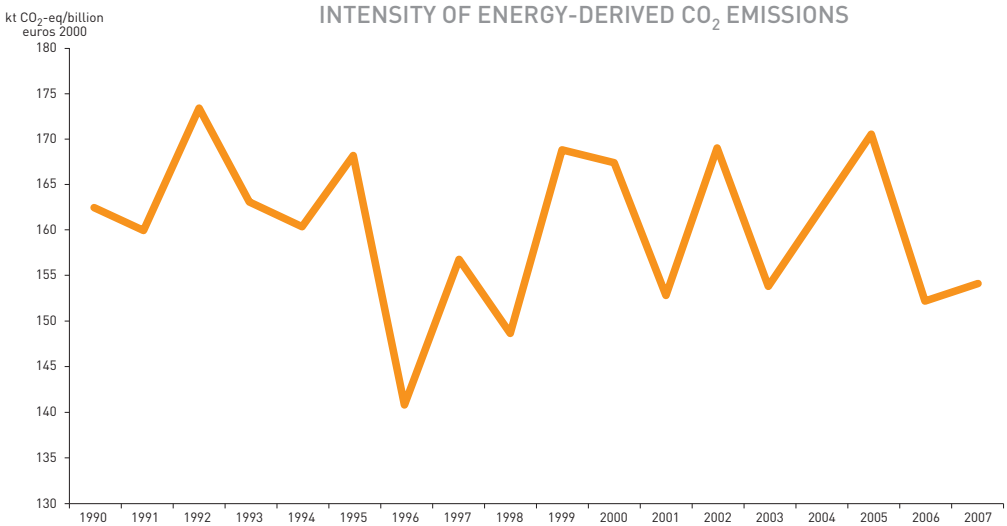
- Eurostat. Structural indicators. Short list. Environment, Energy Intensity (Indicator 13).
- Spanish Ministry of Industry, Tourism and Trade (MITyC). Secretariat General for Energy. "Energy in Spain 2007".
- Spanish Institute for Energy Saving and Diversification (IDAE). Spanish Ministry of Industry, Tourism and Trade (MITyC). "Energy efficiency and renewable energies". IDAE bulletin (Various editions).

MORE INFORMATION

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

Intensity of energy-derived CO_2 emissions

The intensity of energy-derived CO_2 emissions increased slightly in 2007



Source: MARM, MITyC

Energy-related CO_2 emissions intensity is defined as the ratio between total CO_2-equivalent emissions produced by energy-transformation or -processing industries and GDP. This indicator is very useful for analysing the impact of energy production in relation to a country's economic growth.

This indicator increased slightly (1.21%) with respect to 2006, in contrast to the sharp increase (10.77%) experienced between 2003 and 2005. As can be seen from the graph, inter-annual variations are significant. Meteorological changes are the main source of these variations as cold winters lead to greater energy consumption. The increase, or decrease, of the input from hydroelectric energy, which depends to a large extent on the precipitation during the hydrological year, also leads to a variable consumption of fossil fuels and therefore to a variation in emissions.

The intensity of energy-based emissions over the whole period covered (1990-2007) dropped by 5.41%, although this figure cannot be considered definitive due to the size of the variations. On the other hand, electricity production from nuclear energy dropped 8.4% in 2007 due above all to programmed fuel reloads at various plants;

this decrease was compensated mainly by an increase in coal-based electricity production. Total greenhouse gas emissions arising from energy production and transformation rose from 77,583 kilotonnes of CO_2 equivalents in 1990 to 122,504 kt in 2007. A new factor which affects the results of this indicator is emission rights trading, an energy-related activity which also has an economic component.

NOTES

- The energy-related CO_2 emissions intensity is defined as the ratio between total CO_2 emissions from the energy transformation and processing industries and GDP. This indicator is very useful for analysing the impact of energy production in relation to a country's economic growth.

- The CO_2 emissions used to calculate the indicator refer to total combustion emissions in the energy production sector of the six greenhouse gases (expressed as CO_2 equivalents) arising from energy processing (according to IPCC categories). Energy processing covers combustion processes, including electricity generation, combustion at refineries and fuel transformation, as well as combustion in mining.

- The six main greenhouse gases covered by the Kyoto Protocol, in order of relevance, are as follows: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and fluorinated gases, including perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6), although the latter have no impact in the energy sector as they are only emitted by industrial processes.

SOURCES

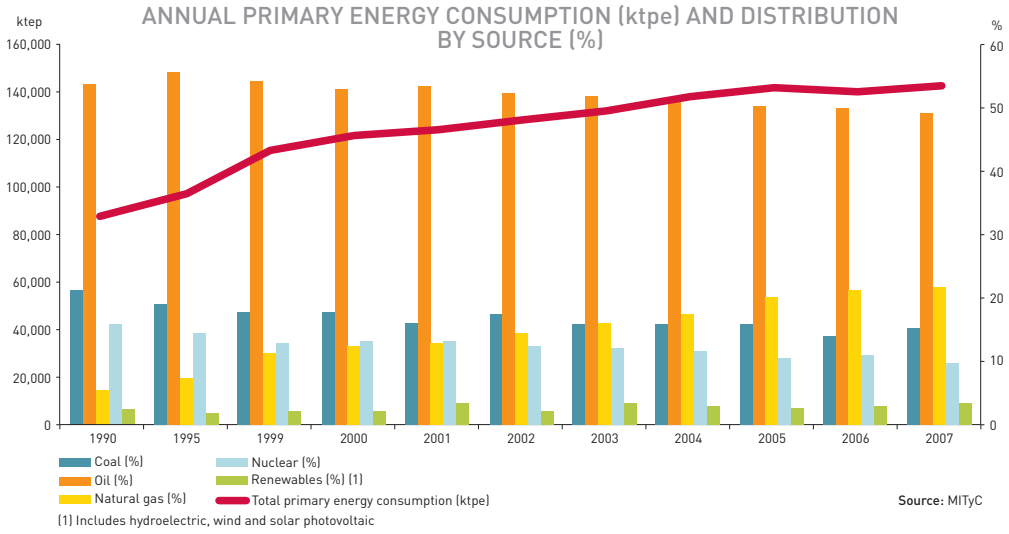
- Emissions figures: Spain's Atmospheric Emissions Inventory. Edition 2009 (series 1990-2007). Directorate General of Environmental Quality and Assessment. MARM.
- GDP figures: 1990-2007: Ministry of Industry, Tourism and Trade. "Energy in Spain 2007".
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MORE INFORMATION

- http://www.idae.es
- http://www.mityc.es
- http://www.ine.es
- http://www.mma.es

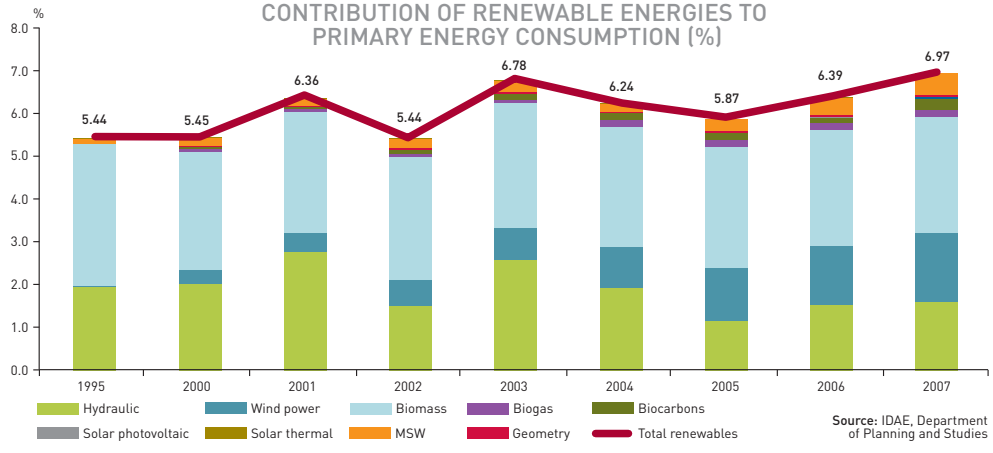
Renewable energies

In 2007, renewable energies were for the first time responsible for a greater proportion of Spanish electricity production than nuclear



energy

Fossil fuels maintain their leading role in production of the primary energy consumed in Spain, with a few minor variations: a notable increase in coal and renewable energies, a similarly notable reduction in nuclear energy and a slight reduction in oil. Total primary energy consumption rose 1.8% in 2007 with respect to the previous year, with the use of coal increasing by 9.5%, oil decreasing by 0.1%, natural gas

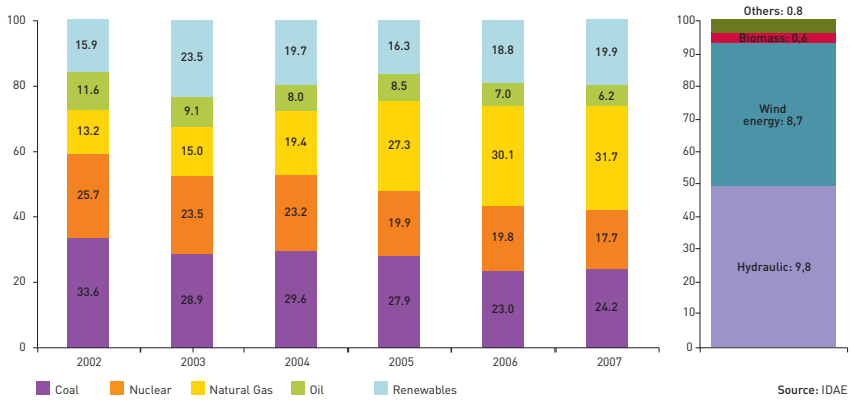


increasing by 4.3%, nuclear decreasing by 8.4% and renewable energies (hydroelectric, wind and solar photovoltaic) increasing by 11%.
The evolution over the past few years, especially since 2004, shows an upward trend in the use of natural gas and renewable energies to cover energy demand. Thus, the participation of renewable energies in total primary energy consumption has risen from 5.87% in 2005 to 6.97% in 2007. This energy source passed the 10,000 ktpe barrier for the first time in 2007.

Within the renewable energies, the proportion of hydroelectric energy has risen again after the drop experienced in 2005. Wind energy has continued its continual and notable rise (it has more than doubled between 2003 and 2007). Biomass has remained relatively stable, with a slight increase with respect to 2006, and biofuels and solar energy (both thermal and photovoltaic) have also increased, although to a lesser extent.

An analysis of the electricity generated in Spain by source shows that the proportion due to coal, natural gas and renewable sources has risen whereas the contribution of nuclear energy and oil has dropped. The evolution of natural gas, which increased its

STRUCTURE OF ELECTRICITY GENERATION IN SPAIN (%)



Source: IDAE

quota by 2.4 times between 2002 and 2007, should be noted.

NOTES

- The total for renewable energies takes into account: hydroelectric, mini-hydroelectric, wind power, biomass and urban waste, along with thermal and photovoltaic solar power and biogas.
- Development of renewable energy sources is a key aspect of national energy policy as they make an efficient contribution to reducing the environmental impact of energy production and transformation, mainly in terms of greenhouse gas emissions, in particular CO_2, and emissions of other pollutants (SO_2, NO_x, particulate matter, etc.). Furthermore, the greater role of renewable energies in the overall energy balance also reduces the country's dependence on petroleum products and diversifies supply sources through the development of inexhaustible and widely distributed supplies. This, in turn, also reduces the need for transformation and transport, with a concomitant reduction in environmental impact.
- The development of renewable energies is supported by the existence of an appropriate regulatory framework to guarantee private investment in this type of energy source. Spain offers a series of incentives to encourage electricity generation from renewable sources, promoting the development of wind energy to such an extent that the country is now ranked second world-wide in terms of wind energy facilities. The changes made to the incentive system in Royal Decree 436/2004, of 12 March 2004, are driving a major increase in solar energy generation (both photovoltaic and thermoelectric). There is also considerable development in the field of biofuels for transport, with Spain now being Europe's leading producer of bioethanol, another of the targets of the PER 2005-2010 plan.

SOURCES

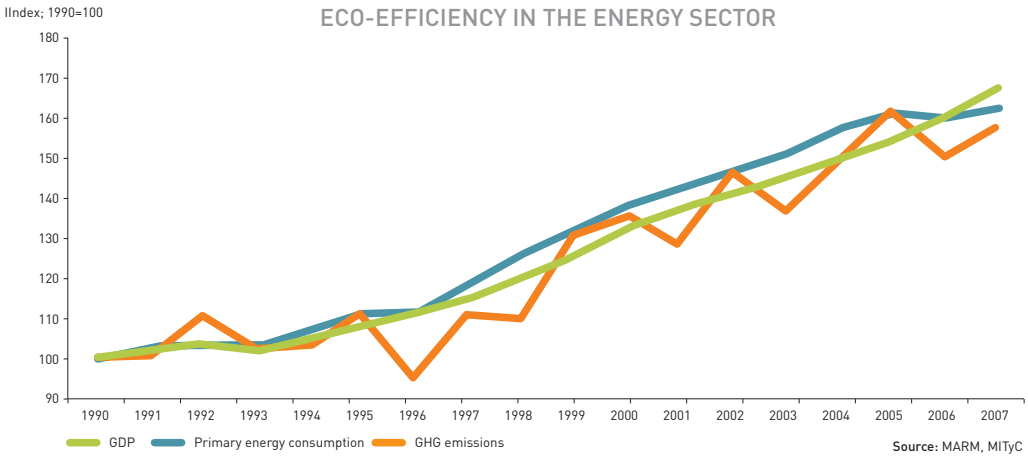
- Figures provided by the Dept. of Studies and Baseline Information. IDAE. Ministry of Industry, Tourism and Trade.
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MORE INFORMATION

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

Eco-efficiency in the energy sector

GDP growth was maintained in 2007, primary energy consumption by the energy sector increased slightly and GHG emissions again increased



Total primary energy consumption rose slightly in 2007, with minor variations in the source of the electricity generated. Thus, hydroelectric and renewable energies production increased, particularly in the third quarter, whereas nuclear and oil-based production dropped. As can be seen from the graph, the country's economic growth in the time period considered is linked to an increase in primary energy consumption and GHG emissions, although this trend is beginning to decouple.

The current Renewable Energies Plan 2005-2010 has allowed Spain to initiate a series of measures which mean that renewable energies will represent around 7.6% of primary energy consumption by 2008 (provisional figures) and has helped Spain to be a market leader in wind- and solar-energy technologies.

In December 2008 the EU approved a new renewable energies directive which stipulates that 20% of final energy consumption should come from this type of source. It also establishes a minimum 10% participation of renewables in the transport sector (biofuels and electricity from renewable sources for electric vehicles, etc.). In light of this new directive, Spain has already begun to draw up a new Renewable Energies Plan (REP) 2011- 2020, at the same time as, and in coordination with, the draft Energy Efficiency and Renewable Energies Act. The new REP proposes to set specific renewable-energy targets for thermal use, electricity generation and transport, as well

as to further support the development of more mature and consolidated fields, such as wind and solar energy, and to incorporate new and emerging technologies such as geothermal energy and wave power.

NOTES

- CO_2 accounts for the vast majority of greenhouse gas emissions during energy production, therefore the use of total GHG emissions (CO_2-eq) or CO_2 emissions has little impact on the analysis of eco-efficiency in the sector and production of the graph.

SOURCES

- Spain's Atmospheric Emissions Inventory. Edition 2009 (series 1990-2007). Directorate General of Environmental Quality and Assessment. MARM. Data on total emissions from combustion in energy sector industries included within Energy (in accordance with IPCC categories).

- Ministry of Industry, Tourism and Trade. Secretariat General for Energy. Directorate General for Energy Policy and Mining. "Energy in Spain 2007".

MORE INFORMATION

- http://www.idae.es
- http://www.mityc.es
- http://www.mma.es
- http://ine.es



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.

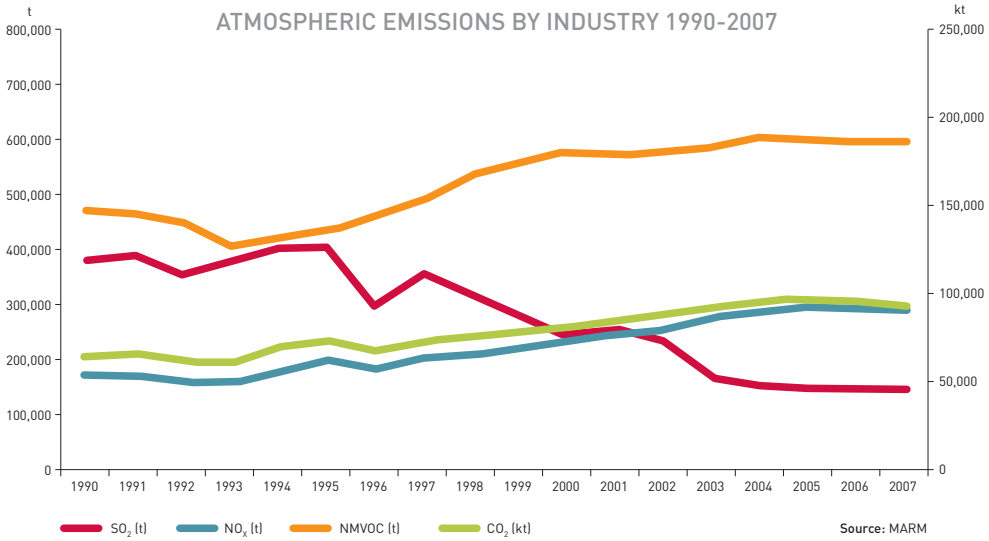
EU as a whole. This increase in industrial activity occurs at the same time as hazardous and non-hazardous waste production by this sector decreases. The amounts set aside by industry for environmental protection also increase, and do so more in terms of investment than in current expenses.

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

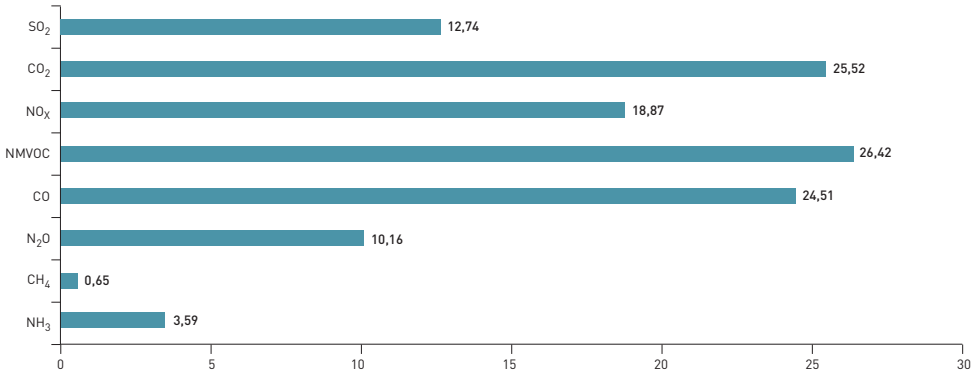
The emission of pollutant gases by the industrial sector has stabilized somewhat in the past three years



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

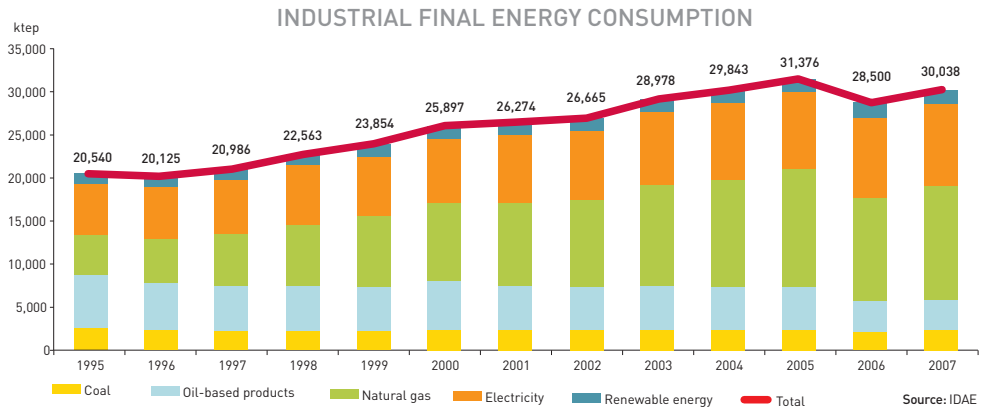
- Spain's Atmospheric Emissions Inventory, version 2009. Directorate General for Quality and Environmental Assessment. MARM.

MORE INFORMATION

- http://www.marm.es

Energy consumption by the industrial sector

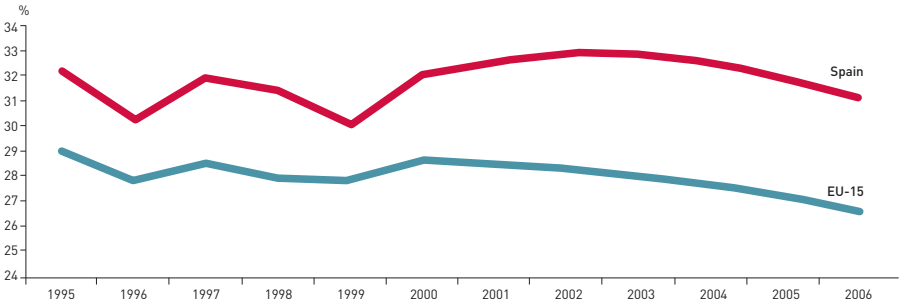
Final energy consumption by industrial processes increased again in 2007



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

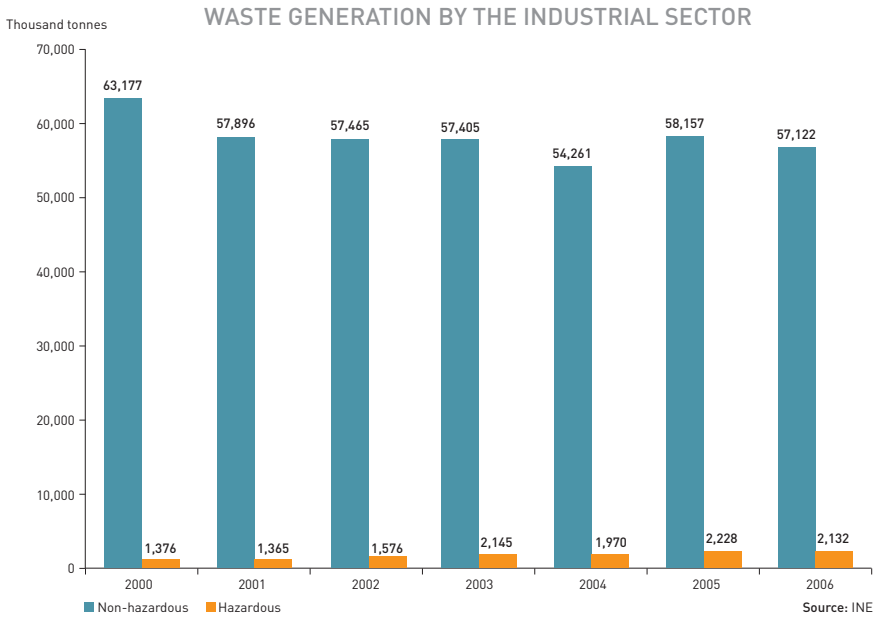
- Energy in Spain 2007. Spanish Ministry of Industry, Tourism and Trade.
- Energy Efficiency and Renewable Energies. IDAE. Ministry of Industry, Tourism and Trade.

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



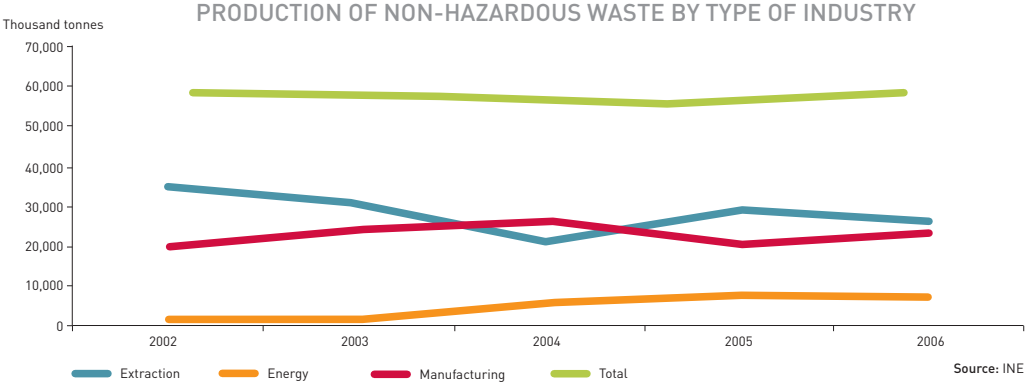
The amount of waste generated by the industrial sector decreased in 2006. The industrial sector produced more than 57 million tonnes of non-hazardous waste in 2006, some 1.78% less than in 2005 for the sector as whole, although with major differences depending on the type of industry. Thus, extractive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

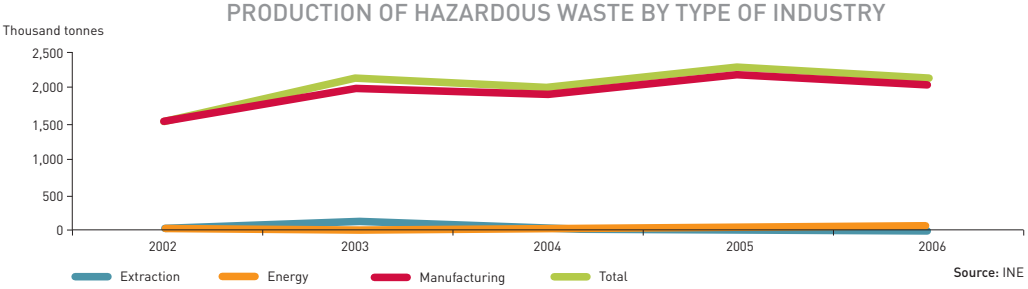
trend in 2006, with a 17.05% increase in investment spending, a 6.08% increase in current spending and a 10.88% increase in total company spending related to environmental protection. The greater increase in investment, which is likely to have an environmental impact in the near future, should be noted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

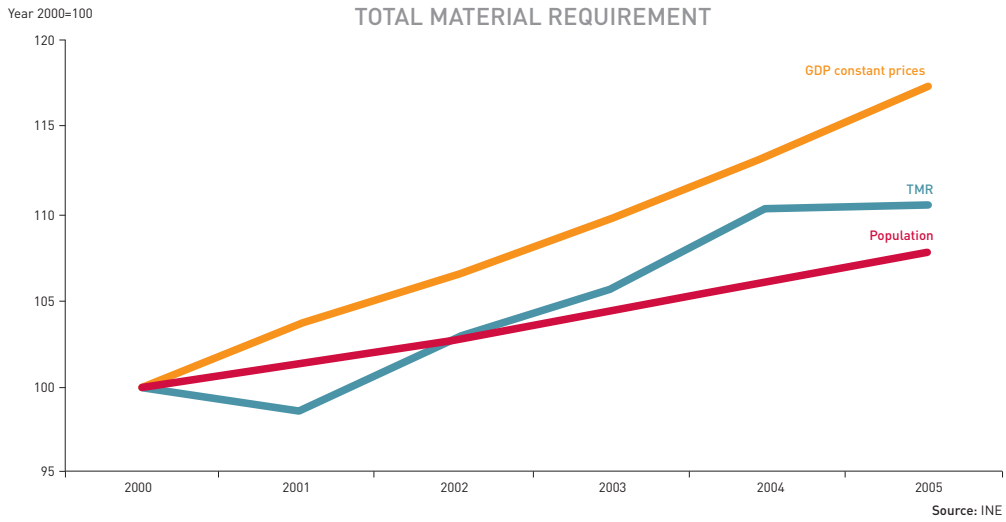
- Waste generation survey. Spanish National Institute of Statistics (INE). In: Environmental Statistics (December 2008).

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.

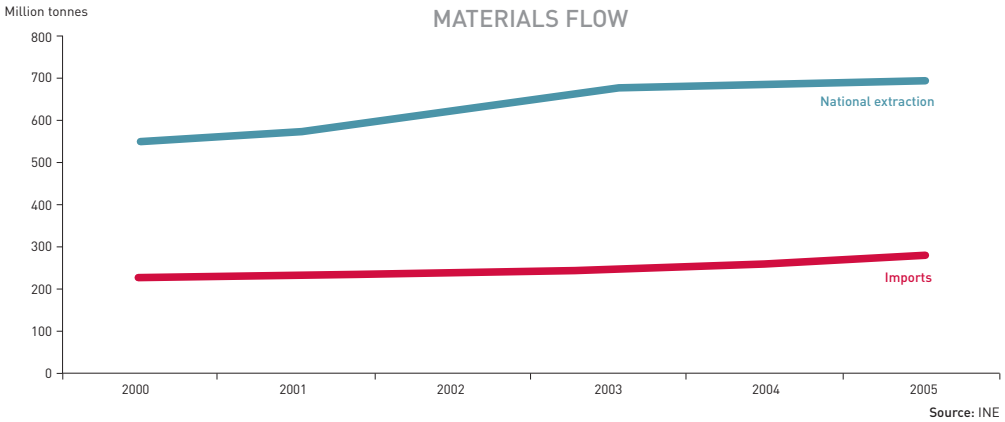
TMR increased slightly in 2005 (0.29%), due above all to import growth, which was 5.34% in 2005 with respect to 2004.

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

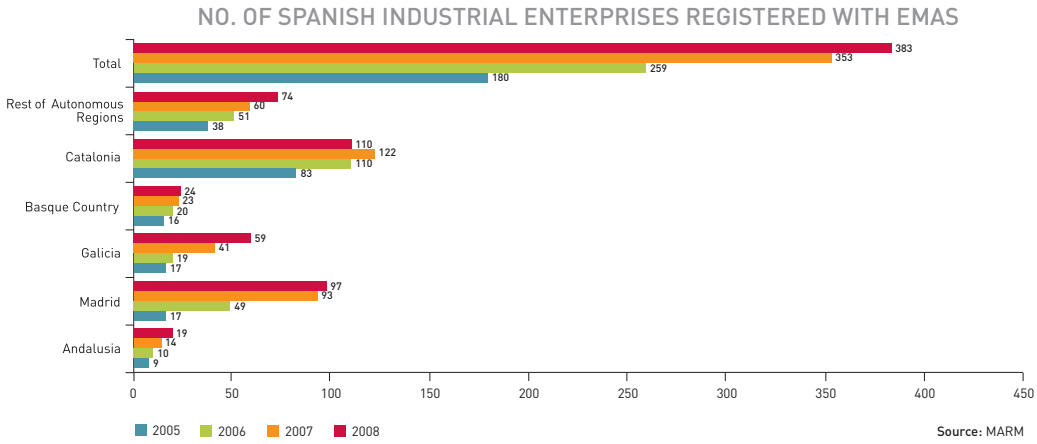
- Total Material Requirement: INE. Material flow accounts. Inebase. In Environment: Environmental accounts.

MORE INFORMATION

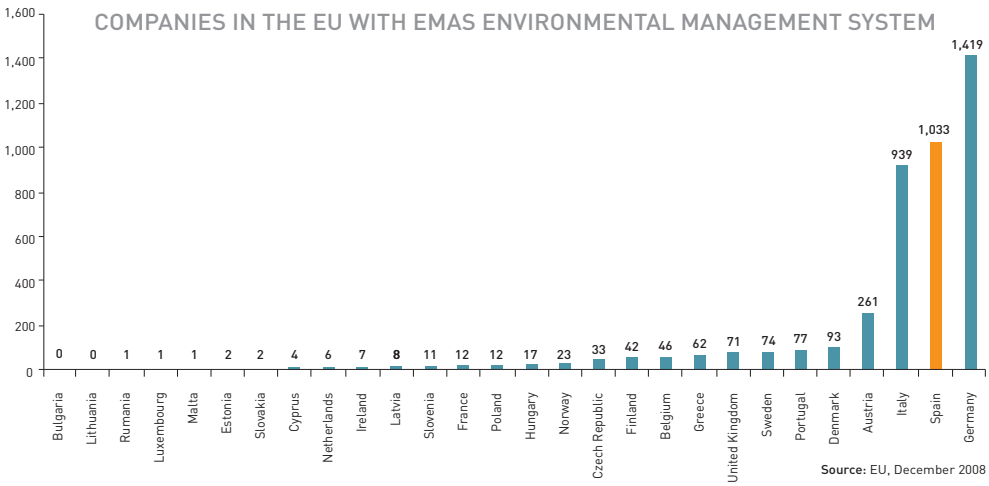
- http://www.ine.es
- http://epp.eurostat.ec.europa.eu

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

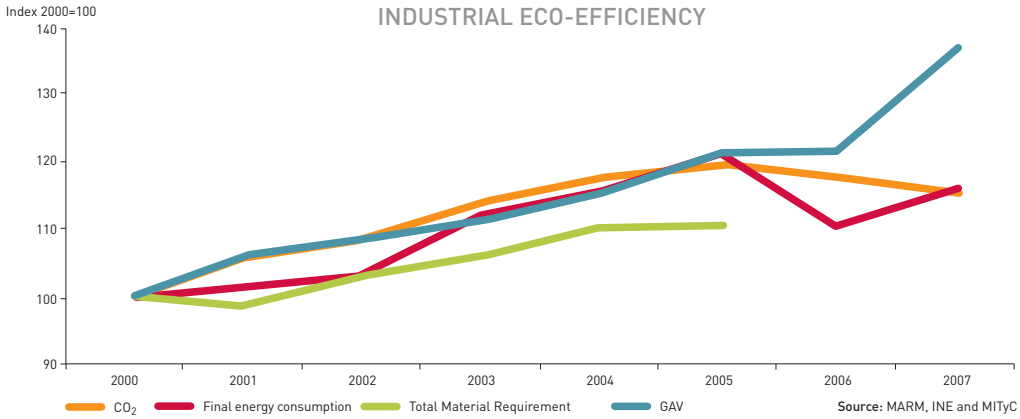
- European EMAS data: EMAS website, European Commission.
- Data for Spain: Directorate General for Quality and Environmental Assessment, MARM.

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



2.9 FISHERIES



The European Union's fishing industry is the world's third largest, catching almost 7 million tonnes of fish a year. European fisheries policy is common to all countries in the EU, which has the world's largest maritime area. The EU has 1200 ports, and close to 400,000 jobs depend on fishing and the industries which process its products.

Fisheries policy and the environment are increasingly seen as going hand in hand. The EU is broadening its perspectives in order to integrate all aspects of the marine environment, via maritime research, technology and innovation values, in accordance with the Lisbon Strategy and the EU's global compromise to ensure that economic progress does not have a negative impact on environmental sustainability. This integrated maritime policy therefore covers sea transport, the competitiveness of maritime companies, scientific research, fishing and protection of the marine environment.

Its objectives include guaranteeing the fishing industry's long-term viability through the conservation, management and exploitation of fishing resources, limiting fishing's impact on the environment and adapting fishing capacity to these considerations. In compliance with these goals, the EU passed Council Regulation (EC) 734/2008, of 15 July 2008, on the



protection of vulnerable marine ecosystems in the high seas from the adverse impacts of bottom fishing gears. Upon Spain's request, and in accordance with the 2006 UN resolution, bottom fishing cannot be undertaken in any region of the high seas where its impact on the sea floor has not been assessed scientifically. This means that bottom fishing cannot be undertaken in those regions identified as containing vulnerable marine ecosystems. The approval of Council Regulation 1005/2008, in September 2008, which establishes a common system to prevent, deter and eliminate illegal, unreported and unregulated fishing, is also worthy of mention.

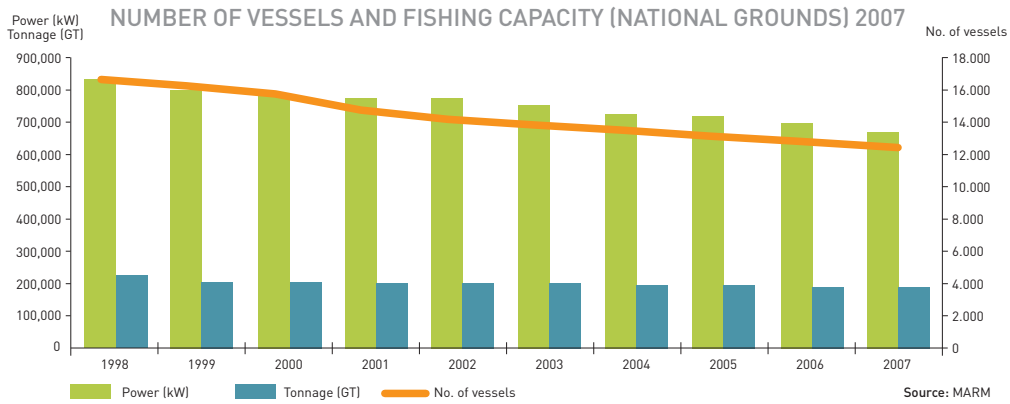
The size of the EU-25's fleet has dropped from 88,467 vessels in 2005 to 87,004 in 2006, according to data from Eurostat. The Spanish fleet accounts for 21.12% of this

INDICATOR	GOAL	TREND
Number of vessels and fishing fleet capacity	Adjust fishing capacity to sustainable limits	Reduce the number of vessels and the power of the Spanish fleet
Fishing fleet catches	Contribute to food security and facilitate fishing grounds' recovery	Increase the total landed catches for the Spanish fleet slightly
Aquaculture production	Increase and diversify production	Variations in mussel production reduce the total volume of aquaculture production
Eco-efficiency in the fishing and aquaculture sectors	Sustainable resource exploitation	The sector's Gross Added Value increases despite the reduction in the fleet's power.

reduction. In Spain, the fishing industry as a whole (including fishing, aquaculture, processing and sales) represents around 1% of the country's Gross Domestic Product. In areas that rely on fishing, however, this sector can contribute 10% or more to local GDP. All of Spain's coastal Autonomous Regions have interests in the fishing sector, particularly Galicia, Andalusia, the Basque Country and the Canary Islands. Marine aquaculture grew in 2007, especially due to an increase in fish production.

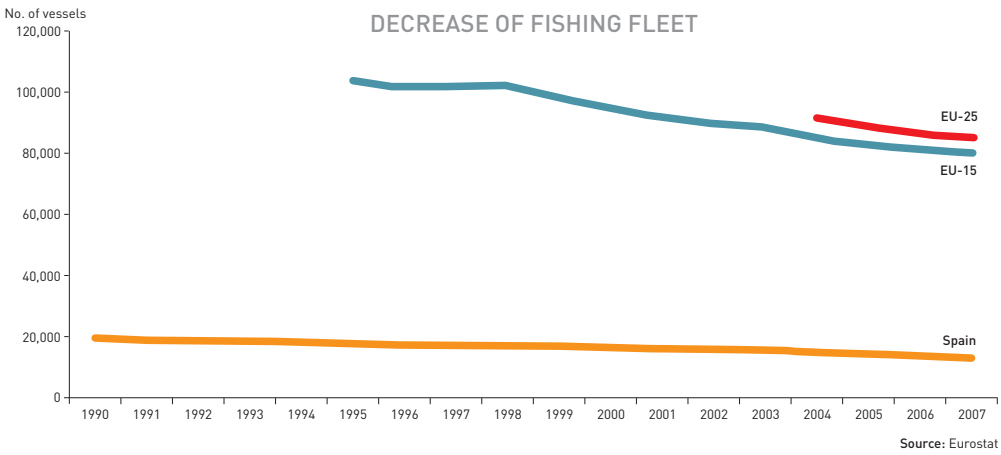
Number of vessels and fishing fleet capacity

The reduction in the number of vessels in the Spanish fishing fleet was greater than in the European fleet



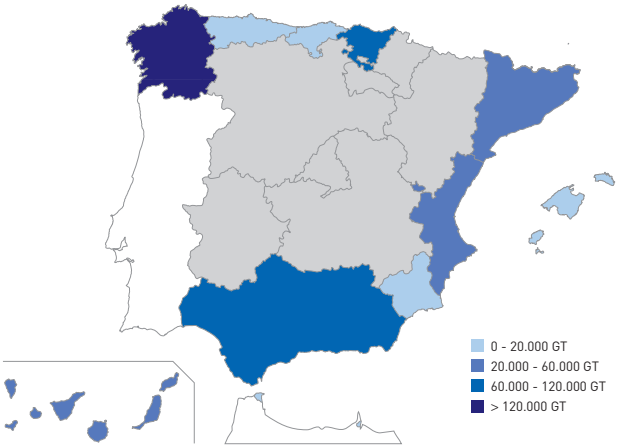
The number of vessels in the EU-15's fishing fleet decreased by 1.9% in 2007 with respect to 2006, according to Eurostat figures. The EU-25's fishing fleet suffered a similar decrease, whereas the Spanish fishing fleet in all fishing grounds decreased by slightly more (2.9%).

As of December 31st, 2007, the Spanish fishing fleet consisted of 13,006 vessels, 12,475 of which were operating in national fishing grounds and 531 in others. The fleet's tonnage and power also decreased, although total catches did not.



TONNAGE OF THE FISHING FLEET (December 2007)

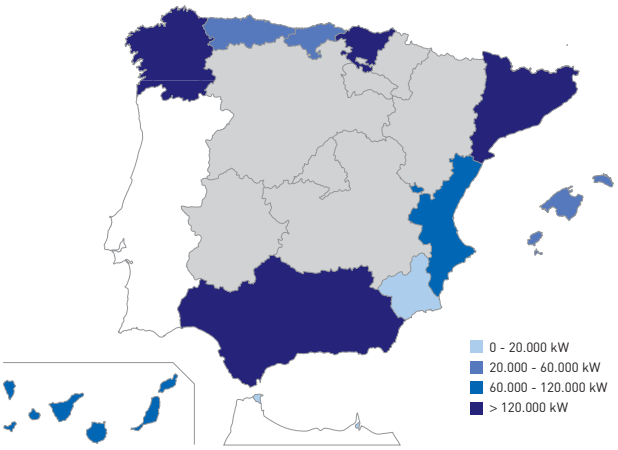
TOTAL FISHING GROUNDS	
Community	**Tonnage (GT)**
Andalusia	57,148
Asturias	10,772
Balearic Islands	3,985
Canary Islands	32,368
Cantabria	10,898
Catalonia	26,863
Ceuta	12,974
Galicia	195,845
Melilla	287
Murcia	3,785
Basque Country	86,940
Valencia	26,173



Source: MARM

POWER OF THE FISHING FLEET (December 2007)

TOTAL FISHING GROUNDS	
Community	**Power (kW)**
Andalusia	164,784
Asturias	26,766
Balearic Islands	23,215
Canary Islands	67,546
Cantabria	26,021
Catalonia	122,374
Ceuta	17,407
Galicia	349,306
Melilla	1,005
Murcia	14,872
Basque Country	149,808
Valencia	95,228



Source: MARM

NOTES

- This indicator refers to vessels in List 3 in the General Shipping Registry, which makes up the Operational Fishing Fleet active as of December 31 each year. Some of these vessels may change fishing ground during the year, which means that their total may differ depending on the date. A large number of these vessels are traditional fishing boats and some even have no fixed engine.
- To calculate this indicator, the fishing capacity, in accordance with regulation 2371/2002/EC of the Council, is expressed in terms of power, in kilowatts (kW), and load capacity (gross tonnage). This unit replaced gross register tonnage in 1998.

SOURCES

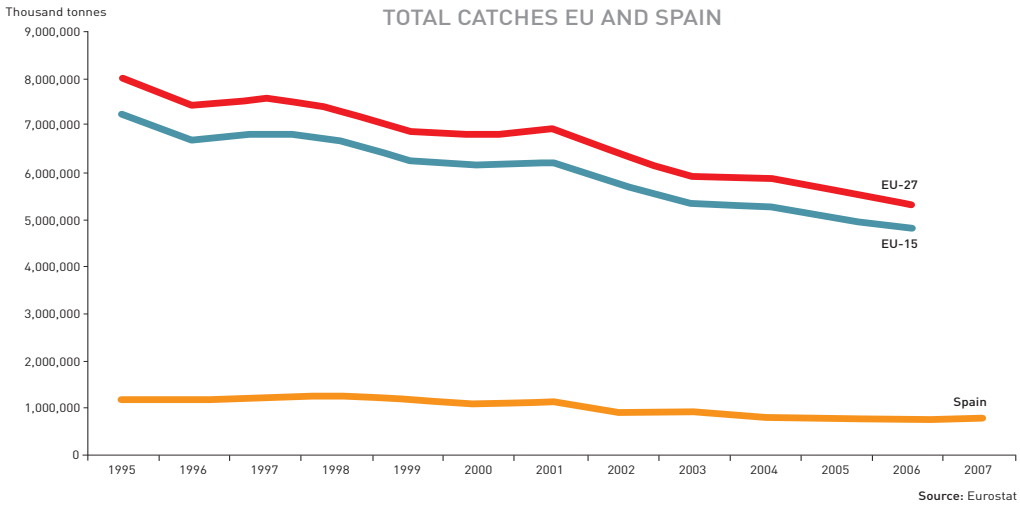
- Data provided by the General Secretariat for the Sea. MARM.
- EU data, Eurostat (http://epp.eurostat.ec.europa.eu) webpage, "Data", "fishing fleet".

MORE INFORMATION

- **http://www.marm.es**
- **http://epp.eurostat.cec.eu.int/**

Fishing fleet catches

Landed Spanish catches increased by 6.8% in 2007



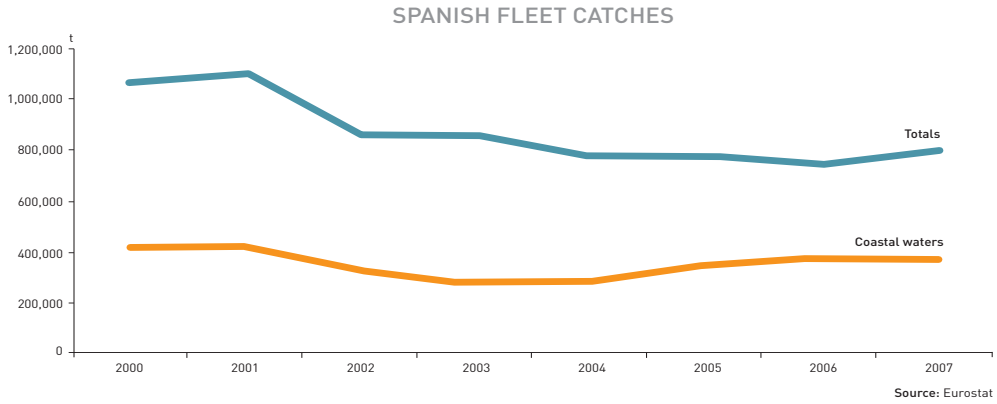
Source: Eurostat

The data for this indicator, obtained from Eurostat, are expressed in terms of live weight equivalent for the landings. They do not include products which, for whatever reason, are not landed.

Around 90% of the European fleet's fish catches come from waters in the NE Atlantic where, according to the European Environment Agency, more than a quarter of the commercial fish populations assessed are outside the biological safety limits. The measures put into place by the EU include the creation of the European Fisheries Agency and the Action Plan to ensure compliance with fishing restrictions, eradicate illegal landings and uncontrolled or unregulated fishing.

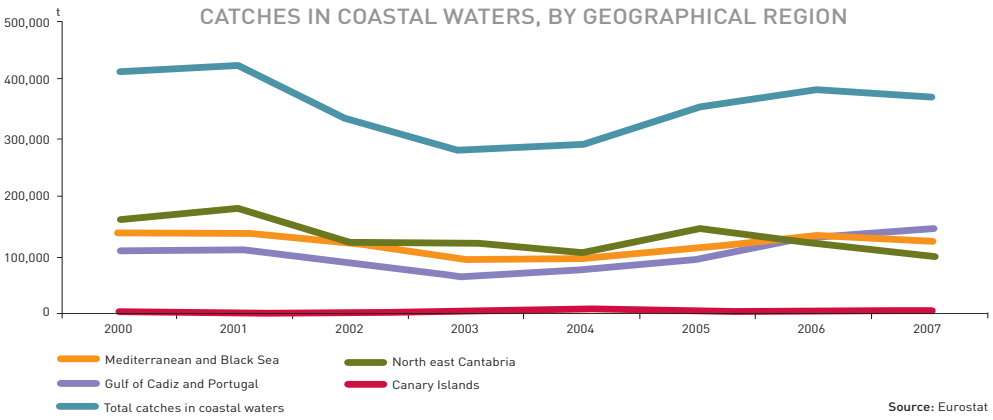
Pan-European seas commonly suffer from overfishing and some species are outside the biological safety limits. Around 10-20% of stocks in the Aegean and Cretan Seas are considered to be outside these limits, and the stock of Red Tuna in both the eastern Atlantic and the Mediterranean is considered to be essentially exhausted.

The evolution of the Spanish fleet's captures is a mirror image of that seen last year. Thus, catches in coastal waters decreased by 3.22% in 2007 with respect to 2006, whereas total catches (in both national and international fishing grounds) increased by 6.86%.



Source: Eurostat

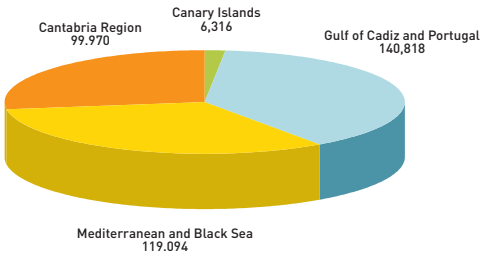
The evolution of catches in coastal waters was very different in 2007 in comparison with the situation in 2006. In the Cantabrian region, for example, catches decreased by 11.47%, and they also decreased in the Mediterranean and Black Sea (by 8.8%). The decrease in the Canary Islands region was even greater, at 37.50%, whereas catches in the Gulf of Cadiz and in Portuguese waters increased by 12.95%.



Source: Eurostat

Marine reserves are a specific measure that helps to achieve sustainable exploitation of fisheries resources by enabling specific protection measures in defined regions of traditional fishing grounds. These regions have contributed to a significant recovery in the fishing grounds. Ten marine reserves have been established in Spanish waters: Cabo de Gata, Cabo de Palos-Islas Hormigas, Cala Rajada-Levante de Mallorca, Isla de Alborán, Islas Columbretes, Isla Graciosa, Isla de Tabarca, La Palma, La Restinga-Mar de las Calmas and Masía Blanca.

CATCHES IN COASTAL WATERS, BY GEOGRAPHICAL AREA, 2007 (t)



Source: Eurostat

SOURCES

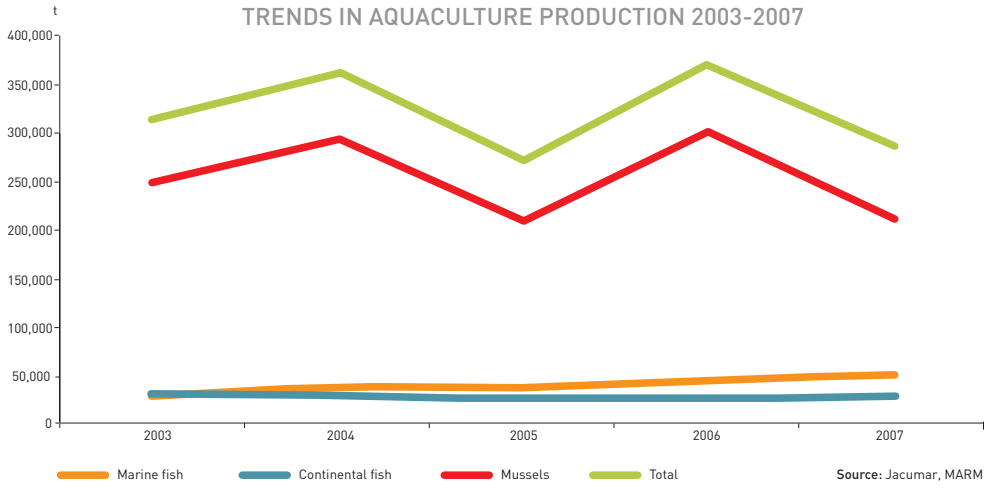
- EUROSTAT, Data, Fisheries. The Eurostat data for the regions "Mediterranean and Black Sea", "NE Atlantic, zone R27-08 c", "NE Atlantic, zone R27-09a" and "Central-Eastern Atlantic, zone 34.1.2" were used for the Mediterranean, NE-Cantabrian, Gulf of Cadiz and Canary Islands zones, respectively.

MORE INFORMATION

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

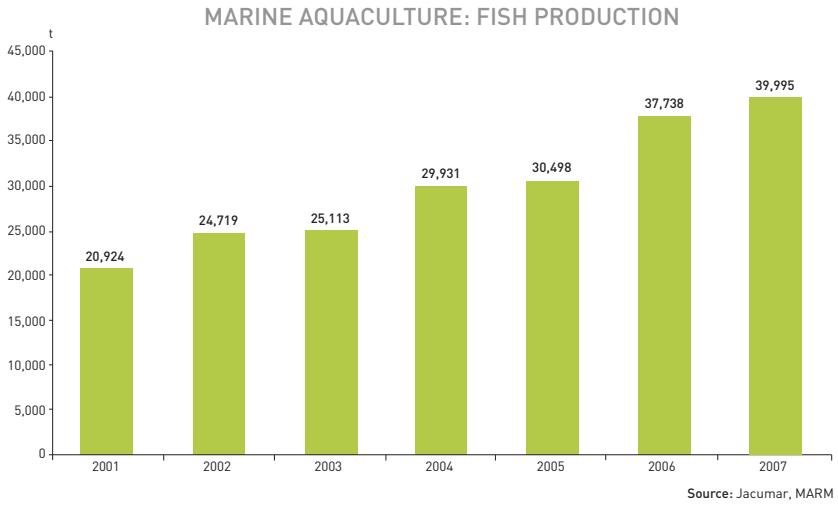
Aquaculture production

Spanish aquaculture production varies in volume depending on mussel production



The overall figures for Spanish aquaculture production over the past few years mirror the significant variations in mussel production, which represents almost 80% of the total number of tonnes produced and close to 30% in economic terms.

Mussel production in 2007 was 211,983 tonnes, a decrease of almost 30% (29.78%) with respect to 2006.



