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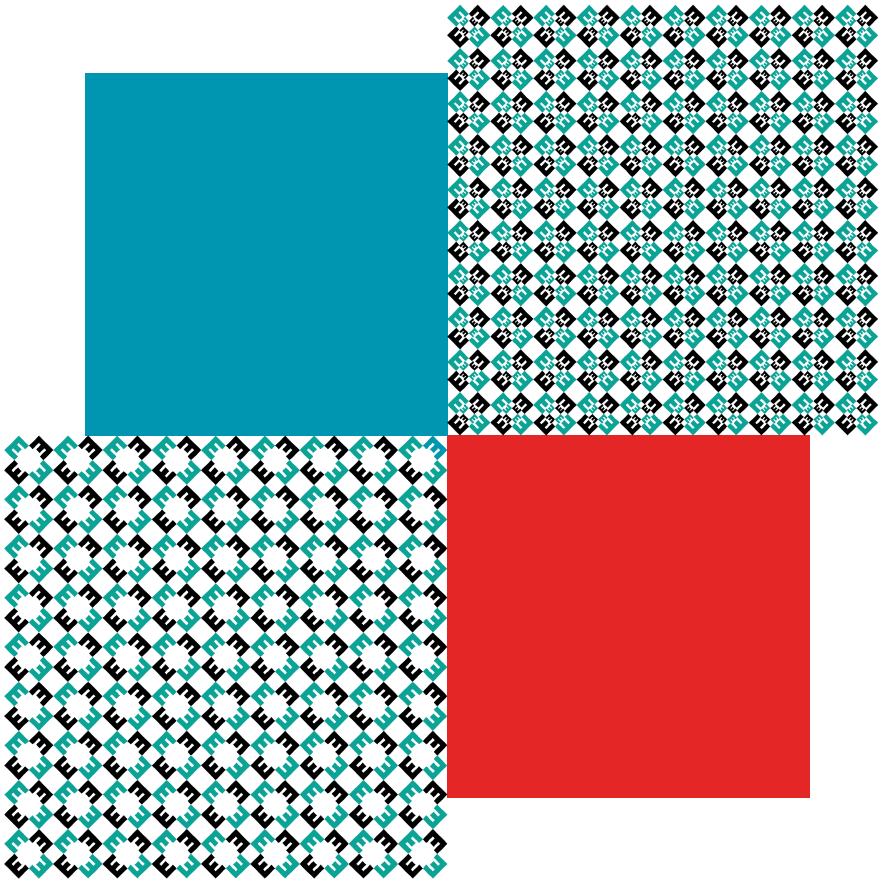
THE STATE OF TRANSPORT ENERGY EFFICIENCY ON NATIONAL LEVEL IN THE V4 REGION

A joint report in the frame of the international project "Cooperation for sustainable transport in the V4 region"



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SUMMARY

An international project, named as "Cooperation for sustainable transport in the V4 region", was launched in autumn 2011 in order to provide guidelines for strategy formation in the transport sector. For this aim, the participating organisations undertook several tasks in the frame of the project, supported by the International Visegrad Fund. One of these tasks was to analyse the opportunities of transposing the transport systems onto a sustainable basis in the Visegrad Countries, with reviewing the transport focused or related governmental strategies, programmes, action plans in this regard.

According to the analysis it can generally be stated that that the governmental strategies in their present state are not capable of being a base for the necessary changes in any of the four countries. The concept of energy efficiency is poorly represented in the field of national transport decision making, and since the fundamental documents contain only several references to energy efficiency, in practice it is hardly a predominant influencing factor.

The structure and interdependence of the strategic documents are diverse; those are rarely coherent and consistent with each other. In Hungary, there is not even a single document that could be referred as National Transport Strategy.

The documents only few times mention energy efficiency and sustainability, based on the number of the references. While the high level, strategy documents contain only theoretical wording on these issues, in the programmes and action plans that represent lower levels, more concrete statements can be found.

