CENTRAL EUROPEAN REVIEW
OF ECONOMICS & FINANCE
Vol. 2, No. 1 (2012) pp. 63-96

Tadeusz Dyr*

EUROPEAN TRANSPORT POLICY AND STRATEGY FOR SUSTAINABLE DEVELOPMENT

Abstract

Sustainable development is the overarching long-term goal of the EU. In realizing its the European transport policy is playing the important part. The paper presents meaning of the transport policy in implementing the idea of sustainable development as well as the instru-ments favoring sustainable development.

JEL classification code: O18 , O20

Keywords: sustainable development, transport policy, transport market, external cost, transport safety, value of life.

Introduction

The first European Union strategy concerning sustainable development was adopted at the Council of Europe meeting in Göteborg in 2001. The strategy cited conclusions of the 1987 Brundtland Commission. Sustainable development was defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (COM (2001) 264). Agreements reached by the Lisbon summit were cited to emphasise the need for an economic policy targeted at leading competitive status of the European Union worldwide while maintaining a balance between economic growth, social

* Prof., Ph.D., The Department of Economy, Kazimierz Pulaski University of Technology and Humanities in Radom, t.dyr@pr.radom.pl

cohesion, and environmental protection. Sustainable development should be the fundamental objective of sectoral policies, including the transport policy.

The recommendations in 2001 strategy of sustainable development were reflected by instruments of the European transport policy. The policy guidelines of the White Paper stressed that transport is a key factor in modern economies. But there is a permanent contradiction between society, which demands ever more mobility, and public opinion, which is becoming increasingly intolerant of chronic delays and the poor quality of some transport services. The transport system needs to be optimised to meet the demands of enlargement and sustainable development. A modern transport system must be sustainable from an economic and social as well as an environmental viewpoint (COM (2001) 370).

The aims of the 2001 European transport policy were formulated for the first decade of the 21st century. 2010 was the deadline for their achievement. Changes in the European Union transport system need to be analysed, therefore, with regard to their effect on sustainable development of the European Union. These issues are addressed in the present paper without discussing theoretical foundations of the transport policy, extensively presented in a range of publications (Grzywacz, Wojewódzka-Król, Rydzkowski, 2002).

1. European transport policy and its instruments determining sustainable development

Implementation of a common transport policy was envisaged in Article 74 of the 1957 Rome Treaty. It was only the 1990s, however, which brought concrete European transport policy solutions. The White Paper on transport policy (COM (1992) 494 final), adopted in 1992, provided for an integrated approach to transport, stressing the need for clear principles of an open, competitive, and non-discriminating market. That spelled an end to domination of transport markets by entities established by public authorities and protected from competition by the public nature of their aims (Dyr, 2009).

The 2001 European transport policy made clear references to the earlier European Union strategy for sustainable development. That strategy proposed actions intended to:

- decouple transport growth significantly from growth in Gross Domestic Product in order to reduce congestion and other negative side-effects of transport,
- bring about a shift in transport use from road to rail, water and public passenger transport so that the share of road transport in 2010 is no greater than in 1998 (the most recent year for which data are available) (COM (2001) 26).

The instruments of realisation of the European Union transport sector goals, defined in the same strategy, included internalisation of transport's external costs, development of intelligent transport systems, prioritising of financing for invest-

ment into public transport and environment-friendly branches of transport (reducing public expenditure on investments into road transport), improvement of public transport service range by opening the market and integration of transport systems.

The 2001 White Paper detailed goals and instruments of the strategy for sustainable development of the European Union by presenting a variety of transport development scenarios. The recommended scenario comprises a series of measures ranging from pricing to revitalising modes of transport alternative to road and targeted investment in the trans-European network. This integrated approach would allow the market shares of the other modes to return to their 1998 levels and thus make for a shift of balance from 2010 onwards (COM (2001) 370). Some 60 specific measures to be taken at the Community level were proposed to implement the recommended approach to creation of a European Union transport system. These include:

- revitalising the railways,
- improving quality in the road transport sector,
- promoting transport by sea and inland waterway,
- striking a balance between growth in air transport and the environment,
- turning intermodality into reality,
- building the trans-European transport network,
- improving road safety,
- adopting a policy on effective charging for transport,
- recognising the rights and obligations of users,
- developing high-quality urban transport,
- putting research and technology at the service of clean, efficient transport,
- managing the effects of globalisation (COM (2001) 370).

The goals and instruments of the European transport policy, based on the 2001 strategy for sustainable development, were reaffirmed in 'Renewed EU sustainable development strategy'. The document stated the principal objective of sustainable transport was to ensure that our transport systems meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment. That objective governed the following:

- decoupling economic growth and the demand for transport with the aim of reducing environmental impacts,
- achieving sustainable levels of transport energy use and reducing transport greenhouse gas emissions,
- reducing pollutant emissions from transport to levels that minimise effects on human health and/or the environment,
- achieving a balanced shift towards environment friendly transport modes to bring about a sustainable transport and mobility system,
- reducing transport noise both at source and through mitigation measures to ensure overall exposure levels minimise impacts on health,

– modernising the EU framework for public passenger transport services to encourage better efficiency and performance by 2010,
– in line with the EU strategy on CO_2 emissions from light duty vehicles, the average new car fleet should achieve CO_2 emissions of 140 g/km (2008/09) and 120 g/km (2012),
– halving road transport deaths by 2010 compared to 2000 (DOC 10917/06).

In consideration of the formulated goals of the strategy for sustainable development of the European Union and the resultant instruments of the European transport policy, a number of legislative initiatives were taken in the first decade of the 21st century. They markedly increased the extent of regulation of the transport market and sectors affecting its operation. In consequence, they led to significant shifts in the European transport system. The subsequent parts of this paper will attempt to determine the degree to which they contributed to achievement of sustainable development objectives.

2. Changing demand for transport services

Separation of economic growth from demand for transportation services is an essential goal of the European transport policy, rooted in the strategy for sustainable development of the European Union. Statistics collected by EUROSTAT indicate there is a high correlation between these two areas. The correlation coefficient between GDP changes in EU-27 and passenger transport in 1995-2009 is 0.99 and between GDP and freight transport is 0.96. The change trends in transport volumes and GDP in UE-27 are outlined in Figure 1.

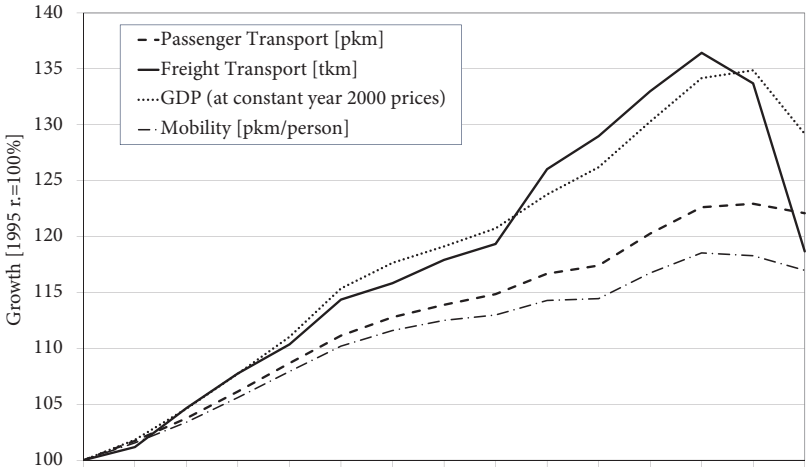


Fig. 1. Dependence between the dynamics of GDP changes, freight and passenger transport in EU-27

Source: Own study on the basis of EUROSTAT data.

Till 2008, GDP growth had been associated with increasing passenger and freight transport. The average GDP growth in EU-27 ranged around 2.33% in 1995-2008. In the same period, the volume of freight transport rose by 2.26%, of the passenger transport 1.6%, and mobility by 1.3% on average.

Approval of the White Paper in 2001, which comprised instruments for decoupling economic growth and the demand for transport, did not affect those trends. In 2001-2008, GDP growth in EU-27 averaged 1.97%. In the same period, the volume of freight transport rose by 2.07%, of the passenger transport 1.24%, and mobility by 0.83% on average.

The dependence between economic growth and the demand for transport can also be observed in the initial period of the crisis. GDP fall in 2009 is accompanied by a drop in demand for both freight and passenger transport services.

These dependences between GDP variation and the demand for transport are similar in all the EU member states including those in Central Europe (Table 1). The relatively high economic growth in Poland, despite the adverse trends in other EU member states, is reflected in systematic increases of freight and passenger transport.

Statistics do confirm a very high correlation between GDP changes and freight and passenger transport in most Central European countries. In the circumstances, the decoupling of economic growth and the demand for transport envisaged in the strategy for sustainable development is not very likely. Transport is an essential factor in realisation of fundamental European Union freedoms, that is, freedom of movement, of working and studying, as well as free movements of foods and services. Considering these freedoms and the expected trends towards closer cooperation with the European Union neighbouring regions, demand for transport services should be expected to rise.

In the long term, lower dynamics of demand for transport can be associated with the expected adverse demographic trends which will have negative impact on economic growth. The total population of EU-25 will fall slightly, but will become much older. In economic terms, the main change will involve the size of the working-age population (15-64 years), which will decrease by 48 million between now and 2050. The dependency ratio (the number of people aged 65 years and above relative to those aged from 15 to 64) is set to double and reach 51% by 2050, which means that the EU will change from having four to only two persons of working age for each citizen aged 65 and above (COM(2006) 571). The anticipated demographic structure in Poland is equally poor. The population of this country is expected to diminish to approx. 31.1m, or by 18%, till 2060. At the same time, the post-working age population will climb by 119% compared to the European Union average of 79%. The working-age population will also systematically decrease. These forecasts suggest that the active population will reduce by 40% in Poland and by 15% in the EU until 2060 (SEC(2008) 2911).

Table. 1. Dependence between the dynamics of GDP changes, freight and passenger transport in the EU and Central European countries

	Period			
	1995-2008	2001-2008	2007-2008	2007-2009
GDP				
EU-27	2.32	2.00	0.5	-1.90
Poland	4.66	4.61	5.1	3.35
Estonia	6.74	6.21	-3.7	-9.00
Latvia	6.52	7.33	-3.3	-10.50
Lithuania	7.00	7.54	2.9	-5.95
Slovak Republic	5.12	6.56	5.9	0.50
Czech Republic	3.51	4.74	3.1	-0.80
Freight Transport				
EU-27	2.22	2.45	-1.99	-5.30
Poland	3.38	6.52	4.17	5.43
Estonia	6.84	10.76	10.55	1.95
Latvia	5.83	9.13	3.56	-8.27
Lithuania	4.81	9.73	0.96	-0.40
Slovak Republic	9.37	5.32	4.04	-1.23
Czech Republic	6.96	1.23	3.56	-3.97
Passenger Transport [pkm]				
EU-27	1.51	1.14	0.59	0.28
Poland	4.82	6.03	11.68	6.86
Estonia	4.28	4.86	2.09	1.18
Latvia	4.98	4.45	4.29	-0.79
Lithuania	5.33	5.18	-3.10	-4.70
Slovak Republic	-0.12	0.02	-1.88	-3.92
Czech Republic	1.27	1.17	2.00	0.70

Source: Own study on the basis of EUROSTAT data.

