



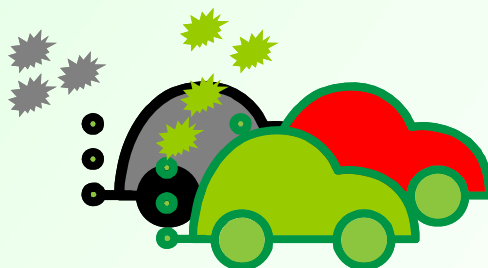
Country Review Report

A report compiled within the European research project

Deriving effective least-cost policy strategies for alternative automotive concepts and alternative fuels-ALTER-MOTIVE

Intelligent Energy – Europe (IEE), STEER
Contract no. IEE/07/807/SI2.499569

edited by
Amela AJANOVIC
Energy Economics Group (EEG), Vienna University of Technology





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(work package 2 – deliverable D3)

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Intelligent Energy  Europe

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I. INTRODUCTION

This report is the first deliverable of the EU-funded project “Deriving a (least-cost) action plan for promoting alternative automotive Technologies and alternative fuels”-ALTER-MOTIVE.

The core objective of the project ALTER-MOTIVE is to derive effective least-cost policy strategies to achieve a significant increase in innovative alternative fuels and corresponding alternative more efficient automotive technologies to head towards a sustainable individual & public transport system.

The first step towards achievement of this target is the documentation of the historical developments in car passenger transport in EU Member States. This documentation is the basis for further analyses in the scope of the ALTER-MOTIVE project.

The major objective of this report is to provide country reviews of the most important historical and current developments and features in car passenger transport in different European countries regarding energy consumption, vehicle and fuel use and fuel economy characteristics.

Moreover, also the relevant policies and measures in car transport with special focus on the promotion of alternative automotive technologies (AAMT) and alternative fuels (AF) implemented so far are identified for EU countries.

In detail the development of the following features is documented:

- ❖ amount of fuel used (energy consumption of passenger cars) with special focus on
- ❖ (total) biofuels consumption and production,
- ❖ fuel price,
- ❖ vehicle stock (including the number and type of AAMT vehicles),
- ❖ travel activity (vehicle-km driven),
- ❖ fuel intensity (litre/100 km) and
- ❖ policy instruments implemented.

The policy analysis focuses on documentation of:

- ❖ types of taxes related to different kinds of fuels (gasoline, diesel and AF), tax levels and tax incentives in relation to vehicles (petrol cars, diesel cars and AAMT vehicles), and CO₂ taxes introduced in recent years in the transport sector
- ❖ CO₂-dependent policies
- ❖ subsidies and other support for vehicle technology development.

This analysis is conducted mainly based on original information provided by the ALTER-MOTIVE project partners in different countries. To some extent existing studies and databases were used (e.g. ODYSSEE; ACEA; IEA EP&T; OECD National accounts; EU Energy in Transport; IEA Energy balances)

Since the statistical data for some EU countries are very poor, in the country surveys it was not possible to show all data for all EU countries for the same period and in the same way.

II. INDICATORS EU-27

In this chapter a summary on the major aggregated indicators in car passenger transport in the EU-27 is provided. For some features (e.g. biofuels production by country) the most recent data available are depicted by country.

1. Energy consumption of passenger cars – conventional and alternative fuels

Overall energy consumption of passenger car transport in the EU-15¹ in 2007 amounted to about 7 EJ. This is an increase of 28% in comparison to the year 1990. As Figure 1 depicts gasoline contributed by 55% in 2007 (compared to 81% in 1990), diesel with 41% (17% in 1990), and alternative fuels with 4% (2% in 1990).

A major feature of car passenger transport in EU countries is the continuous increase of the market share of diesel, which in 2007 almost reached 2100 PJ.

The share of alternative fuels in passenger transport in EU has increased continuously since 2000 especially in Germany and contributes currently with about 4% to total energy consumption, Figure 2.

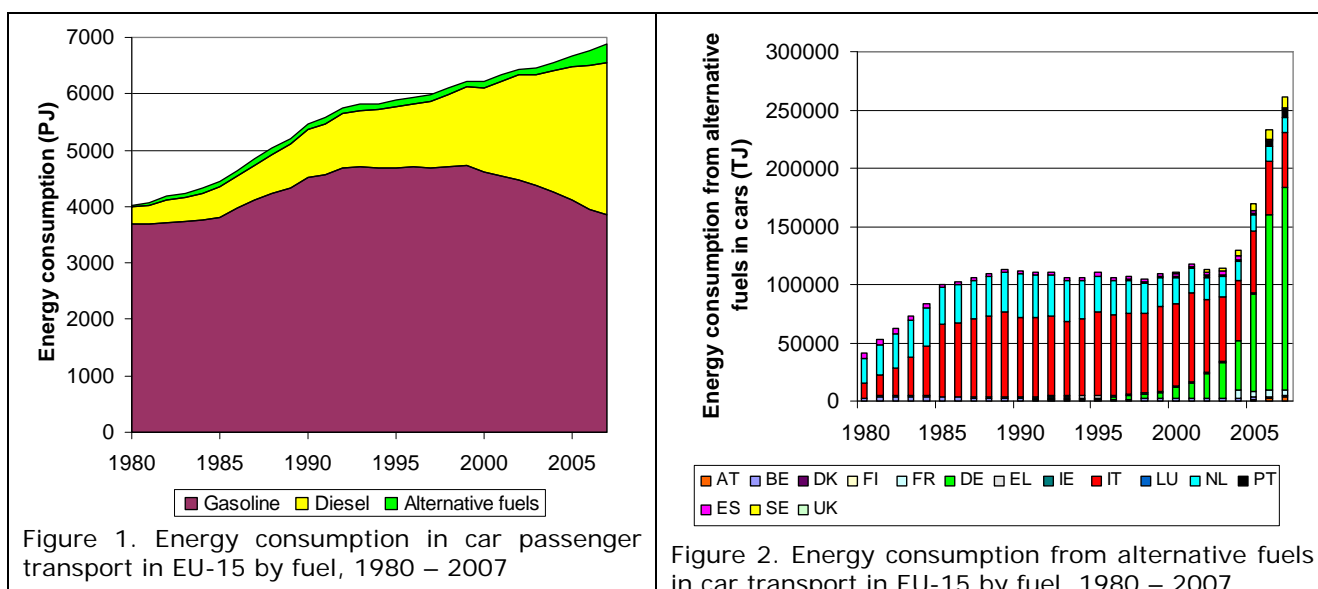


Figure 3 depict the corresponding CO₂ emissions. It can be seen that the profile is very similar to overall energy consumption. For this reason in chapter III this diagram is not repeated for every single country.

¹ For EU-27 no reliable time series back to 1980 are available.

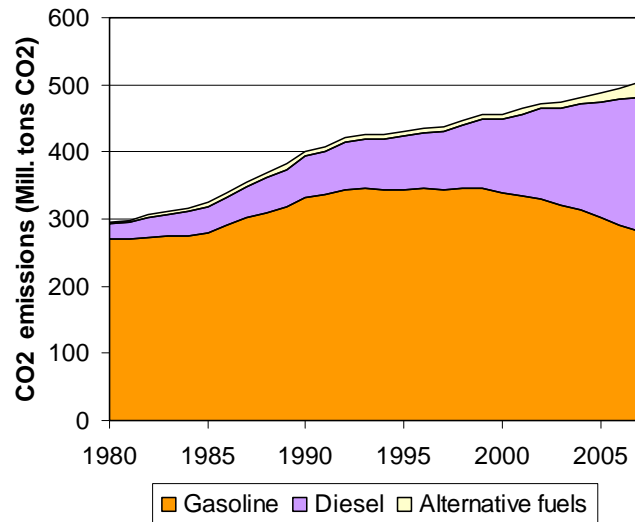


Figure 3. Development of CO2 emissions of car passenger transport in EU-15 by fuel, 1980 – 2007

2. Biofuels consumption and production

Currently, the most interesting alternative fuels are biodiesel and bioethanol. In this chapter the most recent developments in biofuels production in European Member States compared to a global perspective are shown.

2.1 Europe in the world

Global production of biofuels amounted to 46 Mtoe in 2008. Brazil and the United States together account for almost three-quarters of global biofuels supply.

Currently, the share of biofuels is relatively small in almost all countries with the exceptions of USA and Brazil. The share of biofuels in total transport fuels demand in 2007 was about 20% in Brazil, 3% in the USA and less than 2% in the EU, see Figure 4. Many countries have set the goal to replace a significant part of fossil fuels by biofuels, see Table 6 for the EU.

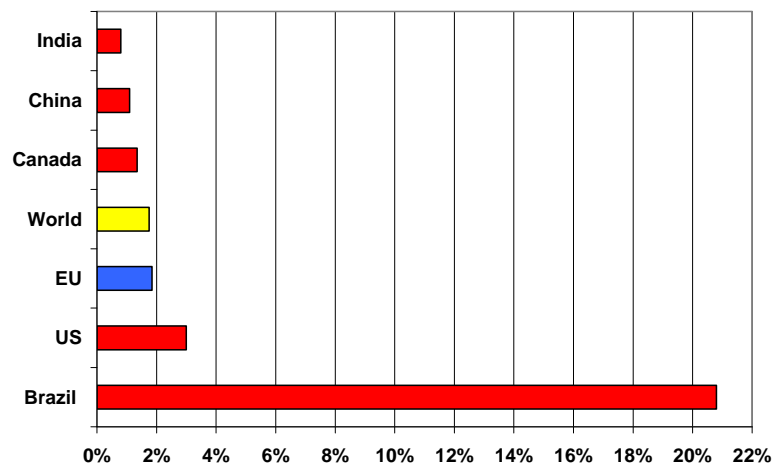


Figure 4. Share of biofuels in total road-fuel consumption in energy terms, 2007 (IEA, F.O.Licht)

Ethanol production is rising rapidly in many parts of the world mainly due to higher oil prices, which are making ethanol more competitive, especially in combination with government incentives. Recent trends in ethanol production are shown in Figure 5. As shown, in 2008 global bioethanol production was 65 billion litres. This is an almost 4 times higher amount than in 2000.

In total bioethanol production, Europe accounted for about 2% in 2003 and for about 3.6 % in 2008.

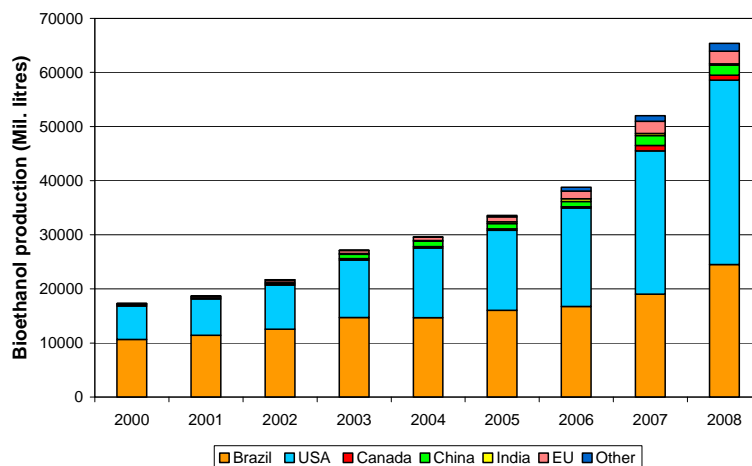


Figure 5. Recent trends in world-wide bioethanol production by region/country (Data source: F.O.Licht, IEA, EBTP)

Total production of biodiesel worldwide was about 12.75 Mtoe in 2008. This is very small compared with that of ethanol production. The largest part of biodiesel, 55% in 2008, was produced in the European Union, 16% in USA, and the rest in other countries. Recent trends in biodiesel production are shown in Figure 6.

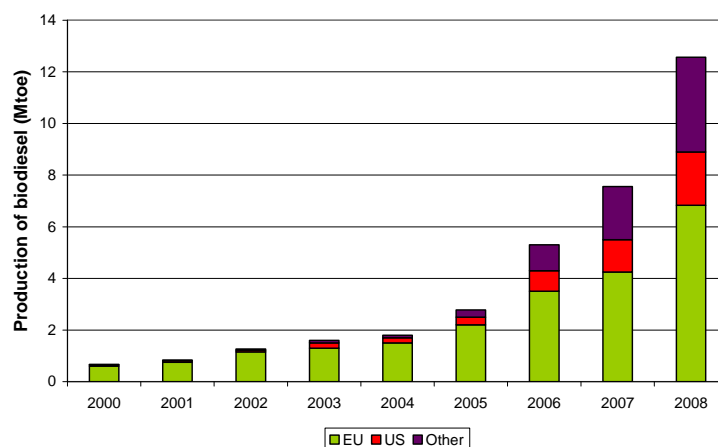


Figure 6. Recent trends in worldwide biodiesel production by region/country (Data source: F.O.Licht, IEA, EBTP)

2.2 Development in EU-27

The production of liquid biofuels in EU-27 increased from 62 PJ in 2003 to about 345 PJ in 2008, see Table 1.

Table 1. Total production and total consumption of biofuels in EU-27 in 2003 and 2008 (PJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	53	285	48	331
Bioethanol	9	60	11	67
Total	62	345	59	399

The EU is today the third largest producer of bioethanol in the world behind the United States and Brazil, but its production is much lower than in the first two. In 2008 the production of bioethanol in EU-27 amounted to 2.816 million litres. After a rather moderate growth in 2007 (+11% with respect to 2006), European bioethanol production increased considerably in 2008 (+56% with respect to 2007).

The total number of bioethanol producing Member States in 2008 was 17. Currently, France is the biggest bioethanol producer in EU. On the second place is Germany, followed by Spain, see Figure 7. All other countries together contributed only one third.

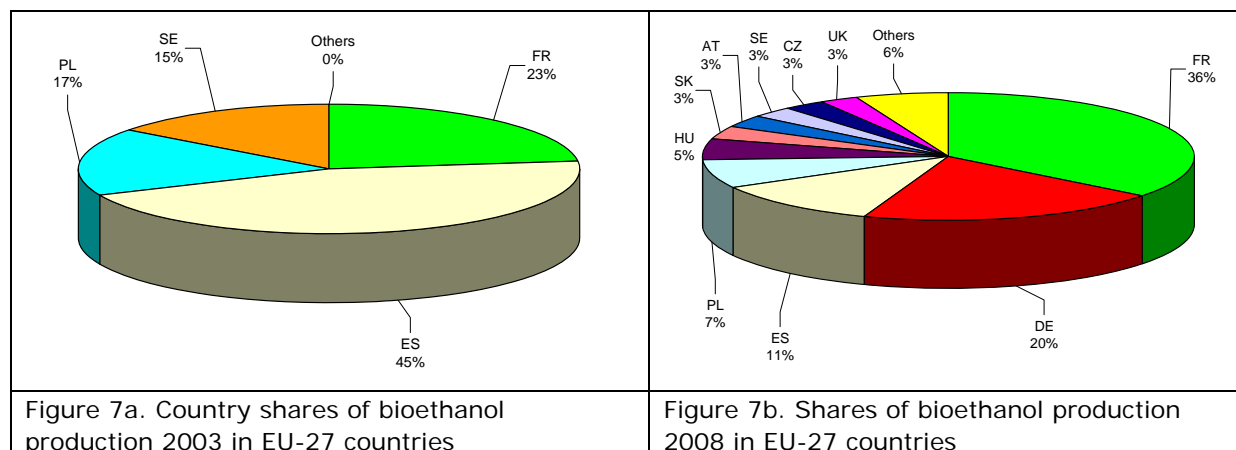


Figure 7a. Country shares of bioethanol production 2003 in EU-27 countries

Figure 7b. Shares of bioethanol production 2008 in EU-27 countries

The year 2008 was also a record year in terms of imports. Total imports are estimated to have reached almost 1.9 billion litres in 2008, i.e. an increase of 400 million compared to 2007. About 75% of the imported ethanol came from Brazil only [EBTP].

Figure 8 shows the evolution of bioethanol production over the past 7 years in the 10 major producing countries in the EU. The bioethanol production in EU is increasing, especially in the last few years, mostly in response to higher oil prices, which are making ethanol more competitive, especially in combination with government incentives.

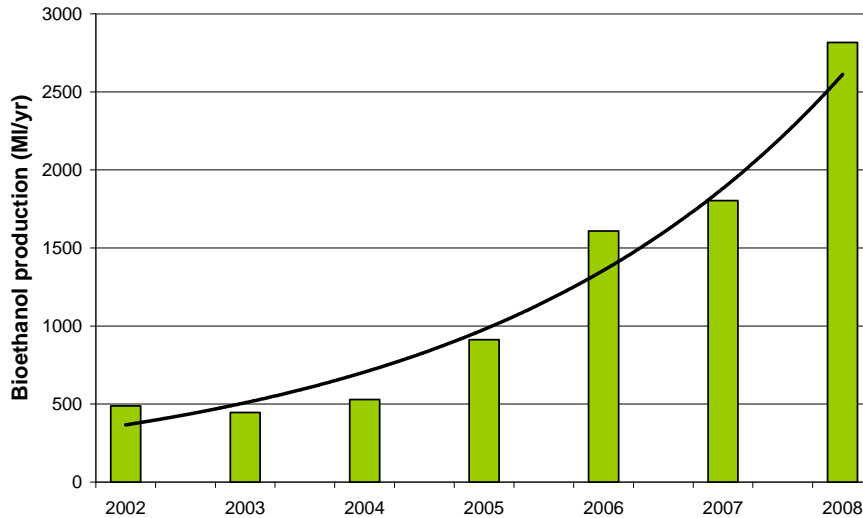


Figure 8. Recent trends in ethanol production in EU-27 (Data source: EBTP)

Almost all European countries have started biodiesel production. Currently the largest biodiesel producer in EU is Germany, followed by France and Italy, see Figure 9. These three countries alone contribute to about two-third of total production.

Total production of biodiesel in EU was 7,75 million tonnes in 2008. This is relative large production compared with the total biodiesel production in the world.

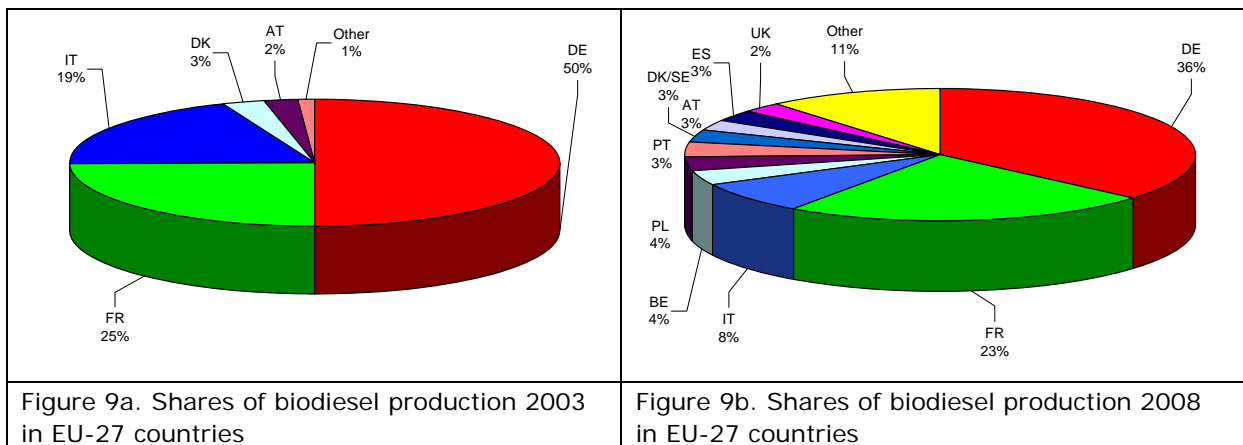


Figure 9a. Shares of biodiesel production 2003 in EU-27 countries

Figure 9b. Shares of biodiesel production 2008 in EU-27 countries

Recent trends in biodiesel production in EU are shown in Figure 10.

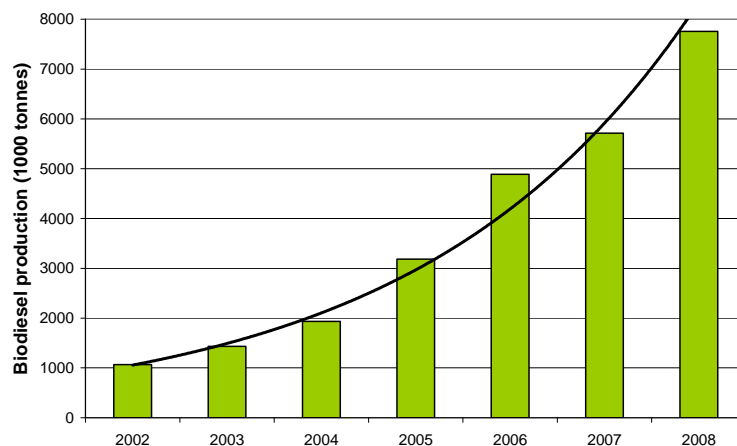


Figure 10. Recent trends in biodiesel production in EU (Data source: EBTP)

With respect to feedstocks in EU-27 wheat was most important for bioethanol production. In 2008 70% of total European bioethanol production was based on wheat. On the second place is barley, followed by corn and rye, see Figure 11a. In the future, according to many studies, ethanol production from lingo-cellulosic sources should play a significant role because of lower feedstock costs.

Biodiesel production in EU-27 is mainly based on rapeseed oil. Only 3% of biodiesel in EU is produced from sunflower oil and 18% from soybean oil, see Figure 11.

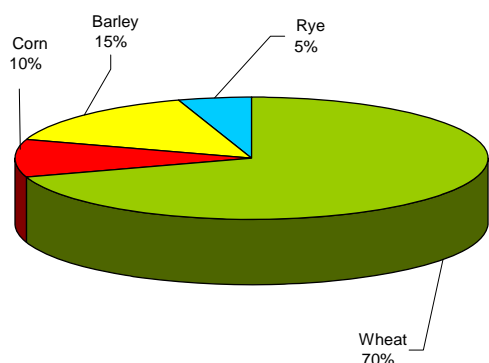


Figure 11a. EU-27: Feedstock use in ethanol production in 2008 [Data source: FAPRI]

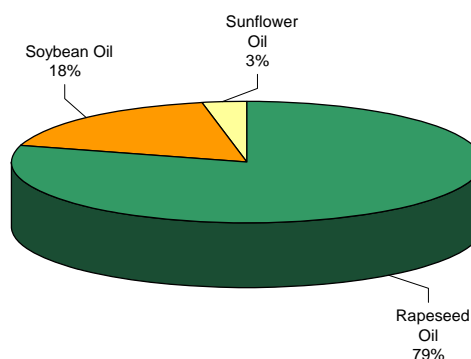


Figure 11b. EU-27: Feedstock use in biodiesel production in 2008 [Data source: FAPRI]

2.3 EU-27: country-specific issues

The rapid growth of biofuels in recent years is supported by the fact that many countries have set the goal to replace a part of fossil fuels by biofuels. In the European Union 5.75 % of the energy used for transportation should be biofuels by the year 2010. By 2020 10% of energy used in transport should be from renewable energy source, biofuels in practical terms.

A comparison of biofuel production in 2008 by country is shown in Figure 12.

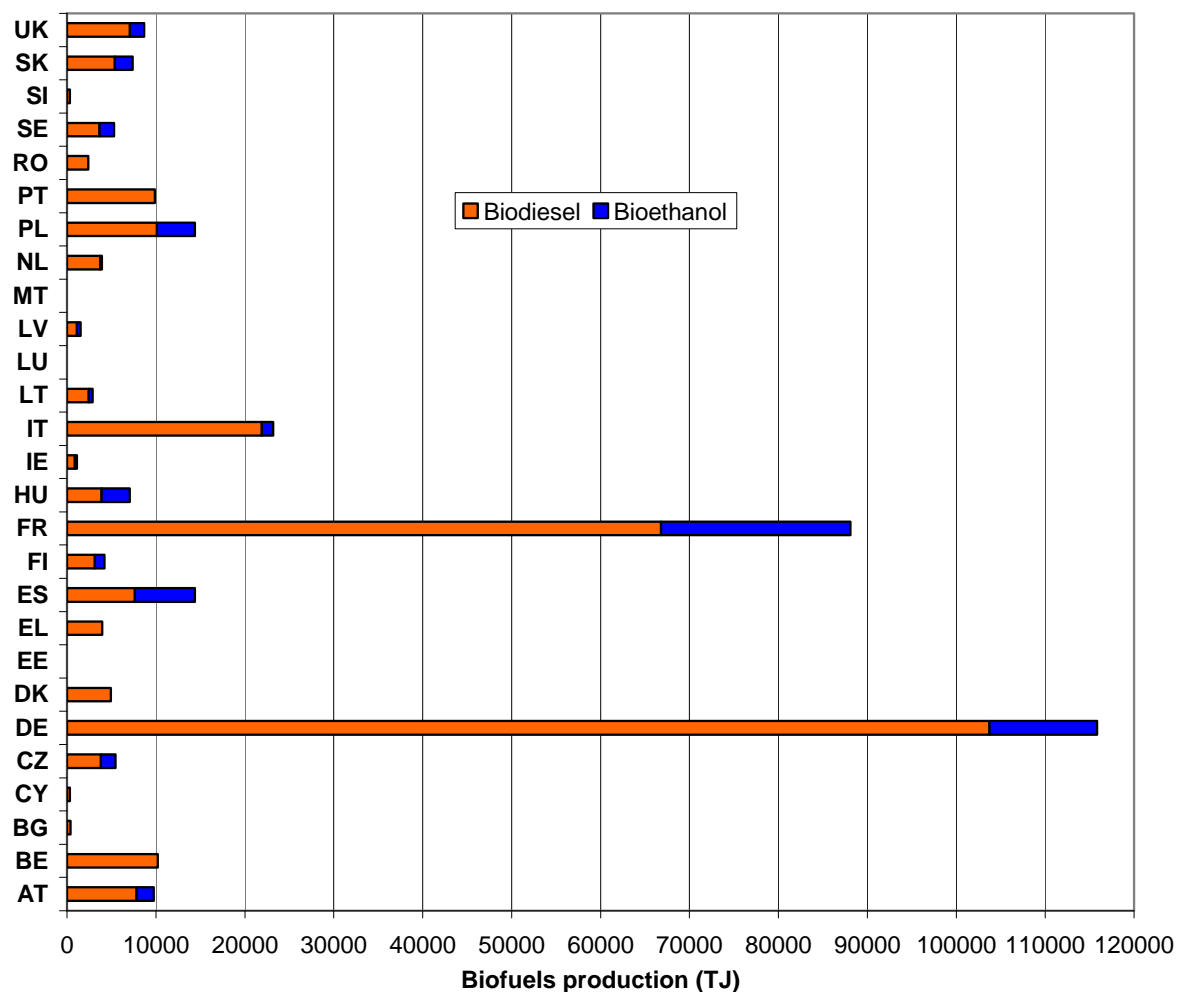


Figure 12. Comparison of biofuel production in 2008 in EU-27 countries (Data source: EBTP, EBB)

The share of LPG, electricity or other alternative fuels is currently low in almost all analysed countries.

3. Development of fuel prices

The development of fossil fuel prices in selected EU countries for the period 1980 to 2007 is shown in Figure 13.

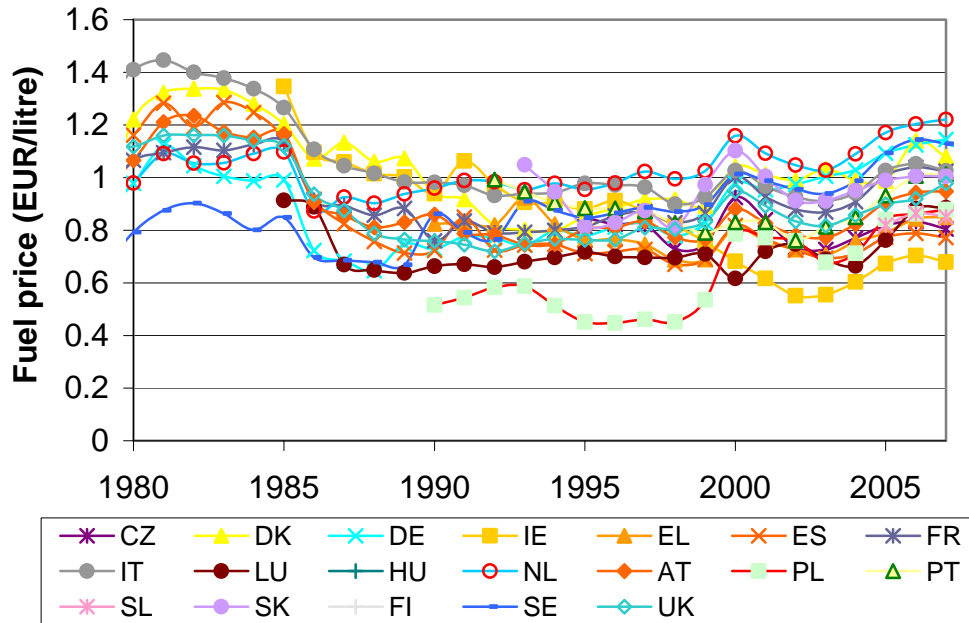


Figure 13. Weighted fuel price (including all taxes) for selected countries 1980 – 2007

Fuel prices may have a significant impact on travel demand and fuel intensity. The range of fuel prices vary wide across analyzed countries. In 2007 the highest fuel price was in the Netherlands (1.2 EUR per litre). Between 1980 and 1998 oil prices have been generally decreasing in real terms. After 1998 fuel prices increased significantly in many countries due to increases in world oil prices, as well as increases in fuel taxes mostly in European countries, as for example in Germany and United Kingdom.

Major parts of fuel prices are taxes - VAT as well as excise taxes.

The share of tax on fuel is very different across the EU countries ranging from 42.6% to 62.6% of the total gasoline price. The share of tax in total gasoline price in 2008 is shown in Figure 14. The highest tax on gasoline is in the Netherlands, 0.94 EUR per litre of gasoline. On the second place is Finland followed by Sweden. The lowest tax on gasoline was in Bulgaria 2.3 times lower than in the Netherlands.

The share of tax in total diesel price in 2008 is shown in Figure 15. The highest tax on diesel fuel in 2008 was in United Kingdom, 0.83 EUR per litre of diesel. There is also high tax on diesel in Sweden, Slovakia and Denmark, in the range from 0.73 to 0.68 EUR per litre. Much lower tax on diesel is in Bulgaria, Cyprus, Latvia, Lithuania, Rumania and Malta, in the range from 0.38 to 0.42 EUR per litre.

The share of tax on diesel is a little bit lower comparing to tax on gasoline. In EU the share of tax on diesel is in range from 36.6% to 57.7% of the total diesel price.