However, according to the overall picture, it is still less than it would be needed. It would be important to make energy efficient and sustainable solutions a clear, determined priority, even if we take into account the common characteristics of the infrastructure of the V4 countries, and their approach towards developments in the transport system:

- mostly outdated infrastructure with large regional differences within the countries;
- there have been developments mainly on motorways in the last decades;
- despite some positive wording towards sustainability and energy efficiency, the support policy is still one sided, as motorway construction continue to be the priority of the plans;
- less emphasis is put on efficient and sustainable solutions, on public transport or bicycle infrastructure than required; even such measures that needs relatively small financial resources, like traffic calming, creating car free zones, road tolls etc. are also out of sight, at least compared to their relevance.

It should be noted that comparison of the four countries was unachievable in all aspects. Regarding modal split, the statistical offices of the particular countries provide data that are based on different methodologies: e.g. while nationwide data on Czech Republic includes data on urban transport and passenger car usage, in Hungary urban and intercity transport are on different tables, which cannot be compared, as performance data on urban transport is not provided, and passenger car usage is missing from both. Data on Czech Republic also contains data on air transport, while Slovakia and Hungary do not.

Although Eurostat offers an opportunity for comparison, and differences (like the certainly higher passenger car usage in Poland than in Hungary, see table below.) can be revealed, Eurostat acknowledges at the same time, that *"the data collection methodology is not harmonized at the EU level."*

Modal split in the V4 countries (Eurostat, 2011, based on passenger-kilometres)

	Czech Republic	Hungary	Poland	Slovakia
Passenger cars	74.4%	63.4%	89.1%	77.3%
Public road transport	18%	24.9%	5.9%	15.7%
Railway	7.6%	11.7%	5%	7%

In our study, we introduce country by country the characteristics of the transport system, the structure of the strategic documents and their content, analyse them especially energy efficiency point of view, and at the end of the country chapters are listed the conclusions and the proposed recommendations.

TABLE OF CONTENT

HUNGARY

1. GENERAL INFORMATION ON THE TRANSPORT SYSTEM OF HUNGARY

Country/Capital[1]	Hungary, Budapest
Territory	93,027.44 km²
Population/population density 2012	9,958,000 inhabitants, 107 inhabitant/km²
GDP/GDP per capita in 2010	EUR 96,609 million, EUR 9,661/capita
GDP/GDP per capita in 2011	EUR 99,876 million, EUR 10,016/capita
Passenger vehicles/capita	300 passenger vehicles/1000 capita (2009)
Share of transport sector in national greenhouse gas emissions	23.1% (2007), 13 million tons
Share of transport sector in national energy consumption	18%, 196 PJ (2009), 224–240 PJ (estimated by 2020)
Length of total road network, national road network, length of motorway network	Total: 170,000 km, national road network: 31,628 km (2010), motorway network: 1,100 km (2009)
Length of rail network	7,718 km
Length of navigable waterways	1,366 km
International transport role of country	transit country

1.1. Modal split

Although on the lower level of the analysed four countries, car usage is the fundamental transport method among passengers. It should be noted that railway is more frequented than in the other three V4 countries; both in total kilometres (see 1. Figure) or in performance. In freight transport, with the two large rivers (Danube, Tisza) inland waterways are also important.

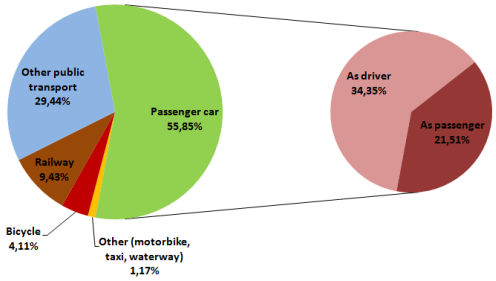
Passenger transport (2011, calculated on passenger-kilometres)[2]

Passenger cars – 63.4%
Public road transport – 24.9%
Railway – 11.7%

Freight transport (2012, calculated on tonne-kilometres)[3]