Table. 2. Pearson's correlation coefficient between GDP and volumes of freight and passenger transport in the EU and Central European countries

	Freight Transport [tkm]	Passenger Transport [pkm]	Mobility [pkm/person]
EU-27	0.92	0.99	0.99
Poland	0.73	0.96	0.97
Estonia	0.79	0.95	0.96
Latvia	0.88	0.94	0.95
Lithuania	0.78	0.98	0.98
Slovak Republic	0.89	0.00	-0.07
Czech Republic	0.73	0.95	0.93

Source: Own study on the basis of EUROSTAT data.

Labour force mobility within the European Union should become a major factor counteracting these adverse demographic trends. Meanwhile, the mobility is relatively weak. A mere 2% of working-age citizens are estimated to live and work in another member state (COM(2007) 773). The report emphasises the degree of mobility has gradually been rising in recent years. The number of mobile workers in EU-15 countries increased from 470 000 in 2000 to around 610 000 in 2005. In addition, numbers of seasonal workers who cross borders (including holiday jobs for young people) can substantially boost the percentage of migrant workers in the EU, although they are usually not included in national data.

The issue of workforce mobility in the European Union has been the subject of public opinion research projects (the so-called EUROBAROMETER). 2005 research suggests Poland is among the countries of relatively high level of stated intentions of worker mobility (Fig. 2).

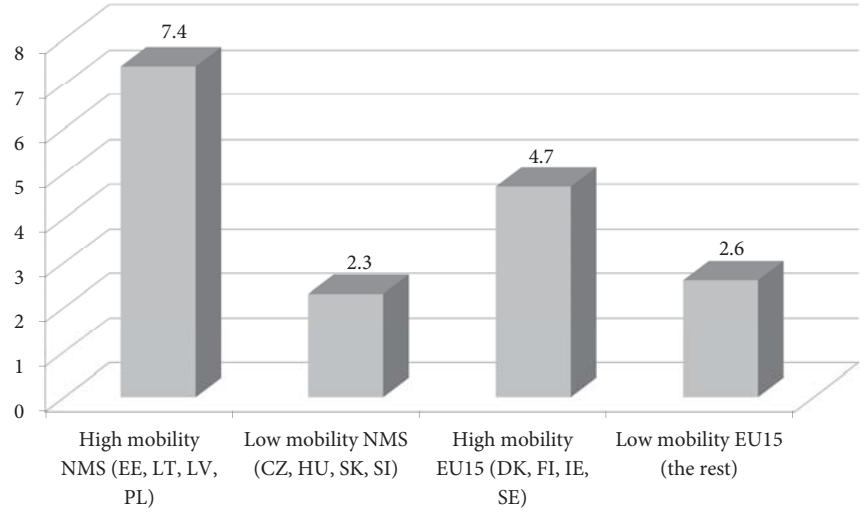


Fig. 2. Intention to move country in the next five years [%]

Source: Long-distance mobility in Europe (2006).

Closer trade relations with the Mediterranean and East European countries will be an important factor influencing growth of freight and passenger transport. Russia and Turkey will become 'foci' of trade flows from the EU. North Africa will also become a major trade direction. Trade turnover between EU member states and countries neighbouring the European Union is expected to rise from 580m ton in 2000 to more than 1.1 bn ton of cargo in 2020 (Table 3). This will have substantial effect on growing demand for freight transportation. The greater trade turnover will generate demand for passenger transport.

Table. 3. Trade exchange between EU member states and neighbouring countries of the European Union ['000s ton p.a.]

EUN	Total imports EUN from UE29			Total exports EUN to EU29		
	2000	2020		2000	2020	
		reference scenario	scenario 2		reference scenario	scenario 2
Albania	2 492	9 329	9 329	179	1 068	1 068
Russia	13 627	33 313	46 355	228 914	475 330	510 467
Ukraine	5 825	13 523	15 223	30 897	103 459	104 640
Belarus	1 919	4 544	5 890	4 981	10 312	11 815
FYROM	2 991	7 069	7 069	915	2 511	2 511
Bosnia & Herzegovina	1 363	3 538	3 538	603	1 389	1 389
Croatia	6 200	12 326	17 190	9 399	14 048	17 109
Serbia and Montenegro	4 090	9 427	11 833	1 357	2 742	4 082
Moldavia	849	2 068	2 233	705	1 114	1 409
Turkey	21 441	54 662	57 211	18 315	41 233	44 128
Rest Europe	6 973	15 785	15 785	1 376	2 308	2 308
Morocco	8 032	13 310	13 310	9 714	13 488	13 488
Algeria	7 238	12 809	12 809	54 522	67 892	67 892
Tunisia	7 303	11 704	11 704	4 613	5 829	5 829
Libya	4 391	6 769	6 769	60 739	65 220	65 220
Egypt	7 631	12 789	12 790	10 150	12 562	12 562
Syria	2 450	5 984	6 788	15 525	17 956	18 155
Lebanon	3 110	6 473	7 459	638	1 363	1 391
Israel	7 348	18 110	20 352	5 496	13 614	14 638
Georgia	589	208	335	843	836	915
Armenia	232	320	503	33	43	58
Azerbaijan	143	150	244	4 078	4 194	4 357
ALL EUN countries	**116 237**	**254 210**	**284 719**	**463 992**	**858 511**	**905 431**

EUN – countries neighbouring the European Union
EU29 = EU27 + Norway and Switzerland

Source: Own study on the basis NEA (2005).

Regional integration and expanding trade relations with countries neighbouring the European Union are inextricably linked with proceeding globalisation processes. This phenomenon involves ongoing reduction or elimination of barriers to the international exchange of goods, services, capital, ideas, and work force. This enhances the degree of integration between countries and regions in the global production system which has been a key characteristic of social and economic development of the last fifty years. The development is fostered by

cheap transport and rollout of communications systems. Although the political and economic crisis as well as delays with trade negotiations can temporarily hinder the process, the progress of communications and transport technologies and directions of economic development of many countries indicate the trend is set to continue.

Globalisation will have substantial impact on development of the transport system in the European Union and relations with the neighbouring regions. Foreign direct investment of EU businesses in third-party countries as well as location of manufacturing in countries of higher labour cost productivity are factors determining rising demand for freight and passenger transport.

In the circumstances, the decoupling of economic and transport growth – a fundamental objective of the European transport policy, rooted in the EU strategy of sustainable development – will be extremely difficult. Free movement, a major achievement of the European Union, is an essential factor of economic growth. It has been signalled that employee mobility helps to limit the adverse demographic trends in the European Union. It is also perceived as a key element of implementation of the Lisbon strategy for growth and employment. The reverse obtains as well – economic growth supports higher mobility which is not job-related. Growing household incomes generate the need to travel for tourism and leisure. Reducing demand for freight transport will prove difficult too. Economic globalisation, regional integration, and higher trade exchange with neighbour countries of the European Union generate increasing demand for transport services.

Noting the inefficiency of transport policy instruments at decoupling economic growth and the demand for transport, 2011 White Paper (COM (2011) 144) abandoned that objective. The need for other solutions to implement the idea of sustainable development was emphasised.

3. Changing structure of demand for transportation services

The decoupling of economic growth and the demand for transport in line with the strategy for sustainable development would be accompanied by changing the sectoral structure of transport. Road transport was assumed to diminish by 2010 in favour of environment-friendly means of transport. In quantitative terms, the transport structure of 1998 was to be restored by 2010. This aim reflected the systematically growing share of road transport in both passenger and freight transportation.

In 1998, the share of road transportation accounted for 42.9% of the freight transport market and 68.5% of the overland freight transport market. Adoption of the European transport policy instruments in 2001 did not contribute to reducing the significance of this transport sector (Table 4).

In 1998-2009, freight transportation in the European Union rose by 793.6 m tkm, i.e. by 24.1%. Road transportation had the largest share in that growth. It grew

by 466.3 m tkm or 33.0%. This means that lorries serviced 58.8% of the overall transport growth and 88.5% of the overland freight transport growth.

Table. 4. Freight transport in the European Union

Year	Road	Rail	Inland Waterways	Pipelines	Sea	Air	Total
Freight Transport [m tkm]							
1998	1 414.2	392.5	116.7	125.4	1 232.0	2.3	3 283.1
1999	1 469.9	383.6	115.1	124.2	1 268.0	2.3	3 363.2
2000	1 518.7	403.7	109.1	126.7	1 314.0	2.5	3 474.6
2001	1 556.3	386.0	118.8	115.5	1 334.0	2.5	3 513.0
2002	1 605.9	383.8	122.1	114.9	1 355.0	2.4	3 584.1
2003	1 625.4	391.9	119.8	119.3	1 378.0	2.4	3 636.8
2004	1 742.1	416.3	127.8	118.2	1 427.0	2.5	3 833.9
2005	1 794.0	414.1	131.0	125.4	1 461.0	2.6	3 928.1
2006	1 847.6	440.4	128.7	124.2	1 505.0	2.7	4 048.6
2007	1 914.5	453.1	133.9	126.7	1 532.0	2.8	4 162.9
2008	1 880.5	442.8	132.5	133.0	1 498.0	2.7	4 089.6
2009	1 691.4	361.6	132.5	128.4	1 336.0	2.5	3 652.5
Modal split [%]							
1998	43.1	12.0	3.6	3.8	37.5	0.1	100.0
1999	43.7	11.4	3.4	3.7	37.7	0.1	100.0
2000	43.7	11.6	3.1	3.6	37.8	0.1	100.0
2001	44.3	11.0	3.4	3.3	38.0	0.1	100.0
2002	44.8	10.7	3.4	3.2	37.8	0.1	100.0
2003	44.7	10.8	3.3	3.3	37.9	0.1	100.0
2004	45.4	10.9	3.3	3.1	37.2	0.1	100.0
2005	45.7	10.5	3.3	3.2	37.2	0.1	100.0
2006	45.6	10.9	3.2	3.1	37.2	0.1	100.0
2007	46.0	10.9	3.2	3.0	36.8	0.1	100.0
2008	46.0	10.8	3.2	3.3	36.6	0.1	100.0
2009	46.3	9.9	3.6	3.5	36.6	0.1	100.0
Modal split for inland modes [%]							
1998	69.0	19.2	5.7	6.1	–	–	100.0
1999	70.2	18.3	5.5	5.9	–	–	100.0
2000	70.4	18.7	5.1	5.9	–	–	100.0
2001	71.5	17.7	5.5	5.3	–	–	100.0
2002	72.1	17.2	5.5	5.2	–	–	100.0
2003	72.0	17.4	5.3	5.3	–	–	100.0
2004	72.5	17.3	5.3	4.9	–	–	100.0
2005	72.8	16.8	5.3	5.1	–	–	100.0
2006	72.7	17.3	5.1	4.9	–	–	100.0
2007	72.8	17.2	5.1	4.8	–	–	100.0
2008	72.6	17.1	5.1	5.1	–	–	100.0
2009	73.1	15.6	5.7	5.6	–	–	100.0