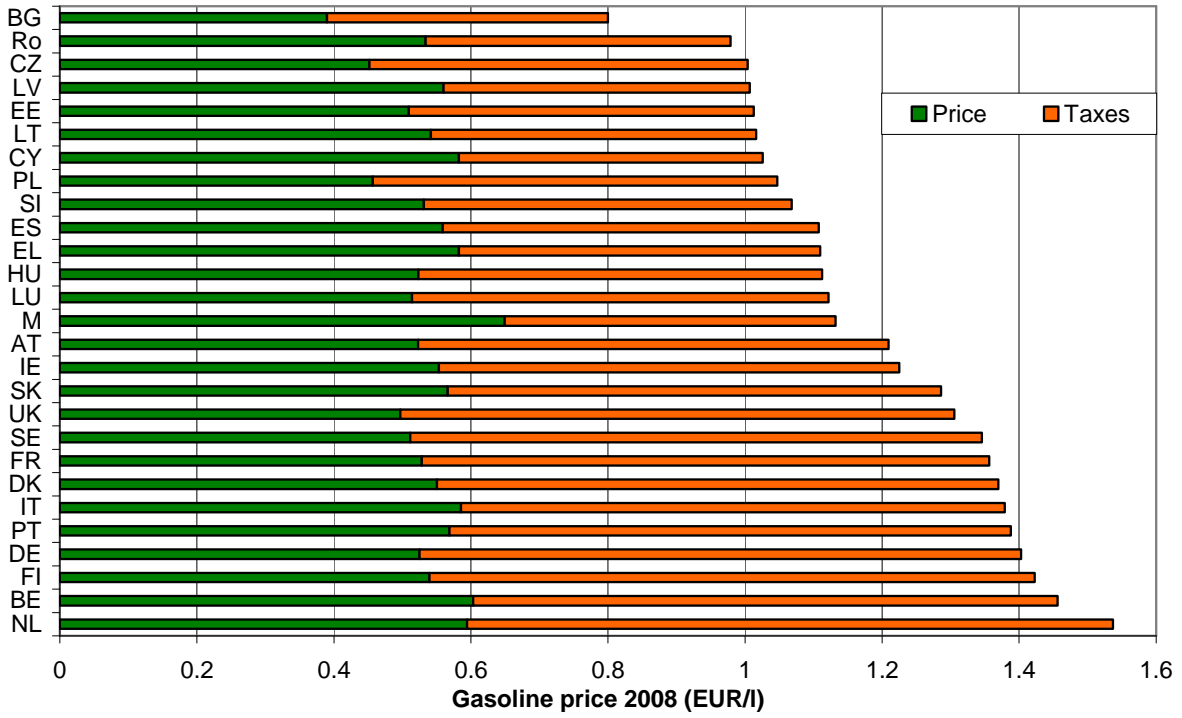


Figure 14. Gasoline prices in 2008 for all EU countries

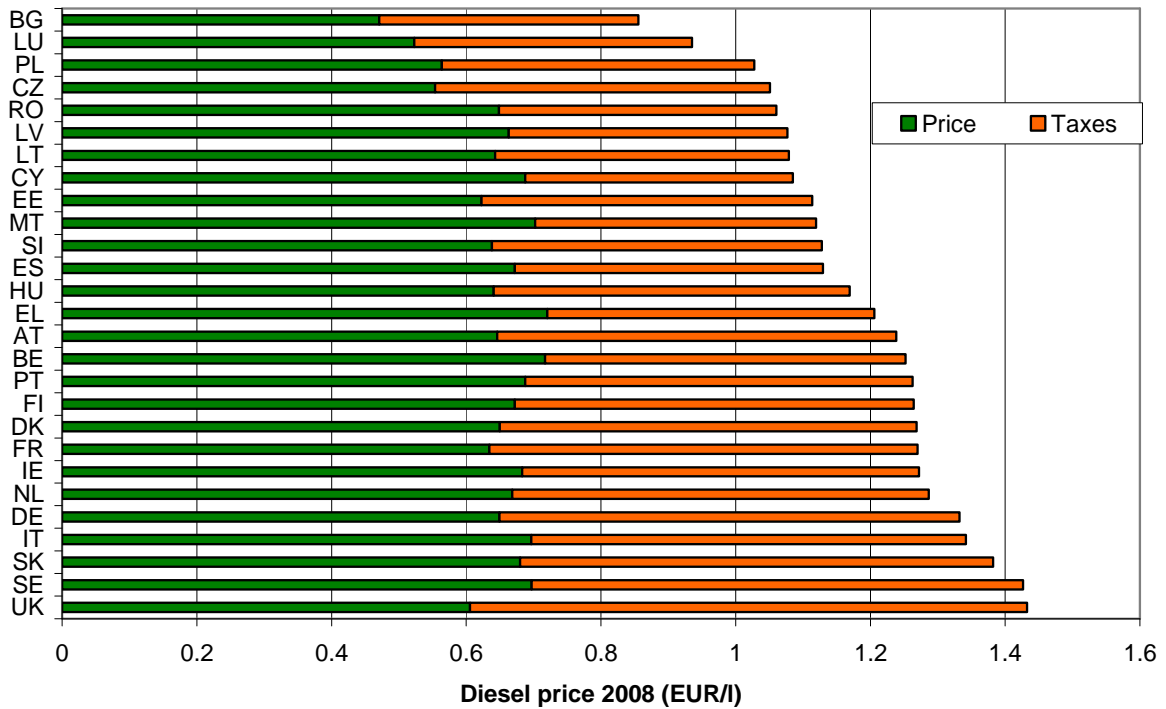


Figure 15. Diesel prices in 2008 for all EU countries

4. Development of car stock and new registered vehicles

The following figures depict major features regarding the development of car stock and new registered vehicles in (selected) EU Member States.

Car stock in EU-15 has grown from about 100 Mill cars in 1980 to more than 190 Mill cars in 2007, see Figure 16. Diesel cars increased their market share continuously. In 1980 the share of diesel cars in the total vehicle stock in EU 15 was 3.3% and 32% in 2007.

The share of alternative automotive technologies, such as electric vehicles, fuel cell vehicles, various types of hybrid systems, ethanol cars and systems based on natural gas or biogas, is still very low in EU countries. In 2007 in EU-15 share of alternative automotive technologies was about 1%.

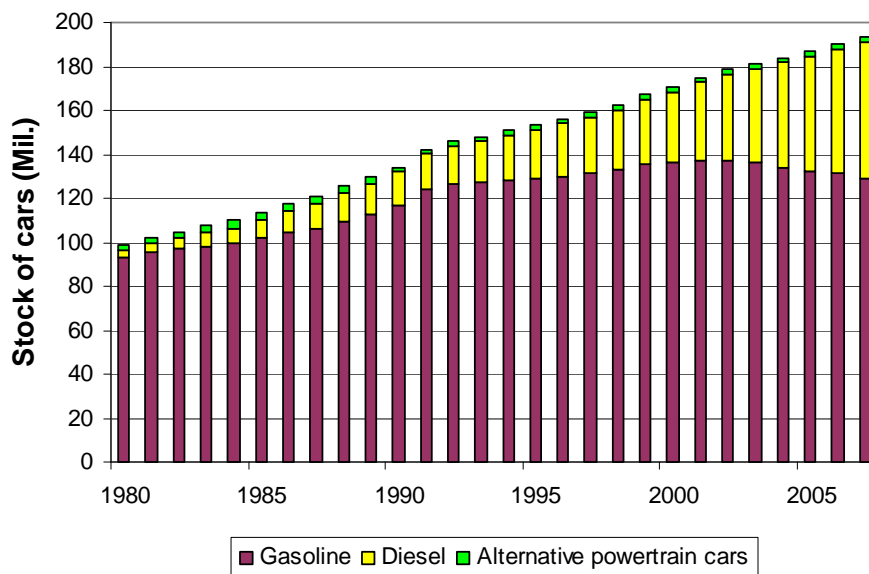


Figure 16. Development of car stock in passenger transport in EU-15, 1980 – 2007

Growth in car ownership is continuously increasing over time in all EU countries, see Figure 17.

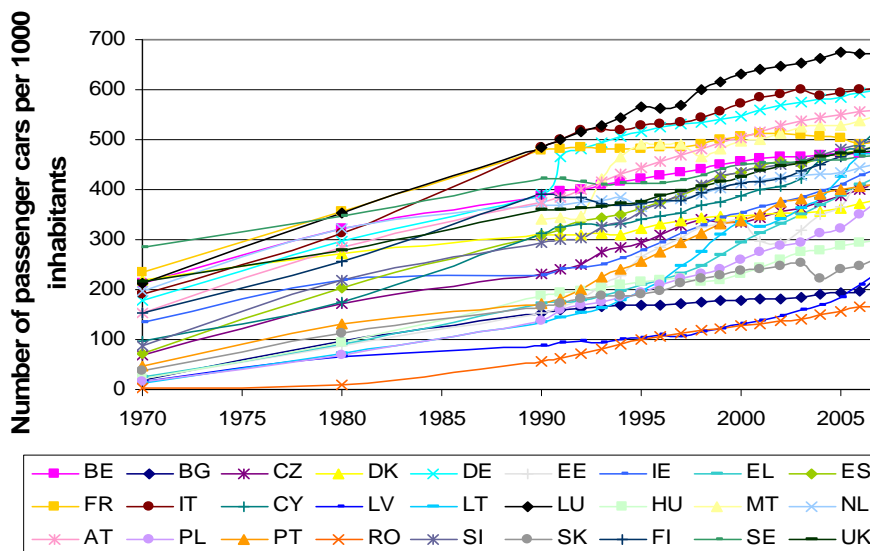


Figure 17. Development of car ownership per 1000 capita in EU- 27, 1970 – 2007

Car ownership level in analysed EU countries in 1970 was ranging between 2 (Romania) and 280 (Sweden) cars per 1000 capita, and in 2007 between 164 (Romania) and 675 (Luxemburg) cars per 1000 capita. The average car ownership level in EU is still low comparing to the United States. Many European countries have currently same car ownership level as United States 30 years ago.

In Figure 18 is also shown development of new registrations of passenger cars in European Member States for the period from 1980 – 2007. In this period the largest number of new cars has been registered in Germany.

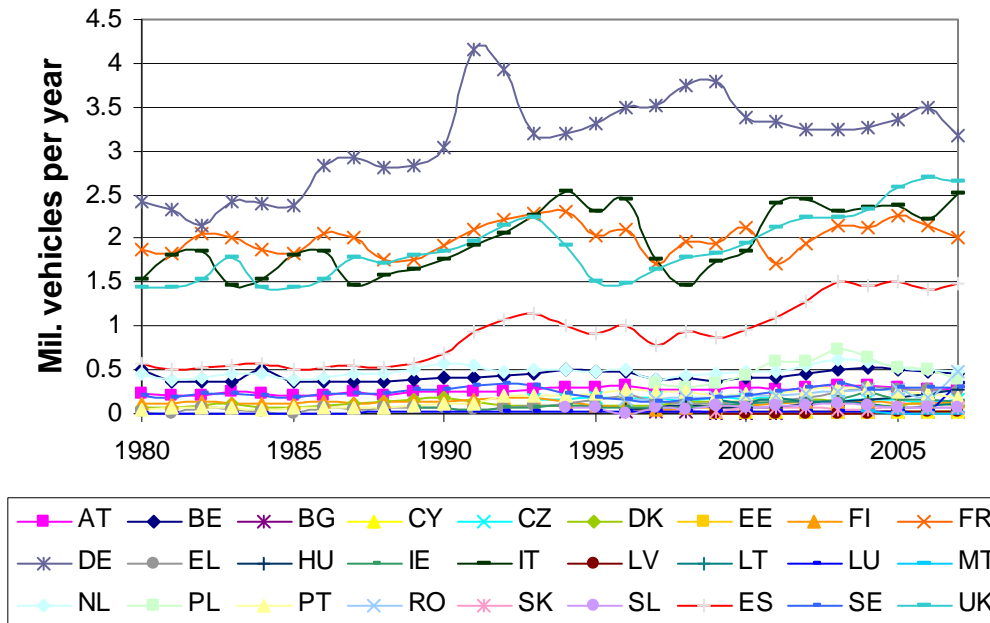


Figure 18. Development of new registrations of passenger cars in EU-27 countries 1980-2007

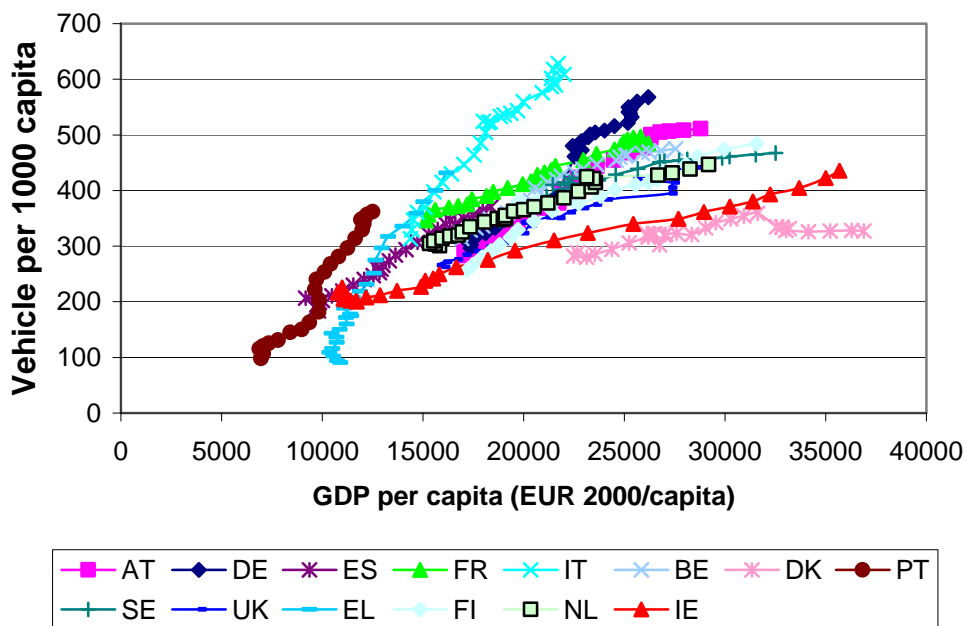


Figure 19. Car ownership versus GDP per capita 1980-2007

The relation between number of vehicles per capita and GDP per capita is shown in Figure 19. It can be noticed that these two parameters are strongly linked and both increasing over time.

Denmark has a relatively high GDP per capita and low car ownership level. This can be explained with the high vehicle taxes in Denmark. Denmark has tried to influence the drivers to buy cars which are energy efficient –with low CO₂ emission through the registration tax and the car owners' tax. From 2000 the registration tax was reduced for the most fuel efficient cars.

From the analysed countries, the highest car ownership level is in Italy and it is rapidly increasing with GDP increase.

Aside from the increasing car ownership also an increasing share of diesel cars can be noticed. One of the biggest advantages of choosing a diesel car is fuel economy. A diesel's extra 20 to 30 percent of fuel efficiency makes a difference. Out of town, some emit even less CO₂ than hybrids. This is one reason why diesels are becoming a more and more popular choice.

As shown in Figure 20 in 1995 in most of European countries the share of diesel cars was very low, between 2 and 33 percents. It is obviously that in 2007 this share is much higher in all analysed countries. In some EU countries is diesel share higher than gasoline share, for example, in Austria, Belgium, France.

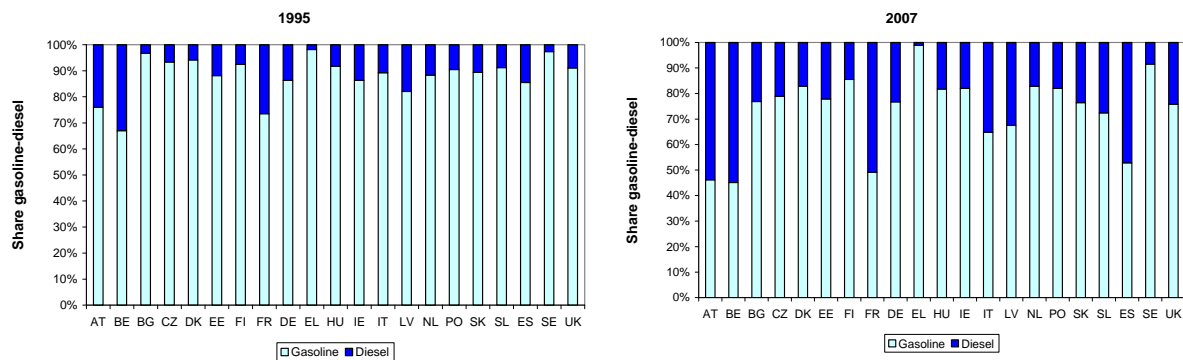


Figure 20. Share of gasoline and diesel cars in selected EU countries 1995 vs 2007

5. Development of vehicle - km driven

In the period 1980-2006 the largest increase in travel activity was in Germany, see Figure 21. In any way, these increases are closely tied to the increases in vehicle ownership.

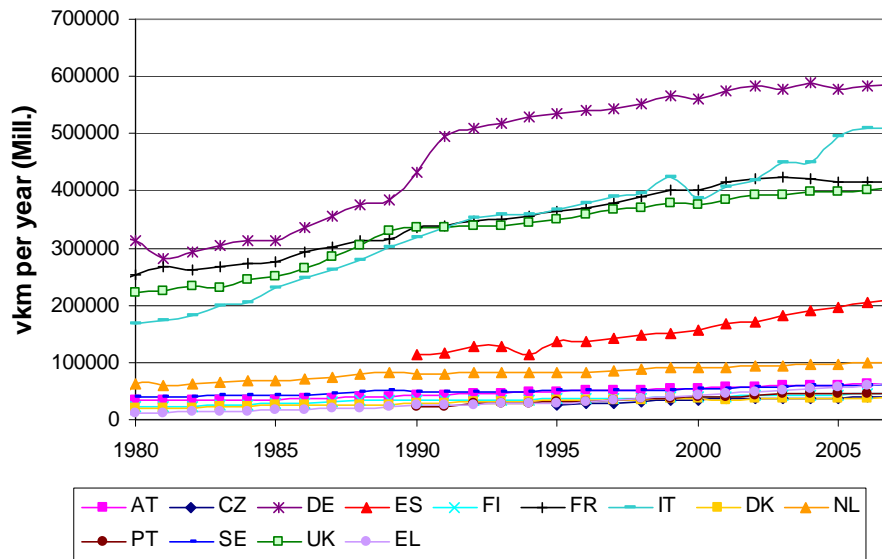


Figure 21. Increase in vehicle-km driven in passenger cars in selected EU-countries, 1980 – 2007

With the increasing car ownership, also overall travel activity is continuously increasing in all countries and the range of vehicle kilometers per capita is between 3 200 and 8 600 vehicle kilometers per capita, see Figure 22. From analyzed countries the highest travel activity is in Finland, Italy, Slovenian and Ireland, and the lowest in Slovakia, Czech Republic and Spain. The low travel activity per capita reflects low car ownership and utilization rates.

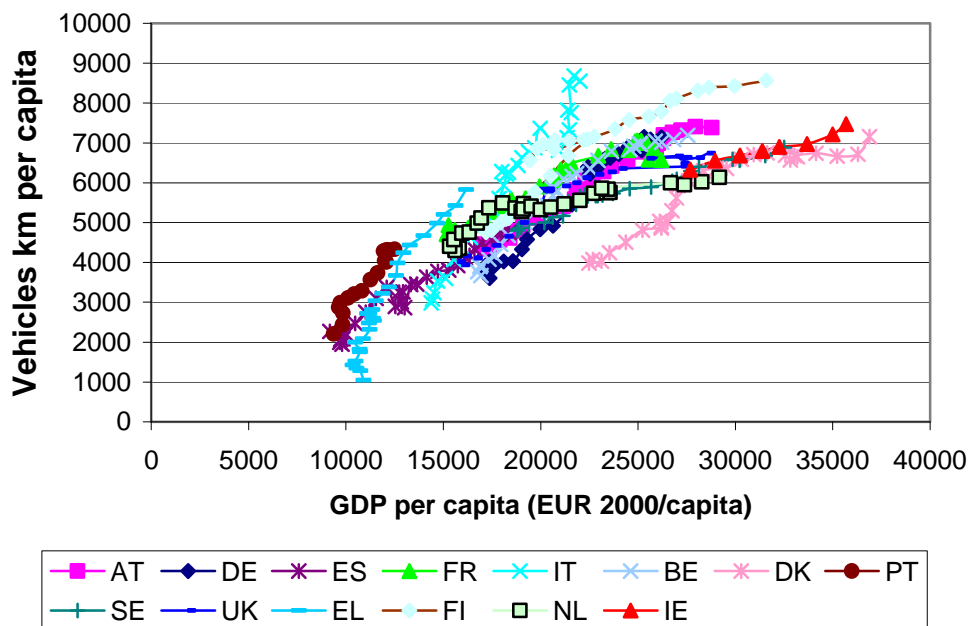


Figure 22. Development of vehicle kilometer per capita in selected EU countries 1980-2007

As shown in Figure 22, it is clear that GDP is an important driver of travel activity. In all analysed countries strong correlation between these two parameters can be noticed.

6. Fuel Intensities

In 2007 the fleets in the European countries have had on-road fuel intensity in the range of 6.5- 8.2 liter per 100 kilometer, see Figure 23.

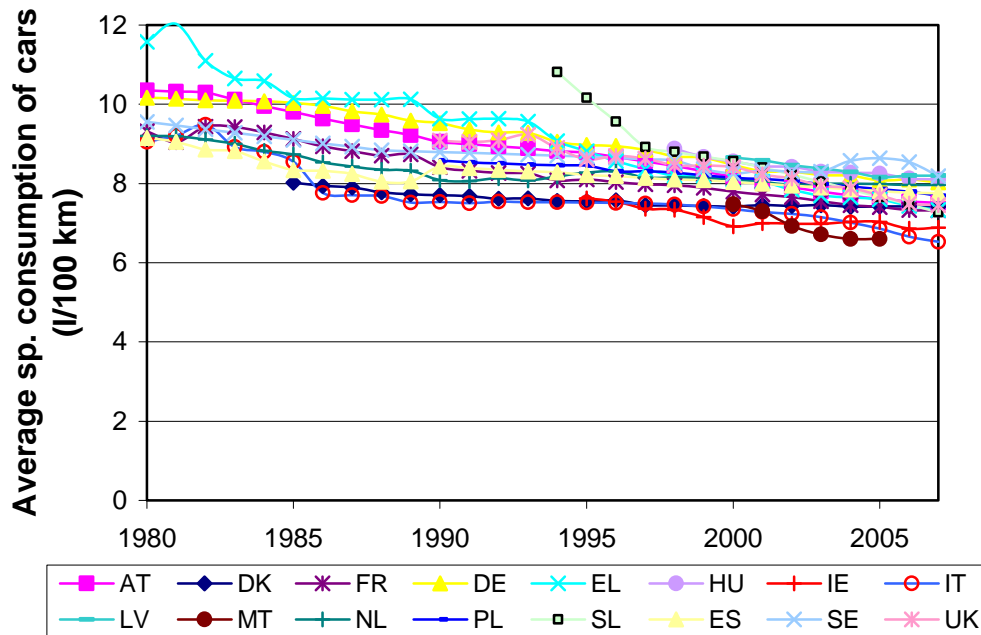


Figure 23. Average on road fuel intensity of stock of cars, gasoline equivalent (Diesel and LPG are converted to liters of gasoline at their energy content. 1 litre diesel = 1.12 litre gasoline)

The fuel economy improvement in new cars in Europe between 1980 and 2006 according to tests, was in range of 18% - 30%. These improvements were mainly due to the voluntary agreements to improve fuel economy, but currently agreements in Japan and Europe are expected to be both tighter and mandatory (Schipper, 2008). The EU proposes to strengthen their "Voluntary Agreement" to become a mandatory target with goal of 120 g/km CO₂ emissions from tests of new cars, which corresponds to roughly 5.5 l/100 km (Major, 2008).

Summing up, the major fact is that important technical improvements have been made to engine and other cars components, but these have been mostly outweighed by heavier, larger and more powerful cars.

In Figure 24 is shown average specific consumption of gasoline cars for selected European Member States for period 1980 – 2007. In 2007 the average fuel intensity of gasoline cars was mostly between 6.5 and 9 l/100 km.

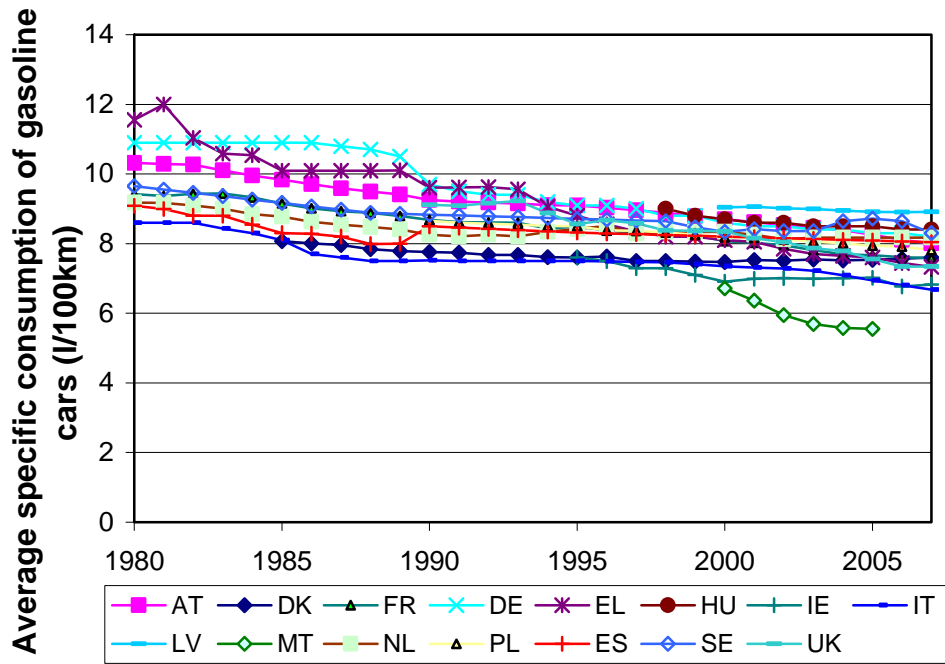


Figure 24. Gasoline fuel intensities over time for selected countries 1980-2007

The average specific consumption of diesel cars is a little bit lower comparing to gasoline cars. In 2007 the average fuel intensity of diesel cars was predominantly between 5.8 and 7 l/100 km, see Figure 25.

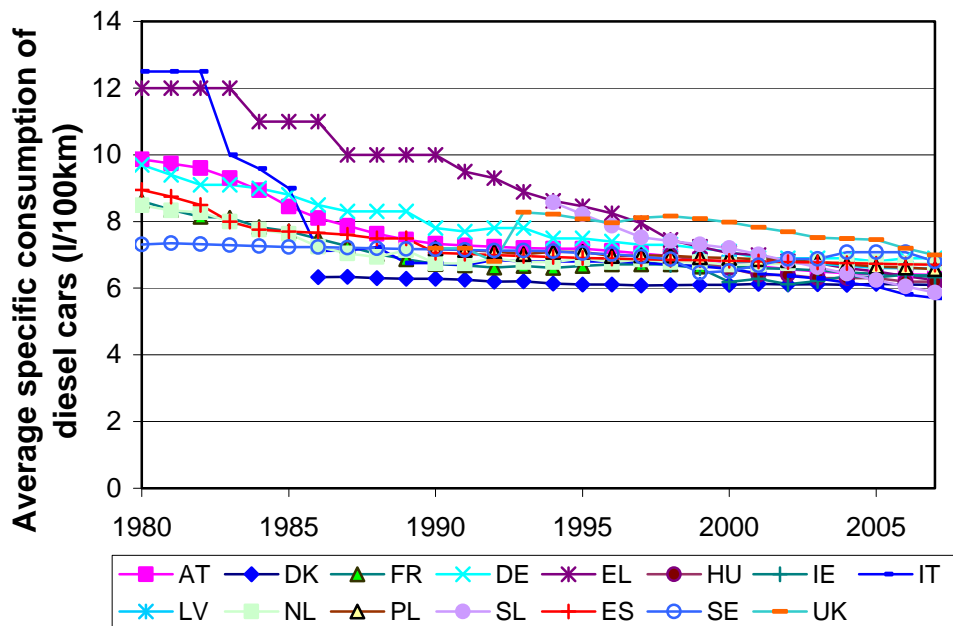


Figure 25. Diesel fuel intensities over time for selected countries 1980-2007

7. Major policies

According to the European Commission, at present there is little Community legislation, or harmonisation of national fiscal provisions, applied by the Member States in the area of passenger car taxation. Therefore, it is for each Member State to lay down national provisions for the taxation of these cars.

In this part is given an overview of most important policy measures in transport in the twenty-seven Member States of the European Union.

The following tables provide an overview of the various taxes and targets at EU level:

- Motor vehicle and fuel taxation
 - Taxes on acquisition/registration
 - Taxes on ownership
 - Taxes on fuel
- Overview of CO₂ based motor vehicle taxes in the EU
- EU Member States biofuels targets

7.1 Taxes on acquisition/registration

A tax on acquisition is tax paid once, by each vehicle owner, for each vehicle purchased and entered into service (sales tax, registration tax).

As shown in Table 2, the criterions for registration taxes are different across Member States of the European Union. The most of criterions are based on fuel consumption, on cylinder capacity, CO2 emissions and price.

The range of Value Added Tax (VAT) in EU-27 is between 15% (United Kingdom) and 25% (Denmark, Hungary and Sweden), but the VAT of 20 percent is the European average, see Table 2.

Table 2. Taxes on Acquisition (Source: ACEA, 2009)

Country	VAT	Registration tax
Austria	20%	Based on fuel consumption Maximum 16% + bonus/malus
Belgium	21%	Based on cc + age
Bulgaria	20%	The "product tax" is defined according to the age of the cars and is paid once, upon first acquisition or registration of the vehicle. The taxes for 2010 are defined, as follows: for new cars - 133 BGL (68 €) cars up to 5 years - 182 BGL (93 €) cars between 6-10 years - 230 BGL (118 €) cars, older than 10 years - 242 BGL (124 €)
Cyprus	15%	Based on cc + CO2
Czech Republic	19%	None
Denmark	25%	105% up to DKK 79,000 180% on the remainder
Estonia	18%	None
Spain	16%	Based on CO2 emissions From 0% (up to 120g/km) to 14.75% (above 200g/km)
Finland	22%	Based on price + CO2 emissions Tax % = 4.88 + (0.122 x CO2) Min. 12.2%, max. 48.8 %
France	19.6%	Based on CO2 emissions From € 200 (161 to 165g/km) to € 2,600 (above 250g/km)
Germany	19%	None
Greece	19%	Based on cc + emissions 5% - 50%
Hungary	25%	Based on emissions
Ireland	21.5%	Based on CO2 emissions max. 36%
Italy	20%	IPT + PRA + MCTC
Lithuania	19%	None
Luxembourg	15%	None
Latvia	21%	€ 373
Malta	18%	Based on price, CO2 emissions, vehicle length
The Netherlands	19%	Based on price + CO2 emissions 40% - € 1, 394 (petrol) 40% + € 290 (diesel)
Poland	22%	Based on cc 3.1% - 18.6%
Portugal	20%	Based on cc + CO2 emissions
Romania	19%	Based on cc + emissions + CO2
Sweden	25%	None
Slovenia	20%	Based on price 1% - 13%
Slovakia	19%	None
United Kingdom	15%	None

7.2 Taxes on ownership

Taxes on ownership are paid annually, regardless of how often the vehicle is used.

For passenger cars taxes on ownership are mostly based on kilowatt, cylinder capacity, CO2 emissions, fuel consumption and weight, see Table 3. For more details see corresponding paragraph in the specific country description (chapter III).

For commercial vehicles taxes on ownership is mostly based on weight.

Table 3. Taxes on ownership (Source: ACEA, 2009)

Country	Passenger cars	Commercial vehicles
Austria	kW	Weight
Belgium	Cylinder capacity	Weight, axles
Bulgaria	kW	Weight, axles
Cyprus	Cylinder capacity, CO2 emissions	NA
Czech Republic	None	Weight, axles
Denmark	Fuel consumption, weight	Weight
Estonia	None	Weight, axles, suspension
Spain	Horsepower	Payload
Finland	Time fuel, weight	Weight, axles
France	CO2 emissions	Weight, axles, suspension
Germany	Cylinder capacity, exhaust emissions CO2 emissions (as from July 2009)	Weight, exhaust emissions, noise
Greece	Cylinder capacity	Payload
Hungary	Weight	Weight
Ireland	CO2 emissions	Weight
Italy	kW, exhaust emissions	Payload, weight, axles
Lithuania	None	NA
Luxembourg	CO2 emissions	Weight, axles
Latvia	Weight	Weight
Malta	Cylinder capacity	NA
The Netherlands	Weight, province	Weight
Poland	None	Weight (below 3,5t)
Portugal	Cylinder capacity, CO2 emissions	Weight, axles, suspension
Romania	Cylinder capacity	Weight, axles
Sweden	CO2 emissions, weight	Weight, axles, exhaust emissions
Slovenia	None	NA
Slovakia	None	Weight, axles
United Kingdom	CO2 emissions, cylinder capacity	Weight, axles, exhaust emissions

NA-not available

7.3 Taxes on fuel

Taxes on motoring are taxes on fuels. Excise duties on fuels in EU countries are shown in Figure 14 and 15, and Table 4.

Table 4. Excise duties on fuels in €/1,000 litres
(Status: 1 January 2009, Source: European Commission)

Country	Unleaded Petrol	Diesel
Austria	442	347
Belgium	592	318
Bulgaria	350	307
Cyprus	299	245
Czech Republic	483	406
Denmark	561	382
Estonia	359	330
Spain	360	330
Finland	627	364
France	607	428
Germany	655	470
Greece	359	302
Hungary	448	368
Ireland	509	368
Italy	564	423
Lithuania	434	330
Luxembourg	462	302
Latvia	379	330
Malta	459	352
The Netherlands	701	413
Poland	488	339
Portugal	583	364
Romania	336	284
Sweden	568	446
Slovenia	403	383
Slovakia	515	481
United Kingdom	661	661

7.4 Overview of CO₂ based motor vehicle taxes in the EU

Since the motor vehicle taxes in most of the EU Member States are totally or partially based on CO₂ emissions and/or fuel consumption, Table 5 provides an overview of these taxes.