Road transport – 75.3%
Railway – 20.3 %
Inland waterways – 4.4 %

1.2. Basic characteristics of transport network



1. Figure: Modal split of Hungary based on total distance (source: www.ksh.hu)

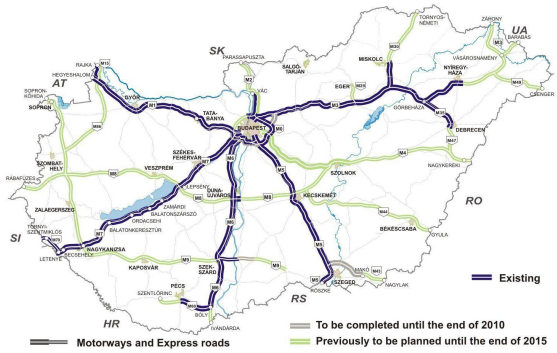
Hungary's geoeconomic location within Central Europe is central; several main European transit routes (TEN-T) traverse the country connecting Eastern and Western Europe. In recent decades increasing the transmissibility of these transport corridors, especially roads, has received outstanding attention (e.g. in terms of level of development, capacity, quality of infrastructure, etc.). The country's transport network is radial with Budapest at the centre, lacking transversal connections, and the new corridors enhance this same pattern. The density of the basic network is good but its technical equipment and state do not meet traffic needs, and there is a constant backlog of maintenance. The modal share of rail and public transport has been decreasing in the long run, but on average it is still more

[1] Sources in this chapter, unless indicated: KSH (Hungarian Central Statistical Office) Annals; EKFS White Paper (2007); KSH Characteristics of public and individual transport (2009); National Climate Change Strategy (NÉS) (2008); New Hungary Development Plan (ÚMFT) (2007); New Széchenyi Plan (ÚSzT) (2011)
[2] Eurostat
[3] www.ksh.hu

favourable in Hungary than in the EU15 countries. There is no comprehensive view of transport modes, separate branch developments or attempts are commonplace.

1.2.1. Public road network

The density of Hungary's road network meets the needs; however, the state of roads is declining. The recent decades were characterized by concentrated highway developments and a lack of maintenance and renovation. The newly constructed highways further enhanced the too central structure of the main network.



2. Figure: Existing and planned motorways in Hungary (www.kti.hu)

According to the Integrated Transport Development Strategy (EKFS), road transport and the road network in Hungary are in a controversial and ever-changing situation. There is a new and rapidly expanding freeway network (although the expansion is performed in a suboptimal structure), and the rest of the road network is degrading simultaneously. In the central and Western regions of the country the capacity is oversaturated, while South Western and South Eastern areas suffer from low quality roads, making trips lengthy. Transport problems in big cities – congestions, parking issues, air pollution – are those of highly motorized countries, whereas the difficulty of accessing peripheral areas has hardly changed in the past 50 years.[4]

1.2.2. Rail network

"The density of Hungary's railroad network is higher than the EU average, but its quality is inferior. The length of rail tracks exceeds 7,500 km, but the tracks are generally in poor state, there are no "D class" sections (approved for an axle load of 22.5 tons), constant and significant speed limits are commonplace. Due to the lack of development, the technologies applied (tracks and accessories, safety equipment, telecommunications, vehicles, etc.) are outdated, compatibility between sections is limited, therefore the competitiveness and economic efficiency of rail transport is declining significantly and constantly."[5] Over 40% of the network has speed limits in place, which means that these sections are not suitable for speeds set at the time of their construction.

3. Figure: Railway network of Hungary (www.kti.hu)

1.2.3. Air transport

Hungary's only airport with international significance is the Liszt Ferenc International Airport in Budapest. Significant developments have been started here in the past decade, the airport's role as a hub has been strengthened. However, the country's role in air transport and its accessibility was diminished by the dissolution of the national air transport company, MALÉV Zrt. in February 2012 and the steps not taken in relation to this.

1.2.4. Water transport

The length of navigable water routes shows a medium density on a European scale, the total length suitable for personal and freight transport is 1,477 km (378 km of which is on the Danube).[6] Due to the limitations of load line regularly applied on Hungarian waterways, the available shipping space can be utilized at 60 to 70% capacity annually. However, comparisons with the most developed navigation and with conditions in the three countries with the mouths of large rivers in the name of "Western European norm" are false. Utilization of existing port facilities is at 30%. The lack of modern ports and connecting

[4] EKFS White Paper

[5] As above

[6] EKFS White Paper

transport facilities are significantly hindering the competitiveness of river transport.