Table 4 Cont'd

Year	Road	Rail	Inland Waterways	Pipelines	Sea	Air	Total
Changes [Year 1998 = 100%]							
1998	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1999	103.9	97.7	98.6	99.1	102.9	102.2	102.4
2000	107.4	102.8	93.5	101.0	106.7	108.9	105.8
2001	110.0	98.3	101.8	92.1	108.3	109.3	107.0
2002	113.6	97.8	104.6	91.6	110.0	106.7	109.2
2003	114.9	99.8	102.6	95.2	111.9	107.6	110.8
2004	123.2	106.1	109.5	94.3	115.8	111.6	116.8
2005	126.9	105.5	112.3	100.0	118.6	114.7	119.6
2006	130.6	112.2	110.3	99.1	122.2	118.2	123.3
2007	135.4	115.4	114.7	101.0	124.4	122.2	126.8
2008	133.0	112.8	113.6	106.1	121.6	120.0	124.6
2009	119.6	92.1	113.5	102.4	108.4	110.2	111.3

Source: Own study on the basis EU Energy and Transport in Figures (2010).

Freight transportation declined in 2007-2009 as a result of the economic crisis. The overall transport fell by 13% at the time. The shrinkage affected mostly rail transport (-20.2%) and inland water transport (-17.3%) whereas the European transport policy envisaged increasing shares of these environment-friendly sectors. Their lower market shares do not help to implement the idea of sustainable development.

Passenger transport climbed by 894.2 bn pkm, that is, by 15.8% in 1998-2008, driven mostly by private car and air transportation. The transportation by private cars rose by 625.9 bn pkm, i.e. 15.1% in 1998-2008. This means that 70% of the growth was caused by cars. The growth was thus comparable to the share of this sector in the passenger transportation market. In terms of only overland transport, the share of car transportation grew by 1 percentage point in the period under discussion. The rise in air transport amounted to 152 bn pkm (37.2%). Its share in rising transport reached 17%, which is more than double the average share of air transport in the passenger transportation market. Such dramatic leaps in both these transport sectors affirm that the European transport policy is ineffective. The instruments adopted in 2001 anticipated reductions of air and car transport growth. The change trends of passenger transport in the European Union are presented in Table 5.

The growth of passenger rail transport is mainly owing to investment in high speed rail transport. The quality of high speed rail transportation attracts growing interest in using it for travelling between cities. In 1990-2009, high speed rail transportation in the EU-27 increased from 15.2 bn pkm to 104.1 bn pkm (Table 6).

Table. 5. Passenger transport in the European Union

	Passenger Cars	P2W	Bus & Coach	Railway	Tram & Metro	Air	Sea	Total
Passenger Transport [1000 m pkm]								
1998	4 136.7	128.8	512.5	350.6	73.5	409.0	43.1	5 654.2
1999	4 240.0	132.3	515.2	358.6	75.1	425.0	42.6	5 788.8
2000	4 321.1	134.4	518.2	370.7	77.2	457.0	41.7	5 920.3
2001	4 404.7	137.9	519.8	372.7	77.8	453.0	42.0	6 007.9
2002	4 479.2	138.4	518.9	365.6	78.5	445.0	41.5	6 067.0
2003	4 510.3	142.1	520.1	361.9	79.3	463.0	41.2	6 117.9
2004	4 571.5	144.6	515.9	367.8	82.0	493.0	40.5	6 215.3
2005	4 563.8	147.9	516.4	377.1	82.4	527.0	39.5	6 254.1
2006	4 677.8	151.4	514.1	389.6	84.2	549.0	40.0	6 406.1
2007	4 756.9	152.0	527.2	396.7	86.0	572.0	41.0	6 531.9
2008	4 762.6	154.1	530.2	410.5	89.2	561.0	40.9	6 548.5
2009	4 780.8	156.5	510.4	404.9	88.8	522.0	40.0	6 503.3
Modal split [%]								
1998	73.2	2.3	9.1	6.2	1.3	7.2	0.8	100.0
1999	73.2	2.3	8.9	6.2	1.3	7.3	0.7	100.0
2000	73.0	2.3	8.8	6.3	1.3	7.7	0.7	100.0
2001	73.3	2.3	8.7	6.2	1.3	7.5	0.7	100.0
2002	73.8	2.3	8.6	6.0	1.3	7.3	0.7	100.0
2003	73.7	2.3	8.5	5.9	1.3	7.6	0.7	100.0
2004	73.6	2.3	8.3	5.9	1.3	7.9	0.7	100.0
2005	73.0	2.4	8.3	6.0	1.3	8.4	0.6	100.0
2006	73.0	2.4	8.0	6.1	1.3	8.6	0.6	100.0
2007	72.8	2.3	8.1	6.1	1.3	8.8	0.6	100.0
2008	72.7	2.4	8.1	6.3	1.4	8.6	0.6	100.0
2009	73.5	2.4	7.8	6.2	1.4	8.0	0.6	100.0
Modal split for inland modes [%]								
1998	80.3	2.5	10.3	7.2	1.5	–	–	100.0
1999	80.5	2.5	10.2	7.1	1.5	–	–	100.0
2000	80.6	2.5	10.1	7.0	1.4	–	–	100.0
2001	80.8	2.5	10.0	6.8	1.4	–	–	100.0
2002	80.9	2.5	9.8	6.8	1.4	–	–	100.0
2003	80.8	2.5	9.7	6.9	1.4	–	–	100.0
2004	81.0	2.5	9.6	6.9	1.4	–	–	100.0
2005	81.3	2.5	9.4	6.6	1.4	–	–	100.0
2006	81.4	2.6	9.4	6.5	1.4	–	–	100.0
2007	81.4	2.6	9.2	6.6	1.5	–	–	100.0
2008	81.2	2.6	9.2	6.7	1.5	–	–	100.0
2009	81.4	2.6	8.9	6.8	1.5	–	–	100.0

Table 5. Cont'd

	Passenger Cars	P2W	Bus & Coach	Railway	Tram & Metro	Air	Sea	Total
Changes [Year 1998 = 100%]								
1998	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1999	102.5	102.7	100.5	102.3	102.1	103.9	98.8	102.4
2000	104.5	104.4	101.1	105.7	104.9	111.7	96.8	104.7
2001	106.5	107.0	101.4	106.3	105.8	110.8	97.4	106.3
2002	108.3	107.4	101.2	104.3	106.8	108.8	96.3	107.3
2003	109.0	110.4	101.5	103.2	107.9	113.2	95.6	108.2
2004	110.5	112.3	100.7	104.9	111.4	120.5	94.0	109.9
2005	110.3	114.9	100.8	107.6	112.1	128.9	91.6	110.6
2006	113.1	117.6	100.3	111.1	114.5	134.2	92.8	113.3
2007	115.0	118.0	102.9	113.2	117.0	139.9	95.1	115.5
2008	115.1	119.6	103.4	117.1	121.2	137.2	94.9	115.8
2009	115.6	121.5	99.6	115.5	120.7	127.6	92.7	115.0

Source: Own study on the basis EU Energy and Transport in Figures (2010).

Table. 6. High speed rail transport [1000 m pkm]

Year	Belgium	Czech R.	Germany	Spain	France	Italy	Holland	Portugal	Slovenia	Finland	Sweden	UK	EU-27
1990	–	–	–	–	14.92	0.30	–	–	–	–	0.01	–	15.23
1991	–	–	2.00	–	17.87	0.40	–	–	–	–	0.09	–	20.36
1992	–	–	5.20	0.40	18.96	0.40	–	–	–	–	0.15	–	25.11
1993	–	–	7.00	0.90	18.93	0.50	–	–	–	–	0.27	–	27.60
1994	–	–	8.20	0.90	20.51	0.80	–	–	–	–	0.31	–	30.72
1995	–	–	8.70	1.29	21.43	1.10	–	–	–	–	0.42	–	32.94
1996	0.32	–	8.85	1.10	24.79	1.30	0.03	–	–	0.02	1.10	–	37.52
1997	0.56	–	10.07	1.30	27.58	2.40	0.07	–	–	0.05	1.33	–	43.36
1998	0.79	–	10.16	1.52	29.98	3.64	0.09	–	–	0.06	1.61	–	47.83
1999	0.80	–	11.59	1.67	32.36	4.46	0.10	–	–	0.05	1.81	–	52.86
2000	0.87	–	13.93	1.94	34.75	5.09	0.11	–	–	0.07	2.05	–	58.80
2001	0.89	–	15.52	2.08	37.40	6.76	0.19	–	–	0.06	2.23	–	65.13
2002	0.91	–	15.26	2.18	39.86	7.08	0.20	–	–	0.14	2.39	–	68.01
2003	0.88	–	17.46	2.03	39.60	7.43	0.66	–	–	0.20	2.40	–	70.66
2004	0.94	0.00	19.60	2.09	41.44	7.93	0.66	0.44	–	0.16	2.42	0.44	76.11
2005	0.98	0.01	20.85	2.32	43.13	8.55	0.69	0.49	–	0.31	2.33	0.45	80.11
2006	1.00	0.15	21.64	2.70	44.85	8.91	0.73	0.51	–	0.44	2.49	0.90	84.32
2007	1.02	0.33	21.92	2.59	47.97	8.82	0.80	0.51	–	0.58	2.78	1.39	88.70
2008	1.08	0.25	23.33	5.48	52.56	8.88	0.87	0.53	0.01	0.62	2.99	0.99	97.60
2009	1.06	0.24	22.56	11.51	51.86	10.75	0.92	0.53	0.02	0.60	3.05	1.01	104.10

Source: Own study on the basis EU Energy and Transport in Figures (2010).