The good fish production figures for marine aquaculture were maintained. Gilthead bream production increased by 11.32% with respect to 2006 to 19,855.4 tonnes and sea bass production increased by 6.37% to 10,049.21 tonnes, whereas turbot production decreased by 2.88% to 6,035 tonnes.

Fish production in inland aquaculture also increased in general terms, with rainbow trout production increasing by 11.52% to 28,416.65 tonnes.

Aquaculture has begun to be considered a possible alternative to wild fishing for human consumption. The European Environment Agency ("The environment in Europe: fourth assessment", 2007) considers, however, a series of impacts it may have on the environment. These include the eutrophication and localised enrichment of sediments, the use of wild fish to manufacture feed for fish farms (4 kg of wild fish are required to raise 1 kg of farmed salmon), the use of antibiotics, chemical products, etc.

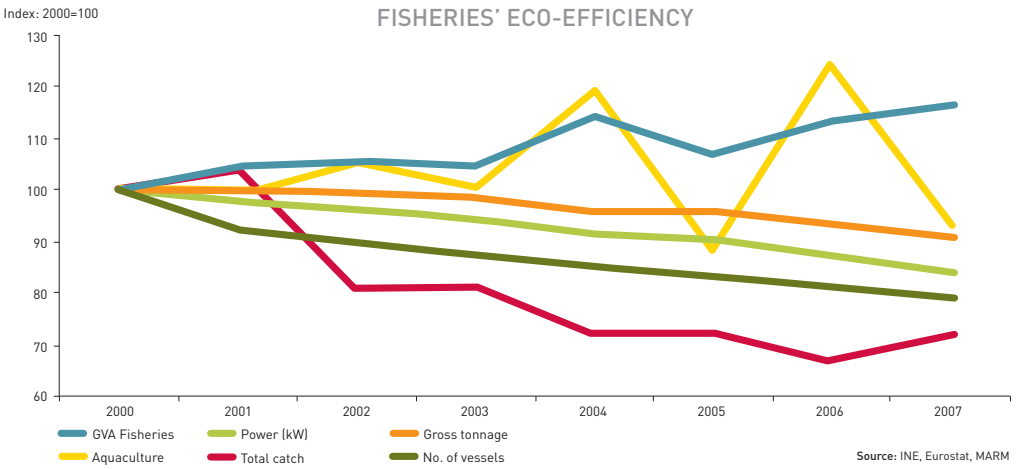
On the basis of these figures, it can be seen that aquaculture is an alternative means of providing consumers with high-quality fish proteins and that it is gaining ground as a complementary activity to fishing and offers excellent prospects for economic growth and job creation.

SOURCES
- JACUMAR, National Advisory Board for Marine Aquaculture. MARM.

MORE INFORMATION
- http://www.marm.es

Eco-efficiency in the fishing and aquaculture sectors

The increase in GVA and the decrease in fleet capacity were maintained in 2007



The Gross Value Added of the fisheries sector (at current prices) increased by 2.5% in 2007 with respect to 2006. This increase occurred at the same time as total catches also increased (by 6.86%). whereas the number of vessels decreased by 2.91%, the power decreased by 3.49% and the fleet's tonnage by 2.88%.

The Gross Value Added, which increased in the last two years for which data are available, varied, with increases due to the greater efficiency and modernisation of the sector. The variations in mussel production produce a series of peaks in aquaculture.

The sector's overall trend, as a result of the Common Fisheries Policy, is a continual decrease in fishing capacity and in catches landed by the Spanish fleet. This trend is not applicable to fish production in marine aquaculture facilities, where output continues to rise each year.

The sector's economic growth in the past few years has occurred at the same time as the number of vessels and the fleet's tonnage and power have decreased.

However, the increase in the sector's gross value added, which has occurred as total

catches have dropped every year since 2001, with a slight rebound in landed catches in 2007, is particularly significant.

NOTES

- Gross Value Added for the sector has been calculated using the Gross Value Added data at basic prices (reference year 2000=100) provided by the National Institute of Statistics.

SOURCES

- GVA: Spanish National Accounts. INE
- No. of vessels, power and tonnage: Secretariat General for Fisheries, MARM.
- Catches: Eurostat, Data, Fisheries.
- Marine aquaculture: Secretariat General for the Sea. MARM.

MORE INFORMATION

- http://www.marm.es
- http://www.ine.es
- http://epp.eurostat.cec.eu.int/

2.10 TOURISM



According to the World Tourism Organisation (WTO), international tourism reached record levels in 2007 with 903.2 million tourists, a 6.6% increase on 2006. Tourism income reached 625,000 million euros, 5.6% more than in the previous year. These figures show the continual growth of the last few years despite external problems such as the safety and health situations in some countries, higher fuel prices, inflationary risks and higher interest rates.

Europe remained in first position as a world destination (54% market share) and continued to grow faster than the average, with 484 million tourists arriving, although its growth rate of 4.8% was below the world average. Spain occupied second place in terms of number of arrivals, behind France but ahead of the USA, and was also in second place in terms of income (€42,171 million).

In 2007, 59,193,289 foreign tourists chose Spain as their holiday destination. This figure, although a new record, shows a clear slowdown in growth. Although positive, the growth rate with respect to 2006 (1.7%) is lower than that seen in other Mediterranean countries. Total tourist spending increased by 3.5%: thus, if each tourist spent €857 in 2006, the figure for 2007 was €870, an increase of 1.5%. The average stay was nine nights (–2.8%), thus prolonging the downward trend observed in previous years.



More than 60% of international tourists came from three countries: United Kingdom, Germany and France. The number of British tourists dropped slightly with respect to 2006 (16 million arrivals), thus confirming the downward trend observed

INDICATOR	GOAL	TREND
Number of foreign tourists per kilometre of coast	Monitor the number of tourists and their relationship with the host population	The rate of tourists per resident (1.31) remained the same as the previous year despite record numbers of tourists arriving in 2007
Tourist Population	Monitor the stay of foreign tourists on the coast to minimise their impact	Spanish coastal resorts received 88% of foreign tourists, with the number of tourists per km of coast increasing by 0.5% in 2007
Tourist-Equivalent Population (TEP) with respect to resident population	Achieve a balance between the TEP and the host population (at state, regional, local level)	Despite the increase in tourist numbers, the TEP with respect to the resident population fell due to a reduction in the number of overnight stays and an increase in the resident population
Number of visitors to National Parks	Preserve National Parks from excessive tourist pressure	The number of visitors to National Parks dropped slightly (1%)
Rural tourism: accommodation, capacity, tourists and overnight stays	Monitor rural tourism infrastructure and services according to the principles of sustainable rural development	Rural tourism accommodation and capacity increased by almost 10% in 2008, although the number of visitors and overnight stays decreased

PRINCIPAL WORLD TOURISM DATA 2007

Tourist Destination	No. of tourists (million)	Growth 2007/2006	Market share (%)
France	81.9	3.8	9.1
Spain	59.2	1.7	6.6
United States	56.0	9.8	6.2
China	54.7	9.6	6.1
Italy	43.7	6.3	4.2
Other countries	607.7	7.0	67.3
World TOTAL	**903.2**	**6.6**	**100**

Source: World Tourism Organisation. "Barómetro OMT del Turismo Mundial". June 2008

in previous years. The number of German tourists also decreased (0.7%) after three successive years of increases, whereas the number of French tourists increased by 1.7% to 24 million. Of the non-European markets, which together make up only 6.9% of the total, the USA was once again the leader, with 1.1 million tourists visiting Spain.

The vast majority of this flow went to six Autonomous Regions: Catalonia, the Balearics, the Canary Islands, Andalusia, Valencia and Madrid, which together accounted for 90.5% of the total. As regards the evolution of the number of tourists visiting other Autonomous Regions, the large drop experienced by the Cantabrian coastal Communities (Galicia, Asturias, Cantabria and the Basque Country) and some inland Communities should be noted. The Canary Islands also experienced a moderate decrease of 1.6%.

Spanish residents also undertook a total of 146.8 million trips within the country (93.58%) and 11.3 million trips abroad (6.42%), with the former falling by 5.0% and the latter rising by about the same amount. The most popular destination for Spanish residents was Andalusia, followed by Catalonia and Valencia. One out of every three trips taken by Spanish residents was taken in either the summer or at Easter, thus highlighting the highly seasonal nature of this sector. As regards trips abroad, the main destinations were European countries (76.8%), chiefly France, Portugal, Italy and Andorra. As would be expected, the majority of these tourists came from the most populated Autonomous Regions, although the Basque Country, La Rioja, Asturias and Castile and Leon exceeded the national average.

As far as the social benefits of tourism-related activities are concerned, the Ministry of Employment and Social Affairs estimates that 1,937,209 people were employed in such activities, i.e. hotels and catering, and travel agencies, a 4.9% increase on the previous year. Of these, 924,511 were employed in catering and 279,446 in hotels and other accommodation.

European policy on sustainable tourism has been explained in various communications from the Commission, including "A renewed EU tourism policy" [COM (2006) 134 final] and, more recently, the "Agenda for a sustainable and competitive European tourism" [COM (2007) 621 final]. These communications emphasise that tourism is a transversal sector which covers numerous economic activities and accounts for 4% of the EU's GDP, but also warn that tourism can easily become a victim of its own success if not developed sustainably.

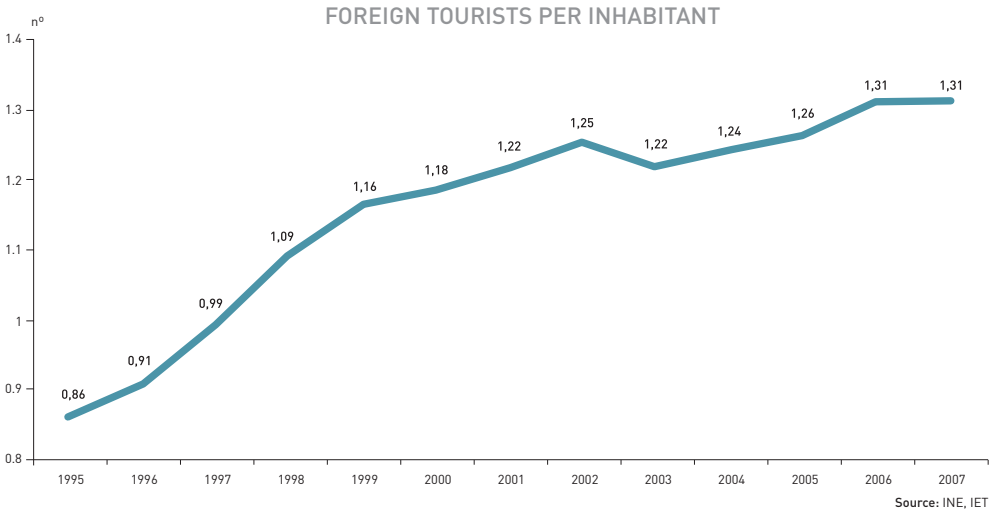
The above-mentioned Agenda proposes a response strategy to current challenges involving reducing the seasonal nature of demand, reducing the impact of tourist transport (emissions in the EU-15 reached 8% of CO_2-equivalent emissions), minimising resource use and waste production, limiting energy consumption, maintaining the prosperity of local communities, conserving natural and cultural heritage, improving the quality of tourism-related jobs and making holidays more accessible for all.

The *Spanish Tourism Plan 2020*, approved by the Council of Ministers on November 8 2007, which aims to ensure that the Spanish tourism system becomes more competitive and sustainable, thereby providing maximum social wellbeing, continues to be implemented. The strengths detected in the system include the EU's political stability and the proximity of the markets of origin, whereas the weaknesses include reduced competitiveness due to recent price increases. The trends detected include greater environmental demands by consumers, with the report highlighting that "the sector's future will depend on a good conservation of the environment and an efficient use of resources".

Joint planning of the reforms by all parties involved is key to make progress towards the sustainable development of the sector. The largest investments are being made in the framework of the so-called *Infrastructure Renewal Plan* (approved by the Council of Ministers on November 21, 2008), followed by actions in more mature sun and beach resorts. Significant investment is also being made in market studies and promotional campaigns abroad.

Number of foreign tourists per resident

Despite the higher number of tourists in 2007, this rate is the same as the previous year (1.31 tourists per resident) due to the increase in population



Source: INE, IET

This indicator shows the number of foreign tourists who visit Spain every year. The number of tourists per resident in 2007 (1.31) was the same as in the previous year, despite the record number of arrivals, due to the increase in the Spanish population.

Tourist arrivals during the period shown in the graph show a continual upward trend except for 2003, increasing from 34.9 million in 1995 to 59.2 million in 2007. This process parallels that of population growth, with the Spanish population increasing from 39.6 million to 45.2 million in the same period. These two phenomena—population growth and increasing numbers of foreign tourists—are closely related due to the need to hire foreign workers to perform services related directly or indirectly with tourism, such as construction of infrastructures and facilities.

Three Autonomous Regions exceed the national average in terms of number of tourists per resident: the Balearics (9.93 foreign tourists per resident), the Canary Islands (4.67) and Catalonia (2.11). Valencia (1.15) and Andalusia (1.07) also exceed the ratio of one tourist per resident, whereas the rest do not.

The most frequently used access route for foreign tourists arriving in Spain was by air, which accounted for 75% of all arrivals. This was the only transport method which increased with respect to 2006 (4.4%). Cars accounted for 22.1% of arrivals, trains 2.6% and the remaining 0.4% arrived by sea. It should be noted that almost 24 million passengers flew with one of the 29 low-cost airlines (LCA), whose combined passenger figures increased by 33.9% with respect to 2006 and which made more than 177,000 flights.

Airline use grew by 28.92% with respect to 2006 and road transport grew by 22.66%, whereas boat and train use continued their severe downward trend (decreases of 36.25% and 43.81%, respectively). This decrease in train access to Spain should be considered a negative trend as it is considered to be the most efficient method of transport from an environmental point of view.

As regards accommodation type, foreign visitors to Spain stayed above all in hotels, followed by their own residences or those of family members. Although the number of tourists staying in hotels has increased in absolute terms from 33.7 million in 2000 to 37.9 million in 2007, there is a clear trend in favour of staying in their own residence (or that of a family member), with an increase from 7.5 million in 2000 to 13 million in 2007. In percentage terms, hotel stays dropped by 6.3% between 2000 and 2007, the same percentage by which accommodation in private residences increased. It is logical to equate this increase with the purchase of a second residence, a phenomenon which has grown strongly due to a series of factors which have affected the market (land-use laws, low interest loans, devalued countryside land, permissiveness of local authorities, etc.).

Outside the summer season, international tourism increased by 5.3% in the first quarter of the year with respect to the same quarter of the previous year. This suggests that the sector is becoming less seasonal, which is a key factor in achieving sustainability.

Despite the financial benefits arising from an increase in tourist numbers (estimated at 11% of GDP), their arrival also leads to greater resource and energy consumption, more waste generation, a need for more infrastructure to provide services, greater land cover, more pollutant gas emissions, etc. The above is heightened by the distinctly seasonal nature of tourism in Spain, which concentrates environmental pressures during a short period of time, thereby exacerbating the situation and, at times, exceeding the environment's carrying capacity.

ACCESS ROUTE USED BY FOREIGN TOURISTS 2000-2007

	2000 (no. tourists)	2007 (no. tourists)	Variation 200 – 2007 (%)
Airport	34,379,930	44,324,017	28.92
Road	10,669,405	13,086,851	22.66
Port	24,03,175	1,532,129	-36.25
Railway	445,405	250,292	-43.81
TOTAL	**47,897,915**	**59,193,289**	**23.58**

NOTES

- Tourist: any person travelling to a place other than his/her usual place of residence, who stays at least one night for a purpose other than the exercise of paid activity.
- Carrying capacity of an area: concept used with reference to the sustainability of tourism, defined as the maximum number of tourists that can visit a tourist destination at the same time, without this causing economic, socio-cultural or environmental damage and without a decrease in the visitors' satisfaction (UNEP). The carrying capacity should be established for each destination on the basis of desirable quality of life standards.

SOURCES

- Institute of Tourism Studies. *Balance of Tourism in Spain 2007.*
- Institute of Tourism Studies. *Spanish Border Survey of Inbound Tourism (FRONTUR). Annual report* 2007.
- National Institute of Statistics. Inbound Tourism. 2005-2007.

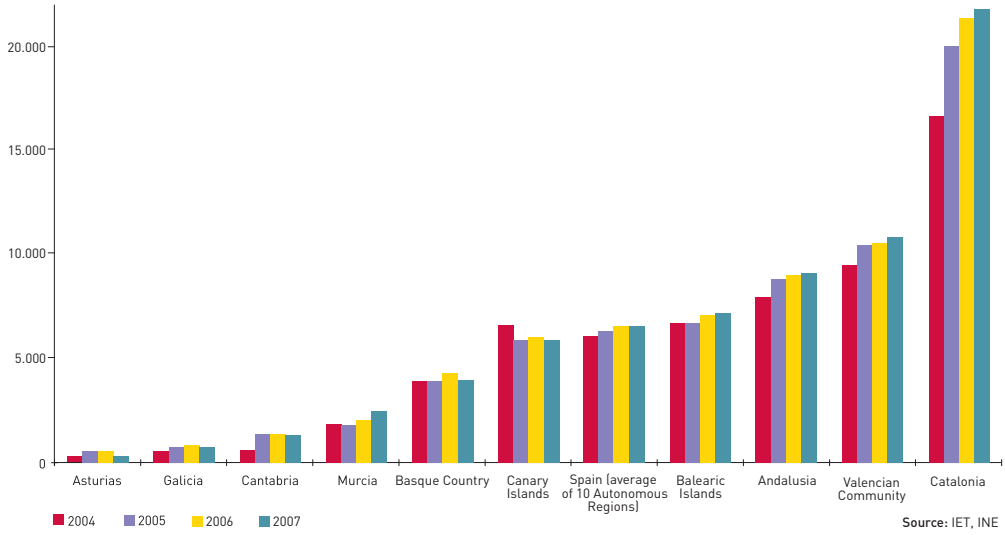
MORE INFORMATION

- **http://www.iet.tourspain.es**
- **http://www.tourspain.es/es/Home/ListadoMenu**
- **http://www.ine.es**

Number of foreign tourists per kilometre of coast

The number of tourists per kilometre of coast remained essentially the same in 2007 with respect to the previous year, with a slight increase of 0.5%.

FOREIGN TOURISTS PER KILOMETRE OF COAST



Source: IET, INE

In 2007, 52.5 million foreign tourists (88.2% of the total) visited the Spanish coast. This represents an average of 6665 tourists per kilometre of coast, an increase of 0.5% on the previous year but less than the increase in overall tourist numbers (1.7%). By Autonomous Region, Catalonia was the most popular (21,807 tourists per km), followed by Valencia (10,809), Andalusia (9,115) and the Balearics (7,166), all of which were above the average. Five Communities experienced decreases with respect to the previous year (Asturias decreasing by a massive 20.7%), whereas all the others showed increases, most notably Murcia, with an increase of 16.9%.

On the Bay of Biscay, the Basque Country had the highest figure (4024 tourists per km), whilst Asturias (408 tourists per km), Cantabria (1328) and Galicia (761) had lower levels. The latter's long coastline (1498 km) partially explains this figure, which nevertheless increased between 2004 and 2006, although it decreased in 2007. The Mediterranean (including the Balearics) and Andalusian coasts together attract more than 40 million tourists (76.9% of the total), which represents 10,446 tourists

per km of coast. In contrast, the Cantabrian and Galician coasts only attract 5% of foreign tourists, which gives a figure of 1099 tourists per km of coast.

The growth rate for Spanish coasts as a whole was 8.9% in the period 2004-2007. This increase was noted in all Autonomous Regions except the Canary Islands, which experienced a 9.8% decrease. Cantabria (97.6%), Galicia (50%), Catalonia (30.5%) and Murcia (30.1%) saw the greatest increases over this period. However, with the exception of Catalonia, it should be noted that overall tourist numbers in these Communities are relatively low, with a maximum of 1,255,148 tourists visiting Galicia in 2006.

NOTES

- This indicator establishes the ratio between the number of foreign tourists visiting the Spanish coast and the length of coastline. When broken down by Autonomous Region, it is once again clear that there is a great imbalance between tourist destinations in northern Spain and those on the Mediterranean, although it should be remembered that the figures are not calculated on the basis of tourist numbers alone, but also in terms of length of coastline, which for three Autonomous Regions (Galicia, the Balearic Islands and the Canary Islands) exceeds 4500 kilometres.

SOURCES

- Spanish Border Survey of Inbound Tourism (FRONTUR). Annual report 2007. Institute of Tourism Studies.
- INS. Inbound Tourism. Series 1995-2007.
- INS. Physical surroundings. Length of coastlines and borders (data from the National Geographical Institute).

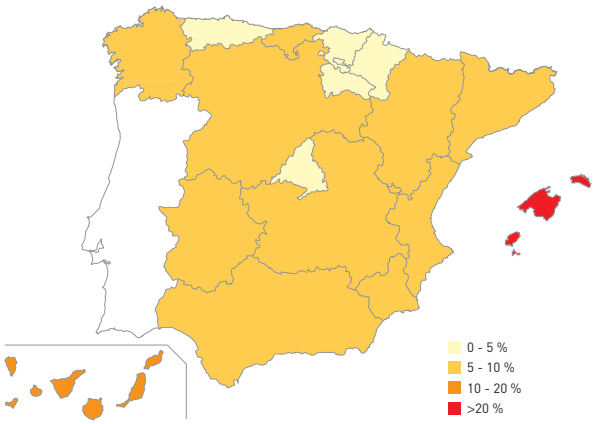
MORE INFORMATION

- **http://www.marm.es**
- **http://www.iet.tourspain.es**

Tourist-Equivalent Population (TEP) with respect to the host population (%)

Despite the higher number of foreign visitors, overnight stays, and therefore tourism pressure on the local population, decreased in 2006

Auton. Region	2006	2007
Andalusia	7.42	7.63
Aragon	5.54	5.42
Asturias	4.64	5.10
Balearic Islands	29.89	27.63
Canary Islands	17.19	16.26
Cantabria	9.20	8.56
Castile and Leon	8.09	8.40
Castile-La Mancha	6.50	6.04
Catalonia	7.46	7.31
Valencia	9.13	8.74
Extremadura	6.32	6.12
Galicia	5.45	4.86
Madrid	2.83	3.32
Murcia	5.33	5.42
Navarre	3.15	3.80
Basque Country	2.49	2.42
La Rioja	4.76	4.85
Ceuta and Melilla	1.18	1.72
SPAIN	7.29	7.21



Source: Compiled in-house from EIT and INS data

Calculation of this indicator allows us to determine how many people resident in Spain all year would be equivalent to the number of overnight stays recorded in tourism-related statistics. More than one billion overnight stays (1,189,199,850) were recorded in 2007, which is equivalent to a population of 3,258,082 people living in Spain for a whole year.

This concept allows us to form a more accurate picture of the pressure resulting from tourism activities. The most widely reported indicator in the media is the total number of foreign tourists per year. Despite the increase in the number of tourists, which reached a record high of 59,193,289 in 2007, one million more than in 2006, both the average stay (5.8 days) and the number of overnight stays decreased, which means that tourism-related pressure on the country also decreased.

The Tourist-Equivalent Population, as a percentage of the resident population (of Spain or, where applicable, of each Autonomous Region), provides a means of assessing tourist pressure on destination regions. High values (of 10% or more) indicate that the tourism sector is equivalent to an average annual population increase of this size, with the concomitant effect on resource consumption, management of urban and environmental services, and land-use planning and land consumption. As can be seen from the table below, the national average does not reach this critical figure of 10% and has even decreased from 7.29% to 7.21%. Seven Autonomous Regions comfortably surpass the national average, notably the Balearics (27.36%) and Canary Islands (16.26%), although both have experienced a slight fall with respect to 2006.

The absolute figures for the chosen variables are presented in the following table. By reducing the data to index form it is possible to see the changes over the period 2003-2007.

SPAIN: EVOLUTION OF THE PRINCIPAL VARIABLES IN THE TOURISM SECTOR (2003-2007)

	2003	2004	2005	2006	2007
No. of overnight stays	1,068,411,997	1,092,106,446	1,243,032,947	1,189,285,167	1,189,199,850
Tourist equivalent population (TEP)	2,927,156	2,992,072	3,405,570	3,258,316	3,258,082
TEP index	**100**	**102**	**116**	**111**	**111**
Resident population	42,717,064	43,197,684	44,108,530	44,708,964	45,200,737
Resident population index	**100**	**101**	**103**	**105**	**106**
TEP with respect to resident population (%)	6.85 %	6.93 %	7.72 %	7.29 %	7.21
Foreign tourists	50,853,815	52,429,832	55,913,778	58,451,141	59,193,289
Foreign tourists index	**100**	**103**	**110**	**115**	**116**

Source: National Institute for Tourism Studies, INS and own data

NOTES

- 365. This figure therefore indicates how many people living in Spain all year round would be equivalent to the number of overnight stays recorded in tourism-related statistics.
- The number of overnight stays is taken from the report published by the Spanish Institute of Tourism Studies (EIT) "Domestic Tourism" 2003-2007. This survey covers overnight stays in the following types of accommodation: hotels and similar, own property, home of family and friends, rented property, other types of accommodation. The data refer to residents and non-residents (Spanish and foreign citizens). The sources of information used were the FRONTUR and FAMILITUR surveys. The Spanish National Institute of Statistics (INS) also publishes these figures under the sections relating to "Domestic Tourism" and "Inbound Tourism".
- Resident population: the population data refer to the population recorded in the municipal population register as of 1 January of each year (INS).

SOURCES

- INE. Inbound Tourism.
- INE. Domestic Tourism
- INE. Taken from the annual municipal register statistics (2003-2007).
- Spanish Institute of Tourism Studies (EIT): Domestic Tourism 2003-2007, with data from the FRONTUR and FAMILITUR surveys.

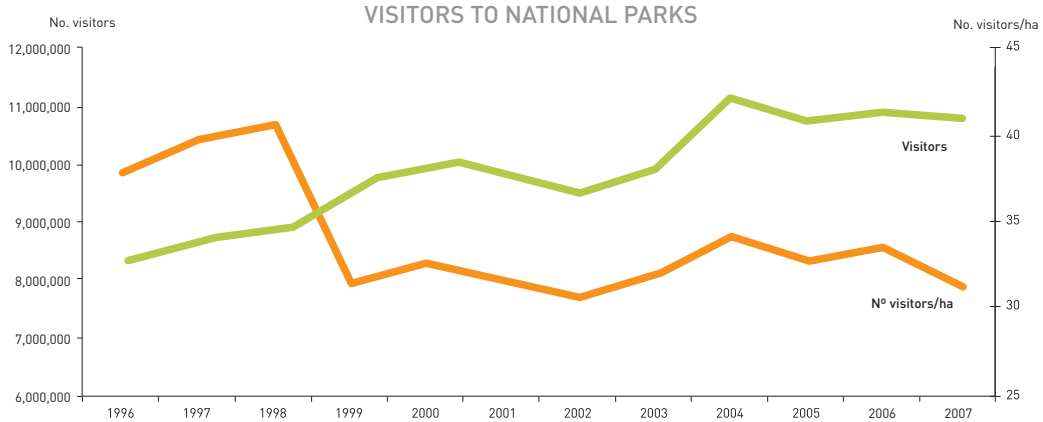
MORE INFORMATION

- **http:// www.ine.es**
- **http:// www.iet.es**

Number of visitors to National Parks

The overall flow of visitors to National Parks fell slightly in 2007, with five parks experiencing large falls and the rest remaining close to 2006 levels

This indicator shows changes in the number of visitors to Spain's National Parks and



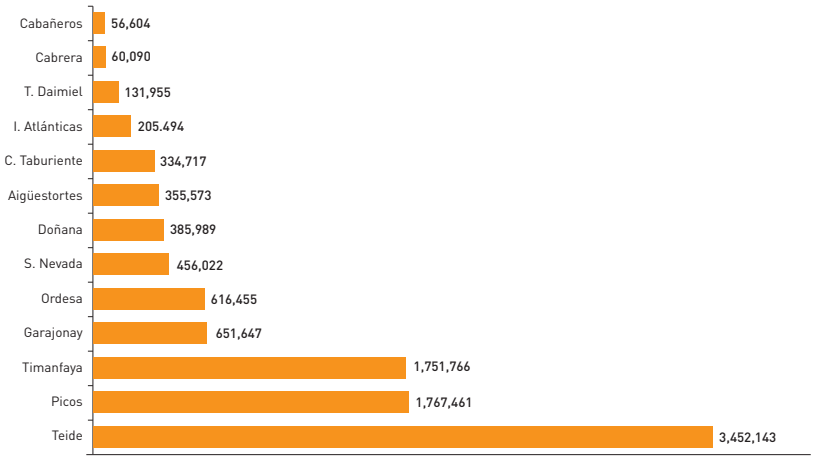
Source: MARM

the number of visitors in relation to the size of the protected area. In 2007 these protected spaces covered a total of 347,022 ha. It should also be highlighted that, in addition to the protected areas themselves, eight of the Parks are also surrounded by a total of 284,252 ha of land covered by different degrees of protection. The conversion of Monfragüe Natural Park into a National Park in 2007 resulted in a large increase in the surface area.

Spain's National Parks have received an average of 10 million visitors per year since 1996, with visitor numbers peaking in 2004 (11,134,880). The number of visitors in 2007 was 10,864,738, 114,732 (–1%) less than in the previous year, although this fall only affected five parks (Teide, Aigüestortes, Picos de Europa, Timanfaya and Cabañeros). The remaining parks received a similar or higher number of visitors than the previous year, with the Tablas de Daimiel seeing its visitor numbers jump by 22.1%.

As the total number of visitors remained relatively stable at around 10 million and the protected area increased, the indicator measuring the number of visitors per hectare decreased to 31.3 in 2007. The Garajonay, Teide, Timanfaya and Caldera de Taburiente National Parks continue to be the most visited in terms of visitors per hectare. The Canary Islands accounted for more than half of all visits made to National Parks in this year (56.7%).

AVERAGE NUMBER OF VISITORS TO NATIONAL PARKS (1996-2007)



Source: MARM

The Monfragüe National Park joined the National Parks Network in March 2007. The area of this park (18,118 ha) resulted in a 5.22% increase in the network's total area. The large amount of protected land surrounding this park (16,160 ha), which is the largest for any National Park, should be highlighted.

BASIC DATA FOR NATIONAL PARKS - 2007

NATIONAL PARK	Area (ha)	Protection zone (ha)	Visitors	Visitors/ha
Aigüestortes i Estany de Sant Maurici	14,119	26,733	322,555	25
Archipiélago de Cabrera	10,020	None	76,541	7
Cabañeros	39,015	None	72,688	2
Caldera de Taburiente	4,699	5.956	389,024	79
Doñana	54,251	13.540	384,638	7
Garajonay	3,986	4.160	884,858	211
Islas Atlánticas de Galicia	8,480	None	238,939	26
Montfragüe	18,118	116,160	351,885	40
Ordesa y Monte Perdido	15,608	19,679	617,950	40
Picos de Europa	64,660	None	1,774,955	29
Sierra Nevada	86,208	85,750	737,183	8
Tablas de Daimiel	1,928	5,410	122,955	52
Teide	18,990	6,864	3,142,418	188
Timanfaya	5,107	None	1,748,149	350
TOTAL NP	**347,022**	**284,252**	**10,864,738**	**31. 3**

Source: MARM. National Parks Network. 2008

Notes: Area of the Islas Atlánticas NP: 7282.,2 ha marine and 1194.8 ha land. Area of the La Cabrera NP: 8703 ha marine and 1318 land.

NOTES

- The Monfragüe National Park was incorporated into the National Parks Network by Act 1/2007, of March 2, on the declaration of Monfragüe as a National Park (BOE no. 54, of March 3 2007)
- The statistical series for the Sierra Nevada NP was begun in 1999, that for the Islas Atlánticas NP in 2003 and that for the Monfragüe NP in 2007.

SOURCES

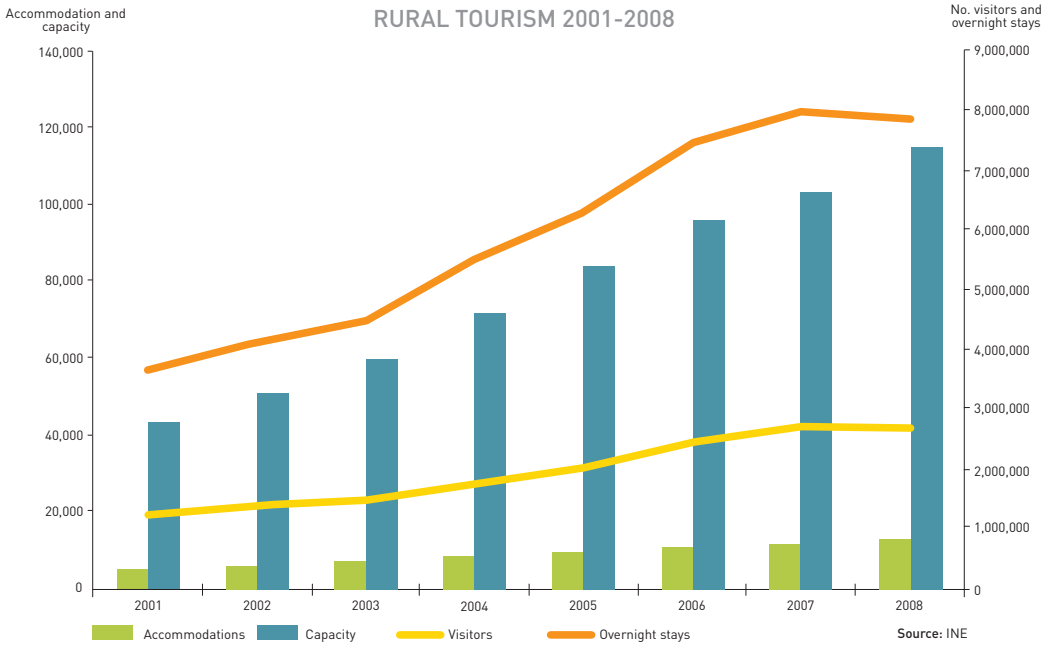
- National Parks Network. MARM: "First National Parks status report as of January 1st 2007"

MORE INFORMATION

- **http://www.marm.es**
- **http://reddeparquesnacionales.mma.es/parques/index.htm**

Rural tourism: accommodation, capacity, tourists and overnight stays

Rural tourism accommodation and capacity increased by almost 10% in 2008, although the number of visitors and overnight stays decreased (1.86% and 2.32% respectively)



Initially, rural tourism came about as an alternative means of income in areas traditionally dependent on farming or fishing that were experiencing a decline in their traditional activities. Rural tourism is no longer an emerging sector and is gradually becoming a consolidated industry with a strong environmental side to it. It contributes to maintaining the rural population, raising income in agricultural areas, conserving natural landscapes and preserving historical and cultural heritage.

The number of rural accommodations increased by 9.61% with respect to 2007, a similar increase to that seen for capacity (9.88%). This increase contrasts with the –1.93% decrease in visitor numbers and –2.32% decrease in overnight stays with respect to the previous year. The decrease in overnight stays only affected Spanish tourists — overnight stays by foreign tourists increased by 4.08%. The average stay was 2.99 days, a decrease of –0.47% on the previous year.

These figures appear to show a disparity between the accommodation on offer and its occupation, most likely due to a drop in the internal demand which is the lifeblood of this activity.

Rural tourism in Spain grew significantly between 2001 and 2008, with the number of establishments open rising from 5497 to 12,804 (a 133% increase) and the capacity also rising from 42,925 to 114,281 (a 167.5% increase). As regards occupancy, it can be seen that the number of visitors who chose to stay in rural accommodation rose from 1,210,891 in 2001 to 2,626,719 in 2008, an increase of 117%. The number of overnight stays also increased, rising by 114.3% from 3,660,815 in 2001 to 7,846,078 in 2008.

The vast majority of the tourists who stay in rural accommodation are either Spanish or resident in Spain and stay for only a short time (weekends or holidays). In 2001 only 10.25% were foreigners (124,125), with this proportion decreasing slightly in 2008 to 9.95%, although in absolute terms the number actually rose to 261,395. The ratio between resident and non-resident visitors is reversed in two regions: the Balearics, with 68,126 foreign tourists versus 19,378 Spaniards, and the Canary Islands, with 30,360 foreign tourists versus 21,187 Spaniards.

The breakdown by Autonomous Region shows that the largest number of rural establishments are found in Castile and Leon (2543), Catalonia (1516), Asturias (1186), Andalusia (1172) and Castile-La Mancha (1005). Castile and Leon also heads the list in terms of number of tourists (572,193), followed by Catalonia (335,882), Cantabria (178,753) and Castile-La Mancha (163,702).

As regards the average length of stay recorded for the various Autonomous Regions, the Canary Islands and Balearics (traditional holiday destinations) present the highest rates, which vary from around 7 days (Canary Islands) to 5-6 days (Balearics). The highest occupation rate is found in the Balearics (47.37%), followed by the Basque Country (27.71%), the Canary Islands (25.11%) and Navarre (22.84%).

The social benefit of this subsector of the hotel trade can be measured in terms of the number of jobs created: the number of people employed in 2001 was 7973, a figure which has increased steadily to reach 19,828. Employee numbers rose by 3% with respect to 2007.

NOTES

- Rural tourism accommodation is classified according to the following types: rural hotel, rural apartment, rural house, rural hostel, active tourism facilities, large-scale complexes and others. Rural houses are the most common, with 9221 of them open in August 2006. The next most common are rural apartments (553 open in August). The accommodation figures supplied by the National Institute of Statistics (INE) are an estimate of the number of establishments open.
- According to the INE, rural tourism accommodation includes establishments or houses that charge for tourist accommodation, with or without other complementary services, and are listed in each Autonomous Region's Tourist Accommodation Register. These establishments tend to have common features, such as being located in buildings typical of the local architectural style or on working farms (agro-tourism). They also offer a limited number of guest beds and rooms and meet certain requirements in terms of infrastructure and basic facilities.
- Act 45/2007, of 13 December, regarding sustainable development in the rural environment, promotes rural tourism by managing supply and improving demand for such tourism. Particular attention is paid to sustainable tourism in priority rural areas, agrotourism and farming-related tourism. This measure relating to sustainable development will be promoted within the context of a future National Plan for Agriculture and Livestock Environmental Quality, which will enable application of the provisions of Act 45/2007.

SOURCES

- INE Tourist Accommodation Occupancy Survey, 2008.

MORE INFORMATION

- **http:// www.marm.es**
- **http:// www.ine.es**



2.11 TRANSPORT



The annual average gross value added (GVA) of the transport sector in Spain over the past few years is close to 5% of total GVA. In 2007 this sector employed 696,300 people (923,400 if transport-related activities such as travel agencies are included). The transport sector is therefore of key economic importance in its own right and due to its transversal nature (as it affects the development of other sectors). It is, however, also responsible for environmental and public-health pressures.

The 2008-2012 Action Plan, which forms part of the Spanish Energy Saving and Efficiency Strategy (E4) 2004-2012, carries on and consolidates the measures undertaken as part of the previous plan. It has been estimated that transport is the sector where most energy savings will be made: 38% of the total (33.4 million tonnes of oil equivalent (TOE)). The Plan proposes as many as 15 measures to achieve this and, as was the case with the previous Plan, concentrates its efforts on those modes of transport which are least efficient and have the greatest effects on the environment (road transport). It also highlights the need to incorporate biofuels and other alternative fuels, extending the degree of participation until 2012, to a level of around 8%.

As an example of this regulatory framework, the VIVE (innovative vehicle, ecological vehicle) Plan was



INDICATOR	GOAL	TREND
Total inter-city transport volume: modal distribution	Achieve a balance between transport modes, promoting the more environmentally friendly options	Road transport is in greatest demand, although air transport has grown the most
Atmospheric emissions of pollutants by transport	Reduce atmospheric pollutant emissions and contribute to meeting environmental targets	Transport-related GHG emissions have increased and ozone-precursor and acidifying-agent emissions have decreased, although to a lesser extent
Air transport	Promote a balance between rail use and air transport and minimise the impact of airports	The total number of passengers fell by 3.2% in 2008 with respect to 2007
Transport waste: ELT	In this order: reduce, reuse, recycle and recover the ELT generated	Increase the integrated management of ELT and their recycling
Bio-fuel consumption	Ensure bio-fuels account for 5.75% of total fuel consumption by 2010	Increase biodiesel consumption and reduce bioethanol consumption
Motorisation and accident rate	The number of road traffic accident deaths in 2010 should be half that in 2001	The vehicle fleet has grown by 93.2% since 1990, whereas the number of victims has decreased by 9.9% and deaths by 45%
Transport's environmental efficiency	Decouple economic growth from the environmental pressures of this sector	Transport demand grows in line with GHG emissions and energy consumption

approved in June 2008 with the aim of rejuvenating the vehicle fleet with cars that emit less than 140 g of CO_2 per kilometre. This Plan was revised at the end of the year and adapted to the country's socioeconomic environment and that of the sector itself. This Plan replaced the former Plan PREVER and will be in force until July 31st 2010. Likewise, Act 34/2007 of 15th November, on Air Quality and Atmospheric Protection, regulates the vehicle registration tax, which as of January 1st 2008 must be based on environmental criteria rather than on the vehicle's cylinder capacity. Along similar lines, the Urgent Measures Plan, which forms part of the Spanish Strategy on Climate Change and Clean Energy, proposes to modify road tax to also take into account CO_2 emissions instead of the vehicle's power and class, as well as a series of considerations related to biofuel use.

Therefore, as part of the structural reforms and measures to promote financing for small and medium-sized companies approved by the Council of Ministers on August 14th 2008, a Plan to promote freight transport by rail and improve competition and competitiveness in the sector, with estimated funding of 4717 million euros, will be presented towards the end of this year. The initial goal of this Plan is to create a basic freight transport network around structuring axes as a result of actions such as upgrading the conventional lines in those corridors which already have high-speed rail links to take freight traffic, developing high-speed lines for mixed passenger and freight traffic, building new rail links within the conventional network, increasing the existing network's capacity and reinforcing the connections between the rail network and nation's main sea ports.

In the summer of 2008 the EC presented a raft of initiatives on "ecological transport" aimed at moving transport towards sustainability. These include a strategy aimed at ensuring that transport costs better reflect the actual cost to society, with the final aim of progressively reducing environmental damage and traffic congestion; a proposal that member states should contribute to meeting this goal by introducing more effective road tolls, which should be used to alleviate the effects of transport on the environment and reduce traffic congestion; and measures to reduce the noise created by railway freight traffic.

In March 2008 the European Council stressed the importance of converging towards a low-carbon-emission, safe and sustainable economy and the need to take advantage of the synergies related to energy and climate change. It also stressed the promotion of a sustainable transport system which will allow member states to implement the measures required to combat climate change within the framework of EU policy. These measures include limiting CO_2 emissions from new cars, including the aviation sector in the Community Emission Rights Trading Scheme (RCCDE), as set out in Directive 2008/101/EC, and basing annual vehicle and road taxes on the vehicle's CO_2 emissions.

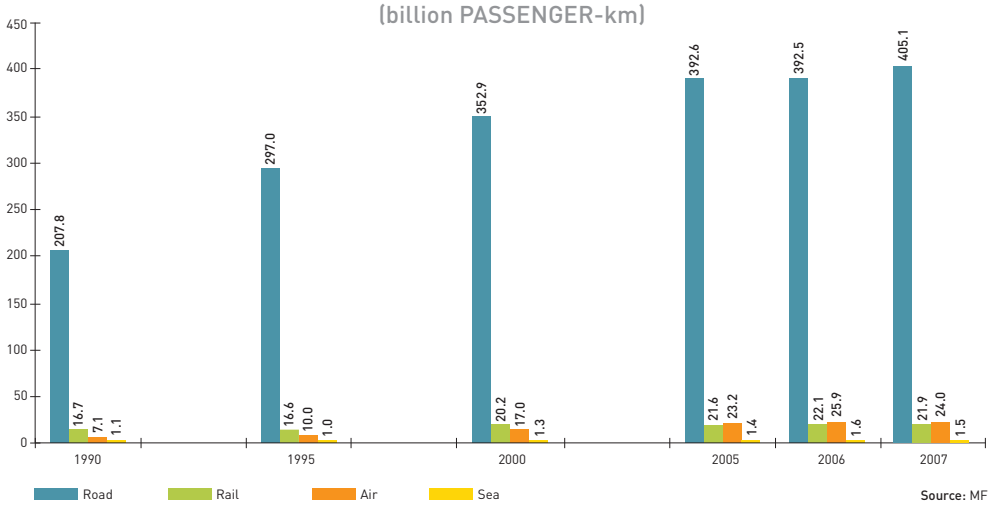
The European transport ministers, for their part, renewed their commitment to develop safe and sustainable transport, with special emphasis on the marine sector, in their meeting of December 9th 2008. Thus, member states should improve the quality of their fleets and their administrations should monitor and control the fleet continually.

It should be remembered that the Commission drew up a 10-year Action Plan for the transport sector in 2001 ("White book on transport policy" COM(2001) 370 final) aimed at reconciling economic progress and the demands of a society which insists on quality and safety to promote a modern and sustainable transport system for 2010. The intermediate review in 2006 suggested that this Action Plan should include measures related to: increasing the competitiveness of railways, introducing a ports policy, developing transport systems that use advanced technologies, payment for using infrastructures, the greater use of biofuels and studying how to eliminate traffic congestion in cities.

Total inter-city transport volume: modal distribution

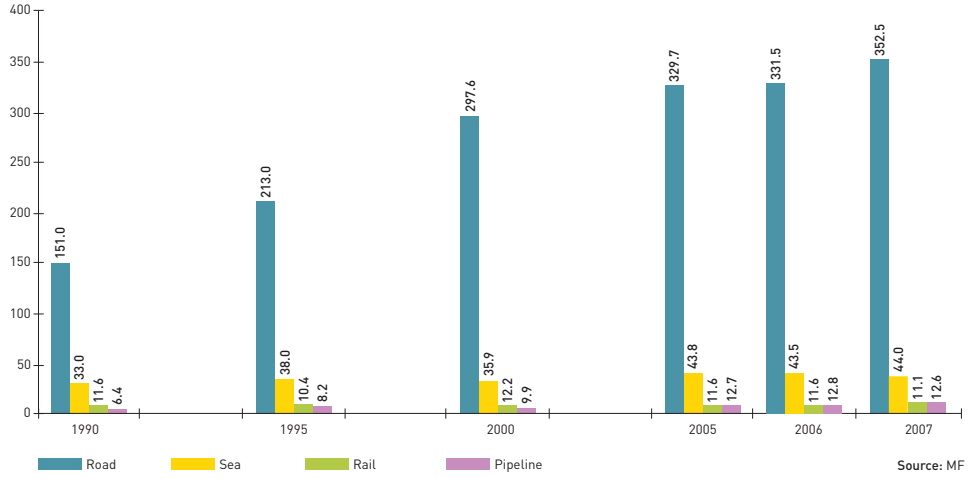
Road transport continued to be most in demand in 2007 (89.5% passengers and 83.9% freight), where rail use fell with respect to 2006

DOMESTIC INTER-CITY PASSENGER TRAFFIC BY MODE OF TRANSPORT
(billion PASSENGER-km)



Source: MF

DOMESTIC INTER-CITY FREIGHT TRAFFIC BY MODE OF TRANSPORT
(billion tonne-km)



Source: MF

The total volume of inter-city passenger transport has grown by 94.6% (in passenger-km) since 1990, whereas freight transport has grown by 107.9% (in t-km).

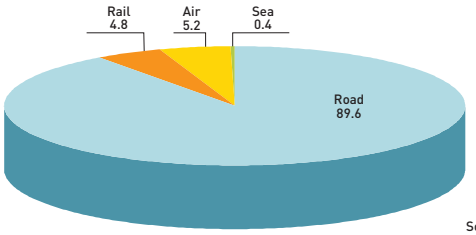
Between 2000 and 2007 the increase in passenger transport demand was 15.6%, whereas that for freight transport was 18.2%. In contrast to the situation in 2006, the increase in total passenger transport was lower than that for freight transport with respect to the previous year (2.4% and 5.2% respectively).

The growth in road passenger transport demand in 2007 with respect to 2006 was 3.2% and sea passenger transport increased by 6.1%, whereas rail passenger transport fell by 1.1% and air passenger transport by 7.1%. Road freight transport grew by 6.3% and sea freight transport by 1.2%, whereas rail freight transport fell by 4.1% and pipeline transport by 1.2%.

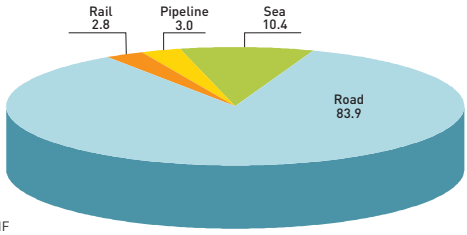
Road transport was still the most popular in 2007, accounting for 89.6% of passengers and 83.9% of freight. As can be seen in the graphs below, the distribution of passenger transport shows that air transport is marginally more important than rail transport (approximately 5% each), whereas sea transport barely appears (0.4%).

Roads were also the principal means of freight transport in 2007 (83.9%), followed by sea transport and pipelines (mainly used for hydrocarbons). Air transport had a similarly low representation (0.2%) to previous years.

MODAL DISTRIBUTION OF PASSENGER TRANSPORT. 2007 (%)



MODAL DISTRIBUTION OF FREIGHT TRANSPORT. 2007 (%)



Source: MF

NOTES

- The unit of measurement for passenger transport is the passenger-kilometre (p-km), which is calculated by multiplying the annual number of passengers by the number of kilometres travelled on each mode of transport.
- The unit of measurement for freight transport is the tonne-kilometre (t-km), calculated by multiplying the number of tonnes transported by the number of kilometres travelled on each mode of transport.

SOURCES

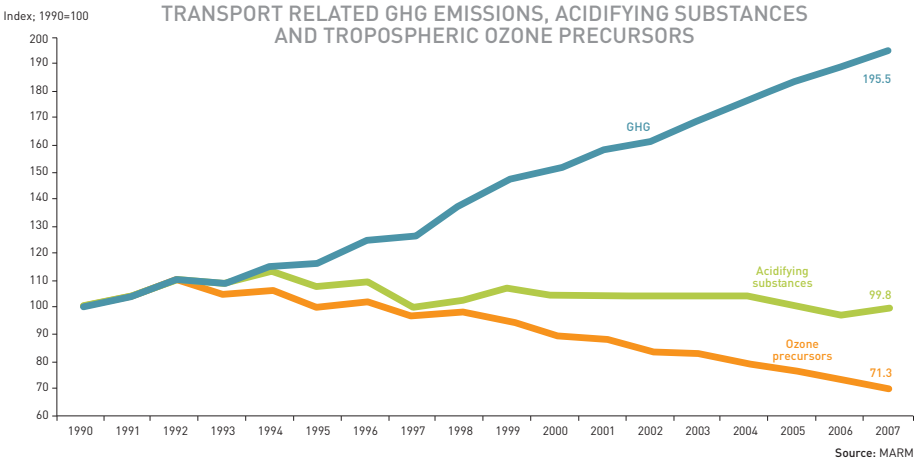
- Ministry of Public Works, 2005-2008. "Transport and Postal Services. Annual report 2004, 2005, 2006 and 2007".

MORE INFORMATION

- http://www.marm.es
- http://www.fomento.es
- http://www.eea.europa.eu

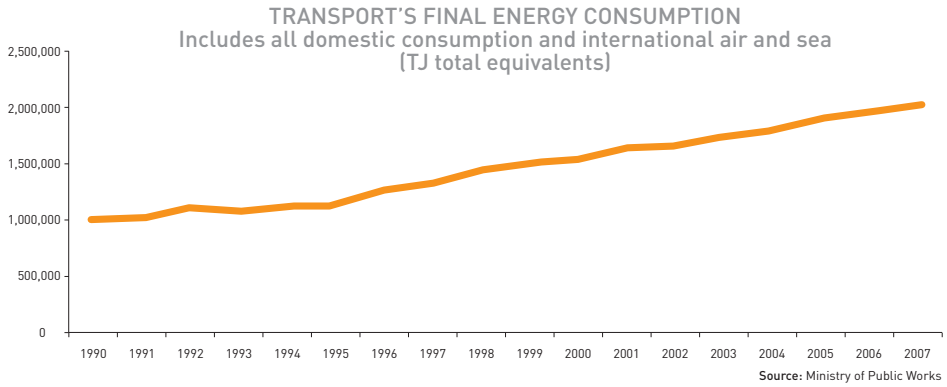
Transport-related pollutant emission into the atmosphere

Transport-related GHG emission increased whereas acidifying-pollutant and ozone-precursor emissions decreased



Source: MARM

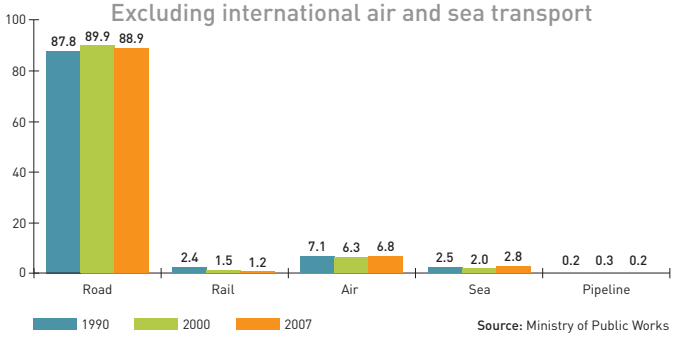
Transport-related greenhouse gas (GHG) emissions in the period 1990-2007 increased by 95.3%, whereas the emission of acidifying substances remained practically unchanged, dropping by 0.2%, and tropospheric ozone precursor emissions fell by 28.7%. GHG emissions increased by 3.4% in 2007 with respect to 2006, and acidifying substance emissions increased by 2.1%. The emission of ozone precursors fell by 1.3%. These figures are notably worse than the year before, when GHG emissions grew by 2.9% with respect to the previous year and both acidifying-substance and ozone-precursor emissions fell significantly (by 2.4% and 5.4% respectively).