Table 5. Overview of CO₂ based motor vehicle taxes in the EU (Source: ACEA, 2009)

Country	CO ₂ /Fuel consumption taxes
AT	<p>A fuel consumption tax (Normverbrauchsabsage or NoVA) is levied upon the first registration of a passenger car. It is calculated as follows:</p> <ul style="list-style-type: none"> - Petrol cars: 2% of the purchase price x (fuel consumption in litres – 3 litres) - Diesel cars: 2% of the purchase price x (fuel consumption in litres – 2 litres) <p>Under a bonus-malus system, cars emitting less than 120g/km receive a maximum bonus of €300. Cars emitting more than 180g/km pay a penalty of €25 for each gram emitted in excess of 180g/km. (160 g/km as from 1 January 2010). Alternative fuel vehicles attract a bonus of maximum €500.</p> <p>In addition, diesel cars emitting more than 5 mg of particulate matter per km pay a penalty of maximum € 300. Conversely, diesel cars emitting less than 5 mg of particulate matter per km and less than 80 g of NOx per km attract a bonus of maximum €200. The same applies to petrol cars emitting less than 60 g of NOx per km.</p>
BE	<ol style="list-style-type: none"> 1. Tax incentives are granted to private persons purchasing a car that emits less than 115g CO₂ /km. The incentives consist of a reduction of the invoice price with the following amount: <ul style="list-style-type: none"> - Cars emitting less than 105g/km: 15% of the purchase price, with a maximum of €4,540 - Cars emitting between 105 and 115 g/km: 3% of the purchase price, with a maximum of €850 2. The company car tax is based on CO₂ emissions. 3. The deductibility of expenses related to the use of the car (60 to 90%) is linked to CO₂ emissions. 4. The Walloon Region operates a bonus-malus system whereby new cars emitting 145 g/km or less obtain a bonus (maximum €1,000 for cars below 105g/km) and cars emitting more than 195 g/km pay a penalty (maximum €1,000 for cars emitting more than 255 g/km).
CY	<ol style="list-style-type: none"> 1. The rates of the registration tax (based on engine capacity) are adjusted in accordance with the vehicle's CO₂ emissions. This adjustment ranges from a 30% reduction for cars emitting less than 120 g/km to a 20% increase for cars emitting more than 250 g/km. 2. The rates of the annual circulation tax (based on engine capacity) are reduced by 15% for cars emitting less than 150 g/km. 3. A premium of €683 is granted for the purchase of a new car when its CO₂ emissions are below 120 g/km or when it is an electric car. For the purchase of hybrid and flexible fuel vehicles, the premium amounts to € 1,196.
DK	<ol style="list-style-type: none"> 1. The annual circulation tax is based on fuel consumption. <ul style="list-style-type: none"> - Petrol cars: rates vary from 520 Danish Kroner (DKK) for cars driving at least 20 km per litre of fuel to DKK 18,460 for cars driving less than 4.5 km per litre of fuel. - Diesel cars: rates vary from DKK 160 for cars driving at least 32.1 km per litre of fuel to DKK 25,060 for cars driving less than 5.1 km per litre of fuel. 2. Registration tax (based on price): An allowance of DKK 4,000 is granted for cars for every kilometre in excess of 16 km (petrol) respectively 18 km (diesel) they can run on one litre of fuel. A supplement of DKK 1,000 is payable for cars for every kilometre less than 16 km (petrol) respectively 18 km (diesel) they can run on one litre of fuel.
FI	<ol style="list-style-type: none"> 1. The registration tax is based on CO₂ emissions. Rates vary from 12.2% for cars emitting 60g/km or less to 48.8% for cars emitting 360g/km or more. The system is fully linear and technologically neutral. 2. The annual circulation tax (currently based on weight) will be based on CO₂ emissions from 2010 onwards. Rates will vary from €20 to €605 per year.
FR	<ol style="list-style-type: none"> 1. Under a bonus-malus system, a premium is granted for the purchase of a new car when its CO₂ emissions are below 130 g/km. The maximum premium is €5,000 (below 60 g/km). A "super-bonus" of €1,000 is granted when a car of at least 10 years old is scrapped and the new car purchased emits maximum 160 g/km. A malus is payable for the purchase of a car when its CO₂ emissions exceed 160 g/km. The maximum tax amounts to €2,600 (above 250 g/km). In addition to this one-off malus, cars emitting more than 250 g/km pay a yearly tax of €160. The different thresholds of the bonus-malus system are strengthened by 5g/km every two years. 2. The regional tax on registration certificates ("carte grise") is based on fiscal horsepower, which includes a CO₂ emissions factor. Tax rates vary between €27 and €46 per horsepower according to the region. 3. The company car tax is based on CO₂ emissions. Tax rates vary from €2 for each gram emitted for cars emitting 100g/km or less to €19 for each gram emitted for cars emitting more than 250g/km.

Country	CO2/Fuel consumption taxes
DE	The Federal Government has decided to change the basis of the annual circulation tax as from 1 July 2009. It will consist of a base tax and a CO ₂ tax. The rates of the base tax will be €2 per 100 cc (petrol) and €9.50 per 100 cc (diesel) respectively. The CO ₂ tax will be linear at €2 per g/km. Cars with CO ₂ emissions below 120 g/km will be exempt (110 g/km in 2012-13, 95 g/km subsequently).
IE	1. The registration tax is based on CO ₂ emissions. Rates vary from 14% for cars with CO ₂ emissions of up to 120 g/km to 36% for cars with CO ₂ emissions above 225 g/km. Hybrid and flexible fuel vehicles benefit from a tax relief of maximum €2,500. 2. The annual circulation tax is also based on CO ₂ emissions. Rates vary from €104 (up to 120 g/km) to €2,100 (above 225 g/km).
IT	Purchasers of new cars emitting maximum 130 g/km (diesel) and 140 g/km (other fuels) respectively receive an incentive of €1,500 if they have a car that is 9 years old or more scrapped simultaneously. Higher incentives apply for alternative fuel vehicles (CNG, LPG, electricity, hydrogen).
LU	1. The annual circulation tax is based on CO ₂ emissions. Tax rates are calculated by multiplying the CO ₂ emissions in g/km with 0.9 for diesel cars and 0.6 for cars using other fuels respectively and with an exponential factor (0.5 below 90 g/km and increased by 0.1 for each additional 10 g of CO ₂ /km). 2. Purchasers of new cars emitting maximum 120 g/km receive an incentive of €2,500 if they have a car that is 10 years old or more scrapped simultaneously. The incentive is €1,500 if the car emits between 120 and 150 g/km.
MT	1. The registration tax is calculated through a formula that takes into account CO ₂ emissions, the registration value and the length of the vehicle. 2. The annual circulation tax is based on CO ₂ emissions and the age of the vehicle. During the first five years, the tax only depends on CO ₂ emissions and varies from €100 for a car emitting up to 100 g/km to €180 for a car emitting between 150 and 180 g/km.
NL	1. The rate of the registration tax (based on price) is reduced or increased in accordance with the car's fuel efficiency relative to that of other cars of the same size (length x width). The maximum bonus is €1,400 for cars emitting more than 20% less than the average car of their size (A label), the maximum penalty is €1,600 for cars emitting more than 30% more than the average car of their size (G label). Hybrid cars benefit from a maximum bonus of €6,400. Cars emitting maximum 95 g/km (diesel) and 110 g/km (other fuels) respectively are completely exempted from this registration tax. Cars emitting more than 205 g/km (petrol) and 170 g/km (diesel) respectively pay an additional tax supplement of €125 per gram emitted in excess of these thresholds. 2. Cars with CO ₂ emissions of up to 110 g/km (petrol) and 95 g/km (diesel) respectively pay a lower annual circulation tax.
PT	1. The registration tax is based on engine capacity and CO ₂ emissions. The CO ₂ component is calculated as follows: - Petrol cars emitting up to 115 g pay [(€3.5 x g/km) - 329]. Diesel cars emitting up to 95 g pay [(€10 x g/km) - 730] - The highest rates are for petrol cars emitting more than 205g [(€125 x g/km) - 20,766] and for diesel cars emitting more than 170g [(€168 x g/km) - 21,610]. 2. Purchasers of new cars emitting maximum 140 g/km receive an incentive of €1,000 if they have a car that is 10 years old or more scrapped simultaneously (€1,250 if the car is more than 15 years old).
RO	The special pollution tax (registration tax) is based on CO ₂ emissions, cylinder capacity and compliance with Euro emission standards. In response to the current crisis, new cars registered between 15.12.2008 and 31.12.2009 are exempt from this tax if their engine capacity is below 2000 cc and they meet Euro 4 and 5 standards or if they are hybrid cars.
ES	1. The registration tax is based on CO ₂ emissions. Rates vary from 0% (up to 120 g/km) to 14.75% (200 g/km and more). 2. Purchasers of new cars emitting maximum 140 g/km and costing maximum €30,000 can obtain an interest-free loan up to €10,000 if they have a car that is 10 years old or more (or that has a mileage exceeding 250,000 km) scrapped simultaneously.
SE	1. The annual circulation tax for cars meeting at least Euro 4 exhaust emission standards is based on CO ₂ emissions. The tax consists of a basic rate (360 SEK) plus SEK 15 for each gram of CO ₂ emitted above 100 g/km. This sum is multiplied by 3.15 for diesel cars registered for the first time in 2008 or later and by 3.3 for other diesel cars. For alternative fuel vehicles, the tax is SEK 10 for every gram emitted above 100 g/km. 2. A premium of SEK 10,000 is granted for the purchase of "environmentally-friendly cars": - Petrol/diesel/hybrid cars with CO ₂ emissions up to 120 g/km - Alternative fuel/flexible fuel cars with a maximum consumption of 9.2 l (petrol)/8.4 l (diesel)/9.7cm/100 km (CNG, biogas) - Electric cars with a maximum consumption of 37 kWh/100 km
UK	1. The annual circulation tax is based on CO ₂ emissions. Rates range from £ 0 (up to 100 g/km) to £ 400 (petrol, diesel)/ £385 (alternative fuels) for cars emitting more than 255 g/km. 2. Company car tax rates range from 10% of the car price for cars emitting up to 120 g/km to 35% for cars emitting 235 g/km or more. Diesel cars pay a 3% surcharge, up to the 35% top rate.

7.5 Overview of EU Member States biofuels targets

According to the European Commission, the use of fuels derived from agricultural sources is the technology with the greatest potential in the short to medium term. The action plan outlines a strategy to achieve a 20% substitution of diesel and gasoline fuels by alternative fuels in the road transport sector by 2020 (Directive 2003/30/EC).

The Commission concludes that only three options would have the potential to achieve individually more than 5% of total transport fuel consumption over next 20 years: biofuels which are already available, natural gas in the medium term and hydrogen and fuel cells in the long term.

Almost all EU countries have set goals to increase the share of biofuels in total road fuels consumption. The national indicative targets for the share of transport biofuels in period from 2006 to 2010 are shown in Table 6.

Table 6. EU Member States Biofuel Targets

Country	2006	2007	2008	2009	2010
Austria	2.50	4.30	5.75	5.75	5.75
Belgium	2.75	3.50	4.25	5.00	5.75
Bulgaria	-	-	2.00	3.50	5.75
Cyprus	-	-	-	-	-
Czech Republic	1.78	1.63	2.45	2.71	3.27
Denmark	0.10	-	-	-	-
Estonia	2.00	-	-	-	5.75
Spain	-	-	-	-	-
Finland	-	-	-	-	-
France	-	-	5.75	-	7.00
Germany	2.00	-	-	5.25	6.25
Greece	2.50	3.00	4.00	5.00	5.75
Hungary	-	-	-	-	5.75
Ireland	1.14	1.75	2.24	5.75	5.75
Italy	2.00	2.00	3.00	4.00	5.00
Lithuania	-	-	-	-	5.75
Luxembourg	2.75	-	-	-	5.75
Latvia	2.75	3.50	4.25	5.00	5.75
Malta	-	-	-	-	-
The Netherlands	2.00	2.00	-	-	5.75
Poland	1.50	2.30	-	-	5.75
Portugal	2.00	3.00	5.75	5.75	5.75
Romania	-	-	-	-	-
Sweden	-	-	-	-	5.75
Slovenia	1.20	2.00	3.00	4.00	5.00
Slovakia	2.50	3.20	4.00	4.90	5.75
United Kingdom	-	-	2.00	2.80	3.50
EU-27	-	-	-	-	5.75

Source: AEBIOM: European biomass statistics 2007

References

- ACEA. European Automobile Manufacturer's Association. Tax Guide 2009. www.acea.be
- Aral AG (2006): Aral Verkehrstaschenbuch 2006/2007. Bochum, S. 303
- Aral: Statistiken zur Kraftstoffpreisentwicklung in Deutschland. Website: <http://www.aral.de/>
- AEBIOM: European biomass statistics 2007
- APA, 2007. Agência Portuguesa do Ambiente (Portuguese Environmental Agency). Portuguese National Inventory Report on greenhouse gases, 1990-2005. April 2007. <http://www.apambiente.pt/>
- BMVBS (Bundesministerium für Verkehr, Bau und Stadtentwicklung) (Hrsg.) (1992): Verkehr in Zahlen 1992. Bonn, S. 194/195 & S.280/281
- DG TREN: Energy and Transport in Figures, 2009
- EBTP, European biofuels technology platform, www.biofuelstp.eu
- EBB (European Biodiesel Board): www.ebb-eu.org/stats.php
- Eurostat: <http://www.ec.europa.eu/eurostat>
- European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>
- European Commission, Taxation and Customs Union,
http://ec.europa.eu/taxation_customs/taxation/other_taxes/passenger_car/index_en.htm
http://ec.europa.eu/taxation_customs/taxation/excise_duties/gen_overview/index_en.htm
http://ec.europa.eu/taxation_customs/taxation/excise_duties/energy_products/alternative_energy/index_en.htm
http://ec.europa.eu/energy/res/legislation/doc/biofuels/en_final.pdf
- EU strategy for biofuels,
http://europa.eu/legislation_summaries/internal_market/single_market_for_goods/motor_vehicles/interactions_industry_policies/l28175_en.htm
- F.O. Lichts. World Ethanol Markets, The Outlook to 2015. An F.O. Licht Special Study, 2006
- FAPRI (Food and Agricultural Policy Research Institute) -
<http://www.fapri.iastate.edu/tools/outlook.aspx>
- International Energy Agency, IEA Statistics, Energy Prices & Taxes, 2009
- International Energy Agency, IEA Statistics, Energy Balances of OECD Countries, 2009
- International Energy Agency, World Energy Outlook 2006. IEA, 2006
- International Energy Agency, World Energy Outlook 2008. IEA, 2008
- KBA (Kraftfahrtbundesamt) (2008): Statistiken zu Neuzulassungen und Bestand nach Kraftstoffart. Website: www.kba.de
- Major, M., 2007: DG-Environment Presentation at the 13th Conference of the Parties (COP), Bali, Indonesia
- Ministry of Finance: Website of the Belgian Federal Ministry of Finance <http://minfin.fgov.be>
- ODYSSEE database, www.odyssee.org
- OECD National Accounts Statistics, OECD Publishing
- Schipper L.: Automobile Fuel: Economy and CO2 Emissions in Industrialized Countries: Troubling Trends through 2005/6, Submitted to "Transport Policy", 2008
- Statistics Belgium: Official Website of the Statistical Office of Belgium <http://www.statbel.fgov.be>

III. COUNTRY SURVEYS/REVIEWS

The following country surveys document key features of historical developments and current situation in car passenger transport in EU-27 countries. Special focus is put on alternative fuels, mainly biofuels and alternative vehicles. Moreover, the most important country specific policies are documented, again paying special attention to alternative options.

Note: In this country specific part, we have tried to provide harmonised information for the different countries. This made it necessary to use some sources with overviews, e.g. for biofuels and car passenger energy consumptions (e.g. ODYSSEE database).

For countries where no specific information for car passenger transport was available but for total road transport (e.g. Portugal, Estonia) we used the following estimation approach to get any useful data: Based on data available for total road energy consumption, car stock and the following assumptions: (i) 95% of total road gasoline is used in passenger cars (as is the average for countries with detailed available data); (ii) diesel passenger cars use 15% more energy per car (due to longer travel distances), (iii) LPG/Natural gas passenger cars use 10% more energy per car (due to longer travel distances).

AUSTRIA

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport in Austria has grown from 66 PJ in 1970 to 142 PJ in the year 2000 and finally to 150000 TJ in 2008. As can be seen from Figure 1 the highest growth rates were in the very early 1970s and in the period 1986-2002 – both periods of low oil prices. A major feature of car passenger transport in Austria is the continuous increase of the market share of diesel, which reached its peak in 2007.

The share of alternative fuels in passenger transport in Austria has increased continuously since 2000 and contributes currently with about 3% to total energy consumption, Figure 2.

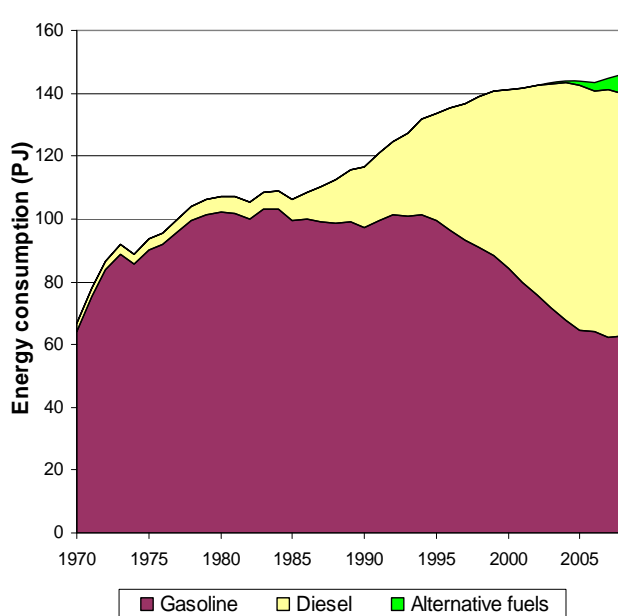


Figure 1. Energy consumption in car passenger transport in Austria by fuel 1970 – 2008

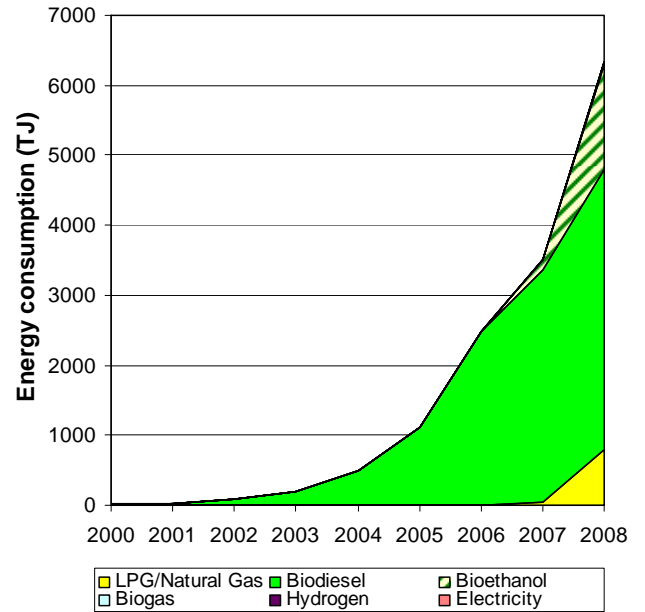


Figure 2. Energy consumption from alternative fuels in car transport in Austria by fuel 2000 – 2008

2. Production and consumption of biofuels

The production of liquid biofuels in Austria increased from 1180 TJ in 2003 to about 9820 in 2008. Total biofuel consumption was even higher, 1250 TJ in 2003 and more than eight times higher in 2008, about 10300 TJ, see Table 1.

Table 1. Total production and total consumption of biofuels in Austria in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	1180	7838	1250	7814
Bioethanol	0	1979	0	2446
Total	1180	9817	1250	10260

3. Development of car stock with special focus on alternative powertrains

Car stock in Austria has grown from about 1.2 Mill cars in 1970 to more than 4 Mill cars in 2007, Figure 3. Diesel cars increased their market share continuously and represent currently more than 50% of the vehicle stock.

Regarding the development of alternative car types in recent years gas driven cars have increased to about 700 and hybrid to about 550 in 2007. The stock of electric cars stands at about 180 since the mid-1990s, see Figure 4.

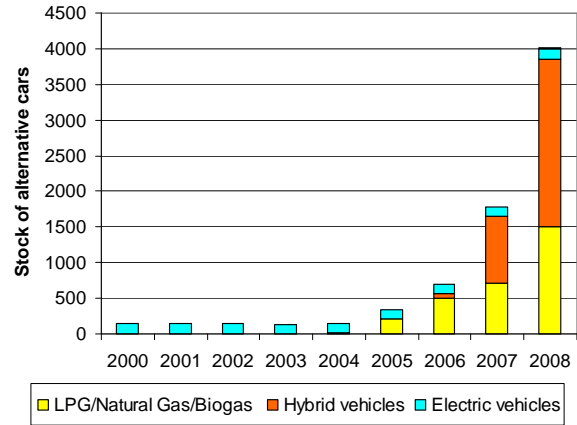
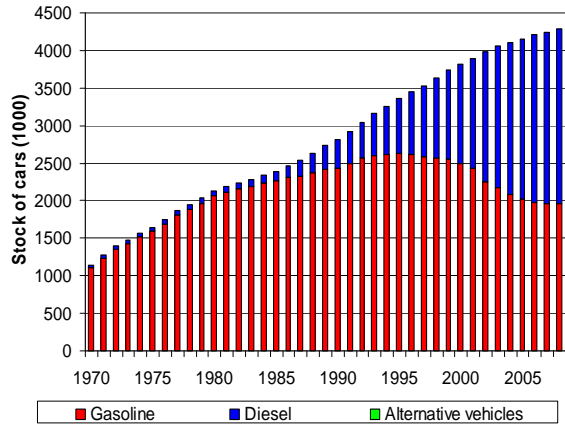


Figure 3. Development of car stock in passenger transport in Austria by fuel 1970 – 2008

Figure 4. Stock of alternative powertrain cars in Austria by category 2000 – 2008

4. Energy policies for car passenger transport

National policies for car passenger transport in Austria are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Austria

VAT:	There is a VAT of 20% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax 0.425 EUR/litre since 2004 (0.415 EUR/litre between 1995 and 2003). Diesel: excise tax 0.325 EUR/litre since 2004 (0.295 EUR/litre between 1995 and 2003). Natural gas is exempted from the excise tax. Biofuels: almost fully exempted from excise tax (tax reduction of approximately 95%).
Registration tax:	On new cars there is a registration tax depending on fuel intensity of cars. Since 2008 it also depends on CO ₂ emissions, see Fig. 5. From 1993 to 2008 it was 3% of the investment costs of new gasoline cars and 2% of new diesel cars. This system was introduced in 1992, prior to which the tax rate on new vehicles was 32 %.
Subsidy:	Available for electric vehicles (500 EUR per new registered car)
Quota:	A quota exists for biofuels: Austrian national indicative targets for biofuels are: 2.5% in 2005; 4.3% in 2007 and 5.75% in 2008
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

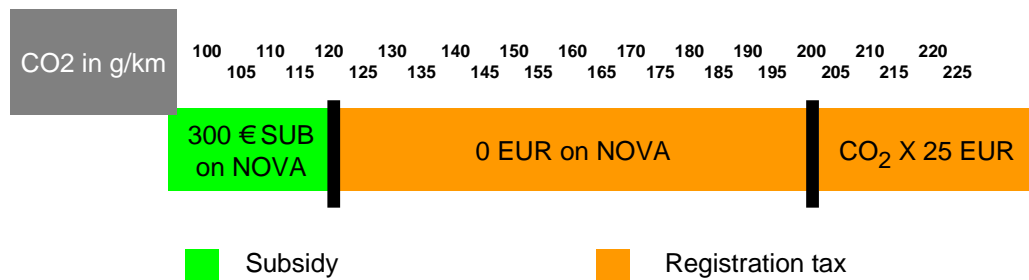


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Austria in 2008

References

ACEA: www.acea.org
 DG TREN: Energy and Transport in Figures, 2009.
 ODYSSEE database, www.odyssee.org
 Statistik Austria: Statistische Nachrichten, various issues 1980-2009.
 Umweltbundesamt: www.uba.at and personal information 2009.

BELGIUM

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road passenger transport in Belgium has grown from 133 PJ in 1980 to its peak of 182 PJ in the year 1995 and finally decreased slightly to 134 PJ in 2007. Between 2000 and 2006 the major amount of consumption of alternative fuels was being held by LPG. Since 2006 it can be noticed significant increase in use of biodiesel, see Figure 2.

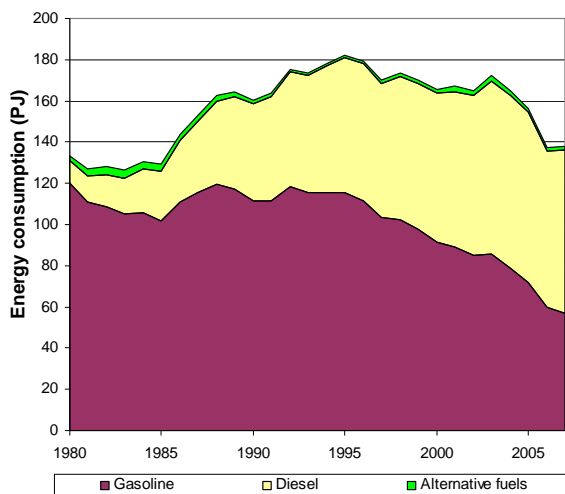


Figure 1. Energy consumption in car passenger transport in Belgium by fuel 1980 – 2007

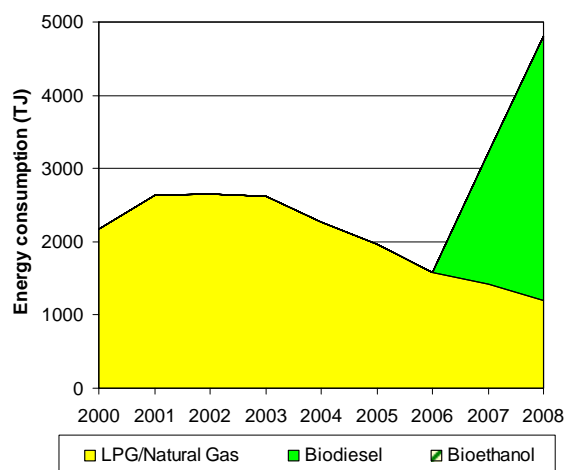


Figure 2. Energy consumption from alternative fuels in car transport in Belgium by fuel 2000 – 2008

2. Production and consumption of biofuels

The use of liquid biofuels increased from a very moderate amount in 2006 steeply to 3.6 TJ in 2008. Still, this shows the very moderate absolute contribution to the fuel use compared to Figure 1.

Table 1. Total production and total consumption of biofuels in Belgium in 2003 and 2007 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	10194	0.	3607
Bioethanol	0	0	0	0
Total	0	10194	0	3607

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in Belgium has grown from about 3 millions cars in 1980 to about 5 millions cars in 2007, Figure 3. Gasoline cars have had a very large market share (over 90%) of the vehicle stock in 1980. However their share were slowly decreasing over the years, favouring diesel cars. In 2006, for the first time more diesel cars than gasoline cars were in the overall vehicle stock.

Regarding the development of alternative car types, gas driven cars have increased from about 60000 in 2000 to more than 74000 in 2002. Afterwards they decreased to 51000 in 2007, see Figure 4. The stock of electric cars has remained constantly in the very small volumes below 100 units.

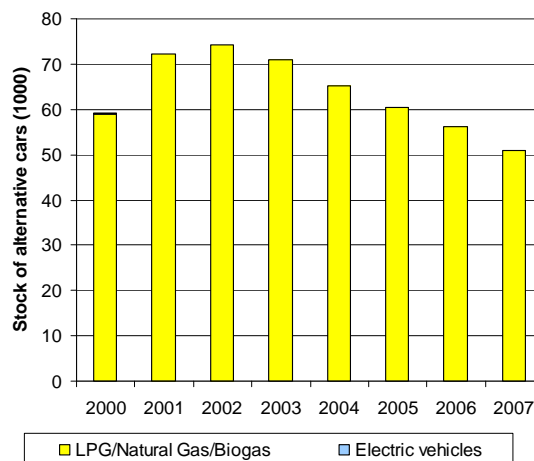
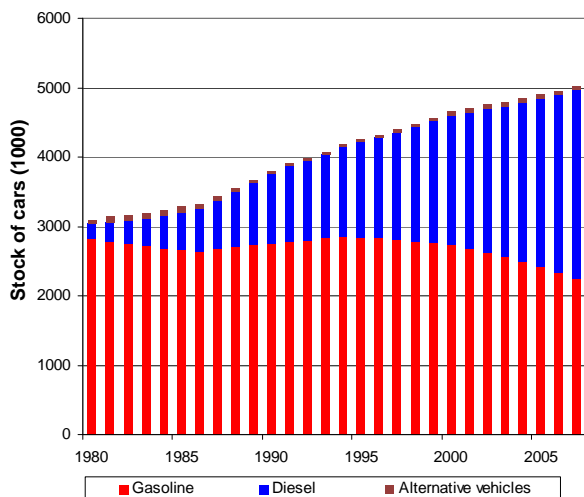


Figure 3: Development of car stock in car passenger transport in Belgium by fuel 1980 – 2006

Figure 4: Development of stock of alternative vehicles for car passenger transport in Belgium by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Belgium are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Belgium

VAT:	There is a VAT of 21% on all types of fuels and vehicles.
Fuel excise tax:	Gasoline: excise tax of 0.592 EUR/litre Diesel: excise tax of 0.318 EUR/litre LPG is exempted from excise tax but subject to higher road tax. Tax exemption for diesel mixtures with min. 4,29% biodiesel share.
Registration tax:	Registration tax is levied on new cars and second-hand cars. The tax is calculated via a table that is based on fiscal horsepower of the vehicle, based on cylinder capacity and power output E.g., for a new car with 2,0l engine a registration tax of € 495,00 has to be paid (2009).
Subsidy:	Since 2007, the Belgium government offers discounts on the purchase price for environmental friendly vehicles. That only applies to new vehicles. For gasoline, the limit for CO ₂ emissions is 115g CO ₂ /km. Diesel vehicles need to be under the limit of 130g CO ₂ /km and have to be in addition equipped with a soot particle filter which emits maximum 5mg particles per km. For a diesel vehicle, the subsidy in 2009 is € 210 if the vehicle fulfils the requirements regarding emissions and particle filter. It is expected that the subsidy is carried further till 2010. (From 2011, there is an EU legislation that each diesel car need to be equipped with a soot filter)
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

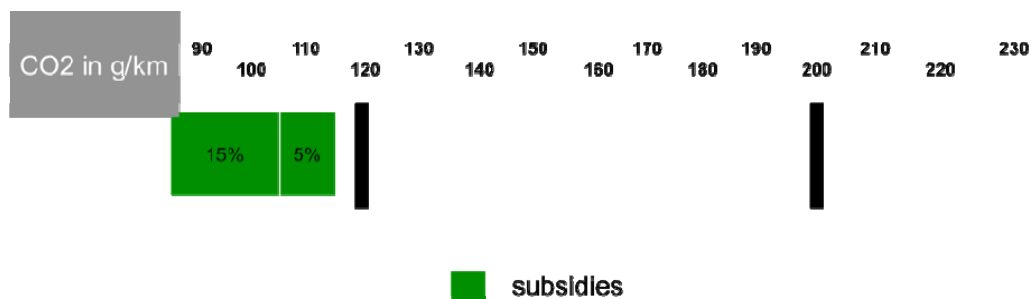


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Belgium in 2008

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
ACEA (2007) Motor Vehicle Taxation in Europe, European Automobile Manufacturers Association, Brussels
Eurostat: <http://www.ec.europa.eu/eurostat>

BULGARIA

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport in Bulgaria has varied between about 28 PJ and 36 PJ within the period 1999 to 2007. As can be seen from Figure 1 the highest growth rates were in recent years after 2005. The market share of diesel in car passenger transport increased continuously until 2007. With respect to alternative fuels in car passenger transport in Bulgaria, their presence is quite symbolical.

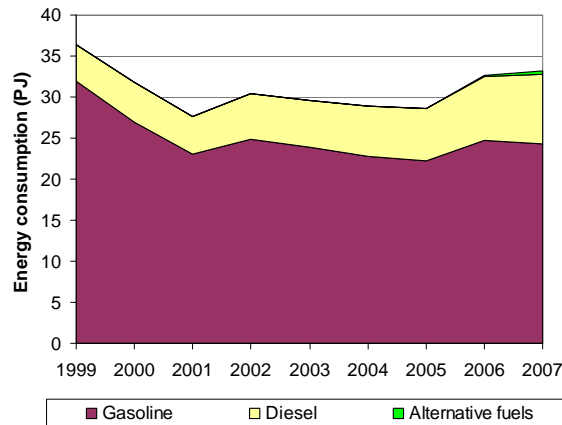


Figure 1. Development of energy consumption in car passenger transport in Bulgaria by fuel 1999 – 2007

2. Production and consumption of biofuels

The production and use of liquid biofuels in Bulgaria started only in recent years. For 2008 figures of 405 PJ for biodiesel production and 1231 PJ for biodiesel consumption are reported by international statistics.

Table 1: Total production and total consumption of biofuels in Bulgaria in 2003 and 2007 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	405	0	1231
Bioethanol	0	0	0	0
Total	0	405	0	1231

3. Development of car stock with special focus on alternative powertrains

The car stock in Bulgaria increased continuously during the last 20 years. Bulgarians received the possibilities to import "second-hand" very cheap, inefficient, low quality, high polluting cars from Western Europe. This process corresponded with the economic situation – collapse of the economy and fall down of the population wealth. Figure 2 gives an idea on the tempo of rising of car stock after the political changes in 1989.