The dynamic rise in high speed rail transportation balances the declining market share of the conventional railways. In 1998-2009, when transportation by conventional railways remained virtually steady. Their market share shrank from 5.4% to 4.6%. At the same time, the share of high speed rail transportation climbed from 0.8% to 1.6% (Table 7). The growth dynamics of high speed rail transportation greatly exceeded economic growth in 1998-2009. It was also much greater than the overall growth of transport and mobility at the time (Fig. 3).

Table. 7. Railway passenger transport in EU27

	Passenger transport [1000 m pkm]			Share in passenger transport market [%]		
	Total railway	Conventional railway	High speed railway	Total railway	Conventional railway	High speed railway
1998	350.60	302.78	47.83	6.2	5.4	0.8
1999	358.60	305.74	52.86	6.2	5.3	0.9
2000	370.71	311.91	58.80	6.3	5.3	1.0
2001	372.74	307.61	65.13	6.2	5.1	1.1
2002	365.57	297.57	68.01	6.0	4.9	1.1
2003	361.89	291.23	70.66	5.9	4.8	1.2
2004	367.82	291.71	76.11	5.9	4.7	1.2
2005	377.15	297.03	80.11	6.0	4.7	1.3
2006	389.60	305.28	84.32	6.1	4.8	1.3
2007	396.71	308.02	88.70	6.1	4.7	1.4
2008	410.54	312.93	97.60	6.3	4.8	1.5
2009	404.88	300.78	104.10	6.2	4.6	1.6

Source: Own study on the basis EU Energy and Transport in Figures (2010).

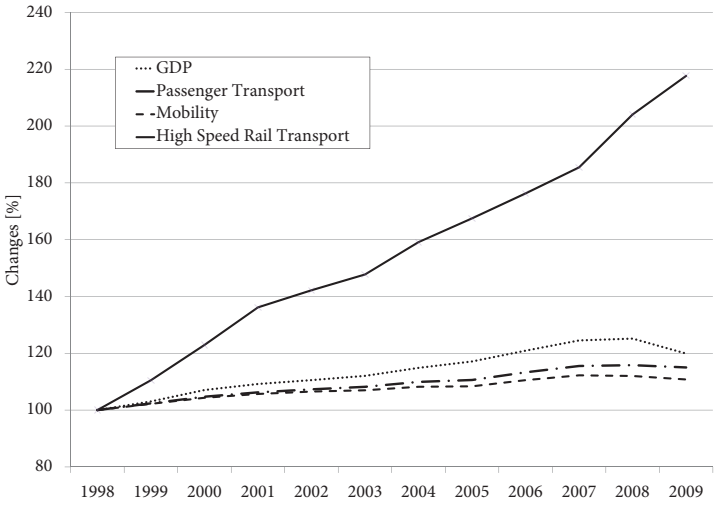


Fig. 3. Dynamics of GNP and passenger transport changes

Source: Own study on the basis of EUROSTAT data.

The extension of rail tracks adapted to high speed trains is a major factor determining their fast growth. Such lines certainly make for more attractive travel and invite passengers. This is not the only factor, however. By comparing length of tracks in the particular periods and transport volume fluctuations, one can note substantial transport growth along unchanged track distances. Let us take France as an example. The high speed tracks measured 1281 km in 1995-2000. In the same time, fast train transportation rose by 13.3 bn pkm, i.e. by 62%. Similar development could be observed in 2001-2006, when high speed lines were 1540 km long and transportation increased by 7.5 bn pkm or 20% (Dyr, 2011).

The high speed rail statistics refer to 12 out of 27 EU member states. Therefore, the states having such lines need to be taken into account first of all. Such an analysis was undertaken with regard to four states where new high speed lines were in operation as long as the early 1990s at the latest, i.e. France, Germany, Spain, and Italy. Calculation results indicate (Fig. 8) that the average shares of high speed rail in three of these states are much higher than the EU averages. Spain exhibits a somewhat lower share as rollout of high speed tracks there is insufficient. The first high speed line in Spain was commissioned in 1992, that is, 10 years later than in France. Density of high speed tracks in Spain averaged 0.93 km/1000 km^2 in 1992-2002. In France, the density in the same period rose from 1.31 km/1000 km^2 to 2.38 km/1000 km^2. Investment in the high speed systems in Spain is most likely to be felt in the second decade of the 21st century.

The average shares of high speed rail do not reflect their true significance in the transport market. Where high speed connections are available, their market share is substantially greater. In Germany, for instance, the average share of high speed rail in the passenger transport market reached 2.3% while its share ranged from 51% to 58% in the four connections where high speed trains were operated (Fig. 4).

These figures suggest the development of high speed rail system is a key factor driving up the share of this environment-friendly transport sector. As a result, it contributes towards achievement of the European transport policy goals and realisation of the strategy for sustainable development. This is mainly due to:

- the relatively low level of land occupation (3.2 ha/1 km of the line versus 9.3 ha/1 km of a motorway, on average),
- high energy efficiency (circa 3.4 times greater than private cars and 8.5 times greater than air transport).
- low emissions of CO_2.
- high safety levels,
- low external costs (approx. 9 times lower than those generated by private cars and 5 times lower than in air transport) (Barrón de Angoiti, 2010).

High speed rail investment is also a transport policy priority in the coming decades of the 21st century. Construction of more than 11 000 kms of new

lines in Europe is forecast till 2025 (Table 8). A new connection Warsaw – Łódź – Wrocław/Poznań is scheduled for the same period in Poland. It is the only planned new high speed line to be constructed in Central Europe.

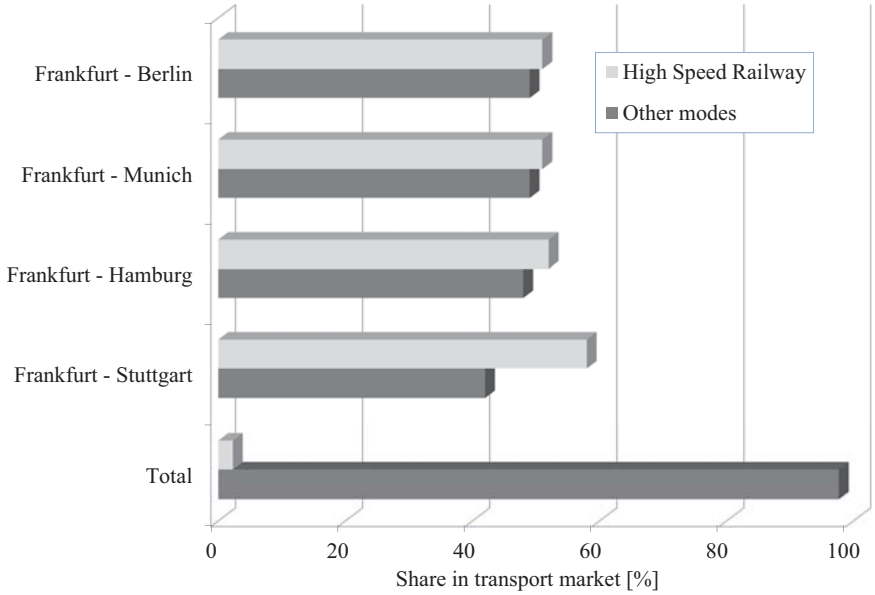


Fig. 4. Rail market shares. Passenger transport in Germany

Source: Garre (2010).

Table. 8. High speed lines in the world

	Track length [km]			
	Existing (11.01.2011)	Under construction	Planned	Total in 2025
Europe	6637	2427	8705	17769
Asia	7701	7076	6683	21460
Other continents	362	200	2206	2768
Total worldwide	14700	9703	17594	41997

Source: Own study on the basis UIC (2011).

At the turn of the 20th and 21st centuries, the share of road transport in Central Europe, in respect of both passenger and freight transport, was much lower than in the European Union. Growth dynamics of road transportation in the region were significantly higher than the European Union average in the first decade. In effect, the share of road transport in freight and passenger transport market rose in all Central European countries (Tables 9 and 10).

Table. 9. Share of the road and railway transport in Central Europe freight market transport

	1998	2001	2004	2009
Road transport				
EU-27	73.5	71.5	72.5	73.1
Poland	49.1	55.2	60.1	73.4
Estonia	38.4	35.3	32.7	47.3
Latvia	24.0	22.2	22.8	25.4
Lithuania	40.0	46.1	46.2	51.4
Slovak Republic	60.3	43.4	52.6	69.3
Czech Republic	64.4	66.9	72.7	75.5
Railway transport				
UE-27	20.4	17.7	17.3	15.6
Poland	43.0	34.1	30.6	17.6
Estonia	61.6	64.7	67.3	52.7
Latvia	76.0	58.7	57.5	58.7
Lithuania	59.0	43.1	43.8	34.4
Slovak Republic	39.7	34.4	27.5	17.4
Czech Republic	35.6	28.9	23.8	21.5

Source: Own study on the basis EU Energy and Transport in Figures (2010).

Table. 10. Share of the road and railway transport in Central Europe passenger market transport

	1998	2001	2004	2009
Road transport				
EU-27	80.8	81.0	81.4	81.2
Poland	70.4	73.1	77.3	85.8
Estonia	70.5	71.4	74.0	78.7
Latvia	75.4	78.6	75.5	85.4
Lithuania	85.4	88.5	88.6	92.0
Slovak Republic	54.8	66.0	68.9	76.9
Czech Republic	66.4	65.8	68.9	69.5
Railway transport				
UE-27	6.8	6.9	6.6	6.9
Poland	10.3	10.4	8.0	5.6
Estonia	2.7	1.9	1.8	1.9
Latvia	8.0	4.6	5.3	3.9
Lithuania	3.1	1.8	1.3	0.9
Slovak Republic	8.8	7.7	6.1	6.6
Czech Republic	7.8	7.6	6.7	6.2

Source: Own study on the basis EU Energy and Transport in Figures (2010).

Trends in the transport market are particularly adverse in Poland. In 1998-2009, the share of road transport in freight transportation market increased from 49.1% to 73.4% and its share in the passenger transport market rose from 70.4% to 85.8%. These tendencies will be difficult to avert in the coming decade as they are helped along by infrastructure investments. Allocation of resources from EU funds as part of operational programmes for 2007-2013 includes € 15.1 bn of road investment and a mere € 5.5 bn of rail investment.

4. Improvement of transport safety

In 2000, nearly 1.5 m accidents involving 56,500 dead and nearly 2 m injured took place on European Union (EU-27) roads (Road safety evolution in EU, 2009). In the circumstances, improvement of road transport safety became a primary objective of the European transport policy. The European Commission stipulated in its White Paper of 2001 that the numbers of road accident casualties should diminish by half till 2010. This aim is a direct consequence of the strategy for sustainable development. Instruments for harmonising penalties and promotion of new technologies were proposed in order to attain it.

