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TRANSPORT



Transport is one of the most important sectors in the economy of a country, but it has a marked impact on the environment. Transport has been the largest consumer of final energy since the early 1990s. In 2009, transport consumed 33% of total final energy in the EU-27. In Spain the figure was almost 38% in 2010, 98.7% of which was produced by oil products and 1.3% by electricity.

It is therefore a key sector for energy saving, which makes enhancing efficiency vital. It is essential to reduce fossil fuel consumption, diversify primary energy sources and make the energy supply more secure. In 2011, Spain adopted Royal Decree 1597/2011 of 4 November 2003, governing the sustainability criteria of biofuels and bioliquids. This decree regulates the origin of such fuels, which are not allowed to be produced from raw materials from land that has a high value in terms of biodiversity.

In turn, the EU White Paper on Transport (Roadmap to a single European transport area: Towards a competitive and resource efficient transport system, is a comprehensive strategy to build a competitive transport network that will increase mobility and cut emissions and fuel growth and employment. One of the challenges will be to gradually remove conventionally fuelled vehicles from roads in cities by 2050 and to promote public transport, walking and cycling.



KEY MESSAGES

Inter-city transportation of freight fell markedly (21.6% between 2007 and 2010), reaching 1999 values. Passenger transport only decreased by 3.6%, recording values close to those in 2005.

Acidifying emissions and ground-level ozone precursors from transport continue to decline, decreasing by 24.8% and 52.9% respectively between 1990 and 2010. Although the GHG emissions from transport decreased by 14.4% between 2007 and 2010, they rose by 66.3% between 1990 and 2010, a significantly higher increase than that recorded by total emissions.

In 2011, Aena-run airports recorded the second best year in their history, with slightly more than 204 million passengers.

Motor vehicle fuel consumption dropped, while the proportion of diesel use increased. The percentage of biofuels in the total of petrol and diesel also increased.

In 2010, growth in gross domestic product outpaced the rest of transport variables for the first time.

In relation to end-of-life tyres, the two Integrated Management Systems (Signus and TNU) handled a total of 857,525 tonnes in 2010, of which: reuse accounted for 8.5%, energy recovery 31.7% and material recovery 59.8%.

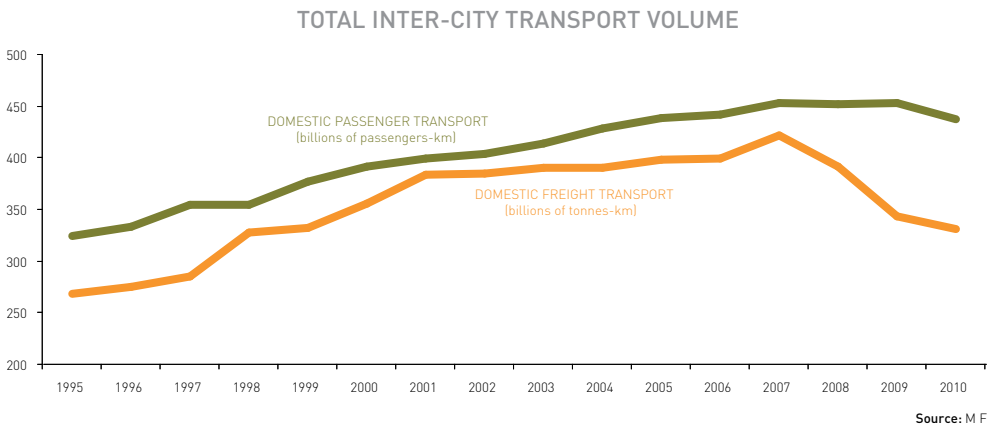
Road accident rates dropped for the eighth consecutive year. A total of 1,479 people died as a result of road accidents in Spain in 2011, 14.5% less than in 2010 and a similar figure to that recorded in 1961.