Source: Ministry of Public Works

The transport sector remains the biggest consumer of final energy (39.3%), followed by industry (33.5%). Final energy consumption by all modes of transport grew by 103.1% between 1990 and 2007, with domestic transport increasing by 91.9% and international transport by 147.6%. Total energy consumption increased in all sectors by around 3.3% in 2007 with respect to 2006, although the increase for international transport was notably lower than in previous years. Road transport continues to consume most energy (88.9% of all the energy consumed by transport, excluding international air and sea travel), although pipeline and sea transport have experienced the highest growth over the past few years.

DISTRIBUTION OF ENERGY CONSUMPTION BY MODE OF TRANSPORT (%)
Excluding international air and sea transport



Source: Ministry of Public Works

NOTES

- This information corresponds to SNAP group 7 (road transport), some of group 8 (08 02 rail, 08 04 02 domestic sea transport within the EMEP zone and 08 05 air) and compressors for pipeline transport (SNAP 01.05.06). Traffic on inland waters is also included (SNAP 08 03) even though it makes no contribution to emissions.
- The GHG emissions estimate takes into account CH_4, N_2O and CO_2 emissions but excludes fluorinated gases. Total emissions (index 1990=100) are obtained from annual emissions of each of the three pollutants, expressed as tonnes of CO_2 equivalent in accordance with their global warming potential: 1 for CO_2, 21 for CH_4 and 310 for N_2O.
- In estimating the total acidifying effect, expressed as acid equivalent, annual emissions of SO_2, NO_x and NH_3 are taken into account and the following weighting factors employed: 31.25 acid equivalents/kg for SO_2 (2/64 acid equivalents/g), 21.74 acid equivalents/kg for NO_x, expressed as NO_2 (1/46 acid equivalents/g) and 58.82 acid equivalents/kg for NH_3 (1/17 acid equivalents/g).
- Emissions of tropospheric ozone precursors were estimated using the tropospheric ozone depleting potential (expressed as NMVOC equivalent) of the four following precursors: nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), carbon monoxide (CO) and methane (CH_4). The weighting factors employed were as follows: 1.22 for NO_x, 1.00 for NMVOC, 0.11 for CO and 0.014 for CH_4. Total emissions are shown as an index (1990=100).

SOURCES

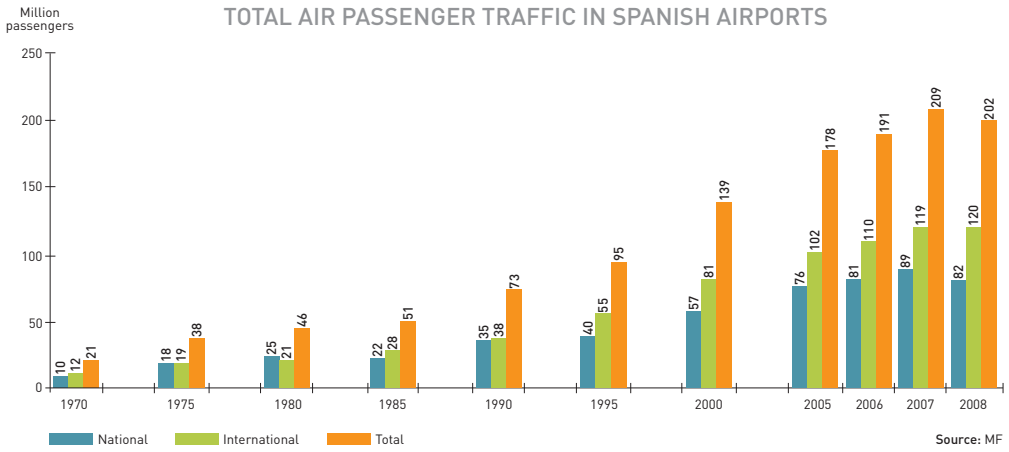
- Emissions figures: MARM, 2009. Spain's Atmospheric Emissions Inventory. Edition 2009 (series 1990–2007). Directorate General of Environmental Quality and Assessment. MARM.
- Energy consumption data: Spain's Atmospheric Emissions Inventory. Edition 2009 (series 1990-2007). Summary of GHG results (MARM) for fuels, Statistical Yearbook (Ministry of Public Works) for electric traction and Energy in Spain 2007 (Ministry of Industry, Tourism and Trade) for the energy balance for each sector.

MORE INFORMATION

- http://www.marm.es
- http://www.fomento.es
- http://www.eea.europa.eu
- http://www.mityc.es

Air transport

Total air passenger traffic grew by 176% between 1990 and 2008 to more than 200 million in Spanish airports



Spanish airports recorded a total of 203.8 million passengers, operated more than 2,400,000 flights and transported almost 630,000 tonnes of freight in 2008. The number of passengers fell by 3.2% and the number of flights by 3.9% with respect to 2007, whereas freight transport remained at essentially the same level (increased by only 0.4%). However, international passenger numbers increased by 0.4% and international freight transport increased by 4.8%.

This fall in passenger volume is due above all to a drop in domestic traffic (7.8%) as international traffic continued to grow.

The balance up to 2008 shows that total passenger traffic has increased by 176% since 1990, with international traffic growing by 215% and domestic traffic by 133%. Total traffic has grown by 46% since 2000, a similar figure to that seen for international (48%) and domestic traffic (42%) over the same period.

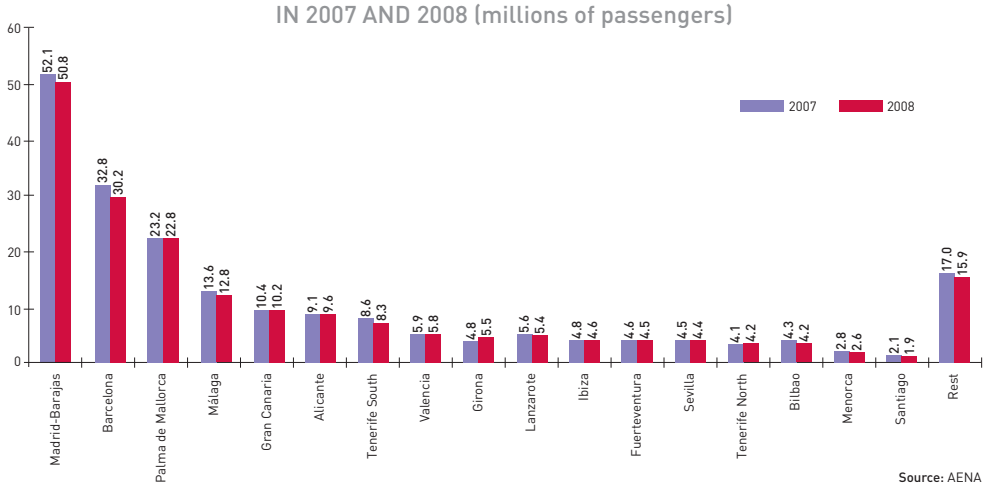
Only Alicante, Girona and Tenerife Norte of the main airports have seen increases in total passenger traffic in 2008. The falls at the other main airports differ. Thus, total passenger traffic fell by 8.2% at Barcelona El Prat, 5.4% at Malaga and 2.4% at Madrid Barajas.

However, international passenger traffic has increased at the former and at the latter (20% for Barcelona and 2.6% for Madrid), therefore a fall in domestic passenger traffic is also responsible for the overall drop at these airports.

Air transport (including international) is the third largest energy consumer in the Spanish transport system behind sea and road transport, accounting for 12.2% of all energy consumed by transport in 2007. The amount of land occupied by airports, the noise generated and pollutant emissions to the atmosphere (CO_2, NO_x, water vapour and particulates) continue to be the major environmental pressures arising from air transport. Furthermore, in 2008 154 people died in an accident at Madrid Barajas during the take-off of a plane destined for Gran Canaria.

In February 2009 Directive 2008/101/EC of the European Parliament, of 19 November, which modifies Directive 2003/87/EC by including aviation activities in the European GHG emission rights trading system and which member states should transpose into their national legislation within one year, came into force. Thus, from 2012 onwards, the emissions of the majority of flights originating from, or destined for, European airports will be counted, with each member state being responsible for supervising the emissions of its domestic operators with an EC licence as well as non-EC operators the majority of whose emissions are produced in their territory. During the first year (2012), airlines will be assigned 97% of the emissions recorded for the sector between 2004 and 2006, the period which will be considered the "base year" for this sector. This is a fairly restrictive measure as it includes all airlines operating within the EU.

TOTAL AIR TRAFFIC IN SPANISH AIRPORTS WITH MORE THAN 2 MILLION PASSENGERS IN 2007 AND 2008 (millions of passengers)



Source: AENA

NOTES
- Total air traffic includes arrivals and departures for both internal (domestic) and international traffic, either regular or charter. Includes transit and other classes of traffic.

SOURCES
- Spanish Airports Authority (AENA), 2008. Annual statistical reports on Spanish airports. Report 2008 (available on web page). Ministry of Public Works.
- Spanish Airports Authority (AENA), 2008. Press release of 14 January 2009 Ministry of Public Works.

MORE INFORMATION
- http://www.mfom.es
- http://www.eea.europa.eu
- http://www.aena.es

Transport waste: End-of-Life Tyres (ELT)

Integrated ELT management increased, with recycling increasing the most

ELT MANAGEMENT ACTIVITIES PERFORMED BY IMS IN 2007

	Signus Ecovalor	TNU	Total
Collected (t) %	**213,542** 62.6	**55,326** 16.2	**268,868** 78.8
Reused and retreaded (t) %	18,035 5.3	8,852 2.6	26,887 7.9
Material recycled (t) %	123,575 36.2	22,684 6.7	146,259 42.9
Recovered for energy value (t) %	21,960 6.4	23,790 6.9	45,750 13.4
Total	**163,570**	**55,326**	**218,896**

Source: PNIR. MARM

The total amount of ELT collected by both Integrated Management Systems (IMS) in 2007 was 268,868 t, some 72,132 t less than the estimated total generated in Spain (341,000 t) according to the National Integrated Waste Plan. The total amount collected in 2005 was 303,118 t, which means a growth of 12.5% over this two-year period. Material recycling stands out amongst the different ELT management activities as the one which has experienced the highest growth.

The new National Integrated Waste Plan (NIWP) 2008-2015, approved by the Council of Ministers on 26 December 2008, is intended to serve as a guide for the development of specific policies to improve waste management by reducing its generation and promoting its correct treatment, in coordination with the Autonomous Regions and local bodies. This Plan includes ELT in chapter 8, which sets specific targets concerning the correct environmental management of ELT and applies the principle of manufacturer responsibility to those responsible for putting the tyres on the market. It also establishes quantitative ELT recovery and recycling targets for 2008, 2012 and 2015.

NIWP 2008-2015: Quantitative ELT targets (%)

	2008	2012	2015
PREVENTION - Reduction - Retread		 15	 8 20
RECOVERY	98	98	98
RECYCLING - Rubber in bituminous mixtures - Steel	50 40 100	52 42 100	55 45 100
RECOVERY FOR ENERGY VALUE	30	25	20

NOTES

- Two Integrated Management Systems (IMS) have been established so far: SIGNUS, which is run by SIGNUS Ecovalor S.L., legally established on 19 May 2005, and TNU, which is run by Tratamiento de Neumáticos Usados, S.L., legally established on 13 July 2006.

SOURCES

- Integrated Used Tyre Management System (SIGNUS), 2008. SIGNUS Report 2007.
- MARM, 2008. National Integrated Waste Plan (NIWP) 2008-2015.

MORE INFORMATION

- http://www.marm.es
- http://www.eea.europa.eu
- http://www.signus.es
- http://www.tnu.es

Biofuel consumption

The average bioethanol content in petrol was 2.2% in 2008, and the average biodiesel content in diesel was 1.66%

MOTOR VEHICLE FUEL CONSUMPTION IN SPAIN (kilotonnes)

Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
Petrol	8,539.0	8,406.0	8,174.0	8,052.0	7,721.0	7,269.0	6,940.0	6,696.0	6,287.0
Diesel	16,847.0	18,073.0	19,234.0	20,755.0	22,132.0	23,282.0	24,585.0	25,772.0	24,822.0
Bioethanol				152.0	168.6	176.5	178.9	198.7	180.4
Biodiesel				5.8	9.4	27.0	62.9	292.6	586.4

Sources: APPA and CORES (MITT)
Bioethanol consumption for 2008 is an estimate

According to the Corporation of Strategic Reserves of Oil-Based Products (CORES), total motor vehicle fuel demand in 2008 was 31.11 million tonnes, 4.18% less than in 2007. Diesel accounted for 79.8% of the total and petrol 20.2%. Petrol consumption in 2008 was 6.30 million tones, 6.0% less than in 2007. This fall in petrol consumption is greater than that seen in previous years - consumption dropped by 3.5% in 2007 and 4.5% in 2006.

Total diesel consumption also fell (3.9%) with respect to 2007, reversing the trend seen in previous years (increases of 4.2% in 2007 and 2.8% in 2006). Diesel fuel consumption fell by 3.7% with respect to 2007. This is therefore the first year to see a fall in diesel consumption, due above all to the difficult economic situation rather than to a decrease in the number of cars that use this fuel. The number of diesel vehicles increased in 2007 whereas the number of petrol vehicles decreased: only 29% of vehicles ran on diesel in 1998, whereas in 2007 half of them (50.4%) did so. Similarly, in 1998 only 21% of cars ran on diesel whereas by 2007 this proportion had risen to almost half (47.1%).

The monthly average bioethanol content in petrol was 2.2% in 2008, with June having the highest proportion (3.2%). Likewise, the monthly average biodiesel content in diesel was 1.66%, with August having the highest content (2.2%).

Spanish biodiesel imports increased in 2008 to reach 71% of total consumption (51% in 2007), which meant that Spanish producers had to reduce their production to 9% of installed capacity. This meant that biodiesel production grew by only 28% with respect to 2007 whereas consumption grew by 100%. Spanish bioethanol production was 273,377 t in 2008, a 3.8% fall with respect to 2007, thus maintaining the trend observed since 2006 (production fell by 11.5% between 2006 and 2007).

Order ITC/2877/2008, of 9 October, establishes a mechanism to promote the use of biofuels and other renewable fuels for transport purposes and envisages a global target of 7% of the energy content of petrol and diesel sold for said purpose.

NOTES

- Directive 2003/30/EC, of 8 May 2003, on the promotion of the use of biofuels or other renewable fuels, sets a target of a 5.75% share of the transport market for these fuels by 2010. This commitment was transposed into Spanish legislation by Royal Decree 61/2006, of 31 January, and incorporated into the Renewable Energies Plan 2005-2010, although the target was raised to a slightly more ambitious 5.83%. The new measures adopted by the EU in 2007 set a 10% minimum obligatory target for biofuel use in transport by 2020.
- It should be noted that the ambitious Community targets for biofuel penetration seem to be contributing to stresses in world food commodity markets. These stresses are also generated by the significant increase in demand for these commodities in Asia's major emerging economies (China and India) and also, possibly, by market speculation. In order to minimise these negative effects on biodiversity and food commodities, the EU is drawing up some basic sustainability criteria for biofuels, which will be incorporated into the legislation governing fuel quality and the promotion of renewable energies.

SOURCES

- Corporation of Strategic Reserves of Oil-Based Products (CORES), 2009. *Hydrocarbon Statistics Bulletin. December 2008.* Ministry of Industry, Tourism and Trade (MITT).
- Association of Renewable-Energy Producers (APPA),2008. Biofuel capacity, production and consumption in Spain. Current situation and outlook. APPA Biofuels.
- European Commission, 2007. "*Report on the progress made in the use of biofuels and other renewable fuels in the Member States of the European Union*". Communication from the Commission to the Council and the European Parliament, COM (2006) 845 final. Brussels.
- Order ITC/2877/2008, of 9 October, which establishes a mechanism to promote the use of biofuels and other renewable fuels for transport purposes. (BOE, 14 October 2008).

MORE INFORMATION

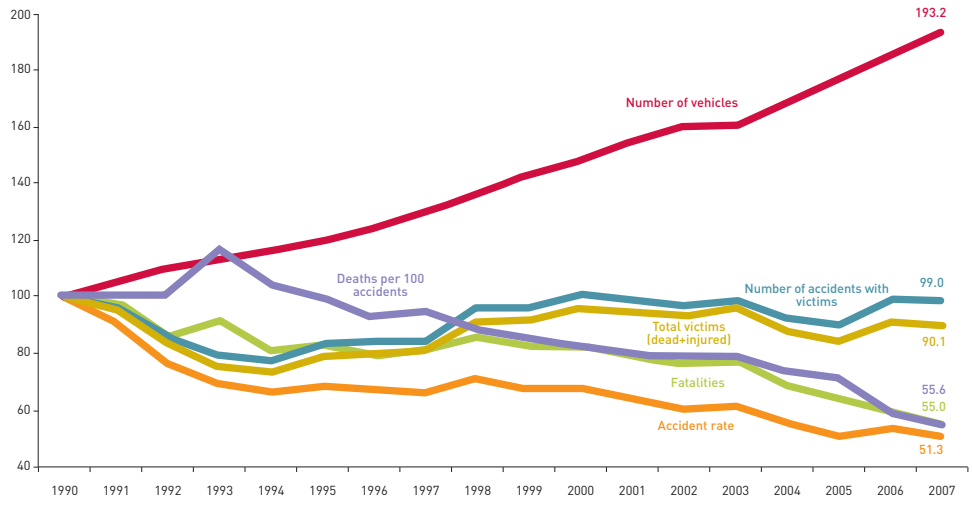
- http://www.appa.es
- http//:www.cores.es

Motorisation and accident rate

Road traffic accident deaths continued to fall, although 3,823 people were still killed in 2007

Index; 1990=100

VEHICLE NUMBERS, TRAFFIC ACCIDENTS AND VICTIMS



Source: DGT

Road traffic accident deaths fell for the fourth consecutive year. The decrease between 2006 and 2007 was 7%, whereas since 2003, the last time an increase was seen and the trend observed since 2000 was interrupted, the decrease is 29%. Nevertheless, there were still 3823 deaths, 19,295 serious injuries and 123,226 minor injuries in the 100,508 road traffic accidents in 2007. These figures give a daily average of 10.5 deaths (11.2 in 2006).

Half the accidents with victims occurred on roads in 2007 and half in urban areas. The number of deaths was higher on roads (81% versus 19% in urban areas). Only 5% of deaths occurred on motorways and 15% on dual carriageways, with the highest proportion of deaths (80%, 2,465) occurring on other roads in 2007.

The total number of vehicles grew by 197.5% between 1980 and 2007, whereas the total number of victims (dead and injured) grew by 29.9% and the number of fatalities fell by 23.8%. The number of vehicles has grown by 93.2% since 1990, whereas the total number of victims has fallen by 9.9% and the number of fatalities by 45%.

The accident rate relates the number of accidents with victims (dead and injured) to total vehicle numbers. This rate has dropped by 48.7% since 1990 to 3.32 accidents

per thousand vehicles in 2007. The evolution of the number of fatalities per 100 accidents, which has trended downwards to 3.2 in 2007, should also be highlighted. In general terms, therefore, road traffic accidents produce fewer and fewer fatalities, although the number of injured, many of whom suffer from serious after-effects, decreased by less than 10% between 1990 and 2007. This situation of stability remains a genuine social problem.

Numerous initiatives from both central government and the sectors involved (preventative and information campaigns, changes to the penal code concerning road safety, introduction of a penalty points system for drivers, technological improvements to improve vehicle safety, etc.) have all led to these figures. Amongst these, the campaign undertaken by various media, with the help of the general public and various bodies and companies concerned with road safety, to signpost accident blackspots stands out. In this sense, in January 2009 the Council of Ministers approved the Treatment Plan for High-Risk Road Sections in the National Roads Network, which will remain in force until 2012 and has an assigned budget of 1.2 billion euros.

Provisional figures for 2008 from the DGT suggest that there have been 1,929 fatal road traffic accidents, with a total of 2,181 deaths in the 24 hours after the accident, 560 fewer than in the previous year. This figure would imply a fall of 20.4%, the highest seen in the period 2003-2008.

NOTES

- The vehicle fleet includes: lorries, vans, buses, passenger cars, motorcycles, industrial tractors and other vehicles (trailers, semi-trailers and special vehicles, excluding self-propelled agricultural machinery and towed agricultural machinery). It does not include mopeds.
- The accident rate is calculated by dividing the total annual number of accidents with victims (on both highways and in urban areas) by the vehicle fleet recorded at the end of each year (multiplied by one thousand). This indicator is represented by means of a reference index (1990), with percentage figures for subsequent years being given in terms of this index.
- The figures for 2008 are provisional and the number of fatalities is calculated 24 hours after the accident occurred.

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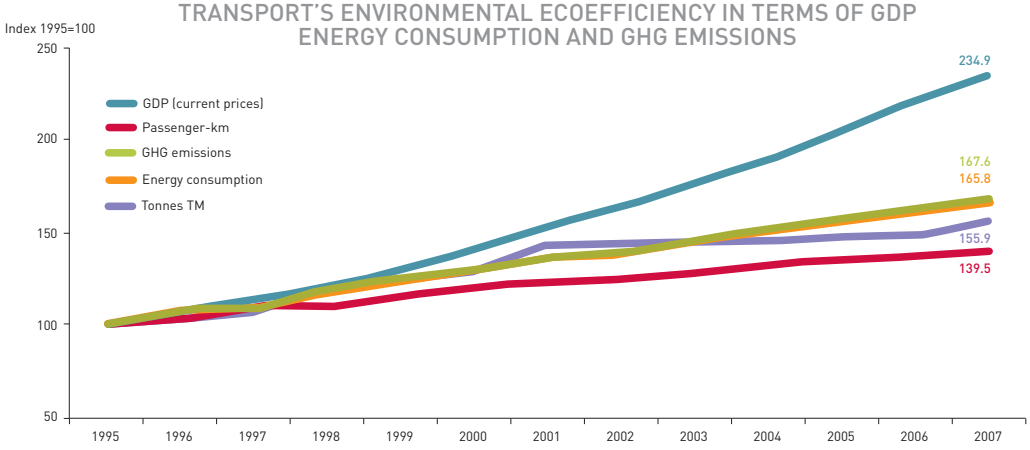
MORE INFORMATION

- **http://www.mfom.es**
- **http://www.dgt.es**
- **http://www.etsc.be**

Transport's environmental efficiency

Transport's energy consumption appears to have stabilised since 2004, which implies a slight improvement in efficiency

TRANSPORT'S ENVIRONMENTAL ECOEFFICIENCY IN TERMS OF GDP ENERGY CONSUMPTION AND GHG EMISSIONS



Source: MF, MARM

Total GDP growth in the period 1995-2007 was 132.2% at current prices and 49.3% at constant prices, higher than inter-city passenger- (in passenger-km) and freight-traffic growth (in t-km; 39.5% and 55.8%, respectively). This indicates that the country's overall economic growth has been accompanied by slower growth in the demand for inter-city transport. However, the strong increase in freight transport in 2007 with respect to the overall trend since 2001 should be noted.

If this efficiency is analysed in terms of the amount transported (passenger-km and t-km) per unit GDP, a continual decrease in this ratio of 39.9% for inter-city passenger traffic and 32.9% for freight traffic can be seen at current prices. This leads to a situation of greater inter-city transport efficiency in economic terms as each unit of GDP is produced with less transport, and therefore by generating fewer pressures.

A comparison of the sector's total energy consumption with goods transported provides information about efficiency in terms of resource consumption. Energy consumption by domestic transport has grown by 65.8% since 1995 (77.5% if international transport is included). In contrast to the situation with GDP, the relationship between inter-city transport undertaken (passengers in passenger-km and freight in t-km) and energy consumed shows a trend which can be considered negative as the number of passengers per unit energy consumed has dropped. Thus, the number of passengers transported per unit energy consumed fell by 15.9%

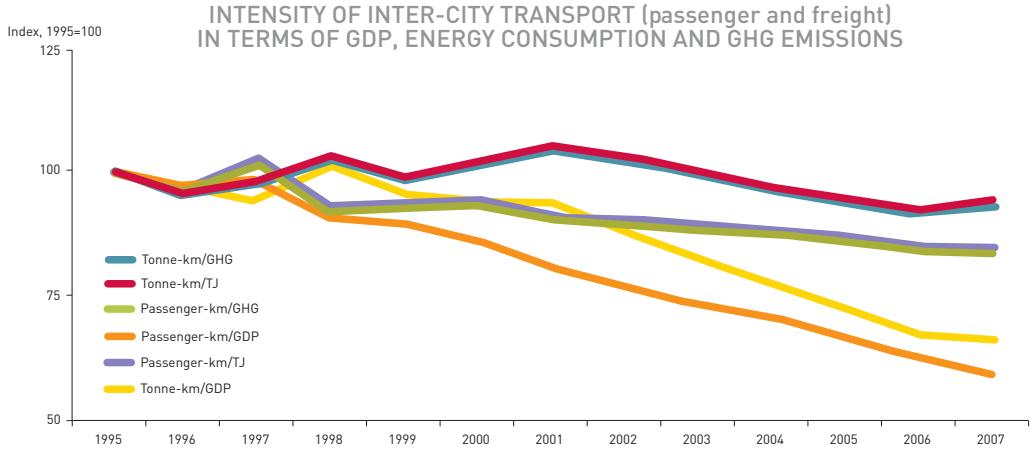
between 1995 and 2007, whereas the amount of freight transported per unit energy consumed fell by 6.0%.

However, in 1998 and between 2000 and 2002 freight transport went through a period of greater environmental efficiency as more freight was transported per unit energy. What could be interpreted as a slight change in the trend for freight transport, which increased per unit energy consumed, occurred in 2006.

This trend should be monitored to ensure it continues. GHG emissions, which are strongly linked to trends in energy consumption, have grown by 67.6% since 1995. This value is lower than GDP growth at current prices and similar to that for energy consumption. An intensity analysis shows that both the number of passenger-km and tonne-km transported per tonne of GHG emitted into the atmosphere decreases every year, with the former decreasing to a greater extent. As was the case with energy consumption, 1998 and the period between 2000 and 2002 saw an increase in the amount of freight transported per tonne of CO_2 equivalents emitted into the atmosphere, an environmentally favourable situation. Furthermore, 2007 also saw an increase in freight transported per unit of CO_2 equivalents emitted into the atmosphere.

The following graph shows the intensity of inter-city passenger and freight transport, as calculated from the coefficient between these variables and GHG emissions into the atmosphere, energy consumption and GDP. The parallel behaviour between GHG emissions and energy consumption can be clearly seen.

INTENSITY OF INTER-CITY TRANSPORT (passenger and freight) IN TERMS OF GDP, ENERGY CONSUMPTION AND GHG EMISSIONS



Source: MF, INE, MARM

NOTES

- Greenhouse gas (GHG) emissions from transport refer to those produced by group 7 of the SNAP classification (Road Transport) and part of group 8 (Other Transport Modes: rail, air and sea) and pipeline transport included in stationary sources (SNAP 01.05.06). Only CH_4, N_2O and CO_2 emissions were considered. Annual emissions of each of the three pollutants are converted into tonnes of CO_2 equivalents in accordance with their global warming potentials: 1 for CO_2, 21 for CH_4 and 310 for N_2O.

SOURCES

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MORE INFORMATION

- **http://www.marm.es/**
- **http://www.fomento.es**
- **http://www.ine.es**
- **http://www.eea.europa.eu**



2.12 HOUSEHOLDS



This chapter covers the residential sector (which consists of all households) from a water- and energy-consumption, waste generation, CO_2 emissions, private car use and gross income point of view. This sector can be considered to be simply one more economic sector; therefore the pressures it generates on the environment can be monitored and its main trends discussed.

According to the National Institute of Statistics (INE), the terms "household" and "home" are two different concepts: a "household" is considered to be a group of people who reside in the same family home (without necessarily being related), whereas the "family home" is the property itself. A household can consist of one or more people and can have various homes (e.g. main and second home).

The population growth of the last few years has resulted in an increase in the number of households and homes, although to different degrees, as can be seen from the table below. The increase in the number of households is partly due to migration, whereas house building has been affected by market pressures and has not always responded to the actual needs of the resident population.



INDICATOR	GOAL	TREND
Number of passenger vehicles per household	Promote urban and inter-urban mobility using other, more eco-friendly forms of transport	A minor increase in the number of passenger vehicles per household with respect to the previous year, although the growth rate and sale of more powerful cars have both slowed
Urban waste production per household	Minimise production of urban waste	Household waste production appears to have stabilized and even dropped slightly in 2006 with respect to 2005. The amount of selectively collected waste increased.
Energy consumption per household	Improve the efficiency of the energy consumed	Energy consumption per household fell more for electrical usage than for heating/air conditioning
CO_2 emissions by the residential sector	Reduce CO_2 generation in the sector	After the important decrease in 2006 (8%), CO2 emissions increased again in 2007
Water consumption per household	Minimise water consumption per household	A notable decrease in water consumption per household has been observed
Gross disposable household income	Achieve consumption more in line with sustainable development	Gross disposable income per household increased, with major differences remaining between Autonomous Communities
Eco-efficiency in the domestic sector	Decouple household income from resource consumption	Energy consumption and waste generation per household are slowing down and water consumption is falling

POPULATION, HOUSEHOLDS AND HOMES 2001-2007

	2001	2004	2005	2006	2007	Increase 2001-2007
Population	41,116,842	43,197,684	44,108,530	44,708,964	45,200,737	10.08%
Households	13,468,068	14,528,259	14,865,707	15,855,594	16,280,438	21.49%
Homes	21,033,759	22,623,443	23,210,317	23,859,014	24,495,844	16.46%

Population: INE: Population and housing census 2001. Municipal register as of January 1: various years.
Households: INE. Ongoing Survey on Household budgets 2000-2005 and Survey on Household budgets 2006-2007.
Homes: Ministry of Housing: Estimated Housing Stock 2001-2007

As far as number of people per household is concerned, all bands show significant rises in 2007 with respect to 2006, except those households containing five/six members or more, which fell in line with the downward trend in large families. Households containing one or two people now account for 46.22% of the total. The increase in the number of households is due mainly to this decrease in the number of people which make up each household, although the immigrant flow, which has been especially intensive since the beginning of this century, should also be taken into account. The average number of people per household, which was 3.0 in 2001, dropped to 2.8 by 2007.

Over three million housing units were built in Spain in the period 2001-2007, bringing the total stock to almost 24.5 million. Around 16.7 million of these correspond to main residences, whereas 7.1 million correspond to a second or non-main residence. This increase in house building has had important environmental consequences: land use, water, materials, increased traffic and effects on the landscape, especially in coastal regions. It has also significantly affected levels of family debt (mainly due to the large increase in house prices) and the current state of the financial system, although, on a more positive note, it has contributed to economic growth and job creation.

As regards the tenancy regime, the balance between home ownership and rented accommodation which was apparent up to the midpoint of the 20th century has tipped strongly in favour of ownership (14,621,334) rather than rented or borrowed accommodation. However, Ministry of Housing data for 2007 show that rented accommodation grew strongly (by 137,492, 7.69%) between 2004 and 2007.

The indicators presented in this chapter concern the household sector from an environmental point of view and highlight the most important trends. In general terms, the increasing pressure of this sector on the environment, which is closely related to the consumption patterns that have become widespread during the period of economic growth which began in the 1990s, can be seen. Influencing these patterns requires campaigns to raise public awareness alongside appropriate policies, in particular in terms of consumption of resources such as water, land and energy.

It should be noted that consumption is analysed in terms of number of households or, on occasions, per person (consumption per capita), but never in terms of the number of homes. This is because the number of empty and second homes is so high in Spain, which would lead to an artificial reduction in these indices.

HOUSEHOLDS ACCORDING TO NUMBER OF MEMBERS

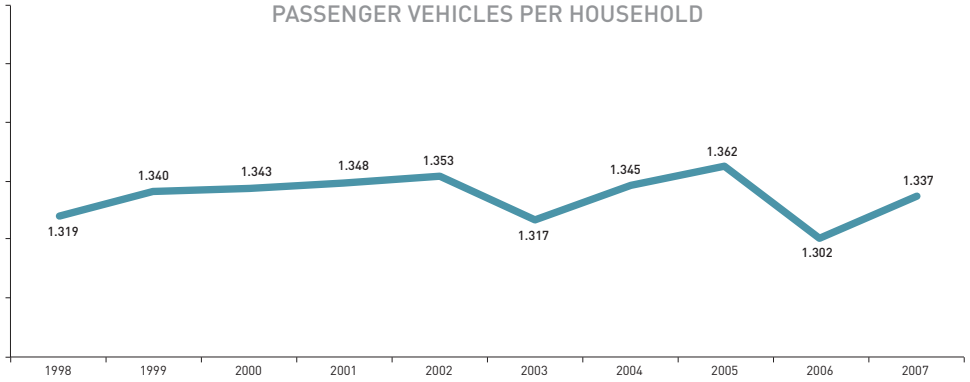
No. of members	2006	2007	Variation 2006-2007
1	2,704,547	2,857,737	5.66
2	4,503,716	4,666,801	3.62
3	4,171,250	4,249,126	1.87
4	3,259,819	3,325,275	2.01
5	898,208	863,717	-3.84
6 or more	318,054	317,781	-0.09
TOTAL	**15,855,594**	**16,280,438**	**2.68**

Source: Household budget survey. 2006-2007

Number of passenger vehicles per household

The number of passenger vehicles per household increased slightly in 2007 despite the increase in the number of households

PASSENGER VEHICLES PER HOUSEHOLD



Source: DGT, INE

The total number of passenger vehicles reached 21.7 million in 2007, an increase of 34.5% with respect to 1998. The number of households has also increased steadily, from 12.3 million in 1998 to 16.3 million in 2007, an increase of 32.76%.

The number of passenger vehicles increased by 5.4% in 2007 with respect to the previous year, whereas the number of households increased by 2.7%. This similar increase in both passenger vehicles and households means that the number of vehicles per household (1.3) remained relatively stable between 1998 and 2007, with some minor variations. However, the stability of this rate should not hide the environmental pressures that are likely to be occurring due to the increased number of passenger vehicles and subsequent increase in private transport. As would be expected, not all households have a car, whereas some have two or more. According to the INE (Living conditions Survey, 2007), only 22.7% of households have no car.

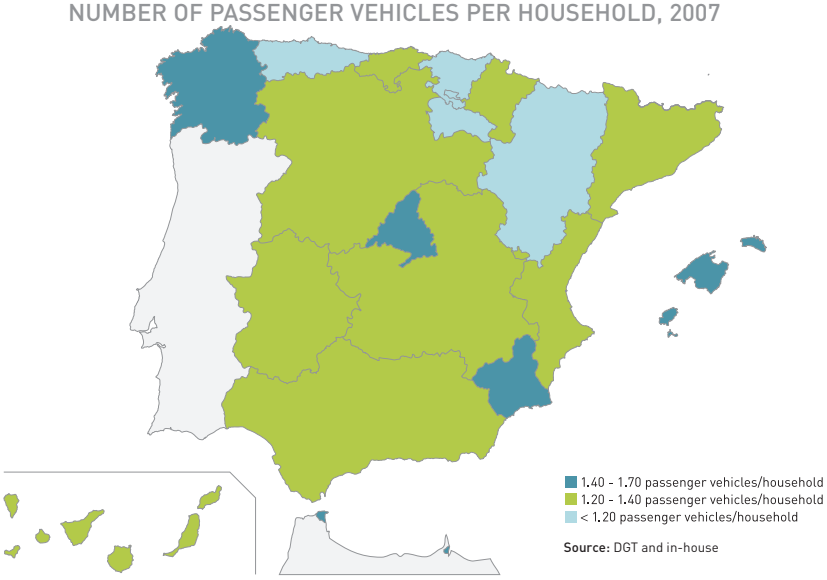
INCREASE IN PASSENGER VEHICLES AND HOUSEHOLDS

	1998	2000	2005	2007	Increase 2007/1998
Passenger vehicles	16,176,787	17,570,782	20,250,377	21,760,174	34.5%
Households	12,263,412	13,086,197	14,865,709	16,280,438	32.8%

Source:
Passenger vehicles: DGT. General Statistics Yearbook. 2007
Households: INE. Ongoing Survey on Household budgets.

Ceuta and Melilla (1.76), the Balearics (1.67), Madrid (1.53), Galicia (1.48), Murcia (1.45), the Canary Islands (1.39), Cantabria (1.36) and Castile-La Mancha (1.36) exceed the national average, whereas the remaining Autonomous Communities meet that figure or lie below it. La Rioja (1.10), the Basque Country (1.15), Asturias (1.18) and Aragon (1.17) have the lowest number of passenger vehicles per household.

NUMBER OF PASSENGER VEHICLES PER HOUSEHOLD, 2007



From an environmental point of view, it is vital to promote vehicle renewal as new vehicles incorporate technology that reduces consumption and pollution. A total of 887,395 vehicles were scrapped in 2007, more than the average for the period 2000-2007 (3.19%). Some 82.66% of these vehicles were first registered before 2000.

It is well known that there is a growing trend in favour of diesel vehicles over those powered by petrol. Thus, in 2000, 27% of passenger cars ran on diesel, while by 2007 that figure had risen to 47.13%. It is clear that fuel prices and economic policies have influenced the trend in favour of this fuel, which is considered to be responsible for the increase in particulate air pollution.

More than half of passenger vehicles in 2007 (52.96%) were cars with a cylinder capacity of more than 1600 cc. The number of cars with a greater capacity (more than 1999 cc) dropped by 6455 in 2007 with respect to 2006.

NOTES

- The total number of vehicles stood at 30,318,457 vehicles on 31/12/2007 (lorries and vans, buses, passenger vehicles, motorcycles, industrial tractors and other vehicles); 67% of these vehicles were registered between 1997 and 2007. Passenger vehicles accounted for the largest proportion (71.77%).
- The Directorate General for Traffic (DGT) calculates the ratio between population and total number of vehicles (of all types), which increased from 278 per 1000 inhabitants in 1980 to 685 in 2007.
- The DGT defines the term "passenger vehicle" as a "vehicle, other than a motorcycle, designed and constructed specifically for the transport of people and with a capacity of up to nine people, including the driver". Rental fleets and commercial vehicles that meet this definition are also included in this indicator. This category does not include vans, which are included together with lorries. (DGT. General Statistics Yearbook).

SOURCES

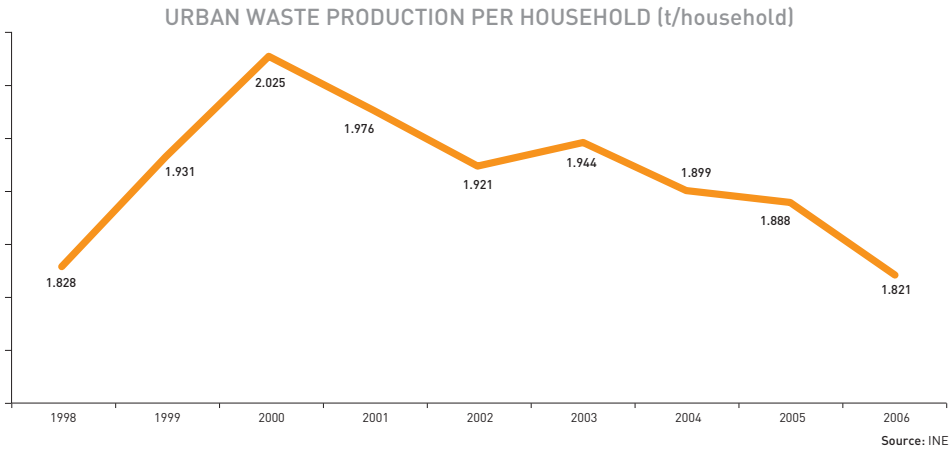
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MORE INFORMATION

- http:// www.ine.es/inebase.
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Urban waste production per household

Although the amount of urban waste generated continues to grow in absolute terms, the amount generated per household per year in 2006 (1.821 tonnes) was slightly lower than in 2005



Source: INE

This indicator estimates the average amount of urban waste (UW) generated per household per year. The total amount of waste generated by the residential sector as a whole in 2006 was 28,418,545 t, 1.27% more than in the previous year. However, due to the higher number of households, this increase in absolute terms was not replicated in the amount generated per household. Indeed, in 2006 each household generated an average of 1.821 t of urban waste, a slight reduction on the value for 2005 (1.888 t).

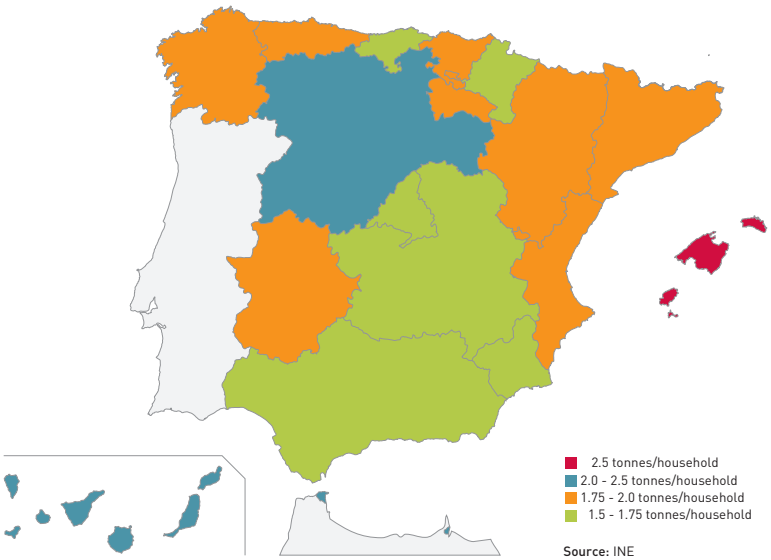
According to the INE methodology, 76.92% of urban waste is mixed waste, in other words, that generated domestically together with that collected from public highways, whereas the remaining 23.07% is selectively collected urban waste. The positive trend in the increase of selectively collected urban waste from 1,470,095 t in 1998 to 6,556,300 t in 2006, an increase of 346%, should be highlighted. Thus, in 1998 each household generated 120 kg of this type of waste, whereas the figure for 2006 was 420 kg.

Despite the steady growth in both total waste (26.7%) and number of households (27.2%) between 1998 and 2006, the amount of waste generated per household dropped slightly in 2007 with respect to 1998 after reaching a highpoint in 2000.

The breakdown by Autonomous Community shows that nine, along with Ceuta and Melilla (2.43 t per household), generate higher than average amounts of waste per

household: Balearics (2.98), Castile and Leon (2.28), the Canary Islands (2.13), Cantabria (1.99), Madrid (1.93), Castile-La Mancha (1.93), Andalusia (1.92) and Navarre, whereas the rest generate less than average amounts. Asturias (1.57), Galicia (1.56) and Catalonia (1.50) generate the lowest amount of waste per household.

WASTE PRODUCTION PER HOUSEHOLD, 2006



According to the latest data from Eurostat, the average amount of waste generated per person per year in the EU-27 was 522 kg in 2007, with 11 countries exceeding this value. The volume of municipal waste generated ranges between 801 kg in Denmark and 294 kg in the Czech Republic. This waste is, however, treated differently: controlled landfill (42%), incineration (20%), recycling (22%) and composting (16%). Germany recycles the highest proportion of municipal waste (46%), whereas Denmark incinerates the most (53%).

NOTES

- Urban waste is that generated in households, shops, offices and services, as well as that which is not considered hazardous and, in light of its nature and composition, can be combined with that produced in the aforementioned locations or activities. The following are also regarded as urban waste: waste arising from the cleaning of public highways, green areas, recreational areas and beaches, dead pets, as well as furniture, fittings and abandoned vehicles and, finally, waste and debris from minor construction works and home repairs. (Waste Act 10/1998)
- According to data from the INE, the average amount of waste collected per person per year in Spain in 2006 was 553.3 kg, 500 kg of which was mixed waste, 22.1 kg paper and cardboard, 12.6 kg glass and 18.6 kg mixed packaging.

SOURCES

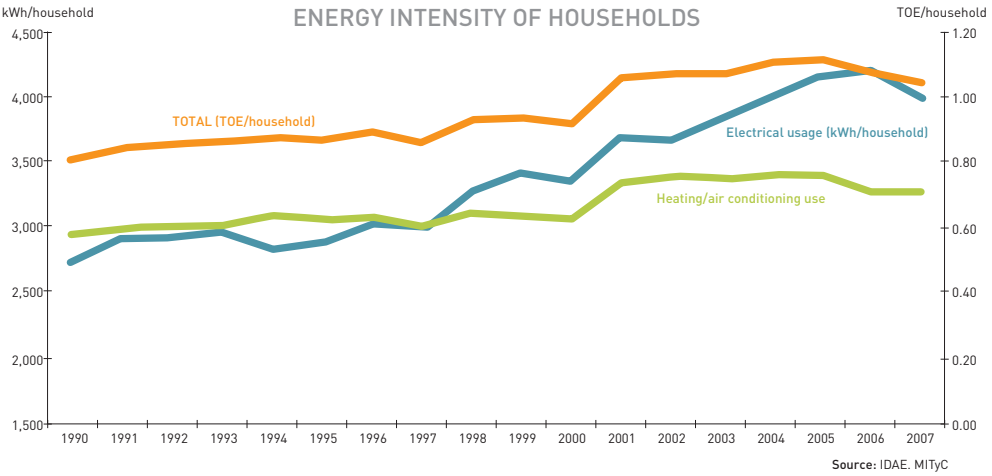
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MORE INFORMATION

- http:// www. ine.es/inebase
- http://www.eea.europa.eu
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Energy consumption per household

Energy consumption per household in 2007 fell by 0.8% with respect to the previous year



This indicator measures energy consumption per household broken down into *electrical usage* (kWh/household) and *heating/air conditioning* (TOE/household). Energy consumption for electrical use was estimated to be 3,992 kWh/household in 2007, whereas that for heating/air conditioning was 0.703 TOE/household. Total consumption, at 1.047 TOE/household, was 0.86% lower than in 2006 (1.056 TOE/household), a similar figure to that seen in 2001, which could indicate a reversal in trend or at least an inflexion point.

Energy consumption for electrical use rose by 46.24% and that for heating/air conditioning by 21.83% in the period 1990-2007, thus giving an overall increase of 28.89% and an average annual increase of 1.70%. Growth was continual over the whole period due to increased economic growth and consumption, with the minor falls in some years, which were rather more significant for heating/air conditioning than for electrical use, being strongly linked to extreme temperatures.

An analysis from 2000 onwards shows that electrical use grew by 19.04% and heating/air conditioning use by 11.99%, which means a total increase of 14.21%. The annual average increase for this period was 2.72% for electrical use and 1.71% for heating/air conditioning use, which gives a combined average of 2.03%.

Spain's residential sector still consumes less energy than in the majority of European countries, although the trend up to 2006 was strongly upwards, whereas the trend in

neighbouring countries and in the EU as a whole was towards a reduction in consumption.

As regards final energy consumption by sector, the residential sector was in third place in 2007, with 16.60% of the total, behind transport (40.30%) and industry (29.60%). Services (9.60%) and agriculture (3.80%) consume much less energy than the other sectors. Industry was, for many years (until the early 1990s), the largest consumer of final energy in Spain, although the application of energy-saving measures increased this sector's energy efficiency to such an extent that the transport sector moved into first place.

The application of measures aimed at the renewal of electrical appliances could produce similar results in the household sector. Thus, the Plan Renove, whose aim is to replace less efficient electrical appliances with more efficient ones with a "class A", or higher, rating, has again been included in the second Action Plan 2008-2012. As 2.8 million electrical appliances are replaced in Spain each year, the effect on the sector's final energy consumption should be significant.

According to the IDEA, average household consumption is around 4000 kWh per year. Supposing that the only energy supply to a household is electrical, this consumption would be divided as follows: lighting (18%), refrigeration (18%), heating (15%), television (10%), hob (9%), washing machine (8%), small electrical appliances (7%), oven (4), tumble dryer (2%), microwave (2%), dishwasher (2%), air conditioning (1%) and computer (1%).

EUROPE 2000-2006: HOUSEHOLD ELECTRICITY CONSUMPTION (units: kTOE)

EU and countries	2000	2005	2006	Increase 2006/2000 (%)	Increase 2006/2005 (%)
EU-27	61,161	68,361	69,348	13.4	1.4
EU-25	59,656	66,790	67,688	13.5	1.3
EU-15	54,608	61,120	61,823	13.2	1.2
Germany	11,084	12,193	12,167	9.8	-0.2
France	11,068	12,815	12,636	14.2	-1.4
Spain	3,751	5,488	5,650	50.6	3.0
Greece	1,222	1,451	1,520	24.4	4.8
Italy	5,255	5,758	5,816	10.7	1.0
Portugal	865	1,139	1,153	33.3	1.2
United Kingdom	9,617	10,044	10,013	4.1	-0.3

Source: Eurostat 2008. Note: this indicator shows household electricity consumption. Household consumption includes total electricity use for appliances, heating/air conditioning and hot water. Data for the EU and Spain are provisional.

NOTES

- From a methodological perspective, it should be noted that when compiling these energy statistics it is not easy to separate consumption attributable to families from that of small tertiary sector businesses that are often signed up to domestic gas and electricity tariffs on account of their small size.

SOURCES

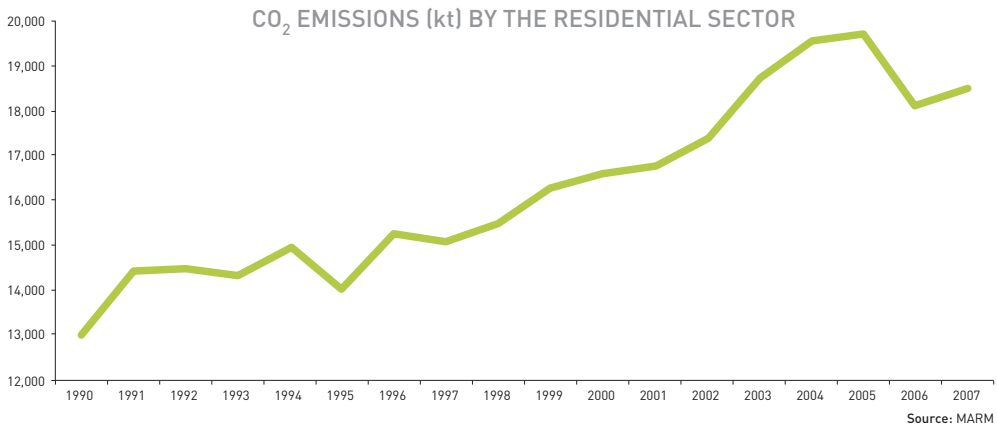
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- **httppwww.mityc.es**
- **http://epp.eurostat.ec.europa.eu**

CO_2 emissions by the residential sector

CO_2 emissions by the residential sector rebounded in 2007 (1.6%), with each household emitting an average of 1.132 t of CO_2 per year



Source: MARM

CO_2 emissions by the residential sector as a whole rebounded slightly in 2007, increasing by 1.6% with respect to 2006, after the significant fall in emissions (approximately 8%) seen in the previous year. This fall was the largest since 1990, although large falls were also seen in 1993, 1995 and 1997. In absolute terms, household emissions were 18,435 kilotonnes in 2007, 5.03% of total emissions of this gas in Spain.

The increase in emissions between 1990 and 2007 was 42%, whereas the increase between 2000 and 2007 was 11.2%. Each household produced 1.132 tonnes of CO_2 in 2007, which is still lower than the European average, due to the fact that energy consumption for heating is much higher in many other European countries because of their lower winter temperatures. The fact that emissions per household were similar to those of the previous year, and even slightly lower (1.132 t vs. 1.142 t in 2006) is due to the large increase in the number of households from 15.8 million in 2006 to 16.3 million in 2007.

The reduction of household emissions is a question of awareness and stimuli from central and regional governments (such as the Plan Renove for electrical appliances).

Improvements to heating systems, reductions in the use of fossil fuels and improved bioclimatic conditions in buildings, on application of the Technical Building Code guidelines, should also result in reductions.

NOTES

- This indicator shows CO_2 emissions from residential combustion plants, a sub-activity belonging to group 2 "Non-industrial combustion plants" in the Selected Nomenclature for Sources of Air Pollution (SNAP)-97. It includes emissions produced by: boilers, gas turbines, stationary engines and other appliances such as heaters, cookers, etc.
- SNAP-97 from the CORINAIR project reflects the relationship between emission sources associated with certain pollutants in accordance with structural principles that allow emissions to be determined by sector, sub-sector and activity.

SOURCES

- Data on CO_2 emissions taken from the Spanish National Atmospheric Emissions Inventory. Edition 2009 (series 1990–2007). Directorate General of Environmental Quality and Assessment. MARM.
- INE. Living conditions Survey (2006).
- INE. Household Budget Survey 2006.

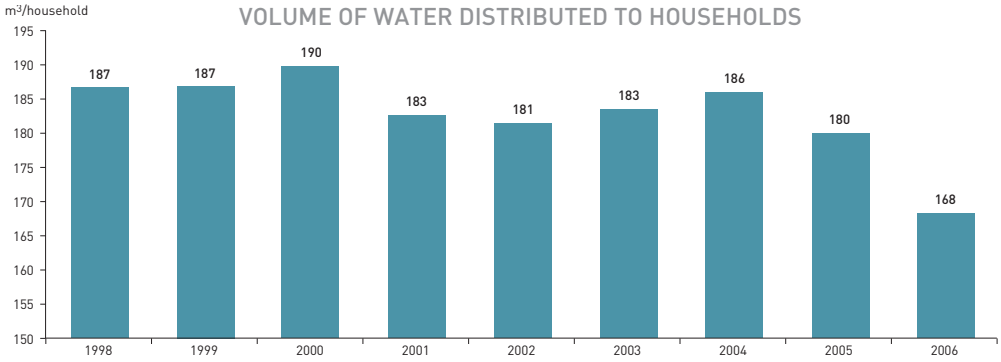
MORE INFORMATION

- http://www.marm.es
- http://www.ine.es

Household water consumption

Water consumption by the residential sector fell again in 2006, as was the case in 2005

VOLUME OF WATER DISTRIBUTED TO HOUSEHOLDS



Source: INE

According to data from the INE, Spain had water reserves of 4.698 hm^3 in 2006, 175 hm^3 less than in 2005. Household consumption, municipal services and the various economic sectors, in other words water for urban supplies, accounted for 83.3% of this figure. Water used for crop irrigation is not included.