The drop in stock in 2006 in Figure 2 was caused by the action of the Ministry of Internal Affairs to re-register the car stock. Several hundred thousands cars were taken out of motion or their registration was terminated.

The passenger cars stock in Bulgaria has disadvantageous age structure. Used vehicles account for 85 % of the country's vehicle stock and imports of used vehicles outnumber new vehicles by 10 to one. New cars represent just 15 % of total automotive imports. The average age of cars on Bulgarian roads is around 17-20 years, according to the Bulgarian Union of Automobile Importers (SVAB). From January 2007, used vehicle imports are subject to sales taxes, but this is not likely to dampen demand. The SVAB forecasts used car sales rising to 320,000 units in 2008, raising the ratio of sales of new cars to old to close to 1:6.

Figure 3 depicts that in recent years the number of LPG-vehicles has increased in the market.

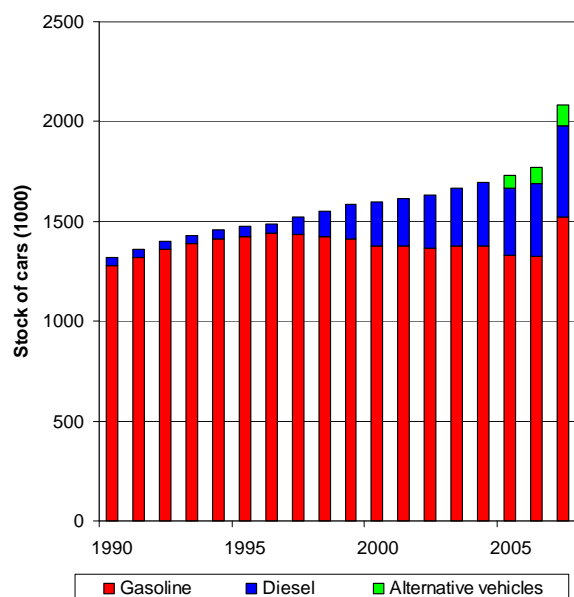


Figure 2. Development of car stock in car passenger transport in Bulgaria by fuel 1990 – 2007

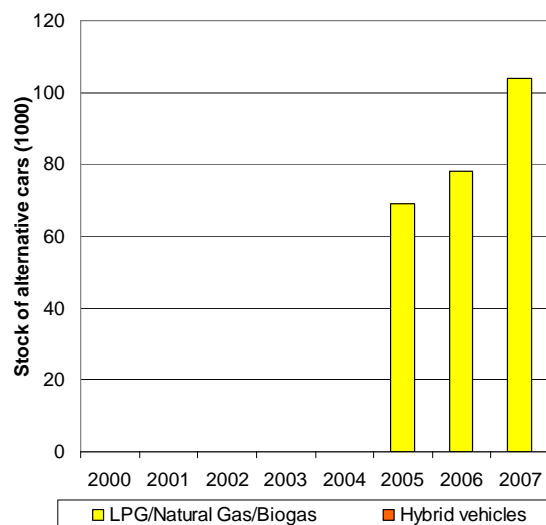


Figure 3. Development of stock of alternative vehicles for car passenger transport in Bulgaria by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Bulgaria are documented in Table 2.

Table 2. Policies for car passenger transport in Bulgaria (1 BGL (Lev) = 0.5129 EUR)

VAT:	Since 1999 there is a VAT of 20% on all types of fuels and vehicles (before: 18% from 1994 to 1995, 22% from 1996 to 1997).
Fuel excise tax:	Gasoline: excise tax of 0.350 EUR/litre; Diesel: excise tax of 0.307 EUR/litre It is envisaged to put 0 EUR/litre excise tax on biodiesel and bio-ethanol, In 2008 the Bulgarian Government decided to freeze the excise tax on gasoline and diesel for the years 2009 and 2010.
Registration tax:	Cars are imposed excise tax, as follows: For the used cars the excise tax is assessed according to the motor power and it varies from 35 BGL/kW (for motors from 120 to 150 kW, DIN system); 60 BGL/kW (above 150 kW, DIN system); or 33,33 BGL/kW (126-157,5 kW, SAE system); 57,14 BGL/kW (above 157,5 kW, SAE system) For the new cars the excise tax amounts to 700 BGL + 90 BGL/kW for the difference above 120 kW, DIN system; and 700 BGL + 85,71 BGL/kW for the difference above 126 kW, SAE system. Currently, in 2009, no CO ₂ -dependent subsidies/taxes for passenger vehicles in Bulgaria exist
Subsidy:	No subsidies are available
Standards:	Up to 2008 no standards existed for any type of car
Quotas:	For establishing the national indicative targets for biofuels use in the country, the indicative targets laid down by Directive 2003/30/EC were taken into account, as well as the new targets for increased share of RES, particularly in biofuels, set by the European Council (8-9 March 2007). The targets for biofuels in the above documents are as follows: * Indicative 5.75 % by 31 December 2010, and * binding 10 % in 2020.
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>

Eurostat: <http://www.ec.europa.eu/eurostat>

Association of car manufacturers and their authorized representatives for Bulgaria (SVAB) www.svab.bg

Strategy for the Development of the National Transport System by 2015, Ministry of Transport, June 2006
www.mt.government.bg

National long-term programme for encouraging the use of biofuels in the transport sector 2008-2020, Ministry of Economy & Energy, June 2007 www.mee.government.bg

CYPRUS

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport in Cyprus has grown from 3.5 PJ in 1980 to 15 PJ in the year 2008. As can be seen from Figure 1 the highest growth rates were in recent years after 2002 and can be attributed at least to some extent to Cyprus' membership in the EU. The market share of diesel in car passenger transport increased till 2001, and decrease afterwards slightly. With respect to alternative fuels in car passenger transport in Cyprus no use has been reported so far.

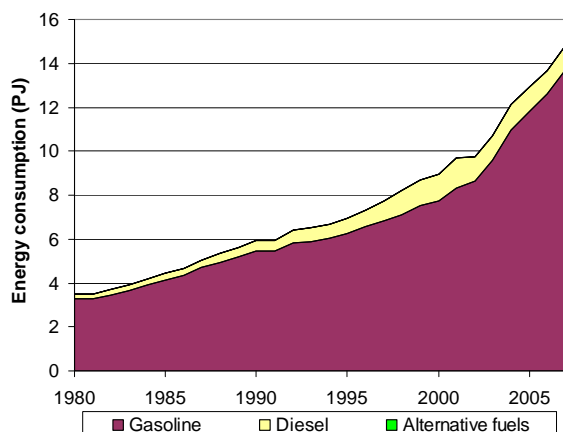


Figure 1. Development of energy consumption in car passenger transport in Cyprus by fuel 1980 – 2007

No use of alternative fuels in car passenger transport has been reported so far

Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Cyprus by fuel 2000 – 2008

2. Production and consumption of biofuels

The production and use of liquid biofuels in Cyprus started only in recent years. For 2008 figures of 331 TJ for biodiesel production and 594 TJ for biodiesel consumption are reported by international statistics.

Table 1: Total production and total consumption of biofuels in Cyprus in 2003 and 2007 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	331	0	594
Bioethanol	0	0	0	0
Total	0	331	0	594

3. Development of car stock with special focus on alternative powertrains

Passenger vehicles total stock in Cyprus has grown from about 64 000 cars in 1974 to more than 400 000 cars in 2007, see Figure 3. The percentage of alternative fuel vehicles is very small (0.09 % for hybrid vehicles, and 0.01 % for electric cars). In absolute figures, 427 hybrid vehicles and 37 electric cars have been registered in year 2008, see Figure 4.

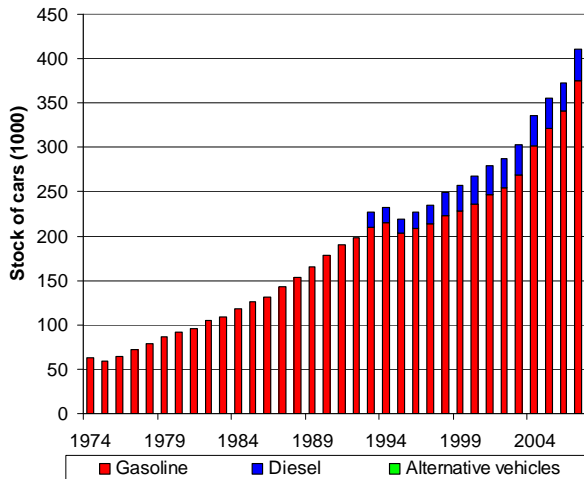


Figure 3. Development of car stock in car passenger transport in Cyprus by fuel 1990 – 2007

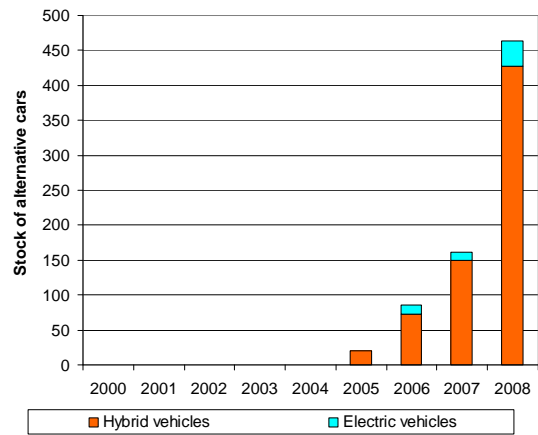


Figure 4. Development of stock of alternative vehicles for car passenger transport in Cyprus by category 2000 – 2008

4. Energy policies for car passenger transport

National policies for car passenger transport in Cyprus are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Cyprus

VAT:	15% on gasoline and diesel since 1 st January 2003 (Before: 5 % imposed on all petroleum products except LPG (July 1992 until September 30, 1993); 8% (As of October 1993 until 30 th June 2000, 10% from 1 st July 2000 and 13% as of July 1 st 2002 e VAT increased to 13 %. Biofuels used for transport are consumer tax exempted.
Fuel excise tax:	0.298 on gasoline
Registration tax:	See Figure 5
Subsidy:	electric cars (up to a maximum € 700 per new registered car), dual propulsion vehicles (up to a maximum € 1,200 per new registered car), hybrid cars (up to a maximum € 1,200 per new registered car) and for cars with CO ₂ emissions below 120 gr/km (up to a maximum € 700 per new registered car) There are also incentives applicable (in the form of subsidies) for withdrawing an old vehicle from circulation. They are divided into 3 categories depending on whether the vehicle holds a registration license or not, and on whether it will be replaced by a new vehicle or not. The level of subsidy varies from €257 to €1,710.
Quota:	The Cyprus national indicative target for biofuels is 2% until 2009
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

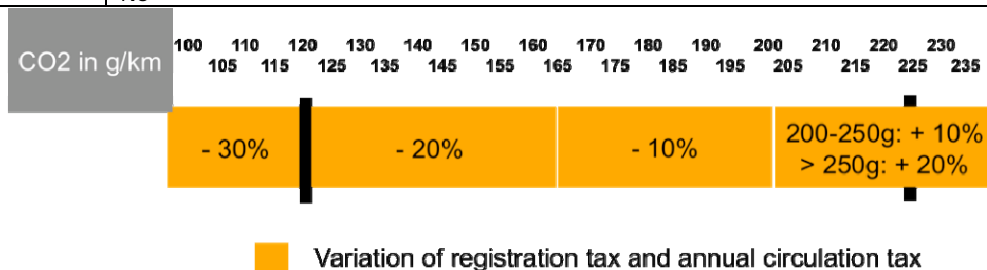


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Cyprus in 2008

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
Eurostat: <http://www.ec.europa.eu/eurostat>

CZECH REPUBLIC

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption of passenger transport in Czech Republic has grown continuously from about 80 PJ in 1995 to 133 PJ in 2007. As it is depicted in Figure 1, gasoline has got the smallest growing rates than diesel. The most important alternative fuel in Czech Republic is natural gas, see Figure 2. Since 2004 we can observe an increase of liquid biofuels, especially biodiesel.

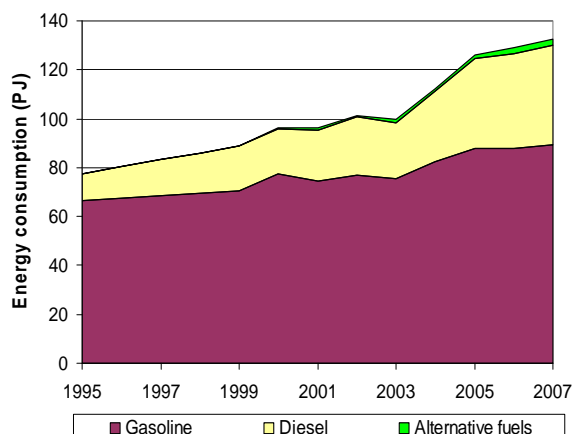


Figure 1. Development of energy consumption in car passenger transport in Czech Republic by fuel 1995 – 2007

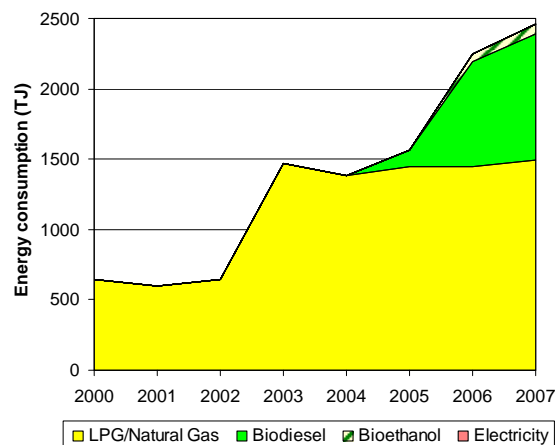


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Czech Republic by fuel 2000 – 2007

2. Production and consumption of biofuels

Table 1 shows the development of the production and consumption of biofuels in the Czech Republic in the years 2003 and 2008. It can be seen that there was a strong increase in the consumption of biodiesel since 2003 and a moderate increase of bioethanol.

Table 1: Total production and total consumption of biofuels in Czech Republic in 2003 and 2008(TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	3827	2576	3173
Bioethanol	0	1690	0	1
Total	0	5517	2576	3174

3. Development of car stock with special focus on alternative powertrains

The passenger vehicles total stock in Czech Republic has increased from 2.8 millions in 1993 to 4.3 millions in 2007. The stock of alternative vehicles (LPG) is experiencing a downward trend, see Figure 4. The stock of diesel cars has continuously increased over the whole period. In 2007 the share of diesel cars was 21%.

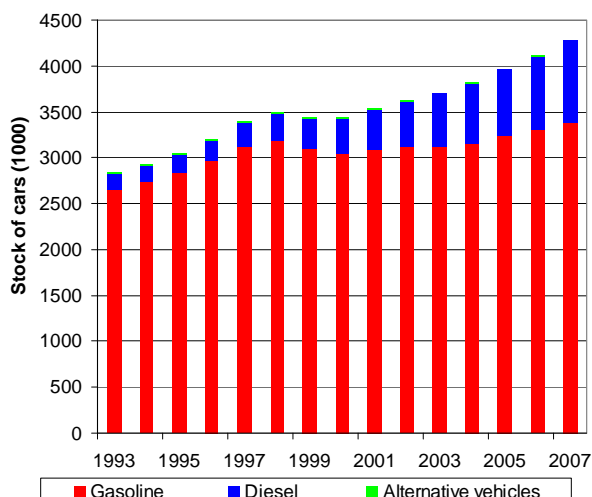


Figure 3. Development of car stock in car passenger transport in Czech Republic by fuel 1993 – 2007

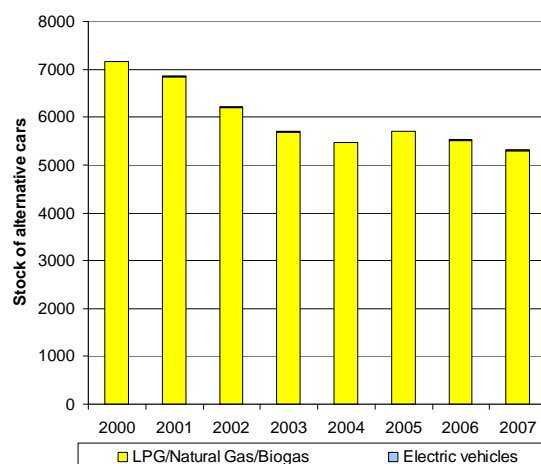


Figure 4. Development of stock of alternative vehicles for car passenger transport in Czech Republic by category 1970 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Czech Republic are documented in Table 2.

Table 2. Policies for car passenger transport in the Czech Republic

VAT:	There is a VAT of 19% on all types of fuels
Fuel excise tax:	Gasoline: excise tax of 0.483 EUR/litre Diesel: excise tax of 0.406 EUR/litre LPG/Natural: excise tax of 0.07992 EUR/litre Electricity: excise tax of 1.0471 EUR/MWh
Registration tax:	None
Subsidy:	An exemption from road taxes that already exists for electric cars will be extended to vehicles powered by liquid petroleum gas, compressed natural gas or fuel blends with high biofuel content. Purchasers of new cars will be eligible for a tax reduction of 48% in the first three years after purchase and 40% in the following three years. In addition, cars more than 18 years of age will attract a premium of 25%. The excise duty on diesel containing at least 31% (by volume) biodiesel from rapeseed methylester is granted a rebate of CZK 3.08 per litre of blended fuel.
Quota:	In line with EU policy to replace 5.75% of its fossil fuels with biofuels by 2010, Czech regulation will allow the addition of grain alcohol in petrol and rapeseed oil methylester to diesel from 2007. Ranging between 2 to 5 percent, the concentration of biofuels to be added to diesel will follow production capacities.
Standards:	Up to 2008 no standards exist for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
EUROSERVER Biofuel reports 2004,2005,2006,2007
European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

DENMARK

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption of passenger cars in Denmark has increased from 57 PJ in 1970 to about 94 PJ in 2007, see Figure 1.

The share of alternative fuels in passenger transport in Denmark is currently very low, see Figure 2. While the consumption of diesel has been growing strongly in Denmark since 2002, there have been only very few experiments with energy from biofuels. This is reflected in Figure 2 where the consumption of bioethanol within the transport sector is zero until 2006.

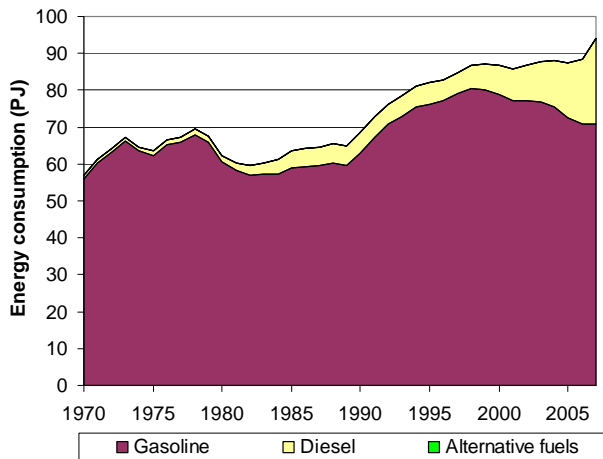


Figure 1. Development of energy consumption in car passenger transport in Denmark by fuel 1970 – 2007

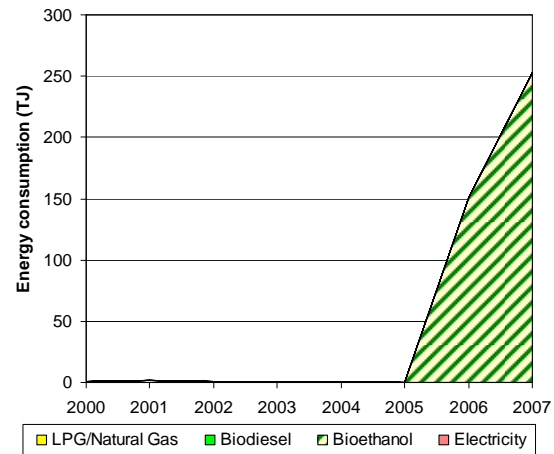


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Denmark by fuel 2000 – 2007

2. Production and consumption of biofuels

In May 2006, the Danish section of the fuel company Statoil introduced Bio 95, which is gasoline added 5 percent bioethanol. The product corresponds to the European gasoline standard, EN 228, which allows a mixture of bioethanol up until 5 %. The Bio 95 product is based on Brazilian sugarcane. Cars capable of running on unleaded gasoline, is capable of running Bio 95. However, Bio 95 is only available to the Danish consumers at the Statoil service stations. After the adoption in the EU of the 5.75% demand for biofuels in cars from 2010, Denmark notified to the Commission that the Danish goal was 0% - because Denmark already used a large share of biomass in its heat- and cogeneration production. The government as well as the opposition is rather sceptical towards the first generation biofuels. But in 2008 the government decided that the 5.75% would be implemented from 2010.

Table 1. Total production and total consumption of biofuels in Denmark in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	1472	4912	0	0
Bioethanol	0	0	0	252
Total	1472	4912	0	252

3. Development of car stock with special focus on alternative powertrains

When you consider the development of car stock and newly registered vehicles by type in Denmark, the following type of fuels are relevant to look into: gasoline, gas, and diesel. In terms of car stock and newly registered cars, which runs on biofuels and electricity, the numbers are very small. Also there is no statistic, yet, on the biofuels car stock, which is close to zero (see figures below). However, various big projects with electric cars are on its way to the Danish consumers.

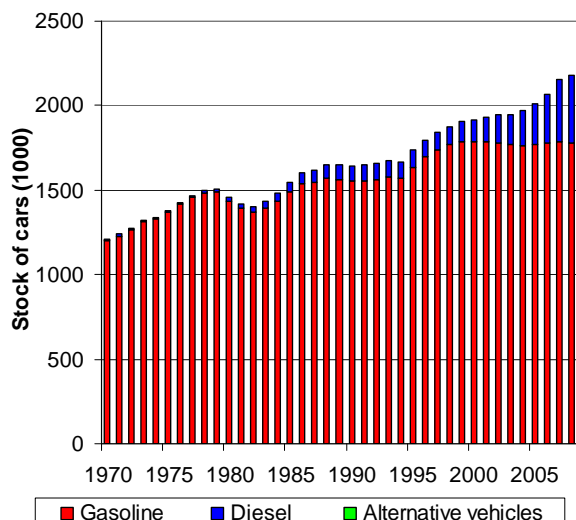


Figure 3. Development of car stock in passenger transport in Denmark by fuel 1985 – 2008

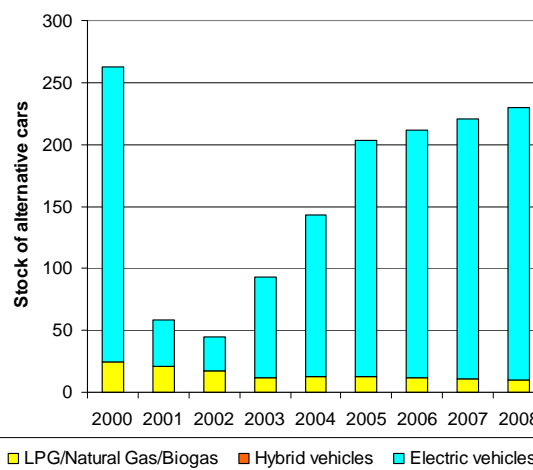


Figure 4. Development of stock of alternative vehicles for passenger transport in Denmark by category 2000 – 2008

4. Energy policies for car passenger transport

National policies for car passenger transport in Denmark are documented in Table 2.

Table 2. Policies for car passenger transport in Denmark

VAT:	There is a VAT of 25% on all types of fuels
Fuel excise tax:	Gasoline: excise tax of 0.561 EUR/litre Diesel: excise tax of 0.382 EUR/litre Denmark has not introduced tax reduction for biofuels, but in a tax agreement between the government and its supporting party in March 2009 the tax was changed to a tax per energy unit. This means a tax reduction for biofuels.
Registration tax:	105% up to DKK 79,000 180% on the remainder
Subsidy:	In Denmark, electric vehicles have been exempted from registration tax and car owners tax until 2012 – extension of this period is under discussion. Tax exemption for hydrogen cars and plug-in hybrid cars are being debated. In accordance with an agreement, entered between the Danish government and the opposition in parliament in February 2008, the appropriation for a pilot scheme for subsidies on electric cars are 1,34 mio. EUR. yearly in 2008 – 2009. It is decided that the appropriation will be 5 Mio. in the following years (2010 – 2012).
Quota:	
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

Energy statistics (Energistatistik) 2007, The Energy Agency (Energistyrelsen) 2008
 Statistics Denmark (Danmarks statistik)
 Danish Electric cars Committee (Dansk Elbilkomitee)
 Danish Ecological Council and environmental organisations from the Nordic Countries
www.bilviden.dk
www.bilstatistikken.dk
www.oliebranchen.dk
www.statistikbanken.dk
www.energistyrelsen.dk

ESTONIA

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport² in Estonia has grown from 12.3 PJ in 2000 to 17 PJ in the year 2007. As can be seen from Figure 1 the highest growth rates were in recent years after 2004 and can be attributed at least to some extent to Estonia's membership in the EU. The market share of diesel in car passenger transport increased till 2007. With respect to alternative fuels in car passenger transport in Estonia there is a moderate stock of LPG since about 1990, Figure 2.

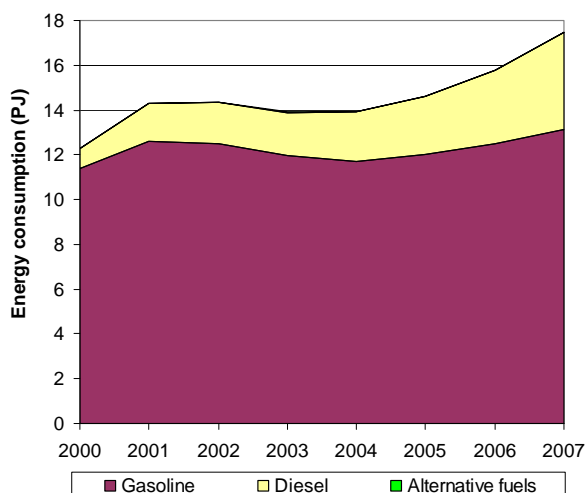


Figure 1. Development of energy consumption in car passenger transport in Estonia by fuel 2000 – 2007

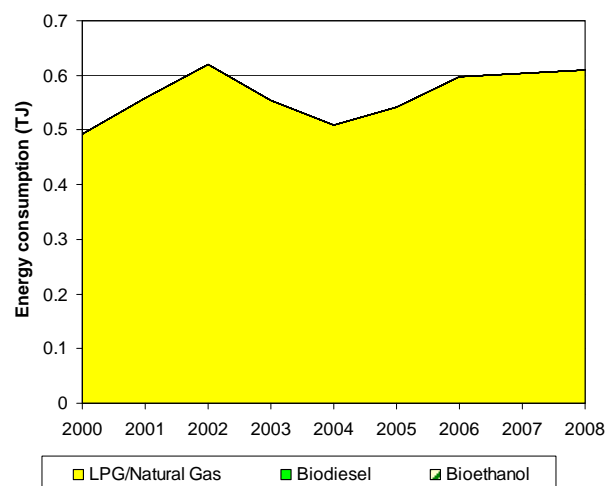


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Estonia by fuel 2000 – 2008

2. Production and consumption of biofuels

The production and use of liquid biofuels in Estonia started only in recent years. For 2008 figures of 116 TJ for biodiesel production and 0 TJ for biodiesel consumption are reported by international statistics.

Table 1. Total production and total consumption of biofuels in Estonia in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	0	0	116
Bioethanol	0	0	0	0
Total	00	0	0	116

3. Development of car stock with special focus on alternative powertrains

Passenger vehicles total stock in Estonia has grown from about 64 000 cars in 1974 to more than 400 000 cars in 2007, see Figure 3. The percentage of alternative fuel vehicles is very small (0.09 % for hybrid vehicles, and 0.01 % for electric cars). In absolute figures, 427 hybrid vehicles and 24 electric cars have been registered in year 2008, see Figure 4.

² Because no explicit data for energy consumption in passenger car transport in Estonia are available, some estimates had to be conducted to get any useful data. These estimates are based on data available for total road energy consumption, car stock and the following assumptions: (i) 95% of total road gasoline is used in passenger cars (as is the average for countries with detailed available data); (ii) diesel passenger cars use 15% more energy per car (due to longer travel distances), (iii) LPG/Natural gas passenger cars use 10% more energy per car (due to longer travel distances).

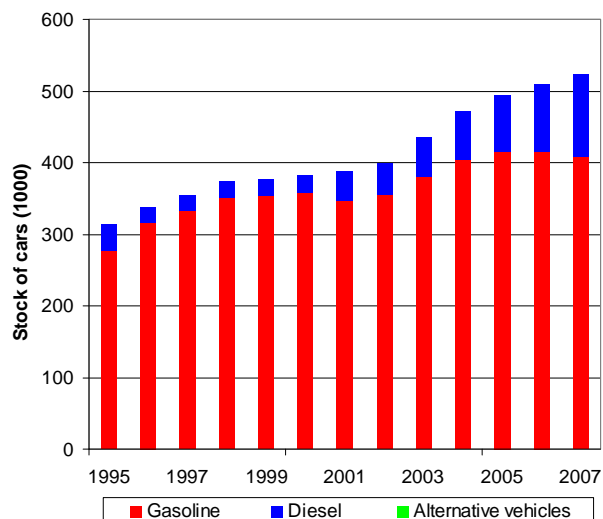


Figure 3. Development of car stock in car passenger transport in Estonia by fuel 1995 – 2007

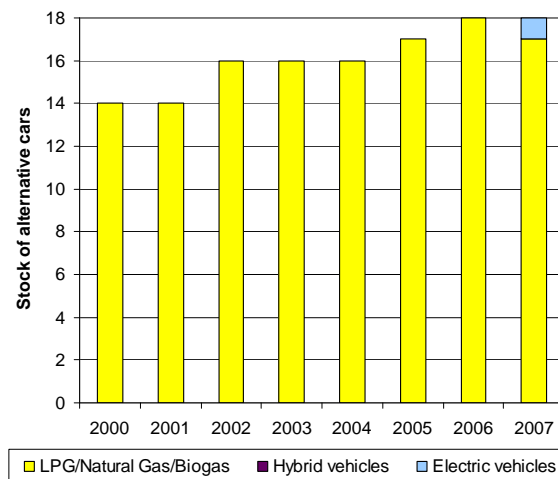


Figure 4. Development of stock of alternative vehicles for car passenger transport in Estonia by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Estonia are documented in Table 2.

Table 2. Policies for car passenger transport in Estonia

VAT:	There is a VAT of 18% on all types of fuels and vehicles.
Fuel excise tax:	Gasoline: excise tax of 0.359 EUR/litre Diesel: excise tax of 0.330 EUR/litre
Registration tax:	N.A.
Subsidy:	N.A.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
Eurostat: <http://www.ec.europa.eu/eurostat>

FINLAND

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption of passenger transport in Finland has grown continuously from about 63 PJ in 1980 to 95 PJ in 1990. After that the consumption remains to stay constant. As it is depicted in Figure 1, by 1995 the amount of gasoline starts to decrease slightly, whereas the amount of diesel grows smoothly after 1992. Since 2006 biofuel consumption has increased significantly.

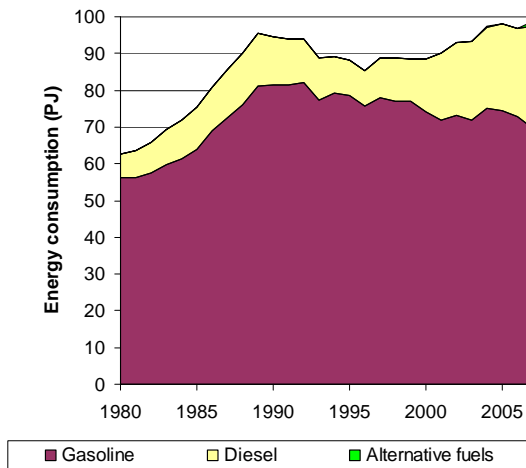


Figure 1. Development of energy consumption in car passenger transport in Finland by fuel 1980 – 2007

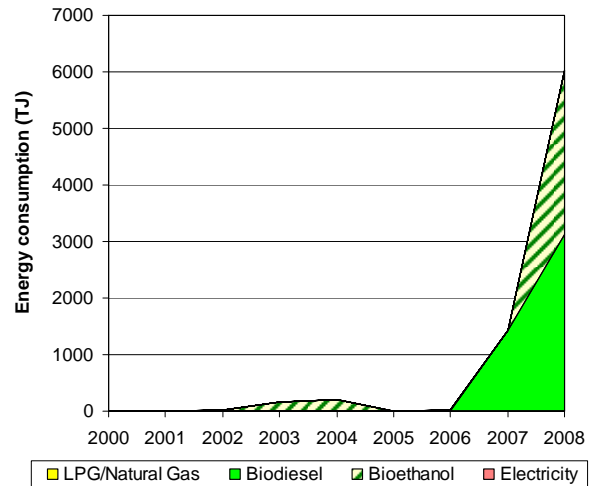


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Finland by fuel 2000 – 2008

2. Production and consumption of biofuels

Table 1 shows the development of the production and consumption of biofuels in Finland in the years 2003 and 2008. It can be seen that there was a strong increase in the consumption of bioethanol since 2003 and a moderate increase of biodiesel.