INDICATORS

- Total inter-city transport volume: modal split
- Emissions of air pollutants by transport
- Air transport
- Motor vehicle fuel consumption
- Eco-efficiency in transport

Total inter-city transport volume: modal split

Inter-city freight traffic has decreased since 2007, recording a 21.6% fall in 2010, while passenger traffic decreased by 3.6% between 2009 and 2010



Inter-city passenger transport demand peaked in 2009, while in the case of freight traffic, the highest value was recorded in 2007. Over the period 1990-2009, the total number of passengers transported rose by 94.8%, very similar to the growth between 1990 and 2007. In the case of freight transport, growth between 1990 and 2007 was much higher, at 109.7%.

Following these peaks in growth, both variables display downturns, breaking the previous trend, although with very different patterns. The situation in freight traffic reflects the economic crisis that broke out in 2007, with annual decreases of 7.3% in 2008, 12.3% in 2009 and 3.6% in 2010. In total, freight traffic fell by 21.6% between 2007 and 2010, returning to the levels of transport in 1999. However, passenger transport only recorded a decrease of 3.6% between 2009 and 2010: figures were close to those in 2005.

Analysing the evolution of the different modes, passenger transport by road, which accounts for the largest share of total passenger transport, continued to grow up until 2009 and this has influenced the trend displayed by passenger traffic as a whole. In turn, rail transport registered a high in 2008 and maritime and air transport in 2007. This irregular pattern shows how differently the crisis has affected each mode. It is

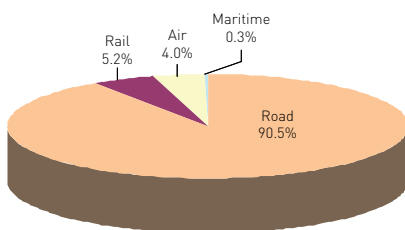
worth highlighting the downturn in air passenger traffic, which after recording a marked increase up until 2007, fell by almost 33% between that year and 2010.

In 2010, only the maritime transport recorded growth worthy of note (5.2%), partly due to the prominent role played by cruises as a holiday alternative. The rest of modes have recorded decreases of between 3% and 4%.

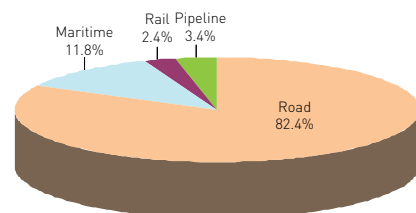
Road and maritime freight transport, the two modes with the most throughput, registered their highest values in 2007. The downturn that began that year has continued in road transport (which fell by a further 4.7% in 2010). This was not the case of maritime transport, which grew by almost 2% in 2010. Rail transport also increased that year (6.5%), partially recovering from the downward trend observed in recent years.

The modal split of passenger transport displays the same scenario as in 2009. Road transport is the leading mode of transport, followed by rail (which has increased its share in recent years mainly due to high-speed railway connections) and air traffic. As regards freight transport, road haulage is the most under demand, followed by maritime transport, which is gradually becoming more important.

MODAL SPLIT OF DOMESTIC PASSENGER TRANSPORT (2010)



MODAL SPLIT OF DOMESTIC FREIGHT TRANSPORT (2010)



Source: Spanish Ministry of Public Works

NOTES

- The unit of measurement used for passenger transport is passenger-kilometre (p-km), which is calculated by multiplying the annual number of passengers by the number of kilometres travelled.
- The unit of measurement used for freight transport is tonne-kilometre (t-km), calculated by multiplying the number of tonnes transported by the number of kilometres travelled.
- Air freight transport is not relevant as it only represents 0.05% of the total t-km transported in 2010.