The scope of inspections and penalties varies across the European Union member states. Drivers know where they have to follow the rules and where they can act with impunity. Drivers losing their licences in one country happen to obtain them in another EU member state. Penalties must therefore be harmonised across the European Union. Given certain offences, penalties (immediate immobilisation of vehicle, forfeiting the driver's licence) should be imposed promptly regardless of a driver's nationality and location of the offence.

Harmonisation of inspections and penalties should apply in particular to speeding and driving under the influence of alcohol, drugs, and medication affecting the ability to drive safely. 17 January 2001, the Commission adopted a recommendation encouraging member states to institute a maximum blood alcohol limit of 0.5 mg/ml for drivers in general and 0.2 mg/ml for professional, motorcycle and inexperienced drivers.

Traffic safety statistics concerning the European Union confirm that alcohol is the cause of 25% accidents. It is also estimated that driver blood alcohol levels are a minimum of 0.5 mg/ml in 1% of the overall traffic volume. Research confirms a correlation between alcohol content in blond and risk of accidents. Where the level is 0.8 mg/ml (which is acceptable in three EU countries: the United Kingdom, Ireland, and Luxembourg), the risk of accident is 2.7 times greater than in a sober driver. The alcohol content of 1.5 mg/ml makes the risk 22 times greater than in a sober driver. Alcohol also seriously affects consequences of accidents. The risk of a fatal accident in drivers whose alcohol blood content has reached 1.5 mg/ml is 200 times greater than in sober drivers

(SafetyNet, 2009). The dependence between the risk of accident and blood alcohol content is illustrated in Figure 5. Alcohol consumption is a particularly grave risk factor among young drivers (Fig. 6). The relative risk of a fatal accident where blood alcohol content is 0.5 mg/ml in a driver who is 16-19 is nearly 60 times greater than in a driver above 30.

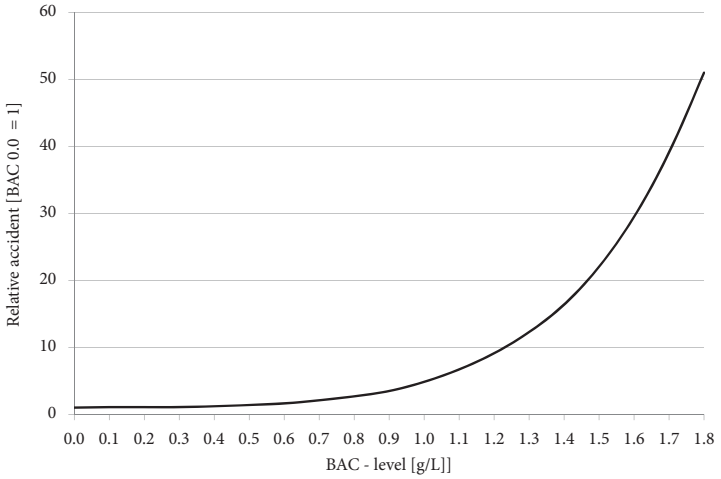


Fig. 5. Relative rate for drink drivers to be involved in a crash as their BAC-level increases

Source: Compton, Blomberg, Moskowitz, Burns, Peck, Fiorentino (2009).

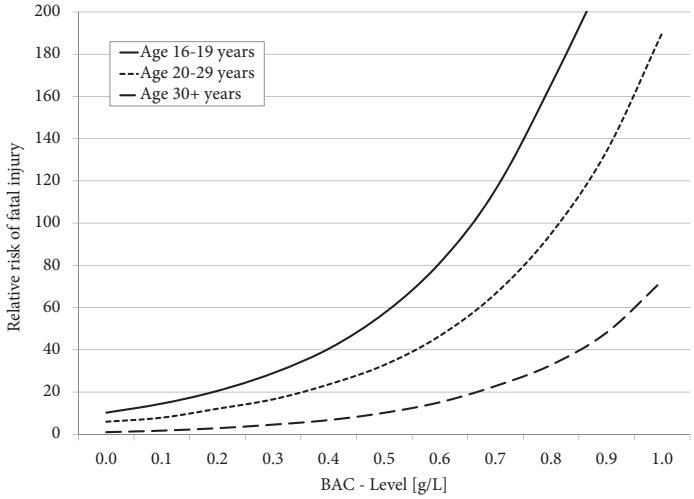


Fig. 6. Relative rate of fatal injury and BAC-level per age group

Source: Keall. Frith. Patterson (2009.

Consumption of drugs and some medications also increases the risk of accidents. Combining alcohol and drugs has an especially adverse effect on road safety. Research in the Netherlands and France indicates that even a low alcohol content (0.5-0.8 mg/ml) where drugs have been taken increases the relative risk of accident by approx. 50% (SafetyNet, 2009; Mathijssen, Houwing, 2005).

Young people most often fall victim to accidents. In 2005, nearly 6000 individuals aged 15-24 died on roads of fourteen European Union countries (EU-15 less Germany) (Fig. 7). This constituted 22.8% of all road fatalities. It should be noted that accidents are the single most common cause of death in this age group.

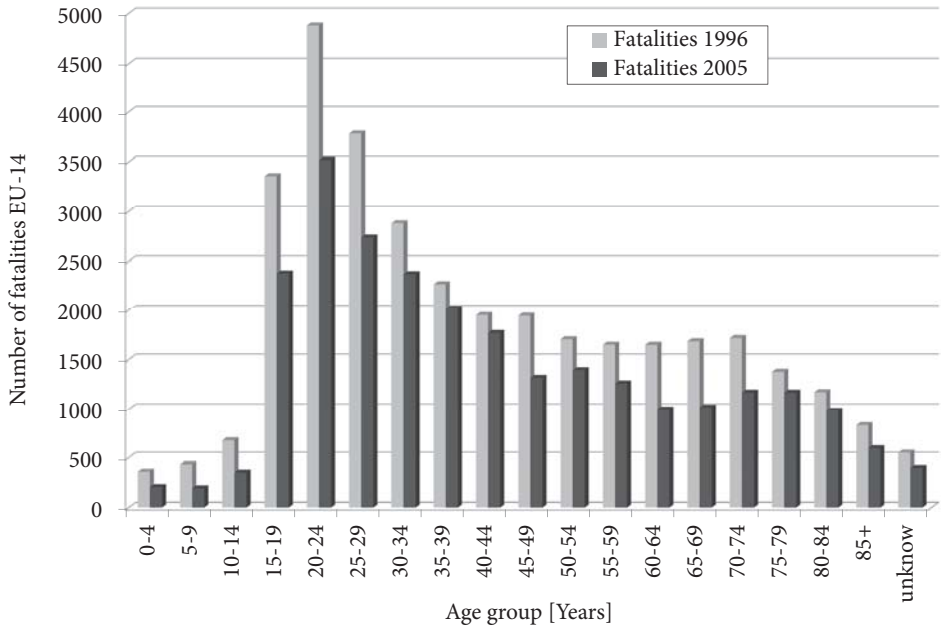


Fig. 7. Fatalities by age group for EU-14

Source: Traffic Safety Basic Facts (2007).

Promotion of new technologies is a major area of the European transport policy with regard to improving road safety. In this respect, the Commission takes steps towards application of an integrated approach to road safety, including projects and car design technologies (including accident prevention and vehicle-infrastructure cooperation technologies, 'e-Safety'), infrastructure, and behaviour of road users (COM (2006) 314). In 2009, a ruling of the European Parliament and of the Council (EC) 661/2009 was adopted. It governs technical requirements of motor vehicle type approval with regard to a range of safety and environment protection elements.

According to this ruling, vehicles must be designed, built, and assembled in such a way as to minimise the risk of injuries to passengers and other road users. Manufacturers have to guarantee that vehicles fulfil the requirements laid down in the ruling and its executive instruments, in particular those concerning:

- vehicle structure integrity, including impact tests,
- systems to aid the driver's control of the vehicle, including steering, braking and electronic stability control systems,
- systems to provide the driver with visibility and information on the state of the vehicle and the surrounding area, including glazing, mirrors and driver information systems,
- vehicle lighting systems,
- vehicle occupant protection, including interior fittings, head restraints, seat belts, 'ISOfix' anchorages or built-in child restraints and vehicle doors,
- the vehicle exterior and accessories,
- electromagnetic compatibility,
- audible warning devices,
- heating systems,
- devices to prevent unauthorised use,
- vehicle identification systems,
- masses and dimensions,
- electrical safety,
- gear shift indicators.

Actions taken by the European Commission and the individual member states bring measurable effects. In 2008, total road accident fatalities in EU-27 dropped from 56 459 to 38 875, i.e. by 31.14%. At the same time, the number of accidents declined from 1 461 700 to 1 228 200, or by 16%, and the number of injuries from 1 986 600 in 2000 to 1 623 500 in 2008, that is, by 18.1%. Despite the progress on improvement of the road safety, the target set for 2010 is unlikely to be reached (Fig. 8). If the existing trends continue, 31-34K people are expected to die on EU roads in 2010. This means that the number of fatalities will decline by 38-44% during 2000-2010.

Roads in Central Europe are among the most dangerous in the European Union (Fig. 9). By referring the number of road accident casualties to the population, road transport and number of cars, it can be said that the relative safety level in Poland is approximately twice lower than in the EU-27 average and about 3-4 times lower than in the UK, Sweden or the Netherlands.

Rollout of the road system, in particular, motor and express ways, is a factor improving safety of road traffic. Statistics confirm a high correlation between density of such roads and rate of accidents. Fewer accidents take place in countries with dense road systems capable of segregating traffic.

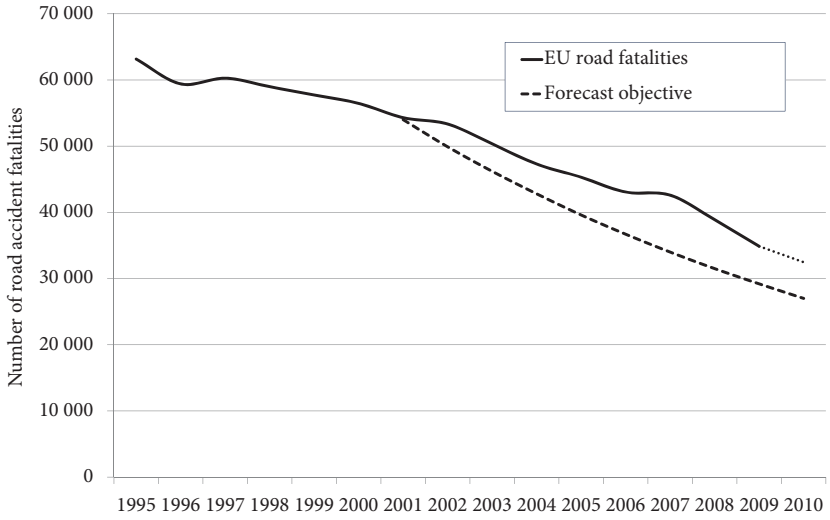


Fig. 8. Evolution of road accident fatalities in the EU-27

Source: Own study on the basis EU Energy and Transport in Figures (2010).