Table 1. Total production and total consumption of biofuels in Finland in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	3128	0	479
Bioethanol	0	1112	168	2890
Total	0	4240	168	3369

3. Development of car stock with special focus on alternative powertrains

The passenger vehicles total stock in Finland has increased from 1.23 millions in 1980 to 2.6 millions in 2007. The development of stock of alternative vehicles for car passenger transport in Finland for the period 2000 – 2007 is shown in Figure 4.

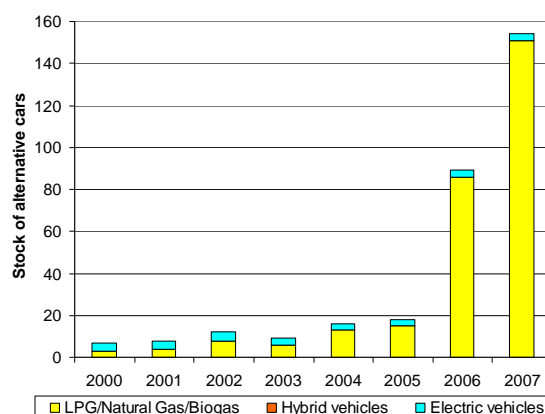
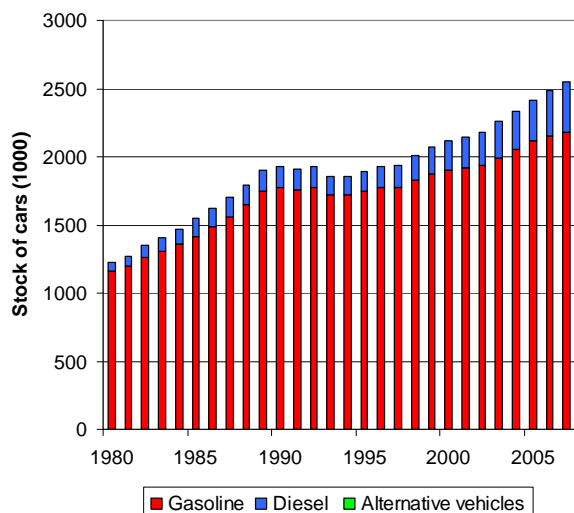


Figure 3. Development of car stock in car passenger transport in Finland by fuel 1980 – 2007

Figure 4. Development of stock of alternative vehicles for car passenger transport in Finland by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Finland are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Finland

VAT:	There is a VAT of 22% on all types of fuels, which is refunded.
Fuel excise tax:	Gasoline: excise tax of 0.627 EUR/litre since 2003 (it was 0.588 EUR/litre between 1998 and 2002). There are Fiscal Charges and Fees like the CO ₂ Tax, which is 0.054 EUR/litre, or the Precautionary Stock Fee, which is 0.004 EUR/litre. Additionally there is an Oil Pollution Fee on imports, which is 0.00042 EUR/litre. Diesel: There is a excise tax of 0.364€/litre on Automotive Diesel, but also a Precautionary Stock Fee in the amount of 0.007 EUR/litre and an Oil Pollution Fee in the amount of 0.00038 EUR/litre. Natural gas is exempted from excise tax. Electricity: The excise tax for Electricity is 0.0087 EUR/kWh.
Vehicle tax:	In late 2007, the Finnish government proposed revisions to the car tax levied on passenger cars upon registration and to the annual vehicle tax levied on all registered vehicles. The revisions will set the tax rates relative to the carbon dioxide emissions resulting from the vehicle's specific consumption of fuel. On average, the revisions should cut the car tax by one-sixth. Each gram of CO ₂ impacts the tax rate, which varies between 10% and 50% of the general retail value of the car (see Fig.3).
Standards:	Up to 2008 no standards existed for any type of car

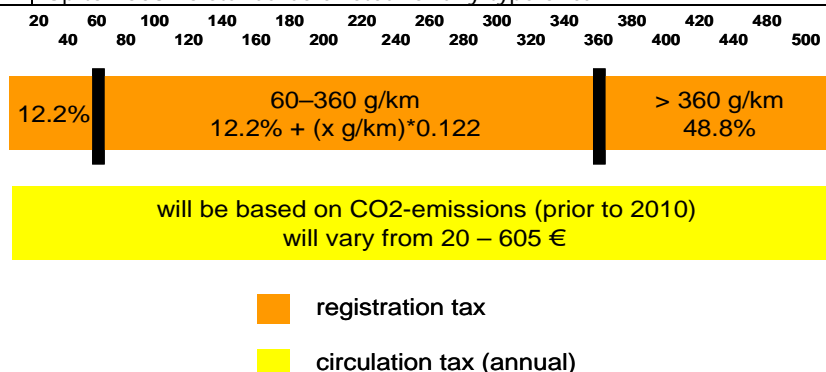


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Finland in 2008

References

- ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
- EUROSERVER Biofuel reports 2004,2005,2006,2007
- European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
- European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>
- ACEA-European Automobile Manufacturers' Association: <http://www.acea.be/>

FRANCE

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road passenger individual transport in France has grown from about 560 PJ in 1973 to 990 PJ in 2008, that represents an increase of 75 %, or 1.7 % per year. A major feature of road passenger transport in France is the continuous increase of the market share of diesel whose consumption became more important than gasoline in 2003. Alternative fuels (including LPG and natural gas) represent 0.5 % of the total, see Figure 1 and 2.

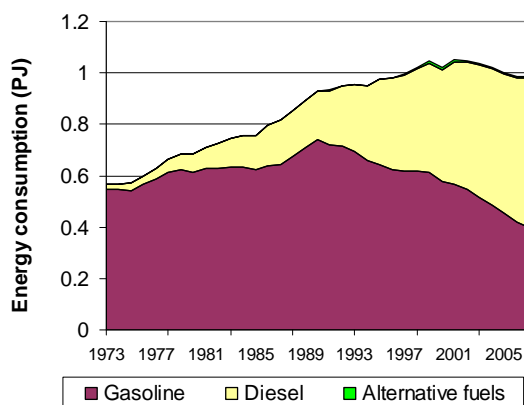


Figure 1. Development of energy consumption in car passenger transport in France by fuel 1973 – 2007

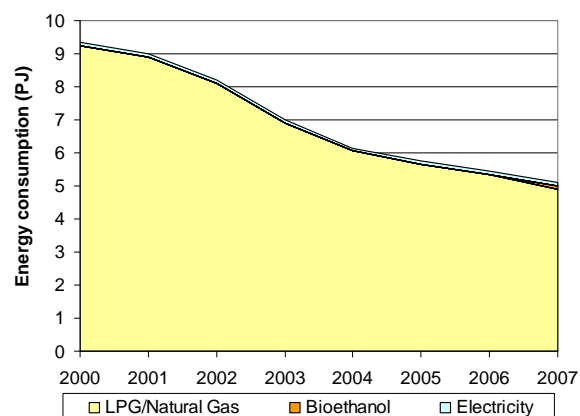


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in France by fuel 2000 – 2007

2. Production and consumption of biofuels

The use of biodiesel and pure plant oil is forbidden in France for individual transport cars (and PPO for transport vehicles). Bioethanol for individual transport cars has been authorised in 2007, and its consumption represents about 100 TJ. The total production of biofuels was 89 PJ in 2008.

Table 1. Total production and total consumption of biofuels in France in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	13138	66792	11858	84602
Bioethanol	2290	22233	2072	19787
Total	15428	89025	13930	104389

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in France has grown from about 12 million cars in 1970 to more than 30 million cars in 2007. Diesel cars increased their market share continuously and represent currently more than 50 % of the vehicle stock. Alternative car types are mainly LPG cars, which represent more than 80 % of them. After a deadly accident in 1999, new regulations (safety valve) have been implemented in France in 2000, which made much more difficult to implement LPG kits on existing cars. Older LPG cars had to be adapted, or were forbidden to enter covered parking places or tunnels. These points lead in a collapse of the number of LPG cars sold.

The number of electric vehicles has increased from about 2000 in 2000 to about 3350 in 2008.

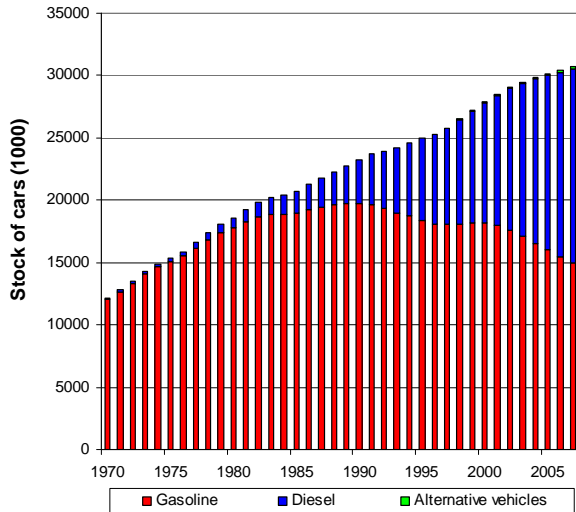


Figure 3. Development of car stock in car passenger transport in France by fuel 1970 – 2006

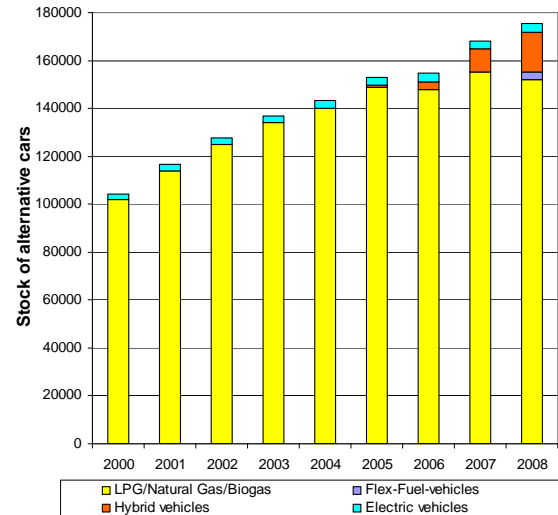


Figure 4. Development of stock of alternative vehicles for car passenger transport in France by category 2000 – 2008

4. Energy policies for car passenger transport

National policies for car passenger transport in France are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in France

VAT:	There is a VAT of 19.6% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax of 0.6069 EUR/litre Diesel: excise tax of 0.4284 EUR/litre LPG: excise tax of 0.1076 EUR/kg Natural gas is exempted from excise tax. Regions can modulate these taxes for a very small part : 0,0177 €/l for gasoline and 0,0115 €/l for diesel.
Registration tax:	Highly emitting vehicles are taxed from 200(161-165 g/km)-2600(>250g/km) EUR when purchased
Subsidy:	Subsidies from 200-5000 EUR are implemented for vehicles with low CO ₂ -Emissions
Quota:	- A quartering of CO ₂ emissions by 2050 - Average reduction of final energy intensity of at least 2% per year from 2015 and of 2,5% from 2015 to 2030, - Production of 10% of energy needs from renewable energy sources by 2010, - Incorporation of bio-fuels and other fuels of renewable origin to a level of 2% in 2006, 5.75% by the end of 2008 and 7% in 2010.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

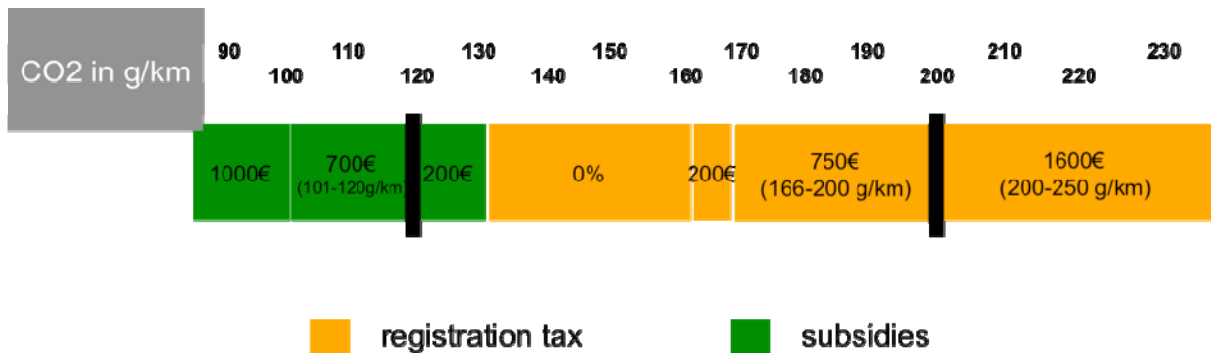


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in France in 2008

References

Consommation carburants voitures particulières, DGEMP (Ministry of energy)
Parc véhicules selon le genre 82 07, MEDAD SESP (Ministry of equipment)

GERMANY

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road passenger individual transport in Germany has grown from about 700 PJ in 1970 to about 1600 PJ in 2007, see Figure 1. In regard to the consumption of conventional fuels, it becomes obvious that the total amount of conventional fuels decreases slightly since 2003 or to be precise the slight decrease is substituted by alternative fuels. The jump in increase in 1990 is due to the reunification of FRG and GDR.

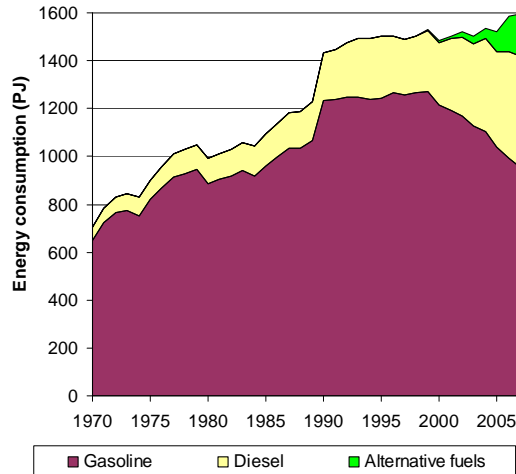


Figure 1. Development of energy consumption in car passenger transport in Germany by fuel 1975 – 2007

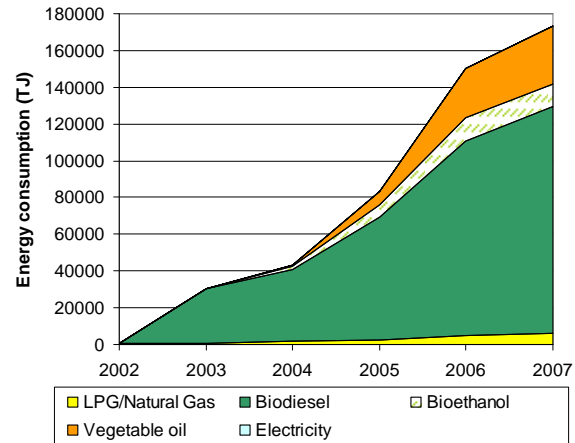


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Germany by fuel 2000 – 2007

2. Production and consumption of biofuels

Also in Germany the use of biofuels is negligible in comparison to the use of conventional fossil fuels. Even if the growth rate from 2000 to 2008 is relatively high, it has to be kept in mind that it is a very moderate absolute contribution to the fuel use.

Table 1: Total production and total consumption of biofuels in Germany in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	26312	103739	29761	103748
Bioethanol	0	12628	0	17564
Vegetable oil	187	31450	187	31450
Total	26499	147817	29948	152762

3. Development of car stock with special focus on alternative powertrains

The stock of passenger cars in Germany has grown from about 14 million cars in 1970 to more than 46 million cars in 2007. Regarding the automotive technologies, the largest part of passenger cars has been gasoline driven. Since the end of the 1970ies diesel cars increased their market share continuously and represent currently nearly a quarter of the vehicle stock. In the last years, the absolute number of gasoline driven cars even has decreased whereas diesel cars are still on the advance.

The car stock decreases rapidly from 2007 to 2008 not only because of an economic crisis, but also because of changing the data collection. Up to 2007 temporarily de-registered cars have been still included, whereas since 2008 de-registered cars do not appear in the statistical data anymore.

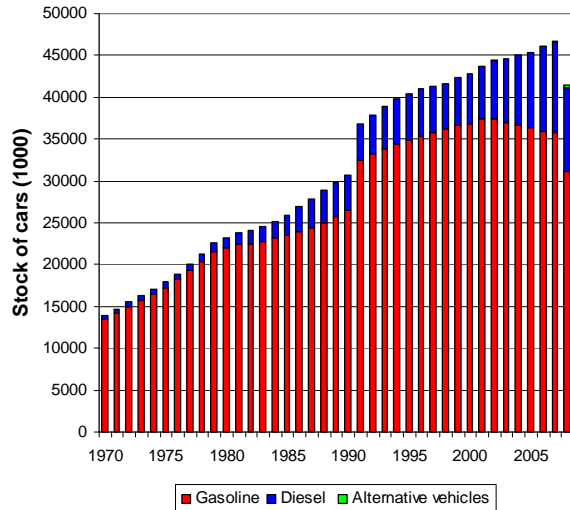


Figure 3. Development of car stock in passenger transport in Germany by fuel 1970 – 2008

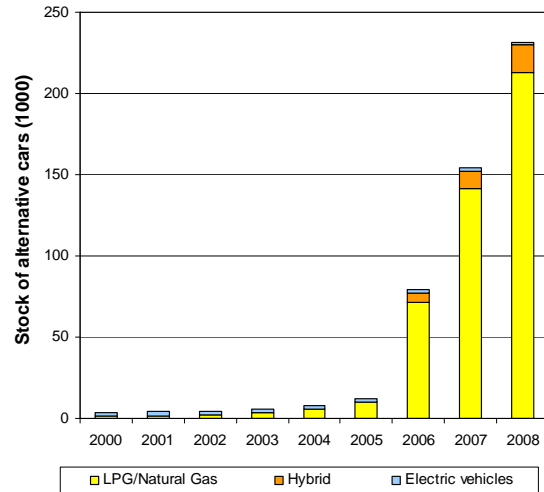


Figure 4. Development of stock of alternative vehicles for passenger transport in Germany by category 2000 – 2008

4. Energy policies for car passenger transport

National policies for car passenger transport in Germany are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Germany

VAT:	There is a VAT of 19 % on all types of all fuels.
Fuel excise tax:	gasoline: 65,45 €ct/l or 7,3 €ct/kWh diesel: 47,04 €ct/l or 4,7 €ct/kWh natural gas (CNG): 18,03 €ct/kg or 1,39 €ct/kWh LPG: 16,6 €ct/kg (about 9 €ct/l) or 1,29 €ct/kWh biodiesel: starting with 9 €ct/l in 2006 and 2007 up to 45 €ct/l in 2012 vegetable oil: starting with 2,15 €ct/l in 2007 up to 45 €ct/l in 2012
Vehicle tax:	From July 2009, the vehicle tax based on cylinder capacity will be changed into a CO2 emission related vehicle tax for new registered cars (see Figure 5). Details: - Until 2011, passenger cars with CO2 emissions up to 120 grams per kilometre are tax-exempt. - Until 2012/2013, passenger cars with CO2 emissions up to 110 grams per kilometre are tax-exempt. - From 2014, passenger cars with CO2 emissions up to 95 grams per kilometre are tax-exempt. - Cars with higher CO2 emissions are subject to the following linear taxation: 2 Euro for each gram/kilometre which exceeds the 120 (resp. 110/ 95) grams per kilometre. - The basis tax depends on propulsion method and cylinder capacity: 2 Euro for each commenced 100 cm3 of otto-motors resp. 9.50 Euro for each commenced 100 cm3 of diesel-engines. - There is a temporary tax-exemption for diesel cars which fulfil EURO 6. The tax-exemption goes from 2011 to 2013 and is limited to 150 Euro. - Whereas the new motor vehicle tax refers to new registered cars, old cars are taxable for the former motor vehicle tax. After an interim period, the taxation of old cars will be transferred to the new CO2 emission based tax from 2013.
Subsidy:	In order to reflate the market, the federal government set aside funds in 2009 (total funds up to five million Euro) for stimulating the new purchase of cars while old cars will be scrapped. The bonus will be paid by the Federal Office of Economics and Export Control (BAFA) if the following requirements are fulfilled: - The applicant is an individual. - An at least nine years old car will be scrapped. - The applicant owns the car to be scrapped at least for one year. - The applicant registers a new or an employee's car between the 14th January and 31st December 2009. - The new or employee's car meet at least the criteria to the emissions standard Euro 4.
Standards:	Up to 2008 no standards existed for any type of car

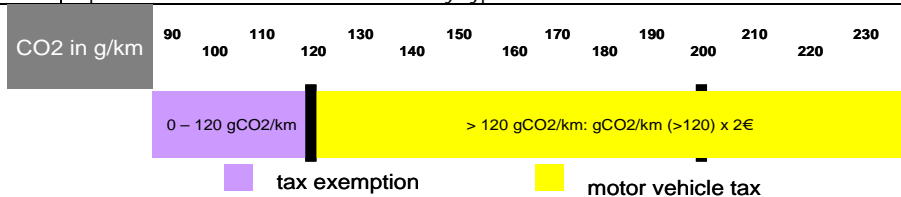


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Germany in 2008ig

References

AG-Energiebilanzen.de: Statistiken zu Energieverbräuchen: <http://www.ag-energiebilanzen.de/>
Bundesamt für Wirtschaft und Ausfuhrkontrolle: <http://www.bafa.de/>

GREECE

1. Energy consumption of passenger cars – conventional and alternative fuels

Energy consumption in the transport sector had almost doubled during the 70's and doubled again during the following 15 years (1980-1995). Total energy consumption in road passenger individual transport in Greece has grown from 36 PJ in 1970 to about 130 PJ in 2007, see Figure 1.

According to Figure 1 the market share of diesel fuel is very low, about 1% in 2007. The use of LPG has decreased from about 930 TJ in 2000 to 490 TJ in 2008. The biodiesel use in passenger cars has started in 2007.

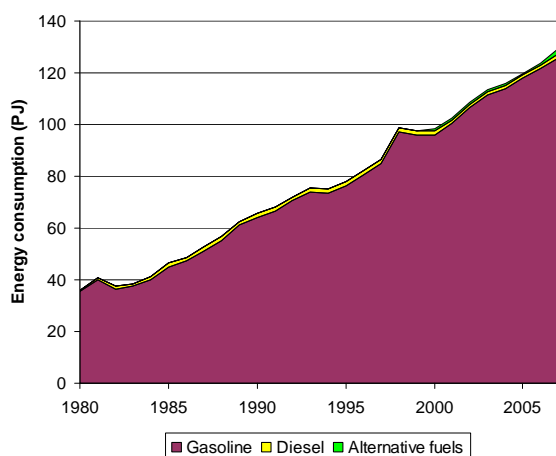


Figure 1. Development of energy consumption in car passenger transport in Greece by fuel 1980 – 2007

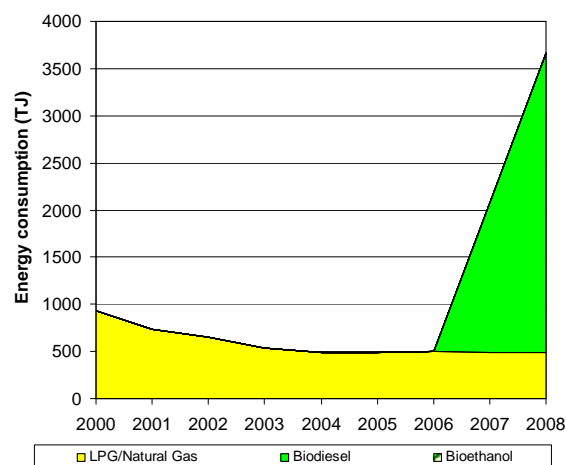


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Greece by fuel 2000 – 2008

2. Production and consumption of biofuels

The major biofuel considered in Greece is biodiesel. The production of biodiesel started in 2006 with the production of 1810 TJ, while a small quantity of 16 TJ was already produced at the end of 2005. A great increase in biofuels production was recorded the following year (2007) with a total biodiesel production that came up to 3482 TJ, whereas in 2008 there was a drop to 2890 TJ, because of the very late announcement of the 2008 quota (announcement in August 2008). Biodiesel production in 2009 is expected to be at the same level as in 2008, and even lower, because of the very late announcement of quota (again in August 2009) which delayed even more because of the elections and change of the Governing party in September 2009. From one biodiesel plant operating in 2005 there are currently 13 biodiesel plants in operation with a total capacity of 575,000 tons of biodiesel per year, and another 4 biodiesel importing companies. However capacities are expected to have only but marginal increase if current market conditions persist.

Table 1: Total production and total consumption of biofuels in Greece in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	2629	0	2890
Bioethanol	0	0	0	0
Total	0	2629	0	2890

3. Development of car stock with special focus on alternative powertrains

The improvement of the economic conditions in Greece the last 20 years had a tremendous impact on the ability of the population to own a car. In Figure 3 the total number of passenger cars (new registered cars and stock cars) for Greece is presented. During the period 1980 -2007 the number of passenger cars increased by 5.5 times (from 0.87 million to 4.8 million cars). The new registered cars each year represent a percentage varying from 5% to 11% of the total passenger cars. The highest percentage of new registered cars was recorded in 1992 (11%).

It should be pointed out that about 99% of the passenger cars in Greece are using gasoline. The use of diesel in transportation cars is allowed only in the countryside.

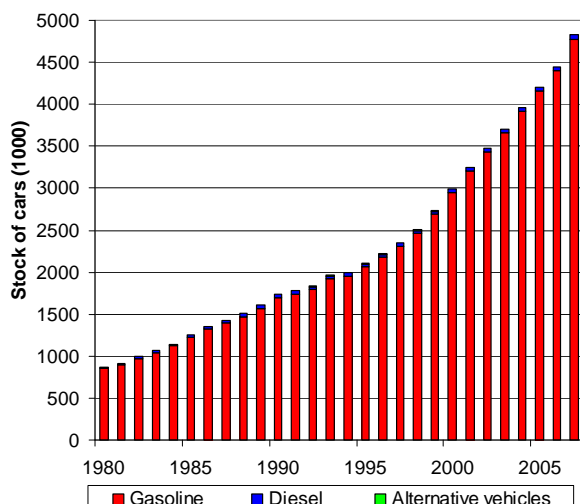


Figure 3. Development of car stock in car passenger transport in Greece by fuel 1980 – 2007

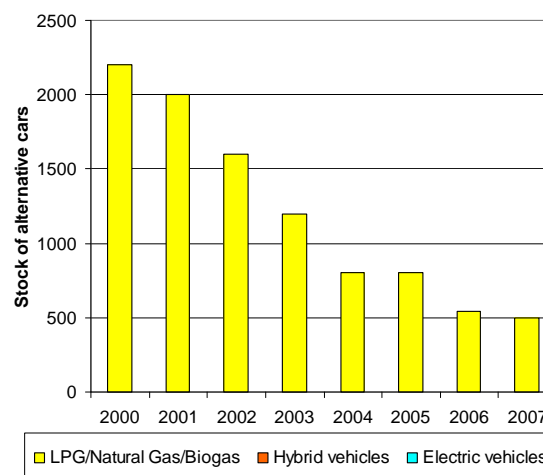


Figure 4. Development of stock of alternative vehicles for car passenger transport in Greece by category, 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Greece are documented in Table 2.

Table 2. Policies for car passenger transport in Greece

VAT:	There is a VAT of 19% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax of 0.359 €/litre Diesel: excise tax of 0.302 €/litre A provision incorporated in Article 34 of Act 3340/2005 provides for a full exemption from excise duties for the following quantities of pure biodiesel: - for 2005: 51 000 (1000l) (in 2005) - for 2006: 91 000 (1000l) (published by the end of 2005) - for 2007: 114 000 (1000l) (published in December 2006) - for 2008: 123 000 (1000l) (published in August 2008) - for 2009: 182 000 (1000l) (published in July 2009, valid until June 2010) The full exemption represents about 33 million € for the year 2007.
Registration tax:	Based on cc + emissions 5% - 50%
Subsidy:	No direct subsidy is applicable for biodiesel so far in Greece.
Quota:	The blend of 2% biodiesel by volume in automotive diesel has been distributed to all final consumers since February 2006 and continues to be distributed smoothly. This percentage was raised to 3.5 % by volume by about the end of 2006, further raised by 4% in 2007, 4.5% in 2009 and is expected to reach 5.75 % in 2010.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

UN, 1998. ECONOMIC ASPECTS OF SUSTAINABLE DEVELOPMENT IN GREECE.

<http://www.un.org/esa/agenda21/natlinfo/countr/greece/eco.htm#trans>

OECD, 2000. Environmental Performance reviews.

MINENV, 2002. 3rd National Report of the programme-framework of united nations for climate change. (In greek)

www.ypan.gr

HUNGARY

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption of passenger transport in Hungary has grown from 67 PJ in 1990 to 77 PJ in 2007. As it is depicted in Figure 1, gasoline has got the smallest growing rates, whereas the major part of growth is held by diesel. The major amount of consumption of alternative fuels is being held by natural gas till 2005. After 2005 this part was complemented by an increasing consumption of biofuels.

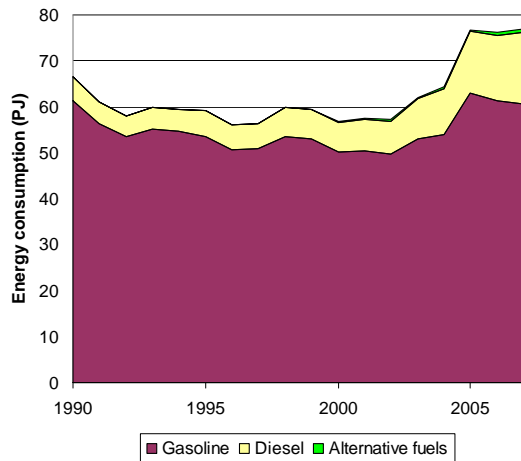


Figure 1. Development of energy consumption in car passenger transport in Hungary by fuel 1990 – 2007

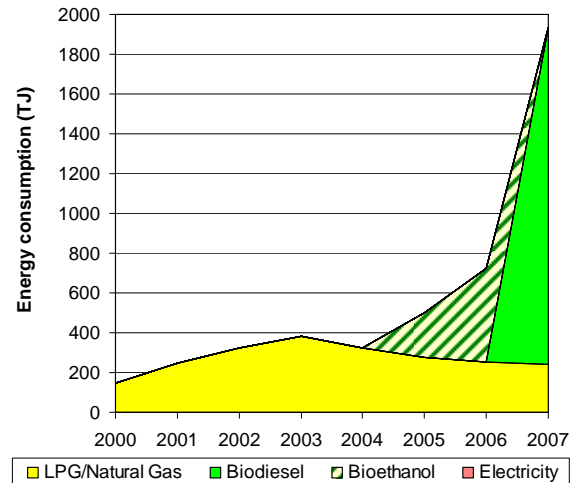


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Hungary by fuel 2000 – 2007

2. Production and consumption of biofuels

The production and use of liquid biofuels in Hungary started in recent years. As shown in Table 1 almost total biofuels consumption in 2008 was based on biodiesel.

Table 1: Total production and total consumption of biofuels in Hungary in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	3864	0	3391
Bioethanol	0	3335	0	1
Total	0	7199	0	3392

3. Development of car stock with special focus on alternative powertrains

The passenger vehicles total stock in Hungary has increased from 1.9 millions cars in 1990 to 3 millions in 2007. The historic development of the stock of gasoline cars shows a fluctuating increasing trend, whereby the stock of diesel cars increased continuously. The stock of alternative cars is held by natural gas cars, see Figure 4.

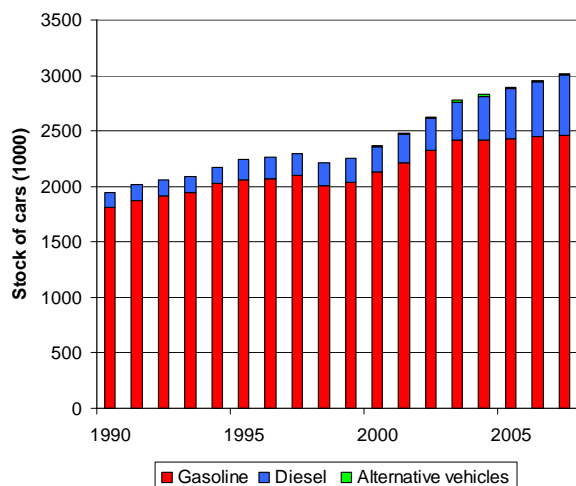


Figure 3. Development of car stock in passenger transport in Hungary by fuel 1990 – 2007

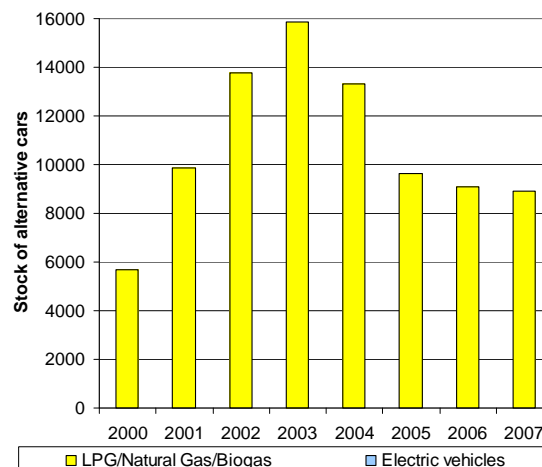


Figure 4. Development of stock of alternative vehicles for passenger transport in Hungary by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Hungary are documented in Table 2.