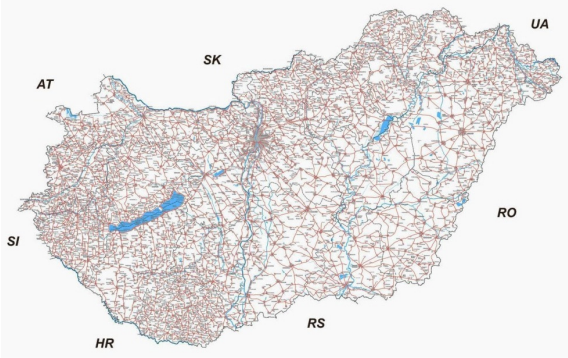
4. Figure: Waterways in Hungary (www.kti.hu)

1.2.5. Personal transport

The number of road vehicles in Hungary was 3.6 million in early 2011, 2.984 million of which were passenger cars. 92% of these were operated by private citizens and 8% by legal entities. That means that 80 to 85% of Hungarian households use cars.[7]

Within personal transport, individual transport increased between 1980 and 2005 from 45% to 60%, and the tendency is still increasing. Rail transport incurs the biggest loss from this shift towards individual transport.[8] In comparison to EU average (83% private cars), the share of public transport is still high in the modal split (60% private cars).[9]

Intercity public transport is well-developed on a European scale, but the pool of vehicles is rather old. Another problem is the fact that the state-owned bus companies handling intercity public transport are operated unfeasibly and economically inefficiently, often parallel to railways.



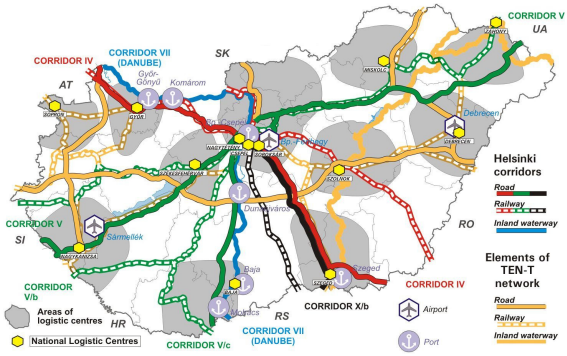
5. Figure: Intercity bus lines (www.kti.hu)

The potential of water transport is underutilized in Budapest.

Bicycles are worth mentioning, their share in personal transport is relatively high, 11% on a national level. However, this share is only 1–2% in Budapest according to 2010 data of the KSH and the Municipal Government. The Critical Mass movement estimates this share to be approximately 5%. According to the results of representative surveys[10] performed for the Hungarian Cyclists' Club (MKK) between March 2010 and September 2011, on average 42% of the Hungarian population uses bicycles as a means of transport nationally, while this ratio is 10% on average in Budapest (these figures do not represent everyday use but use within a period of 14 days).

1.2.6. Freight transport

As stated in the EKFS White Paper: "In the past decade, freight transport has become a definitive element of integration-oriented economic policy in Hungary". This can be interpreted as evidence that transport policy successfully persuaded economic policy that it is sensible to base macroeconomic policy on increasing freight transport, on transit shipments travelling through the country. In terms of sustainability, this idea is clearly errant and outdated, but even in an economic sense it is false that the country's (partially perceived) favourable location should be commoditized.



6. Figure: Network of international freight transport (www.kti.hu)

With regard to the transport of goods, the share of road transport, a more environmentally harmful mode using more specific energy, increased significantly in comparison with rail transport. The volume of

[7] KSH
[8] EKFS White Paper
[9] As above

[10] New national data about bicycle use – stages 1 to 6 of the Research, TNS Hoffman

road transport exceeded 35,000 million ton-kilometres by 2009, surpassing the figure of 1990 by 80% (excluding goods transit passing through the country). Rail transport of goods amount to 60% of the 1990 level in ton-kilometres. In addition, combined Ro-La (rolling highway) transport has been decreasing in recent years. The number of trailer trucks forwarded via railway was over 100 thousand in 2003, 89 thousand in 2004, and only 64 thousand in 2005. The reason for this is that the EU only applies a quota system for outside countries, not in its internal regulations. Ton-kilometres shipped on national waters are moderately increasing, but the figure is still below that of 1995.