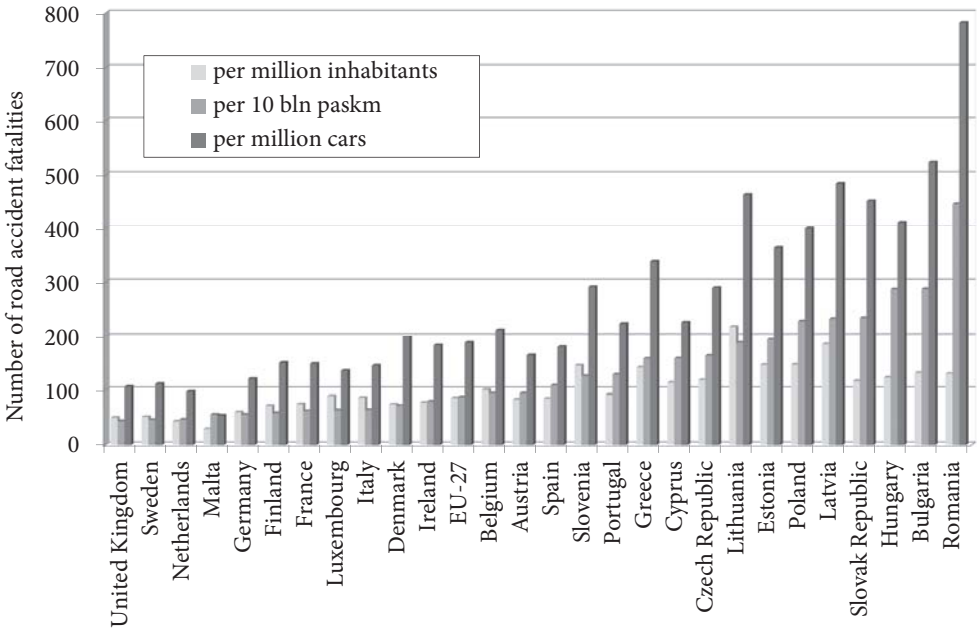


Fig. 9. Fatality rates in EU countries

Source: Own study on the basis EU Energy and Transport in Figures (2010).

Accidents have not only social but also significant economic dimensions as they generate definite costs. Value of human life is used in their estimates, assessed on the basis of two fundamental methodologies:

– constructive (direct) which measures sum total of revenue that can be generated in an individual lifetime,
– disclosed preferences (indirect) which identifies value of life with a monetary compensation expected for an increased risk of death (Accocela, 2002).

Valuations of human life may give rise to ethical dilemmas. Value of life is identified with revenue attained by a person according to the first method. As a result, pensioners are assigned zero value – their death does not lead to lost income. Under the second method, value of a life depends on somebody's wealth. A rich person expects a higher compensation for the risk of death than a poor individual. Life of somebody with higher income commands a greater value. According to both these methods, therefore, value of a human life is dependent on economic development of a country and directly tied to *per capita* GNP. This means that value of a human life in Central Europe is much lower than in Western Europe (Fig. 10).

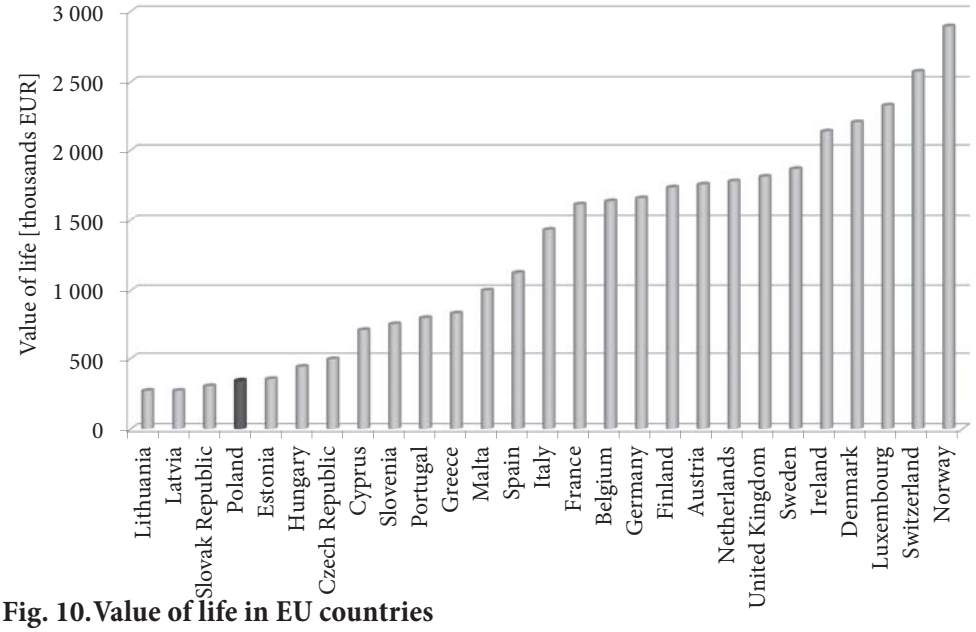


Fig. 10. Value of life in EU countries

Source: HEATCO (2006).

Total costs of road accidents in Poland in 2000-2009 were estimated in consideration of accident statistics and valuation of human life and other costs of

accidents (Jaspers, 2008). Their total value in the first three years of the current EU financial perspective is calculated at nearly PLN 60 bn. On the other hand, approx. PLN 75 bn will be spent on road and rail investments that could improve safety on Polish roads in the entire perspective (2007-2013).

Table. 11. External cost of road accidents in Poland

	Number of			Cost [m PLN]			
	accidents	accident fatalities	injuries	materials	fatalities	injuries	Total
2007	49 536	5 583	63 224	708.2	7 614.4	12 203.8	20 526.3
2008	49 054	5 437	62 097	701.3	7 415.3	11 986.2	20 102.8
2009	44 196	4 572	56 046	670.0	6 612.5	11 472.2	18 754.6
Total	142 786	15 592	181 367	2 079	21 642	35 662	59 384

Source: Own study on the basis of Komenda Główna Policji (2010) and JASPERS (2008).

5. Climate changes and environment protection challenges

Improving the condition of natural environment and counteracting climate changes are major policy areas of the European Union. Environment protection standards in the European Union are one of the strictest worldwide. Most pressing problems include: struggle against climate changes, protection of biodiversity, reduction of health problems due to environment pollution, and more responsible use of natural resources.

Increasing consumption in the European Union member states is a key factor raising emissions of harmful substances (Fig. 11). The current model of consumption exacerbates negative impact on the environment as spending rises on consumption categories associated with intensive environment impacts, in particular, on transport and energy consumption by households (EEA, 2007).

Actions taken by the European Union member states have led to a significant reduction of greenhouse gas emissions. Total GHG emissions (without land use, land-use change and forestry) in the EU-27 decreased by 17.4 % between 1990 and 2009 (974 million tonnes CO_2-equivalents) (EEA, 2011).

Energy and transport sectors are major emitters (Fig. 12) which generate half the emissions in the EU member states. While the energy-producing sector can be observed to lower its emissions, the transport sector emissions continue to rise (Fig. 13) due mainly to increasing demand for both passenger and freight transport. The European Union exhibits a distinct correlation – demonstrated in the initial part of this article – between rising demand for transport and economic growth.

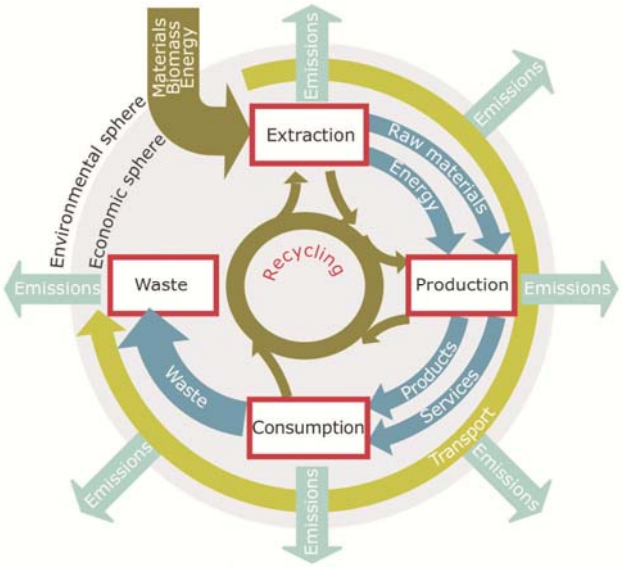
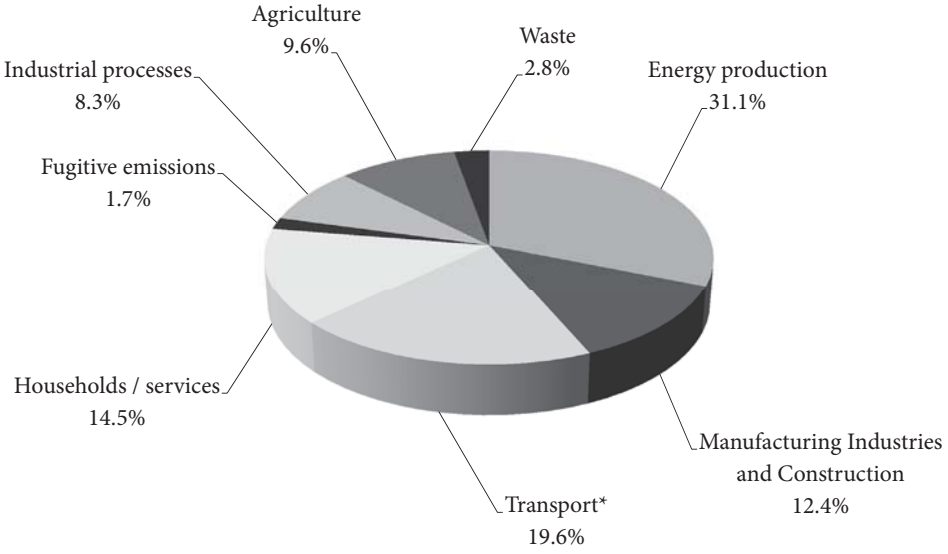


Fig. 11. Life-cycle chain from extraction – through production – to consumption and waste

Source: (EEA, 2007).