WATER SUPPLIED TO PUBLIC URBAN SUPPLY NETWORKS 2006

	hm^3	%
Households	2,616	55.7
Economic sectors (industry, services, livestock farming)	911	19.4
Municipal consumption	328	7.0
Other consumption	58	1.2
Network losses	785	16.7
Total water supplied	**4,698**	**100**

Source: INE

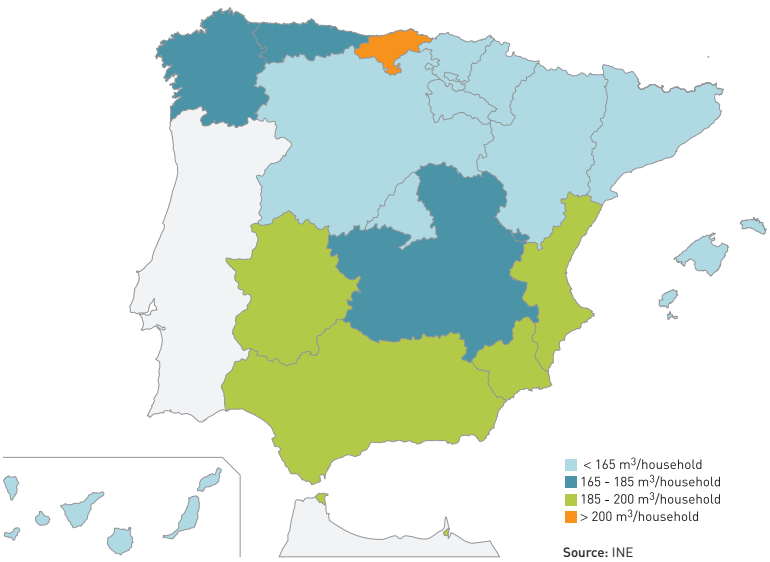
Water consumption by Spanish families stood at 2,616 hm^3 in 2006, a 2.2% decrease on the previous year's figure of 2,673 hm^3. Consumption per household per year was 167.6 m^3 (based on the number of households from the INE's *Living Conditions Survey 2006* of 15,604,300).

As can be seen from the graph above, household consumption has remained relatively steady since 2001, with the occasional variation. This evolution could be due to a balance between two opposing trends: an increase in consumption due to a higher standard of living and the population increase, and a fall in consumption due to higher prices, the implementation of technologies to prevent unnecessary waste and,

in some years, water restrictions due to drought. The effect of awareness campaigns aimed at promoting responsible consumption should also be taken into account.

Consumption per person per day was estimated to be 160 litres, six litres less than in 2005. As can be seen from the table below, average water consumption per person per day increased by 14 litres (9.6%) between 1996 and 2006, although the figure for 2006 is similar to that for 1998.

VOLUME OF WATER DISTRIBUTED TO HOUSEHOLDS, 2006 (m^3/household)



As regards consumption by Autonomous Community, seven of them consumed more than the national average of 167.6 m^3 per household per year in 2006: Cantabria (215.4), Extremadura (197.4), Andalusia (194.6), Valencia (188.8), Murcia (187.4), Castile-La Mancha (178.5) and Asturias (178). The remainder consumed less than the national average, with lowest consumption being seen in the Basque Country (126.9), Balearics (150.5) and Navarra (135.0).

AVERAGE CONSUMPTION PER PERSON PER DAY (litres)

1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
146	153	159	165	168	165	164	167	171	166	160

Source: INE

In terms of water-demand management, an important factor to be taken into account is the price of this service. According to the INE, the unit cost of water in Spain rose by 5.9% in 2006, to an average of 1.08 €/m^3, compared with 0.98 €/m^3 the previous year. The highest water prices were found in the Canary Islands (1.74), the Balearics

(1.61), Murcia (1.53), Valencia (1.30), Madrid (1.27), Navarre (1.25) and Catalonia (1.1), all of which had prices above the national average.

According to the OCDE, European households consume an average of 150 litres per person per day. The figure for France (160 litres, 2001) is similar to that for Spain in 2006. As for losses in the distribution networks, France has a very high percentage (26%), whereas Germany (9%) and the Netherlands (5%) have much lower rates. Water losses in the Spanish public urban distribution networks were estimated to be around 785 hm^3 in 2006, 16.7% of all the water distributed by these networks, although 6.7% less than the previous year. The main causes for these losses were leaks, bursts, damage, measurement errors, frauds, etc.

NOTES

- Water consumption in households is calculated from the INE's *Water Supply and Treatment Survey* for the period 1996-2006. It includes the volume of water measured and distributed to households. Water distribution includes the total amount of water available in the distribution network, plus losses from the network itself. It is calculated from total water abstraction by the supply company plus the net balance of water purchase and sale by other companies and local councils. In the series of data provided by the INE's *Water Indicators* (Series 1996-2003), the indicators used are water supply and treatment, volume of water available and volume of water supplied (litres/inhabitant/day).

SOURCES

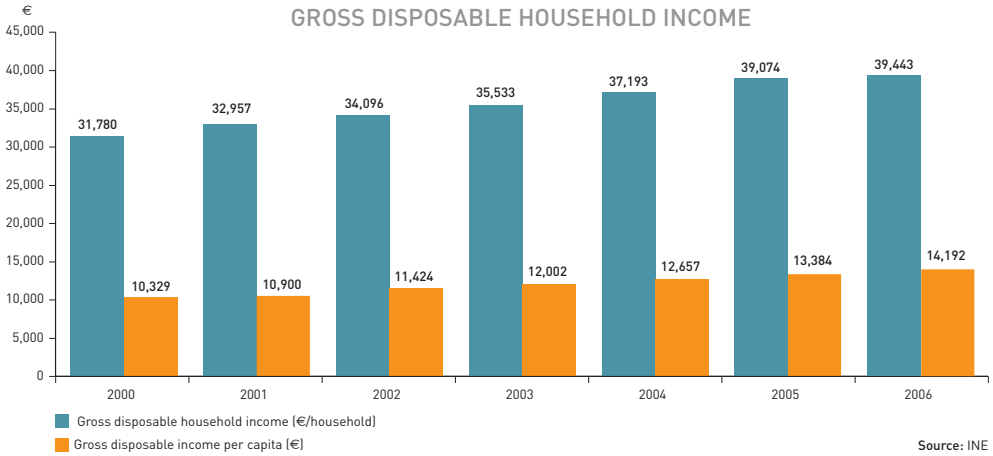
- INE. Survey on Water Supply and Treatment. 1996-2006.
- INE. Survey on Water Supply and Treatment. Press release July 17th, 2008.

MORE INFORMATION

- http://www.ine.es/inebase

Gross disposable household income

Gross disposable household income averaged almost ¤40,000 in 2006, an increase of 24.1% since 2000

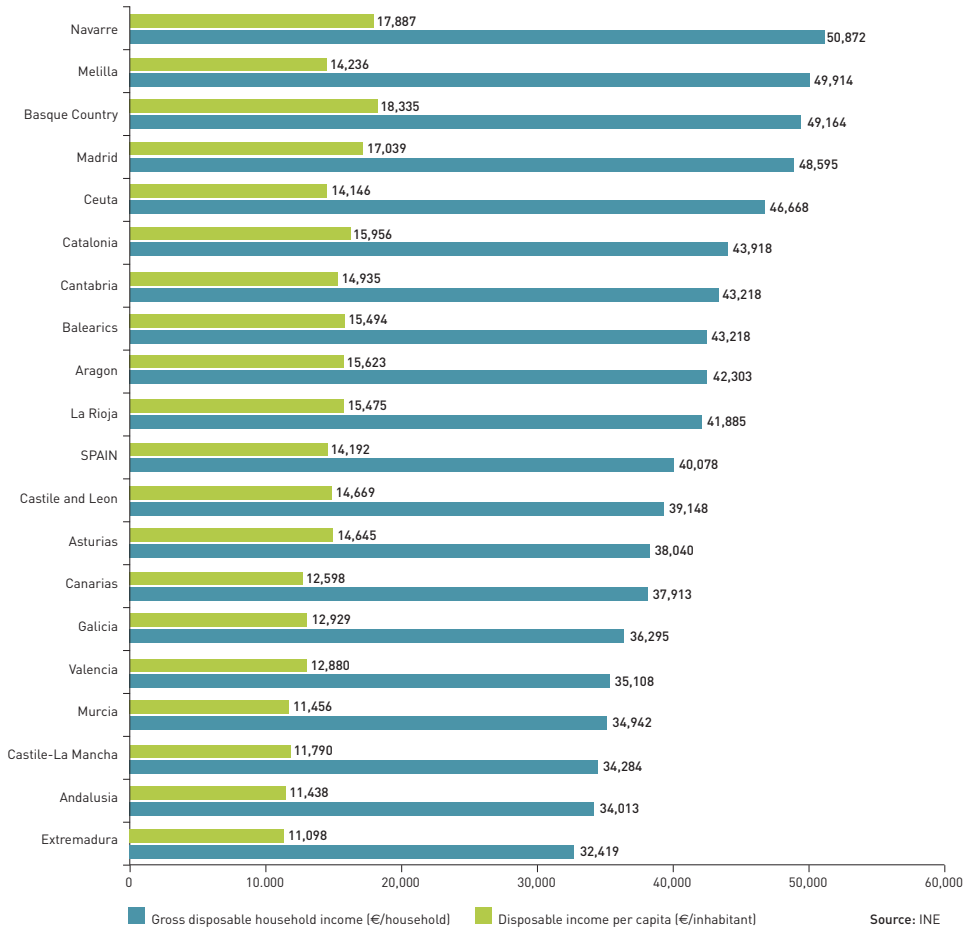


Gross household income averaged €39,443 in 2006, 0.5% more than in the previous year, whereas income per capita increased by 6.0% with respect to 2005 to €14,192. Gross household income increased by 24.1 points up to 2006 with respect to 2000 (index = 100), whereas income per capita increased by 37.4 percentage points. This increase coincided with a period of strong economic growth and a large population increase.

Households in eight Autonomous Communities, as well as the enclaves of Ceuta and Melilla, exceeded the national average, with Navarre heading the list (€50,872, 26.9% above the average), followed by Melilla, the Basque Country, Ceuta, Madrid, Catalonia, Cantabria, Balearics and Aragon. Extremadura, Andalusia and Valencia had the lowest gross household income.

If a similar analysis is performed to calculate gross disposable income per capita, the Basque Country heads the list with €18,355 (29% higher than the average), followed by Navarre, Madrid and Catalonia.

GROSS DISPOSABLE INCOME PER HOUSEHOLD (€/HOUSEHOLD) AND PER CAPITA (€/INHABITANT), 2006



Source: INE

As for household spending, each household spent an average of almost €30,000 per year, an increase of around 7.7% with respect to the previous year once the bridging calculations with the survey performed previously by the INE (ECPF) are carried out.

The highest proportion of this figure corresponds to housing (including an estimated rent for owned houses) and housing supplies (26.4%), followed by transport (14.31%) and food, including non-alcoholic drinks (14.0%). Average spending per person in 2006 was €10,632.

AVERAGE SPENDING AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD SPENDING, 2006

Spending groups	%	Av. household spending (€)
Housing, water, electricity and fuel	26.39	7,757.35
Transport	14.31	4,207.61
Food and non-alcoholic drinks	14.04	4,126.98
Hotels, cafes and restaurants	9.61	2,823.34
Other goods and services	7.96	2,338.81
Recreation, events and culture	6.75	1,983.80
Clothing and footwear	6.66	1,958.92
Furniture, equipment and other housing costs	5.78	1,699.32
Communications	2.91	856.33
Health	2.88	846.35
Alcoholic drinks and tobacco	1.78	523.56
Teaching	0.92	271.55
TOTAL	**100.00**	**29,393.93**

Source: INE. Ongoing Survey of Household Budgets. 2006.

NOTES

- The Survey on Family Budgets (EPF), launched in 2006, replaces the Ongoing Survey on Family Budgets (ECPF; base year 1997), which was taken quarterly from 1997 to 2005. The new survey provides annual information regarding the nature and destination of consumer spending, as well as various characteristics concerning households' living conditions. Bridging tables have been established between these two surveys for the various spending groups

SOURCES

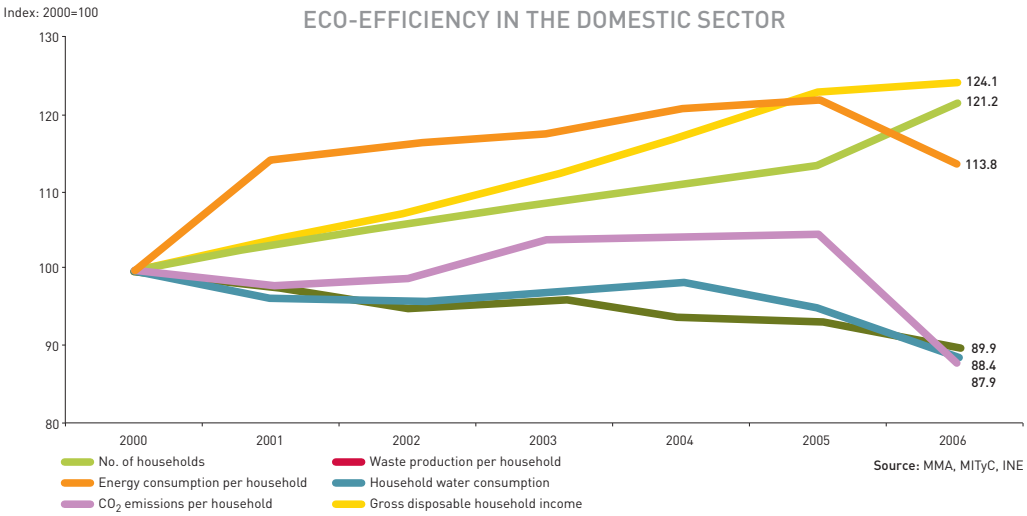
- INE. Spanish Regional Accounts. Base 2000. Gross Disposable Household Income. Series 2000-2006.
- INE. Spanish Regional Accounts. Base 2000 (CRE-2000). Household Income Accounts. Series 2000-2007. Press release, December 30th, 2008.
- INE. Household Budget Survey. 2006. Main findings. Press release, December 16th 2007.

MORE INFORMATION

- http://www.ine.es/inebase

Eco-efficiency in the domestic sector

Whereas the number of households and their gross income continued to increase in 2006, other indices decreased



The above graph shows the evolution of the residential sector between 2000 and 2006 on the basis of some of its variables (data for 2007 have not been included as not all series are available up to that year). The size of the sector, which has increased from 13.0 million to 16.3 million, should be highlighted initially. This demographic growth has been accompanied by strong economic growth, which means that household income has increased from €31,780 in 2000 to €39,443 in 2006.

In light of this scenario of both economic and demographic growth, it is logical that the sector's variables have also trended upwards over the same period. Spanish households as a whole have consumed more energy, emitted more CO_2 into the atmosphere and produced more waste. However, there have been some positive trends in the past few years: stabilization in urban waste generation since 2000 as well as decreased household water consumption in 2005 and 2006.

As for household energy consumption, this also decreased in terms of both electrical and heating/air conditioning use in 2006. Likewise, according to data from the INE, the amount of waste generated per household in 2006 decreased to 1.821 t from the 1.888 t of the previous year. In contrast, CO_2 emissions, which remained steady between 2003 and 2005, dropped sharply in 2006. These figures should be interpreted in light of the increase in the number of households.

Water consumption per household behaves differently to the other variables, showing fluctuations that could be related to meteorological parameters. It shows a certain decoupling from growth in gross disposable income per household and number of households, and a sharp fall in 2006 with respect to 2005. This effect could also be due to greater awareness of sustainable water use or the price increases imposed in almost all Autonomous Communities.

NOTES

- This indicator is calculated using the annual change in each of the indicators discussed, with 2000 as reference year and quoting each indicator's value as a percentage.
- European households account for nearly 27% of energy consumption, mainly for heating and air conditioning. This figure is lower in Spain, due above all to the milder climate, which means that intense use of heating systems is not necessary. Domestic energy consumption, excluding transport, is increasing overall due to the growth in both the number of households and their spending. The greater efficiency of household appliances is counteracted by the large number of these devices used in households.
- The 2005-2007 Action Plan drawn up under the Spanish Energy Saving and Efficiency Strategy set a savings target of approximately 500,000 TOE in 2007 for the Construction subsector. To achieve this objective, a series of measures were established. Some of these were directed at the existing stock of buildings, while other more ambitious measures target new buildings. All these measures could bring about a fall in residential energy consumption in the future.
- Practically all Spanish households have access to water, although its cost and the rationing imposed in times of drought prevent unlimited consumption. The Segura, Júcar, Sur and Guadiana river basins, inland basins in Catalonia and certain areas of the Ebro Basin suffer periods of water scarcity. These were particularly acute in the 2004-2005 hydrological year. In Spain, 17% of water consumed is used for urban supply, whereas in the rest of the European Union this figure does not exceed 10%.

SOURCES

- Number of households: INE. Ongoing Survey of Household Budgets. Base 1997. INE. Household Budget Survey.
- Waste: INE. Survey on Waste Collection and Treatment, 2006.
- Energy: Institute for Energy Saving and Diversification (IDAE).
- Ministry of Industry, Tourism and Trade. General Secretariat for Energy, 2006. "Energy in Spain, 2007".
- Water consumption: INE. Survey on Water Supply and Treatment. Various years.

MORE INFORMATION

- http://www.ine.es



2.13 URBAN ENVIRONMENT



In 2007, Spanish population reached 45.2 million inhabitants, of which 78.2% lived in 711 municipalities of more than 10,000 inhabitants, a figure that describes the urban environment mentioned in this report. Rural population amounted to 21.8% in said year, distributed in 7,390 municipalities.

These two environments, urban and rural, interact all the time and their relationships must be developed in a collaborative and supplementary framework, in line with the guidelines included in the Spanish Urban and Local Sustainability Strategy (EESUL - Estrategia Española de Sostenibilidad Urbana y Local) - currently in development- and in accordance with EU's proposals, among which it is worth noting the ones included in the Commission Green Paper: "Towards a New Culture for Urban Mobility", of 25 September, COM (2007) 551, which continues the debate on the most adequate policies that must be implemented in order to obtain a better quality of life in the cities, from the perspective of one of its most important items: public transport enhancement. More recently, the final declaration of the Ministers in charge of urban development (Marseille, 25 November 2008) highlighted the need to move towards an integrated, sustainable and unified urban development.



INDICATOR	GOAL	TREND
Urban pressure on land	Achieve a sustainable balance in land use	Urban pressure continues to increase, more significantly in eight Autonomous Regions that exceed the national average growth rate
Air quality in the urban environment	Not to exceed established limits	Confirmation of the increase in the number of hours when NO_2 exceeds 200 $\mu g/m^3$
Environmental noise	Not to exceed established limits	Noise maps of the major road infrastructures have been completed. The implementation of action plans will help to alleviate noise effects on the population
Monumental heritage of Spain's cities	Ensure maximum protection to monumental heritage property	The number of protected Sites of Cultural Interest (immovable property) continues to increase
Local mobility and passenger transport: public transport metropolitan areas	Promote less polluting modes of transport	Increase in the number of journeys by public transport (net figure) in all public transport metropolitan areas. There is also a growing dependence on private transport
Public participation in environmental policies	Undertake local sustainability commitments	Increase in sustainability commitments undertaken by local administrations through the Network of Networks for Sustainable Local Development (Red de Redes de Desarrollo Local Sostenible) and the Spanish Network of Cities for Climate (Red Española de Ciudades por el Clima)

SPANISH POPULATION DEMOGRAPHIC DISTRIBUTION BY SIZE OF MUNICIPALITY OF RESIDENCE - 2007

	<10,000	10,001-20,000	20,001-50,000	50,001-100,000	100,001-500,000	>500,000
Total municipalities	7,390	348	228	76	53	6
Total population	9,859,224	4,963,221	7,005,876	5,444,955	10,487,449	7,440,012

Source: INE. Municipal Register as of 1 January 2007

On the Green Paper the role of cities as drivers of economy, employment generation and service development is highlighted. However, it is also acknowledged that in the last decades, urban quality of life has deteriorated as a consequence of, among other things, a significant increase in traffic that leads to an increase in emissions, noise, energy consumption, space utilization, road accidents and less safety for pedestrians. This document states that European cities are faced with *five great challenges* that need to be answered through an integrated approach by all Public Administrations. Objectives:

- *Cities with fluid traffic:* to achieve this, it is necessary to reduce the negative impact of traffic congestion, encourage journeys on foot and by bicycle, regulate goods distribution and encourage the economic use of private cars.

- *Greener cities:* it is necessary to apply new technologies in order to obtain less polluting and more efficient vehicles, to use alternative fuels, and to implement traffic restrictions and dissuasive urban tolls.

- *Smarter urban transport:* aimed at a more efficient application of Intelligent Transportation Systems (ITS) to better manage demands, user information, the existing infrastructure management and goods distribution.

- *Access to urban transport:* in order for bus transport to satisfy the population's needs for mobility and accessibility, it must be efficient, accessible and of good quality. For this reason, it is essential to have land use management and an integrated approach to urban mobility.

- *Safe and protected urban transport*: it is important to ensure the security of journeys - a goal which should be met by every mode of transport -; in order to achieve this, road safety policies must focus on road and vehicle safety and encourage public awareness.

Following these guidelines, the Spanish Ministry of the Environment and Rural and Marine Affairs (Ministerio de Medio Ambiente y Medio Rural y Marino) has drawn up the Spanish Sustainable Mobility Strategy draft, which includes action proposals to promote a change in the current mobility model, making it more efficient and

sustainable, reducing its impact on the environment, particularly on the atmosphere, and fighting against climate change.

The Strategy is based on a mobility diagnosis in Spain, where it is highlighted, among other general aspects, that there is a strong growth in the demand, an increase in the number and distance of journeys made, a very high rate of road accidents, an imbalance among modes of transport –including the significant decrease in rail transport–, deficiencies of intermodal connections and the excessive utilization of urban space by road infrastructures. It also shows a significant traffic concentration on the coast during the summer, the growth of the vehicle fleet and an increase in traffic (interurban, rural and urban), which in 2006 reached a total of 371,140 Mkm, almost doubling 1990's figure.

In order to achieve sustainable mobility, the problem must be tackled from three angles: economic, social and environmental. In terms of this sustainability approach, the Strategy objectives are developed in five areas: 1) land use, through planning of transport and its infrastructures; 2) fight against climate change and energy dependence; 3) improvement of air quality and noise mitigation; 4) enhancement of road safety and sanitary conditions and, lastly; 5) demand management. The Strategy defines general guidelines for these five objectives and details measures to be implemented in the most important areas.

To achieve the objectives associated with climate change, the initiatives focus on giving priority to the public transport of passengers, boosting the renewal of the vehicle fleet and supporting innovative technical solutions to have cleaner and energy-efficient vehicles. Moreover, it has been highlighted that greater energy efficiency is needed in the case of public transport fleets, directing said fleets towards the use of cleaner fuel and energy, as well as the encouragement of bio-fuels and other renewable fuels, the promotion of a more efficient driving, and the energy labelling of vehicles in order to inform buyers about their technical specifications.

Lastly, in the health and safety section, the initiatives proposed in the Strategy tend to increase road safety by improving road network standards and Accident Concentration Zones (TCA - Tramos de Concentración de Accidents), increase rail safety through the implementation of the Highway-Railroad Crossing Safety Plan, and enhance the equipment for maritime rescue operations and for civil aviation at airports. All modes of transport must satisfy accessibility needs for people with limited mobility.

In this chapter, besides dealing with the situation on metropolitan areas from the Public Transport Authorities perspective, we introduce the demographic evolution of

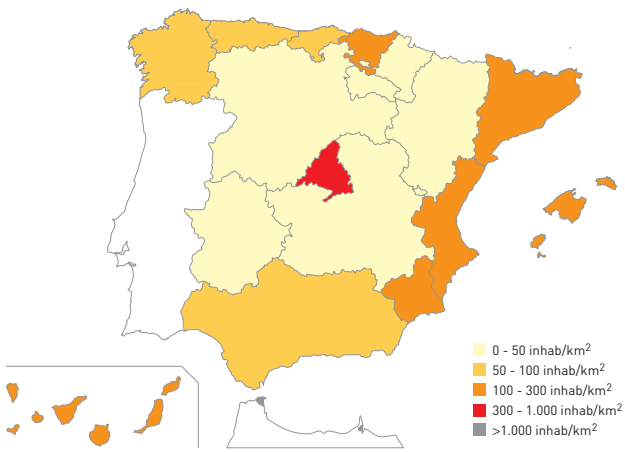
cities of more than 10,000 inhabitants, the air quality in the urban environment, the result of noise maps of the most important roads in connection with the population affected, and the initiatives to have a positive role in sustainable local development by promoting public participation.

Urban pressure on land

Pressure exerted by demographic growth in urban centres of more than 10,000 inhabitants on land increased 13.29% over the 2001-2007 period, with slight decreases in five Autonomous Regions

BAN DENSITY BY AUTONOMOUS REGION, 2007 (inhab/km^2)

SPAIN/AC	Variation rate 2007/2001	Urban density 2007
SPAIN	69.85	13.29
Andalusia	72.89	12.92
Aragon	18.39	7.57
Asturias	87.40	1.84
Balearic Islands	172.83	29.80
Canary Islands	241.45	23.96
Cantabria	72.91	9.50
Castile-Leon	14.93	4.25
Castile-La Mancha	13.16	19.95
Catalonia	181.36	15.20
Valencia	172.53	20.76
Extremadura	12.45	10.84
Galicia	63.46	5.31
Madrid	712.01	11.73
Murcia	116.64	19.21
Navarre	31.41	13.72
Basque Country	237.16	1.97
La Rioja	38.69	16.89
Ceuta y Melilla	4,563.84	5.89



Source: INE. Municipal Register as of 1 January 2007

This indicator measures the pressure exerted by urban population centres with more than 10,000 inhabitants on the land. It is the ratio between the population in urban centres of more than 10,000 inhabitants and the area of their respective Autonomous Region. Based on recent data, the urban population growth observed in the last decades continues, but in some Autonomous Region this growth seems to be slowing down or even decreasing. At national level, the 2007 variation rate compared to 2001, when the last census was carried out, was 13.29%, a rate wich can be considered high.

The highest urban density can be found in the following Autonomous Regions: Madrid (712.01), Basque Country (237.16), Canary Islands (241.45), Catalonia (181.36), Balearic Islands (172.83), Valencian Community (172.53) and Murcia (116.64). Also, Asturias, Andalusia and Cantabria are above the national average, while the others fall

below the national average. The case of Ceuta and Melilla is unique due to its limited territory.

In the 2001-2007 period, the highest increases occurred in the Autonomous Regions with more demographic variations, which are the island groups and those communities located on the Mediterranean coast, a main attraction for immigrants. Besides Madrid, which presents a 11.73% growth rate since 2001, the greatest increases within Spain took place in La Rioja and Castile-La Mancha, the latter reflecting the population growth of Guadalajara, as it has become one of the expansion areas of Madrid. Those with the lowest growth rates in the 2001-2007 period are: Asturias, the Basque Country, Castile and Leon, Galicia, and the cities of Ceuta and Melilla. In the latter case, the demographic saturation of these two cities explains the low rate of growth.

In terms of the variation experienced in 2007 compared to 2006, it is worth noting increases in five Autonomous Regions (Castile-La Mancha, the Balearic Islands, the Canary Islands, Navarre and Murcia). However, there were decreases in Galicia (0.04), Asturias (0.11), Castile and Leon (0.33), La Rioja (0.40) and Extremadura (1.08), which had under gone sustained increases of urban population since the 2001 census. Although insignificant, these decreases may indicate a change of cycle.

NOTES

- Currently, the Spanish urban system is unbalanced and scarcely hierarchical, and three areas can be distinguished according to the Statistical Atlas of Urban Areas in Spain 2006 (Ministry of Housing [Ministerio de Vivienda], 2007):

  – Large urban areas > 50,000 inhabitants.
  – Small urban areas: 50,000 - 5,000 inhabitants.
  – Non-urban areas < 5,000 inhabitants.

- Large Urban Areas occupy 9.4% of the national area, and encompass 67.8% of the total Spanish population. Small Urban Areas occupy 10.8% of the country's area and their population stands at 12.9% of the total figure. Lastly, Non-urban Areas host 19.3% of the population in an area that represents 79.8% of the total area. In any case, it is beyond any doubt that the city must be a space where citizens can satisfy their basic needs for activity and social life. This sets out many challenges; but in order to achieve them, sustainability must be taken into account, since it is in our cities where we have to fight for it, at a local and global level.
- In this chapter (from a demographic point of view) all urban centres of more than 10,000 inhabitants are considered cities, provided they are concentrated, with flat buildings predominance and devoted to activities related to secondary and tertiary sectors. Also, the population density of the city or country must be taken into account since this element could make smaller centres subject to the same classification. The European Conference on Statistics held in Prague considers that "a city" is a concentration of more than 2,000 inhabitants, provided that the population devoted to agriculture does not exceed 25% of the total.
- The population living in towns of less than 10,000 inhabitants (rural population) is not taken into consideration, although the boundaries between the urban and rural environments are increasingly blurred as a result of the new model of scattered residential development (urban sprawl) which is increasingly affecting the rural environment.
- This indicator was calculated using the Census of Population and Housing (Censo de población y vivienda) figures for 2001, together with those included in the Municipal Register as of 1 January 2006 (Royal Decree 1683/2007 of 14 December). The growing number of inhabitants in the period under analysis is of great significance; particularly in the case of communities that have seen an increase in construction and services due to the flux of immigrants to those sectors. Given the temporary coverage of this report, a decision was made to use 2007 figures instead of 2008, already available through the INE.

SOURCES

- INE. Demographic and Housing Census. 2001.
- INE. Municipal Register as of 1 January 2007
- Geographical extension: INEbase data.

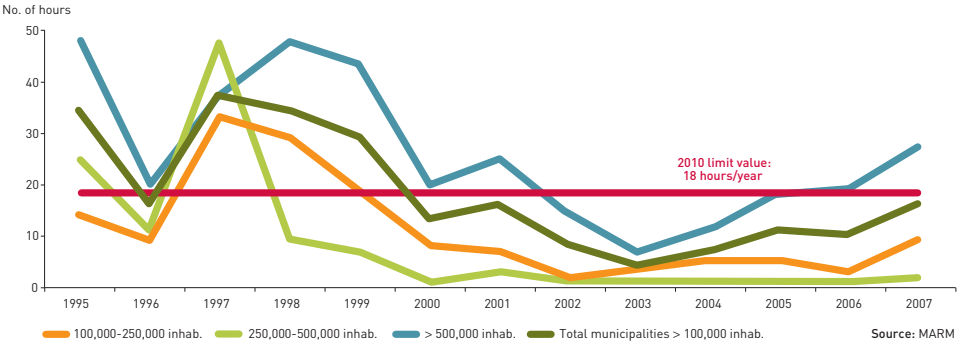
MORE INFORMATION

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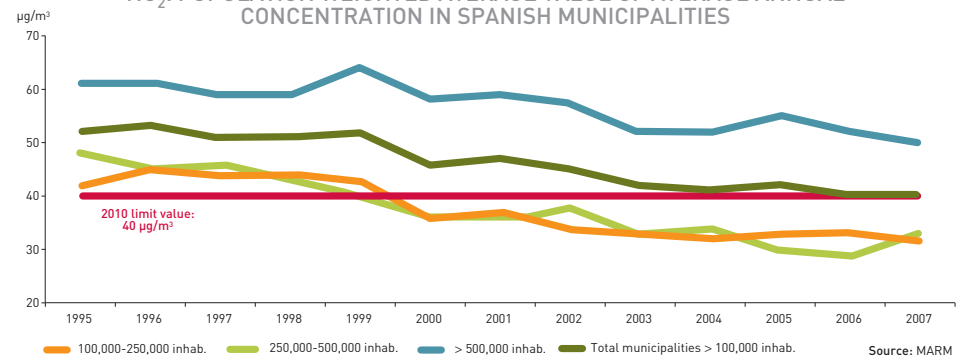
Air quality in the urban environment

NO_2 pollution is still of concern in the big cities

NO_2: POPULATION WEIGHTED AVERAGE VALUE OF THE NO. OF HOURS PER YEAR IN WHICH THE AVERAGE 200 µg/m³ HOURLY CONCENTRATION IS EXCEEDED IN SPANISH MUNICIPALITIES



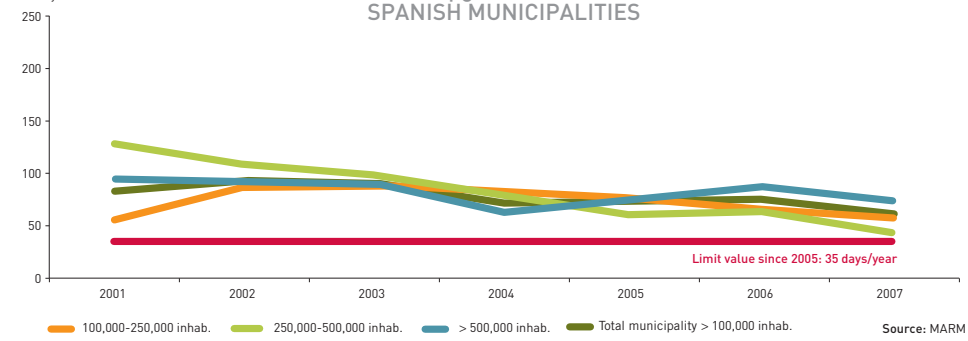
NO_2: POPULATION WEIGHTED AVERAGE VALUE OF AVERAGE ANNUAL CONCENTRATION IN SPANISH MUNICIPALITIES



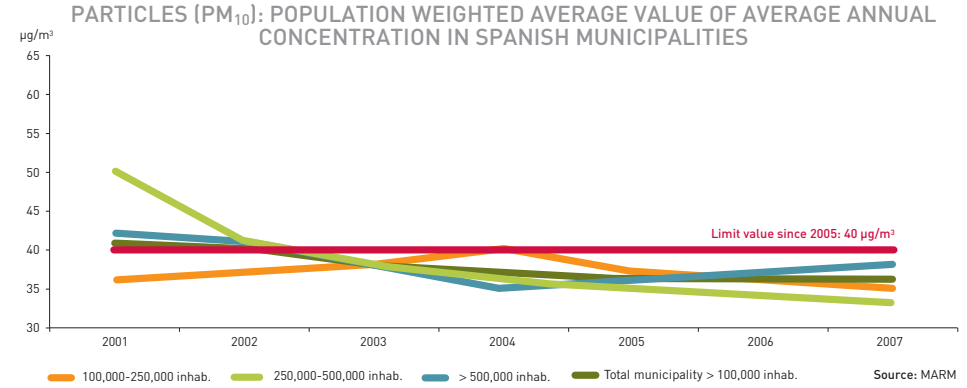
In urban environments, the average situation of air quality in Spanish municipalities of more than 100,000 inhabitants shows differences for each pollutant and for each variable evaluated of that pollutant. In the case of NO_2, mainly caused by road traffic and, to a lesser extent, by industries and households, the average number of hours in which the average 200 µg/m³ hourly concentration is exceeded shows an increase after the fall experienced until 2003. In 2007, for all population bands, an increase in the number of excess levels can be observed, particularly in cities of more than 500,000 inhabitants, which are the ones with more excess levels and which have been exceeding since 2005 the legal limit for 2010.

Instead, NO_2 annual mean concentration has fallen in every area, and since 2005, the 2010 limit has only been exceeded in cities of more than 500,000 inhabitants. For all cities with between 250,000 and 500,000 inhabitants, there was a 13.8% increase during last year.

PARTICLES (PM_{10}): POPULATION WEIGHTED AVERAGE VALUE OF THE NO. OF DAYS PER YEAR IN WHICH THE AVERAGE 50 50 µg/m³ DAILY CONCENTRATION IS EXCEEDED IN SPANISH MUNICIPALITIES



PARTICLES (PM_{10}): POPULATION WEIGHTED AVERAGE VALUE OF AVERAGE ANNUAL CONCENTRATION IN SPANISH MUNICIPALITIES

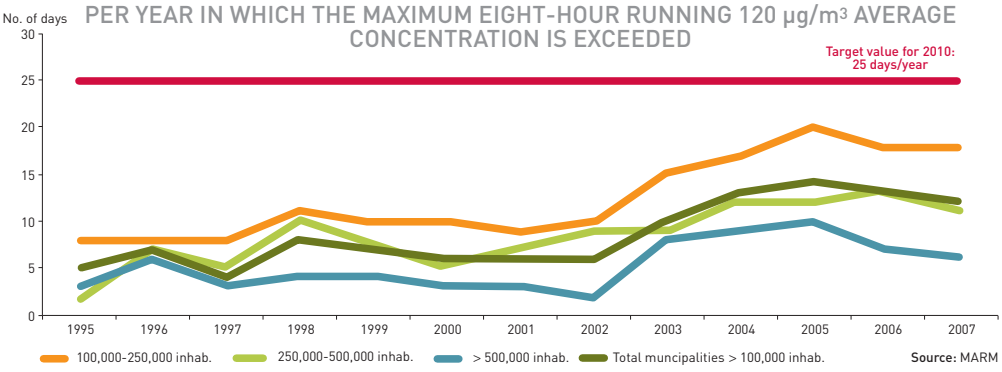


Regarding particles with a diameter of less than 10 µm, for all population bands considered, in 2007 there was a decrease in the population weighted average value of the number of days per year in which the average 50 µg/m^3 daily concentration is exceeded, repeating the trend of previous years and getting us closer to achieve the 2005 limit. The population weighted average value of the average annual PM_{10} concentration has remained below the limit since 2003. Nevertheless, in cities of more than 500,000 inhabitants, there was an increase in 2005 which remained unchanged until 2007.

Ozone is a photochemical pollutant whose concentration in the lowest layer of the atmosphere can increase due to human activities. Combustion processes that occur in cities (industries, traffic, etc.) release NO_X and other ozone precursor gasses (such as non-methane volatile organic compounds or NMVOCs), which react by solar radiation and produce ozone formation (tropospheric ozone formation usually appears on hot and sunny days), almost always in locations far away from emission sources. Since 2005, there has been a decrease in the population weighted average value of the number of days in which the concentration exceeds 120 µg/m3, measured as the maximum daily 8 hour running average, for all population bands. This drop changes the upward trend experienced since 2002, due to weather conditions experienced in

recent years (high temperatures and solar radiation). The improvement of these conditions in 2008 leads us to expect that this downward trend will continue in the next few years.

URBAN OZONE: POPULATION WEIGHTED AVERAGE VALUE OF THE NO. OF DAYS PER YEAR IN WHICH THE MAXIMUM EIGHT-HOUR RUNNING 120 µg/m3 AVERAGE CONCENTRATION IS EXCEEDED

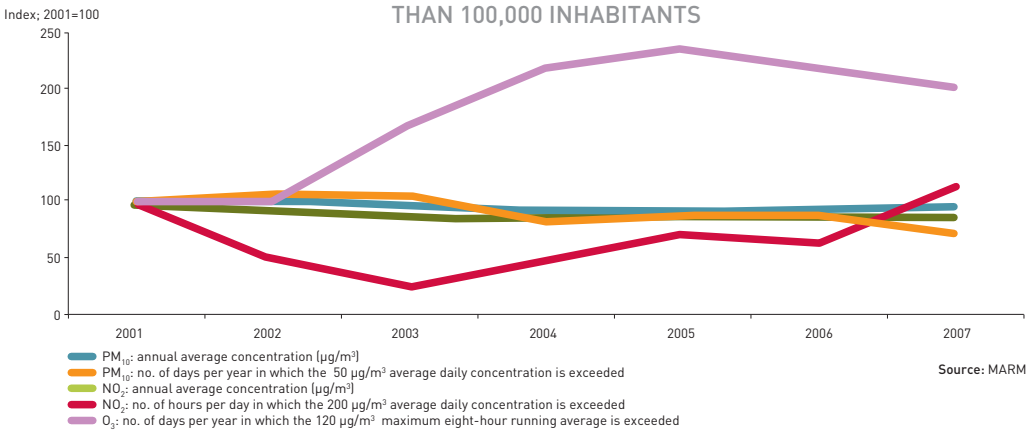


Source: MARM

To sumarise and in an attempt to provide an initial idea about the general situation of air quality in Spanish cities of more than 100,000 inhabitants, the analysis below includes the average trend of these variables as an index, as from 2001. It is worth noting that this does not represent the situation of spedific areas which may have more critical values.

The significant increase in excess levels until 2005 and the downward trend that started that year, together with the slight reduction of particles (excess levels and average annual concentration) and the average annual NO_2 concentration, and also the decrease until 2003 and later increase in NO_2 are to be highlighted.

CHANGES IN MAIN POLLUTANTS IN THE URBAN ENVIRONMENT. POPULATION WEIGHTED AVERAGE VALUE IN SPANISH MUNICIPALITIES OF MORE THAN 100,000 INHABITANTS



Source: MARM

NOTES

- In order to describe air quality for all Spanish cities by means of a representative average value, it has been decided to apply the EU methodology. For each pollutant, the average value of all monitoring stations in a city is calculated and then, this value is multiplied by the number of inhabitants of that city. The sum of these values for every population that belongs to the same population range, divided by the total number of inhabitants of those cities, indicates the weighted average value we want. The weighted average value is used for three municipality sizes (of between 100,000 and 250,000 inhabitants, 250,000 and 500,000 inhabitants and >500,000 inhabitants) with a summary for all municipalities of more than 100,000 inhabitants. For ozone, the indicator is based on a three-year average, under current legislation.
- All stations with enough data, and not only monitoring stations, have been included. However, it is worth noting that the average value obtained represents the average situation of that pollutant, although there might be major differences between that value and the specific situations existing in the different cities.
- The location and type of monitoring station (urban, traffic or industrial), maintenance and calibration of the analysers, and the number of monitoring stations used to produce average values are just some of the aspects which affect calculation of the variables, and thus the final calculated indicator. It would be easy to follow up variables for specific stations, located in representative sites and with enough valid data. Doing so would offer a picture of air quality at that specific point; however, that information does not reflect a general air quality average for all the country, which is the idea behind this indicator.
- The indicator monitors the variables covered by the European Common Indicators (ECI) Project, and shows changes over time of excess values for NO_2, PM10, and ozone, together with average annual concentration levels for the first two, making a comparison between them and the target and limit values set for 2005 and 2010 under current legislation: Royal Decree 1073/2002 on nitrogen dioxide (NO2) and particulate matter smaller than 10 (PM_{10}), and Royal Decree 1796/2003 on ozone.
- It is important to highlight that modifying the location of measuring stations, in accordance with legislative recommendations, in order to make them increasingly representative, has a significant impact on the indicator and the trends shown by it. The total number of stations taken into account for the calculation of the indicators varies throughout the period, a very significant aspect that conditions the final result. Hereinbelow is the table summarizing the percentage of monitoring stations for the period considered.

BREAKDOWN OF AIR QUALITY MEASURING STATIONS USED TO OBTAIN INDICATORS

	1995	2000	2005	2006	2007
Industrial	16.7	18.4	20.2	19.9	19.9
Traffic	78.8	72.2	58.3	55.6	55.6
Background	4.5	9.5	21.4	24.6	24.6

- It should also be remembered that the analysis does not include changes in concentrations of SO_2 and CO (which were covered by previous editions), essentially as a result of the apparent absence of problems involving these substances. Use of low-sulphur fuels and the replacement of coal-burning boilers with natural gas units, among other measures, have led to an improvement in air quality in terms of SO_2 concentration and it has been some years since the limits set for 2005 have been exceeded. Moreover, since 1999 the number of excess levels has decreased (no. of days per year that exceeded the CO concentration of 10 mg/m^3, measured as the maximum daily 8 hour running average) in Spanish municipalities. Since 2002, the 2005 limit set for CO has not been exceeded.
- With regard to the source of tropospheric ozone, it is known that urban areas generate the primary pollutants (mainly due to traffic) that are responsible, after a series of chemical processes (conditioned by high temperatures and solar radiation), for ozone production. These precursors or primary pollutants, after being transported out of the cities by the wind, produce an increase in ozone concentrations, with pollution becoming evident in suburban and rural areas, where the highest levels of said pollutant can actually be found.

SOURCES

- Air Quality Database (Base de datos de Calidad del Aire). Directorate General of Industrial Environmental and Air Quality (Dirección General de Calidad del Aire y Medio Ambiente Industrial). Directorate General for Quality and Environmental Assessment (Dirección General de Calidad y Evaluación Ambiental). MARM.

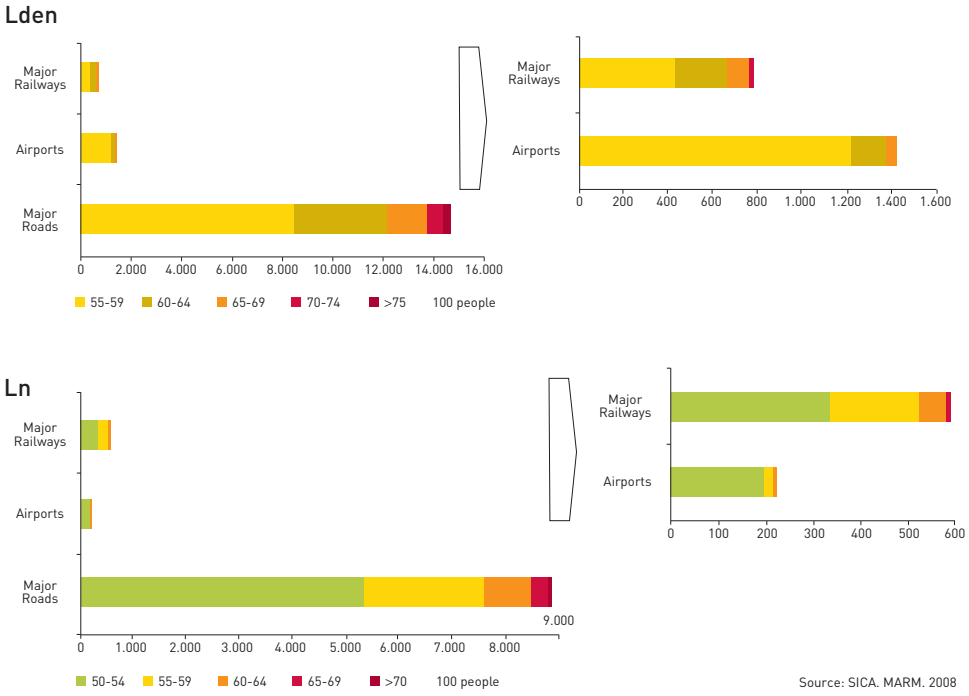
MORE INFORMATION

- www.marm.es
- www.eea,europa.eu

Environmental noise

Strategic Noise Maps (MER - Mapas Estratégicos de Ruido) show a total of 1,463,000 people who are exposed to noise coming from major roads; 78,100 from major railways and 143,700 from large airports

SOUND LEVELS FROM THE STATE TRANSPORT INFRASTRUCTURE NETWORK
(major roads, major railways and airports): Lden and Ln indicators



Source: SICA. MARM. 2008

Following Act 37/2003, of 17 November, on Noise and its development standards, and on the assessment and management of environmental noise, which has transposed Directive 2002/49/EC of 25 June into our legal framework, the first stage in Strategic Noise Maps production has been completed. The State Highways Network's maps, together with major railway, port and airport infrastructure maps have been finished and approved by the Ministry of Public Works (Ministerio de Fomento).

Through the Directorate General for Highways (Dirección General de Carreteras), strategic noise maps for 213 UMEs, including a total of 4,779 km of highway, have been drawn up. Also, the maps for 685.1 km of rails have been drawn up by the

Railway Infrastructure Manager (ADIF - Administrador de Infraestructuras de Ferrocarril) and the Directorate General for Railways (Dirección General de Ferrocarriles), and maps have also been drawn up for the 10 airports included by AENA (Spanish Airports Authority) in this first stage.

Meanwhile, the Ministry of Public Works developed a Noise Action Plan (PAR - Plan de Acción contra el Ruido) (2008-2012) in order to comply with Directive 2002/49/EC and to incorporate other actions of the Directorate General of Roads. The Plan's basic objective is to adequately manage actions for the next few years, so that financing and implementation can be carried out in a coordinated manner. PAR focuses on two aspects: the mitigation of noise at the source and the reduction of sound transmission through noise barriers set in the 584 UMEs, upon the analysis of the MER results and in the 109 UMEs which require complex solutions.

Main results obtained from 1st stage Strategic Noise Maps are introduced here and incorporated at national level by means of the following indicators:

- Sound levels from major roads, major railways and large airports (L_{den}, L_n), stated with the number of people exposed
- Exposure of affected population, including agglomerations
- Area exposed, including agglomerations

Moreover, there are three indicators that show the following for each mode of transport:

- Range distribution for L_{den} and L_n in major roads
- Range distribution for L_{den} and L_n in major railways
- Range distribution for L_{den} and L_n in the 10 selected airports

Previous graphics represent the number of people (in hundreds) who are exposed outside agglomerations for each L_{den} and L_{night} (Ln) indicator in the ranges shown. Based on data obtained from the development of the first stage of the Strategic Noise Maps (MER) for major state transport infrastructures, it can be observed that a total of 1,463,000 people are exposed to noise coming from major roads, 78,100 from major railways and 143,700 from large airports.

POPULATION EXPOSED AND AREA EXPOSED IN THE STATE TRANSPORT INFRASTRUCTURE NETWORK

DATA ON EXPOSURE OF AFFECTED POPULATION, INCLUDING AGGLOMERATIONS

	Length (km)	Affected population (inhabitants)			Area (km^2) exposed (including agglomerations)			No. of inhabitants exposed to L_{den}/km, including agglomerations
		Lden > 55	Lden >65	Lden >75	Lden > 55	Lden > 65	Lden > 75	
Major roads	5,917	18,709	3,073	294	6,527	1,674	399	373
Major railways	689	1,093	164	1	127	34	3	183
Airports	10	1,722	59	1	435	121	19	

Source: SICA. MARM. 2008

DATA OF AREA EXPOSED FOR AFFECTED POPULATION, INCLUDING AGGLOMERATIONS

	Area (km^2) exposed to Lden > 55 (including agglomerations)	No. of housing units exposed (in hundreds) (including agglomerations)		No. of hospitals exposed		No. of educational centres	
		Lden > 55	Lden >65	Lden >55	Lden > 65	Lden > 55	Lden > 65
Major roads	8,600	8,625	17,720	129	53	1,491	436
Major railways	164	751	134	7	1	133	35
Airports	575	590	25	2	3	100	7

Source: SICA. MARM. 2008

In this first stage, all major roads with more than six million vehicles a year, major railways with more than 60,000 trains a year and large commercial airports with more than 50,000 journeys a year are included.

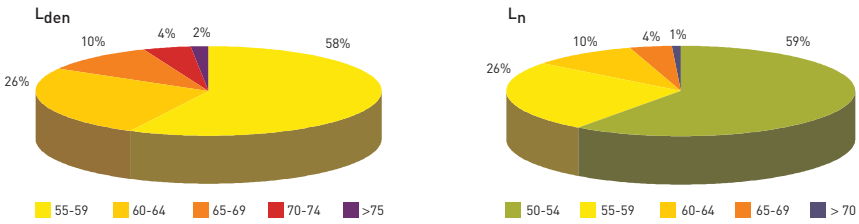
MER's only purpose is to assess the noise situation and environmental quality of life of the population in order to implement noise action plans that may lead to the control of noise by means of a series of measures and the drawing up of necessary action plans, thus contributing to people's health protection.

The Basic Noise Pollution Information System (SICA - Sistema básico de información de la contaminación acústica), which depends of MARM, collects, analyses and processes noise data compiled by competent authorities, and also makes information publicly available and promotes research on noise pollution (http://sicaweb.cedex.es/).

Major roads

State highways studies include 5,953 km out of a total of 25,415 km (data from 2005) of the State Highways Network that have been organised in 27 studies, of which 7 belong to government-licensed toll roads. The remaining portion (4,790 km) has been organised by provinces or Autonomous Regions.

RANGE DISTRIBUTION FOR L_{den} AND L_n IN MAJOR ROADS



Source: SICA. MARM. 2008

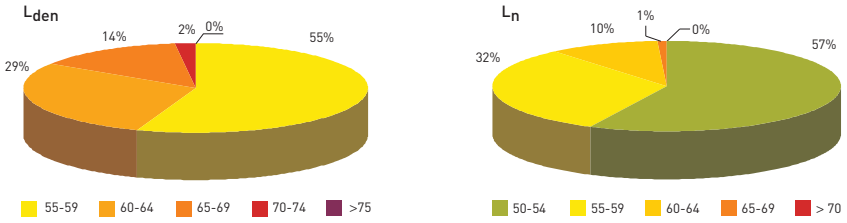
The previous graphic shows L_{den} and L_n percentage breakdown for the periods considered, without including agglomerations. The number of people affected by the L_{den} > 55 indicator reaches 1,463,000, while a total of 884,600 people are exposed to L_n > 50. Regarding the population exposed, the number of inhabitants exposed to L_{den} values above 55 dB(A) per kilometre climbs to 373.

The Noise Action Plan (PAR - Plan de Acción contra el Ruido) 2008-2012 for State Highways focuses on two types of actions to alleviate noise: the mitigation of noise at its source (drain and double-layered pavements) and the reduction of sound transmission through the set-up of noise barriers. The Noise Action Plan provides for the installation of 383 km of barriers, which will benefit a total of 1,128,013 people and will cost €230,689,200. Moreover, some "complex actions" will be performed through specific regional plans for 151 km and will benefit a total of 353,574 people.

Major railways

Maps drawn up at state level in this first stage correspond to three large zones in the areas of Madrid and Castile-La Mancha; Barcelona and Valencia; and Basque Country and Asturias, with 689 km studied out of a total of 11,780 km of the state network (data from 2005).

RANGE DISTRIBUTION FOR L_{den} AND L_n IN MAJOR RAILWAYS



Source: SICA. MARM. 2008

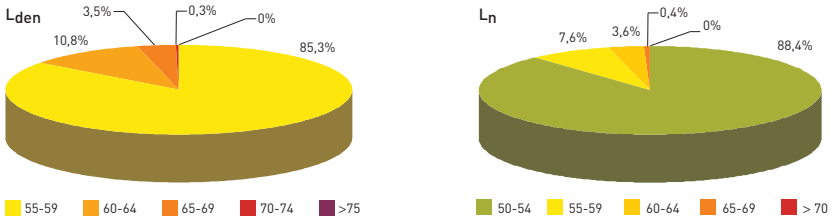
The adjacent graphic shows L_{den} and L_n percentage breakdown for the periods considered, without including agglomerations. L_{den} > 55 value affects 78,100 people, while L_n > 50 affects 58,900 people.

