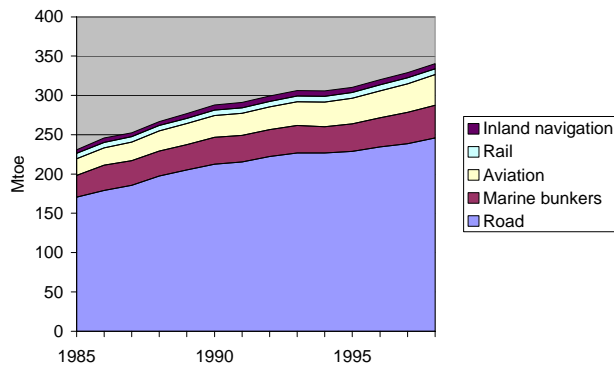


## Energy consumption

**Transport was responsible for about 34 % of total energy consumption in 1998. Transport energy consumption is continuing to grow by about 3 % per year. Road transport and aviation contributed 74 % and 31 % respectively to the increase of energy use by transport between 1997 and 1998.**

Figure 1: Total energy consumption in transport (EU) in Mtoe, 1985 to 1998



**Source:** Eurostat

**Note:** Transport by oil pipelines is responsible for between 1 and 1.5 % of total energy consumption by transport and is therefore omitted.

### **Objective**

Reduce consumption of fossil energy by transport.

### **Definition**

Final energy consumption by transport mode (road, aviation, marine, rail and inland waterways), expressed in million tonnes of crude oil equivalent (Mtoe).

Linked with the following 'explaining' fact sheets: Passenger transport, Freight transport, Energy and CO<sub>2</sub> intensity, Uptake of cleaner fuels.

This fact sheet explains the following other fact sheets: Air emissions.

### **Policy and targets**

Common Transport Policy's action programme (European Commission, 1998)

The Common Transport Policy's Action Programme highlights the need to "reduce the dependence of economic growth on increases in transport activity and any such increases on energy consumption". This is mainly achieved by promoting environmentally-friendly transport modes.

Green Paper Towards a European Strategy for the security of energy supply	<p>In its Green Paper the European Commission sketches out the pillars of a long-term strategy to ensure a secure energy supply for the future. The proposed strategy is based on both demand and supply of energy. With regard to demand, the Green Paper calls for a real change in consumer behaviour, achievable through taxation measures and levies that aim to penalise the harmful environmental impact of energy. Transport industries are urged to apply active energy-savings policy and diversification in favour of non-polluting energy.</p> <p>With regard to supply, priority must be given to the fight against global warming by the development of non-fossil sources. The Commission aims at doubling the share of new and renewable energies in the energy supply quota from 6 now to 12 % in 2010. One way that could be explored is that established energies such as oil, gas and nuclear could finance the development of renewable energies.</p>
Community's Action Plan to Improve Energy Efficiency (European Commission, 2000b)	<p>It is estimated that improving energy efficiency could reduce energy consumption in the EU by more than 18 %, through breaking down the market barriers which prevent satisfactory diffusion of energy-efficient technologies and efficient energy use. The Action Plan aims at removing these barriers. For the transport sector, policy priorities include incentives for optimal occupancy of vehicles, the promotion of new and alternative infrastructure and subsequently modal shifting and improving intermodal transport systems, developing alternatives to air transport, completion of the internal market in rail transport and changing behaviour regarding mobility. Moreover, a clearer mandate is sought to accelerate and broaden these developments, for example by pilot actions and greater Member State involvement.</p>
Community's CO <sub>2</sub> reduction strategy (European Commission, 2000a)	<p>The Community's strategy to reduce CO<sub>2</sub> emissions from passenger cars and improve fuel economy was endorsed by the Council in 1996. It aims at achieving an average CO<sub>2</sub> emission figure for new passenger cars of 120 g CO<sub>2</sub>/km by 2005, and 2010 at the latest. The strategy is based on three pillars:</p> <ul style="list-style-type: none"> <li>– commitments of the automobile industry on fuel economy improvements;</li> <li>– fuel-economy labelling of cars;</li> <li>– the promotion of car efficiency by fiscal measures.</li> </ul>
Green Paper on Clean Urban Transport	<p>Energy-saving targets are expected to be included as a new item in a Green Paper on Clean Urban Transport the Commission intends to publish in 2001.</p>
SAVE II (European Commission, 1999a)	<p>The SAVE Programme is the principle focus of the Community's non-technical action on energy efficiency. It is the only EU-wide programme dedicated exclusively to promoting energy efficiency and encouraging energy-saving behaviour through policy measures, information, studies and pilot actions. SAVE has identified several priorities for the transport sector. These include measures to increase the use of energy-efficient transport in European cities for passengers and freight, including the optimal occupancy of vehicles (both public and private), promotion of new and alternative infrastructure, management alternatives to air</p>