* – excludes international aviation and shipping = 6% of total GHG emissions.

Fig. 12. Total greenhouse gas emissions by sector in EU-27 in 2008

Source: Own study on the basis database of European Environment Agency.

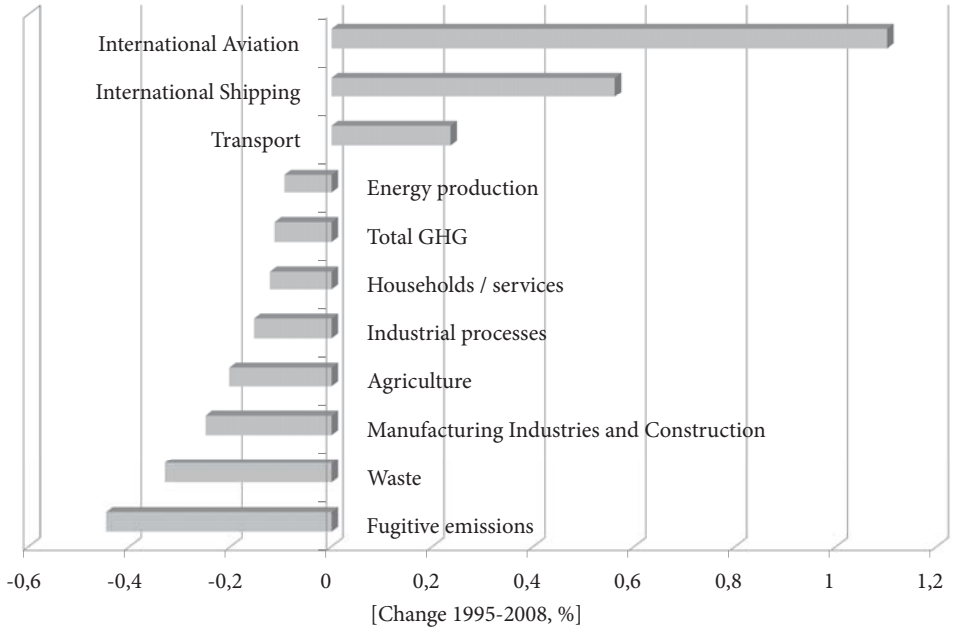


Fig. 13. Change of greenhouse gas emissions by sector in EU-27

Source: Own study on the basis database of European Environment Agency.

In an attempt to realise the idea of sustainable development, the European Commission formulated a package of actions to develop the transportation system that would be friendly to the natural environment in 2008 (The Greening transport package, 2010). The package consists of five parts:

- Greening Transport Communication: summarises the whole package and sets out what new initiatives the Commission will take in this field until the end of 2009 (COM (2008) 433).
- Greening Transport Inventory: describes the large amount of EU action already taken to green transport and on which this package builds (SEC(2008)2206).
- Strategy to Internalise the External Costs of Transport: focuses on making transport prices better reflect their real cost to society so that environmental damage and congestion can be reduced while boosting the efficiency of transport and ultimately the economy as a whole (COM(2008) 435; SEC(2008)2207).
- Proposal for a Directive on road tolls for lorries: would enable Member States to reduce environmental damage and congestion through more efficient and greener road tolls for lorries. Revenue from the tolls would be used to reduce environmental impacts and cut congestion (COM/2008/0436).

- Rail Transport and Interoperability communication: sets out how to reduce the perceived noise from existing rail freight trains by 50% and the measures the Commission and other stakeholders will need to take in the future to achieve this (COM(2008)432).

Measures taken in the European Union to reduce the adverse impact of transport on the natural environment comprise a broad range of instruments applicable to the climate change, local environment pollution, noise, congestion, and safety.

With regard to factors affecting the climate change, the Commission proposed means of reducing CO_2 emissions from new cars, including aviation in the EU Emissions Trading System (EU ETS), introduction of annual road and registration fees for cars to be diversified in terms of CO_2 levels, and guaranteeing that all means of transport exempt from the ETS will contribute to meeting of national targets of greenhouse gas emissions.

Counteracting local environment pollution is a key area of the European Commission's activity. As part of the common market, means of reducing air pollution have been developed which broadly differ for the particular modes of transport yet focus on lowering emissions by new vehicles (EURO standards), ships or leisure planes. Maximum contents of certain fuel pollutants have been defined, e.g. sulphur levels in marine transport fuels and lead content in petrol, and regulations have been set regarding lowering of emissions arising from fuel storage and distribution. Requirements for reducing water pollution apply to water transport. All modes of transport are subject to general regulations of acceptable methods and locations of waste disposal, detailed requirements apply to certain types of road vehicles and their elements (e.g. tyres and batteries).

The Commission has proposed applying methods considering energy consumption and cost of CO_2 and pollutant emissions in the entire lifecycle of a vehicle to public tenders for cars, trucks, buses, and lorries. In addition, most new transport infrastructure projects are governed by environment impact assessment regulations and some are subject to nature protection legislation as well.

EU noise reduction measures have so far focussed on introduction of an overall framework of noise level assessment and reduction of noise emissions from all types of overland motor transportation (e.g. technical interoperability specifications in the rail sector). There are also noise limits for airships and stricter restrictions can be introduced at some EU airports. Noise maps must be developed for airports, large cities (and their ports), as well as high traffic intensity roads and motorways, and steps should be taken to reduce noise where necessary. Tyre noise limits were introduced in 2009, applicable to new tyres.

EU financing has contributed to extended capacity of the existing and construction of new infrastructure, where EU policies aimed at moving traffic to less congested modes of transport while developing joint rules of fee collection. There are fee-collection instruments for lorries using the infrastructure and de-

tailed requirements of rail infrastructure. The Commission has additionally proposed to collect airport fees. Railways, inland waterways, and marine transport are the largest recipients of funds for trans-European infrastructure and Marco Polo programme. This is intended to encourage traffic transfers from roads to these transport modalities. Measures to enhance productivity of infrastructure have been introduced to air and rail transport sectors, work is also under way on technological improvements in road transport.

Internalisation of external costs is expected to become of special importance to actions reducing negative effect of transport on the natural environment. It is the focus of actions proposed for implementation by the European Commission (COM(95)691). Absence of such measures may lead to marked escalation of negative effect of transport on the natural environment and congestion (SEC(2008)2208).

Taxes, toll fees (or fees for infrastructure use), and emission trade are key instruments for the internalisation of external costs. Their selection should be appropriate to the nature of external costs generated since each of their components has unique features that require application of relevant economic instruments. Some external costs relate to use of infrastructure and change over time and place. These include congestion, air pollution, noise, and accidents, which are largely local and vary in time, space and type of a system. Application of diversified fees may best address these specific characteristics, therefore. Climate changes do not have a local dimension, on the other hand. Greenhouse gas emissions do not depend on a time or location but relate to fuel consumption. In the event, instruments directly linked to that consumption can prove the proper economic instrument, such as fuel tax or a system of CO_2 emissions trade (COM(2008) 435).

Greenhouse gas emissions by the transport sector increase in Central Europe just like in the EU-27. Dynamics of this growth are higher than EU-27 average, however (Fig. 14), principally due to higher growth dynamics of road transport in this region.

Use of alternative fuels, including those from renewable sources, is an important way of reducing greenhouse gas emissions and other air pollutants in line with the strategy for sustainable development. The Directive 2003/30/EC obliged the EU member states to take steps to increase use of and access to energy from renewable sources. It was agreed that the share of renewable energy in the overall consumption of energy by the transport sector should reach a minimum of 2% in 2005 and 5.75% in 2010. Research conducted in 2006 suggests only two countries (Germany and Sweden) had attained the use levels of renewable energy stipulated for 2005 (COM(2006)845).

Use of biofuels has brought measurable economic effects that include:

– security of supply by decreasing fossil fuel and diversifying fuel consumption in the EU – in 2007 the use of biofuels in the EU replaced 1 593 million litres

of gasoline and 7 730 million litres of diesel. This is almost 3% of the total EU fuel consumption in road transport,
- generating additional jobs – in 2005, non-grid biomass use accounted for 600 thousand employees, biomass grid and biofuels contributed over 100 thousand employees and biogas around 50 thousand,
- the net greenhouse gas savings achieved in the EU from biofuels placed on the market and consumed in 2006 and 2007 amounted to 9.7 and 14.0 Mt CO_2-eq respectively,
- contribution to increased intensification of agricultural production in the EU. which can increase pressure on the use of land with high biodiversity value and soil carbon stock and use of fertiliser (COM(2009) 192).

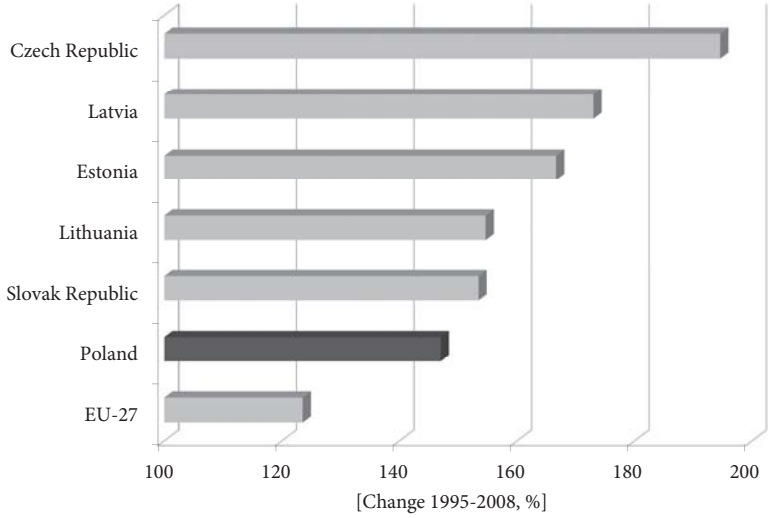


Fig. 14. Change of greenhouse gas emissions by transport sector

Source: Own study on the basis EU Energy and Transport in Figures (2010).

The positive effects of using biofuels encourages more intensive efforts for even further expansion of their share. The share of renewable energy in the overall gross energy consumption by the Community is expected to rise to 20% and by the transportation sector to 10% by 2020 (Directive 2009/28/EC). Possible adverse consequences of the more intensive production of energy-generating crops need to be noted, however. Using ever more extensive land areas for these crops may, in the long term, undermine food security of the European Union member states. As a result, dramatic price hikes of food products may not only affect living standards of the EU populations but also competitiveness of its economy.