SOURCES

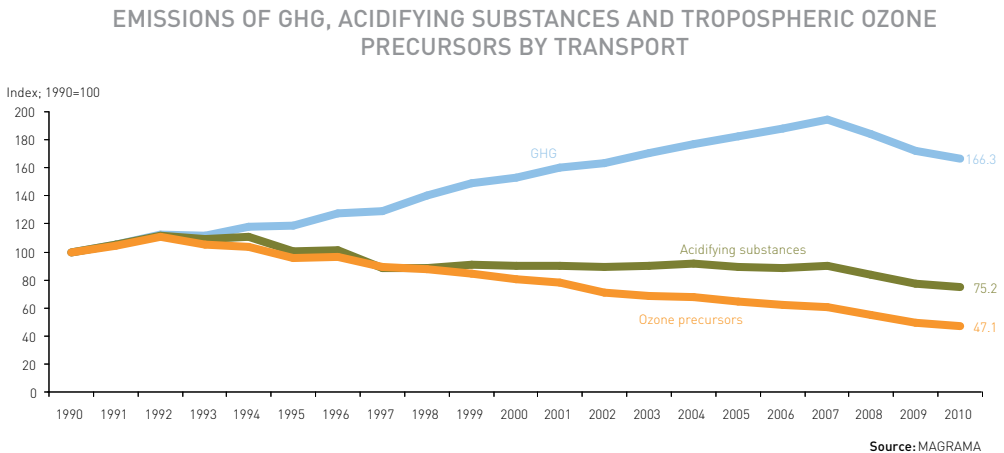
- Spanish Ministry of Public Works, 2011. Transport and infrastructure. Annual report 2010.
- Spanish Ministry of Public Works. Transport, infrastructure and postal services (Several years).

FURTHER INFORMATION

- <http://www.fomento.es>
- <http://www.eea.europa.eu/>

Emissions of air pollutants by transport

Emissions of greenhouse gases, acidifying gases and ground-level ozone precursors by transport continued to decrease, albeit to a lesser extent than the previous year



Greenhouse gas emissions by transport have decreased since 2007. They also declined in 2008, 2009 and in 2010, albeit to a lesser extent: 3.2% in 2010, compared to 6.8% in 2009.

The same applies to emissions of acidifying and eutrophying substances and ground-level ozone precursors, which have been reduced by 2.7% and 5.3%, respectively. As in the case of GHG, these reductions were lower than those recorded the previous year, which stood at 8.0% and 9.3%, respectively.

GHG emissions by transport increased by 66.3% over the period 1990-2010, which is significantly higher than the upturn in total emissions in Spain for the same period, which was 22.8% (or 25.8% if referring to the base year set in the Kyoto Protocol). However, emissions of acidifying and eutrophying substances by transport decreased by 24.8%, while ground-level ozone precursors fell by 52.9%, also over the same period of 1990-2010. This reduction is also less than that of total emissions of acidifying substances, which fell by 48.6%. By contrast, it is much higher than that of ozone precursors, which fell by 24.7% for all activities. By gas and for the same period, only CO₂, N₂O and NH₃ emissions increased, the rest of pollutants recording decreases.

In the EU-27, GHG emissions by transport increased by 20.8% over the period 1990-2009. In Spain, this growth was much higher, reaching 71.4% for the same period. In 2009, transport represented 20.2% of total GHG emissions in the EU, while in Spain, this figure was slightly higher at 25.7%.

In 2010, the energy consumed by transport once again decreased by 2%, following on from the decreases registered in 2008 (4.4%) and 2009 (0.6%), and is now close to 2003 levels. Road transport remains the largest consumer of energy. In 2010, this mode was responsible for 92.3% of the energy consumed, followed by civil aviation (3.7%) and maritime transport (3.6%). Railways only accounted for 0.3% of the energy consumed by transport.

In Spain, passenger vehicle emissions averaged 137.8 grams of CO₂ per kilometre in 2010, which is below the average for the EU-27, where the average was 140.3, placing Spain among the top ten countries in the EU in terms of new low-emission motor vehicles. This estimate was made by the EEA, in application of Regulation 443/2009 of 23 April 2009, establishing performance standards for emissions from new passenger cars as part of the integrated approach of the Community towards reducing light motor vehicle CO₂ emissions.