transport and changing behaviour. For the period 2000 to 2002, emphasis will be placed on information dissemination and reducing the use of private cars, encouraging collective transport modes and seriously considering how to reduce the need for transport. The SAVE programme was adopted by the Council in 1996 for a five year period (1996 to 2000). It now forms part of the Energy Framework Programme for 1998 to 2002.

THERMIE and RTD on energy, environment and sustainable development

The THERMIE Programme (European Commission, 1994) of the Commission aimed at promoting more efficient energy technology. The programme, now closed, had a budget of about 700 million ECU. It is estimated that the THERMIE projects alone saved around 1 million tonnes of oil equivalent. Additionally, replication of projects, encouraged by demonstration and promotional activities conducted under THERMIE, is estimated to result in a future yearly energy saving of 12.5 million tonne of oil equivalent (DG Energy, 1997). THERMIE now forms part of the specific programme on research, technological development and demonstration on energy, environment and sustainable development for 1998 to 2002 (European Commission, 1999b). Priorities in this programme include an integrated approach to improving energy efficiency, including in transport, and improvements in the efficiency of new and renewable energy sources.

In addition to technological improvements, some Member States are implementing other measures to improve the sector's energy efficiency, such as promoting public transport, rail and inland waterways, financial support for the purchase of fuel-efficient vehicles, traffic control and rationalisation of urban transport.

Some examples of measures at the Member State level to decrease energy consumption by transport are:

Germany (Inter Ministerial Working Group)

The German Automobile industry is committed to a 25 % reduction in fuel consumption of new cars built and sold in Germany between 1990 and 2005.

Italy

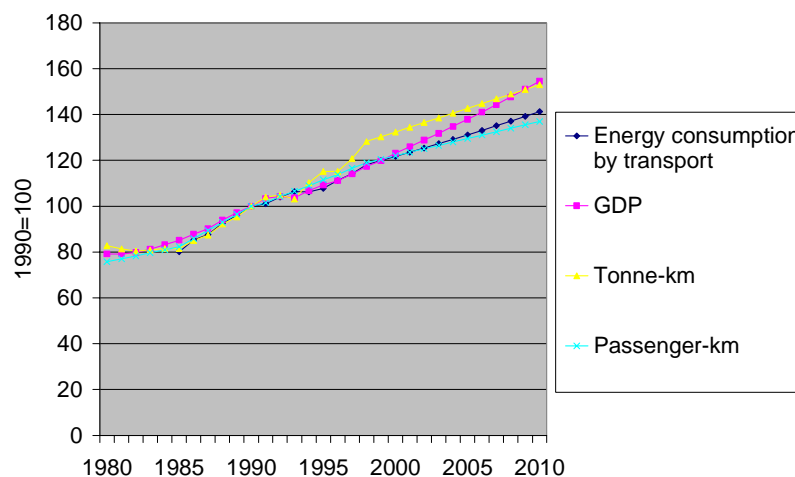
The Italian government has developed a voluntary programme, jointly with the major Italian manufacturer FIAT, to make more efficient vehicles available.

### ***Findings***

Relative energy consumption by transport

Transport energy consumption is still growing by about 3 % a year, using 340 Mtoe in 1998 (some 34 % of all energy use). Thus, the objective of reducing energy consumption by the transport sector has not been achieved. Projections to 2010 show that energy consumption by transport is expected to follow growth in transport demand, even though significant reductions in fuel consumption by new cars and trucks will be realised (see #Energy and CO<sub>2</sub> intensity).