Table 2. Policies for car passenger transport in Hungary

VAT:	There is a VAT of 25% on all types of fuels
Fuel excise tax:	Gasoline: Excise tax of 0.448 €/litre Diesel: Excise tax of 0.368 €/litre From 1 July 2007 a tax reduction to 0% excise tax will apply for biofuels blended up to 4.4% of the volume of gasoline and from 1 January 2008 this tax exemption will also apply to 4.4% of biodiesel blended into diesel. Fuel distribution companies not complying with the 4.4% requirement will have an extra tax burden of HUF 8 per litre of fuel at the wholesale level. In addition, as of 1 January 2007 the bioethanol component of fuel E85 (defined as containing at least 70% bioethanol) is exempt from excise duty.
Registration tax:	Based on emissions
Subsidy:	
Quota:	The excise reduction has been enacted as part of the government of Hungary's decision in 2006 setting a target of achieving 5.75% of biofuels as a proportion of the energy content of total fuel consumption for transport by 2010.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
EUROSERVER Biofuel reports 2004,2005,2006,2007
European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

IRELAND

1. Energy consumption of passenger cars – conventional and alternative fuels

As it is depicted in Fig. 1, the total energy consumption of passenger transport in Ireland has grown continuously from 38 PJ in 1990 to 90 PJ in 2007. The main parts of the consumption are gasoline and diesel.

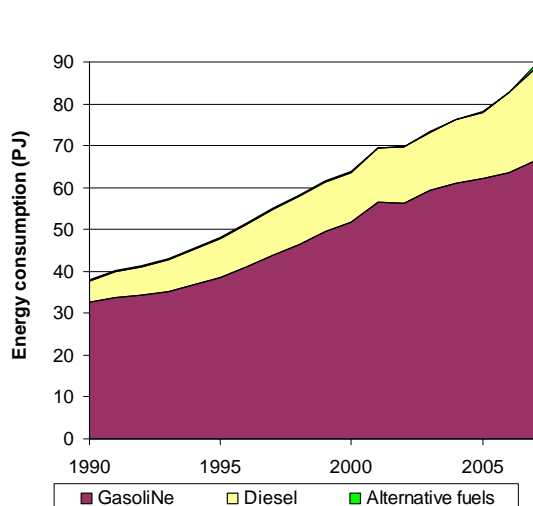


Figure 1. Development of energy consumption in car passenger transport in Ireland by fuel 1990 – 2007

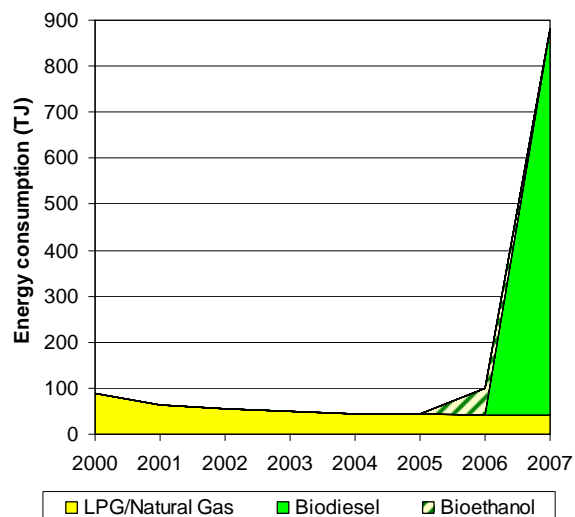


Figure 2: Development of energy consumption from alternative fuels in car passenger transport in Ireland by fuel 2000 – 2007

2. Production and consumption of biofuels

Since 2005 we can observe an increase of liquid biofuels, especially biodiesel, see Table 1.

Table 1: Total production and total consumption of biofuels in Ireland in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	883	0	1675
Bioethanol	0	222	0	0
Total	0	1096	0	1675

3. Development of car stock with special focus on alternative powertrains

The passenger vehicles total stock in Ireland has increased from 0.7 millions in 1985 to 1.9 millions cars in 2007. The share of alternative vehicles is very low, see Figure 3.

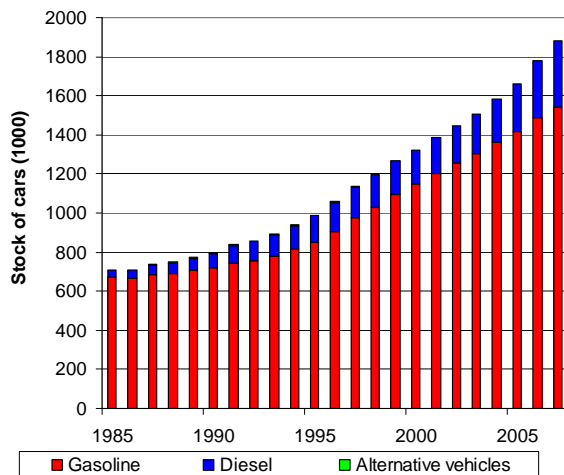


Figure 3. Development of car stock in car passenger transport in Ireland by fuel 1985 – 2007

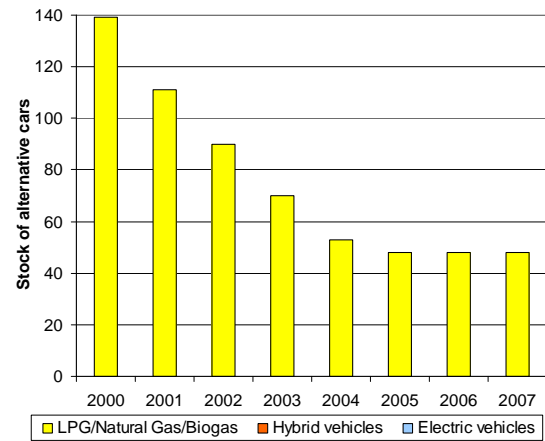


Figure 4. Development of stock of alternative vehicles for car passenger transport in Ireland by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Ireland are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Ireland

VAT:	There is a VAT of 21.5% for gasoline and diesel, and 13.5% for electricity.
Fuel excise tax:	Gasoline: Excise tax of 0.509 EUR/litre (it was 0.401 EUR/litre between 2001 and 2003) Diesel: Excise tax of 0.368 €/litre
Registration tax:	In addition to the benefit of the CO ₂ based VRT system, there is a further top-up relief up to 2,500EUR on the VRT payable available. 7 VRT rates, ranging from 14% to 36%, depending on the car's CO ₂ emission level are applied to the Open Market Selling Price of the car (see Fig.3). Rates will range from 100 EUR a year for the least CO ₂ emitting cars, to 2,000 EUR for cars with the highest emissions rating. In an effort to foster the use of electric cars and electric mopeds these are being exempted from VRT (Vehicle Registration Tax).
Subsidy:	Existing incentives for certain hybrid electric and flexible fuel cars
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

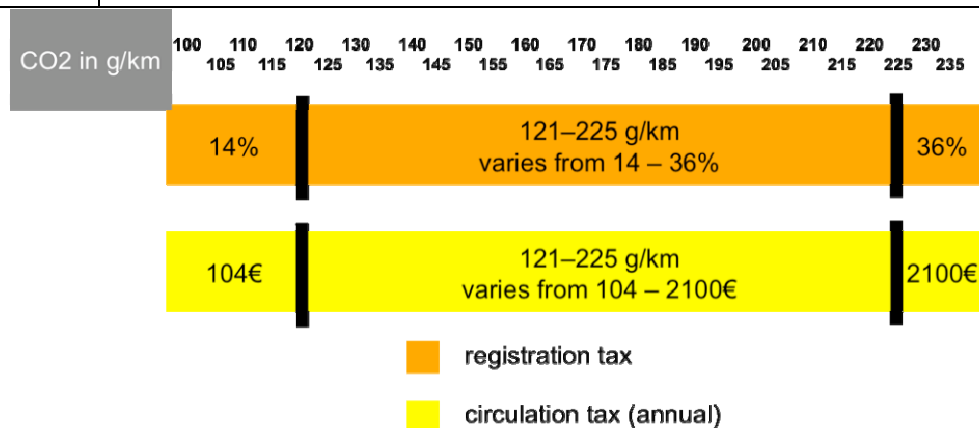


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Ireland in 2008

References

- ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
- EUROSERVER Biofuel reports 2004,2005,2006,2007
- European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
- European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

ITALY

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road passenger transport in Italy has grown from about 500PJ in 1980 to 880 PJ in 2007. A major feature of road passenger transport in Italy is the continuous increase of the market share of diesel. Figure 1 shows how the diesel diffusion exploded in the years after 2000 with the car makers offering a much wider range of diesel cars. Historically the diffusion of diesel cars was made difficult by the taxation on diesel cars until the 1980s. In 2007 share of diesel in total energy consumption in car passenger transport was 53%.

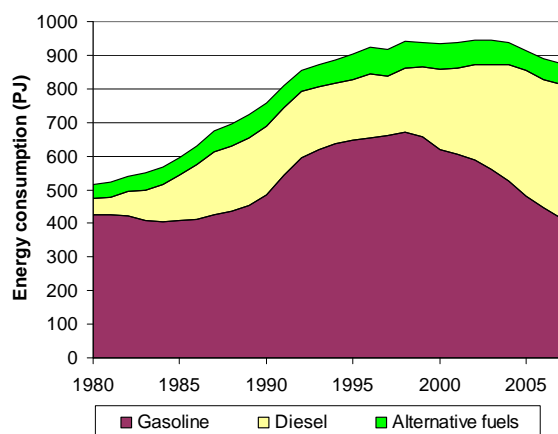


Figure 1. Development of energy consumption in car passenger transport in Italy by fuel 1970 – 2007

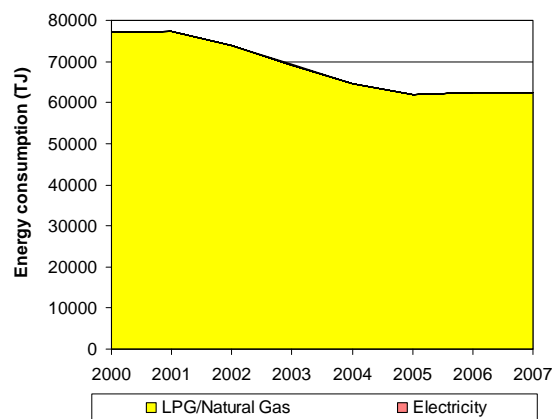


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Italy by fuel 2000 – 2007

2. Production and consumption of biofuels

Energy consumption concerning alternative fuels, showed in Figure 2, confirms that in car passenger transport it is limited to the LPG/Natural Gas. Actually, biofuels have not a real market as distribution around the country is insignificant. Consumption of biofuel in transports is limited to some public transport fleets and in agriculture sector.

Table 1: Total production and total consumption of biofuels in Italy in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	10046	21896	0	23332
Bioethanol	0	1334	0	0
Total	10046	23230	0	23332

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in Italy has grown from about 10 million cars in 1970 to more than 35 million cars in 2007. Figure 3 shows development of the car stock.

Diesel cars increased their market share continuously. In 2007 the market share of diesel cars was about 34%. LPG/Natural gas cars had an important development in past decades. During the 1970s and 1980s the increase was modest. More recently, with by-power cars and the dramatic increase of gasoline/diesel prices, they register a new success. This is also due to incentives, and favourable local rules concerning circulation in the inner cities.

Electric vehicles are limited to some city administration fleets and are not statistically significant until now.

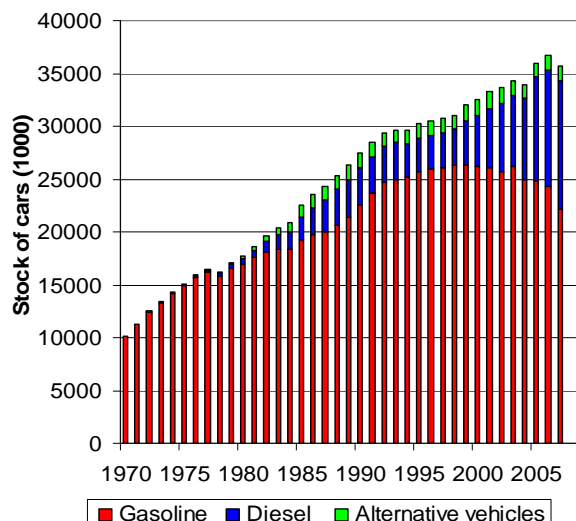


Figure 3. Development of car stock in car passenger transport in Italy by fuel 1970 – 2007

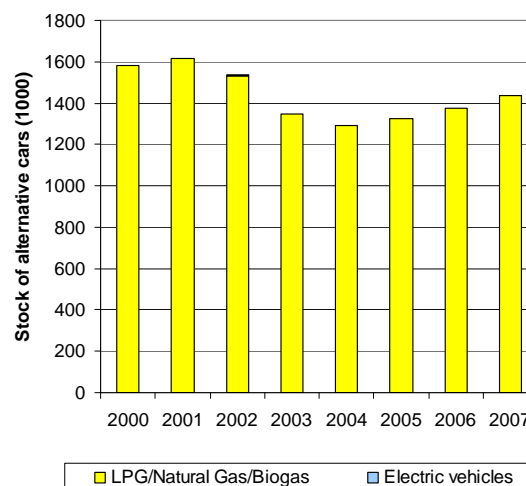


Figure 4. Development of stock of alternative vehicles for car passenger transport in Italy by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Italy are documented in Table 2.

Table 2. Policies for car passenger transport in Italy

VAT:	The VAT is 20% on all types of fuels
Fuel excise tax:	Gasoline: excise tax of 0.564 EUR/litre Natural gas/LPG: excise tax of 0.423 EUR/litre.
Registration tax:	IPT + PRA + MCTC
Subsidy:	Subsidies are available for electric cars and LPG/natural gas cars. They can differ from Region to Region, and they are related to car scrappage programs. More recently (years 2009) due to the economic crisis, incentives of around 1500 EUR are granted to buyers of new cars respecting EURO 5 standards. Many cities authorities in the country have limited the city centres circulation to environmental most performing Euro 4 cars and diesel cars with Anti Particulate Filters. As mentioned before, electric cars and other alternative cars do not suffer any restriction to the circulation during the restriction imposed by local authorities.
Quota:	Not later than 31/12/2005: share of 1,0% of biofuels used in transport sector Not later than 31/12/2008: share of 2,5% Not later than 31/12/2010: share of 5,75%
Standards:	Up to 2008 no standards exist for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
EUROSERVER Biofuel reports 2004,2005,2006,2007
European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

LATVIA

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport in Latvia has grown from 3.5 PJ in 1980 to 15 PJ in the year 2008. As can be seen from Figure 1 the highest growth rates were in recent years after 2002 and can be attributed at least to some extent to Latvia' membership in the EU. The market share of diesel in car passenger transport increased till 2001, and decrease afterwards slightly. With respect to alternative fuels in car passenger transport in Latvia there is a moderate stock of LPG which increased continuously in recent years.

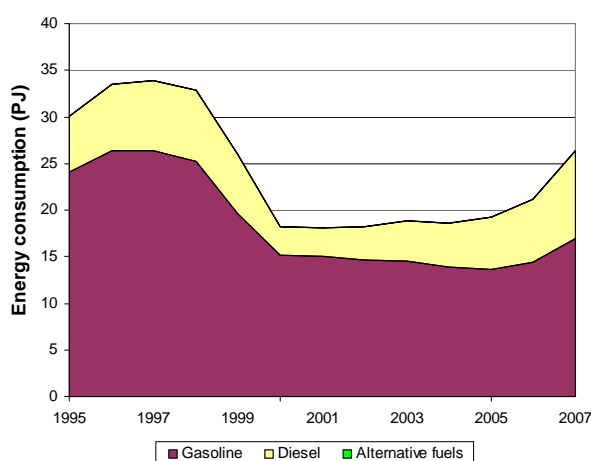


Figure 1. Development of energy consumption in car passenger transport in Latvia by fuel 1990 – 2007

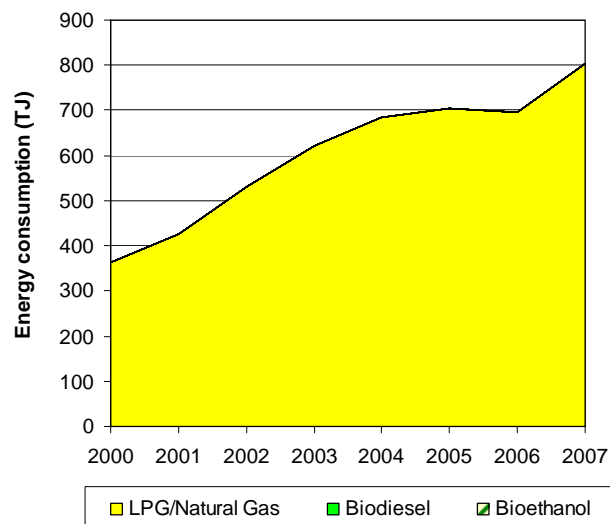


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Latvia by fuel 2000 – 2007

2. Production and consumption of biofuels

The production and use of liquid biofuels in Latvia started only in recent years. For 2008 figures of 1104 TJ for biodiesel production and 81 TJ for biodiesel consumption are reported by international statistics. It is of interest that Latvia produced by far more biodiesel than it consumed.

Table 1: Total production and total consumption of biofuels in Latvia in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	1104	0	81
Bioethanol	0	0	0	0
Total	0	1104	0	81

3. Development of car stock with special focus on alternative powertrains

Total passenger vehicles total stock in Latvia has grown from about 230 000 cars in 1990 to more than 530 000 cars in 2007, see Figure 3. The percentage of alternative fuel vehicles is small and consists mainly of LPG cars, see Figure 4.

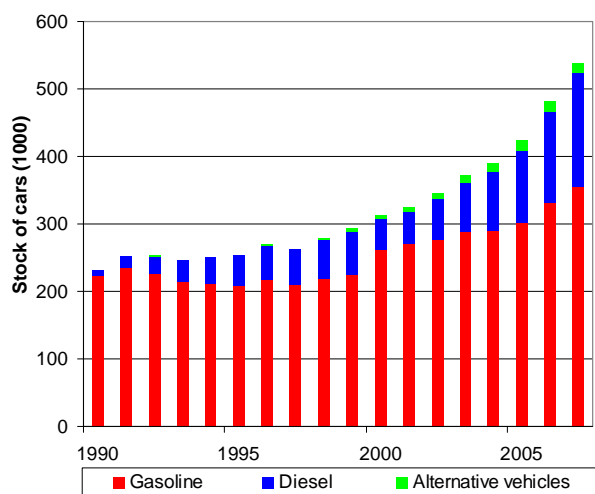


Figure 3. Development of car stock in passenger transport in Latvia by fuel 1990 – 2007

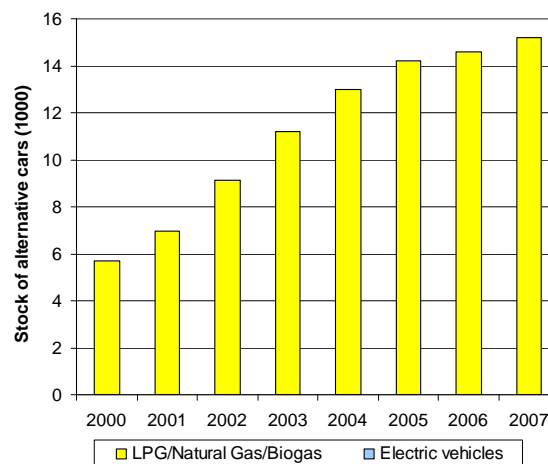


Figure 4. Development of stock of alternative vehicles for passenger transport in Latvia by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Latvia are documented in Table 2.

Table 2. Policies for car passenger transport in Latvia

<i>VAT:</i>	There is a VAT of 21% on all types of fuels and vehicles.
<i>Fuel excise tax:</i>	Gasoline: excise tax of 0.379 EUR/litre Diesel: excise tax of 0.330 EUR/litre
<i>Registration tax:</i>	N.A.
<i>Subsidy:</i>	N.A.
<i>Standards:</i>	Up to 2008 no standards existed for any type of car
<i>Other:</i>	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
Eurostat: <http://www.ec.europa.eu/eurostat>

LITHUANIA

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport in Lithuania has decreased from about 20 PJ in 1995 to about 36 PJ in the year 2007. As can be seen from Figure 1 the highest growth rates were in recent years after 2004 and can be attributed at least to some extent to Lithuania's membership in the EU. The market share of diesel in car passenger transport is increasing. With respect to alternative fuels in car passenger transport in Lithuania there is a moderate use of LPG.

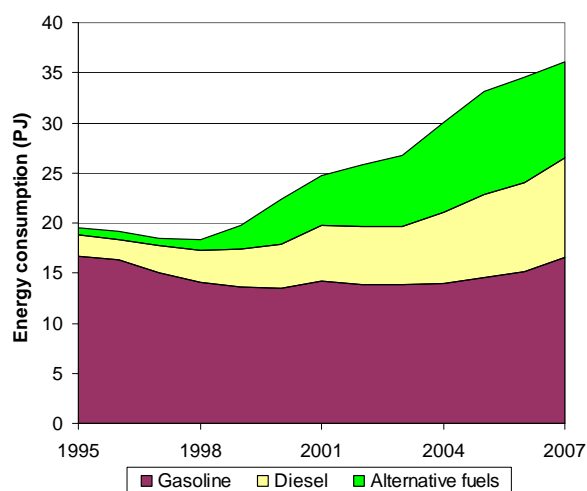


Figure 1. Development of energy consumption in car passenger transport in Lithuania by fuel 1995 – 2007

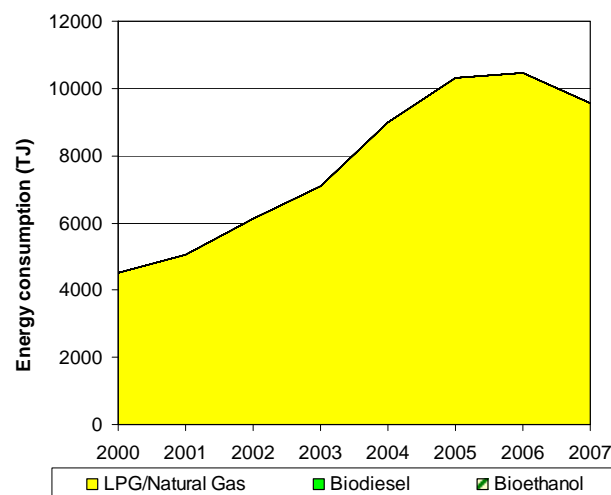


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Lithuania by fuel 2000 – 2007

2. Production and consumption of biofuels

The production and use of liquid biofuels in Lithuania started only in recent years. For 2008 figures of 2429 TJ for biodiesel production and 1916 TJ for biodiesel consumption are reported by international statistics.

Table 1: Total production and total consumption of biofuels in Lithuania in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	2429	0	1916
Bioethanol	0	0	0	0
Total	0	2429	0	1916

3. Development of car stock with special focus on alternative powertrains

Passenger vehicles total stock in Lithuania has grown from about 700 000 cars in 1995 to about 1.6 million cars in 2007, see Figure 3. The percentage of alternative fuel vehicles is small and consists mainly of LPG cars. Since 2005 the stock of LPG cars decreased slightly, see Figure 4.

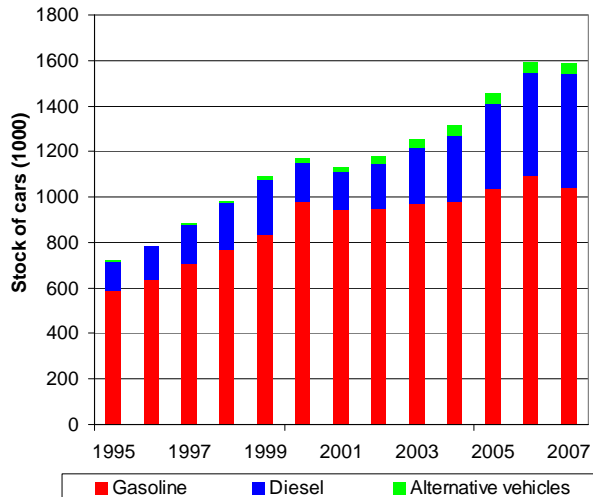


Figure 3. Development of car stock in passenger transport in Lithuania by fuel 1995 – 2007

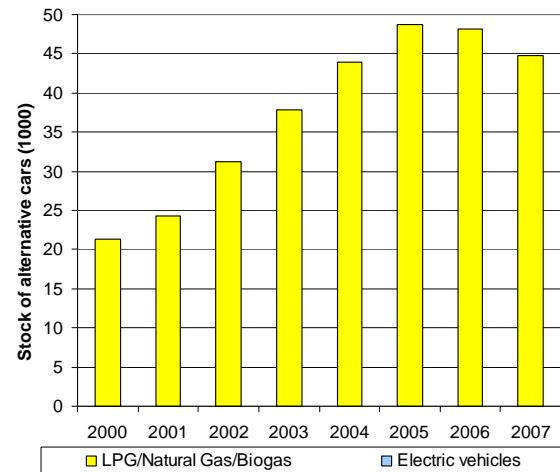


Figure 4. Development of stock of alternative vehicles for passenger transport in Lithuania by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Lithuania are documented in Table 2.

Table 2. Policies for car passenger transport in Lithuania

VAT:	There is a VAT of 19% on all types of fuels and vehicles.
Fuel excise tax:	Gasoline: excise tax of 0.434 EUR/litre Diesel: excise tax of 0.330 EUR/litre
Registration tax:	
Subsidy:	
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
Eurostat: <http://www.ec.europa.eu/eurostat>

LUXEMBOURG

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road passenger transport in Luxembourg has grown from 18 PJ in 1985 to 34 PJ in the year 2003, see Figure 1. After 2004 it decreased and reached 30 PJ in 2007.

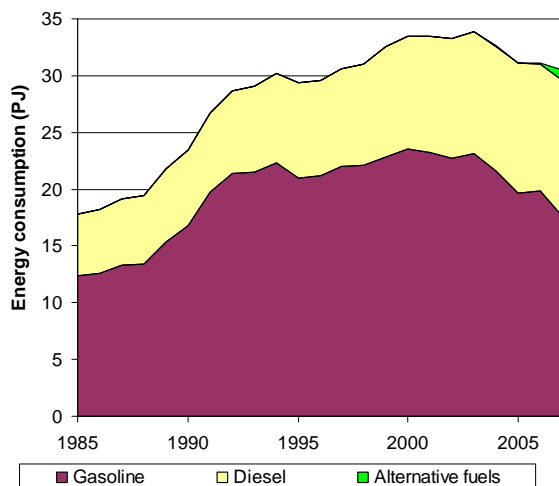


Figure 1. Development of energy consumption in car passenger transport in Luxembourg by fuel 1985 – 2007

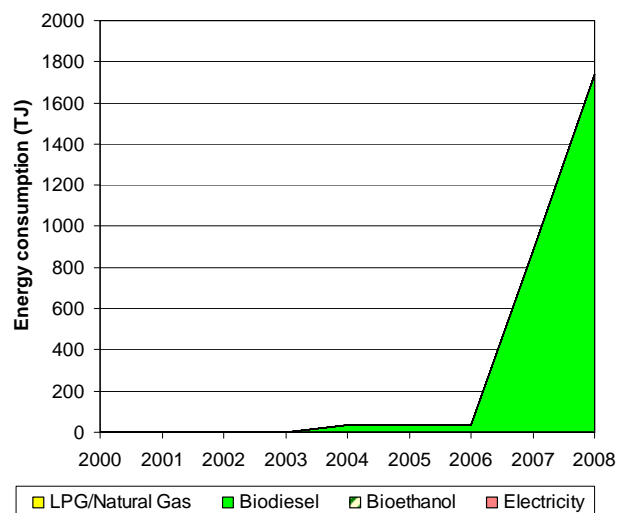


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Luxembourg by fuel 2000 – 2008

2. Production and consumption of biofuels

The use of liquid biofuels increased to 1735 TJ in 2008. This shows the very moderate absolute contribution to fuel use.

Table 1: Total production and total consumption of biofuels in Luxembourg in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	0	0	1735
Bioethanol	0	0	0	0
Total	0	0	0	1735

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in Luxembourg has doubled from about 0.15 million cars in 1985 to 0.3 million in 2007, see Figure 3. Gasoline cars have had a very large market share of about two-third of the vehicle stock since 1985 compared to one-third of diesel cars and this distribution has remained until today.

No information is available on the stock of alternative fuel cars.

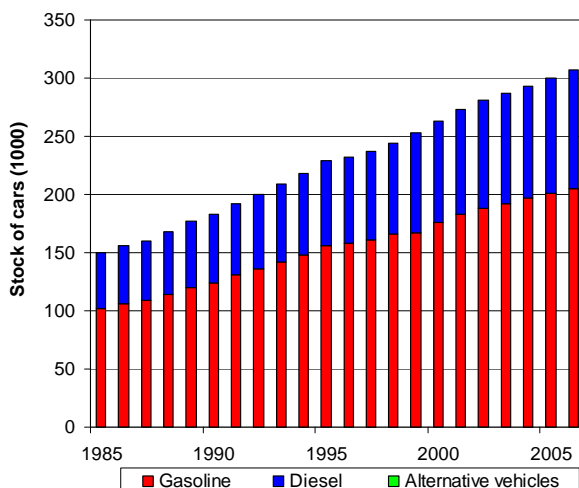


Figure 3. Development of car stock in car passenger transport in Luxembourg by fuel 1985 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Luxembourg are documented in Table 2 and Figure 4.

Table 2: Policies for car passenger transport in Luxembourg

VAT:	There is a VAT of 15% on all types of fuels except LPG with a tax rate of 6%
Fuel excise tax:	Gasoline: excise tax of 0.4621 EUR/litre Diesel: excise tax of 0.2904 EUR/litre LPG: excise tax of 0.1016 EUR/litre Tax exemption of 100% for pure biofuel (B100/E100) consumed on the Luxembourg territory (2007)
Registration tax:	VAT of 15% is levied on new cars, second hand cars are not taxed. New cars are also subject to registration tax which is issued in the form of revenue stamps by a private company. Usually the tax has to be payed together with the registration plates. A set of two plates is € 16,51 including VAT 15%.
Subsidy:	
Quota:	A quota exists for biofuels: Incorporation of mandatory 2% biofuel as of Januar 1st 2007. Luxembourg national indicative targets for biofuels are: 5.75% in 2010.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

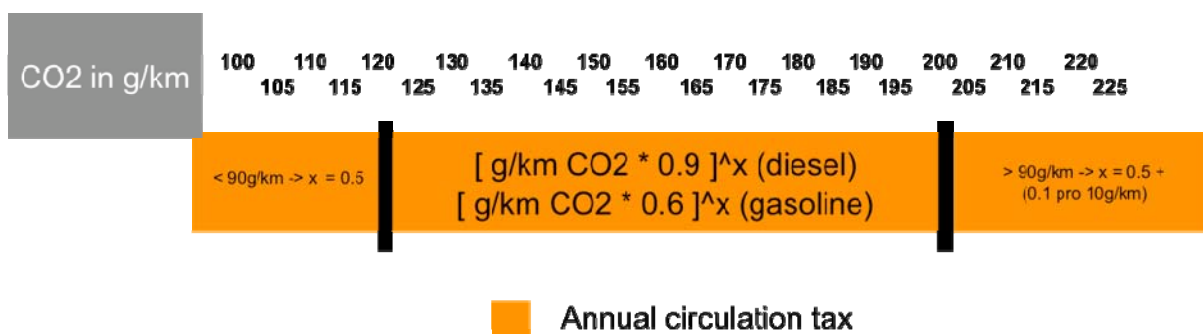


Figure 4. CO₂-dependent subsidies/taxes for passenger vehicles in Luxembourg in 2008

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
 ACEA (2007) Motor Vehicle Taxation in Europe, European Automobile Manufacturers Association, Brussels, Belgium
 Statistic Office Website of the Statistical Office of Luxembourg: <http://www.statistiques.public.lu/>
 Ministry Website of the Luxembourg Ministry of Economics Of Economics <http://www.eco.public.lu/>

MALTA

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in car passenger transport in Malta has slightly declined since 2000 as can be seen from Figure 1. The market share of diesel in car passenger transport is virtually constant since 2001. With respect to alternative fuels in car passenger transport in Malta no use has been reported so far.