Legal regulations intended to restrict the negative impact of transportation on the natural environment involve support for infrastructure of the transport

modes friendly to the environment. EUROSTAT figures indicate, however, that these investments primarily concerned road infrastructure in the last two decades. More than 24 000 kms of motorways and merely 4,700 kms of high speed railroads were constructed in 1990-2008. The overall distance of railways fell by nearly 20 000 kms in the same period. These adverse trends persist despite the declared support for the strategy of sustainable development and a European transport policy envisaging rollout of environment-friendly means of transport, including first of all railroads.

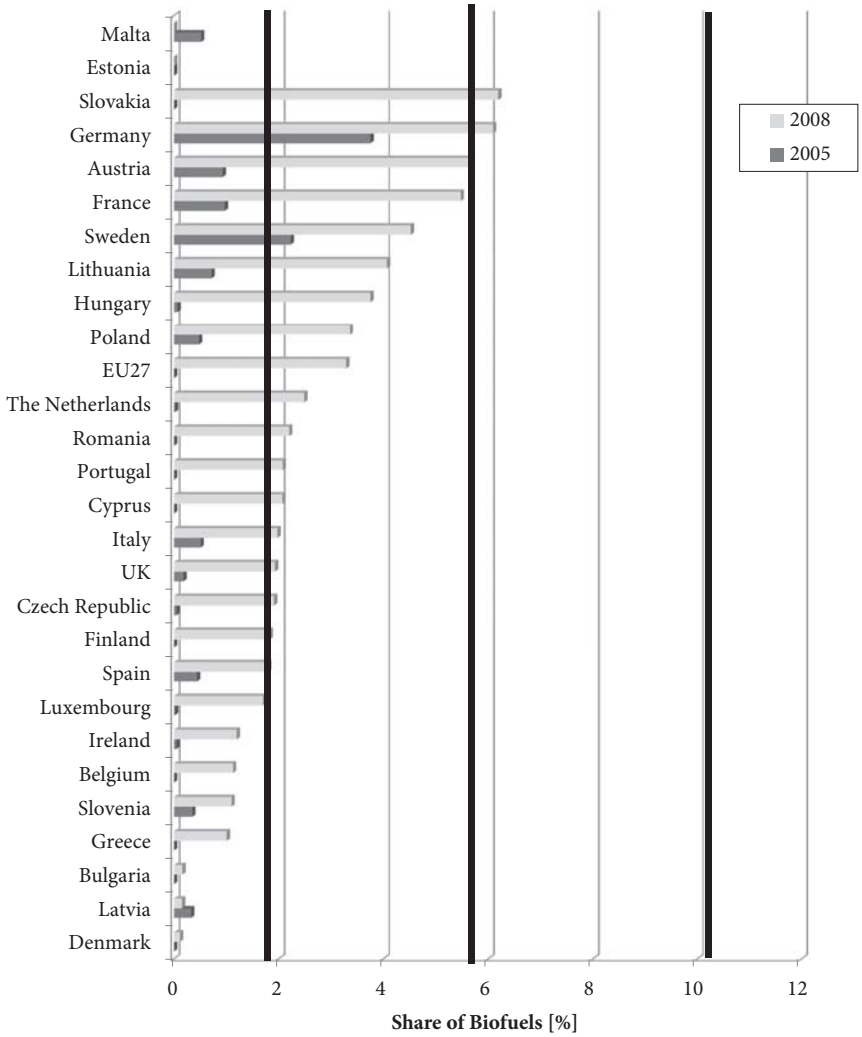


Fig. 15. Share of biofuels in total final fuel consumption in transport sector

Source: Own study on the basis EU Energy and Transport in Figures (2010) and MEMO/07/5.

Conclusion

Most economic decisions in a market economy are made in the real market and management processes are regulated by the market mechanism. Market regulation by public authorities – regardless of their level – should constitute an exception rather than a rule. The scope of regulation in the European Union is systematically increasing, however. Views of Milton Friedman, a Nobel Prize winner for economics, need to be cited in this connection. He said transport is among the most heavily regulated sectors of economy. It provides an example of a sector deformed by over-regulation beyond capability of effective competition (Friedman, 2006). It should be pointed out that economic regulation is often motivated not only by shortcomings of market mechanisms but also pressure of interest groups. They regard economic regulation as protection of their own interests and an opportunity for boosting their own wealth (Becker, 1983).

The rulings, directives, communications, and opinions referred to in this paper are but a fraction of the acquis communautaire relating to transportation. They help to outline essential directions of transformations in the sector. The vision of an EU transportation system incorporated in the strategy for sustainable development and successive editions of the European transport policy indicate growing commitment of public authorities to regulation of this economic sector. Their formulations and aims express the belief of their authors that issues of the transport sector can be solved by market regulation.

References

Barrón de Angoiti I., 2010, The sustainability of high speed. Presentation of the 7th Training on High Speed Systems, UIC, Paris, 28 June 2010, [Access 08.02.2011], accessible in World Wide Web: http://www.uic.org/ spip.php?article2092.

Becker G. A., 1983, Theory of Competition Among Pressure Groups for Political Influence. Quarterly Journal of Economics, No. 3.

COM (1992) 494 final, Communication from the Commission: The future development of the common transport policy – A global to the construction of a Community framework for sustainable mobility.

COM (2001) 264, Communication from the Commission: A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development.

COM (2001) 370, WHITE PAPER European transport policy for 2010: time to decide.

COM (2006) 314 final, Communication from the Commission to the Council and the European Parliament: Keep Europe moving – Sustainable mobility for our continent – Mid-term review of the European Commission's 2001 Transport White paper.

COM (2008) 433, Communication from the Commission: Greening Transport.

COM (2011) 144 final, WHITE PAPER Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system.

COM(2006) 571 final, Commission Communication: The demographic future of Europe – from challenge to opportunity.

COM(2006)845, Communication from the Commission to the Council and the European Parliament: Biofuels Progress Report – Report on the progress made in the use of biofuels and other renewable fuels in the Member States of the European Union.

COM(2007) 773 final, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Mobility, an instrument for more and better jobs: The European Job Mobility Action Plan (2007-2010).

COM(2008) 435, Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions: Strategy for the internalisation of external costs.

COM(2008)432, Communication from the Commission to the European Parliament and the Council: Rail noise abatement measures addressing the existing fleet.

COM(2009) 192, Communication from the Commission to the Council and the European Parliament: The Renewable Energy Progress Report – Commission Report in accordance with Article 3 of Directive 2001/77/EC, Article 4(2) of Directive 2003/30/EC and on the implementation of the EU Biomass Action Plan.

COM(95)691, Green Paper Towards fair and efficient pricing in transport. Policy Options for Internalising the External Costs of Transport in the European Union.

COM(98)466, White Paper Fair payment for infrastructure use: A phased approach to a common transport infrastructure charging framework in the EU.

COM/2008/0436 final, Proposal for a Directive of the European Parliament and of the Council amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures.

Compton R. P., Blomberg R. D., Moskowitz H., Burns M., Peck R. C., Fiorentino D., 2002, Crash rate of alcohol impaired driving. Proceedings of the sixteenth International Conference on Alcohol, Drugs and Traffic Safety ICADTS. Montreal.

Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport. OJ L 123, 17.5.2003, pp. 42-46.

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. OJ L 140, 5.6.2009, pp. 16-62.

DOC 10917/06, Renewed EU sustainable development strategy. Council of the European Union, Brussels, 26 June 2006.

Dyr T., 2009, Czynniki rozwoju rynku regionalnych przewozów pasażerskich. Radom: Wydawnictwo Politechniki Radomskiej.

EEA, 2007, Sustainable consumption and production. European Environment Agency.

EEA, 2011, Annual European Union greenhouse gas inventory 1990-2009 and inventory report 2011. Technical report No. 2.

EU Energy and Transport in Figures 2010. European Commission. Directorate-General for Energy and Transport.

Garre K. H., 2010, Success Factors of the German HST-System Presentation of the 7th Training on High Speed Systems. UIC. Paris. 28 June 2010. [Access 08.02.2011]. accessible in World Wide Web: http://www.uic.org/ spip.php?article2092.

Grzywacz W., Wojewódzka-Król K., Rydzkowski W., 2002, Polityka transportowa. Gdańsk: Wydawnictwo Uniwersytetu Gdańskiego.

HEATCO, 2006, Developing Harmonised European Approaches for transport costing and Project Assessment. Project funded under the 6th Framework Programme. coordinated by the University of Stuttgart. European Commission.

High Speed Lines in the World. UIC High Speed Department. 11 January 2011. [Access 05.02.2011]. accessible in World Wide Web: http://www.uic.org/IMG/pdf/20110111 _a1_high_speed_lines_in_the_world.pdf.

JASPERS, 2008, Blue Book – Road Infrastructure. Warsaw.

Keall M., Frith W., Patterson T., 2004, The influence of alcohol. age and number of passengers on the night-time rate of driver fatal injury in New Zealand. Crash Analysis & Prevention. 2004.

Komenda Główna Policji, 2010, Wypadki drogowe w Polsce w 2009 r. Biuro Ruchu Drogowego. Wydział Profilaktyki i Analiz, Warszawa.

Long-distance mobility in Europe: Getting the balance right, 2006, European Foundation for the Improvement of Living and Working Conditions.

Mathijssen M. P. M., Houwing S., 2005, The prevalence and relative rate of drink and drug driving in the Netherlands: a case control study in the Tilburg police district. SWOV report R-2005-9, SWOV, Leidschendam.

NEA, 2005, Scenarios, Traffic Forecasts and Analysis of Traffic Flows Including Countries Neighbouring the European Union. NEA Transport Research and Training, Final Report.

Regulation (EC) No. 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor. OJ L 200, 31.7.2009, pp. 1-24.

Road safety evolution in EU. December 2009. accessible in World Wide Web: http://ec.europa.eu/transport/ road_safety/observatory/doc/historical_evol.pdf, [Access 8 Feb. 2010].

SEC(2008) 2911, Demography Report 2008: Meeting Social Needs in an Ageing Society.

SEC(2008)2206, Commission staff working document accompanying the communication from the Commission to the European Parliament and the Council: Greening Transport.

SEC(2008)2207, Commission staff working paper accompanying communication from the commission to the European Parliament, to the Council, to the Economic and Social Committee and to the Committee of the Regions: Strategy for the internalisation of external costs Technical annex to the strategy for the internalisation of external costs.

The Greening transport package. [Access 16 January 2010]. Accessible in World Wide Web: http://ec.europa. eu/ transport/strategies/2008_greening_transport_en.htm.

Traffic Safety Basic Facts 2007. Accessible in World Wide Web: http://ec.europa.eu/ transport/ roadsafety_library/care/doc/safetynet/2007/bfs2007_sn-kfv-1-3-main-figures.pdf. [Access 8 February 2009].

Treaty establishing the European Economic Community. Rome, 25th March 1957.