**Figure 2: Evolution of energy consumption by transport, GDP, passenger-km and tonne-km (EU-15), 1980-2010**



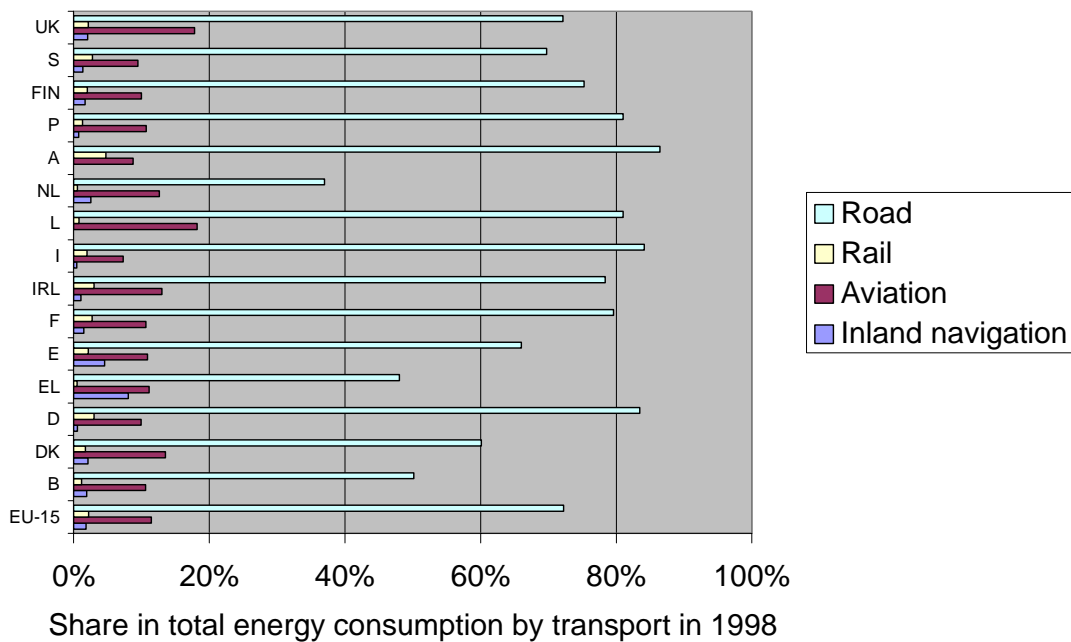
**Note:** Projections for energy consumption to 2010 are based on PRIMES (DG Energy, 1999). These do not include the voluntary agreements with the car manufacturing industry and assume a 1.5 % average annual growth rate from now up to 2010. The recently published Green Paper on a Strategy for the security of energy supply (European Commission, 2000a) assumes a 2 % average annual growth rate up to 2010, including the effects of the voluntary agreements. In this graph, an average annual growth rate of 1.5 % is used.

**Source:** Eurostat, DG Energy, 1999

Modal shares	In 1998, road transport was responsible for 73 % of transport energy consumption (an increase in share of 3 %), and aviation and marine bunkering each for about 12 %. The shares of other modes are slightly decreasing.
Road transport	<p>Growth in road transport was the main cause of the increase in energy use up to 1997: the increasing use of heavier, more powerful cars and trucks, together with low occupancy rates and load factors, have offset improvements in fuel economy – mostly related to engine technology (see fact sheets #Passenger transport, #Freight transport, #Energy and CO<sub>2</sub> intensity, #Uptake of cleaner fuels).</p> <p>Between 1997 and 1998, energy use by road transport fell in Austria and in the UK.</p>
Marine bunkering	Energy use by marine bunkering in the EU fell slightly between 1997 and 1998. Country differences are closely related to the level of activity in ports; the economic benefits of these activities accrue mainly to the countries of origin and destination of the transported freight.
Air transport	Energy use by aviation in the EU almost doubled between 1985 and 1998. Growth is still 8 % per year.
Rail transport	Energy use by rail transport has been stable between 1985 and 1998, and fell by 3 % between 1997 and 1998.
Inland navigation	Energy use by inland navigation increased by almost 50 % between 1985 and 1998, but it fell by 3 % last year.

Share of passenger and freight transport in energy consumption Passenger transport accounts for 55 to 65 % of total energy use by transport. Energy use by freight is growing at the fastest rate.

Figure 2: Final energy consumption by transport: modal shares in 1998



Source: Eurostat

**Future work**

Develop EU statistics of primary energy consumption from a life-cycle perspective

Energy use by transport comprises direct consumption (vehicle operation) and indirect consumption from primary fuel production (extraction) and transformation (refineries, power generation, etc.), infrastructure and vehicle manufacture, maintenance and disposal, etc.