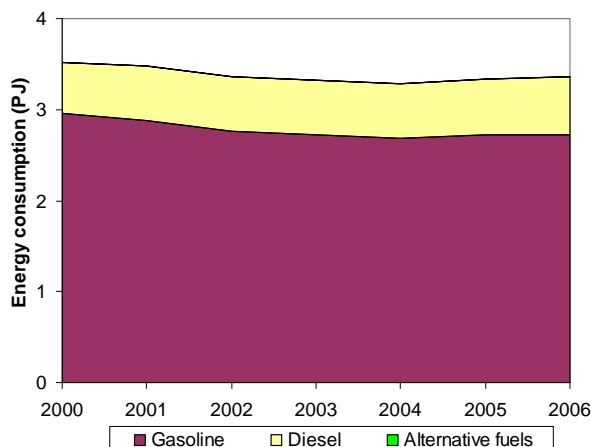


Figure 1. Development of energy consumption in car passenger transport in Malta by fuel 2000 – 2006

No use of alternative fuels in car passenger transport has been reported so far

Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Malta by fuel 2000 – 2007

2. Production and consumption of biofuels

There is virtually no production and use of biofuels in Malta. For 2008 figures of 40 TJ for biodiesel consumption are reported by international statistics.

Table 1: Total production and total consumption of biofuels in Malta in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	0	0	40
Bioethanol	0	0	0	0
Total	0	0	0	40

3. Development of car stock with special focus on alternative powertrains

Total passenger car stock in Malta has grown from about 180 000 cars in 2000 to more than 220 000 cars in 2007, see Figure 3. The share of alternative automotive technologies is currently very low, see Figure 4.

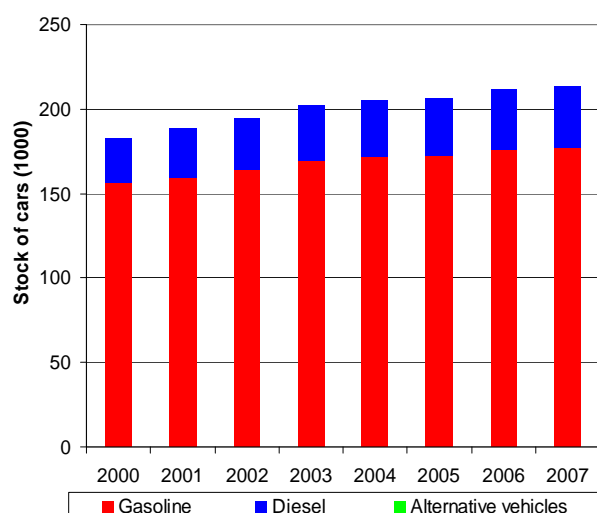


Figure 3. Development of car stock in car passenger transport in Malta by fuel 2000 – 2007

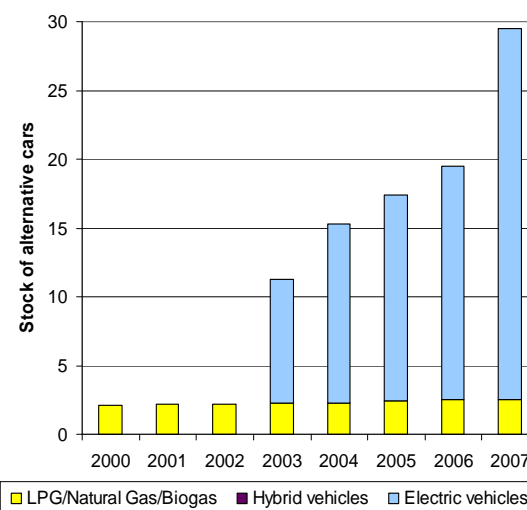


Figure 4. Development of stock of alternative vehicles for car passenger transport in Malta

4. Energy policies for car passenger transport

National policies for car passenger transport in Malta are documented in Table 2.

Table 2. Policies for car passenger transport in Malta

VAT:	There is a VAT of 18% on all types of fuels and vehicles.
Fuel excise tax:	Gasoline: excise tax of 0.459 EUR/litre Diesel: excise tax of 0.352 EUR/litre
Registration tax:	N.A.
Subsidy:	N.A.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
Eurostat: <http://www.ec.europa.eu/eurostat>

THE NETHERLANDS

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road passenger transport in the Netherlands has grown from 180 PJ in 1980 to 249 PJ in the year 2000 and finally to 266 PJ in 2007. As can be seen from Figure 1 the gasoline use was relatively stable since 1980 while the use of diesel increased. LPG reached its peak in the eighties and decreased again afterwards.

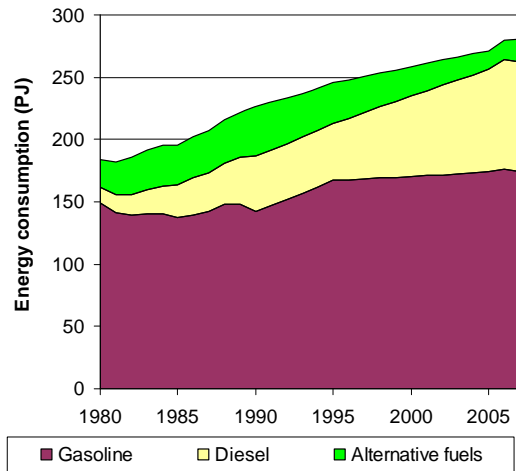


Figure 1. Development of energy consumption in car passenger transport in the Netherlands by fuel 1980 – 2007

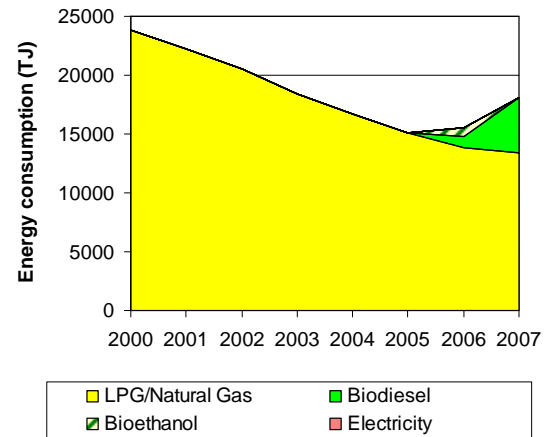


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in the Netherlands by fuel 2000 – 2007

2. Production and consumption of biofuels

The total use of liquid biofuels increased from 0 still in 2003 to 10780 TJ in 2008. In the last years a growing amount of biodiesel (920 TJ in 2006) and bioethanol (784 TJ in 2006) is blended with diesel and gasoline.

Table 1: Total production and total consumption of biofuels in Netherlands in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	3717	0	8457
Bioethanol	0	200	0	2323
Total	0	3917	0	10780

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in the Netherlands has grown from about 4.2 million cars in 1980 to 7.4 million cars in 2007, see Figure 3. Gasoline cars have had a very large market share (over 85%) of the vehicle stock since 1980.

Regarding the development of alternative car types LPG driven cars have increased from over 300000 in 1980 to more than 0.5 million in 1990 and decreased after that again to a quarter of a million in 2007. The stock of electric cars started increasing since 1999 and stands at about 9500 in 2007, see Figure 4.

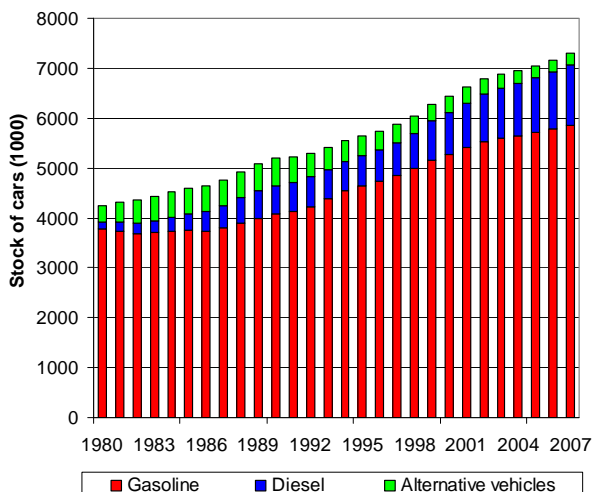


Figure 3. Development of car stock in passenger transport in the Netherlands by fuel 1980 – 2007

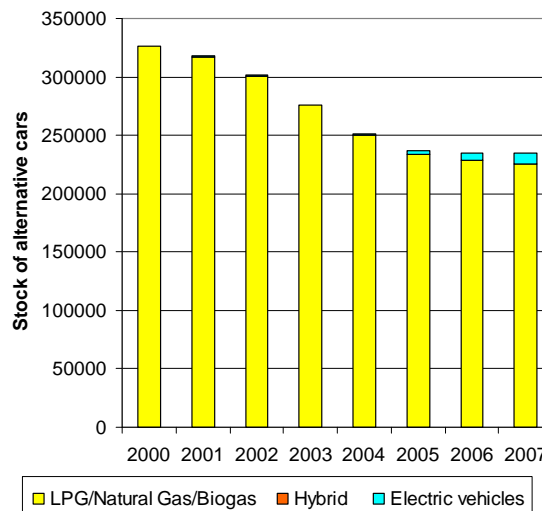


Figure 4. Development of stock of alternative vehicles for passenger transport in the Netherlands by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in the Netherlands are documented in Table 2 and Figure 5.

Table 2: Policies for car passenger transport in the Netherlands

VAT:	There is a VAT of 19% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax of 0.714 EUR/litre and a storage tax of 0.0059 EUR/litre Diesel: excise tax of 0.421 EUR/litre and a storage tax of 0.005 EUR/litre LPG: excise tax of 0.081 EUR/litre and a storage tax of 0.0031 EUR/litre There is no excise tax for Hydrogen.
Registration tax:	On new cars there is a registration tax of 27.4% (up from 2010) of the list price of the car with a reduction of 1288 euro for gasoline cars, a reduction of 1788 euro for CNG cars, an extra fee of 1076 euro for diesel cars. Additionally, the registration tax has a component that is based on the CO ₂ emissions of the vehicle. There is a reduction of 300 euro for diesel cars emitting less than 5mg/km of PM ₁₀ . The coming years the registration tax will be fully replaced by taxes depending on the CO ₂ -emissions of the car.
Subsidy:	
Quota:	
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

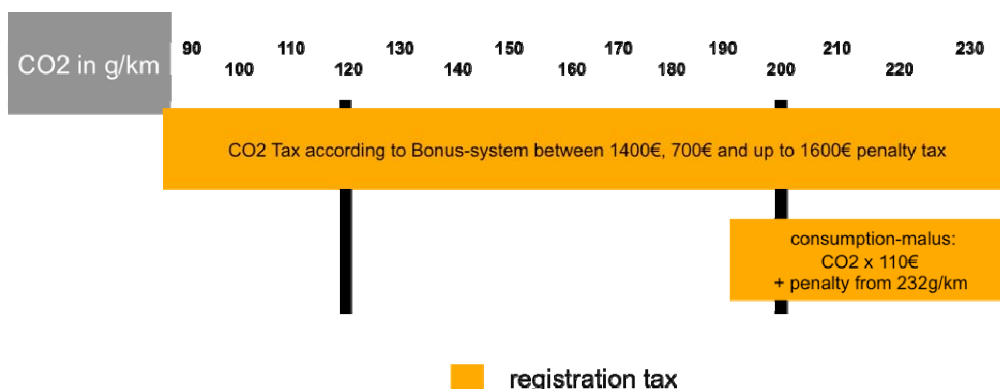


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in the Netherlands in 2008

References

ODYSSEE-Database 2009: <http://www.odyssee-indicators.org/>
 EUROSERVER Biofuel reports 2004,2005,2006,2007
 European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
 European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

POLAND

1. Energy consumption of passenger cars – conventional and alternative fuels

Total energy consumption in road transport has grown from about 100 PJ in 1990 to 250 PJ in 2007. As can be seen from Figure 1 the highest growth rates started in 1990 (political transformation) and since 2003 till now. A major feature of road passenger transport in Poland is the continuous increase of the market share of diesel and LPG.

Further important features are:

- The sharp increase in 1990 – 91 is mostly due to massive influx to Poland of second-hand, old, high fuel consumption cars, mainly from Germany, after the democratic transition in 1989.
- The other sharp increase started in 2004 with Poland's accession to EU.

The alternative fuels are dominated by LPG with a negligible contribution of natural gas. In the transportation sector in Poland it started to be used in 1990 and currently contributes about 15% of the total transport fuel consumption, as shown in Figure 2.

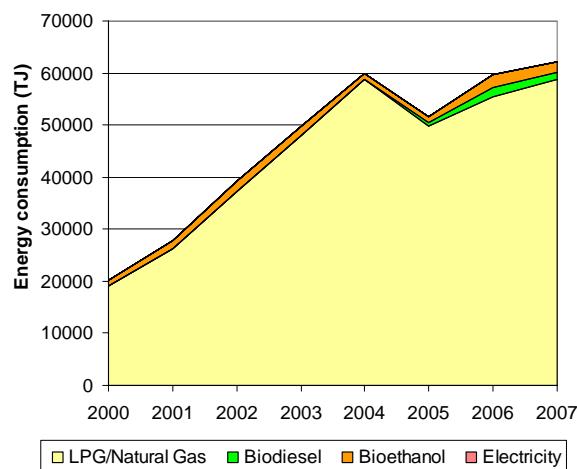
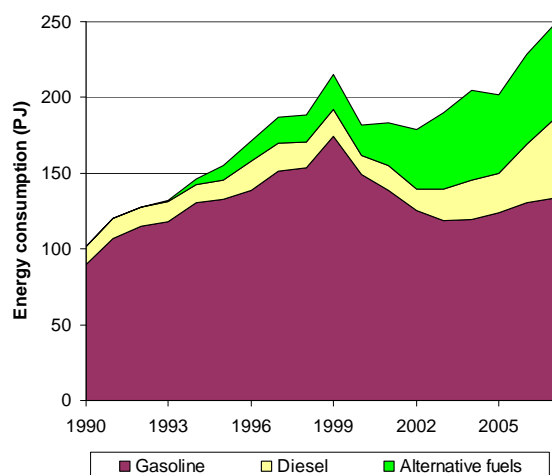


Figure 1. Development of energy consumption in car passenger transport in Poland by fuel 1990 – 2007

Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Poland by fuel 2000 – 2007

2. Production and consumption of biofuels

The use of liquid biofuels increased by an average of 14 percent per year in the period from 1997 to 2007, reaching a level of 16500 TJ in 2007.

It is worth noting that the use of bioethanol (as admixture to petrol) was higher in 1997 than in 2008. The decrease in the use of bioethanol between 1997-2008 should be attributed at least partly to „black PR“ by some lobbies, during the debate on introduction of the Polish Biofuel Act, which finally failed to be introduced by the presidential veto. It was widely claimed in media that adding bio-components to mineral fuels would damage car engines. It should be noted that before then ethanol had been added to petrol without informing car users.

Table 1: Total production and total consumption of biofuels in Poland in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	9943	0	13211
Bioethanol	1690	2459	1232	5291
Total	1690	12402	1232	18502

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in Poland has grown from about 5.3 million cars in 1990 to more than 14 million cars in 2007, which is illustrated in Figure 3. Regarding the development of alternative car types, the number of gas driven cars increased to nearly 2 million in 2007. Hybrid cars in Poland amounted to only 710 units in 2007, see Figure 4.

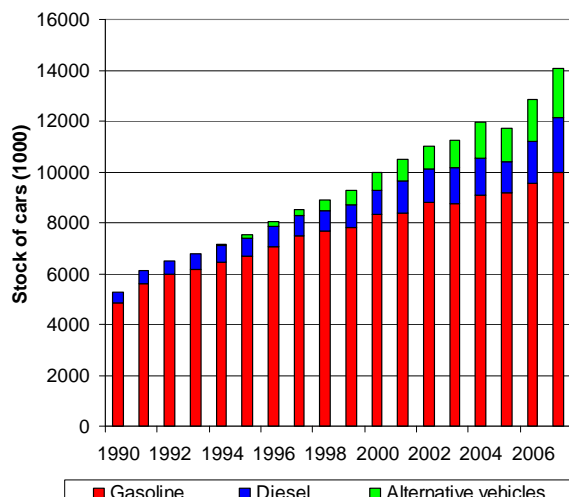


Figure 3. Development of car stock in car passenger transport in Poland by fuel 1990 – 2007

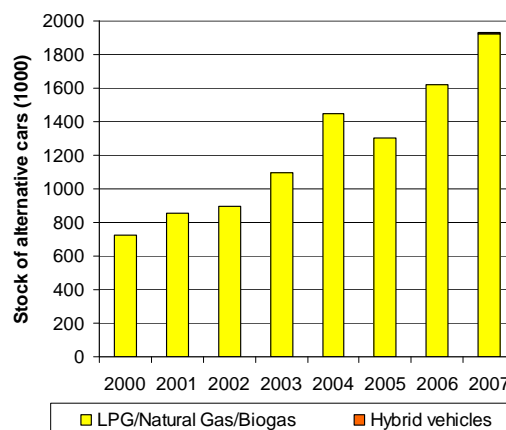


Figure 4. Development of stock of alternative vehicles for car passenger transport in Poland by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Poland are documented in Table 2.

Table 2. Policies for car passenger transport in Poland

VAT:	There is a VAT of 22% on all types of fuels and vehicles. There is no exemption
Fuel excise tax:	Gasoline: excise tax of 0.488 EUR/litre since 2008 (2004 it was 0.352 EUR/litre) Diesel: excise tax of 0.339 EUR/litre (2004 it was 0.236 EUR/litre) Natural gas: excise tax of 0.090 EUR/litre (2004 it was 0.059 EUR/litre) Biofuels are almost fully exempted from the excise tax (tax reduction of approximately 95%). Tax Exemptions: As it stands in the latest Excise Tax Act (Polish Official Journal 2009 nr 3, pos. 11) fuels which contains more than 2% of bio-components are eligible to excise tax reduction of - 1,565 PLN (0,364 EUR at present rate) per litre of bio-component added to petrol mix; - 1,048 PLN (0,244 EUR at present rate) per litre of bio-component added to diesel mix; under the condition that the minimum excise tax is 10,00 PLN/1000 litres of fuel, which is the excise tax for pure biofuels. Biogas, hydrogen and bio-hydrogen are exempted from excise tax.
Registration tax:	Based on engine capacity, expressed in litres, of the cylinders chambers. (3,1% on cars up to 2 litres) (18,6 % on cars more than 2 litres)
Subsidy:	There are no direct subsidies to bio- or alternative fuels;
Quota:	Polish National Indicative Target for biofuels were set at the following levels: <ul style="list-style-type: none"> • 0,50 % - 2005 • 1,50 % - 2006 • 2,30 % - 2007 • 3,45 % - 2008 • 4,60 % - 2009 • 5,75 % - 2010
Standards:	Euro 2 - since 1996, Euro 3 - since 2000, Euro 4 - since 2006, Euro 5 – since 2009
Other:	No

References

"Energy Statistics", Polish Central Statistical Office
"Report to EU Commission about supporting of use biofuels and other renewable fuels in Poland in 2007".
"Excise Tax Act", Polish Official Journal
Civitas Caravel Krakow, www.caravel-krakow.pl

PORTUGAL

1. Energy consumption of passenger cars – conventional and alternative fuels

Energy consumption of passenger cars³ in Portugal has grown from 33 PJ in 1980 to over 100 PJ in 2007. As it can be seen from Figure 1 the highest growth rates were in the late 1990's with a period of fuel prices' stability and strong economic growth. This period also shows a continuous increase of the market share of diesel which reached its peak in 2007 (almost 30%). As shown from Fig.1b, alternatives fuels still have a negligible share of the market. However, new energy policy regarding biofuels penetration became effective in 2006 and will induce an important evolution in this sector in the following years as Portugal has committed to reach a 10% target in 2010 for biofuels penetration in transport sector.

Alternative fuels have currently a very marginal share of the market

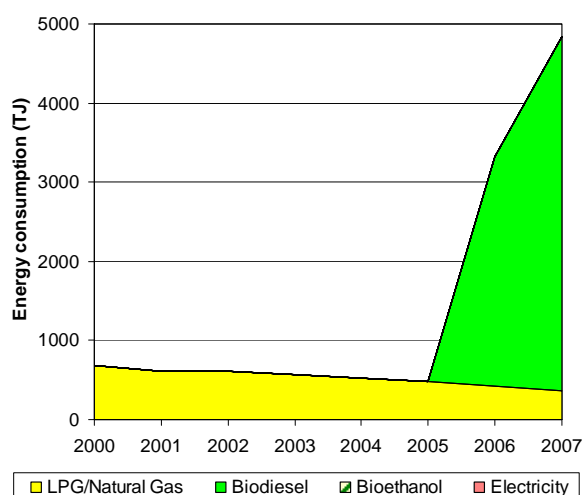
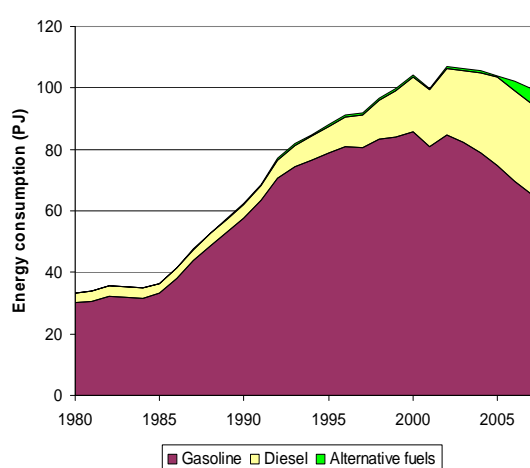


Figure 1. Development of energy consumption in car passenger transport in Portugal by fuel 1990 – 2007

Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Portugal by fuel 2000 – 2007

2. Production and consumption of biofuels

The total use of liquid biofuels increased from 0 in 2003 to 6024 TJ in 2008, see Table 1.

Table 1: Total production and total consumption of biofuels in Portugal in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	9862	0	6023
Bioethanol	0	0	0	1
Total	0	9862	0	6024

3. Development of car stock with special focus on alternative powertrains

According to ACAP estimates passenger vehicle stock in Portugal has grown from about 1.6 million cars in 1990 to almost 4 million cars in 2007.

As shown in Figure 3 diesel cars increased their market share continuously and represent currently more than 25% of the vehicle stock.

Regarding the development of alternative car types in recent years gas driven cars (LPG) have decreased in number, their market share in 2007 was less than 0.4 %.

As far as biofuels are concerned, the market penetration will not appear through the vehicle stock as the Portuguese strategy is mainly focussed in mixing biofuels with diesel oil or gasoline.

³ Because no explicit data for energy consumption in passenger car transport in Portugal are available, some estimates had to be conducted to get any useful data. These estimates are based on data available for total road energy consumption, car stock and the following assumptions: (i) 95% of total road gasoline is used in passenger cars (as is the average for countries with detailed available data); (ii) diesel passenger cars use 15% more energy per car (due to longer travel distances), (iii) LPG/Natural gas passenger cars use 10% more energy per car (due to longer travel distances).

For hybrid cars, the market development is recent and has induced a very small market share (less than 0.1% in 2007). For other alternative fuels sells are negligible (e.g. electric vehicles) or any (e.g. fuel cell vehicles).

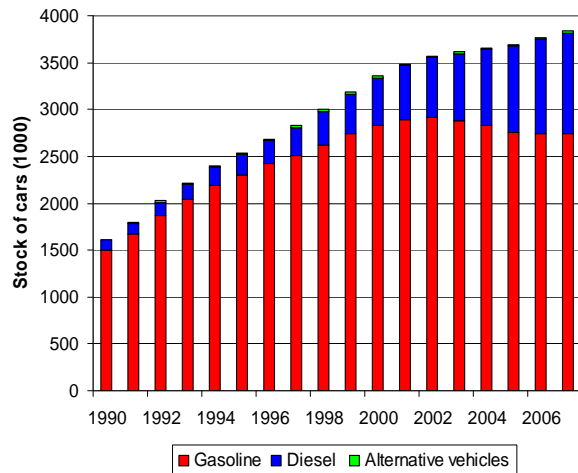


Figure 3. Development of car stock in passenger transport in Portugal by fuel 1990 – 2007

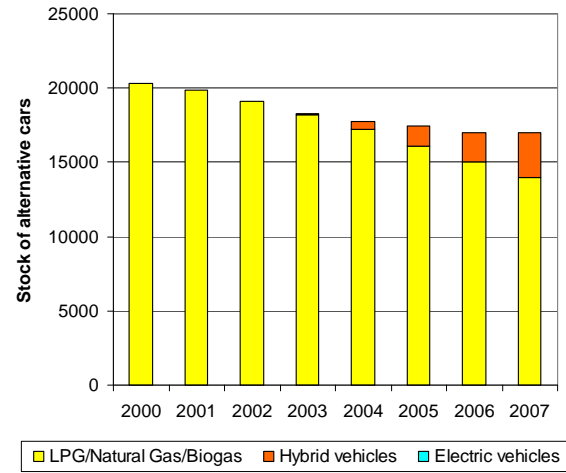


Figure 4. Development of stock of alternative vehicles for passenger transport in Portugal by category 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Portugal are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Portugal

VAT:	There is a VAT of 20% on all types of fuels and vehicles
Fuel excise tax:	Since January 2007: Gasoline 0.583 EUR/litre, Diesel 0.364 EUR/litre, LPG: 0.054 EUR/litre. Natural gas and biofuels are exempted from excise tax.
Vehicle taxation:	Since 2007, the policy for car taxation is to transfer tax burden from tax on acquisition (ISV- Imposto sobre Veículos) to the annual tax on ownership (IUC- Imposto Único de Circulação). ISV and IUC tax are calculated from two parts: cylinder capacity part and a CO ₂ -related one. The CO ₂ -part of ISV tax differs for diesel and non-diesel cars (LPG, NG and hybrid gasoline vehicles) and is based on CO ₂ emissions. LPG, NG and hybrid vehicles enjoy 50% ISV tax reduction. Electric vehicles are exempted from the IUC tax. For old passenger cars (until 2007), tax remains based on cylinder (or electric power) capacity. Since 2009, an income tax reduction of 30% up to €796 is provided as an incentive for purchasing electric vehicles or passenger cars using exclusively RES as fuel.
Subsidy:	Subsidies are only available for car abatement. The subvention was limited to the purchase of new cars with CO ₂ emissions lower than 140 g/km.
Quota:	A quota exists for biofuels: Portuguese national indicative target is to reach a 10% incorporation of biofuels in transport sector by 2010.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

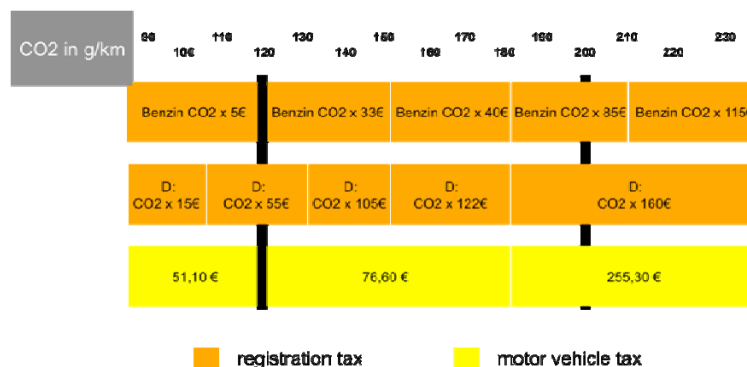


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Portugal in 2008

References

ACAP, 2009. Associação Automóvel de Portugal (Portuguese car association): <http://www.acap.pt/>
 Decree-Law n° 62/2006 of March 21. Adoption of the Directive n° 2003/30/EC on biofuels.
 Decree-Law n.° 66/2006, date 22 March on tax exemptions for biofuels.
 ODYSSEE-Database 2009: <http://www.odyssee-indicators.org/>
 DGEG – Directorate-General for Energy and Geology. <http://www.dgge.pt/>

ROMANIA

1. Energy consumption of passenger cars – conventional and alternative fuels

Beside one considerable exemption, the total energy consumption of passenger transport in Romania has grown continuously from about 30 PJ in 1992 to 65 PJ in 2006. As depicted in Figure 1, we can see a break in the continuous increase of the consumption in 1998. We can assume that this break is not a real fact, rather than a change in the measuring method.

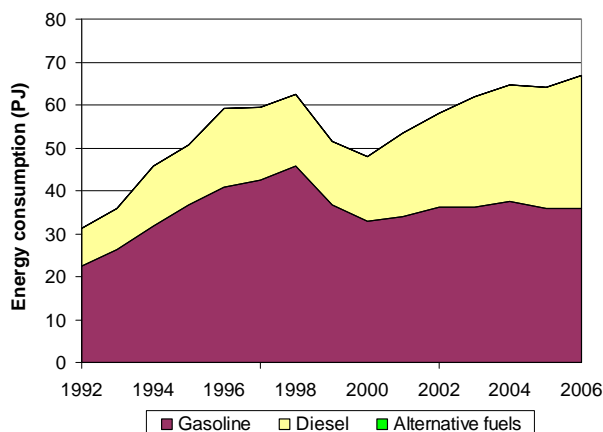


Figure 1. Development of energy consumption in passenger transport in Romania by fuel 1992 – 2006

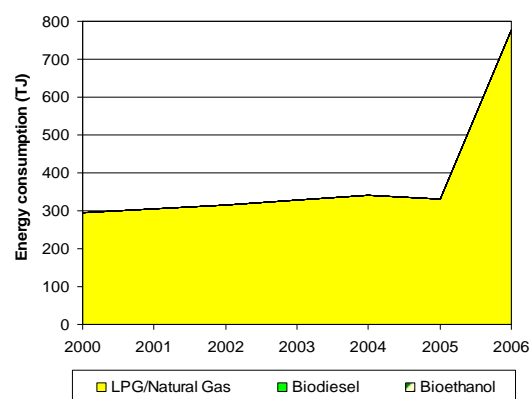


Figure 2. Development of energy consumption from alternative fuels in passenger transport in Romania by fuel 2000 – 2006

2. Production and consumption of biofuels

The production and use of liquid biofuels in Romania started only in recent years. In principle, there is only a very fragmentary database about the penetration of biofuels in Romania. For 2008 figures of 2392 TJ for biodiesel production and 2521 TJ for biodiesel consumption are reported by international statistics.

Table 1: Total production and total consumption of biofuels in Romania in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	2392	0	2521
Bioethanol	0	0	0	0
Total	0	2392	0	2521

3. Development of car stock with special focus on alternative powertrains

The total stock of cars in Romania increased continuously from 1.6 millions in 1992 to 3.6 millions in 2006, see Figure 3. The most important alternative vehicles for passenger transport in Romania are LPG vehicles. However, as shown in Figure 4 there is decreasing trend in their quantity.

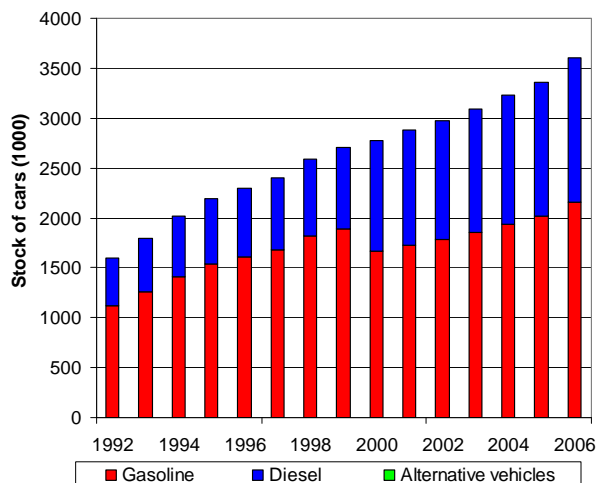


Figure 3. Development of car stock in passenger transport in Romania by fuel 1992 – 2006

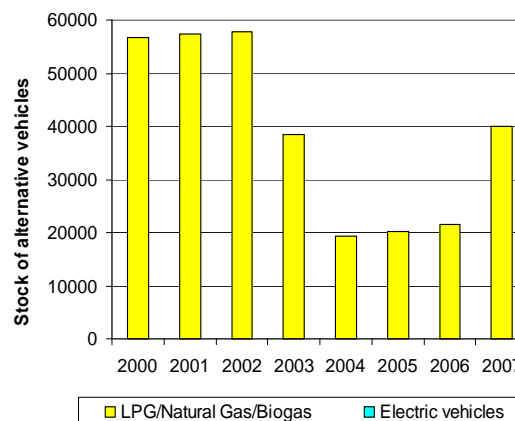


Figure 4. Development of stock of alternative vehicles for passenger transport in Romania by category, 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Romania are documented in Table 2.

Table 2: Policies for car passenger transport in Romania

VAT:	There is a VAT of 19% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax of 0.336 EUR/litre Diesel: excise tax of 0.284 EUR/litre Natural gas: excise tax of 0.275 EUR/m ³ Biofuels are almost fully exempted from the excise tax (tax reduction of approximately 95%).
Registration tax:	The special pollution tax (registration tax) is based on CO ₂ emissions, cylinder capacity and compliance with Euro emission standards. In response to the current crisis, new cars registered between 15.12.2008 and 31.12.2009 are exempt from this tax if their engine capacity is below 2000 cc and they meet Euro 4 and 5 standards or if they are hybrid cars.
Subsidy:	N.A.
Quota:	N.A.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
EUROSERVER Biofuel reports 2004,2005,2006,2007
European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

SLOVAKIA

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption for car passenger transport in Slovakia increased from 22 PJ in 1993 to an historical peak of 36 PJ in 2002. Afterwards there was a slight decrease to 32 PJ in 2007. Whereas in absolute terms, diesel has only a small growth rate, gasoline consumption increased remarkable till 2002. No use of alternative fuels in car passenger transport has been reported so far.