Regarding the population exposed, the number of people exposed to L_{den} > 55 reaches 183 inhabitants per kilometre. In terms of action initiatives, agreements between local entities and Autonomous Regions are being made and specific action plans have been developed. Besides, noise absorption panels have been installed as corrective measures. Future actions as measures related to the 1st stage MER are being developed in appropriate Action Plans which will be effective for 5 years.

Airports

In Spain, strategic noise maps for 10 airports have been drawn up during the first stage: Madrid-Barajas, Barcelona, Palma de Mallorca, Malaga, Gran Canaria, Valencia, Alicante, South Tenerife, North Tenerife and Bilbao.

RANGE DISTRIBUTION FOR L_{den} AND L_n IN MAJOR AIRPORTS



Source: SICA. MARM. 2008

The adjacent graphic shows L_{den} and L_n percentage breakdown for the periods considered, without including agglomerations. The number of people affected by L_{den} > 55 indicator reaches 143,700, while in the case of L_n > 50 indicator, it stands at 22,500.

At every airport under consideration, a series of measures are applied in order to alleviate the noise impact on the population exposed. Among others, it is worth noting the introduction of operative restrictions, the establishment of noise quotas, noise monitoring systems, air traffic control discipline and noise isolation action plans. Action plans for these 1st stage MERs are being drawn up, including actions to be developed within the next 5 years.

NOTES

- The information disclosed to the Spanish Ministry of the Environment and Rural and Marine Affairs (as the body responsible for collecting all the information that then is reported to the European Commission) on strategic noise maps has been published through the Basic Noise Pollution Information System (SICA - Sistema básico de información de la contaminación acústica, http://sicaweb.cedex.es) which depends of MARM and is developed and managed by the Spanish Centre for Public Works Studies and Documentation (Centro de Estudios y Documentación de Obras Públicas). MARM has renewed the collaboration agreement with this body in order to maintain said system. This agreement shall be effective for three years (2009-2012).
- The indicators used for drawing up Strategic Noise Maps (MER - Mapas Estratégicos de Ruido) are L_{den}, Ld, L_t and L_n, as defined by Royal Decree 1513/2005 that led to Act 37/2003 on Noise, in connection with the assessment and management of environmental noise. L_{den} is associated with global disturbance, L_d and L_t indicate noise related to the day-time and night-time disturbances suffered, respectively, and L_n is the indicator linked to sleep disturbances.
- A Strategic Noise Map comprises:
  - Sound level maps: (L_{den}, L_d, L_t, L_n): they are immision levels where isophonic contours are represented for previously defined periods with a preset range of colours to make comparison easier. Generally, the scale used is 1:25.000, except for detailed maps which use a scale of 1:5.000 in densely populated residential areas or areas of special interest or conflict which do not comply with set forth noise quality target values.
  - Noise exposure maps: these depict data concerning buildings, housing units and population exposed to certain noise levels at the building facade, together with other data required under the Directive. Educational and sanitary equipments are distinguished. In table 2, the affected area of state networks for transport infrastructures, which represents the area included within $L_{den} > 55$ and $L_{den} > 65$ isophonic contours, as well as housing units (in hundreds), hospitals and educational centres exposed to the same ranges can be observed.
  - Exposure maps: these maps collect data associated with the total area (Km^2) exposed to L_{den} >55, >65 and >75 values, and inform on the estimated total number of housing units and people (in hundreds) who live in these areas, as well as schools and hospitals exposed to these ranges of noise.

SOURCES

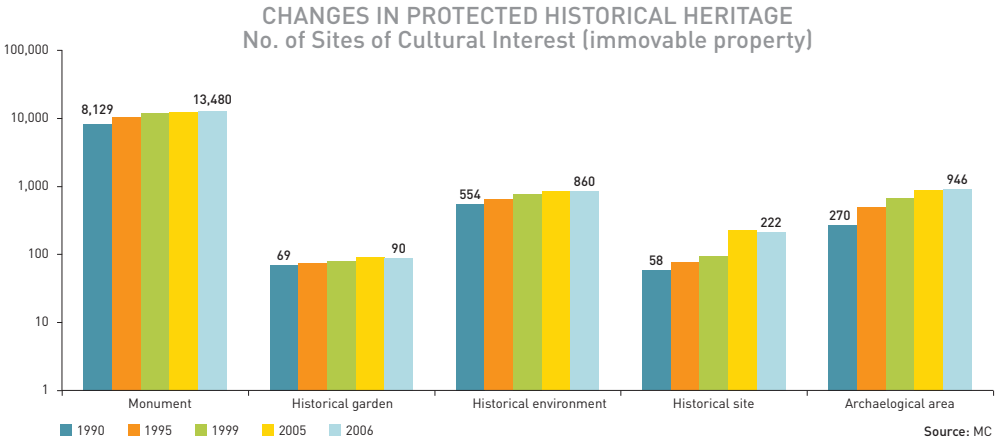
- Basic Noise Pollution Information System (SICA - Sistema Básico de Información sobre la Contaminación Acústica). Sub-Directorate of Industrial Environmental and Air Quality (Subdirección de Calidad del Aire y Medio Ambiente Industrial). Directorate General for Quality and Environmental Assessment (Dirección General de Calidad y Evaluación Ambiental). MARM.
- *First stage in the development of Strategic Noise Maps of the State Network Highways: Summary of results and Action Plan (PAR) 2008-2012, September 2008.* Ministry of Public Works (Ministerio de Fomento). Dirección General de Carreteras (Memoria). http://www.cedex.es/egra/DOCUMENTACION/Memoria.pdf.

MORE INFORMATION

- **http://sicaweb.cedex.es**
- **http://eea.eionet.europa.eu/Public/irc/eionet-circle/eione_noise/library**
- **http://ec.europa.eu/environment/noise/**

Monumental heritage of Spain's cities

In 2007, the legal protection of historical heritage encompassed 15,598 Sites of Cultural Interest



Immovable property included in the Spanish Historical Heritage (PHE - Patrimonio Histórico Español) represents only a small part of the Spanish heritage, given the geographical and cultural diversity of its regions and the country's history. Protection of this legacy is provided under Act 16/1985, of 25 June, on Spanish Historical Heritage (Official State Gazette of 29 June 1985), which establishes a register of Sites of Cultural Interest, including movable and immovable property. The latter are considered in the indicator, which comprises five categories: monument, historical garden, historical environment, historical site and archaeological area.

Based on data provided by the Ministry of Culture (Ministerio de Cultura) in 2007, monuments represented 86.4% of total immovable property; followed by archaeological areas (6.1%), historical environments (5.5%), historical sites (1.4%) and historical gardens (0.6%).

There are European institutions which focus on the protection of European Cultural Heritage, such as Europa Nostra or the Council of Europe. This body participates in these three areas: culture, heritage and nature, which show the close relationship between nature and cultural heritage. Its current priorities are intercultural dialogue, heritage value for society, landscape importance for sustainable development, policy-making based on knowledge, regional cooperation, climate change and biodiversity.

In Spain, the association Hispania Nostra has been developing its activities in collaboration with Europa Nostra since 1976 and focuses on the defence and

promotion of cultural heritage and its environment. Its initiatives include the development of a Red List that will highlight each element of the Spanish Historical Heritage that might be in danger of disappearing, being destructed or suffering an alteration of its core or essential values.

It is worth noting that Europa Nostra annually awards those initiatives which contribute to promote and protect European heritage. In 2008, four Spanish initiatives were awarded by Europa Nostra: the restoration of medieval bridge on Río Truchas (La Pobleta de San Miguel), the restoration of San Nicolás de Bari Church's choir (Madrigal de las Altas Torres), the restoration of Cerralbo Museum's building and collections in Madrid, Spain Fortified Military Architecture Inventory and the International Monuments Photographic Experience (EPIM) of Catalonia Museum of History, the latter for its contribution to education, training and awareness-raising.

NOTES

- The graph showing Monumental Heritage data uses a logarithmic scale due to the wide difference between the number of Historical Gardens and Monuments.
- The Immovable Property Register includes these categories: declared and initiated.
- Act 16/1985 defines the concept of Spanish Historical Heritage (PHE) as including movable and immovable property with an artistic, historical, archaeological and ethnographic value. Documentary and bibliographic heritage, archaeological sites, natural environments, gardens and parks with artistic or historical interest are also included.
- Spain heads the worldwide list along with Italy in terms of the highest number of sites declared as World Heritage by the UNESCO (40 nominations), the last one being Teide National Park in 2007. It will be decided halfway through 2009 whether the Tower of Hercules will be included in UNESCO'S World Heritage List. The UNESCO list, in addition to its strictly monument-related categories, also includes four National Parks, and semi-natural sites such as Las Médulas.
- The Council of Europe is an international organization of states constituted in La Haya in 1948. It has 47 member states, almost all European countries except for Belarus and Kosovo. According to its Statute (1949), it was constituted with the purpose of defending human rights, pluralist democracy and the rule of law, as well as encouraging the development of Europe's cultural identity. This council should not be confused with the Council of the European Union (EU deliberative body) or the European Council (meeting of the heads of state or government from the member states and the president of the European Union Commission) in spite of their symbol sharing. This is merely due to the fact that both share the purpose of promoting European integration. Spain presided over the Council of Ministers, the executive body of the Council, between 27 November 2008 and 12 May 2009.

SOURCES

- Spanish Ministry of Culture (Ministerio de Cultura), 2008: Anuario de estadísticas culturales 2007 (*Cultural Statistics Yearbook).*
- Decision no. 1855/2006/ of the European Parliament and the Council of 12 December 2006. (*Culture Programme 2007-2013).*
- Act 16/1985 of 25 June on Spanish Historical Heritage *(Official State Gazette of 29 June 1985).*

MORE INFORMATION

- http://www.mcu.es

Local Mobility and Passenger Transport: Public Transport Metropolitan Area

Spain's 16 public transport metropolitan areas accommodate a population of 21.3 million people, with 55,000 km of bus lines (urban and metropolitan) and 2,380 km of railway lines

GENERAL CHARACTERISTICS OF PUBLIC TRANSPORT METROPOLITAN AREAS - 2006

Metropolitan Area	No. of Participating Municipalities	Metropolitan Area (km^2)	Population Metropolitan Area (1/1/2006)	Urbanized Area (km^2)	Density Metropolitan Area (inhab/km^2)	Density of Main City (inhab/km^2)	Ratio Population Main City/ MA (%)
Madrid	179	8,030	6,008,183	1,040	5,775	5,164	52
Barcelona	164	3,239	4,857,000	539	9,011	15,714	33
Valencia	60	1,415	1,732,830	325	5,332	5,885	46
Seville	31	1,741	1,250,597	306	4,086	4,985	56
Biscay	111	2,217	1,139,863	ND	ND	8,583	31
Asturias	43	5,191	947,681	ND	ND	1,151	23
Malaga	14	1,258	931,508	ND	ND	1,421	60
Gran Canaria	21	1,560	807,049	330	2,446	3,751	47
Zaragoza	35	2,234	731,998	116	6,310	611	89
Bay of Cadiz	7	1,877	644,738	80	8,059	10,880	20
Camp de Tarragona*	131	2,999	530,115	ND	177	1,965	24
Granada	32	861	484,168	ND	ND	12,328	49
Alicante	5	355	434,505	66	6,543	1,604	74
Pamplona	17	90	309,607	44	7,008	7,765	63
Vigo	1	109	297,028	ND	ND	2,715	100
A Coruña	1	37	244,388	ND	ND	6,641	100

Source: Metropolitan Mobility Observatory. [5th report] June 2008. NOTE: NA= Data not avaible

The Public Transport Authorities (ATP – Autoridades de Transporte Público) have been created in order to provide a coordinated response to the population mobility demand in public transport metropolitan areas (MA). According to the Metropolitan Mobility Observatory, residing population in these areas reached 21.3 million inhabitants in 2006, occupying an area of 33.2 million km^2, of which 10% (3,243 km^2) belongs to the main city that is the core of the surrounding areas. The 16 MA include a total of 816 municipalities, among which we can find Spain's 5 most-populated cities.

These areas are divided into three groups based on their population: large (Madrid, Barcelona, Valencia, Seville and Biscay); medium (Asturias, Malaga, Gran Canaria, Zaragoza, Tarragona and Bay of Cadiz); and small (Granada, Alicante, Pamplona, Vigo and A Coruña). It is worth noting that the concept of Metropolitan Area in connection with public transport does not match the idea behind the use of this concept in urban planning. Thus, in the case of Madrid, its metropolitan core includes 27 municipalities, instead of the 179 that were used in that context and that make up the total of this Autonomous Region.

The highest population density belongs to the city of Barcelona, followed by Granada, Cadiz and Bilbao, which have densities that exceed by far the average density figure (3,067 inhabitants per km^2) of the main cities. The highest population density in Metropolitan Areas also belongs to Barcelona, followed by the Bay of Cadiz and Pamplona.

Two new entities have been incorporated: the Gran Canaria Sole Transport Authority (AUTGC - Autoridad Única del Transporte de Gran Canaria) and the Public Transport Authority (ATP - Autoridades de Transporte Público) of the City of Vigo. The first one is composed of the Cabildo of Gran Canaria, the Local Council of Las Palmas and other Local Councils with jurisdiction over regular passenger public transport. Its territorial scope is the island of Gran Canaria, with a population of almost one million inhabitants. Regarding the City of Vigo, the authority in charge of bus public transportation management is the Local Council, providing services to a population of almost 300,000 inhabitants within its territory (109 km^2).

In order to meet their goals, the ATPs have an infrastructure that offers one or more transport modes, mainly urban and metropolitan buses and rails (subway, RENFE's short distance trains, tramways, autonomic railways and narrow gauge railways). In just one case (Pamplona), the ATPs have authority over taxis. As evidenced by the bus lines-related data included in the table below, the lengths of urban and metropolitan lines are close to 9,000 and 45,000 km, respectively.

PUBLIC TRANSPORT METROPOLITAN AREAS LENGTH OF BUS LINES (KM) AND NUMBER OF STOPS

Metropolitan Area	Number of lines		Number of stops		Length of lines (km)	
	Urban	Metropolitan	Urban	Metropolitan	Urban	Metropolitan
Madrid	209	441	10.430	19.667	3.444	20.823
Barcelona	112	497	5.520	19.000	1.808	8.555
Valencia	59	55	2.031	1.919	884	2.095
Seville	40	50	1.680	916	537	1.510
Asturias	13	305	756	ND	154	ND
Malaga	40	51	1.782	650	610	1.516
Gran Canaria	41	145	1.768	4.512	370	3.177
Zaragoza	38	44	1.739	1.956	557	3.551
Bay of Cadiz	52	41	ND	911	ND	2.324
Granada	28	53	ND	ND	335	1.445
Alicante	13	24	ND	ND	ND	ND
Pamplona	20		706		343	
Vigo	29		1.050		ND	
A Coruña	22		961		147	

Source: Metropolitan Mobility Observatory. [5th report] 2005-2007

Middle-sized areas, such as Gran Canaria, Zaragoza or Granada, have the *highest densities of bus lines* per inhabitant (between 4,000-5,000 million

inhabitants).Regarding the area of the MAs, the greatest density values belong to the big and small areas (between 3,000 and 4,000 km/1,000 km^2). The lowest stops density values – both in relation to inhabitants and the area of the MA – belong to Valencia, Seville, Asturias and Malaga. In 2007, the several rail modes amounted to 2,380 km, distributed in the manner presented in the table hereinbelow. Regarding density (km/area), Barcelona, Valencia and Asturias (which have several lines in their own respective territories) show the highest values, in comparison with metropolitan areas such as Malaga and the Bay of Cadiz, where only short-distance services are available. This also applies if the calculation is based on population.

PUBLIC TRANSPORT METROPOLITAN AREAS LENGTH OF RAILWAYS (KM) AND NUMBER OF STOPS

	Subway	Tramway	RENFE (short-distance train)	FEVE (narrow-gauge)	Autonomic Rails	TOTAL Railways	Total stations
Madrid	233.0	23.80	340.00	-	-	596.80	295
Barcelona	110.3	15.92	453.00	-	120.00	699.20	339
Valencia	121.7	-	85.00	-	-	206.70	140
Seville*	-	-	145.00	-	-	145.00	24
Asturias	-	-	117.70	459.73	-	577.43	226
Malaga	-	-	67.90	-	-	67.90	25
Bay of Cadiz	-	-	51.10	-	-	51.10	13
Alicante	-	29.8	-	-	-	29.8	-
A Coruña	-	6.25	-	-	-	6.25	-

Source: Metropolitan Mobility Observatory [5th report] 2005-2007
[*] On 1 April, 2009, line 1 of Seville subway was opened, with a length of 18 km and 22 stops

The indicators that allow the comparison of different services and cities are the following: “vehicles-km per year” and “beds-km per year”, both in connection with buses and railways, as shown below:

VEHICLES-KM PER YEAR (million)

	Buses			Rail Modes
	Urban Buses	Metropolitan Buses	Total Buses	Total Rail Modes
Madrid	100.00	163.00	263.00	259.00
Barcelona	42.10	66.00	108.10	167.80
Valencia	21.40	8.79	30.19	28.07
Seville	17.00	9.00	26.00	2.18
Asturias	3.70	n.d.	3.70	6.68
Malaga**	9.45	6.00	15.45	3.28
Gran Canaria	10.70	29.70	40.40	-
Zaragoza	19.90	5.10	25.00	-
Granada	7.21	5.43	12.65	-
Alicante	4.29	3.66	7.95	0.39
Pamplona	6.75		6.75	-
A Coruña	5.58		5.58	-

Source: OMM. 5th report 2005-2007.

BEDS-KM PER YEAR (MILLION)

	Buses			Rail Modes
	Urban Buses	Metropolitan Buses	Total Buses	Total Rail Modes
Madrid	7,802	11,101	18,903	37,473
Barcelona	3,789	5,082	8,871	25,893
Valencia	2,342	791	3,133	4,362
Seville	1,430	720	2,150	614
Asturias	425	n.d.	425	1,156
Malaga**	945	432	1,377	272
Gran Canaria	1,063	1,507	2,570	-
Zaragoza	2,144	299	2,443	-
Alicante	331	281	612	78
Pamplona	777		777	-
A Coruña	614		614	-

Source: OMM. 5th report 2005-2007.

In connection with rail modes, we must highlight the importance of short-distance trains in order to achieve sustainable mobility in metropolitan areas and to contribute to the cohesion and integration of the territory surrounding the metropolis. The table below shows some of the most relevant data provided by RENFE (Spanish National Railway Network) in eight specific areas.

RENFE SHORT DISTANCE SERVICE IN METROPOLITAN AREAS

Metropolitan Area	Length of Lines	No. of Stops in Lines	Tourists-km (million)	Beds-km offered (million)	Average frequency during rush hour	Average Commercial Speed (km/h)	Average distance traveled by tourist (km)
Madrid	587.5	191	3,894.13	9,928	5	52.54	15.22
Barcelona	543.1	139	2,682.52	7,047	7	50.23	21.95
Valencia	405.7	84	784.32	1,720	25	64.34	30.83
Seville	193.1	31	171.39	617	30	60.60	24.21
Biscay	75.2	52	208.16	656	15	43.19	9.87
Asturias	140.1	53	173.96	706	30	49.65	21.99
Malaga	67.9	26	160.44	272	30	41.02	16.32
Bay of Cadiz	51.2	13	81.14	252	30	52.59	23.38

Source: RENFE, General Directorate of Short and Medium-Distance Services (quoted by the Metropolitan Mobility Observatory).
This data encompasses some publications that do not belong to the transport authorities scope of action.

The quality of services rendered by the public offer of buses may be analysed through a set of indicators, among which we can mention: the commercial speed of buses, the frequency, the service hourly range, the night services, and the percentage of the fleet that is entirely equipped for people with limited mobility.

Due to its importance in terms of the environment, we also provide the percentage of bus fleets with reduced emissions capabilities. It is worth highlighting that since the time when data was collected (2005-2007), the urban fleet has evolved towards a greater sustainability level in terms of the use of fuel. For example, Madrid's EMT had,

in 2007, 1,266 buses that used alternative energy (of a total of 2,033 as of 31/12/2007), of which 69% used bio-diesel and 27.72% used compressed natural gas, according to the report issued in the Technical Conference V, organized by MARM and the Metropolitan Mobility Observatory (Valencia, 2008). Recently (2009), a hybrid bus prototype was tested in Barcelona (electric propulsion, assisted by a diesel engine), which may reduce fuel consumption and therefore, pollutant emissions, reaching at the very least, a 20% less than a conventional thermal motor vehicle.

URBAN BUSES WITH REDUCED EMISSIONS IN COMPARISON WITH THE FLEET TOTAL (%)

	Euro IV	GNC	GLP	Hybrids	Bio-diesel	Other*
Madrid	78.3	10.0	-	1.0	10.3	0.4
Barcelona	-	20.2	-	-	-	0.3
Valencia	-	6.3	-	0.6	20.8	-
Seville	-	20.1	-	-	14.0	-
Asturias	-	-	-	-	100.0	-
Malaga	0.4	1.7	-	-	65.0	-
Gran Canaria	4.6	-	0.8	-	-	-
Zaragoza	-	-	-	-	9.7	-
Vigo	-	-	0.9	-	1.8	-

Source: Metropolitan Mobility Observatory [5th report] 2008 (*) Other: hydrogen and bioethanol, CNG: Compressed Natural Gas, LPG: Liquefied Petroleum Gas

NOTES

- Metropolitan Area: following the criteria of the Metropolitan Mobility Observatory, metropolitan area means: "the urbanized geographical area where there is a high degree of interaction between the several urban centres in terms of journeys, daily relations, economic activities, etc."
- The transport data of the metropolitan areas has been provided by the ATPs. Population data was last updated on 1 January, 2006, except Camp de Tarragona's, which was last updated on 1 January, 2005. There is no data available of this metropolitan area for the tables presented in the foregoing.
- The draft of the "Spanish Sustainable Mobility Strategy" (public information until 15 February 2009) includes certain action proposals that lead to a change in the current mobility model, making it more efficient and sustainable, and contributing to the fight against climate change and the reduction of the mobility model impact on the environment, especially on the atmosphere.
- Regarding urban and metropolitan transport, the EEMS highlights the need to implement a series of measures, among which we can mention: a) to draw up mobility evaluation studies in order to implement corrective measures; (b) to establish the basis set forth in the PEIT in order to boost the cooperation with other administrations having jurisdiction over transport in cities and metropolitan areas; (c) to encourage short-distance rail services; (d) to establish public transport access in the terminals of the different transport modes; (e) to encourage alternatives such as Bus and Bus/VAO lanes in order to increase the capacity of the access ways to the big cities, (f) to encourage non-motorized transport modes, thus increasing opportunities for the use of bicycles and for pedestrians; (g) to implement sustainable mobility plans that include a diagnosis of the situation and the goals of that state, the measures to be adopted and the funding mechanisms; (h) to encourage mobility plans for companies and industrial parks; and (i) to limit the speed in access ways to the big cities.
- According to said Strategy, in order to achieve sustainable mobility the problem must be tackled from three angles: economic, social and environmental. In terms of this sustainability approach, the Strategy objectives are developed in five areas: 1) territory (through planning of transport and its infrastructures); 2) fight against climate change and energy dependence; 3) improvement of air quality and noise mitigation; 4) enhancement of road safety and sanitary conditions; and, lastly, 5) demand management. The Strategy defines general guidelines for these five objectives and details measures to be implemented in the most important areas.
- Data provided by the Metropolitan Mobility Observatory (5th report, 2008) has been supplied by the ATPs. Population data was last updated on 1 January, 2006, except Camp de Tarragona's, which was updated on 1 January, 2005, since there is no data available that will allow updating the relevant tables and charts.

SOURCES

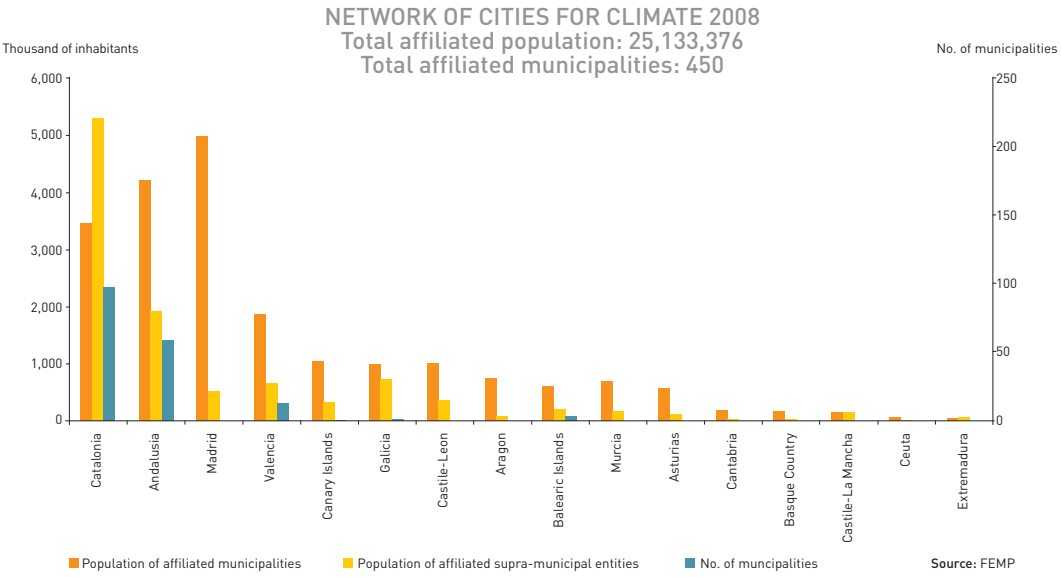
- The Commission Green Paper, of 25 September 2007 – Towards a New Culture for Urban Mobility (COM (2007) 551 final – Not published in the Official Journal).
- MARM. MF: Metropolitan Mobility Observatory Report 2008 (5th report). Madrid, 2008.
- Metropolitan Mobility Observatory: Technical Conference V: Transport Authorities and Climate Change Valencia, June 2008. (several papers). http://www.transyt.upm.es/index.php?lang=en

MORE INFORMATION

- http://europa.eu/scadplus/leg/es/lvb/l24484.htm
- http://www. fomento.es

Public Participation in Environmental Policies

Public participation in environmental policies is organized through networks such as the Spanish Network of Cities for Climate (Red Española de Ciudades por el Clima) and the Network of Networks for Sustainable Local Development (Red de Redes de Desarrollo Local Sostenible), which encompasses 16 regional or provincial networks



Public participation is a key factor for the implementation of sustainability policies. This document shows the available data on two initiatives launched by the Spanish Ministry of the Environment and Rural and Marine Affairs: The Spanish Network of Cities for Climate and the Network of Networks for Sustainable Local Development. Both initiatives encompass a great number of local councils, and, in the case of the former, it also includes supra-municipal bodies such as: councils, cabildos and commonwealths. The Spanish Network of Cities for Climate has a clearer goal (to develop local policies to combat climate change), but it is also clear that both are closely related to sustainable local development and the local Agenda 21.

In the case of the Spanish Network of Cities for Climate, the number of affiliated municipalities is given, together with the population of said municipalities. The population figures breakdown shows the population affiliated through municipalities and the population affiliated through supra-municipal entities that promote their own local networks. The number of municipalities exclusively refers to the ones expressly

listed in the documents provided by the source, without taking into account those that might have also been affiliated through their respective supra-municipal entities.

The Spanish Network of Cities for Climate was established due to the collaboration agreement executed between the FEMP and the Ministry of the Environment on 4 November 2004. The general goal of this agreement was to create a framework for the definition of actions and the implementation of pollution and climate change prevention initiatives, within a general context aimed at local sustainability.

This initiative is closely related to the implementation of the Local Agendas 21, which encourage the inter-administrative coordination and cooperation with the purpose of establishing necessary actions and mechanism in order to meet the sustainability goals set forth in Rio 92, and that join other initiatives with similar goals, such as the Network of Networks for Sustainable Local Development.

This agreement included the actions to be carried out in order to promote sustainability policies in Spanish cities, based on the important role that municipal policies play in the reduction of greenhouse gas emissions. On the one hand, the goal was to provide technical support to municipalities (collaboration with the development of projects or programmes, creation of an experience exchange forum and a website, promotion of the environment management, implementation of joint public awareness actions); and, on the other hand, to follow-up and evaluate the proposed actions within the Network framework (development of an indicator system, follow-up of the development of Local Agendas 21, development of annual reports, etc.).

Actions carried out under the scope of the FEMP's initiative were planned in two stages, which were subject to an evaluation report (2007). This report summarized the status of the different commitments undertaken in the affiliated local councils, indicating the percentage of those that participated of said actions: land reserves for green zones (54.2%), awareness-raising campaigns (45.8%), agreements with economic agents (7.6%), traffic relief measures (67.45%), energy efficiency in municipal facilities (33,3%), sustainability criteria for the hiring process (32.05%), energy efficiency criteria for the hiring process (16.7%) and economic and tax measures (58.3%). Second stage actions were also evaluated: bioclimatic architecture promotion (15.3%), sustainable mobility plan (15.3%), lighting efficiency resolution (9.7%), thermal solar energy resolution (24.3%), renewable energy implementation (45.1%), energy-related audits (31.3%) and municipal energy plans (12.5%).

The Network celebrated its 3rd Meeting (San Sebastián, 21-22 July 2008) in which it was agreed on the objective of reaching the total of 36 million inhabitants during the current municipal term and encouraging the Covenant of Mayors, a European

movement which establishes the commitment to reduce 20% of greenhouse gas (GHG) emissions in municipalities by 2020. It is worth noting that the Network received international acknowledgement (November 2008), being granted the award as one of the twelve best practices in the international contest promoted by the United Nations Human Settlements Programme (UN Habitat), sponsored by Dubai Municipality (United Arab Emirates).

Regarding the Network of Networks for Sustainable Local Development, it is a forum created in December 2005 that includes 2,536 municipalities encompassing a population of 25 million people. The MARM acts as the Secretariat branch of the Network. Data offered here is provided by affiliated networks and the possibility of figure overlapping that may occur due to the fact that municipalities may freely sign up for more than one network is not considered. As a result, Andalusia, for instance, besides being affiliated to Programme Ciudad 21 at a regional level, belongs to other autonomous provincial networks (Huelva, Jaen and Cordoba).

NETWORK OF NETWORKS FOR SUSTAINABLE LOCAL DEVELOPMENT - 2008

Supra-municipal sustainability	Nº municipalities	Population
Environmental Sustainability Programme (Programa de Sostenibilidad Ambiental Ciudad 21), Andalusia	231	6,917,653
Castile-La Mancha Network of Sustainable Towns and Cities (Red de ciudades y pueblos sostenibles de Castilla-La Mancha)	670	1,797,649
Basque Network of Municipalities for Sustainability (Udalsarea 21 - Red vasca de municipios hacia la sostenibilidad)	197	1,936,354
Network of Towns and Cities for Sustainability (Xarxa de ciutats i Pobles cap a la Sostenibilitat), Barcelona Provincial Govt	208	5,456,229
Network of Valencian Municipalities for Sustainability (Xàrcia de municipis valencians cap a la sostenibilitat)	208	2,394,820
Balearic Sustainability Network (Xarxa Balear de Sostenibilitat)	67	1,072,844
Huelva Provincial Network of Sustainable Cities (Red provincial de ciudades sostenibles, Huelva)	79	483,792
Jaen Provincial Network of Sustainable Municipalities (Red de municipios sostenibles de la provincia de Jaén)	76	469,309
Cordoba Local Agenda 21 Network (Red de Agendas 21 Locales Cordobesas)	48	275,936
Alto Aragón Network of Local Authorities for Sustainability (RETE 21 - Red de Entidades Locales del alto Aragón por la sostenibilidad), Huesca	30	152,788
Navarre Network of Local Authorities for Sustainability (Red Navarra de entidades locales hacia la sostenibilidad)	272	584,734
Cantabrian Network of Local Sustainability (Red Local de Sostenibilidad de Cantabria)	82	572,824
Girona Council of Local Initiatives for the Environment (CILMA - Consell d'Iniciatives Locals per al Medi Ambiente de les comarque de Girona)	176	677,897
Alicante Natura - Provincial Network of Agenda 21	76	814,457
Zaragoza Provincial Network of Sustainable Municipalities (Red de municipios sostenibles de la provincia de Zaragoza)	76	109,116
RedMur21 - Network of Sustainable Municipalities of the Region of Murcia (Red de Municipios Sostenibles de la Región de Murcia)	40	1,342,879

Source: MARM. 2009

The incorporation of three new networks should also be highlighted: Alicante Natura - Provincial Network of Agenda 21, the Network of Sustainable Municipalities of Zaragoza, and RedMur21- Network of Sustainable Municipalities of the Region of Murcia, which reveals an increase of 192 municipalities and almost 3 million inhabitants (2,835,233).

Regarding the extent of development of sustainability processes being developed in municipalities, the Spanish Sustainability Monitoring Centre (Observatorio de la

Sostenibilidad en España) has published a report in which sustainability is assessed separately in urban and rural environments. The global assessment carried out in this report regarding the implementation and development of Agenda 21 schemes in the urban environment (through a detailed analysis of the provinces' capital cities) is not very positive; specially in relation to people's involvement, the small number of municipalities that have an Action Plan or the environmental approach shown by most Agendas 21.

It is not easy to make a relative summary of sustainability in rural environments due to its large area (90% of total territory and 20% of total population), the number of municipalities and its diversity. However, in OSE's report, not only problems are highlighted, but also challenges and opportunities that would make sustainable development possible, provided specific supporting policies are applied. In this respect, Act 45/2007 for the Sustainable Development of the Rural Environment brings about a significant array of opportunities for this sector as it recognizes Spanish rural environment diversity, the most serious problems it has to deal with, the diversity of the participants involved and how important and necessary it is to develop coordination and collaboration mechanisms.

NOTES

- According to the Spanish Federation of Municipalities and Provinces, supra-municipal entities affiliated to the Network of Cities for Climate are mentioned in the table below. The Council of Barcelona participates through Xarxa de Ciutats and Pobles Cap a la Sostenibilitat, which encompasses municipalities inside and outside the province of Barcelona.

SUPRA-MUNICIPAL ENTITIES AFFILIATED TO THE NETWORK OF CITIES FOR CLIMATE – 2009

Entity	Population
Island Cabildo of La Gomera	22,622
Island Council of Ibiza	66,283
Island Council of Menorca	34,834
Provincial Council of Barcelona	2,315,224
Provincial Council of Cádiz	524,319
Provincial Council of Huelva	375,147
Provincial Council of Jaén	488,604
Provincial Council of Castellón	315,878
Celanova Commonwealth	22,685
TOTAL	**4,165,596**

SOURCES

- Urban Ecology Agency of Barcelona (Agencia de Ecología Urbana de Barcelona).
- MARM. Directorate General of Industrial Environmental and Air Quality (Dirección General de Calidad del Aire y Medio Ambiente Industrial). Urban Environment Area (Área de Medio Ambiente Urbano).
- Spanish Sustainability Monitoring Centre (OSE – Observatorio de la Sostenibilidad en España): "Local Sustainability: an urban and rural approach" [s.l.: Alcalá de Henares; D.L.2008].

MORE INFORMATION

- http:// www.redciudadesclima.es
- http:// www.ecourbano.es (includes links to all bodies of the Network of Networks for Sustainable Local Development).

2.14 NATURAL AND TECHNOLOGICAL DISASTERS



Between 1950 and 2007 there were 283 major natural disasters throughout the world, 28% of which were earthquakes, tsunamis or volcanic eruptions, 41% storms, 25% floods and 6% heat waves that led to extreme temperatures. These disasters resulted in around 1.8 million deaths (55% due to earthquakes, tsunamis or volcanic eruptions, 36% storms, 7% floods and 2% extreme temperatures).

This year (2008) has been one of the worst in terms of natural disasters in recent years, with more than 220,000 deaths. Furthermore, this large number of deaths was the result of a lower number of disasters than in 2006 and 2007, when there were many fewer victims. The United Nations International Strategy for Disaster Reduction (UNISDR) provides even more shocking figures, with more than 235,000 deaths and damage totalling some 181,000 million dollars (around 139,281 million euros).

Close to 158,000 people were killed in the 10 worst natural disasters in 2008 and more than 168,000 disappeared. Two of these disasters, namely Cyclone Nargis in Myanmar (formerly Burma) and an earthquake in China, resulted in at least 84,500 deaths and 50,000 disappeared and 70,000 deaths and



18,000 disappeared, respectively. Both events occurred in May. The cold wave that affected parts of Afghanistan, Kyrgyzstan and Tajikistan in January led to around 1000 deaths.

INDICATOR	GOAL	TREND
Deaths due to natural disasters	Prevent disasters and industrial accidents, with the aim of reducing the number of deaths and environmental impacts arising from natural phenomena and technological processes by taking appropriate preventative, interventionist and informational measures	As was also the case in 2007, 2008 saw a very low number of deaths due to natural disasters
Droughts		Between 1941 and 2008, 34% of years were drier than normal whereas 66% were normal or wetter than normal
Forest fires		2008 saw the lowest area hit by forest fires since 1973
Road and rail accidents causing possible environmental damage		Accidents which could lead to environmental damage continue to occur during transport of hazardous materials
Oil spills due to maritime accidents		Five accidents involving oil tankers occurred off the Spanish coast in 2007 (two in 2005 and four in 2006)
Industrial accidents involving hazardous substances		Only one accident covered by the Seveso Directive occurred in 2008

NO. OF CATASTROPHES AND DEATHS DUE TO NATURAL DISASTERS WORLDWIDE

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Events	890	701	698	699	641	648	850	960	750
Deaths	10,300	25,063	10,576	77,886	183,000	100,995	20,000	16,000	220,000

Source: Munich Reinsurance Company (various years):"Topics Geo Annual review: Natural catastrophes 2005" "Topics Geo. Natural catastrophes 2006 and 2007" and Press release - Munich 29 December 2008". Available at: www.munichre.com.

In Europe, two major low-pressure systems (in March and May) led to a large number of phenomena (major storms with heavy rain, tornados and wind and hail storms, etc.), which resulted in significant economic losses, although no direct fatalities, particularly in Central Europe. This situation was in contrast to that seen in 2007, when the winter storm "Krill" and floods in the UK in June and July caused 49 and 5 deaths, respectively, and significant economic losses.

Disaster Risk Reduction (DRR) is the principal axis for action in the UNISDR. The "Hyogo Framework", adopted in 2005, is the plan which defines the lines of action to achieve a safer world in the face of natural threats. Its main goal is to reduce loss of human life and social, economic and environmental assets due to disasters over the next 10 years.

This Strategy defines the concept of "disaster" on the basis of its consequences (which themselves depend on the threat or danger in question and the vulnerability of the community affected) and the ability of the population affected to confront them.

Every year the UN undertakes specific campaigns to reduce disasters and their effects. The World Campaign 2008-2009 is based around: "Safe hospitals against disasters: reduce risk, protect health installations, save lives", a topic which reflects one of the five key priorities of the Hyogo Framework for Action 2005-2015. Coordinated by the UNISDR's Secretariat and the World Health Organisation (WHO), its aim is to raise consciousness concerning the need to protect health installations and ensure their functioning during and after disasters and emergency situations. The importance of hospitals and health installations goes well beyond their direct role as they are also symbols of social progress and contribute to a country's stability and economic development. Their functioning after a disaster is therefore vital.

The EU is continuing with its *Global Monitoring for Environment and Security* (GMES), which will provide reliable and independent data (for public authorities, scientists, businesses and the general public) to allow the environment to be managed appropriately, mitigate the effects of climate change and guarantee the safety of the population. According to the Commission, this project will lead to an improvement in natural resources management, allow water and air quality to be monitored, cities to be planned, thereby avoiding urban sprawl, facilitate transport flows, optimise

agricultural activities and promote renewable energies. Its role in improving the safety of the population by providing information on natural disasters such as floods and forest fires, for example, should be highlighted.

The economic growth of the past few years has contributed to an increase in industrial activity and the transport of hazardous materials. Likewise, increased oil consumption means that its transport from oil-producing countries is unavoidable and continues to grow, especially for highly energy dependent countries such as Spain, hence the need to monitor those aspects linked to these activities which could generate environmental and health risks for the population.

As for nuclear energy, the International Nuclear Events Scale (INES) allows incidents and accidents at nuclear installations to be catalogued in a homogeneous manner according to their seriousness on a scale from 0 (no safety significance) to 7 (major accident). According to the Spanish Nuclear Safety Council (NSC), no "accident" (level 4 or higher) has ever occurred at a Spanish nuclear installation, although several "incidents" (levels 1 to 3) have been reported. Two of the events above level 0 were classified as "incidents" (level 2; Trillo in 1992 and Vandellós II in 2004) and one as a "serious incident" (level 3; Vandellós I in 1989), whereas the remaining events were classified as "anomalies" (level 1). A fire that lasted for less than two hours broke out at Vandellós II in August 2008; this event was classified as level 0 and had no radiological consequences.

Natural phenomena of various types and industrial accidents with social and environmental consequences also occur in Spain. None of these can be compared with events in other parts of the world, although they are still serious. The most important are analysed herein.

Deaths due to natural disasters

The natural phenomena which cause most deaths are floods, maritime storms and thunderstorms

NUMBER OF DEATHS IN SPAIN DUE TO NATURAL DISASTERS 1995-2007

Type of natural disaster	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Floods	22	110	40	0	5	14	9	13	9	7	8	9	11	6	263
Storms	19	13	14	2	20	28	17	12	8	6	8	9	4	3	163
Forest fires	8	1	4	4	8	6	1	6	11	4	19	8	1	1	82
Landslides	7	8	2	0	0	0	1	1	2	0	0	5	2	1	29
Heat waves	0	0	0	0	1	0	0	0	60	23	4	14	0	0	102
Avalanches	7	1	0	0	0	4	2	4	4	5	1	0	0	4	32
Cold waves	0	2	5	1	0	2	4	0	0	3	3	0	0	0	20
Deaths on land due to maritime storms	19	13	13	36	17	37	27	15	5	20	ND	ND	ND	4	206
TOTAL FOR YEAR	82	148	78	43	51	91	61	51	99	68	43	45	18	19	897

Source: Directorate General of Civil Protection and Emergencies (Ministry of the Interior)

Between 1995 and 2008 897 people died in natural disasters in Spain, with floods (29.3%), maritime storms (23.0%) and thunderstorms, including lightning and strong winds (18.2%), being the most serious and responsible for the most deaths.

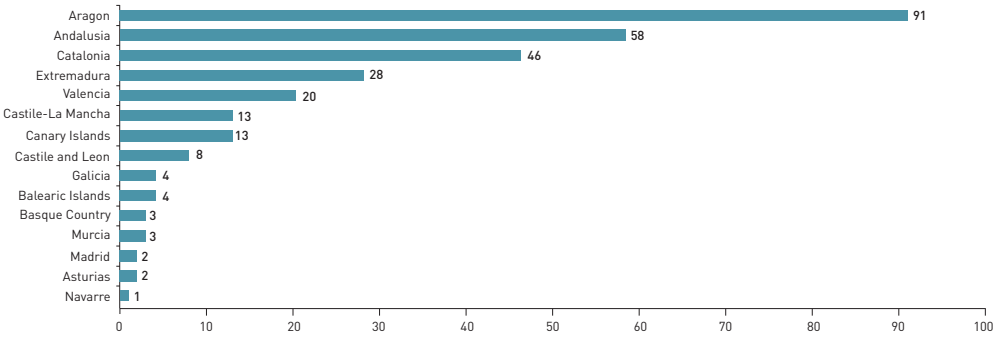
The importance of maritime storms, which kill a large number of people close to the coast, should be noted. No data are available for 2005-2007, although data collection was restarted in 2008. The total number of deaths caused by maritime storms at sea is difficult to determine. Despite this difficulty, however, the Directorate General for the Merchant Navy recorded a total of 90 people affected by maritime accidents in 2007 (38 deaths, 12 disappeared and 40 injured). According to this same source, the six vessels that sunk that year (for various reasons, not just storms) led to 16 victims (deaths, disappeared and injured), 11 of which were on fishing vessels and four on recreational vessels.

Heat waves are another phenomenon that has had serious consequences in the past few years. The Ministry of Health and Consumer Affairs has for some years undertaken a series of measures to prevent problems and illnesses arising from exposure to excessive heat. Thus, the main aim of the *National Action Plan to Prevent the Health Effects of Excessive Heat*, which was launched in 2008, was to raise awareness of the negative effects of excessive heat on public health, especially the most vulnerable groups.

Forest fires are also a major cause of worry in those groups affected, including the general population and those who work to extinguish them.

An analysis of the floods which occurred in the period 1990-2008 shows that 297 people died, with Aragon, Andalusia and Catalonia being the Autonomous Regions with most victims. Six people died in 2008 (three of them in Valencia), versus 11 in 2007 and nine on 2006.

FATALITIES DUE TO FLOODS OR FLASH FLOODS. 1990-2008 (Total 297 deaths)



Source: Directorate General for Civil Protection and Emergencies.
Note: 87 of the 91 victims in Aragon perished in the same incident (Biescas, 1996).

NOTES

- The fatal landslides in Spain are all closely linked to heavy rains, which provoked flooding or flash floods. The vast majority of these landslides occurred during the rains or shortly afterwards as a direct result of them.
- Fatalities due to maritime storms refer only to those people killed onshore due to falls, sea surges, etc. Deaths at sea (sinkings, falls, etc.) due to this type of phenomenon are not included.
- Volcanic eruptions, droughts and earthquakes have been excluded from the analysis as, although they can occur in Spain (droughts relatively frequently and low-magnitude earthquakes as well in some regions), they have not caused any deaths in the period under consideration. The Canary Islands are the only volcanically active region in Spain at risk from this type of event. The last eruptions were at Chinyero (a lateral volcano on the Teide volcano) in Tenerife (1909), and at Nambroque (1949) and Teneguía (1971), both on the island of La Palma.
- The Maritime Safety and Rescue Society, from the Ministry of Public Works, responds to all emergences at sea (rescues, searches, medical evacuations, towing, combating pollution, publishing navigational alerts and promoting sea traffic safety) and receives and responds to all mayday calls.

SOURCES

- Subdirectorate General for Plannning, Operations and Emergencies. Directorate General of Civil Protection and Emergencies. Ministry of the Interior.
- Maritime Safety and Rescue Society, 2009. Press release of 05/02/2009. Ministry of Public Works.
- Ministry of Public Works, 2008. *Transport and Postal Services.* Annual Report 2007.

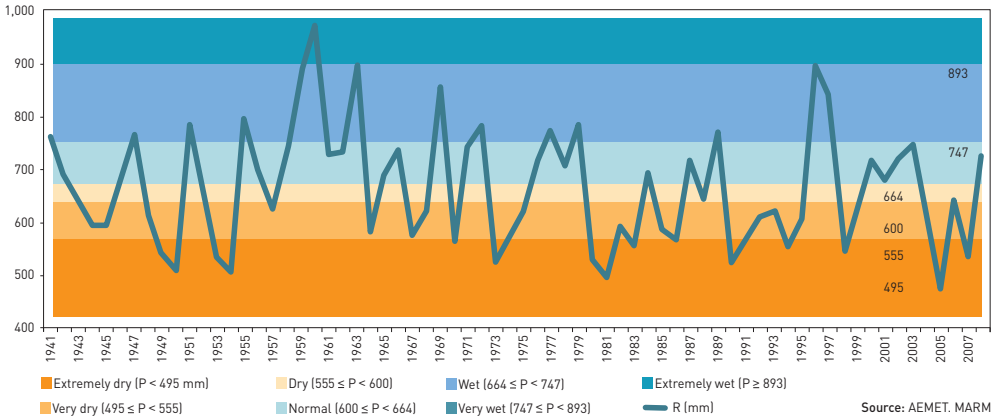
MORE INFORMATION

- http://www.eea.europa.eu
- www.proteccioncivil.org/
- http://natural-hazards.jrc.it
- Natural and Environmental Disasters Information Exchange System (NEDIES) http://nedies.jrc.it/
- European Flood Alert System (EFAS) EC initiative aimed at preparing riparian environments against floods.
- Emergency Events Database EM-DAT. Centre for Research on the Epidemiology of Disasters (CRED).
- http://www.emdat.be/
- http://www.salvamentomaritimo.es

Droughts

After a very dry year in 2007, 2008 was much wetter, with precipitation reaching similar levels to those seen in 2006

AVERAGE ANNUAL RAINFALL IN SPAIN



Source: AEMET. MARM

On the basis of the mean annual precipitation recorded, 33.8% of the years between 1941 and 2008 were drier than average, whereas 66.2% were normal or wetter than average. More specifically, as can be seen from the following table, where years are grouped by precipitation level, 30.7% of years were dry or very dry, 20.6% were normal and 42.6% were wet or very wet. Furthermore, the proportion of extremely dry or extremely wet years is very similar, at about 3%.

PROPORTION OF YEARS CLASSIFIED ACCORDING TO MEAN PRECIPITATION (1941-2008)

Extremely dry P<495 (mm)	Very dry (495<P<555) (mm)	Dry (555<P<600) (mm)	Normal (600<P<664) (mm)	Wet (664<P<747) (mm)	Very wet (747<P<893) (mm)	Extremely wet P>893 (mm)
2,9	16.2	14.7	20.6	25.0	17.6	2.9

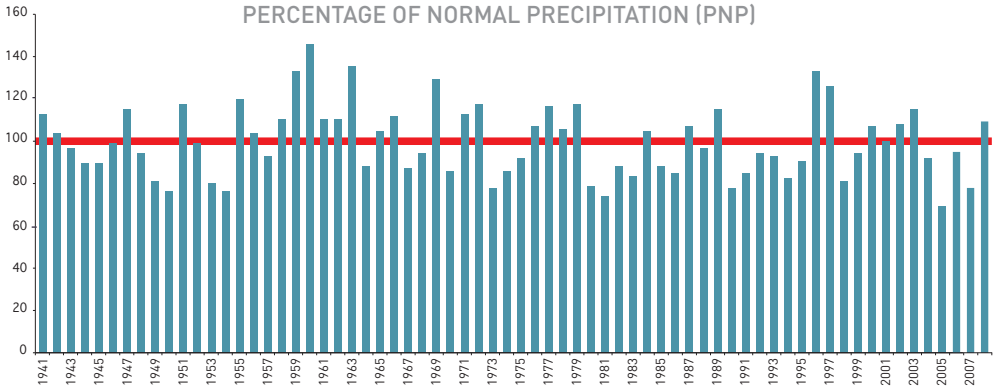
Source: Compiled in-house from AEMET data

Analysis of the percentage of normal precipitation for the same period shows that annual precipitation was lower than the average for the period in 54.4% of years, whereas it was higher than the average in the remaining 45.6%.

Precipitation in 2008 was distributed very unevenly throughout the year. The significant lack of precipitation in the first three months of the hydrological year (October to September), particularly in the northern half of the peninsula, was compensated by spring and autumn rainfall, with the year as a whole being classified as wet.

The breakdown by Autonomous Region shows that Cantabria, the Basque Country, the northern part of Castile and Leon, the central region and the Balearic Islands had a very wet year, whereas the south of Galicia, NE Castile and Leon, the north of Extremadura, the south of Valencia and the Canary Islands has a dry or very dry year.

A series of very intense precipitation episodes towards the end of September in the region of the Straits of Gibraltar, Murcia, central Valencia and some regions of Madrid and Castile-La Mancha should be noted.



Source: AEMET. MARM

NOTES

- According to the Spanish Water Information System (Hispagua), the percentage of normal precipitation (PNP) is one of the indicators used to study droughts. It is calculated as the ratio between annual cumulative precipitation and average annual precipitation for a given region and timeframe, and is expressed as a percentage. Average annual precipitation is also known as normal precipitation and is obtained from the average annual precipitation for a time period of no less than 30 years.
- The reference period for AEMET (1971-2000; 30 years) is representative of the precipitation regime and allows the following intervals to be established and a generic classification in which each year can be fitted according to its average precipitation to be determined:
  - Extremely Dry: precipitation does not exceed the minimum value in the series (495 mm).
  - Very dry: precipitation is less than or equal to the 20th percentile of the series and greater than the minimum value registered in the reference period ($495 < P \leq 555$ mm)
  - Dry: precipitation is greater than the 20th percentile and less than or equal to the 40th percentile ($555 < P \leq 600$ mm).
  - Normal: precipitation is greater than the 40th percentile and less than or equal to the 60th percentile ($600 < P \leq 664$ mm), in other words close to the average..
  - Wet: precipitation is greater than the 60th percentile and less than or equal to the 80th percentile ($664 < P \leq 747$ mm).
  - Very wet: precipitation is greater than the 80th percentile and less than the maximum value recorded in the series ($747 < P < 893$ mm).
  - Extremely wet: precipitation equals or exceeds the highest value in the series (893 mm).
- Drought is an extreme phenomenon characterised by a shortage of precipitation over a certain period of time in comparison to an area's normal rainfall. Lack of precipitation (meteorological drought) can lead to a lack of water resources (hydrological drought) needed to supply current demand. There is therefore no universally accepted definition of drought as this differs from place to place, and each water user will have her own concept of drought.
- Previous editions have included ample information regarding the consequences, definitions and types of drought. The EU makes a clear distinction between "drought", a temporary decrease in water availability due to lack of precipitation, and "lack of water", which occurs when water demand exceeds exploitable water resources under sustainable conditions.

SOURCES

- Precipitation figures provided by the National Meteorological Agency (AEMET). MARM.