NOTES

- The graph for the indicator shows the changes in aggregate total annual emissions of greenhouse gases (CO₂, N₂O, CO and CH₄ and fluoridated gases), acidifying and eutrophying substances (SO₂, NO_x and NH₃) and ground-level ozone precursors (NO_x, NMVOC, CO and CH₄) in relation to the base year of 1990 (1990 = 100).
- GHG emissions are expressed in CO₂ equivalent, calculated by the global warming potential of each gas (see chapter on "Air"). Emissions of acidifying and eutrophying gases are presented as acid equivalent (hydrogen ion generating potential) and are aggregated using the following weighting factors: 31.25 acid equivalent/kg for SO₂ (2/64 acid equivalent/gram), 21.74 acid equivalent/kg for NO_x, expressed as NO₂ (1/46 acid equivalent/g) and 58.82 acid equivalent/kg for NH₃ (1/17 acid equivalent/gram). Emissions of ground-level ozone precursors were estimated using the tropospheric ozone depleting potential (expressed as NMVOC equivalent). The following weighting factors were employed: 1.22 for NO_x, 1.00 for NMVOCs, 0.11 for CO, and 0.014 for CH₄.
- International air and maritime transports' consumption are excluded from the calculation, as is rail's electricity consumption.

SOURCES

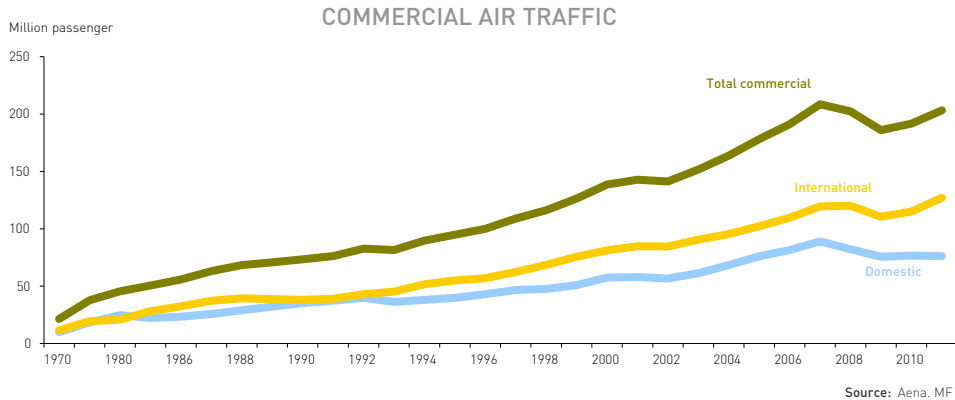
- Ministry of Agriculture, Food and Environment, 2012. *Inventory of Emissions of Greenhouse Gases in Spain. 1990-2010*. Directorate-General for Environmental Quality and Assessment.
- European Environment Agency, 2012. Interactive viewer to monitor CO₂ emissions from new passenger cars. Available on the Agency web page.

FURTHER INFORMATION

- <http://www.magrama.gob.es/es/calidad-y-evaluacion-ambiental/temas/sistema-espanol-de-inventario-sei-/>
- <http://www.eea.europa.eu/>

Air transport

Aena airports once again registered a rise in the number of passengers in 2011, continuing the recovery that began in 2010



In 2011, the number of passengers at airports in the Aena network rose by 6% to 204,386,371. This increase is higher than the previous year, which was 2.8%, and contributes to the recovery in air traffic passengers following decreases in 2008 and 2009. The highest ever number of passengers was recorded in 2007 at slightly more than 210.4 million. 2011 is the second highest number in history.

Excluding passengers in transit from that total, there were a total 203,305,122 passengers on commercial flights, also 6.1% more than in 2010. The breakdown of commercial flights retains similar proportions to those in previous years (62.5% International flights and 37.5% internal flights).

Madrid-Barajas airport once again recorded the greatest number of passengers in 2011, although figures were down by 0.4% in regard to 2010. It is worth highlighting the Barcelona-El Prat airport, with a record number of passengers following a 17.8% increase on the previous year and those in Gran Canaria, Alicante, Ibiza, Sevilla, Fuerteventura, Santiago and Santander, which also set records.