2. PRIORITIES OF THE NATIONAL TRANSPORT STRATEGY

The system of strategic documents in international transport policy shows a unique, transitional picture, because there is virtually no comprehensive, current strategy at the top of the hierarchy. Although the "Hungarian Transport Policy 2003–2015" document, formally still in effect, is supposed to fill this role, but on one hand the document was prepared with a confusing set of goals and was unsuitable to fulfil its task to begin with[11], and on the other hand the EU's transport policy was modified both in 2006 at the half-time revision[12] and in 2011.[13]

The Hungarian transport management did not adhere to this transport policy document when devising the New Hungary Development Plan (ÚMFT, 2007) from 2006 on, even though it was only 2 years old at the time, or when preparing the Transport Operative Program (KözOP, 2007) as part of the ÚMFT. When the strategy behind the program was requested in the course of the negotiation with the EU, the transport administration began preparing a new strategy hastily, resulting in the Integrated Transport Development Strategy 2007–2020 (EKFS Green Paper and EKFS White Paper, 2007, followed by the EKFS branch 2008 publication). Its long-term validity is reflected in the fact that a new National Transport Strategy is expected to be prepared by 2013. As a result of this situation, currently the Hungarian Transport Policy 2003–2015, the New Széchenyi Plan replacing the New Hungary Development Plan, the Transport Operative Program derived from the New Hungary Development Plan are all in effect; in addition, even the EKFS has not gone out of effect officially.

2.1. The priorities of Hungarian Transport Policy 2003–2015

The Hungarian Transport Policy and the parliamentary decree approving its improved version[14] name a total of 32 goals in various lists. These goals are not presented in a structured manner, they are hard to comprehend.[15]

The **task** of transport policy:
1 (=3) tasks:

(1) encouraging permanent economic growth,
(2) (goal:) improving the quality of life
(3) through ensuring environmentally sustainable mobility

The **three priorities** of transport policy:

1st priority: (4) building the missing infrastructure,
2nd priority: (5) adhering to the EU's transport regulations,
3rd priority: (6) the establishment of an environmentally friendly transport system

The **five main strategic directions** of transport policy:

1st direction:

(7) improving the quality of life
(8) preserving health
(9) diminishing regional differences
(10) improving traffic safety
(11) protecting the built and natural environment

2nd direction: (12) assisting Hungary's successful integration into the European Union
3rd direction: (13) expanding and improving the relationship with neighbouring countries

[11] Fleischer et al. 2005
[12] Keep Europe moving (2006)
[13] COM(2011) 144 final (White Paper)
[14] Parliament decree 19/2004 (III.26)
[15] This section is based on statements made by Szlávik-Kósa (2004) on the Hungarian Transport Policy for comparison with sustainability and environmental goals. The numbering from (1) to (32) is not from the original document, it just helps overview the list.

4th direction: (14) assisting the fulfilment of regional development goals
5th direction: (15) establishing the conditions for efficient operation through well-regulated competition

The **nine requirements** of the transport development program set by the Transport Policy:

1st requirement: (16) ensuring sustainable development
2nd requirement: (17) improving traffic safety
3rd requirement: (18) enhancing the country's defence capability
4th requirement: (19) providing high quality transport services
5th requirement: (20) utilizing existing transport elements efficiently
6th requirement: (21) building missing infrastructural elements
7th requirement: (22) predictable financing system
8th requirement: (23) competitiveness and efficiency on national and international levels
9th requirement: (24) using modern expertise and technology

The six general transport items serving the achievement of transport policy goals:

1st general item: (25) expansion of the Pan-European network in Hungary through developing a freeway system easing the currently too Budapest-centric system
2nd general item: (26) consolidating transport branches with regard to sustainable development
3rd general item: (27) improving traffic safety
4th general item: (28) decreasing environmental pollution
5th general item: (29) establishing a system of EU conform transportation fees and subsidies
6th general item: (30) increasing the wages of persons working in transport

(+ **two operational-transportation priorities:**

(31) public and non-motorized personal transport and
(32) rail, water and combined freight transport)

From these 32 goals, without any official merit, through selection, we can divide them into two groups:[16] general social-political goals (that are not transport goals but areas served by transport) or *general directions, and comprehensive transport goals.*

The five potential directions of transport policy:

1st direction: improving health and the quality of human life
2nd direction: diminishing regional and social differences
3rd direction: protecting the built and natural environment
4th direction: expanding and improving the relationship with neighbouring countries and the European Union
5th direction: ensuring an efficient, competitive economy

Comprehensive transport goals:

Main priority: the establishment of a sustainable, environmentally friendly transport system, mainly characterized by the following items:

- improving traffic safety
- preference of public transport over individual transport
- item: encouraging rail and water freight transport, and combined freight transport
- efficient use of existing transport elements
- building missing infrastructure, through developing a network dissolving the Budapest-centered system
- providing high quality transport services
- wide-scale use of modern expertise and information technology
- adherence to the EU's regulations, fees and subsidies in transport
- predictable financing system
- implementing the transport tasks set as goals in an internationally competitive and efficient manner

2.2. Transport priorities of the New Hungary Development Plan

- Improving the international accessibility of the country (and its regions)
- Improving regional accessibility
- Integration of transport modes, development of the intermodality and transport infrastructure of economic centres
- Development of urban and agglomeration public transport

[16] Szlávik – Kósi (2004)

These priorities are well-structured and follow regional network logic: the four main priorities may be interpreted as improving *external relations,* improving *internal relations, strengthening freight transport hubs and developing personal transport hubs,* respectively. (In the KözOP document the four priorities became five because – without weakening the logic of division – it divided the improvement of external relations into improvement through road infrastructure and rail and water infrastructure development.)

2.3. The Integrated Transport Development Strategy and its priority

The EKFS (Green Paper and White Paper) used, in lieu of a location-based approach, another type of logic. According to this, the main organizing factors of the strategy are:

1. Strategy of improving personal transport

1.1 Situation analysis
1.2 SWOT analysis
1.3 Key areas derived from the SWOT analysis
1.4 Development challenges and instruments of implementation

2. Strategy of improving freight transport

2.1 Situation analysis etc., see above

3. Strategy of improving transport infrastructure

3.1 Situation analysis etc., see above

4. Horizontal factors in transport

4.1 Traffic safety situation
4.2 Capacity of the environment
4.3 The development of transport energy use
4.4 Smart technologies, application of telematics
4.5 National institutional environment

Based on situation analysis, the EKFS Green Paper specified key areas where intervention is urgent, and developed comprehensive goals with analyzing the reasons. Originally the White Paper was supposed to break down the goals in terms of actions and measures, and to assign financial and action plans to achieve these goals – in practice, the debated and improved Green Paper was named White Paper.

2.3.1. Substantial goals of the EKFS

- Optimizing the modal split of personal transport and preserving the above EU25 share of public transport
- Improving the efficiency of the modal split of public transport through providing co-modality
- Achieving increasing mobility while improving equal opportunities in mobility
- Ensuring the economic sustainability of personal transport through rational organization
- Ensuring a share of environmentally friendly branches over EU25 average in freight transport
- Improving the profitability of environmentally friendly transport modes, and their capability of maintaining infrastructure
- Increasing the share of combined freight transport
- Improving the efficiency of intermodal logistics service centres
- Establishing a main network structure improving economic competitiveness
- Improving regional accessibility on different levels
- Developing the infrastructure of urban and suburban public transport
- Preventing the increased road amortization due to the traffic of road vehicles with increasing axle load
- Pushing the number of road accident fatalities under 500 per year
- Developing more environmentally friendly, energy-efficient transport systems
- Providing long-term sustainability through conscious infrastructure development
- Accelerating the implementation schedule of ITS applications

2.4. New Széchenyi Plan (2011) Transport development Action Plan 2011-2013

The New Széchenyi Plan (ÚSzT) is a comprehensive economic policy program, aimed at addressing three challenges: creating financial stability, competitiveness and economic growth. The plan specifies balance + growth + employment as the three pillars of the desired economic policy.