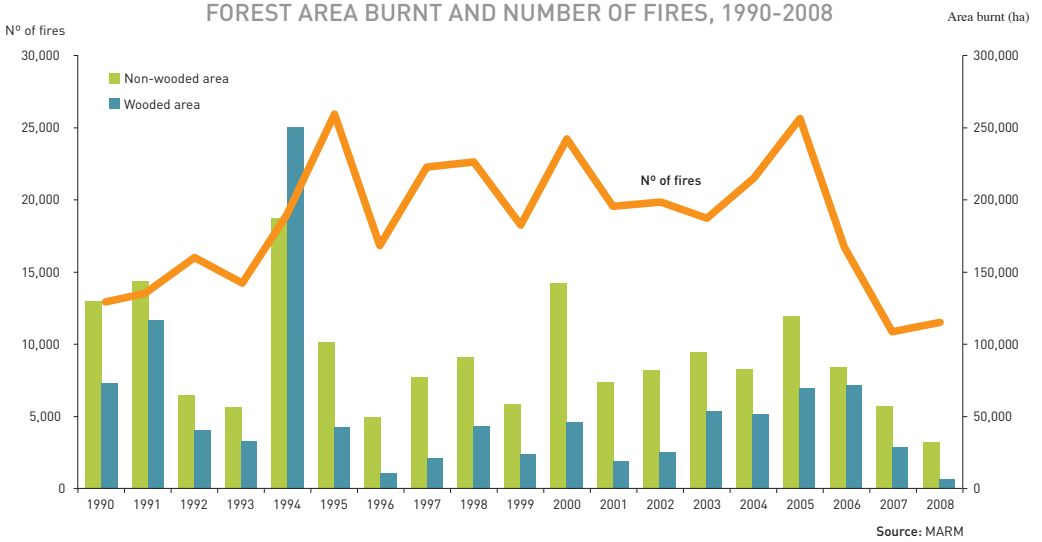
MORE INFORMATION

- http://www.aemet.es/es/portada
- http://www.eea.europa.eu
- http://hispagua.cedex.es/documentacion/especiales/sequia/indicadores_sequia.htm

Forest fires

The area burnt in 2008 reached a low that hadn't been seen for several decades (7,636 ha of wooded area versus the ten-yearly average of 43,298 ha)

FOREST AREA BURNT AND NUMBER OF FIRES, 1990-2008



Source: MARM

The number of incidents in 2008 was the lowest for a decade, except for 2007, which saw 680 fewer incidents. However, the amount of forested area affected was the lowest for a decade with a highly significant difference with respect to the average for that period (39,984.8 ha of forested area vs. 131,774.5 ha).

A combination of the meteorological conditions and the preventative actions undertaken jointly by the Autonomous Regions and central government influenced the generalised reduction in number of fires during the summer in all Autonomous Regions.

The preventative actions undertaken by MARM include educational campaigns aimed at the rural population and schoolchildren, the Forest Fire Prevention Teams (EPRIF) who work together with the rural population and providing subsidies to the Autonomous Regions to undertake preventative forestry measures. The deterrent effect of the monitoring undertaken by the Civil Guard and the Forest and Environmental Wardens appointed by the Autonomous Regions, in coordination with other security forces in some regions, should also be mentioned.

The large fire-fighting body employed by all administrations, together with the circumstances outlined above, led to these results. The difference between the area of forest burnt in 2008 and that burnt in 2001, the year with the smallest amount of forest burnt in the past decade, was more than 10,000 ha of wooded land.

August saw the highest number of interventions by MARM's fire-fighting teams, with 1,770 incidents and 2,784 ha of forest area affected. There were two major fires (more than 500 ha) in this month, one in Zuera (Zaragoza) and another in Honrubia de la Cuesta (Segovia). These two, together with the fire in Porto (Zamora) in February, were the largest fires in 2008.

The general scenario for forest fires can be described in terms of the following variables, which complement the information resulting from the General Forest Fire Statistics (EGIF). These data are compiled and maintained by MARM's Forest Fire Defence Area on the basis of information provided by the forest fire defence services from each Autonomous Region.

- **Percentage of forest area affected (total, wooded and non-wooded):** describes the effects of the fires in terms of area. The overall trend is downwards, except for 1994, when the wooded area was higher. This indicates a consolidated improvement in the results achieved with forest fire defence strategies.

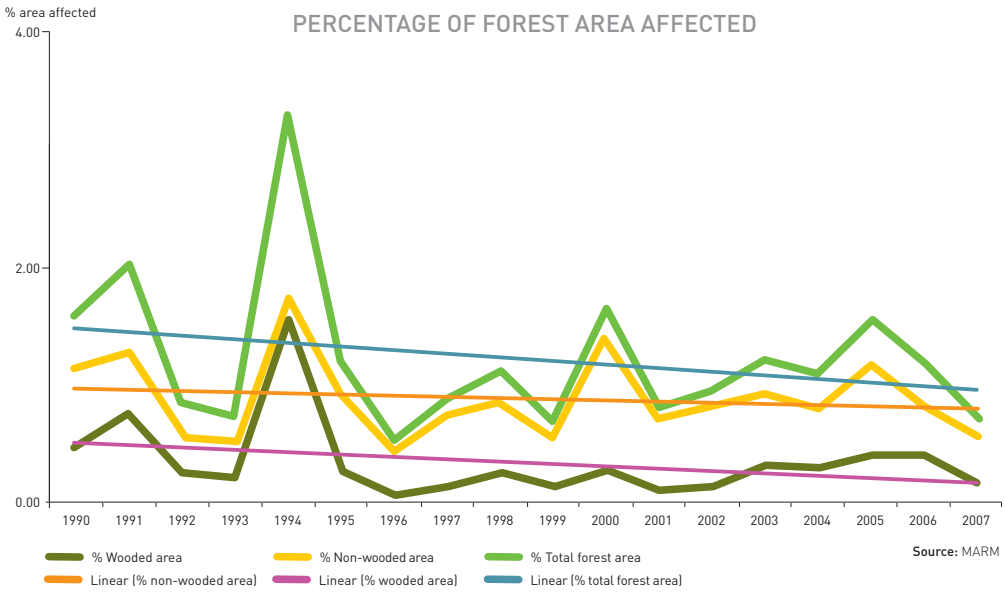
- **Percentage of outbreaks (incidents < 1 ha):** describes the number of small fires (< 1 ha) with respect to the total number of fires. The higher this figure the lower the overall impact of the fires. The trend is upwards, reaching 68% in 2007.

- **Percentage of fires at which the first fire-fighting team arrived less than 15 minutes after detection:** reflects the operational efficiency of the fire-fighting team. The higher the number, the greater the operational efficiency. The trend is neutral, with values of between 45% and 50%, although in 2006 and 2007 this figure dropped to 40%.

- **Percentage of fires with a known cause:** reflects the operational efficiency of the prevention system as a greater percentage of fires with a known cause justifies the preventative actions to be undertaken. This figure is around 85% for Spain as a whole, with an upward trend, although it reaches almost 100% in some Autonomous Regions.

Various cooperation mechanisms exist within the EU by which countries can share human and technological resources when faced with natural or man-made disasters.

In 2008, for example, Bulgaria and Greece received help from Spain, France, Italy and Cyprus to fight forest fires. During this year a pilot project with a budget of 3.5 million euros was launched to increase cooperation in the fight against this problem.



NOTES
- The data for 2008 are provisional.

SOURCES
- Data provided by the Forest Fire Defence Area. Directorate General for the Environment and Forestry Policy. MARM.
- MARM, 2009. "Forest fires between January 1 and December 31 2008". Preliminary report for 2008 based on provisional data published on the web page.

MORE INFORMATION
- http://www.marm.es
- http://www.incendiosforestales.org

Road and rail accidents causing possible environmental damage

A significant number of accidents which could lead to environmental damage occur every year when transporting hazardous materials

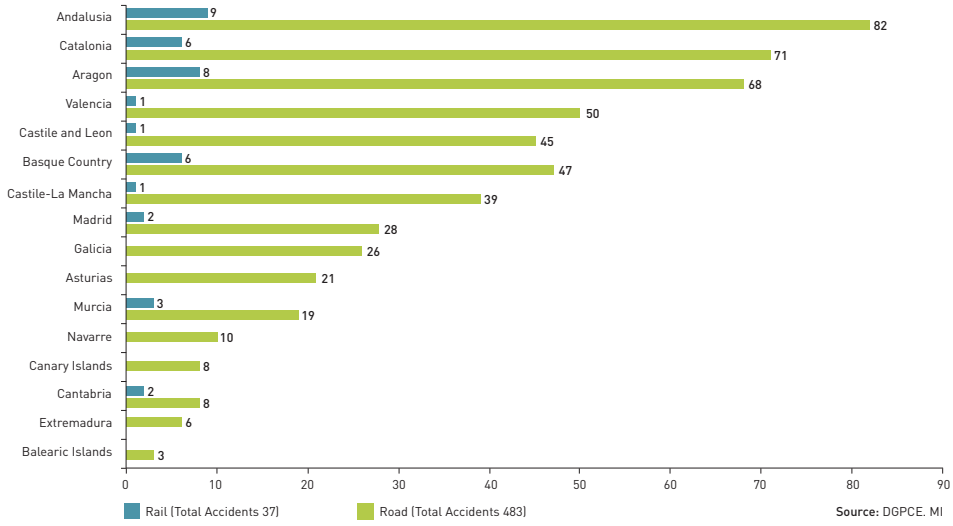
NUMBER OF ACCIDENTS WHICH MAY HAVE CAUSED ENVIRONMENTAL DAMAGE DURING TRANSPORT OF HAZARDOUS MATERIALS BY ROAD AND RAIL, 1997-2007

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Road	29	50	34	53	44	47	55	64	61	46	48	531
Rail	10	8	s.d.	4	2	1	5	4	2	1	2	39
TOTAL	39	58	34	57	46	48	60	68	63	47	50	570

Source: Directorate General of Civil Protection and Emergencies. Ministry of the Interior.

Fifty accidents with possible environmental damage occurred during the transport on hazardous materials in 2007. Of these, 48 occurred on the road network and the other two during rail transport. As can be seen from the series, road transport has a higher risk of suffering an accident of this type due to its much greater use.

NUMBER OF ACCIDENTS WHICH MAY HAVE CAUSED ENVIRONMENTAL DAMAGE DURING TRANSPORT OF HAZARDOUS MATERIALS BY ROAD AND RAIL, 1997-2007



Source: DGPCE. MI

Andalusia is the Autonomous Region which suffered most accidents of this type, for both road and rail transport, between 1997 and 2007, followed by Catalonia and Aragon. Factors such as its area, strategic location for international trade and

industrial development should be taken into account when evaluating the risk of this type of accident. In 2007 Aragon suffered most accidents (nine road and one rail), followed by Andalusia and Catalonia, both with six.

The total number of environmental effects in the period under consideration was 630, with an annual distribution for each medium as shown in the following table. Land was the most frequently affected (close to 80% of incidents), followed by water (13.5%) and the atmosphere (10.3%).

NUMBER OF INCIDENTS WITH POSSIBLE ENVIRONMENTAL DAMAGE THAT OCCURRED DURING TRANSPORT OF HAZARDOUS MATERIALS BY MEDIUM AFFECTED, 1997-2007

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Atmospheric pollution	5	3	2	4	3	0	8	8	17	7	8	**65**
Water pollution	7	11	6	9	5	5	4	14	9	8	7	**85**
Land pollution	36	49	29	51	41	46	57	55	49	41	43	**497**
TOTAL	**48**	**63**	**37**	**64**	**49**	**51**	**69**	**77**	**75**	**47**	**50**	**630**

Source: Directorate General of Civil Protection and Emergencies. Ministry of the Interior

NOTES

- For road and rail accidents, hazardous materials are considered to be those substances which, in the event of an accident during their transport, could cause a risk to the population, property and/or the environment. Possible environmental damage is considered to exist when the existence of a leak or spillage (to land, water or the atmosphere) which could cause pollution has been notified.
- It should be noted that the number of incidents is not the same as the number of accidents as a single accident can affect various media.

SOURCES

- Information provided by the Directorate General of Civil Protection and Emergencies. Ministry of the Interior.

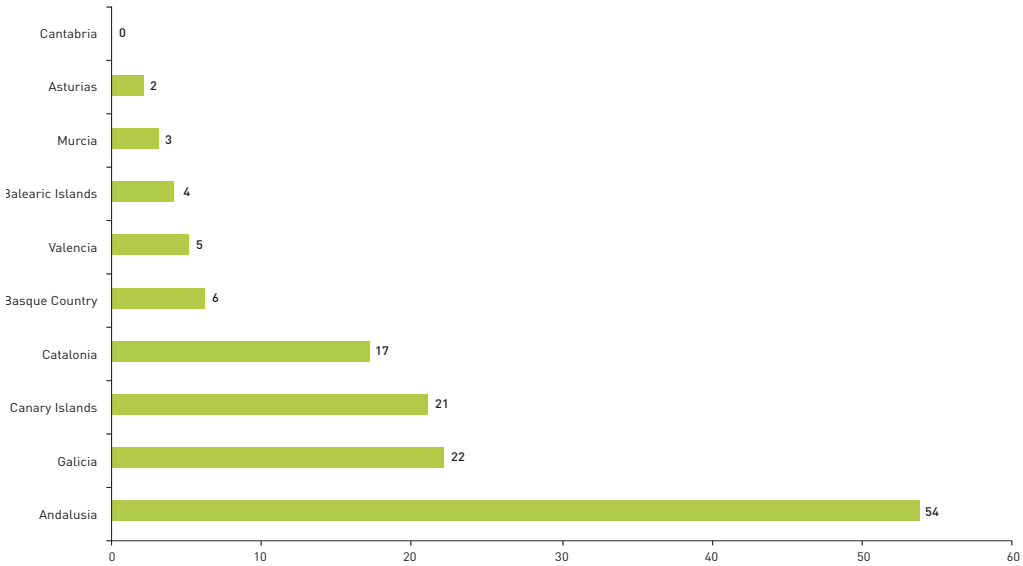
MORE INFORMATION

- http://www.proteccioncivil.org/
- http://mahbsrv.jrc.it/ (Major Accident Hazards Bureau –MAHB. Comisión Europea))
- www.eea.europa.eu

Oil spills due to maritime accidents

Five accidents involving oil tankers occurred off the Spanish coast in 2007, versus the two for 2005 and the four for 2006

NO. OF ACCIDENTS INVOLVING OIL TANKERS OFF THE SPANISH COAST, 1991-2007



Source: Directorate General for the Merchant Navy. Ministry of Public Works

A total of 134 accidents involving oil tankers which led to oil leaks or spillages occurred off the Spanish coast between 1991 and 2007.

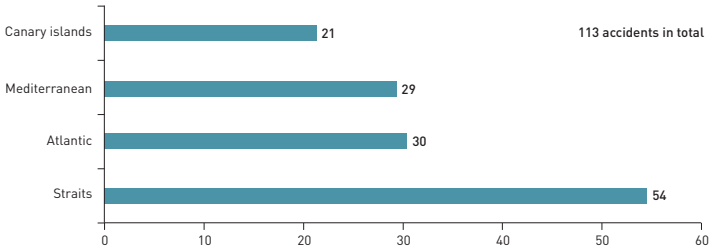
Five accidents of this type occurred in 2007, two off Andalusia, two off the Canaries and one off the Basque Country. This number is higher than the four accidents in 2006 and the two in 2005, although lower than the 14 in 2002. During the period under consideration, the Autonomous Regions which have suffered most accidents of this type are Galicia and Catalonia, followed by Andalusia and the Canary Islands.

The distribution of accidents by maritime safety region shows that the Straits of Gibraltar and the Atlantic have seen most oil tanker accidents since 1991.

As well as spills from oil tankers, a large number of oil spills occur when other types of vessels suffer an accident. Two such accidents occurred in Algeciras Bay in 2007: the reefer Sierra Nava and the cargo ship New Flame. These, together with the Greek oil tanker Samothraki, were the three accidents which occurred in the Straits. A similar

type of accident involving the merchant vessel Don Pedro in August 2007 close to the port of Ibiza resulted in the closure of several beaches due to spillage of the fuel it was carrying.

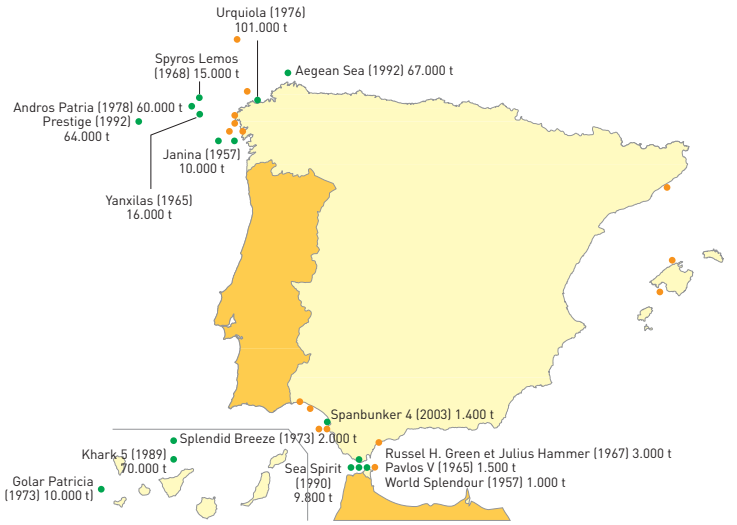
NATURAL AND TECHNOLOGICAL DISASTERS OIL TANKER ACCIDENTS OFF THE SPANISH COAST BY MARITIME SAFETY REGION, 1991-2007



Source: Directorate General for the Merchant Navy. Ministry of Public Works

It should be noted that spillages at sea as a result of an accident do not always involve liquid hydrocarbons. Thus, in 1986 the Castillo de Salas spilt 100,000 tonnes of coal, along with its fuel, close to Gijon, 39 miles from Cabo Peñas.

LOCATION OF OIL TANKER ACCIDENTS OFF THE SPANISH COAST WITH HYDROCARBON SPILLAGE



- Approximate location of oil tanker accidents with spillage of more than 1,000 t. The name of the tanker, the date of the accident and the amount spilled are detailed.
- Approximate location of oil tanker accidents with spillage of less than 1,000 t.

Source: Prepared in-house with data from CEDRE

NOTES

- The Documentation, Research and Experimental Centre for Accidental Water Pollution (CEDRE), created in 1978, is responsible for documenting and for research and experimentation with pollutants, their effects and the methods and means required to fight them. Its advice and experimentation mission covers both marine and inland waters.

SOURCES

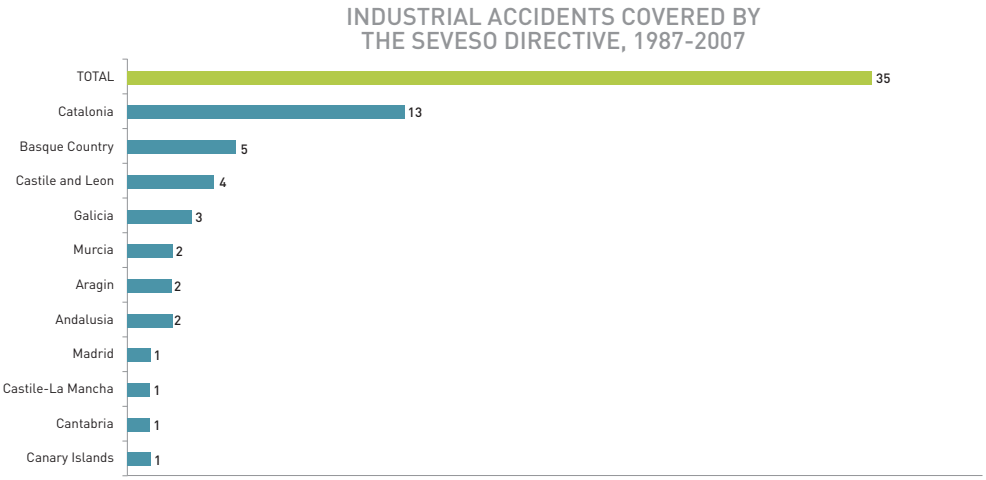
- Data provided by the Maritime Safety Area. Sub-directorate General for Maritime Safety and Pollution. Directorate General for the Merchant Navy. Ministry of Public Works.

MORE INFORMATION

- www.mfom.es
- www.eea.europa.eu
- www.itopf.com/
- www.le-cedre.fr/index_es.html

Industrial accidents involving hazardous substances

Only one industrial accident covered by the Seveso Directive occurred in 2008



Source: DGPCE. MI

Only one industrial accident covered by the Seveso Directive occurred in 2008, in Castile and Leon. The total number of accidents in the period 1987-2008 was 35. Catalonia has suffered most accidents of this type, although it is also the Autonomous Region with the highest number of industrial plants covered by this Directive.

The basic Civil Protection control and planning guidelines for serious accidents involving hazardous substances specify that External Emergency Plans will determine the preventative, informational, organisational and procedural actions and coordinate the equipment and resources from central government and other public and private bodies. Twenty-four such Special Plans were approved by the National Civil Protection Committee in 2008, and from July 1994 up to the end of 2008 the total number of plans approved was 224.

NOTES

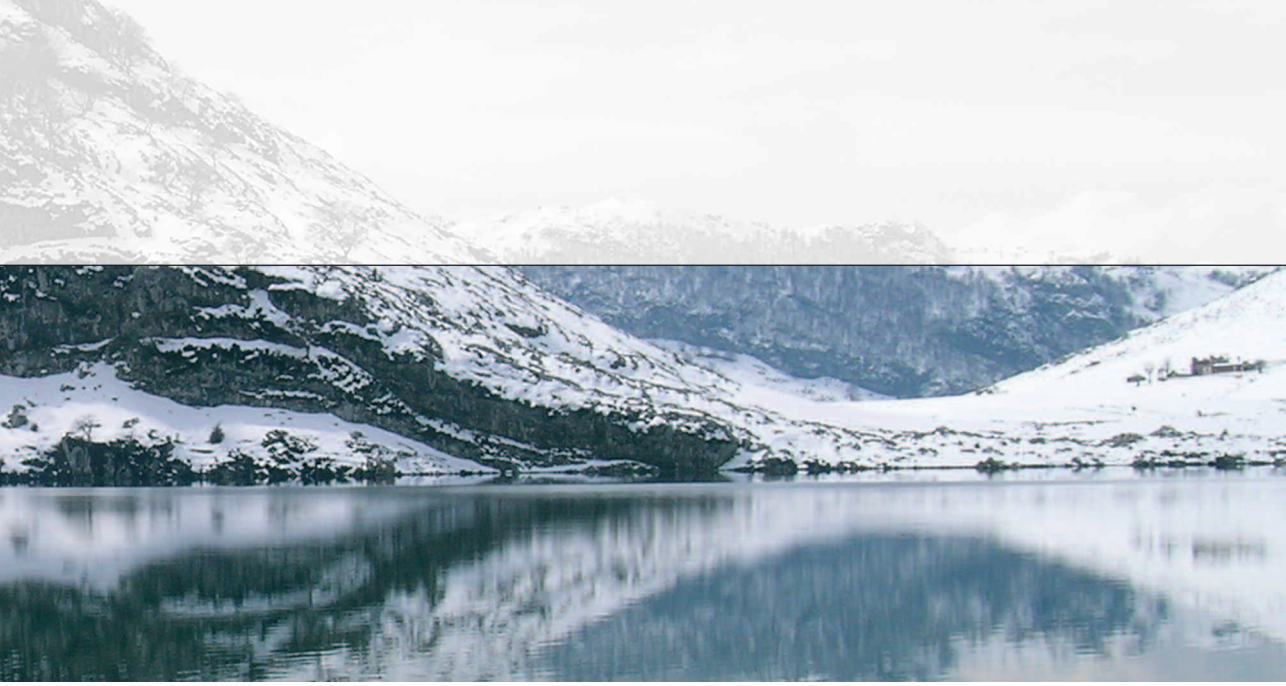
- The group of accidents considered is those covered by the Seveso Directive, which occurred during industrial operations (chemical, pharmaceutical, energy industry, etc.) and include the storage, distribution and sale of hazardous materials or products.
- Directive 96/82/EC concerning the control of risks inherent to serious accidents involving hazardous substances (Seveso II) aims to prevent this type of accident and reduce their effects on the safety and health of people and the environment. It replaces Directive 82/501/EEC (Seveso I). The Seveso II Directive was incorporated into Spanish legislation by RD 1254/99, of 16 July, which approved control measures for the risks inherent to serious accidents involving hazardous substances. This Royal Decree was subsequently modified by RD 119/2005, of 4 February, and by RD 948/2005, of 29 July. This regulatory framework is complemented by RD 1196/2003, of 19 September, which approves the basic Civil Protection control and planning guidelines for serious accidents involving hazardous substances. (BOE no. 242, of 9 October 2003).
- Serious accidents: any event involving one or more hazardous substances, such as a major leak or spillage, fire or explosion, which occurs as a consequence of an uncontrolled process during the functioning of any establishment subject to RD 1245/1999 and which supposes a serious immediate or deferred risk for people, property or the environment, either inside or outside the establishment.
- The existence of other types of equally serious accidents with significant effects on the environment but which are not covered by the Seveso Directive should be highlighted. These include those resulting from mining activities, such as the rupture of the Aznalcollar Dam (Seville) in April 1998.

SOURCES

- Data provided by the Sub-directorate General for Planning, Operations and Emergencies. Directorate General of Civil Protection and Emergencies. Ministry of the Interior.

MORE INFORMATION

- http://www.proteccioncivil.org
- http://www.eea.europa.eu
- http://www.proaida.es/index2.php



3. Information by Autonomous Regions: basic data

In the 2007 edition, the *Environmental Profile of Spain, Indicator-based Report* includes a new chapter with a structured and very summarised relationship of indicators or environmental variables by Autonomous Regions. Its goal was to supplement and increase the environmental information given for each Autonomous Region within all the indicators included, improving the information that defines the environmental profile of our country.

This new edition collects a first revision of the content included in this chapter, which was made by the Spanish EIONET Network. Many suggestions received have been included immediately, especially when they are clarifications of the information given and, very often, they have been taken into account. Other proposals will be discussed in future meetings in order to make a decision about their inclusion and definition.

The basic data presented offers information on certain environmental aspects which are supplemented by administrative, territorial and socioeconomic data, and structured in the five sections mentioned below.

- Territorial and administrative data
- Socio-economic data
- Environmental data and information on key environmental issues
- Other noteworthy features of the Autonomous Region
- Web pages and further reading

As in the original edition, it has been decided to present the information in data sheets in order to facilitate interpretation. Likewise, the Autonomous Regions are presented alphabetically, without any other institutional consideration. When there was some information missing for an Autonomous Region, it has been decided to delete it from the data sheet in order to make it lighter. The incorporation of a specific data sheet to provide information about the sources used must be highlighted. For each variable, the *source* or origin is given. For those variables requiring clarification, there is a section of *methodology notes,* where the content is thoroughly described and all considerations that should be taken to make a correct interpretation are included. When the information has been provided by the Autonomous Focal Point, that information is registered in the data sheet that corresponds to that Autonomous Region and the reference "Data provided by AC" are added to this variable. This is an addition to the data sheet of information sources mentioned and it highlights that, in

that specific case, the information was not taken from a general source, but it has been expressly provided by the Autonomous Region itself.

The participation of the Spanish EIONET Network Autonomous Focal Point (AFP) representatives has been a key factor in the elaboration of the chapter. It was only thanks to their data contributions and final revision that its development was possible. The work process had two phases. In the first phase, once the final content was defined, the National Focal Point (NFP) started to look for the information on public sources and administrative records in order to offer homogenous information elaborated with the same methodology to all Autonomous Regions. Many times, this information comes from Autonomous Regions which had previously provided this data to comply with information obligations. This way, the duplication of information requests is avoided along with the inconveniences that it may cause. Later, the information collected was added to the sample data sheet; one for each Autonomous Region. In the second phase, the completed data sheet was sent to the AFPs so that they could revise its content and provide the information that the NFP was unable to find.

It is important to highlight some aspects already mentioned in previous editions about the situation of the Spanish environmental information, indicating the differing extent of the scope and application of the powers transferred to each Autonomous Region (both as regards statistics and the environment). This produces widely varying results in terms of data quality and availability as well as methodological differences. We are confident that the work carried out to make this edition can contribute to the study of the current situation and reach the desired consensus on the development and disclosure to the public of environmental information.



Andalusia



Statute of Autonomy: Organic Law 2/2007, of 19 March (Official State Gazette no. 68, of 20 March 2007)
Area: 87,598 km^2
Length of coastline: 945 km
Capital: Seville. **Provinces:** 8. **Municipalities:** 770
Population, 2008: 8,202,220 inhab
Population density, 2008: 93.6 inhab/km^2
Population growth 2000-2008: 11.7%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 3.4
  2,001-10,000 inhabitants: 17.0
  10,001-100,000 inhabitants: 43.3
  100,001-500,000 inhabitants: 20.9
  > 500,000 inhabitants: 15.4
  By age group
  < 15 years old: 16.2 15-64 years old: 69.2
  > 64 years old: 14.6
- **WORKING POPULATION (THOUSAND)**
  3,904.7 (Q4 2008)
- **UNEMPLOYMENT RATE**
  21.78% (Q4 2008)
- **UNEMPLOYMENT RATE < 15 YEARS OLD (EU-27=7.2%), 2007**
  12.8%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 7.1. Industry: 9.9
  Construction: 11.4. Services: 71.6
- **GDP MP, 2007**
  18,154 €/inhab. Growth 2006-2007: 4.9%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  11,438 €/inhab. Growth 2000-2006: 41.3%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 4.9 / Industry: 12.5
  Construction: 14.7. Services: 67.9

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 38 / Suburban: 31 / Rural: 15
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007 (DATA PROVIDED BY THE AUTONOMOUS REGION)**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 38 (value recorded in the urban background station which has had the worst performance in 2007)
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 50 (value recorded in the urban background station which has had the worst performance in 2007)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  176 litres/inhab/day. Consumption decreased 3.8% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 67.1 / Municipal consumption: 8.7 / Economic sectors: 23.0 / Other: 1.2
- **DISTRIBUTION NETWORK LOSSES, 2006**
  16.1%
- **WASTE-WATER TREATMENT, 2008**
  75.4% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 1.6 / Agriculture: 55.1 / Forest: 41.8 / Wetlands: 0.8 / Water bodies: 0.7
- **INCREASE IN ARTIFICIAL SURFACES, 1990- 2000 (%)**
  16.4
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 57.61 / Intermediate: 19.76 / High: 22.63
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 36.65 / Intermediate: 20.84 / High: 32.60 / Very high: 2.45

NATURE & BIODIVERSITY

- **NATIVE TAXA (2007)**
  600 species of fauna (vertebrates) and 4,000 species of flora, of which 900 are Ibero-Mauritanian endemic. At the same time, 500 of those are strict endemic species. All data provided of fauna and flora is approximate
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 868 species of flora and 574 species of fauna / Vulnerable: 288 species of flora and 217 species of fauna / Endangered: 129 species of flora and 87 species of fauna / Critically endangered: 102 species of flora and 28 species of fauna

- **CATALOGUED TAXA (2007)**
  Included in Regional Catalogue: 187 species of flora and 381 species of fauna
  Included in the National Catalogue (CNEA): 30 species of flora and 379 species of fauna
- **PROTECTED AREA, 2008**
  1,628,337.1 ha (18.6% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  2,587,188 ha (29.5% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  9 reserves (1,492,676 ha of terrestrial area) and 12,000 ha of marine area
- **RAMSAR WETLANDS, 2008**
  20 wetlands (140,181.6 ha)
- **WETLANDS INCLUDED IN THE SPANISH NATIONAL WETLANDS INVENTORY, MARCH 2009**
  117 wetlands (117,970.94 ha)
- **FOREST FIRES, 2007**
  819 fires which affected 6,269.75 ha. An average of 1,027 annual fires occurred during the decade between 1997-2006, which affected 12,119.01 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 551.4 kg/inhab. Variation 2000-2006: -23.1%
  - Mixed: 515 kg/inhab. Variation 2000-2006: -24.9%
  - Paper/cardboard: 11.8 kg/inhab. Variation 2000-2006: -12.6%
  - Glass: 8.3 kg/inhab. Variation 2000-2006: -42.4%
  - Packaging: 16.3 kg/inhab. Variation 2000-2006: 409.9%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  582,745.2 ha. Growth 2001-2007: 442.7%
- **IRRIGATED AREA, 2007**
  945,780 ha (19.71% of total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.31 / Hydraulic: 0.15 / Thermal: 1.00
  Nuclear: 0.00 / Wind: 0.13 / Other renewable: 0.03
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  4.8 MWh/inhab. Growth 2000-2007: 28.7%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 4.53 / Foreign tourists: 1.07
- **HOTEL CAPACITY, 2007**
  279,593 hotel beds (34.7 beds/1,000 inhab) and 8,969 beds in rural accommodation (1.1 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  5,135,947 vehicles. Growth 2000-2007: 40.5%
  637.3 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  3,637,027 passenger cars. Growth 2000-2007: 36.3%
  451.3 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 27.0 km/100 km^2 / Rail: 2.7 km/100 km^2
  Roads: 2.9 km/1,000 inhab / Rail: 0.3 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  22,402,704 passengers. Growth 2000-2007: 63.5%
- **GOODS PORT TRAFFIC, 2007**
  128.94 million tonnes. Growth 2000-2007: 43.6%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21 REGISTERED WITH THE SCHEME CIUDAD 21, 2007**
  230 municipalities, of which 89 have already implemented it and are currently developing action plan projects. Moreover, 156 municipalities have the A21L diagnosis completed
- **INTERNAL EXPENSES IN R&D, 2007**
  1,478.5 million € (1.01% of GDP).
  Growth 2000-2007: 172.72%

RELEVANT INFORMATION

The Andalusian Environmental Information Network (REDIAM - Red de Información Ambiental de Andalucía) aims to integrate all Andalusian environmental information provided by different types of environmental information centres in the Autonomous Region. The Andalusian Environmental Information Network (REDIAM) web feed is created by means of Act 7/2007 of 9 July on Integrated Environmental Quality Management (GICA), in order to make publicly available the standard environmental information of Andalusia, offering available data for analysis as well as technical studies on the status of natural resources, the pressures they suffer due to anthropic activities and the regulations that, in response to that, intend to create an Environmental Sustainability Scheme. Its creation responds to the needs laid down in Act 27/2006 on right of access to information, public participation and access to justice in environmental matters.

RECOMMENDED WEBSITES

- http://www.juntadeandalucia.es
- http://www.juntadeandalucia.es/medioambiente/
- http://www.juntadeandalucia.es/medioambiente/site/web/rediam/
- http://www.egmasa.es

FURTHER READING

- Medio Ambiente de Andalucía (Andalusian Environment). Informe 2007 (Report 2007)
  Hitos y Tendencias del Medio Ambiente de Andalucía (Milestones and trends of Andalusian environment)
- Andalusia. Datos Básicos (Basic data). 2007
- Atlas de Andalucía (Atlas of Andalusia). Several volumes
- Compendio de Cartografía y Estadística (Cartography and statistics summary). 2nd edition 2008



Aragon



Statute of Autonomy: Organic Law 8/82, of 10 August (Official State Gazette no. 195, of 16 August 1982). Reform approved by Organic Law 5/2007, of 20 April (Official State Gazette no. 97, of 23 April 2007)
Area: 47,720 km^2
Capital: Zaragoza **Provinces:** 3 **Municipalities:** 731
Population, 2008: 1,326,918 inhab
Population density, 2008:27.8 inhab/km^2
Population growth 2000-2008: 11.5%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 14.2
  2,001-10,000 inhabitants: 17.2
  10,001-100,000 inhabitants: 18.1
  100,001-500,000 inhabitants: 0.0
  > 500,000 inhabitants: 50.2
  By age group
  > 15 years old: 13.1
  15-64 years old: 67.2
  > 64 years old: 19.8
- **WORKING POPULATION (THOUSAND)**
  664.5 (Q4 2008)
- **UNEMPLOYMENT RATE**
  9.57% (Q4 2008)
- **UNEMPLOYMENT RATE < 15 YEARS OLD (EU-27=7.2%), 2007**
  5.2%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 4.4 / Industry: 19.9
  Construction: 10.1 / Services: 65.6
- **GDP MP, 2007**
  25,604 €/inhab. Growth 2006-2007: 7.0%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  15,632 €/inhab. Growth 2000-2006: 41.1%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 4.3 / Industry: 23.9
  Construction: 12.3. Services: 59.5

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 7 / Suburban: 4 / Rural: 18
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 40
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 203

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  150 litres/inhab/day. Consumption decreased 14.8% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 62.5 / Municipal consumption: 10.5
  Economic sectors: 25.1 / Other: 2.0
- **DISTRIBUTION NETWORK LOSSES, 2006**
  19.5%
- **WASTE-WATER TREATMENT, 2007**
  72% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 0.6 / Agriculture: 49.0 / Forest: 49.7 / Wetlands: 0.1 / Water bodies: 0.6
- **INCREASE IN ARTIFICIAL SURFACES, 1990- 2000 (%)**
  21.8
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: No data / Intermediate: No data / High: No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 40.13 / Intermediate: 24.15 / High: 16.10 / Very high: 0.00

NATURE & BIODIVERSITY (Data provided by the AC, except for fires)

- **NATIVE TAXA, 2007**
  348 species of fauna (vertebrates), of which 3 are endemisms and 5,112 species of flora, of which 136 are endemisms
- **THREATENED TAXA ACCORDING TO THE CATALOGUE OF THREATENED SPECIES CATEGORIES OF ARAGON, 2007**
  Fauna: Endangered: 11 / Sensitive to habitat alteration: 19 / Vulnerable: 21 / Special interest: 41 / Extinct: 1
  Flora (includes bryophytos): Endangered: 15 / Sensitive to habitat alteration: 20 / Vulnerable: 45 / Special interest: 56
- **PROTECTED AREA, 2008**
  221,188 ha (4.64% of total AC area). This information includes the Peripheral Areas of Protection
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  1,361,203 ha (28.5% of total AC area)

- **BIOSPHERE RESERVES, 2008**
  1 reserve (48,855 ha)
- **RAMSAR WETLANDS, 2008**
  2 wetlands (6,711.18 ha)
- **FOREST FIRES, 2007**
  415 fires which affected 1,860.38 ha. An average of 406 annual fires occurred during the period between 1997-2006, which affected 1,738.55 ha

WASTE (Data provided by the AC)

- **URBAN WASTE PER INHABITANT, 2006**
  – Total: 523.32 kg/inhab. Increase in 2003-2006: 4.6%
  – Mixed: 480.63 kg/inhab. Increase in 2003-2006: 1.2%
  – Paper/cardboard: 19.37 kg/inhab. Increase in 2003-2006: 42.65%
  – Glass: 14.22 kg/inhab. Increase in 2003-2006: 23.87%
  – Packaging: 9.1 kg/inhab covered. Increase in 2003-2006: 33.26%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  70,229.3 ha. Growth 2001-2007: 47.6%
- **IRRIGATED AREA, 2007**
  385,994 ha (18.69% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007 (DATA PROVIDED BY THE AC)**
  Total: 5.33 / Hydraulic: 1.22 / Thermal: 2.79
  Nuclear: 0.00 / Wind: 1.31 / Other renewable: 0.004
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  7.8 MWh/inhab. Growth 2000-2007: 29.3%

TOURISM (Data provided by the AC)

- **NO. OF TOURISTS PER INHABITANT, 2007** Total tourists: 6.93 / Foreign tourists: 1.18
- **HOTEL CAPACITY, 2007**
  38,120 hotel beds (29.84 beds/1,000 inhab) and 11,491 beds in rural accommodation (9 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  828,224 vehicles. Growth 2000-2007: 31.9%
  638.7 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  563,990 passenger cars. Growth 2000-2007: 22.9%
  435.0 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 23.9 km/100 km^2 / Rail: 2.7 km/100 km^2
  Roads: 8.8 km/1,000 inhab / Rail: 1.0 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  513,570 passengers. Growth 2000-2007: 108.2%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  362 municipalities, of which 134 have already implemented it and are currently developing action plan projects. Moreover, 144 municipalities have the A21L diagnosis completed and 84 have a completed action plan (although with pending ratification). It is about data provided by the provincial councils, and there might be some other municipality that might be included
- **INTERNAL EXPENSES IN R&D, 2007**
  296.9 million € (0.91% of GDP). Growth 2000-2007: 121.28%

RELEVANT INFORMATION

- Aragon has approved the Aragonese Catalogue of Waste that summarises the different types of waste and its treatment, which is a key tool for the Waste Recovery and Prevention Programme covered by the Integrated Waste Management Plan of Aragon (GIRA, Gestión Integral de Residuos de Aragón).
- The working paper for the Aragonese Climate Change and Clean Energies Strategy (EACCEL, Estrategia Aragonesa de Cambio Climático y Energías Limpias) has been created and it endeavours to be the reference document for all of Aragonese society. This document has been submitted to a process of public participation, information and disclosure before being definitely approved.
- The Aragonese Special Wastewater Treatment Plan has won its second award at the Global Water Awards.
- The Interpretation Centres of the Aragonese Natural Network had a visit record in 2007. More than 120,000 people visited the fifteen centres scattered in different regions of Aragon.
- The La Alfranca ecological road, a 15-kilometre pedestrian path which links Las Fuentes de Zaragoza neighbourhood to the International Centre for Water and Environment (CIAMA-La Alfranca), through Zaragoza, La Puebla de Alfindén and Pastriz.
- During the 2007-2008 season, there has been a significant improvement in the reproductive patterns of the bearded vulture population in Aragon in comparison with the previous campaign, with a total of 28 fledglings as opposed to 22 in 2007 and 13 in 2006.

RECOMMENDED WEBSITES

- www.aragon.es

FURTHER READING

- Estado del medio ambiente en Aragón 2006-2007 *(Environmental status of Aragon 2006-2007)*
- Compras verdes *(Green purchases)*. Catálogo de productos y proveedores de Aragón *(Catalogue of products and suppliers of Aragon)*
- Atlas climático de Aragón *(Climatic Atlas of Aragon)*
- Catálogo de Especies Amenazadas en Aragón *(Catalogue of Threatened Species in Aragon)*. Flora and fauna

Asturias



Statute of Autonomy: Organic Law 7/81, of 30 December (Official State Gazette no. 9, of 11 January 1982)
Area: 10,604 km^2
Length of coastline: 401 km
Capital: Oviedo **Provinces:** 1 **Municipalities:** 78
Population, 2008: 1,080,138 inhab
Population density, 2008: 101.9 inhab/km^2
Population growth 2000-2008: 0.3%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 3.3
  2,001-10,000 inhabitants: 10.3
  10,001-100,000 inhabitants: 40.4
  100,001-500,00 inhabitants: 46.0
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 10.0
  15-64 years old: 68.2
  > 64 years old: 21.8
- **WORKING POPULATION (THOUSAND)**
  491.8 (Q4 2008)
- **UNEMPLOYMENT RATE**
  9.95% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  8.5%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 3.8 / Industry: 15.8
  Construction: 10.6. Services: 69.7
- **GDP MP, 2007**
  21,578 €/inhab. Growth 2006-2007: 7.0%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  14,645 €/inhab. Growth 2000-2006: 52.3%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 2.2 / Industry: 22.5
  Construction: 14.3. Services: 61.1

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 8 / Suburban: 9 / Rural: 3
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 32
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 26 (and 23 excluding African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  184 litres/inhab/day. Consumption increased 21.9% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 66.1 / Municipal consumption: 6.1
  Economic sectors: 27.4 / Other: 0.3
- **DISTRIBUTION NETWORK LOSSES, 2006**
  9.6%
- **WASTE-WATER TREATMENT, 2008**
  69.26% of population equivalent provided with waste-water treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 1.8 / Agriculture: 28.1 / Forest: 69.8 / Wetlands: 0.1 / Water bodies: 0.2
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  21.3
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 61.92 / Intermediate: 21.67 / High: 16.42
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Every surface is classified as wetland and sub-wetland; therefore, there is no desertification risk

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  456 species of fauna (vertebrates), of which 15 are endemisms, and 2,038 species of flora
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007 (ONLY FAUNA)**
  Total number of evaluated taxa: 511 / Vulnerable: 26 / Endangered: 6 / Critically endangered: 5
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 20 species of fauna and 63 species of flora, of which 19 species of fauna and 4 species of flora have published action plans.

Included in the National Catalogue (CNEA): 344, of which 2 have published action plans

- **PROTECTED AREA, 2008**
  237,585.9 ha (22.4% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  280,811 ha (26.5% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  4 reserves (281,960 ha). One of these reserves (159,378.6 terrestrial ha and 571 marine ha) is shared with Galicia. Besides, there are 64,315 ha in another BR shared with Castile and Leon and Cantabria
- **RAMSAR WETLANDS, 2008**
  1 wetland (1,740.0 ha) shared with Galicia
- **FOREST FIRES, 2007**
  1,083 fires which affected 2,690.31 ha. An average of 1,729 annual fires occurred during the period between 1997-2006, which affected 11,544.86 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 533.6 kg/inhab. Variation 2000-2006: -13.0%
  - Mixed: 482 kg/inhab. Variation 2000-2006: -17.2%
  - Paper/cardboard: 32.2 kg/inhab. Variation 2000-2006: 103.8%
  - Glass: 11.1 kg/inhab. Variation 2000-2006: -21.0%
  - Packaging: 8.3 kg/inhab. Variation 2000-2006: 591.17%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  6,630.7 ha.
- **IRRIGATED AREA, 2007**
  1,651 ha (0.39% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 3.56 / Hydraulic: 0.69 / Thermal: 2.53
  Nuclear: 0.00 / Wind: 0.26 / Other renewable: 0.08
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  9.0 MWh/inhab. Growth 2000-2007: 19.5%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007** Total tourists: 3.90 / Foreign tourists: 0.15
- **HOTEL CAPACITY, 2007**
  27,643 hotel beds (25.7 beds/1,000 inhab) and 8,180 beds in rural accommodation (7.6 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  634,983 vehicles. Growth 2000-2007: 25.6%
  590.8 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  483,289 passenger cars. Growth 2000-2007: 20.9%
  449.6 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 47.4 km/100 km^2 / Rail: 6.7 km/100 km^2
  Roads: 4.7 km/1,000 inhab / Rail: 0.7 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  1,560,830 passengers. Growth 2000-2007: 90.9%
- **GOODS PORT TRAFFIC, 2007**
  26.39 million tonnes. Growth 2000-2007: 10.2%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  55 municipalities, of which 25 have already implemented it and are currently developing action plan projects. Moreover, 27 municipalities have the A21L diagnosis completed
- **INTERNAL EXPENSES IN R&D, 2007**
  211.7 million €(0.94% of GDP). Growth 2000-2007: 84.77%

RELEVANT INFORMATION

- Decree 58/2008, of 26 June, by means of which the Sustainability Monitoring Centre in the Principality of Asturias is created.
- The Governing Council approved in November 2008 the Sustainable Development Strategy of the Principality of Asturias.
- The Climate Change Strategy of the Principality of Asturias is being developed.
- In 2008, the creation of an environmental network (RAMAS project) was proposed in order to facilitate access to environmental information and encourage public participation to create a web portal and enable electronic services.

RECOMMENDED WEBSITES

- http://www.asturias.es
- http://tematico.asturias.es/mediambi/siapa/
- http://www.cogersa.es/
- http://www.consorcioaa.es/
- http://www.juntadesaneamiento.com/
- http://www.osasturias.es

FURTHER READING

- Red Book of Fauna of the Principality of Asturias
- Nature Reserves and Parks of the Principality of Asturias
- Landscapes and Natural Monuments of the Principality of Asturias

Balearic Islands



Statute of Autonomy: Organic Law 2/83, of 25 February (Official State Gazette No. 51, of 1 March 1983), drafting according to Organic Law 1/2007, of 28 February (Official State Gazette No. 51, of 1 March 2007)
Area: 4,992 km^2
Length of coastline: 1,428 km
Capital: Palma de Mallorca **Provinces:** 1 **Municipalities:** 67
Population, 2008: 1,072,844 inhab
Population density, 2008: 214.9 inhab/km^2
Population growth 2000-2008: 26.9%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 1.6
  2,001-10,000 inhabitants: 14.7
  10,001-100,000 inhabitants: 46.8
  100,001-500,000 inhabitants: 37.0
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 15.0
  15-64 years old: 71.5
  > 64 years old: 13.6
- **WORKING POPULATION (THOUSAND)**
  564.1 (Q4 2008)
- **UNEMPLOYMENT RATE**
  12.32% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  7.0%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 1.0 / Industry: 8.9
  Construction: 14.5 / Services: 75.7
- **GDP MP, 2007**
  25,342 €/inhab. Growth 2006-2007: 3.7%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  15,494 €/inhab. Growth 2000-2006: 23.9%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 1.1 / Industry: 7.1
  Construction: 11.3 / Services: 80.6

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 3 / Suburban: 6 / Rural: 6
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 29
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 17

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  150 litres/inhab/day. Consumption increased 16.3% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 57.4 / Municipal consumption: 4.5
  Economic sectors: 37.2 / Other: 0.9
- **DISTRIBUTION NETWORK LOSSES, 2006**
  19.5%

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 5.5 / Agriculture: 58.1 / Forest: 35.7 / Wetlands: 0.2 / Water bodies: 0.6
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  43.0
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 76.62 / Intermediate: 13.69 / High: 9.70
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 49.73 / Intermediate: 18.33 / High: 3.26 / Very high: 1.48

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2008**
  173 species of fauna (vertebrates) (5 are endemisms), 239 species of endemic invertebrates and 1,729 species of higher flora (173 are endemisms)
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2008**
  Total number of evaluated taxa: 1,256 / Vulnerable: 112 / Endangered: 47 / Critically endangered: 19
- **CATALOGUED TAXA, 2008**
  Included in Regional Catalogue: 80, of which 20 have published action plans
  Included in the National Catalogue (CNEA): 251, of which 18 have published action plans
- **PROTECTED AREA, 2008**
  74,761.3 ha, (14.9% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  115,220 ha (23.0% of total AC area)

- **BIOSPHERE RESERVES, 2008**
  1 reserve (64,441 ha of terrestrial area and 1,745.2 ha of marine area)
- **RAMSAR WETLANDS, 2008**
  2 wetlands (3,340.0 ha)
- **FOREST FIRES, 2007**
  113 fires which affected 123.90 ha. An average of 129 annual fires occurred during the period between 1997-2006, which affected 408.75 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 736.0 kg/inhab. Variation 2000-2006: -13.8%
  - Mixed: 630 kg/inhab. Variation 2000-2006: -22.9%
  - Paper/cardboard: 66.3 kg/inhab. Variation 2000-2006: 330.5%
  - Glass: 23.2 kg/inhab. Variation 2000-2006: 16.0%
  - Packaging: 16.5 kg/inhab. Variation 2000-2006: 1,275.0%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  19,284.8 ha. Growth 2001-2007: 233.6%
- **IRRIGATED AREA, 2007**
  18,327 ha (9.1% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.88 / Hydraulic: 0.00 / Thermal: 1.84
  Nuclear: 0.00 / Wind: 0.00 / Other renewable: 0.03
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  5.4 MWh/inhab. Growth 2000-2007: 17.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007** Total tourists: 12.52 / Foreign tourists: 9.93
- **HOTEL CAPACITY, 2007**
  326,028 hotel beds (316.3 beds/1,000 inhab) and 2,499 beds in rural accommodation (2.4 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  878,607 vehicles. Growth 2000-2007: 24.7%
  852.5 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  645,216 passenger cars. Growth 2000-2007: 20.4%
  626.0 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 43.5 km/100 km^2 / Rail: 2.2 km/100 km^2
  Roads: 2.1 km/1,000 inhab / Rail: 0.1 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  30,770,830 passengers. Growth 2000-2007: 15.4%
- **GOODS PORT TRAFFIC, 2007**
  15.1 million tonnes. Growth 2000-2007: 38.4%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2008**
  67 municipalities, of which 43 have already implemented it and are currently developing action plan projects. Moreover, 20 municipalities have the A21L diagnosis completed and 4 have a completed action plan (although with pending ratification)
- **INTERNAL EXPENSES IN R&D, 2007**
  86.8 million €(0.33% of GDP). Growth 2000-2007: 149.05%

RELEVANT INFORMATION

- Action Plan to Combat Climate Change (approved by the Governing Council on 1 August 2008).
- New SPAs and enlargement of existing ones (Agreement of the Governing Council of 30 May 2008, Official Gazette of the Balearic Islands (BOIB) 78 ext., of 4 June 2008).
- Natural park declaration of the Serra de Tramuntana (Agreement of the Governing Council of 16 March 2007, Official Gazette of the Balearic Islands (BOIB) 54 ext., of 11 April 2007).
- Calvia *Limonium (Limonium sps)* and Ferreret Recovery Plans, Osprey Conservation Plan and Audouin's Gull and European Shag Management Plan of Balearic Islands (Resolution of 30 July 2007).
- *Limonium barceloi, Milvus milvus* and *Apium bermejoi* Recovery Plans and *Miniopterus schreibersii* Conservation Plan (Resolution of 5 May 2008)

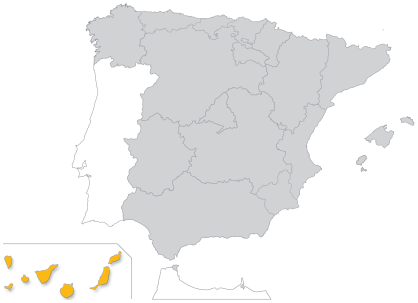
RECOMMENDED WEBSITES

- http://www.cre.uib.es
- http://ces.caib.es
- http://www.obsam.cat
- http://caib.es
- http://pia.caib.es
- http://www.xarxanatura.es

FURTHER READING

- Conselleria de Medi Ambient. Estat del Medi Ambient a les Illes Balears 2006-2007

Canary Islands



Statute of Autonomy: Organic Law 10/82, of 10 August (Official State Gazette no. 195, of 16 August 1982)
Area: 7,492 km^2
Length of coastline: 1,583 km
Capital: Las Palmas de Gran Canaria and Santa Cruz de Tenerife
Provinces: 2 **Municipalities:** 88
Population, 2008: 2,075,968 inhab
Population density, 2008: 277.1 inhab/km^2
Population growth 2000-2008: 21.0%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 0.6
  2,001-10,000 inhabitants: 10.5
  10,001-100,000 inhabitants: 52.7
  100,001-500,000 inhabitants: 36.2
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 14.9 15-64 years old: 72.4
  > 64 years old: 12.7
- **WORKING POPULATION (THOUSAND)**
  1,055.5 (Q4 2008)
- **UNEMPLOYMENT RATE**
  21.18% (Q4 2008)
- **UNEMPLOYMENT RATE, > 15 YEARS OLD (EU-27= 7.2%) 2007**
  10.4%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 2.7 / Industry: 6.9
  Construction: 10.8 / Services: 79.6
- **GDP MP, 2007**
  20,637 €/inhab. Growth 2006-2007: 4.2%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  12,598 €/inhab. Growth 2000-2006: 31.4%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 1.5 / Industry: 7.3
  Construction: 12.5 / Services: 78.9

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 4 / Suburban: 19 / Rural: 5
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): Las Palmas de Gran Canaria: 29 and Santa Cruz de Tenerife: 24
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): Las Palmas de Gran Canaria: 57 and Santa Cruz de Tenerife: 129 (32 and 113; respectively, excluding African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  141 litres/inhab/day. Consumption increased 1.4% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 66.5 / Municipal consumption: 7.6
  Economic sectors: 23.9 / Other: 2.0
- **DISTRIBUTION NETWORK LOSSES, 2006**
  18.1%
- **WASTE-WATER TREATMENT, 2008**
  54% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC. It is worth noting that urban agglomerations without analytic information have been considered non compliant

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 4.6 / Agriculture: 22.8 / Forest: 72.6 / Wetlands: 0.0 / Water bodies: 0.0
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  8.9
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 69.25 / Intermediate: 21.86 / High: 8.89
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 8.20 / Intermediate: 9.74 / High: 47.62 / Very high: 29.98

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  116 species of fauna (vertebrates), of which 58 are endemisms and 5,015 species of flora, of which 748 are endemisms
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 449, of which 15 have published action plans
  Included in the National Catalogue (CNEA): 178, of which 12 have published action plans

- **PROTECTED AREA, 2008**
  302,778.4 ha, (40.7% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  348,038 ha (46.8% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  4 Reserves (221,037 ha of terrestrial area and 87,633.8 ha of marine area)
- **RAMSAR WETLANDS, 2008**
  1 wetland (91.5 ha)
- **FOREST FIRES, 2007**
  139 fires which affected 35,758.62 ha. An average of 88 annual fires occurred during the period between 1997-2006, which affected 1,360.54 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 628.9 kg/inhab. Variation 2000-2006: -18.7%
  - Mixed: 566 kg/inhab. Variation 2000-2006: -23.5%
  - Paper/cardboard: 39.3 kg/inhab. Variation 2000-2006: 132.5%
  - Glass: 10.5 kg/inhab. Variation 2000-2006: -36.0%
  - Packaging: 13.1 kg/inhab. Variation 2000-2006: No data

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  5,482.0 ha. Growth 2001-2007: 6.7%
- **IRRIGATED AREA, 2007**
  22,743 ha (36.49% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.33 / Hydraulic: 0.00 / Thermal: 1.24
  Nuclear: 0.00 / Wind: 0.07 / Other renewable: 0.03
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  4.4 MWh/inhab. Growth 2000-2007: 29.6%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 6.66 / Foreign tourists: 4.67
- **HOTEL CAPACITY, 2007**
  199,099 hotel beds (98.3 beds/1,000 inhab) and 3,925 beds in rural accommodation (1.9 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  1,448,849 vehicles. Growth 2000-2007: 28.0%
  715.1 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  967,689 passenger cars. Growth 2000-2007: 18.8%
  477.6 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 60.0 km/100 km^2 / Rail: 0.0 km/100 km^2 Roads: 2.2 km/1,000 inhab / Rail: 0.0 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  34,807,816 passengers. Growth 2000-2007: 15.5%
- **GOODS PORT TRAFFIC, 2007**
  48.4 million tonnes. Growth 2000-2007: 45.7%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  88 municipalities, of which 6 already have an approved action plan. Moreover, 14 municipalities (among which are the 6 previously mentioned) have the A21L diagnosis completed. There are 9 municipalities with Participation Forums or Regulation approved
- **INTERNAL EXPENSES IN R&D, 2007**
  266.8 million € (0.63% of GDP). Growth 2000-2007: 123.4%

RELEVANT INFORMATION

- In December 2008, the Canaries Autonomous Region Air Quality Action Plan was approved.
- Also, in December 2008 the Canaries Autonomous Region Strategic Noise Maps were approved.
- During this year, 12 Integrated Environmental Authorisations have been granted, among others, to Santa Cruz Refinery and the Thermal Stations located in the Canary Islands.
- Between 2007 and 2008, Recovery Plans for endangered species such as *Atractylis preauxiana, Lotus berthelotii* and *L. maculatus, Helianthemum teneriffae, Cheirolophus duranii,* and Conservation Plans for *Silene sabinosae* and *Echium acanthocarpum,* have been approved.