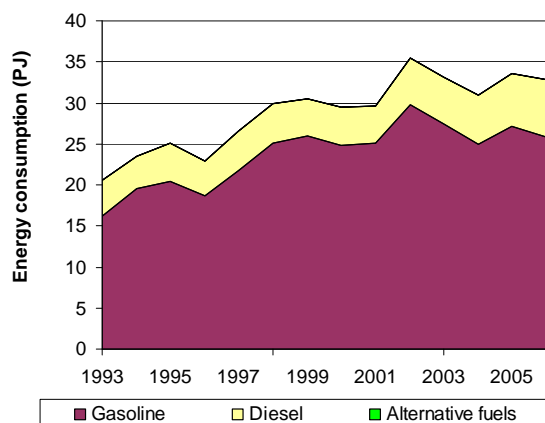


Figure 1. Development of energy consumption in passenger transport in Slovakia by fuel 1993 – 2006

No use of alternative fuels in car passenger transport has been reported so far

Figure 2. Development of energy consumption from alternative fuels in passenger transport in Slovakia

2. Production and consumption of biofuels

The production and use of liquid biofuels in Slovakia started only in recent years. For 2008 figures of 5373 TJ for biodiesel production and 2222 TJ for biodiesel consumption are reported by international statistics. It is of interest that Slovakia produced by far more biodiesel than it consumed.

Table 1: Total production and total consumption of biofuels in Slovakia in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	5373	74	2222
Bioethanol	0	2000	0	0
Total	0	7373	74	2222

3. Development of car stock with special focus on alternative powertrains

Total passenger vehicles stock in Slovakia has increased from 0.88 millions in 1990 to 1.43 millions in 2007, see Figure 3. After 2003 there was a small break in the stock of cars, which can be assumed to be a change in the measurement method. With respect to alternative vehicles Figure 4 shows that there was a continuously increasing trend of LPG vehicles.

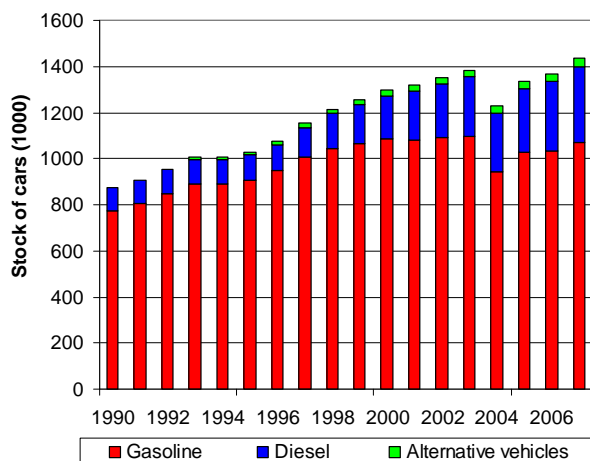


Figure 3. Development of car stock in passenger transport in Slovakia by fuel 1990 – 2007

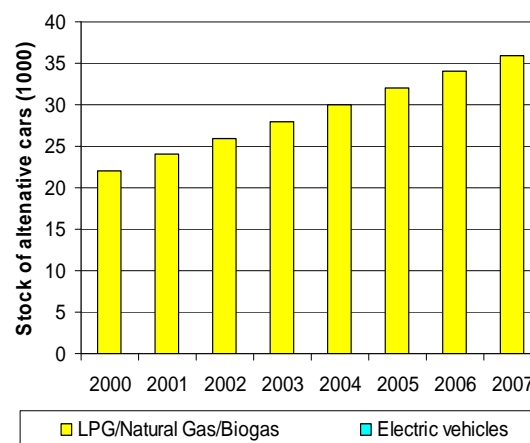


Figure 4. Development of stock of alternative vehicles for passenger transport in Slovakia by category, 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Slovakia are documented in Table 2.

Table 2: Policies for car passenger transport in Slovakia

VAT:	There is a VAT of 19% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax of 0.515 EUR/litre Diesel: excise tax of 0.481 EUR/litre
Registration tax:	Most vehicles (including automobiles, trucks and buses) used for business purposes in Slovakia are subject to road tax. The amount of the tax depends on the type of vehicle. The base for passenger cars is the cylinder volume, and varies from SKK 1,600 to SKK 5,600.
Subsidy:	N.A.
Quota:	N.A.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
 EUROSERVER Biofuel reports 2004,2005,2006,2007
 European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
 European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

SLOVENIA

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption of car passenger transport in Slovenia has grown continuously from 26 PJ in 1994 to 36 PJ in 2007, see Table 1. After 2000 the amount of gasoline decreased slightly, whereas the amount of diesel grew. Since 2005 we can observe an increase of biodiesel consumption, see Figure 2.

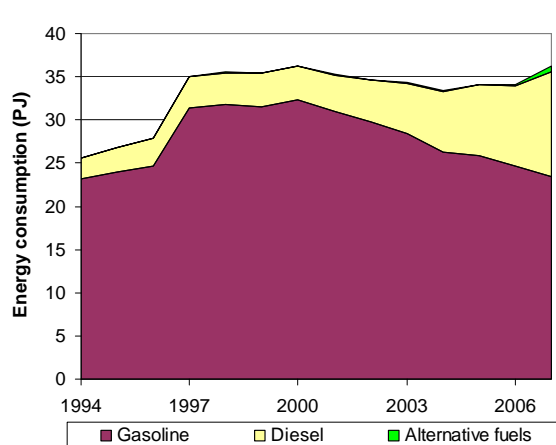


Figure 1. Development of energy consumption in car passenger transport in Slovenia by fuel 1994 – 2007

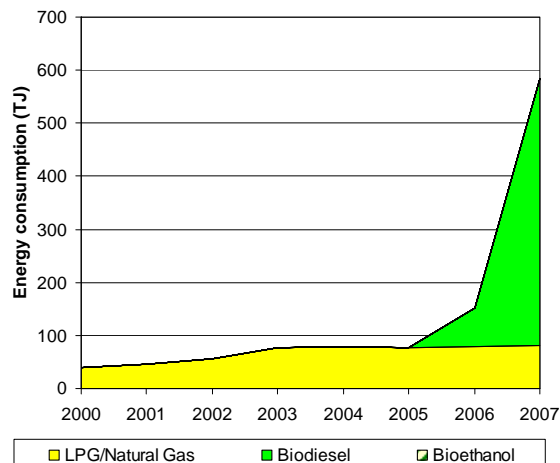


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Slovenia by fuel 2000 – 2007

2. Production and consumption of biofuels

The use of biodiesel increased in the period from 2003 to 2008, reaching a level of 932 TJ in 2008. Also the production of biodiesel has grown to 331 TJ in 2008. Currently there is bioethanol use and consumption in Slovenia.

Table 1: Total production and total consumption of biofuels in Slovenia in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	0	331	0	932
Bioethanol	0	0	0	0
Total	0	331	0	932

3. Development of car stock with special focus on alternative powertrains

Passenger vehicle stock in Slovenia has grown from about 0.6 millions cars in 1990 to more than 1 million cars in 2007, see Figure 3. Diesel cars increased their market share continuously and represent currently more than 25 % of the vehicle stock.

Regarding the development of alternative car types in recent years gas driven cars have increased to about 2300 in 2007.

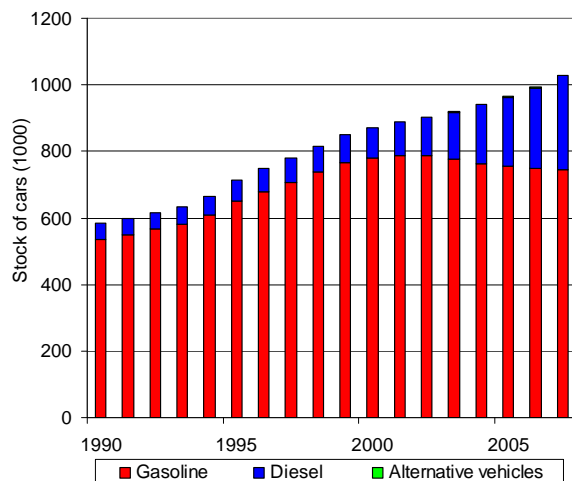


Figure 3. Development of car stock in passenger transport in Slovenia by fuel 1990 – 2007

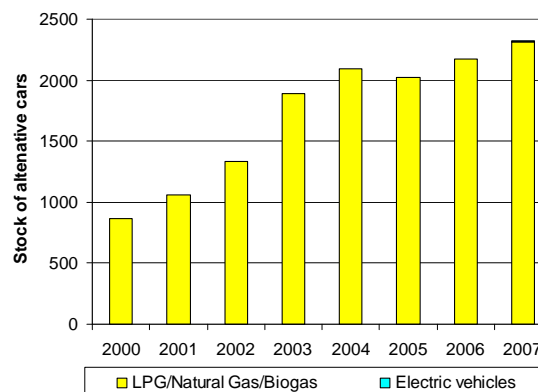


Figure 4. Development of stock of alternative vehicles for passenger transport in Slovenia by category, 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in Slovenia are documented in Table 2.

Table 2: Policies for car passenger transport in Slovenia

VAT:	There is a VAT of 20% on all types of fuels and vehicles
Fuel excise tax:	Gasoline: excise tax is 0.403 EUR/litre Diesel: excise tax of 0.383 EUR/litre Biofuels sold in pure form have been completely exempt from excise taxes since December 2003. Those sold in blends are subject to excise taxes, but may apply for a 25% rebate.
Registration tax:	Based on price (1% –13%)
Subsidy:	N.A.
Quota:	A law requiring producers and retailers to supply a certain percentage of the market share as biofuels is planned. It will help meet a target of 1% penetration by 2010. Fuel excise duty increased by over 60 percent between 1999 and 2002.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

5. References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
 EUROSERVER Biofuel reports 2004,2005,2006,2007
 European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
 European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

SPAIN

1. Energy consumption of passenger cars – conventional and alternative fuels

Beside two small exemptions – between 1988 and 1995 – total energy consumption in car passenger transport in Spain, has grown continuously from 220 PJ 1980 to 520 PJ in 2007. As it is depicted in Figure 1, by 1995 the amount of gasoline starts to decrease slightly, whereas the amount of diesel strongly grew. The consumption of alternative fuels has grown continuously since 2004, see Figure 2. The major amount of consumption of alternative fuels is being held by LPG. This part remains to stay approximately constant over the period of 2000 till 2006. In 2004 we can observe an increase of liquid biofuels, as well as a smooth decline of LPG.

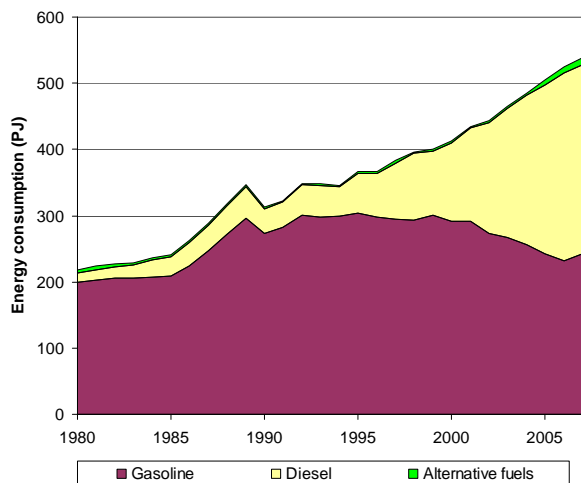


Figure 1. Development of energy consumption in passenger transport in Spain by fuel 1980 – 2007

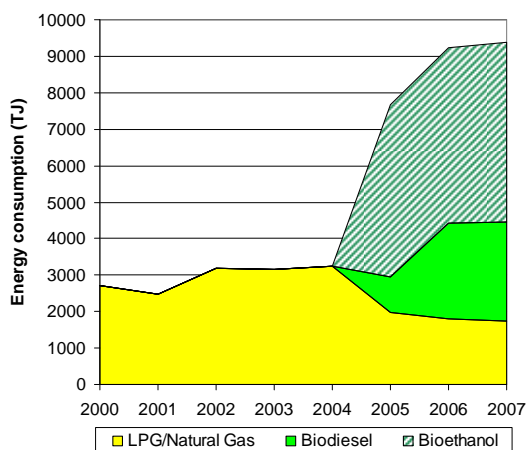


Figure 2. Development of energy consumption from alternative fuels in passenger transport in Spain by fuel 2000 – 2006

2. Production and consumption of biofuels

The production and use of liquid biofuels in Spain started in about 2000 and has increased considerably in recent years. For 2008 figures of 7618 TJ for biodiesel production, 6745 for Bioethanol production and 21730 TJ for biodiesel consumption as well as 4730 TJ for Bioethanol consumption are reported by international statistics.

Table 1: Total production and total consumption of biofuels in Spain in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	221	7618	3790	21730
Bioethanol	4277	6745	4	4730
Total	4498	14363	3795	26460

3. Development of car stock with special focus on alternative powertrains

As shown in Figure 3 the passenger vehicles total stock in Spain has increased from 6.83 millions in 1980 to 16.3 millions in 2007. Whereas the stock of alternative vehicles is very small, the penetration of gasoline cars starts to decline in 2000. There are no reliable data available about the registrations of alternative vehicles in Spain.

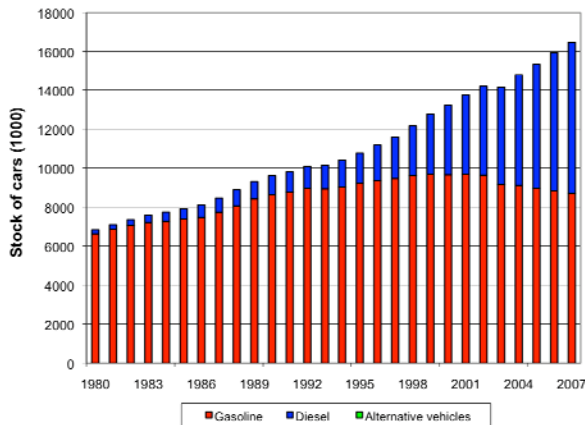


Figure 3. Development of car stock in passenger transport in Spain by fuel 1980 – 2007

No reliable data on use of alternative vehicles in car passenger transport in Spain has been documented so far

Figure 4. Development of stock of alternative vehicles for passenger transport in Spain

4. Energy policies for car passenger transport

National policies for car passenger transport in Spain are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Spain

VAT:	There is a VAT of 16% on all types of all fuels
Fuel excise tax:	Gasoline: excise tax of 0.360 EUR/litre since 2002 (prices rose continuously between 1986 to 2002). Diesel: excise tax of 0.302 EUR/litre since 2007 (it was 0.294 EUR/litre between 2002 and 2007). Natural gas is exempted from excise tax. Electricity is taxed with 4.864% (special tax) and 6% (turnover tax).
Registration tax:	The registration tax is based on CO ₂ emissions. Rates vary from 0% (up to 120 g/km) to 14.75% (200 g/km and more) (see Fig.3). Purchasers of new cars emitting maximum 140 g/km and costing maximum € 30,000 can obtain an interest-free loan up to €10,000 EUR if they have a car that is 10 years old or more (or has a mileage exceeding 250,000 km) scrapped simultaneously.
Subsidy:	N.A.
Quota:	N.A.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

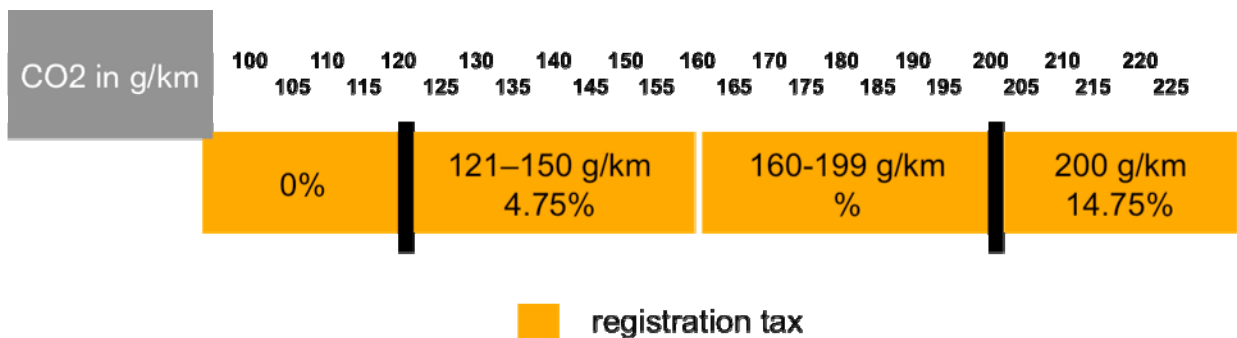


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Spain in 2008

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
 EUROSERVER Biofuel reports 2004,2005,2006,2007
 European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
 European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

SWEDEN

1. Energy consumption of passenger cars – conventional and alternative fuels

Since 1970 total energy consumption for passenger road transport has grown from roughly 100 PJ to about 180 PJ in 2007, see Figure 1. The highest growth rates were in the early 1970s, late 1980s and the first years of the new millennium. It is also interesting to note that total energy consumption has levelled off in the last 3 – 4 years, mainly due to more energy efficient cars. During the same period use of gasoline has decreased, while the market share of diesel and alternative fuels, mainly bioethanol, has increased.

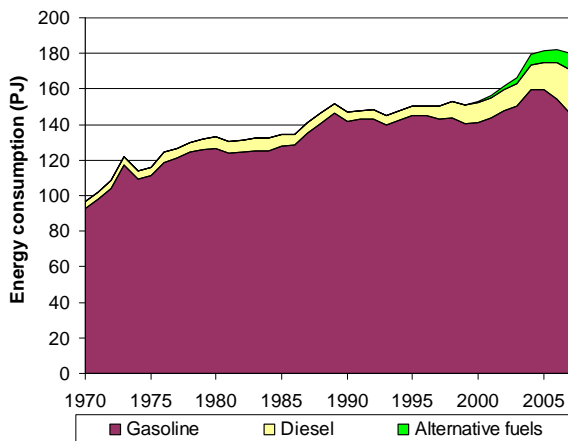


Figure 1. Development of energy consumption in car passenger transport in Sweden by fuel 1970 – 2007

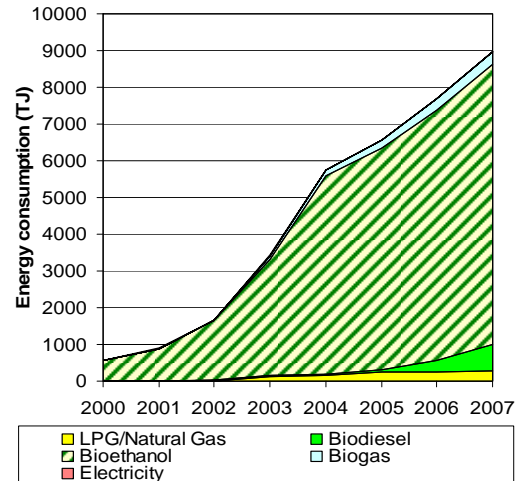


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in Sweden by fuel 2000 – 2007

2. Production and consumption of biofuels

Over the last decade the use of alternative fuels has increased constantly with ethanol as the main fuel option. Total use of alternative fuels in 2007 were roughly 9 000 TJ, 85% out of that being ethanol, see Figure 2. However, total contribution of alternative fuels in car passenger transport in Sweden was only about 5% in 2007.

Table 1. Total production and total consumption of biofuels in Sweden in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	37	3635	147	5438
Bioethanol	1445	1734	2744	9449
Total	1482	5369	2891	14887

3. Development of car stock with special focus on alternative powertrains

Since 1970 the passenger car stock in Sweden has grown from about 2.3 millions cars to about 4.3 million cars in 2008, see Figure 3. Gasoline cars are totally dominant on the Swedish market, making up 86% of the stock in 2008. However, cars run on diesel shows a strong up-going trend for the last couple of years. The same trend is also seen for Flex-Fuel-Vehicles (FFVs), see Figure 4. In 2008, 21% of new registered cars were FFVs and FFVs do now make up 4.5% of the total stock. However, since the FFVs can be fuelled with either E85 or gasoline, the actual fuel use is to a large extent dependent on the price at the fuel station.

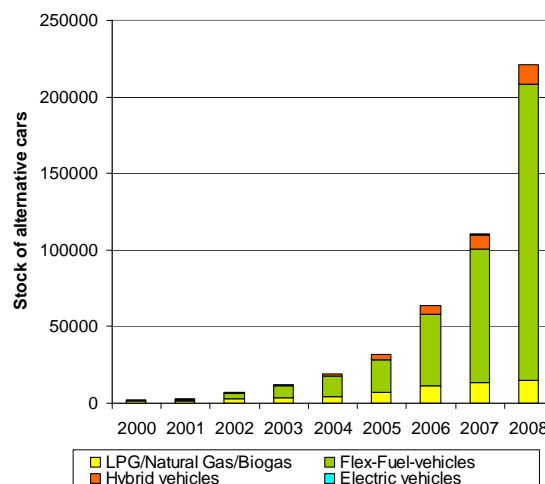
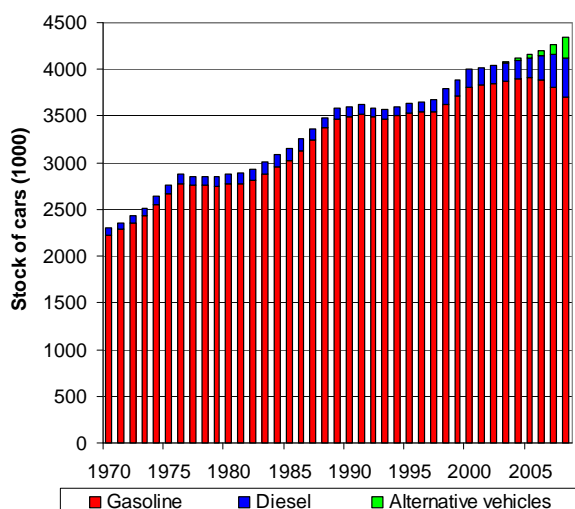


Figure 3. Development of car stock in car passenger transport in Sweden by fuel 1970 – 2008

Figure 4. Development of stock of alternative vehicles for car passenger transport in Sweden by category 2000 – 2008

4. Energy policies for car passenger transport

National policies for car passenger transport in Sweden are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in Sweden

VAT:	There is a VAT of 25% on all types of fuels and additional energy- and CO ₂ -taxes
Fuel excise tax:	Gasoline: Excise tax of 0.568 EUR/litre Diesel: Excise tax of 0.446 EUR/litre In addition to the VAT there are energy and CO ₂ taxes on all fossil fuels, the levels vary and have been changed once a year the last couple of years. Biofuels are exempt from both energy and CO ₂ taxes.
Registration tax:	None
Subsidy:	Local subsidies are available for eco-friendly vehicles, i.e. vehicles running on alternative fuels and/or has very low CO ₂ emissions. In many municipalities these cars have free or subsidised parking.
Quota:	Almost all gasoline sold in Sweden include 5% ethanol, which is a result from the biofuel tax exemption. During 2009 10% blending became legal and by the end of 2009 there was 7% ethanol blended in gasoline.
Standards:	Up to 2008 no standards existed for any type of car
Other:	Customers buying a new eco-friendly car for private use receive 10,000 SEK in a governmental cash payback. This offer was valid between 1 April 2007 and 30 June 2009.

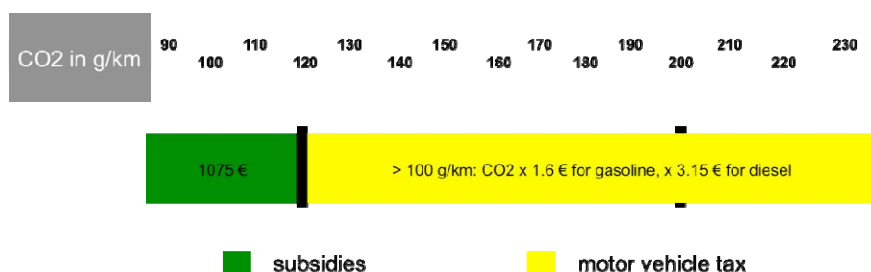


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in Sweden in 2008

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
 EUROBSERVER Biofuel reports 2004,2005,2006,2007
 European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
 European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>
<http://www.regeringen.se/sb/d/8093/a/74480>

UNITED KINGDOM

1. Energy consumption of passenger cars – conventional and alternative fuels

The total energy consumption of passenger transport in UK has grown continuously from 575 PJ in 1990 to about 1000 PJ in 1992. After that the consumption remains to stay constant. As it is depicted in Figure 1, by 1995 the amount of gasoline starts to decrease slightly, whereas the amount of diesel grows smoothly after 1992.

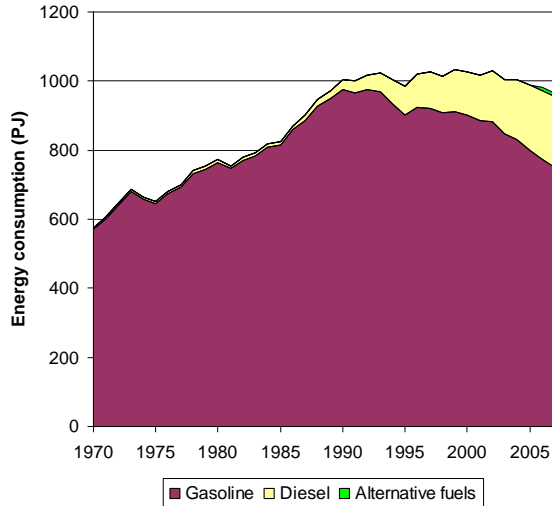


Figure 1. Development of energy consumption in car passenger transport in the UK by fuel 1980 – 2007

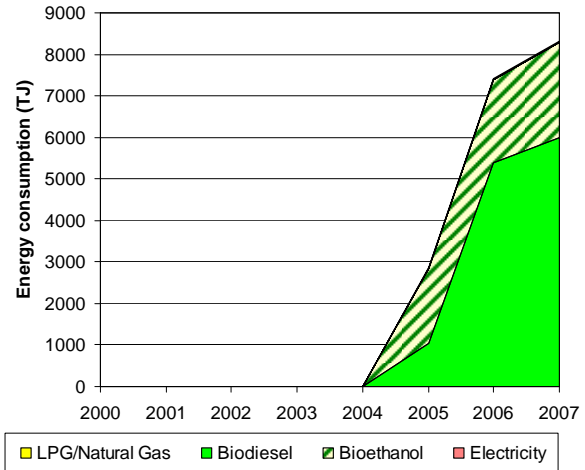


Figure 2. Development of energy consumption from alternative fuels in car passenger transport in the UK by fuel 2000 – 2007

2. Production and consumption of biofuels

Table 1 shows the consumption of biofuels in 2003 and 2008. We can observe a significant growth of biodiesel.

Table 1. Total production and total consumption of biofuels in UK in 2003 and 2008 (TJ)

	<i>Biofuel production</i>		<i>Biofuel consumption</i>	
	<i>2003</i>	<i>2008</i>	<i>2003</i>	<i>2008</i>
Biodiesel	331	7066	589	28945
Bioethanol	0	1667	0	4447
Total	331	8733	589	33392

3. Development of car stock with special focus on alternative powertrains

The passenger vehicles stock in UK has increased from 10 millions in 1970 to 27 millions in 2007. Whereas the stock of alternative vehicles and diesel cars grows continuously, the penetration of gasoline cars stayed nearly constant since about 1990. In 2007 there was a stock of about 3200 electric cars in the UK.

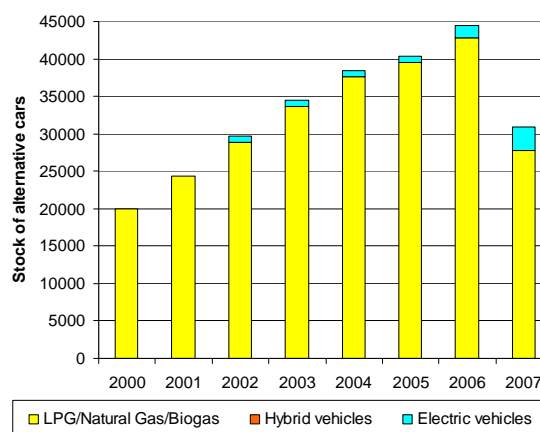
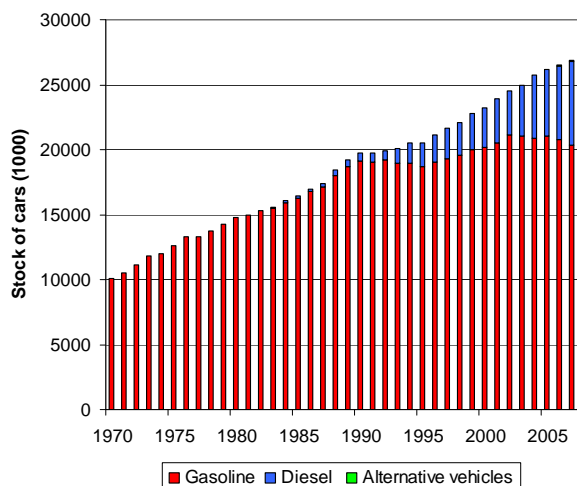


Figure 3. Development of car stock in car passenger transport in the UK by fuel 1970 – 2007

Figure 4. Development of stock of alternative vehicles for car passenger transport in the UK by category, 2000 – 2007

4. Energy policies for car passenger transport

National policies for car passenger transport in the UK are documented in Table 2 and Figure 5.

Table 2. Policies for car passenger transport in the UK

VAT:	There is a VAT of 17.5% on gasoline, 5% on automotive diesel and hydrogen
Fuel excise tax:	Gasoline: excise tax of 0.661 EUR/litre Diesel: excise tax of 0.661 EUR/litre
Registration tax:	None
Subsidy:	N.A.
Quota:	In force since April 2008, the Renewable Transport Fuels Obligation (RTFO) places an obligation on fuel suppliers to ensure a 2.5% (2008), 3.75% (2009) and 5%vol (2010) inclusion of renewable fuels in all fuels and to publicly report on the carbon savings and sustainable production of biofuels supplied. Non-complying suppliers will pay a penalty.
Standards:	Up to 2008 no standards existed for any type of car
Other:	No

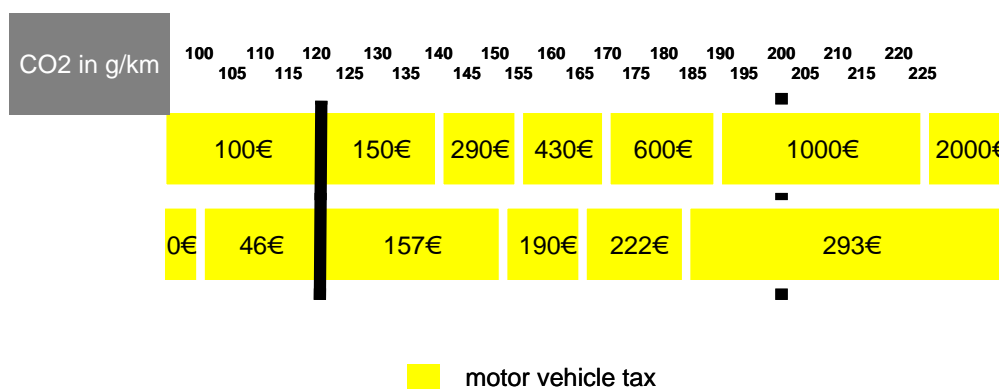


Figure 5. CO₂-dependent subsidies/taxes for passenger vehicles in the UK in 2008 (gasoline, diesel vs. alternative fuels)

References

ODYSEE-Database 2009: <http://www.odyssee-indicators.org/>
 EUROSERVER Biofuel reports 2004,2005,2006,2007
 European Biodiesel Board EBB: <http://www.ebb-eu.org/stats.php>
 European Bioethanol Fuel Association EBIO: <http://www.ebio.org/>

IV. APPENDIX: IMPORTANT CONVERSION FACTORS USED**Energy:**

1 litre gasoline = 8.94 kWh = 32.18 MJ

1 litre diesel = 9.98 kWh = 35.91 MJ

1 litre LPG = 7.03 kWh = 25.30 MJ

1 litre bioethanol = 7.78 kWh = 28.01 MJ

1 litre biodiesel = 10.22 kWh = 36.79 MJ

CO₂ emissions:

1 litre gasoline = 2.36 kg CO₂

1 litre diesel = 2.63 kg CO₂

1 litre LPG = 1.66 kg CO₂

1 litre bioethanol = 1.52 kg CO₂

1 litre biodiesel = 2.50 kg CO₂