The number of air operations was rose slightly 1% in regard to 2010 to 2,140,308. The all-time high was also registered in 2007 and was in excess of 2.5 million.

As regards freight, a total of 672,146,043 tonnes of cargo were transported in 2011, 3% more than in 2010. International freight accounted for 78.1% of this amount, while internal freight represented 21.6%.



The table presents the growth in passenger traffic and air operations for the period 2000-2011 and in the last year.

TOTAL AND COMMERCIAL AIR TRAFFIC (%)

Period	Total number of passengers	Total number of operations	Number of passengers on commercial flights		
			National	International	Total
2000-2011	45,0	15,4	32,7	56,6	46,7
2010-2011	6,0	1,0	-0,6	10,5	6,1

Source: AENA

According to the Corporation of Strategic Reserves of Oil-based Products, aviation kerosene consumption in Spain grew significantly until 2007, when it peaked at more than 5.7 million tonnes. Marked decreases were recorded in 2008 and 2009, before increasing once again in 2010 and 2011.

NOTES

- Total air traffic includes inbound and outbound flights and includes all commercial traffic (both scheduled and charter flights). It includes passengers in transit and other traffic types. Total commercial air traffic is the sum of Spain's national (or internal) and international flights.

SOURCES

- Aena Airports, 2012. Annual statistical reports on Spain's airports: 2011 Report. Consult website, Airport statistics, Air traffic statistics.
- Aena Airports, 2012. Press release from 11 January 2012.

FURTHER INFORMATION

- <http://www.mfom.es>
- <http://www.aena.es>
- <http://www.cores.es>

Motor vehicle fuel consumption

The proportion of biofuels in diesel and petrol is increasing

MOTOR VEHICLE FUEL CONSUMPTION (TONEES)

TYPE OF FUEL		2007	2008	2009	2010	2011
Petrol	95 I.O	5,848,339	5,577,911	5,362,514	5,101,258	4,843,764
	98 I.O	839,196	709,279	641,993	566,359	448,795
	Bioethanol				6	52
	Mix	80	314	453	2,382	901
	Car petrol subtotal	6,687,615	6,287,504	6,004,960	5,670,005	5,293,512
	Other	9,425	8,287	7,863	6,612	5,945
	Total	6,697,039	6,295,791	6,012,823	5,676,616	5,299,457
Diesel	A	25,826,919	24,851,226	23,576,727	23,292,185	22,436,351
	Biodiesel	62,094	100,161	41,225	41,628	25,520
	Biodiesel Mixture	188,841	173,997	166,871	254,446	149,392
	Subtotal gasóleos auto	26,077,854	25,125,385	23,784,824	23,588,260	22,611,263
	B	6,110,553	5,913,876	5,571,284	5,582,905	5,046,744
	C	2,887,698	2,782,953	2,511,585	2,575,543	2,036,479
	Other	1,755,159	1,554,707	1,477,575	1,471,386	1,424,145
	Total	36,831,264	35,376,920	33,345,268	33,218,094	31,118,631
TOTAL	75,003,357	72,534,455	68,442,033	67,095,846	64,313,435	
% of biofuels in car petrol subtotal	1.85	2.29	3.9	6.38	6.73	
% of biofuels in car diesel subtotal	1.05	2.34	4.21	5.73	7.22	

Source: CORES.

Motor vehicle fuel consumption has displayed a downward trend in recent years, despite the increase in the fleet of vehicles. Petrol consumption fell by 20.8% between 2007 and 2011, while diesel fuel consumption dropped by 13.3%. In this scenario, an increase is observed in the percentage of biofuels in petrol and diesel, which in 2011 stood at 6.73% for petrol and 7.22% for diesel.

The current situation of the fleet of vehicles in Spain reveals an increase in diesel vehicles and a reduction in petrol vehicles. In 2000, only 34.4% of vehicles ran on diesel fuel, while in 2010 the figure stood at 53.9%. This growth should be seen in the context of a period of strong economic expansion, during which the fleet of vehicles increased by 31.6%. This conversion has led to a similar change in the consumption of the two types of fuels. In 2000, diesel fuel consumption accounted for 66.5% of all motor vehicle fuel, while petrol represented 33.5%. By contrast, in 2010, diesel fuel consumption accounted for 80.6%, while petrol represented only 19.4%.