RECOMMENDED WEBSITES

- http://www.gobiernodecanarias.org

FUTHER READING

- Gobierno de Canarias *(Government of Canaries)*. Canarias, Medio Ambiente y Territorio *(Canaries, Environment and Territory)*. Years 2001-03 and 2004-05.Consejería de Medio Ambiente y Ordenación Territorial *(Regional Ministry of the Environment and Land Organisation)*.



Cantabria



Statute of Autonomy: Organic Law 8/1981, of 30 December, of the Statute of Autonomy of Cantabria
Area: 5,321 km^2
Length of coastline: 284 km
Capital: Santander **Provinces:** 1 **Municipalities:** 102
Population, 2008: 582,138 inhab
Population density, 2008: 109.4 inhab/km^2
Population growth 2000-2008: 9.6%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 8.9
  2,001-10,000 inhabitants: 23.7
  10,001-100,000 inhabitants: 36.2
  100,001-500,000 inhabitants: 31.3
  > 500,000 inhabitants: 0.0

  By age group
  < 15 years old: 12.4
  15-64 years old: 69.1
  > 64 years old: 18.4
- **WORKING POPULATION (THOUSAND)**
  281.5 (Q4 2008)
- **UNEMPLOYMENT RATE**
  8.90% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  5.9%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 3.4 / Industry: 19.6
  Construction: 11.5 / Services: 65.5
- **GDP MP, 2007**
  23,446 €/inhab. Growth 2006-2007: 6.3%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  14,935 €/inhab. Growth 2000-2006: 46.0%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 3.2 / Industry: 20.9
  Construction: 14.1 / Services: 61.8

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 9 / Suburban: 1 / Rural: 1
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): Central Santander: 38 µg/m^3 and Tetuan: 21 µg/m^3
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): Central Santander: 43 excess levels and 29 excess levels excluding African dust outbreaks. Tetuan: 27 excess levels. Outbreak exclusions have not been determined as the limit was not exceeded

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  201 litres/inhab/day. Consumption increased 6.9% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 63.6 / Municipal consumption: 8.2
  Economic sectors: 25.6 / Other: 2.6
- **DISTRIBUTION LOSSES, 2006**
  24.8%
- **WASTE-WATER TREATMENT, 2008**
  94.69% of population equivalent provided with waste-water treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 2.5 / Agriculture: 28.5 / Forest: 67.2 / Wetlands: 0.7 / Water bodies: 1.2
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  11.8
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 59.91 / Intermediate: 22.39 / High: 17.70
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Every surface is classified as wetland and sub-wetland; therefore, there is no desertification risk

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  349 species of fauna (vertebrates) of which 3 (Urogallo,The Desman and Grey Partridge are endemisms). There are flora endemisms (*Androsace cantabrica*), for instance.
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 82, of which 1 (bear) has published action plans

Included in the National Catalogue (CNEA): 30, of which 1 (bear) has published action plans

- **PROTECTED AREA, 2008**
  193,558.1 ha (36.4% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  146,726 ha (27.6% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (64,315 ha) shared with Asturias and Castile and Leon
- **RAMSAR WETLANDS, 2008**
  1 wetland (6,678.3 ha)
- **FOREST FIRES, 2007**
  296 fires which affected 3,452.83 ha. An average of 357 annual fires occurred during the period between 1997-2006, which affected 4,122.20 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 621.9 kg/inhab. Variation 2000-2006: 36.1%
  - Mixed: 563 kg/inhab. Variation 2000-2006: 32.8%
  - Paper/cardboard: 20.8 kg/inhab. Variation 2000-2006: 15.6%
  - Glass: 17.7 kg/inhab. Variation 2000-2006: 31.1%
  - Packaging: 20.4 kg/inhab. Variation 2000-2006: 1.260%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  5,147.9 ha. Growth 2001-2007: 56.5%
- **IRRIGATED AREA, 2007**
  328 ha (0.13% of total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.37 / Hydraulic: 0.84 / Thermal: 0.50
  Nuclear: 0.00 / Wind: 0.00 / Other renewable: 0.04
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  7.9 MWh/inhab. Growth 2000-2007: 12.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 6.87 / Foreign tourists: 0.66
- **HOTEL CAPACITY, 2007**
  23,547 hotel beds (41.1 beds/1,000 inhab) and 5,939 beds in rural accommodation (10.4 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  372,945 vehicles. Growth 2000-2007: 35.2%
  651.1 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  274,040 passenger cars. Growth 2000-2007: 29.6%
  478.4 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 48.7 km/100 km^2 / Rail: 6.6 km/100 km^2
  Roads: 4.5 km/1,000 inhab / Rail: 0.6 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  761,780 passengers. Growth 2000-2007: 192.1%
- **GOODS PORT TRAFFIC, 2007**
  11.4 million tonnes. Growth 2000-2007: 13.1%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  87 municipalities with local Agenda 21, of which 8 municipalities and 1 commonwealth have already implemented it and are currently developing action plan projects. Moreover, 8 municipalities have the A21L diagnosis completed
  (74 remaining municipalities are in the process of drawing up the diagnosis).
- **INTERNAL EXPENSES IN R&D, 2007**
  117.5 million € (0.89% of GDP). Growth 2000-2007: 226.83%

RELEVANT INFORMATION

Environmental legislation passed by the Autonomous Region of Cantabria in 2007:

- Act 3/2007 of Cantabria, of 4 April, on Fishing in Inland Waters.
- Decree 102/2006, of 13 October, on the Cantabria Waste Plan 2006-2010.
- Act 17/2006 of Cantabria, of 11 December, on Integrated Environmental Control
- Environmental legislation passed by the Autonomous Region of Cantabria in 2008: Decree 15/2008, of 22 February on the developing Hunting Regional Reserves of Act 12/2006, of 17 July, on Hunting in Cantabria.

RECOMMENDED WEBSITES

- www.gobcantabria.es
- www.medioambientecantabria.es
- www.icane.es

FURTHER READING

- (2006): El agua de abastecimiento en Cantabria 2005 *(Supply Water in Cantabria 2005)*. CIMA (Centro de Investigación del Medio Ambiente). Regional Ministry of the Environment. Regional Government of Cantabria.
- (2006): Informe quinquenal de Calidad del Aire en Cantabria *(5-year Report on the Air Quality of Cantabria)*. 2001-2005. CIMA (Centro de Investigación del Medio Ambiente). Regional Ministry of the Environment. Regional Government of Cantabria
- (2007): Guía para el diseño y la dinamización de los procesos participativos en las Agendas 21 Locales de Cantabria *(Guide for the Design and Outreach of Participative Processes in Cantabria Local Agendas 21)*. CIMA (Centro de Investigación del Medio Ambiente) Regional Ministry of the Environment. Regional Government of Cantabria.

Castile-La Mancha



Statute of Autonomy: Organic Law 9/82, of 10 August (Official State Gazette no. 195, of 16 August 1982)
Area: 79,462 km^2
Capital: Toledo **Provinces:** 5 **Municipalities:** 919
Population, 2008: 2,043,100 inhab
Population density, 2008: 25.7 inhab/km^2
Population growth 2000-2008: 17.8%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 15.7
  2,001-10,000 inhabitants: 31.0
  10,001-100,000 inhabitants: 45.1
  100,001-500,000 inhabitants: 8.2
  > 500,000 inhabitants: 0.0

  By age group
  > 15 years old: 15.1
  15-64 years old: 67.2
  > 64 years old: 17.7
- **WORKING POPULATION (THOUSAND)**
  965.5 (Q4 2008)
- **UNEMPLOYMENT RATE**
  14.90% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  7.6%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 6.6 / Industry: 16.8
  Construction: 15.0 / Services: 61.6
- **GDP MP, 2007**
  18,294 €/inhab. Growth 2006-2007: 5.3%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  11,790 €/inhab. Growth 2000-2006: 35.8%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 9.0 / Industry: 20.8
  Construction: 14.6 / Services: 55.6

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 2 / Suburban: 6 / Rural: 2
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  Average annual NO_2 concentration in µg/m3 (2010 limit: 40 µg/m^3): 25
  No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 63 (55 excluding African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  166 litres/inhab/day. Consumption decreased 11.7% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 69.4 / Municipal consumption: 9.7
  Economic sectors: 19.4 / Other: 1.5
- **DISTRIBUTION NETWORK LOSSES, 2006**
  18.7%

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 0.7 / Agriculture: 59.3 / Forest: 39.3 / Wetlands: 0.1 / Water bodies: 0.5
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  29.5
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: No data / Intermediate: No data / High: No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 36.71 / Intermediate: 33.98 / High: 22.38 / Very high: 2.60

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  Castile-La Mancha is the exclusive home of 3 endemic species of flora and also of another 3 endemisms that, although Iberian, are only found in this Autonomous Region
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 837, of which 12 have published action plans
  Included in the National Catalogue (CNEA): 292, of which 8 have published action plans

- **PROTECTED AREA, 2008**
  326,335.7 ha (4.11% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  1,839,296 ha (23.2% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (25,000 ha)
- **RAMSAR WETLANDS, 2008**
  7 wetlands (3,249.0 ha)
- **FOREST FIRES, 2007**
  694 fires which affected 2,026.46 ha. An average of 840 annual fires occurred during the period between 1997-2006, which affected 7,539.86 ha

WASTE (DATA PROVIDED BY THE AC)

- **URBAN WASTE PER INHABITANT, 2007**
  - Total: 500.5 kg/inhab. Variation 2000-2007: No data
  - Mixed: 469.1 kg/inhab. Variation 2000-2007: No data
  - Paper/cardboard: 11.2 kg/inhab. Variation 2000-2007: 154.6%
  - Glass: 9.5 kg/inhab. Variation 2000-2007: 1,145.4%
  - Packaging: 10.7 kg/inhab. Variation 2000-2007: 246.7%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  48,452.2 ha. Growth 2001-2007: 227.6%
- **IRRIGATED AREA, 2007**
  491,134 ha (11.39% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 3.66 / Hydraulic: 0.42 / Thermal: 1.20
  Nuclear: 0.54 / Wind: 1.43 / Other renewable: 0.07
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  6.1 MWh/inhab. Growth 2000-2007: 26.7%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 5.86 / Foreign tourists: 0.11
- **HOTEL CAPACITY, 2007**
  34,194 hotel beds (17.3 beds/1,000 inhab) and 6,616 beds in rural accommodation (3.3 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  1,333,681 vehicles. Growth 2000-2007: 46.4%
  674.5 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  909,160 passenger cars. Growth 2000-2007: 42.6%
  459.8 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 24.2 km/100 km^2 / Rail: 2.0 km/100 km^2 Roads: 9.7 km/1,000 inhab / Rail: 0.8 km/1,000 inhab
- **AIR TRANSPORT (2007)**
  9,881 passengers. Growth 2003-2007: 326.1%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  54 municipalities that have already implemented and are currently developing action plan projects. Moreover, 84 municipalities have the A21L diagnosis completed and 65 have a completed action plan (although with pending ratification). There are 635 municipalities involved
- **INTERNAL EXPENSES IN R&D, 2007**
  214.0 million €(0.59% of GDP). Growth 2000-2007: 80.43%

RELEVANT INFORMATION

Environmental legislation passed during 2007:

- Act 4/2007, of 8 March, on Environmental Evaluation of Castile-La Mancha. Official Gazette of Castile-La Mancha (DOCM) No. 60, of 20 March 2007.
- Act 5/2007, of 8 March, on Natural Park Declaration of Serranía de Cuenca. Official Gazette of Castile-La Mancha (DOCM) No. 60, of 20 March 2007.
- Act 11/2007. Creation of the National Park Agency of Castile-La Mancha. Official Gazette of Castile-La Mancha (DOCM) No. 60 of 19 April 2007.
- Decree 18/2007, of 20 March 2007, issued by the Governing Council, by means of which the Natural Resources Management Plan of the Lakes of Cañada del Hoyo located in the Cañada del Hoyo de Cuenca municipality is approved and the Lakes of Cañada del Hoyo are declared as a Natural Monument. Official Gazette of Castile-La Mancha (DOCM) No. 63, of 23 March 2007.
- Decree 26/2007, of 3 April on the creation of the Environmental Education Resource Network of Castile-La Mancha.

RECOMMENDED WEBSITES

- http://www.jccm.es/medioambiente/index.htm
- http://www.ies.jccm.es/
- http://www.jccm.es/medioambiente/publicaciones/
- http://www.revistamedioambientejccm.es/

FURTHER READING

- Revista Medio Ambiente Castilla-La Mancha (Castile-La Mancha Environment Journal) (every 3 months)
- Revista Red 21 CLM (CLM Network 21 Journal) (every 6 months)

Castile and Leon



Statute of Autonomy: Organic Law 14/2007, of 30 November, amendment of the Statute of Autonomy of Castile and Leon
Area: 94,225 km^2
Capital: Valladolid **Provinces:** 9 **Municipalities:** 2,248
Population, 2008: 2,557,330 inhab
Population density, 2008: 27.1 inhab/km^2
Population growth 2000-2008: 3.2%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 26.8
  2,001-10,000 inhabitants: 17.1
  10,001-100,000 inhabitants: 25.3
  100,001-500,000 inhabitants: 30.8
  > 500,000 inhabitants: 0.0

  By age group
  > 15 years old: 11.1
  15-64 years old: 66.1
  > 64 years old: 22.3
- **WORKING POPULATION (THOUSAND)**
  1,186.3 (Q4 2008)
- **UNEMPLOYMENT RATE**
  11.22% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  7.2%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 7.2 / Industry: 17.5
  Construction: 11.6 / Services: 63.7
- **GDP MP, 2007**
  22,680 €/inhab. Growth 2006-2007: 6.7%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  14,669 €/inhab. Growth 2000-2006: 47.4%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 7.3 / Industry: 19.5
  Construction: 12.4 / Services: 60.8

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 27 / Suburban: 16 / Rural: 24
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 31
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 16 (10 excluding African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  147 litres/inhab/day. Consumption decreased 3.9% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 58.7 / Municipal consumption: 15.0
  Economic sectors: 24.5 / Other: 1.8
- **DISTRIBUTION NETWORK LOSSES, 2006**
  17.3%
- **WASTE-WATER TREATMENT, 2008**
  83.5% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 0.7 / Agriculture: 47.14 / Forest: 51.96 / Wetlands: 0.0 / Water bodies: 0.4
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  36.6
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: No data / Intermediate: No data / High: No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 56.92 / Intermediate: 9.24 / High: 3.95 / Very high: 0.20

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  390 species of fauna (vertebrates), of which 38 are endemisms, and 3,300 species of flora
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 390 / Vulnerable: 50 / Endangered: 15 / Critically endangered: 4
- **CATALOGUED TAXA, 2007**
  – Included in Regional Catalogue: 301 (without published action plans)
  – Included in the National Catalogue (CNEA): 347, of which 5 have published action plans

- **PROTECTED AREA, 2008**
  619,646.5 ha (6.6% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  2,461,624 ha (26.1% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  7 reserves (318,029 ha). Besides, there are 64,315 ha in another BR shared with Asturias and Cantabria
- **RAMSAR WETLANDS, 2008**
  2 wetlands (3,161.3 ha)
- **FOREST FIRES, 2007**
  1,511 fires which affected 9,760.29 ha. An average of 2,064 annual fires occurred during the period between 1997-2006, which affected 30,930.26 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 519.7 kg/inhab. Variation 2000-2006: 14.3%
  - Mixed: 472 kg/inhab. Variation 2000-2006: 10.0%
  - Paper/cardboard: 19.0 kg/inhab. Variation 2000-2006: 74.3%
  - Glass: 14.0 kg/inhab. Variation 2000-2006: -2.8%
  - Packaging: 14.7 kg/inhab. Variation 2000-2006: 4,800.0%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  17,842.6 ha. Growth 2001-2007: 11.6%
- **IRRIGATED AREA, 2007**
  411,575 ha (7.43% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 4.28 / Hydraulic: 1.65 / Thermal: 1.29
  Nuclear: 0.18 / Wind: 1.11 / Other renewable: 0.05
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  5.6 MWh/inhab. Growth 2000-2007: 34.8%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 6.86 / Foreign tourists: 0.49
- **HOTEL CAPACITY, 2007**
  61,837 hotel beds (24.5 beds/1,000 inhab) and 20,109 beds in rural accommodation (8.0 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  1,632,112 vehicles. Growth 2000-2007: 28.1%
  645.5 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  1,195,333 passenger cars. Growth 2000-2007: 23.7%
  472.8 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 34.7 km/100 km^2 / Rail: 2.4 km/100 km^2
  Roads: 12.9 km/1,000 inhab / Rail: 0.9 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  739,849 passengers. Growth 2003-2007: 174.3%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  2,248 municipalities, of which 10 have already implemented it and are currently developing action plan projects. Moreover, 21 municipalities have the A21L diagnosis completed and have a completed action plan (although with pending ratification)
- **INTERNAL EXPENSES IN R&D, 2007**
  620.7 million € (1.10% of GDP). Growth 2000-2007: 178.59%

RELEVANT INFORMATION

- Construction and development of the Centre for Educational Environmental Proposals (PRAE, Centro de Propuestas Ambientales Educativas), a building of 3,500 m^2, built according to eco-efficiency and sustainability criteria, and which has obtained the first prize of the Castile and Leon Sustainable Building award bearing the prestigious Green Seal certification awarded by the Green Build Challenge (GBC). It was selected to represent Spain in the "Sustainable Building Challenge 08" World Conference in Melbourne (Australia). In the future, this facility will include not only this resource centre but also an environmental park, as it is an ambitious integral environmental educational project that will provide social, technical and educational applications.
- The Regional Ministry of the Environment has deployed a new environmental information system by means of the environmental indicators and sustainability system of Castile and Leon.
- The Regional Government of Castile and Leon is working on two new strategies: The Regional Strategy of Sustainable Development and the Strategy on Climate Change.

RECOMMENDED WEBSITES

- http://www.jcyl.es/
- http://www.patrimonionatural.org/
- http://rednatura.jcyl.es/natura2000/
- http://www.jcyl.es/sie/
- http://www.sitcyl.jcyl.es/sitcyl/home.sit
- http://www.sigpac.jcyl.es/visor/

FURTHER INFORMATION

- Regional Government of Castile and Leon, 2008. "Anuario Estadístico 2007" (Statistics Yearbook 2007)
- Regional Ministry of the Environment. "Informe Medio Ambiente 2005-2006" (2005-2006 Environmental Report)
- Boletín de información ambiental de Castilla y León (Environmental information gazette of Castile and Leon)
- Boletín de difusión de la Educación Ambiental de Castilla y León (Newsletter on Environmental Education of Castile and Leon)

Catalonia



Statute of Autonomy: Organic Law 6/2006, of 19 July. (Official State Gazette no. 172, of 22 July 2006)
Area: 32,113 km^2
Length of coastline: 827 km
Capital: Barcelona **Provinces:** 4 **Municipalities:** 946
Population, 2008: 7,364,078 inhab
Population density, 2008: 229.3 inhab/km^2
Population growth 2000-2008: 17.6%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 4.9
  2,001-10,000 inhabitants: 13.7
  10,001-100,000 inhabitants: 39.2
  100,001-500,000 inhabitants: 20.3
  > 500,000 inhabitants: 21.9
  By age group
  < 15 years old: 14.7
  15-64 years old: 69.0
  > 64 years old: 16.2
- **WORKING POPULATION (THOUSAND)**
  3,854.8 (Q4 2008)
- **UNEMPLOYMENT RATE**
  11.82% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  6.5%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 1.9 / Industry: 20.6
  Construction: 10.8 / Services: 66.6
- **GDP MP, 2007**
  27,443 €/inhab. Growth 2006-2007: 4.4%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  15,956 €/inhab. Growth 2000-2006: 33.8%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 1.4 / Industry: 22.8
  Construction: 10.5 / Services: 65.3

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 35 / Suburban: 48 / Rural: 28
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 53
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 66 (and 52 excluding the African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  150 litres/inhab/day. Consumption decreased 19.4% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 66.0 / Municipal consumption: 6.3
  Economic sectors: 26.6 / Other: 1.1
- **DISTRIBUTION NETWORK LOSSES, 2006**
  15.1%
- **WASTE-WATER TREATMENT, 2008**
  95% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 4.2 / Agriculture: 39.7 / Forest: 55.5 / Wetlands: 0.1 / Water bodies: 0.5
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  10.9
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 54.41 / Intermediate: 24.86 / High: 20.74
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 28.91 / Intermediate: 14.83 / High: 11.44 / Very high: 0.36

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  511 species of fauna (vertebrates) of which 2 are endemisms

- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 511 / Vulnerable: 57 / Endangered: 24 / Critically endangered: 11
- **CATALOGUED TAXA, 2007**
  Included in the National Catalogue (CNEA): 6 which already have published action plans
- **PROTECTED AREA, 2008**
  1,038,460.89 ha (29.92% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  957,051 ha (29.8% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (30,120 ha)
- **RAMSAR WETLANDS, 2008**
  4 wetlands (53,532.1 ha)
- **FOREST FIRES, 2007**
  579 fires which affected 1,612.25 ha. An average of 733 annual fires occurred during the period between 1997-2006, which affected 5,643.72 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  – Total: 498.7 kg/inhab. Variation 2000-2006: -19.1%
  – Mixed: 441 kg/inhab. Variation 2000-2006: -24.4%
  – Paper/cardboard: 26.3 kg/inhab. Variation 2000-2006: 82.6%
  – Glass: 18.8 kg/inhab. Variation 2000-2006: 26.2%
  – Packaging: 12.6 kg/inhab. Variation 2000-2006: 200.0%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  60,094.7 ha. Growth 2001-2007: 18.3%
- **IRRIGATED AREA, 2007**
  240,979 ha (23.24% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.62 / Hydraulic: 0.35 / Thermal: 0.77
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  6.9 MWh/inhab. Growth 2000-2007: 27.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 5.05 / Foreign tourists: 2.1
- **HOTEL CAPACITY, 2007**
  275,247 hotel beds (38.2 beds/1,000 inhab) and 11,068 beds in rural accommodation (1.5 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  4,922,667 vehicles. Growth 2000-2007: 23.1%
  682.7 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  3,332,852 passenger cars. Growth 2000-2007: 16.9%
  462.2 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 38.2 km/100 km^2 / Rail: 5.5 km/100 km^2
  Roads: 1.7 km/1,000 inhab / Rail: 0.2 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  39,053,638 passengers. Growth 2003-2007: 84.2%
- **GOODS PORT TRAFFIC, 2007**
  89.9 million tonnes. Growth 2000-2007: 47.6%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  353 municipalities
- **INTERNAL EXPENSES IN R&D, 2007**
  2,908.7 million € (1.48% of GDP).
  Growth 2000-2007: 130.45%

RELEVANT INFORMATION

- Development of Catalonian Sustainability Strategy for Climate Change.
- New waste programmes have been developed: Municipal Waste Management Programme of Catalonia (PROGREMIC, Programa de gestión de residuos municipales) 2007 – 2012; Industrial Waste Management Programme of Catalonia (PROGRIC, Programa de gestión de residuos industriales de Cataluña) 2007-2012; and Construction Waste Management Programme (PROGROC, Programa de gestión de Residuos de la construcción) 2007-2012.
- The year 2007 was the driest in the last decade; for this reason, exceptional measures were taken, such as drought declaration by means of Decree 84/2007, of 3 April, abolished by Decree 5/2009, of 13 January.

RECOMMENDED WEBSITES

- http://mediambient.gencat.net/cat/inici.jsp

FURTHER INFORMATION

- Informe de Coyuntura del Medio Ambiente 2008 *(Environment Report 2008)*
- Datos del Medio Ambiente en Cataluña 2008 *(Catalonian Environment Data 2008)*
- El Agua en Cataluña *(The Water in Catalonia)*
- Revista de Medio Ambiente, tecnología y cultura *(Journal on Environment, Technology and Culture)*



Ceuta



Statute of Autonomy: Organic Law 2/1995, of 13 March. (Official State Gazette no. 14 March 1995) **Area:** 19 km^2
Length of coastline: 21 km
Capital: Ceuta **Provinces:** 1 **Municipalities:** 1
Population, 2008: 77,389 inhab
Population density, 2008: 4,073.1 inhab/km^2
Population growth 2000-2008: 2.9%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 0.0
  2,001-10,000 inhabitants: 0.0
  10,001-100,000 inhabitants: 100.0
  100,001-500,000 inhabitants: 0.0
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 20.5
  15-64 years old: 68.3
  > 64 years old: 11.2
- **WORKING POPULATION (THOUSAND)**
  32.6 (Q4 2008)
- **UNEMPLOYMENT RATE**
  16.32% (Q4 2008)
- **UNEMPLOYMENT RATE, > 15 YEARS OLD (EU-27= 7.2%) 2007**
  20.3%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 0.0 / Industry: 2.5
  Construction: 6.2 / Services: 91.3
- **GDP MP, 2007**
  21,679 €/inhab. Growth 2006-2007: 7.0%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  14,164 €/inhab. Growth 2000-2006: 50.1%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 0.3 / Industry: 6.9
  Construction: 8.1 / Services: 84.8

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 0 / Suburban: 0 / Rural: 0
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  Without measuring network

WATER (joint figure for Ceuta and Melilla)

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  140 litres/inhab/day. Consumption decreased 8.5% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 74.0 / Municipal consumption: 3.7
  Economic sectors: 8.5 / Other: 13.9
- **DISTRIBUTION NETWORK LOSSES, 2006**
  34.2%
- **WASTE-WATER TREATMENT (2008)**
  0% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND (joint figure for Ceuta and Melilla)

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 40.8 / Agriculture: 17.7 / Forest: 41.5 / Wetlands: 0.0 / Water bodies: 0.0
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  5.1
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  No data

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  Over 500 species of flora (none of them is a strict endemism of the region)
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Not evaluated
- **CATALOGUED TAXA, 2007**
  Included in the National Catalogue (CNEA): 168, none of which have published action plans

- **NATURA 2000 NETWORK, 2008**
  630 ha (31.8% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  Without biosphere reserves
- **RAMSAR WETLANDS (2008)**
  Without Ramsar wetlands
- **FOREST FIRES, 2007**
  No fires occurred in 2007. Three fires occurred during the period between 1997-2006, which affected 2.10 ha

WASTE (joint figure for Ceuta and Melilla)

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 649.0 kg/inhab. Variation 2000-2006: 49.7%
  - Mixed: 609 kg/inhab. Variation 2000-2006: 48.2%
  - Paper/cardboard: 6.0 kg/inhab. Variation 2000-2006: 44.4%
  - Glass: 2.9 kg/inhab. Variation 2000-2006: -75.2%
  - Packaging: 31.1 kg/inhab. Variation 2000-2006: No data

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 0.74 / Hydraulic: 0.00 / Thermal: 0.74
  Nuclear: 0.00 / Wind: 0.00 / Other renewable: 0.00
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  2.5 MWh/inhab. Growth 2000-2007: 37.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007 JOINT FIGURE FOR CEUTA AND MELILLA**
  Tourist resident (Spanish): 0.65
- **HOTEL CAPACITY, 2007**
  861 hotel beds (11.2 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  55,948 vehicles. Growth 2000-2007: 15.1 %
  730.4 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  40,758 passenger cars. Growth 2000-2007: 5.2% 532.1 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 152.6 km/100 km^2 / Rail: 0.0 km/100 km^2
  Roads: 0.4 km/1,000 inhab / Rail: 0.0 km/1,000 inhab
- **AIR TRANSPORT (2007)**
  23,852 passengers. Growth 2004-2007: 51.2%
- **GOODS PORT TRAFFIC, 2007**
  2.6 million tonnes. Growth 2000-2007: -8.7%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21 (2007)**
  Without approved local Agenda 21
- **INTERNAL EXPENSES IN R&D (2007)**
  2.1 million € (0.14 % of the GDP)

RELEVANT INFORMATION

- Since 2007, 85% of the drinking water demand has been met by the production of the desalination plant. Until 2003, this proportion stood at 60%.
- In 2007, works started on the construction of a new waste-water treatment plant with a 120,000-population-equivalent capacity and a smaller plant with a 1,100- population-equivalent capacity.
- Ceuta is home to approximately 500 species of flora. These are predominantly Mediterranean and Macaronesian and include a significant number of endemisms. As regards terrestrial fauna, it is home to many exclusively North African species not present in the Iberian Peninsula. Ceuta is located between the Atlantic Ocean and the Mediterranean Sea. This location turns it into an essential element of first-order migration routes, both in connection with landbirds, seabirds, cetaceans, marine turtles and fish. The contact between these two bodies of water gives rise to the presence of extremely remarkable and diverse coastal communities, with elements from several origins, among which we can highlight invertebrates such as Patella ferruginea and Orange coral.

FURTHER INFORMATION

- http://www.ceuta.es/medioambiente/



Valencian Community



Statute of Autonomy: Organic Law 1/2006, of 10 April, amendment of Organic Law 5/1982, of 1 July, on the Statute of Autonomy of the Valencian Community
Area: 23,255 km^2
Length of coastline: 518 km
Capital: Valencia **Provinces:** 3 **Municipalities:** 542
Population, 2008: 5,029,601 inhab
Population density, 2008: 216.3 inhab/km^2
Population growth 2000-2008: 22.1%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 4.2
  2,001-10,000 inhabitants: 13.2
  10,001-100,000 inhabitants: 49.9
  100,001-500,000 inhabitants: 16.7
  > 500,000 inhabitants: 16.0
  By age group
  < 15 years old: 14.6
  15-64 years old: 69.2
  > 64 years old: 16.2
- **WORKING POPULATION (THOUSAND)**
  2,569.8 (Q4 2008)
- **UNEMPLOYMENT RATE**
  14.85% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  8.8%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 3.1 / Industry: 17.9
  Construction: 11.9 / Services: 67.1
- **GDP MP, 2007**
  21,218 €/inhab. Growth 2006-2007: 3.8%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  12,880 €/inhab. Growth 2000-2006: 27.7%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 2.3 / Industry: 18.3
  Construction: 13.0 / Services: 66.5

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 20 / Suburban: 14 / Rural: 14
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 46
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): without sufficient amount of data

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  185 litres/inhab/day. Consumption increased 11.4% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 77.1 / Municipal consumption: 6.0
  Economic sectors: 15.7 / Other: 1.2
- **DISTRIBUTION NETWORK LOSSES, 2006**
  22.8%
- **WASTE-WATER TREATMENT, 2008**
  95.10% of population equivalent provided with waste-water treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 3.9 / Agriculture: 45.5 / Forest: 49.9 / Wetlands: 0.3 / Water bodies: 0.4
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  49.0
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: No data / Intermediate: No data / High: No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 39.24 / Intermediate: 30.66 / High: 22.61 / Very high: 5.72

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  886 species of fauna (vertebrates) (2 endemisms), and 2,779 species of flora (367 endemisms), (specifically, 233 are Iberian, mainly Iberian-South-east, 68 are shared with neighbouring Autonomous Regions and 66 are exclusively Valencian endemisms)
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 344 / Vulnerable: 188 (40 species of fauna and 148 species of flora) / Endangered: 42 (15 species of fauna and 27 species of flora) / Critically endangered: 39 (6 species of fauna and 33 species of flora)

- **CATALOGUED TAXA, 2008**
  Included in Regional Catalogue: 94, of which 11 have published action plans
  Included in the National Catalogue (CNEA): 31, 26 species of fauna (of which 5 have published action plans) and 5 species of flora (of which 1 has a published action plan). Only referred to in connection with vulnerable and endangered species
- **PROTECTED AREA, 2007**
  233,348.4 ha (10.0% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  635,277 ha (27.3% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  There are no biosphere reserves
- **RAMSAR WETLANDS, 2008**
  6 wetlands (31,678.0 ha)
- **FOREST FIRES, 2007**
  375 fires which affected 8,224.69 ha. An average of 490 annual fires occurred during the period between 1997-2006, which affected 3,295.76 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 525.9 kg/inhab. Variation 2000-2006: -15.3%
  - Mixed: 475 kg/inhab. Variation 2000-2006: -20,3%
  - Paper/cardboard: 20.0 kg/inhab. Variation 2000-2006: 92.3%
  - Glass: 12.7 kg/inhab. Variation 2000-2006: -11.2%
  - Packaging: 18.2 kg/inhab. Variation 2000-2006: 3,540.0%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  32,069.5 ha. Growth 2001-2007: 76.3%
- **IRRIGATED AREA, 2007**
  307,400 ha (41.75% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.32 / Hydraulic: 0.28 / Thermal: 0.71
  Nuclear: 0.22 / Wind: 0.08 / Other renewable: 0.02
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  5.7 MWh/inhab. Growth 2000-2007: 21.7%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 4.36 / Foreign tourists: 1.15
- **HOTEL CAPACITY, 2007**
  131,387 hotel beds (26.9 beds/1,000 inhab) and 7,840 beds in rural accommodation (1.6 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  3,327,281 vehicles. Growth 2000-2007: 31.8%
  681.1 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  2,387,557 passenger cars. Growth 2000-2007: 28.0%
  488.7 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 37.0 km/100 km^2 / Rail: 4.5 km/100 km^2
  Roads: 1.8 km/1,000 inhab / Rail: 0.2 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  15,054,055 passengers. Growth 2000-2007: 81.4%
- **GOODS PORT TRAFFIC, 2007**
  71.5 million tonnes. Growth 2000-2007: 81.0%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007. VALENCIA ONLY**
  209 municipalities, of which 49 have already implemented it and are currently developing action plan projects. Moreover, 116 municipalities have the A21L diagnosis completed and 53 have a completed action plan (although with pending ratification)
- **INTERNAL EXPENSES IN R&D, 2007**
  977.6 million € (0.95% of GDP). Growth 2000-2007: 127.07%

RELEVANT INFORMATION

- The Valencian Community Biodiversity Database (http://bdb.cma.gva.es) provides a lot of information about the Community species: legal status, biology, distribution maps, pictures. The cartographic server allows queries by specific areas within the territory and by UTM grids of 10 km^2.
- The Valencian Community is the leader of water reuse in terms of the collection and treatment of waste-water within Spanish territory, surpassing every year the volume of water obtained to that effect. According to the last available data, reused water amounts to 35% of treated water.
- Water consumption in agriculture during 2006 decreased by 55 million m^3, almost 3.5%.
  It is important to highlight a reduction in CO_2 emissions, with a 13% decrease in total emissions (CORINE AIRE emissions inventory). In the last few years, this reduction has also been attested in all Community facilities, which keep their emissions under the levels allocated by the National Plan for Emission Rights Allocation.
- This year, the Environmental Education Valencian Strategy for Sustainable Development will be ready for its approval.

RECOMMENDED WEBSITES

- http://www.gva.es
- http://www.cma.gva.es
- http://bdb.cma.gva.es

FURTHER READING

- Revista Biodiversitat *(Biodiversitat Journal).* http://www.cma.gva.es/biodiversidad
- Revista Reútil *(Reútil Journal).* The business and environment journal in the Valencian Community. http://www.cma.gva.es/CTL
- Estrategia Valenciana ante el Cambio Climático 2008-2012 *(Valencian Strategy for Climate Change 2008-2012)*
- Catàleg dels Vertebrats Valencians



Extremadura



Statute of Autonomy: Organic Law 1/83, of 25 February. (Official State Gazette no. 49, of 26 February 1983)
Area: 41,635 km^2
Capital: Mérida **Provinces:** 2 **Municipalities:** 383
Population, 2008: 1,097,744 inhab
Population density, 2008: 26.4 inhab/km^2
Population growth 2000-2008: 2.6%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 19.8
  2,001-10,000 inhabitants: 31.3
  10,001-100,000 inhabitants: 35.5
  100,001-500,000 inhabitants: 13.4
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 14.5
  15-64 years old: 66.6
  > 64 years old: 18.9
- **WORKING POPULATION (THOUSAND)**
  483.3 (Q4 2008)
- **UNEMPLOYMENT RATE**
  17.96% (Q4 2008)
- **UNEMPLOYMENT RATE, > 15 YEARS OLD (EU-27= 7.2%) 2007**
  13.1%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 10.6 / Industry: 10.7
  Construction: 12.9 / Services: 65.8
- **GDP MP, 2007**
  16,109 €/inhab. Growth 2006-2007: 6.5%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  11,098 €/inhab. Growth 2000-2006: 47.1%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 9.1 / Industry: 10.2
  Construction: 16.2 / Services: 64.1

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 0 / Suburban: 4 / Rural: 2
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 12
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 17 (and 0 excluding the African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  183 litres/inhab/day. Consumption increased 17.3% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 65.1 / Municipal consumption: 9.6 / Economic sectors: 23.9 / Other: 1.4
- **DISTRIBUTION NETWORK LOSSES, 2006**
  18.5%
- **WASTE-WATER TREATMENT (2008)**
  93.98% of population equivalent provided with waste-water treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 0.6 / Agriculture: 55.6 / Forest: 42.2 / Wetlands: 0.0 / Water bodies: 1.6
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  23.4
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 83.75 / Intermediate: 9.81 / High: 6.44
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 59.21 / Intermediate: 23.00 / High: 8.95 / Very high: 0.21

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  459 species of fauna (vertebrates), without endemisms, although 20 are Iberian endemisms; and 2,053 species of flora, of which 4 are Autonomous Region endemisms and 12 are endemisms from Sierra de Gredos or the Central Mountain Range
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 459 / Vulnerable: 48 / Endangered: 17 / Critically endangered: 8
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 450, of which 4 have published action plans
  Included in the National Catalogue (CNEA): 253, of which 4 have published action plans

- **PROTECTED AREA, 2008**
  314,314.3 ha (7.5% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  1,257,693 ha (30.2% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (116,160 ha)
- **RAMSAR WETLANDS, 2008**
  2 wetlands (7,378.3 ha)
- **FOREST FIRES, 2007**
  748 fires which affected 6,032.6 ha. An average of 1,131 annual fires occurred during the period between 1997-2006, which affected 12,550.8 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 505.4 kg/inhab. Variation 2000-2006: -4.2%
  - Mixed: 461 kg/inhab. Variation 2000-2006: -7.1%
  - Paper/cardboard: 14.0 kg/inhab. Variation 2000-2006: 35.9%
  - Glass: 5.5 kg/inhab. Variation 2000-2006: -62.8%
  - Packaging: 24.9 kg/inhab. Variation 2000-2006: 283.1%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  65,673.0 ha. Growth 2001-2007: -62.0%
- **IRRIGATED AREA, 2007**
  228,554 ha (7.24% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 3.38 / Hydraulic: 1.99 / Thermal: 0.01
  Nuclear: 1.80 / Wind: 0.00 / Other renewable: 0.04
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  4.1 MWh/inhab. Growth 2000-2007: 54.7%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 4.41 / Foreign tourists: 0.21
- **HOTEL CAPACITY, 2007**
  17,580 hotel beds (16.1 beds/1,000 inhab) and 4,312 beds in rural accommodation (4.0 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  704,592 vehicles. Growth 2000-2007: 36.1%
  646.4 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  509,913 passenger cars. Growth 2000-2007: 32.9%
  467.8 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 21.9 km/100 km^2 / Rail: 1.9 km/100 km^2
  Roads: 8.4 km/1,000 inhab / Rail: 0.7 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  91,585 passengers. Growth 2000-2007: 190.5%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  All municipalities have a Local Agenda 21 at the regional or commonwealth level, and they are developing action plan projects
- **INTERNAL EXPENSES IN R&D, 2007**
  129.0 million €(0.75% of GDP). Growth 2000-2007: 128.09%

RELEVANT INFORMATION

- According to the parameters measured in the region's air quality monitoring stations, Extremadura's air quality is very good. As a result, it has not been necessary to draw up improvement plans. However, air quality in terms of particles is affected by African dust outbreaks.
- The Autonomous Region of Extremadura has Spain's lowest level of greenhouse gas emissions per capita.
- Extremadura is home to an enormous range of biodiversity and is one of Spain's most valuable regions in this regard. The following management plans have been drawn up:
  - Iberian Lynx and Spanish Imperial Eagle Recovery Plan
  - Black Vulture and Bonelli's Eagle Habitat Conservation Plan
  - Arthropod Conservation Plan: Coenagrion mercuriale, Gomphus graslinii, Macromia splendens and Oxygastra curtisii
- The following fire-fighting and prevention plans have been drawn up: The Extremadura Autonomous Region Forest Fire-Fighting Plan (INFOEX, Plan de Lucha contra los Incendios Forestales de la Comunidad Autónoma de Extremadura) for the creation of forest fire detection and fire-fighting measures and the resolution of situations deriving from these; and Plan PREIFEX, which establishes the guidelines that must be used to draw up Forest Fire Prevention Plans and Periurban Fire Prevention Plans for forest area and forestry land.
- Extremadura is encouraging the production of renewable energies, mainly solar energy.

RECOMMENDED WEBSITES

- http://www.extremambiente.es

FURTHER READING

- Regional Government of Extremadura. "Espacios protegidos de Extremadura" *(Extremadura Protected Areas)*. DVD showing Extremadura's natural areas
- Regional Government of Extremadura (several years). "Extremadura en cifras 2000 a 2007" *(Extremadura in numbers 2000-2007)*.
- Regional Government of Extremadura (several years). "Anuario estadístico" *(Statistics Yearbook)*.
- Regional Government of Extremadura. Catálogo de Aves de Extremadura *(Extremadura Bird Catalogue)*



Galicia



Statute of Autonomy: Organic Law 1/81, of 6 April (Official State Gazette no. 101, of 28 April 1981)
Area: 29,574 km^2
Length of coastline: 1,498 km
Capital: Santiago de Compostela **Provinces:** 4
Municipalities: 315 **Population, 2008:** 2,784,169 inhab
Population density, 2008: 94.1 inhab/km^2
Population growth 2000-2008: 1.9%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 4.6
  2,001-10,000 inhabitants: 27.4
  10,001-100,000 inhabitants: 44.7
  100,001-500,000 inhabitants: 23,3
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 11.3
  15-64 years old: 67.0
  > 64 years old: 21.7
- **WORKING POPULATION (THOUSAND)**
  1,324.1 (Q4 2008)
- **UNEMPLOYMENT RATE**
  9.74% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  7.6%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 7.5 / Industry: 17.5
  Construction: 10.2 / Services: 64.7
- **GDP MP, 2007**
  19,739 €/inhab. Growth 2006-2007: 6.6%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  12,929 €/inhab. Growth 2000-2006: 47.1%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 4.9 / Industry: 20.1
  Construction: 13.6 / Services: 61.4

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 7 / Suburban: 6 / Rural: 14
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 33
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 3

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  159 litres/inhab/day. Consumption increased 24.2% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 69.8 / Municipal consumption: 7.2
  Economic sectors: 18.3 / Other: 4.7
- **DISTRIBUTION NETWORK LOSSES, 2006**
  16.8%
- **WASTE-WATER TREATMENT, 2008**
  78% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 1.6 / Agriculture: 36.9 / Forest: 60.6 / Wetlands: 0.2 / Water bodies: 0.6
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  12.7
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 74.34 / Intermediate: 13.06 / High: 12.61
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Every surface is classified as wetland and sub-wetland; therefore, there is no desertification risk

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  299 species of fauna (vertebrates), of which 17 are peninsular endemisms, and 2,658 species of flora, (2,100 vascular plants and 558 non-vascular plants), of which 45 are endemisms (44 +1 respectively)
- **CATALOGUED TAXA, 2007**
  Included in the National Catalogue (CNEA): 137 threatened species (14 catalogued as “Endangered” and 1 protected by a conservation plan)
- **PROTECTED AREA, 2008**
  355,025.2 ha (12.0% of total AC area)

- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  345,720 ha (11.7% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  4 reserves (743,670 ha) One of these reserves (159,378.6 terrestrial ha and 571 marine ha) is shared with Asturias
- **RAMSAR WETLANDS, 2008**
  5 wetlands (8,256.23 ha)
- **FOREST FIRES, 2007**
  3,063 fires which affected 6,766.40 ha. An average of 10,759 annual fires occurred during the period between 1997-2006, which affected 38,394.85 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2007 (DATA PROVIDED BY THE AC)**
  - Total: 410.4 kg/inhab. Variation 2002-2007: +5.6%
  - Mixed: 356.2 kg/inhab. Variation 2002-2007: +3.1%
  - Paper/cardboard: 21.5 kg/inhab. Variation 2003-2007: +95.4%
  - Glass: 14.8 kg/inhab. Variation 2003-2007: +59.1%
  - Packaging: 17.9 kg/inhab. Variation 2003-2007: +59.8%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  10,985.03 ha. Growth 2001-2007: 551.9%
- **IRRIGATED AREA, 2007**
  25,152 ha (2.91% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2008**
  Total: 3.89 / Hydraulic: 1.20 / Thermal: 1.52
  Nuclear: 0.00 / Wind: 1.12 / Other renewable: 0.04
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  7.2 MWh/inhab. Growth 2000-2007: 33.6%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 3.54 / Foreign tourists: 0.41
- **HOTEL CAPACITY, 2007**
  67,549 hotel beds (24.4 beds/1,000 inhab) and 5,747 beds in rural accommodation (2.2 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  1,845,467 vehicles. Growth 2000-2007: 28.5%
  665.6 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  1,434,751 passenger cars. Growth 2000-2007: 25.1%
  517.5 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 59.3 km/100 km^2 / Rail: 3.7 km/100 km^2
  Roads: 6.3 km/1,000 inhab / Rail: 0.4 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  4,722,935 passengers. Growth 2000-2007: 78.7%
- **GOODS PORT TRAFFIC, 2007**
  36.12 million tonnes. Growth 2000-2007: 20.5%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  93 municipalities that have already implemented it and are currently developing action plan projects
- **INTERNAL EXPENSES IN R&D, 2007**
  555.6 million € (1.03% of GDP). Growth 2000-2007: 165.27%

RECOMMENDED WEBSITES

- http://xunta.es/
- http://www.inega.es/
- http://sirga.medioambiente.xunta.es
- http://www.siam-cma.org/siam/
- http://www.ige.eu



La Rioja



Statute of Autonomy:: Organic Law 3/82, of 9 June (Official State Gazette no. 146, of 19 June 1982)
Area: 5,045 km^2
Capital: Logroño **Provinces:** 1 **Municipalities:** 174
Population, 2008: 317,501 inhab
Population density, 2008: 62.9 inhab/km^2
Population growth 2000-2008: 20.2%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%) BY MUNICIPALITY SIZE**
  By municipality size
  < 2,001 inhabitants: 13.5
  2,001-10,000 inhabitants: 23.3
  10,001-100,000 inhabitants: 16.0
  100,001-500,000 inhabitants: 47.3
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 13.8
  15-64 years old: 68.2
  > 64 years old: 18.0
- **WORKING POPULATION (THOUSAND)**
  160.1 (Q4 2008)
- **UNEMPLOYMENT RATE**
  9.75% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  5.7%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 3.4 / Industry: 25.3
  Construction: 11.2 / Services: 60.0
- **GDP MP, 2007**
  25,133 €/inhab. Growth 2006-2007: 5.1%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  15,475 €/inhab. Growth 2000-2006: 29.6%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 6.8 / Industry: 25.9
  Construction: 11.9 / Services: 55.4

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 1 / Suburban: 0 / Rural: 4
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 24
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 3 (and 0 excluding the African dust outbreaks with the reference station Izqui)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  148 litres/inhab/day. Consumption decreased 20.4% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 55.2 / Municipal consumption: 8.8
  Economic sectors: 35.9 / Other: 0.1
- **DISTRIBUTION NETWORK LOSSES, 2006**
  16.3%
- **WASTE-WATER TREATMENT, 2008**
  95% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 1.0 / Agriculture: 42.2 / Forest: 56.4 / Wetlands: 0.0 / Water bodies: 0.4
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  20.2
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 65.84 / Intermediate: 20.43 / High: 13.72
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 28.78 / Intermediate: 16.25 / High: 15.99 / Very high: No data

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  276 species of fauna (vertebrates), of which 12 are endemisms, and 2,018 species of flora
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 419 / Vulnerable: 68 / Endangered: 40 / Critically endangered: 20

- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 9, of which 5 have published action plans
  Included in the National Catalogue (CNEA): 18, of which 1 has published action plans
- **PROTECTED AREA, 2008**
  166,418.4 ha (33.0 % of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  167,473 ha (33.2 % of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (59,379 ha)
- **RAMSAR WETLANDS, 2008**
  1 wetland (86.1 ha)
- **FOREST FIRES, 2007**
  93 fires which affected 69.49 ha. An average of 105 annual fires occurred during the period between 1997-2006, which affected 149.31ha

WASTE (Data provided by the AC)

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 451.2 kg/inhab. Variation 2000-2006: 0.42%
  - Mixed: 396.3 kg/inhab. Variation 2000-2006: -5.07%
  - Paper/cardboard: 23.88 kg/inhab. Variation 2000-2006: 8.47%
  - Glass: 19.32 kg/inhab. Variation 2000-2006: 44.27%
  - Packaging: 11.71 kg/inhab. Variation 2000-2006: 172.27%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  8,560.8 ha. Growth 2001-2007: 263.2%
- **IRRIGATED AREA, 2007**
  44,982 ha (20.58% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 4.40 / Hydraulic: 0.08 / Thermal: 2.72
  Nuclear: 0.00 / Wind: 1.57 / Other renewable: 0.03
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  5.6 MWh/inhab. Growth 2000-2007: 17.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 4.11 / Foreign tourists: 0.19
- **HOTEL CAPACITY, 2007**
  6,445 hotel beds (20.9 beds/1,000 inhab) and 767 beds in rural accommodation (2.5 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  188,430 vehicles. Growth 2000-2007: 30.9%
  609.9 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  127,445 passenger cars. Growth 2000-2007: 25.4%
  412.5 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 37.5 km/100 km^2 / Rail: 2.4 km/100 km^2
  Roads: 6.1 km/1,000 inhab / Rail: 0.4 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  56,371 passengers. Growth 2003-2007: 178.8%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  7 municipalities that have already implemented it and are currently developing action plan projects
- **INTERNAL EXPENSES IN R&D, 2007**
  90.2 million €(1.18% of GDP). Growth 2000-2007: 229.46%

RECOMMENDED WEBSITES

- http://www.larioja.org/

FURTHER READING

- Plan Director de Saneamiento y Depuración 2007-2015 de la Comunidad Autónoma de La Rioja *(Sewerage and Wastewater Treatment Guiding Plan 2007-2015 of the Autonomous Region of La Rioja)*
- Estrategia Regional Frente al Cambio Climático 2008-2012 *(Regional Strategy for Climate Change 2008-2012)*
- Decree 59/1998, of 9 October, by means of which the Regional Catalogue of Wild Threatened Species of Flora and Fauna of La Rioja is created and regulated.
- Inventario de lepidópteros de La Rioja *(La Rioja Lepidoptera Inventory)* (1995-2001)
- Mapa de lepidópteros de La Rioja *(La Rioja Lepidoptera Map)*
- Inventario de flora vascular silvestre de La Rioja *(La Rioja Wild Vascular Flora Inventory)* (1997-1999)
- Mapa de áreas de interés especial de especies protegidas de Flora de La Rioja *(Map of Special Interest Areas of Protected Species of Flora in La Rioja)*
- Plan Director de Residuos 2007-2015 *(Waste Guiding Plan 2007-2015)*
- Regional Government of La Rioja, 2007. Medio Ambiente en La Rioja 2003-2006 *(Environment in La Rioja 2003-2006)*
- Regional Government of La Rioja, 2003. Medio Ambiente en La Rioja 2002 *(Environment in La Rioja 2002)*
- Regional Government of La Rioja, 2002. Medio Ambiente en La Rioja 2001 *(Environment in La Rioja 2001)*
- Regional Government of La Rioja, 2000. Medio Ambiente en La Rioja 2000 *(Environment in La Rioja 2000)*

Madrid



Statute of Autonomy: Organic Law 3/83, of 25 February. (Official State Gazette no. 51, of 1 March 1983)
Area: 8,028 km^2
Capital: Madrid **Provinces:** 1 **Municipalities:** 179
Population, 2008: 6,271,638 inhab
Population density, 2008: 781.2 inhab/km^2
Population growth 2000-2008: 20.5%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 0.7
  2,001-10,000 inhabitants: 5.0
  10,001-100,000 inhabitants: 19.9
  100,001-500,000 inhabitants: 23.2
  > 500,000 inhabitants: 51.2
  By age group
  < 15 years old: 14.7
  15-64 years old: 71.1
  > 64 years old: 14.3
- **WORKING POPULATION (THOUSAND)**
  3,402.2 (Q4 2008)
- **UNEMPLOYMENT RATE**
  10.15% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  6.3%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 0.5 / Industry: 9.9
  Construction: 9.2 / Services: 80.4
- **GDP MP, 2007**
  30,419 €/inhab. Growth 2006-2007: 4.6%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  17,039 €/inhab. Growth 2000-2006: 33.3%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 0.2 / Industry: 13.2
  Construction: 10.9 / Services: 75.7

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 38 / Suburban: 4 / Rural: 6
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 60
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 51

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  148 litres/inhab/day. Consumption decreased 15.9% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 72.1 / Municipal consumption: 7.7 / Economic sectors: 20.1 / Other: 0.1
- **DISTRIBUTION NETWORK LOSSES, 2006**
  12.3%

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 11.2 / Agriculture: 38.4 / Forest: 49.6 / Wetlands: 0.0 / Water bodies: 0.7
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  49.2
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 81.28 / Intermediate: 10.89 / High: 7.83
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 46.45 / Intermediate: 21.62 / High: 22.04 / Very high: 0.14

NATURE & BIODIVERSITY

- **PROTECTED AREA, 2008**
  113,583.7 ha (14.2 % of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  319,821 ha (39.9 % of total AC area)
- **BIOSPHERE RESERVES, 2008**
  2 reserves (62,731 ha)
- **RAMSAR WETLANDS, 2008**
  1 wetland (487.2 ha)
- **WETLANDS INCLUDED IN THE SPANISH NATIONAL WETLANDS INVENTORY, 2008**
  23 wetlands (282.65 ha)
- **FOREST FIRES, 2007**
  230 fires which affected 449.75 ha. An average of 290 annual fires occurred during the period between 1997-2006, which affected 1,403.75 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 619.7 kg/inhab. Variation 2000-2006: 2.0%
  - Mixed: 564 kg/inhab. Variation 2000-2006: 2.2%
  - Paper/cardboard: 22.4 kg/inhab. Variation 2000-2006: 14.9%
  - Glass: 9.0 kg/inhab. Variation 2000-2006: -57.9%
  - Packaging: 24.3 kg/inhab. Variation 2000-2006: 63.1%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  4,918.2 ha. Growth 2001-2007: 156.8%
- **IRRIGATED AREA, 2007**
  14,964 ha (4.89% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 0.08 / Hydraulic: 0.02 / Thermal: 0.05
  Nuclear: 0.00 / Wind: 0.00 / Other renewable: 0.02
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  4.9 MWh/inhab. Growth 2000-2007: 17.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 2.52 / Foreign tourists: 0,72
- **HOTEL CAPACITY, 2007**
  92,802 hotel beds (15.3 beds/1,000 inhab) and 3,034 beds in rural accommodation (0.5 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  4,333,476 vehicles. Growth 2000-2007: 26.3%
  712.5 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  3,326,579 passenger cars. Growth 2000-2007: 19.2%
  547.0 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 42.2 km/100 km^2 / Rail: 8.2 km/100 km^2
  Roads: 0.6 km/1,000 inhab / Rail: 0.1 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  52,149,556 passengers. Growth 2000-2007: 58.2%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  80 municipalities, of which 9 have already implemented it and are currently developing action plan projects. Moreover, 23 municipalities have the A21L diagnosis completed and 18 have a completed action plan (although with pending ratification)
- **INTERNAL EXPENSES IN R&D, 2007**
  3,584.1 million €(1.96% of GDP). Growth 2000-2007: 104.58%

RELEVANT INFORMATION

- In 2008, the Telematic Registry of the Regional Ministry of the Environment, Housing and Land Use Planning was authorised for the reception, through electronic media, of control and tracking documents in connection with hazardous waste, used oils and small amounts of hazardous waste, as well as the Annual Declaration of Hazardous Waste Producer, by means of formalities entitled "Presentación de documentos de control y seguimiento de residuos peligrosos" (Hazardous waste control and tracking documents) and "Presentación de la Declaración de Productor de Residuos Peligrosos" (Submitting of the Declaration of Hazardous Waste Producer) (Resolutions dated 15 December 2008. Official Gazette of the Community of Madrid 5/II/2009).
- In 2008 the Environment Legislation Database was implemented, and is now available at www.madrid.org/rlma_web.