Primary energy consumption would therefore provide a better basis for comparing transport modes. However, such statistics are currently only available in a few countries and are not always comparable.

Efforts are needed to improve methodologies and data to develop an EU appraisal of energy consumption by transport from a life-cycle perspective.

Analysis of driving forces: passenger or freight?

No split of energy consumption data according to freight and passenger transport is currently available at Eurostat. Such information would enable a better assessment of energy consumption by freight and passenger transport

consumption by freight and passenger transport.

Attribute international bunkering to countries of origin and destination  
 Marine bunkers (the amount of energy carried in marine bunkers) does not necessarily reflect the marine activity of the country in which the bunkers are located. The same may be true, to a lesser extent, for aviation. Data for inland waterways may include some coastal shipping. Efforts are needed to improve methodologies and data to improve the statistics in this respect.

### Data

#### Energy consumption by transport

Unit: Mtoe

	EU-15	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
1985	230,9	8,4	4,0	51,6	5,8	17,7	35,9	1,7	31,2	0,6	17,5	4,5	3,1	3,8	7,0	38,0
1986	245,9	9,5	4,0	55,0	6,4	19,4	37,6	1,8	33,0	0,6	18,8	4,7	3,3	4,1	7,5	40,2
1987	252,5	10,1	4,6	56,0	6,6	20,7	38,6	1,7	33,0	0,7	18,7	4,7	3,5	4,3	7,9	41,3
1988	266,7	11,1	4,8	57,4	7,2	23,4	40,9	1,8	34,2	0,7	20,2	5,1	3,8	4,4	8,1	43,5
1989	276,9	11,5	5,1	58,2	7,5	24,6	42,5	1,9	35,5	0,8	20,3	5,3	4,1	4,7	8,4	46,6
1990	288,1	11,8	5,5	61,3	8,3	26,1	44,5	2,0	36,1	1,0	21,1	5,4	4,3	4,8	7,9	48,0
1991	291,1	12,0	5,3	61,3	8,3	28,0	44,2	2,1	36,9	1,2	21,6	6,0	4,6	4,7	7,9	47,2
1992	299,6	12,4	5,4	63,0	8,8	28,7	45,1	2,1	38,3	1,3	22,3	6,0	4,9	4,8	8,3	48,2
1993	306,4	12,6	5,7	65,0	9,6	27,9	46,9	2,1	39,1	1,3	23,1	6,1	5,0	4,6	8,2	49,3
1994	306,0	12,6	6,0	63,9	9,7	28,7	45,6	2,3	39,1	1,3	22,8	6,1	5,2	4,6	8,6	49,3
1995	310,5	12,4	6,2	64,9	10,0	29,2	46,5	2,3	40,1	1,3	23,6	6,2	5,3	4,4	8,7	49,4
1996	320,4	13,4	6,2	64,6	9,7	32,3	48,5	2,9	40,3	1,4	24,5	6,4	5,6	4,4	8,7	51,4
1997	329,0	14,3	6,2	65,8	9,8	33,7	49,8	3,1	41,1	1,5	25,6	6,4	5,7	4,7	9,0	52,4
1998	340,4	15,0	6,1	66,7	10,8	36,4	51,5	3,5	43,6	1,6	25,8	6,3	6,1	4,8	9,3	53,0

Source: Eurostat

### Meta data

#### Technical information

##### Data sources:

Eurostat Compendium, Transport and Environment: Statistics for the Transport and Environment Reporting Mechanisms (TERM) for the European Union. Data 1980 - 1999. Theme 8 Environment and Energy. 2001 edition. *Draft November 2000*

##### Description of data:

File: Energy consumption.xls

##### Original measure units:

-

##### Original purpose:

-

##### Geographical coverage:

EU-15 (Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom).

##### Temporal coverage:

1985-1998

*Methodology and frequency of data collection:*  
Yearly by Eurostat.

*Methodology of data manipulation:*  
None

**Qualitative information**

*Strength and weakness (at data level): no split in freight and passenger transport available*

-

*Reliability, accuracy, robustness, uncertainty (at data level):*

-

*Further work required (for data level and indicator level):*

-

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Inter Ministerial Working Group: *Bi-annual report by the inter-ministerial working group on CO<sub>2</sub>-reduction*, Germany