As far as biofuels are concerned, the figures provided by the Corporation of Strategic Reserves of Oil-based Products (CORES) displayed growth in biofuel energy participation in petrol and diesel, recording values that exceed the targets set for 2011.

In this respect, Royal Decree 459/2011, of 1 April establishes the obligatory minimum annual targets for the sale or use of biofuels for transport purposes for 2011, 2012 and 2013. The decree sets the minimum targets of energy content for petrol, diesel and total biofuels sold or consumed.

MINIMUM MANDATORY SALES OR CONSUMPTION OF BIOFUELS (% OF ENERGY CONTENT)

Period	Number of passengers on commercial flights		
	2011	2012	2013
Biofuel target	6.2	6.5	6.5
Diesel biofuel target	6.0	7.0	7.0
Petrol biofuel target	3.9	4.1	4.1

Source: RD459/2011, of 1 April

Spain has the second greatest capacity in the EU for biodiesel production and is the third largest producer of biodiesel and bioethanol. However, these fuels are increasingly consumed by imports (which represented nearly 74% of biodiesel consumption and 45% of bioethanol consumption in 2011), which has an enormous impact on the stability and sustainability of this industry in Spain.

At the end of October 2011, an agreement was signed to give a boost to the production of biokerosene for use by aviation in Spain (from the production of sustainable raw materials to the commercial use of aircraft). MAGRAMA, AESA, SENASA and the IDAE are all participating, along with various companies in air and energy industries that have joined the convention by means of voluntary agreements to participate in its development.

SOURCES

- Corporation of Strategic Reserves of Oil-based Products (CORES).
– Consult statistics on the following web page: www.cores.es (Statistics/Oil /Consumption/consumption of petroleum products 1996-2012).
- Annual summaries. Several years. Consult web (Publications/Annual summaries).
- Appa Biofuels, 2012. Press release from 20 March 2012.
- IDAE. Renewable energies bulletin.

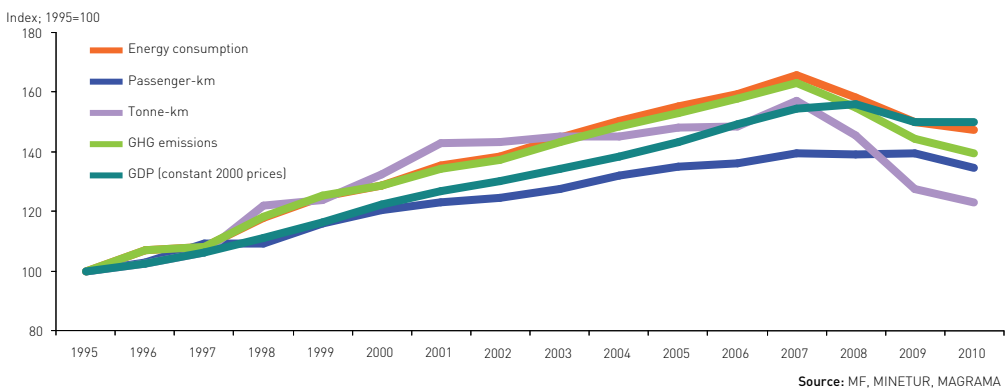
FURTHER INFORMATION

- <http://www.cores.es>
- <http://www.idae.es>
- <http://epp.eurostat.ec.europa.eu>
- <http://www.appa.es>
- <http://www.obsa.org>

Eco-Efficiency in transport

GDP registered the lowest decrease in 2007 in comparison to inter-city passenger transport, inter-city freight transport and energy consumption