The official task of the New Széchenyi Plan was replacing the New Hungary Development Plan (ÚMFT), while the operative programs derived from the ÚMFT had been approved by Brussels, and linked development subsidies to them. Therefore only very cautious modifications could be applied in the actual developments. The New Széchenyi Plan was prepared in cooperation by the Ministry for National Economy and the Ministry of National Development, and it contains programs (points of breakthrough) practically only for branches under the authority of these ministries. However, transport is one of these programs, providing reason for presenting the New Széchenyi Plan here. The plan puts great emphasis on problems arising from dual economy, more specifically on the breach between exportable, competitive producers and producers unable to compete, the increasing gap between these groups, and the necessity to slow this process down. Unfortunately, the section on transport, instead of focusing on strengthening the internal relations necessary for this, aims to feed growth by encouraging activities related to the country's location, based on West-East and North-South transport transit – not considering that this may further enhance economic duality. (*"By 2020, Hungary […] will establish its transit economy through logistics developments, taking on the role of a regional hub."* ÚSzT p. 326)

The goals of the above mentioned different transport documents include several priorities that are directly or indirectly related to the energy efficiency of transport (improving co-modality, combined freight transport, ITS applications, public transport support, etc.). A table and detailed analysis of these issues follow. Here we just want to note our general experience that road infrastructure investments were usually prioritized over areas more closely related to energy efficiency when it comes to allocate funds to transport development.

3. ENERGY EFFICIENCY IN THE NATIONAL TRANSPORT STRATEGY DOCUMENTS

3.1. Integrated Transport Development Strategy

Several sections of the Integrated Transport Development Strategy deal with the issue of energy efficiency as well as other related topics. Goals clearly include improving energy efficiency and major instruments necessary to achieve it. The goals specified are vague; the strategy does not name specific areas of involvement. The text emphasizes the need for harmony with EU requirements.

Two areas indirectly related to energy efficiency, co-modality and preserving the share of public transport, or reversing its diminishing tendency, are frequently mentioned in the strategy. The wording of the goal *(preserving the share of public transport over the EU25[17] average)* evokes an important issue, but in light of the dynamic expansion of personal transport, this phrasing is not strong enough, a bolder strategic statement would be needed.

As an instrument of this goal, the strategy specifies the development of urban and suburban public transport infrastructure. It also emphasizes the importance of a nationally integrated smart card system in transport, which could increase the efficiency and attractiveness of using public transport. We should add, however, that while the major transport service providers had signed a letter of intent in this respect, the system has not been launched in the past ten years.

One of the most significant problems of the public transport system is that the pool of vehicles both in municipal and intercity service is outdated, worn-down, both in road and rail transport. The strategy discusses this issue in detail, and proposes the modernization of vehicles.

Strategic goals pertaining to freight transport are limited to maintaining its level. *"Ensuring that the share of environmentally friendly branches remain over the EU25 average in*

[17] Romania and Bulgaria joined the EU in 2007; therefore the transport figures of these two countries were irrelevant in relation to the EKFS.

freight transport" is necessary, but it is not sufficient as a goal because one of the most important tools of improving energy efficiency is redistributing road transport to rail or water transport modes, in which area Hungary shows a declining tendency.

The following sentence in the EKFS contains important information: *"The larger part of the amount available from the KözOP and the ROPs shall be used to develop environmentally friendly modes of transport, specifically the development of rail and public transport, as well as constructing sites for transfer between transport modes, intermodal logistics centres."* This is a very strong notion in terms of shifting towards energy efficiency. The practice, however, shows that road infrastructure development is prevailing, and the constant difficulties surrounding the operation of public transport companies reflect the gap between the plan and reality. This is even more articulated by the short-term debt decreasing program of 2011 not detailed above, Széll Kálmán Plan (2011–2014), specifying potential revenue increasing and expense reducing options for the whole economy, specifying public transport as one of the latter areas with 165 billion forints to be *cut* in the scope of three years.