RECOMMENDED WEBSITES

- www.madrid.org/medioambiente
- http://gestiona.madrid.org/aireinternet

FURTHER READING

- El Medio Ambiente en la Comunidad de Madrid (The Environment in the Community of Madrid)
- Series "Cuadernillos de información ambiental" *(Environmental Information Handbooks)*

Melilla



Statute of Autonomy: Organic Law 2/1995, of 13 March (Official State Gazette of 14 March 1995)
Area: 13 km^2
Length of coastline: 9 km
Capital: Melilla **Provinces:** 1 **Municipalities:** 1
Population, 2008: 71,448 inhab
Population density, 2008: 5,496.0 inhab/km^2
Population growth 2000-2008: 7.8%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 0.0
  2,001-10,000 inhabitants: 0.0
  10,001-100,000 inhabitants: 100.0
  100,001-500,000 inhabitants: 0.0
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 22.1
  15-64 years old: 67.3
  > 64 years old: 10.5
- **WORKING POPULATION (THOUSAND)**
  25.7 (Q4 2008)
- **UNEMPLOYMENT RATE**
  16.87% (Q4 2008)
- **UNEMPLOYMENT RATE, > 15 YEARS OLD (EU-27= 7.2%) 2007**
  18.2%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 0.0 / Industry: 3.4
  Construction: 5.5 / Services: 91.0
- **GDP MP, 2007**
  21,177 €/inhab. Growth 2006-2007: 5.2%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  14,236 €/inhab. Growth 2000-2006: 50.2%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 0.7 / Industry: 4.4
  Construction: 9.9 / Services: 85.0

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 0 / Suburban: 0 / Rural: 0
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  Without measuring network However, the air quality is evaluated with assistance from MARM's mobile laboratory by means of several campaigns (the last one took place in 2005)

WATER (joint figure for Ceuta and Melilla)

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  140 litres/inhab/day. Consumption decreased 8.5% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 74.0 / Municipal consumption: 3.7
  Economic sectors: 8.5 / Other: 13.9
- **DISTRIBUTION NETWORK LOSSES, 2006**
  34.2%
- **WASTE-WATER TREATMENT, 2008**
  100% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND (joint figure for Ceuta and Melilla)

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 40.8 / Agriculture: 17.7 / Forest: 41.5 / Wetlands: 0.0 / Water bodies: 0.0
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  5.1
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  No data

NATURE & BIODIVERSITY

- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  103 ha (7.4% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  Without biosphere reserves
- **RAMSAR WETLANDS (2008)**
  Without Ramsar wetlands

- **FOREST FIRES, 2007**
  No fires occurred in 2007. There were no forest fires in the period between 1997-2006 either

WASTE (joint figure for Ceuta and Melilla)

- **URBAN WASTE PER INHABITANT, 2006**
  – Total: 649.0 kg/inhab. Variation 2000-2006: 49.7%
  – Mixed: 609 kg/inhab. Variation 2000-2006: 48.2%
  – Paper/cardboard: 6.0 kg/inhab. Variation 2000-2006: -44.4%
  – Glass: 2.9 kg/inhab. Variation 2000-2006: -75.2%
  – Packaging: 31.1 kg/inhab. Variation 2000-2006: No data

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 0.91 / Hydraulic: 0.00 / Thermal: 0.86
  Nuclear: 0.00 / Wind: 0.00 / Other renewable: 0.04
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  2.6 MWh/inhab. Growth 2000-2007: 45.4%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007 JOINT FIGURE FOR CEUTA AND MELILLA**
  Tourist resident (Spanish): 0.65
- **HOTEL CAPACITY, 2007**
  848 hotel beds (12.2 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  51,310 vehicles. Growth 2000-2007: 40.1%
  738.9 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  36,043 passenger cars. Growth 2000-2007: 33.7%
  519.1 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 230.8 km/100 km^2 / Rail: 0.0 km/100 km^2
  Roads: 0.4 km/1,000 inhab / Rail: 0.0 km/1,000 inhab
- **AIR TRANSPORT (2007)**
  339,244 passengers. Growth 2000-2007: 28.6%
- **GOODS PORT TRAFFIC, 2007**
  0.83 million tonnes. Growth 2000-2007: 3.4%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21 (2007)**
  1 municipality that has already implemented it and that is currently developing action plan projects
- **INTERNAL EXPENSES IN R&D (2007)**
  4.0 million € (0.27 % of the GDP)

RELEVANT INFORMATION

The water network is improved.
The improvement of the hydric resources has become one of the main goals of the Regional Ministry of the Environment, which has planned a dozen actions that will lead to an investment exceeding € 3.6 million. Almost two million euros have been allocated for the improvement of water pipes, both for distribution and collection, in order to reduce leaks as much as possible and also to reduce the production of desalination and well water. Two new improvement works for the water supply network have been planned in order to secure water demand and, above all, to regenerate and protect the hydric environment.

Works are currently in progress in order to renovate the city centre parks, and to make the Río de Oro river navigable.
The Regional Ministry of the Environment will implement three projects that will entail an investment exceeding € 11.5 million, and that will improve the two parks of the city centre and transform the mouth of the Río de Oro river. Besides putting a stop to the degradation of the watercourse, the goal is to mitigate the damage caused by future avenues. Moreover, the Río de Oro river will be navigable for small vessels and pedestrian accesses will be built for the residents to be able to walk in the surrounding area.

Construction of the nursery that will supply plants and flowers to the city.
The future plants and flowers to be placed in the city public parks and gardens will be brought, in the next few months, from the future municipal nurseries that the Regional Ministry of the Environment has begun to build and that will occupy a space of approximately 18,000 m^2. On top of the nurseries, a nature classroom will be built.

RECOMMENDED WEBSITES

- http://www.melilla.es/melillaPortal/index.jsp

Murcia



Statute of Autonomy: Organic Law 4/82, of 9 June (Official State Gazette no. 146, of 19 June 1982)
Area: 11,313 km^2
Length of coastline: 274 km (290 including Mar Menor and islands) **Capital:** Murcia **Provinces:** 1 **Municipalities:** 45
Population, 2008: 1,426,109 inhab
Population density, 2008: 126.1 inhab/km^2
Population growth 2000-2008: 24,1%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 0.4
  2,001-10,000 inhabitants: 4.8
  10,001-100,000 inhabitants: 49.8
  100,001-500,000 inhabitants: 44.9
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 17.2
  15-64 years old: 69.2
  > 64 years old: 13.6
- **WORKING POPULATION (THOUSAND)**
  725.2 (Q4 2008)
- **UNEMPLOYMENT RATE**
  15.53% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  7.6%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 10.7 / Industry: 14.2
  Construction: 12.0 / Services: 63.1
- **GDP MP, 2007**
  19,324 €/inhab. Growth 2006-2007: 3.6%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  11,456 €/inhab. Growth 2000-2006: 31.1%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 5.1 / Industry: 17.8
  Construction: 12.5 / Services: 64.5

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 1 / Suburban: 5 / Rural: 0
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION (2007)**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 37
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 9

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  166 litres/inhab/day. Consumption increased 14.5% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 69.0 / Municipal consumption: 6.8
  Economic sectors: 23.4 / Other: 0.8
- **DISTRIBUTION NETWORK LOSSES, 2006**
  14.7%
- **WASTE-WATER TREATMENT, 2008**
  100 % of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC. 5% of the total of population equivalent within the Region of Murcia is not covered by the scope of said Directive

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 2.6 / Agriculture: 56.8 / Forest: 39.2 / Wetlands: 0.1 / Water bodies: 1.3
- **INCREASE IN ARTIFICIAL SURFACES, 1990-2000 (%)**
  52.7
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 66.41 / Intermediate: 18.13 / High: 15.46
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 19.28 / Intermediate: 37.10 / High: 25.10 / Very high: 18.27

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  425 taxa of vertebrate fauna, of which 10 are Iberian endemisms
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Flora: Total number of evaluated taxa: 89 / Vulnerable: 41 / Endangered: 9 / Critically endangered: 13
  Fauna: Total number of evaluated taxa: 119 / Vulnerable: 40 / Endangered: 18 / Critically endangered: 16
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 58 without published action plans
  Included in the National Catalogue (CNEA): 19 without published action plans
- **PROTECTED AREA (2008) (DATA PROVIDED BY THE AUTONOMOUS REGION)**
  Protected Areas (after the Land Law "Ley Suelo"): 66,864.97 ha (5.91% of total AC area)
  Protected Areas according to the Spanish Natural Resources Management Plan (PORN, Plan de Ordenación de los Recursos Naturales): 12,562.50 ha (1.11% of total AC area)

Protected Areas, total: 79,427.47 ha (7.02% of total AC area)

- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008 (DATA PROVIDED BY THE AUTONOMOUS REGION)**
  Natura Terrestrial Network (with Sites of Community Importance accepted by the Commission): 265,804.69 ha (23.50% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  Without biosphere reserves
- **RAMSAR WETLANDS, 2008**
  1 wetland (14,933.0 ha)
- **FOREST FIRES, 2007**
  113 fires which affected 160.18 ha. An average of 144 annual fires occurred during the period between 1997-2006, which affected 153.63 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 552.6 kg/inhab. Variation 2000-2006: -4.1%
  - Mixed: 502 kg/inhab. Variation 2000-2006: -9.2%
  - Paper/cardboard: 11.2 kg/inhab. Variation 2000-2006: -11.1%
  - Glass: 9.8 kg/inhab. Variation 2000-2006: -3.9%
  - Packaging: 29.6 kg/inhab. Variation 2000-2006: 4,833.31%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  24,683.1 ha. Growth 2001-2007: 41.5%
- **IRRIGATED AREA, 2007**
  168,594 ha (34.79% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 3.15 / Hydraulic: 0.03 / Thermal: 3.04
  Nuclear: 0.00 / Wind: 0.06 / Other renewable: 0.02
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  5.6 MWh/inhab. Growth 2000-2007: 27.4%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 2.89 / Foreign tourists: 0.48
- **HOTEL CAPACITY, 2007**
  20,384 hotel beds (14.6 beds/1,000 inhab) and 2,580 beds in rural accommodation (1.9 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  957,599 vehicles. Growth 2000-2007: 42.2%
  687.9 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  673,379 passenger cars. Growth 2000-2007: 37.3%
  483.7 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 33.2 km/100 km^2 / Rail: 2.5 km/100 km^2
  Roads: 2.7 km/1,000 inhab / Rail: 0.2 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  2,002,949 passengers. Growth 2000-2007: 1,179.5%
- **GOODS PORT TRAFFIC, 2007** 24.05 million tonnes. Growth 2000-2007: 38.2%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  No municipality has implemented the Agenda yet but 22 already have the A21L diagnosis completed and 11 have a completed action plan (although with pending ratification).
- **INTERNAL EXPENSES IN R&D, 2007**
  247.6 million € (0.91% of GDP). Growth 2000-2007: 137.53%

RELEVANT INFORMATION

- Creation of a Dog Squad for the detection of poisoned baits, and the Horse Squad for the implementation of horse patrols that will avoid the impact on the environment that might be caused by the use of other means of transport.
- New 2008 image, NATMUR08, of the photogrammetric flight, which has provided updated geographical information. It has infrared information and it is the first project in the Region of Murcia to use a combination of digital photogrammetric cameras with a LIDAR laser sensor.
- Creation of a draft for the Decree of Natural Monuments.
- There is an increase in number regarding the facilities of the Nature Classrooms Network, the goal of which is to encourage curiosity and to awaken the interest on the knowledge of the natural and cultural values of the environment.
- Correction of electrical lines: the project began during 2008. Upon its completion, in 2010, it is expected that over 1,000 supports would have been revised, thus achieving a reduction in the number of deaths by electric shock of over 85% within SPA zones.
- Development of the document entitled "Criterios ambientales" (Environmental Criteria), a series of criteria applicable to the different projects and actions that are subject to reporting due to the potential impact they may have on the environment.
- Proposal of Public Use Decree: draft of the decree that is currently being developed and that will regulate public use in protected areas.

RECOMMENDED WEBSITES

- http://ww.carm.es/medioambiente

FURTHER READING

- D.G. Patrimonio Natural y Biodiversidad (Directorate General of Natural Heritage and Biodiversity). Murcia enclave ambiental. Journal
- D.G. Patrimonio Natural y Biodiversidad (Directorate General of Natural Heritage and Biodiversity). El Mirador: Boletín de la Red de Espacios Naturales Protegidos de la Región de Murcia (Journal on the Network of Natural Protected Areas of the Region of Murcia). Journal
- D.G. Patrimonio Natural y Biodiversidad (Directorate General of Natural Heritage and Biodiversity). Voluntari@s por Naturaleza. Journal
- D.G. Patrimonio Natural y Biodiversidad (Directorate General of Natural Heritage and Biodiversity). Informative Journal "Aulas de la Naturaleza" (Nature Classrooms)

Navarre



Statute of Autonomy Organic Law 13/82, of 10 August, on the reincorporation and improvement of the Regional Government of Navarre
Area: 10,390 km^2
Capital: Pamplona **Provinces:** 1 **Municipalities:** 272
Population, 2008: 620,377 inhab
Population density, 2008: 59.7 inhab/km^2
Population growth 2000-2008: 14.1%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 14.7
  2,001-10,000 inhabitants: 31.9
  10,001-100,000 inhabitants: 21.6
  100,001-500,000 inhabitants: 31.8
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 14.7
  15-64 years old: 68.0
  > 64 years old: 17.3
- **WORKING POPULATION (THOUSAND)**
  309.0 (Q4 2008)
- **UNEMPLOYMENT RATE**
  8.12% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  4.8%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 4.1 / Industry: 27.7
  Construction: 10.0 / Services: 58.2
- **GDP MP, 2007**
  29,549 €/inhab. Growth 2006-2007: 5.5%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  17,887 €/inhab. Growth 2000-2006: 38.7%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 2.8 / Industry: 28.5
  Construction: 11.7 / Services: 57.0

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 3 / Suburban: 2 / Rural: 3
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 29
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 27

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  128 litres/inhab/day. Consumption decreased 19.5% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 49.0 / Municipal consumption: 14.3
  Economic sectors: 30.6 / Other: 6.1
- **DISTRIBUTION NETWORK LOSSES, 2006**
  13.9%
- **WASTE-WATER TREATMENT, 2008**
  97% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)**
  Artificial: 1.0 / Agriculture: 46.6 / Forest: 52.2 / Wetlands: 0.0 / Water bodies: 0.3
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  50.3
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: 65.64 / Intermediate: 18.79 / High: 15.57
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 20.53 / Intermediate: 15.60 / High: 4.30 / Very high: 0.00

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  390 species of fauna (vertebrates), without endemisms; and 2,650 species of flora with two endemisms
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 43 / Vulnerable: 24 / Endangered: 3 / Critically endangered: 4
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 50 without published action plans
  Included in the National Catalogue (CNEA): 1 without published action plan

- **PROTECTED AREA, 2008**
  84,914.4 ha (8.18% of total AC area)
- **NATURA 2000 NETWORK, 2008**
  253,002 ha (24.4% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (41,845 ha)
- **RAMSAR WETLANDS, 2008**
  2 wetlands (315.77 ha)
- **FOREST FIRES, 2007**
  504 fires which affected 473.86 ha. An average of 181 annual fires occurred during the period between 1997-2006, which affected 519.53 ha

WASTE (Data provided by the AC)

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 466.73 kg/inhab. Variation 2000-2006: 5.41%
  - Mixed: 355 kg/inhab. Variation 2000-2006: -3.39%
  - Paper/cardboard: 50.13 kg/inhab. Variation 2000-2006: 46.04%
  - Glass: 20.90 kg/inhab. Variation 2000-2006: 40.63%
  - Packaging: 49.72 kg/inhab. Variation 2000-2006: 45.58 %

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  28,378.5 ha. Growth 2001-2007: 48.9%
- **IRRIGATED AREA, 2007**
  80,167 ha (17.06% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 4.10 / Hydraulic: 0.21 / Thermal: 2.24
  Nuclear: 0.00 / Wind: 1.51 / Other renewable: 0.15
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  8.0 MWh/inhab. Growth 2000-2007: 21.2%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007**
  Total tourists: 3.54 / Foreign tourists: 0.31
- **HOTEL CAPACITY, 2007**
  11,198 hotel beds (18.5 beds/1,000 inhab) and 3,121 beds in rural accommodation (5.2 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  413,820 vehicles. Growth 2000-2007: 24.3%
  683.0 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  286,394 passenger cars. Growth 2000-2007: 19.1%
  472.7 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 37.8 km/100 km^2 / Rail: 2.3 km/100 km^2
  Roads: 6.5 km/1,000 inhab / Rail: 0.4 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  500,097 passengers. Growth 2000-2007: 44.8%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  131 municipalities that have already implemented it and that are currently developing action plan projects (all have the A21L diagnosis completed)
- **INTERNAL EXPENSES IN R&D, 2007**
  333.9 million € (1.89% of GDP). Growth 2000-2007: 252.97%

RELEVANT INFORMATION

- The difference in GDP per capita (purchasing power) has increased by 14% in the period 2000-2007.
- In 2007, the unemployment rate was 4.8%, almost half the EU-27 figure.
- The Regional Government of Navarre enjoys an excellent air quality and the regulatory limits established by the European Union have not been exceeded yet.
- Regarding waste-water treatment, they are in the lead among the Autonomous Regions, since 97% of the population is provided with said service, in accordance with Directive 91/271/EEC.
- It is remarkable how small a surface area was affected by forest fires in 2007, with less than 500 affected ha in almost 500 disaster events.
- There was a slight increase in the production of urban waste (5%), partially offset by the reduction of mixed waste (3%) and the improvement of the recycling process, which has increased over 40% during 2000-2006 in the case of paper/cardboard, glass and packaging.
- The region is one of the leaders in the production of renewable energy (46.42%), with 63.14% of electricity consumption for year 2007.

RECOMMENDED WEBSITES

- http://www.navarra.es
- http://sitna.navarra.es

FURTHER READING

- Informe de Estado del Medio Ambiente en Navarra *(Report on the Environmental Status of Navarre)*. 2008

Basque Country



Statute of Autonomy: Organic Law 3/79, of 18 December (Official State Gazette no. 306, of 22 December 1979)
Area: 7,235 km^2
Length of coastline: 252 km
Capital: Vitoria **Provinces:** 3 **Municipalities:** 251
Population, 2008: 2,157,112 inhab
Population density, 2008: 298.1 inhab/km^2
Population growth 2000-2008: 2.8%

- **DEMOGRAPHIC DISTRIBUTION, 2008 (%)**
  By municipality size
  < 2,001 inhabitants: 5.2
  2,001-10,000 inhabitants: 14.4
  10,001-100,000 inhabitants: 44.7
  100,001-500,000 inhabitants: 35.7
  > 500,000 inhabitants: 0.0
  By age group
  < 15 years old: 12.7
  15-64 years old: 68.6
  > 64 years old: 18.6
- **WORKING POPULATION (THOUSAND)**
  1,063.9 (Q4 2008)
- **UNEMPLOYMENT RATE**
  8.32% (Q4 2008)
- **UNEMPLOYMENT RATE > 15 YEARS OLD (EU-27= 7.2%), 2007**
  6.1%
- **EMPLOYMENT BREAK-DOWN BY SECTOR, 2008 (%)**
  Agriculture: 1.6 / Industry: 23.3
  Construction: 8.7 / Services: 66.5
- **GDP MP, 2007**
  30,450 €/inhab. Growth 2006-2007: 6.3%
- **GROSS DISPOSABLE INCOME PER INHABITANT, 2006**
  18,335 €/inhab. Growth 2000-2006: 45.3%
- **GVA BREAK-DOWN BY SECTOR, 2007 (%)**
  Agriculture: 1.2 / Industry: 30.2
  Construction: 10.3 / Services: 58.4

AIR

- **NO. OF AIR QUALITY MONITORING STATIONS IN THE AUTONOMOUS REGION, 2007**
  Urban: 20 / Suburban: 13 / Rural: 4
- **VALUES RECORDED ABOVE REGULATORY LEVELS IN URBAN STATIONS IN THE CAPITAL OF THE AUTONOMOUS REGION, 2007**
  – Average annual NO_2 concentration in µg/m^3 (2010 limit: 40 µg/m^3): 33
  – No. days/year average daily PM_{10} concentration exceeds 50 µg/m^3 (2005 limit: 35 days/year): 26 (and 16.5 excluding the African dust outbreaks)

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION, 2006**
  129 litres/inhab/day. Consumption decreased 16.2% in the 2000-2006 period
- **WATER DISTRIBUTION BY SECTOR, 2006 (%)**
  Households: 52.9 / Municipal consumption: 13.9
  Economic sectors: 31.0 / Other: 2.2
- **DISTRIBUTION NETWORK LOSSES, 2006**
  12.7%
- **WASTE-WATER TREATMENT, 2008**
  91.5% of population equivalent provided with wastewater treatment compliant with Directive 91/271/EEC

LAND

- **LAND-USE BREAK-DOWN, 2000 (%)** Artificial: 3.2 / Agriculture: 31.4 / Forest: 64.7 / Wetlands: 0.1 / Water bodies: 0.6
- **INCREASE IN ARTIFICIAL SURFACES 1990- 2000 (%)**
  13.6
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION, 2008 (%)**
  Moderate: No data / Intermediate: No data / High: No data
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Low: 1.28 / Intermediate: 2.46 / High: 1.52 / Very high: 0.00

NATURE & BIODIVERSITY

- **NATIVE TAXA, 2007**
  487 species of fauna (vertebrates) and 2,830 species of flora
- **THREATENED TAXA ACCORDING TO IUCN THREATENED CATEGORIES, 2007**
  Total number of evaluated taxa: 3,317 / Vulnerable: 18 / Endangered: 5 / Critically endangered: 3
- **CATALOGUED TAXA, 2007**
  Included in Regional Catalogue: 269, of which 17 have published action plans

Included in the National Catalogue (CNEA): 260, of which 8 have published action plans

- **PROTECTED AREA, 2008**
  98,740.5 ha (13.7% of total AC area)
- **NATURA 2000 NETWORK TERRESTRIAL AREA, 2008**
  145,320 ha (20.1% of total AC area)
- **BIOSPHERE RESERVES, 2008**
  1 reserve (22,041 ha)
- **RAMSAR WETLANDS, 2008**
  6 wetlands (1,714.1 ha)
- **FOREST FIRES, 2007**
  63 fires which affected 96.11 ha. An average of 199 annual fires occurred during the period between 1997-2006, which affected 812.62 ha

WASTE

- **URBAN WASTE PER INHABITANT, 2006**
  - Total: 583.0 kg/inhab. Variation 2000-2006: 12.7%
  - Mixed: 488 kg/inhab. Variation 2000-2006: 1.0%
  - Paper/cardboard: 39.3 kg/inhab. Variation 2000-2006: 72.4%
  - Glass: 19.7 kg/inhab. Variation 2000-2006: 84.1%
  - Packaging: 36.0 kg/inhab. Variation 2000-2006: 3,500.0%

AGRICULTURE

- **ORGANIC FARMLAND, 2007**
  1,061.7 ha. Growth 2001-2007: 86.6%
- **IRRIGATED AREA, 2007**
  10,413 ha (4.63% of the total agricultural area)

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS, 2007**
  Total: 1.86 / Hydraulic: 0.07 / Thermal: 1.65
  Nuclear: 0.00 / Wind: 0.07 / Other renewable: 0.08
- **ELECTRICITY CONSUMPTION PER INHABITANT IN MWH, 2007**
  9.3 MWh/inhab. Growth 2000-2007: 20.5%

TOURISM

- **NO. OF TOURISTS PER INHABITANT, 2007** Total tourists: 2.02 / Foreign tourists: 0.46
- **HOTEL CAPACITY, 2007**
  23,624 hotel beds (11.0 beds/1,000 inhab) and 2,882 beds in rural accommodation (1.3 beds/1,000 inhab)

TRANSPORT

- **VEHICLE FLEET, 2007**
  1,252,519 vehicles. Growth 2000-2007: 19.1%
  584.8 vehicles/1,000 inhab
- **PASSENGER CAR FLEET, 2007**
  928,759 passenger cars. Growth 2000-2007: 13.2%
  433.6 passenger cars/1,000 inhab
- **TRANSPORT NETWORK DENSITY, 2007**
  Roads: 58.5 km/100 km^2 / Rail: 8.5 km/100 km^2
  Roads: 2.0 km/1,000 inhab / Rail: 0.3 km/1,000 inhab
- **AIR TRANSPORT, 2007**
  4,927,086 passengers. Growth 2000-2007: 66.2%
- **GOODS PORT TRAFFIC, 2007**
  40.3 million tonnes. Growth 2000-2007: 38.3%

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED LOCAL AGENDA 21, 2007**
  251 municipalities, of which 197 have already implemented it and are currently developing action plan projects. Moreover, 217 municipalities have the A21L diagnosis completed and 20 have a completed action plan (although with pending ratification)
- **INTERNAL EXPENSES IN R&D, 2007**
  1,216.7 million €(1.87% of GDP). Growth 2000-2007: 164.72%

RELEVANT INFORMATION

- The quality of air, water and soil, the adaptation to climate change and the biodiversity of the Autonomous Community of Basque Country have improved and actually show a positive trend.
- The consumption of natural resources, the generation of waste, the emissions of Greenhouse Gases and the use of the land show significant, but still inadequate progress.
- Only the goal of reaching a mobility sustainable management model shows a negative trend.
- The 2007 and 2008 Local Sustainability Reports of the Autonomous Region of Basque Country have been drawn up, which describe the progress made regarding the global execution of local action plans.
- 90 municipalities are currently carrying out the annual follow-up of the Local Action Plan (assessing the degree of execution of their plans and calculating the local sustainability indicators).

RECOMMENDED WEBSITES

- http://www.ogasun.ejgv.euskadi.net/r51-udalmap/es/contenidos/informacion/udalmap/es_udalmap/udalmap.html
- http://www.ingurumena.net
- http://www.eustat.es/indic/indicadores.asp?idioma=c&indictipo=2

FURTHER READING

- Estado del Medio Ambiente en la CAPV *(Environmental Status of the Basque Country)*
- Anuario ambiental de la CAPV *(Basque Country Environmental Yearbook)*

INFORMATION SOURCES AND METHODOLOGY NOTES

STATUTE OF AUTONOMY, AREA, POPULATION AND POPULATION DENSITY, DEMOGRAPHIC DISTRIBUTION, WORKING POPULATION, UNEMPLOYMENT RATE, UNEMPLOYMENT RATE > 15 YEARS OLD (COMPARISON WITH EU-27), EMPLOYMENT BREAK-DOWN BY SECTOR, GDP MP AND GROWTH 2006-2007, AND GVA BREAK-DOWN BY SECTOR

Source of the information: Spanish Ministry of Public Administrations (Ministerio de Administraciones Públicas) (http://www.map.es//index.html). In Documentation / Regional Policy / Statutes of Autonomy, and also in Economic-financial information / Economic Analysis of the Autonomous Regions / Indicators. Data generated by the MAP's Directorate General for Regional Cooperation (Dirección General de Cooperación Autonómica), compiled from different sources and extracted from its website. Used several times.

MUNICIPALITIES

Source of the information:

Spanish National Institute of Statistics (INE - Instituto Nacional de Estadística). http://www.ine.es/en/welcome_en.htm In Physical variables/Environment/Physical variables/Territory/Main result/Superficial extension by AC/provinces.

POPULATION GROWTH 2000-2008

Source: Compiled in-house from INE's data. Using: Population figures as of 01/01/2000. Summary by Autonomous Region and population figures as of 01/01/2008 Royal Decree 2124/2008, of 26 December. In Demography and population / Population figures and Demographic Censuses / Official population figures: Municipal register.

LENGTH OF COASTLINE

Source: Spanish National Institute of Statistics (INE). http://www.ine.es/en/welcome_en.htm In Physical variables / Environment / Physical variables / Compiled by other bodies / Territory / Main Result / Length of the Spanish coast by provinces.

GROSS DISPOSABLE INCOME PER INHABITANT, 2006

Source: Spanish National Institute of Statistics (INE - Instituto Nacional de Estadística) http://www.ine.es/en/welcome_en.htm In Economy / National accounts / Spanish Regional Accounts. Base 2000 / Institutional approach. Household income distribution accounts / Main results / Gross disposable income per inhabitant (per capita).

AIR

Source: Air Quality Database (Base de datos de Calidad del Aire). Directorate General of Industrial Environment and Air Quality (Dirección General de Calidad del Aire y Medio Ambiente Industrial). MARM

Methodology notes: The indicator reflects the situation of the Autonomous Region capital. All stations have been used for the calculation of excess levels (urban, suburban and rural or background, industrial and traffic) with a specific amount of data. The minimum number of used data for NO_2 is 50%, that is, 4,380 hours per year, while for PM_{10} the figure reaches 86% (minimum number of data set forth by law for evaluation purposes), that is, 314 days per year. This distinction has been drawn due to the fact that the statistical factor selected as indicator of PM_{10} (number of days per year exceeding 50ug/m^3) reflects the specific outbreak episodes, since it is extremely important to have a broad collection of data in order for the statistical factor to be representative enough. However, in the case of NO_2, due to the fact that the statistical factor is an average figure, a minimum number of data of 50% is enough for the statistical factor to be deemed as representative.
The value of the exceeding instances of daily average PM_{10} concentration (excluding episodes of African dust outbreaks) was provided by the Autonomous Region.

WATER

- **AVERAGE HOUSEHOLD WATER CONSUMPTION,**
  Source: Spanish National Institute of Statistics (INE).
  Year 2006: INE, 2008. Survey on Water Supply and Treatment 2006. Press release, 17 July 2008.
  Year 2000: Water Survey 2000. Press release 12 December 2002 and 2000.
  In Press Area / Press releases
- **WATER DISTRIBUTION BY SECTOR AND DISTRIBUTION NETWORK LOSSES**
  Source: Spanish National Institute of Statistics (INE). Survey on Water Supply and Sewerage. YEAR 2006. Water Supply and Sewerage Distribution by large user groups and Autonomous Region. In Physical variables / Environment / Environment statistics.
  Methodology notes: It means water supplied in public urban supply networks (it does not include water used in irrigation farming).
- **WASTE-WATER TREATMENT**
  Source: Data provided by the Autonomous Region.

LAND

- **LAND-USE BREAK-DOWN (2000) AND INCREASE IN ARTIFICIAL SURFACES, 1990- 2000 (%)**
  Source: Compiled in-house from data by Corine LandCover 1990 and 2000, provided by the Directorate General of the Spanish National Geographic Institute (IGN - Instituto Geográfico Nacional). Ministry of Public Works (Ministerio de Fomento)
  Methodology notes: The forest zone includes forest area and zones with natural vegetation and open spaces.
- **ESTIMATED SOIL LOSS: AREA AFFECTED BY EROSION**
  Source: National Soil Erosion Inventory 2002- 2012 *(Inventario Nacional de Erosión de Suelos)*. Directorate General for the Natural Environment and Forestal Policy (Dirección General de Medio Natural y Política Forestal). MARM.
  Methodology notes: The information refers to land area affected by laminar erosion and in water trails, and establishes the percentage of land area affected by several erosion levels (moderate, intermediate or high) out of the total area of the Autonomous Region.
- **AREA AT RISK OF DESERTIFICATION, 2008 (%)**
  Source: Spanish National Action Programme to Combat Desertification (Programa de Acción Nacional contra la Desertificación) Directorate General on Natural Environment and Forestry Policy (Dirección General de Medio Natural y Política Forestal). MARM.
  Methodology notes: The total area is divided into areas at risk of desertification (Low, Intermediate, High and Very high), water bodies and artificial surfaces, and wetland

and sub-wetland surfaces. The percentage means the total area; therefore, the sum of the areas at risk of desertification do not represent the 100%.

NATURE & BIODIVERSITY

- **THREATENED AND CATALOGUED NATIVE TAXA**
  Source: Data provided by the Autonomous Region.
- **PROTECTED AREA, NATURA 2000 NETWORK AREA, RAMSAR WETLANDS AND WETLANDS INCLUDED IN THE SPANISH NATIONAL WETLANDS INVENTORY**
  Source: Directorate General for the Natural Environment and Forestry Policy (Dirección General de Medio Natural y Política Forestal). MARM.
  Methodology notes: Only those wetlands with a resolution published in the Official State Gazette are included in the Spanish National Wetlands Inventory.
- **BIOSPHERE RESERVES**
  Source: National Parks Agency. Directorate General for the Natural Environment and Forestry Policy (Dirección General de Medio Natural y Política Forestal). MARM. Updated to May 2008.
- **FOREST FIRES**
  Source: Forest Fire Defence Area (ADCIF - Área de Defensa contra Incendios Forestales). Directorate General for the Natural Environment and Forestryl Policy (Dirección General de Medio Natural y Política Forestal). MARM.

WASTE

- **URBAN WASTE PER INHABITANT**
  Source: Spanish National Institute of Statistics (INE). Year 2000: Survey on urban waste collection and treatment. Year 2000. Press release of 26 March 2002. Year 2006: Survey on waste collection and treatment. Year 2006. Press release of 28 October 2008 In Press Area / Press releases. Where it is explicitly stated that way, data is provided by the AC.
  Methodology notes: The information on the total amount of waste has been estimated through the sum of the amount of mixed and separately collected waste. All amounts are expressed as kg/inhab.

AGRICULTURE

- **ORGANIC FARMLAND**
  Source: MARM. "Statistics 2007. Organic Agriculture. Spain" and "Statistics 2001. Organic Agriculture. Spain". In MARM/Food/Organic farming/Documents of Interest (http://www.marm.es/en).
- **IRRIGATED AREA, 2007**
  Source: Survey on Surface areas and Crop Field (ESYRCE 2007). In MARM/Statistics/Survey on Surface areas and Crop Field (ESYRCE 2007).
  Methodology notes: It refers to the total agricultural area, i.e. arable land, fallow, green-houses and family small holdings.

ENERGY

- **INSTALLED ELECTRIC POWER IN MW PER ONE THOUSAND INHABITANTS**
  Source: Spanish Ministry of Public Administrations (Ministerio de Administraciones Públicas) (http://www.map.es//index.html).
- **ELECTRICITY CONSUMPTION PER INHABITANT**
  Source: Compiled in-house from energy data provided by the Sub-Directorate General for Energy International Relations (Subdirección General de Relaciones Internacionales de Energía) of the Ministry of Trade, Industry and Tourism (Ministerio de Industria, Turismo y Comercio) and official population figures (Municipal register) from the INE.

TOURISM

- **NO. OF TOURISTS PER INHABITANT AND HOTEL CAPACITY**
  Source of the information: In-house compilation and use of direct sources of information.
  Data on tourists: Spanish Institute of Tourism Studies (Instituto de Estudios Turísticos), 2008. *Turismo Interior en España en el año 2007 (Internal Tourism in Spain 2007).* IET. MITyC.
  Data on population: Population figures as of 01/01/2007. Royal decree 1683/2007, of 14 December. Hotel capacity: Spanish Ministry of Public Administrations (Ministerio de Administraciones Públicas) (http://www.map.es//index.html). Beds in rural accommodation: INE. Tourist Accommodation Occupancy Survey (Rural tourism accommodation). Year 2007. Press release of 31 January 2008.

TRANSPORT

- **VEHICLE FLEET AND PASSENGER CAR FLEET**
  Source: Directorate General for Traffic (Dirección General de Tráfico), 2008. General Statistics Yearbook 2007. DGT. Ministry of the Interior (Ministerio del Interior) (page 74-75) and Directorate General for Traffic, 2002. General Statistics Yearbook 2000. DGT. Ministry of the Interior (Ministerio del Interior)
  Methodology notes: The vehicle park refers to lorries, vans, buses, passenger cars, motorcycles, industrial tractors and other vehicles.
- **TRANSPORT NETWORK DENSITY**
  Source: Spanish Ministry of Public Administrations (Ministerio de Administraciones Públicas) (http://www.map.es//index.html).
- **AIR TRANSPORT**
  Source: AENA (Spanish Airports Authority). Airport Statistics. Traffic Statistics. Passengers, operations and cargo. Annual reports. Reports 2000 and 2007.
- **MARITIME TRANSPORT**
  Source: Directorate General of the Merchant Navy (Dirección General de la Marina Mercante), 2001 and 2008. Statistics Yearbook 2000 and 2007. Ministry of Public Works (Ministerio de Fomento).
  Methodology notes: Includes goods traffic (local and foreign), fishing, supplying and regular traffic, both from State Ports and ports managed by the Autonomous Regions.

URBAN AND INVESTMENT POLICY

- **MUNICIPALITIES WITH COUNCIL-APPROVED (RATIFIED) LOCAL AGENDA 21, 2007**
  Source: Data provided by the Autonomous Region.
- **INTERNAL EXPENSES IN R&D, 2007**
  Source: Spanish National Institute of Statistics (INE) Statistics on R&D activities. Year 2007. Provisional figures. Press release of 2 December 2008, Statistics on Scientific Research and Technological Development (R&D). Basic indicators Year 2000. Press release of 21 December 2001.

RELEVANT INFORMATION, RECOMMENDED WEBSITES AND PUBLICATIONS

Source: Information provided by the Autonomous Focal Point of the Spanish EIONET Network.





4. Appendices

I Acronyms and abbreviations

II Thematic index of indicators

III Alphabetical index of indicators

IV Representatives and technicians from the EIONET Network and other expert collaborators

APPENDIX I: LIST OF ACRONYMS, ABBREVIATIONS AND UNITS

6PAMA	Sixth EU Environment Action Programme
AEDyR	Spanish Desalination and Reclamation Association
AEMA / EEA	European Environment Agency
AEMET	Spanish State Meteorological Agency
AENA	Spanish Airports Authority
AEPLA	Spanish Plant Protection Association
AER	Spanish Tyre Recycling Association
AGUA (Programme)	Spanish Water Management and Use Action Programme
AHE	Spanish Herpetological Association
ANFFE	Spanish Association of Fertiliser Manufacturers
ASPAPEL	Spanish Association of Pulp, Paper and Cardboard Manufacturers
ATP	Spanish Public Transport Authority
AVE	Spanish High Speed Train
BIC	Site of Cultural Interest
BOE	Spanish Official State Gazette
BPIA	Public Bank of Environmental Indicators of the Spanish Ministry of the Environment
CAFE	Clean Air For Europe Programme
CAMP	Comprehensive Atmospheric Monitoring Programme
CAP	Common Agricultural Policy
CCAA	Autonomous Community/ Region
CCHH	Hydrographic Confederations
CEDEX	Spanish Centre for Public Works Studies and Experimentation
CEDRE	Documentation, Research and Experimental Centre for Accidental Water Pollution / *Centre de documentations de recherche et d'experimentations sur les pollutions accidentelles des eaux*
CEMR	Council of European Municipalities and Regions
CES	Spanish Economic and Social Council
CFP	Common Fisheries Policy
CIS	Spanish Centre for Sociological Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLC	*Corine Land Cover*
CLIF	Forest Fire Fighting Committee
CMDS / MCSD	Mediterranean Commission on Sustainable Development
CNAE	Spanish National Classification of Economic Activities
CNE	Spanish National Accounts
CNE	Spanish National Energy Commission
CNEA	Spanish National Catalogue of Endangered Species
CNEAM	National Centre for Environmental Education (MARM)
CTE	Spanish Building Code

CTE/TMA	Topic Centre on Terrestrial Environment (EEA)
DG	Directorate General
DGPCE	Directorate General for Civil Protection and Emergencies
DGT	Spanish Directorate General for Traffic
DPSIR	Driving forces, Pressures, States, Impacts, Responses. A theoretical framework used by the European Environment Agency to analyse the environment and classify environmental indicators.
DRR	Disaster Risk Reduction
EC	European Commission
Ecoembes	Ecoembalajes España, S.A.
Ecovidrio	Association responsible for managing recycling of glass packaging waste throughout Spain
EDAR	Waste-water treatment plant
EEC	European Economic Community
EEDS	Spanish Sustainable Development Strategy
EEMS	Spanish Strategy for Sustainable Mobility
EINECS	European Inventory of Existing Commercial Chemical Substances
EIONET	Environmental Information and Observation Network
EIRD / ISDR	International Strategy for Disaster Reduction
ELC	European Landscape Convention
ELINCS	European List of Notified Chemical Substances
ELT	End-of-Life Tyre
EMAS	Eco-Management and Audit Scheme
EMEP	European Monitoring Evaluation Programme
EMS	Environmental Management System
ENAC	Spanish National Accreditation Body
EOAT- EOTR	Holiday Dwellings Occupancy Survey – Rural Tourism Accommodation Occupancy Survey
EPER	European Pollutant Emission Register
ERDF	European Regional Development Fund
EU15	Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom
EU25	Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom, Hungary, Poland, Cyprus, Czech Republic, Estonia, Malta, Latvia, Lithuania, Slovenia, Slovakia
EU27	EU25 +Bulgaria and Romania
EUROPARC	Federation of Nature and National Parks of Europe
Eurostat	Statistical Office of the European Union
EUROWATERNET	Monitoring and Information Network for Water Resources
FAMILITUR	Spanish national tourism survey (carried out by the IET)
FAO	Food and Agriculture Organisation of the United Nations
FAOSTAT	FAO Statistical Database

FEMP	Spanish Federation of Municipalities and Provinces
FEVE	European Container Glass Federation
FRONTUR	Spanish Border Survey of Inbound Tourism
GAW	Global Atmospheric Watch
GDP	Gross Domestic Product
GHG	Greenhouse gas
GIS	Geographic Information System
GVA	Gross Value Added
HBFC	Hydrobromofluorocarbons
HCFC	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbons
HU	Hydrogeological Unit
IAEST	Aragon Statistics Institute
ICES	International Council for the Exploration of the Sea
ICLEI	International Council of Local Environmental Initiatives
ICT	Information and Communication Technologies
IDAE	Institute for Energy Saving and Diversification
IET	Spanish Institute of Tourism Studies
IFN3	Third National Forestry Inventory
IGME	Geological and Mining Institute of Spain
IGN	Spanish National Geographic Institute
IHOBE	Basque Public Environmental Management Company
IMF	International Monetary Fund
INB	Spanish National Biodiversity Inventory
INE	Spanish National Institute of Statistics
INM	Spanish National Institute of Meteorology
IPCC	Intergovernmental Panel on Climate Change
IPI	Industrial Production Index
IPPC	Integrated Pollution Prevention and Control
ISO	International Organisation for Standardisation
ITOF	International Tanker Owners Pollution Federation
IUCLID	International Uniform Chemical Information Database
IUCN	The World Conservation Union
JACUMAR	Spanish National Advisory Board for Marine Aquaculture
LCA	Low-Cost Airlines
LEAC	*Land and Ecosystem Account* (European database on land and ecosystems)
Life	European Financial Instrument for the Environment
MAPA	Spanish Ministry of Agriculture, Fisheries and Food
MARM	Ministry of the Environment and Rural and Marine Affairs
MC	Spanish Ministry of Culture
MER	Strategic Noise Map
MITyC	Spanish Ministry of Trade, Industry and Tourism

MMA	Spanish Ministry of the Environment
MSC	Spanish Ministry of Health and Consumer Affairs
NAFO	Northwest Atlantic Fisheries Organisation
NGO	Non-Governmental Organisation
NP	National Park
NRC	EIONET National Reference Centre
ODP	Ozone Depleting Potential
OECD	Organisation for Economic Cooperation and Development
OFICEMEN	Spanish Cement Manufacturers' Association
OMM	Metropolitan Mobility Monitoring Centre
ONS	Spanish National Drought Monitoring Centre
OOAA	Autonomous Organisms
OSE	Spanish Sustainability Monitoring Centre
OSPAR	Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
PA	Protected area
PACIAP	Spanish Annual Programme for the Integrated Monitoring of Fisheries
PAND	National Action Programme Against Desertification
PAR	Noise Action Plan
PEI	Primary Energy Intensity
PEIT	Spanish Strategic Infrastructure and Transport Plan
PERCA	Strategic Noise Contamination Reduction Plan 2001-2003
PICTE 2000	Integral Quality Plan for Spanish Tourism
PM	Particulate Matter in the air
PNIR	Spanish National Integrated Waste Plan
PNR	Spanish National Reform Plan
PNSD	National Sewerage and Waste-water Treatment Plan
PORN	Natural Resources Management Plan
PRUG	Use and Management Master Plan
RENFE	Spanish National Rail Network
REPACAR	Spanish Paper and Cardboard Recovery Association
ROI (Network)	Saline Intrusion Observation Network
RW	Railway
SAC	Special Area of Conservation
SAP-BIO	Strategic Action Programme for the Conservation of Biological Diversity in the Mediterranean
SCI	Sites of Community Interest
SECEM	Society for the Conservation and Study of Mammals
SEO	Spanish Ornithological Society
SEPRONA	Nature Protection Service of the Civil Guard
SIA	Spanish System of Environmental Indicators

SICA	Basic Noise Pollution Information System
SIGNUS ECOVALOR	Integrated Management System for End-of-Life Tyres
SNAP	Selected Nomenclature for sources of Air Pollution
SOER 2005	EEA report: "State and Outlook on the Environment Report 2005"
SPA	Special Protection Area
STECF	Scientific, Technical and Economic Committee for Fisheries
TCA	High-risk road sections
TEP	Tourist Equivalent Population
TERM	Transport and Environment Reporting Mechanism
TMR	Total Material Requirement
UAA	Utilised Agricultural Area
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPM	Polytechnic University of Madrid
UV-B	Ultraviolet-B radiation
UW	Urban Waste
WISE	Water Information System for Europe
WTO	World Trade Organisation
WWF	World Wide Fund for Nature
YIR	Yearly Indicator Reporting

SYMBOLS, UNITS AND CHEMICAL COMPOUNDS

<	Less than
>	Greater than
µg	Microgrammes
€	Euro
1000 t	Thousand tonnes
AOT 40	Amount Over Threshold
CCl4	Carbon tetrachloride
CFC	Chlorofluorocarbon
CH_4	Methane
CO	Carbon monoxide
CO2	Carbon dioxide
COD	Chemical Oxygen Demand
dB	Decibel. Measure of sound pressure level
dB(A)	A-weighted decibel
DBO_5	Five-day Biochemical Oxygen Demand
DQO	Chemical Oxygen Demand
GRT	Gross Registered Tonnage
GT	Gross tonnes: measure of a fishing vessel's tonnage which replaced Gross Registered Tonnage (GRT) in 1998

h	Hour
ha	Hectare
hm^3	Cubic hectometre
inhab	Inhabitant
kg	Kilogramme
km	Kilometre
km^2	Square kilometre
kt	Thousand tonnes
kTOE	Kilotonnes of oil equivalents
kW	Kilowatt
kWh	Kilowatt-hour
l	Litre
LAeq	Equivalent continuous A-weighted sound pressure level. Expressed in decibels (A).
Lden	Day-evening-night noise level. Measured in dB
Leq	Equivalent continuous noise level. Expressed in dB
L_n	Nighttime noise level. Measured in dB
m^2	Square metre
m^3	Cubic metre
mg	Milligramme
MW	Megawatts
MWp	Megawatt peak
MWt	Megawatt thermal
N	Nitrogen
N_2O	Nitrous oxide
NH_3	Ammonia
NMVOC	Non-methane volatile organic compounds
NOx	Nitrogen oxides
O_3	Ozone
P	Phosphorus
P2O5	Orthophosphate
PCB	Polychlorinated biphenyls
PCT	Polychlorinated triphenyls
PFC	Perfluorocarbons
PM10	Particulate matter with a diameter of 10 microns or less
ppb	Parts per billion
ppm	Parts per million
SF_6	Sulphur hexafluoride
SNS	Spanish National Health System
SO_2	Sulphur dioxide
t	Tonne
VOC	Volatile Organic Compound

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