ECO-EFFICIENCY IN TRANSPORT IN TERMS OF GDP, ENERGY CONSUMPTION, VOLUME OF TRANSPORT AND GHG EMISSIONS



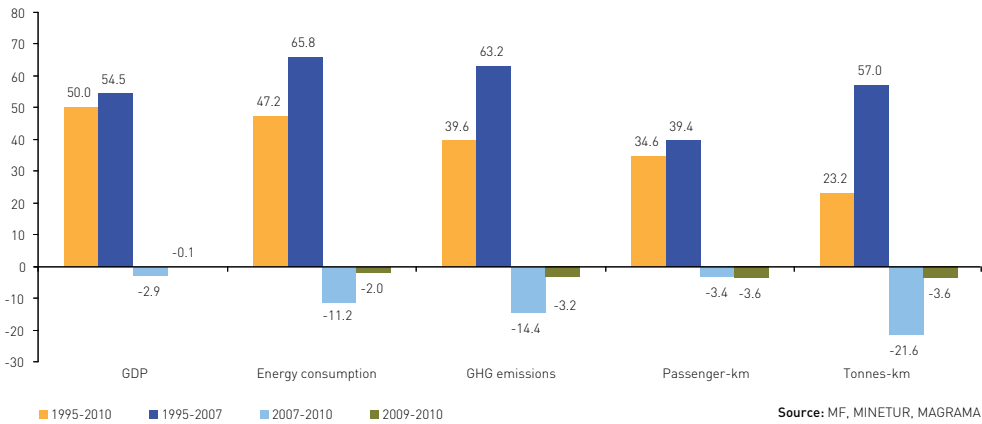
Growth in inter-city transport of passengers, freight, the consumption of energy and greenhouse gas emissions has decoupled from GDP growth since 2007. Until that year, all these variables had grown virtually parallel to each other, except for passenger transport, which outpaced economic growth. However, in the change in tendency observed since that year, GDP has decreased the least, with a 0.1% reduction between 2009 and 2010, compared to a 2% drop in energy consumption, 3.2% in GHG emissions and 3.6% in inter-city passenger and freight traffic.

2010 was the first year since 1995 that growth in gross domestic product was higher than the increase in the rest of variables, due to less growth compared to these variables that year. The graph shows a decoupling process that has not been seen previously.

Until 2007, only inter-city transport of passengers had grown more slowly than GDP, highlighting the growth in energy consumption standing out above the rest of the variables. Between 2007 and 2010, when the consequences of the crisis can be clearly observed, freight transport fell by nearly 21.6%, while energy consumption and GHG emissions dropped by 11.2% and 14.4% respectively. GDP shrank by 2.9%.

Both graphs show how GHG emissions have grown less than energy consumption, recording more significant reductions in certain periods. It is particularly worth highlighting that in 2010, to produce one unit of economic growth, less energy is consumed and, above all, less GHG are emitted to the atmosphere.

ECO-EFFICIENCY IN TRANSPORT. GROWTH OF THE MAIN VARIABLES CONSIDERED BY PERIOD (%)



NOTES

- Greenhouse gas emissions by transport refer to those produced by Group 7 of the SNAP classification (Road Transport), part of Group 8 (Other Transport Modes: rail, air and sea) and pipeline transport included in stationary sources (SNAP 01.05.06). The estimates include emissions of CH₄, N₂O and CO₂. Annual emissions of each of these three pollutants, converted into tonnes of CO₂ equivalent according to their global-warming potential, are as follows: 1 (CO₂), 21 (CH₄) and 310 (N₂O).
- The GDP figures are those used by the Ministry of Industry, Energy and Tourism to estimate energy intensity at constant prices (base year 2000).

SOURCES

- Ministry of Agriculture, Food and Environment, 2012. Inventory of Greenhouse Gases in Spain. 1990-2010. Directorate-General for Environmental Quality and Assessment.
- Ministry of Public Works, 2011. Transport and infrastructure. Annual report 2010.
- Ministry of Industry, Energy and Tourism, 2011: Energy in Spain 2010.

FURTHER INFORMATION

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- <http://www.minetur.gob.es>
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