In terms of the mechanical state of motorized transport vehicles, the EKFS points out the significant increase in the efficiency of passenger cars between 2001 and 2006, and mentions the increase of alternative fuels and related excise duty benefits as potential state subsidies.

The strategy highlights its adherence to the EU's targets, and its coherence with other relevant Hungarian documents.[18] It should be noted, however, that as the EKFS was prepared in 2007, it cannot be in total harmony with the provisions of the EU's new White Paper.

[18] The EKFS specifies the following documents: Hungarian Transport Policy (2003–2015), New Hungary Development Plan, Ministry of Economy and Transport (GKM) Strategy (2007–2010), Urban transport policy concept (2004–2005), Transport Development Operative Program (KözOP) (2007–2013), Economic Development Operative Program (2007–2013), National Regional Development Concept (2005–2020), National Regional Development Plan, National (Lisbon) action plan (2005–2008), National Strategy of Sustainable Development, Energy efficiency section of GKM Strategy (2007–2010), National Environment Protection Program (2003–2008).

In summary we can say that energy efficiency appears in the strategy directly and indirectly from different viewpoints. The direction set by the goals and instruments specified is great, but the way they are elaborated is vague: it may be called an overview of possibilities.

3.2. Transport Operative Program (KözOP) 2011–2013 Action Plan

In the area of energy efficiency, the following priorities can be highlighted in the operative program: *integrating transport modes, developing the intermodality and transport infrastructure of economic centres, improving the international rail and water access to the country and regional centres, developing urban and suburban public transport.*

The subsidy budgets for road and rail/water transport are approximately equal. In the field of urban transport, development of the bicycle network is not prominent, and public transport developments focus mainly on fixed-rail infrastructure, which is favourable in terms of energy efficiency, but limited resources are allocated to the modernization of other transport vehicles.

3.3. Terminology in comparison with EU White paper

The following table contains a list of terms related to the environmental aspects of transport, their frequency and volume share in the EU's 2011 White Paper, the two EKFS papers and the ÚSzT's Transport Development Program. The figures offer an estimate of how well-represented the listed terms are within each document, and in the comparison of the documents. Of course, the terminology of the EU documents and the Hungarian ones are slightly different, and synonyms make it harder to draw straight conclusions (e.g. environment protection, environmentally friendly).

It is an interesting result how underrepresented the terms "climate change" and especially "emission" are in Hungarian documents compared to the EU's 2011 White Paper, even if we take into account how the significance of climate change increased in the time between the publication of the former and the latter. Interestingly, energy efficiency and environmental protection appear more

frequently in the EKFS than in the EU's White Paper.[19] It is clear, however, that the section on transport of the New Széchenyi Plan falls short of all the other documents.

	EKFS Green Paper (83 pages)		EKFS White Paper (100 pages)		New Széchenyi Plan Transport Development Program (39 pages)		EU White Paper (35 pages)	
	Occurrence	Rate	Occurrence	Rate	Occurrence	Rate	Occurrence	Rate
Energy efficient, energy efficiency	27	0.33	29	0.29	1	0.03	8	0.23
Sustainable, sustainability	54	0.65	78	0.78	7	0.18	24	0.69
Environmentally friendly	27	0.33	13	0.13	3	0.07	10	0.29
Environment protection, environmental protection	40	0.48	42	0.42	5	0.13	5	0.14
Eco-friendly	17	0.20	19	0.19	2	0.05	0	0
Climate change	7	0.08	9	0.09	1	0.02	6	0.17
Emission	15	0.18	17	0.17	5	0.12	45	1.28

[19] The terms appear in greater numbers in the New Széchenyi Plan in total, but the section on the green economy development program, which has the most occurrences of the terms "energy efficient" and "energy efficiency", has no overlap with the transport development program, therefore the analysis of the frequency of terminology cannot be extended to the whole of the document.

4. OTHER DOCUMENTS IN WHICH TRANSPORT ENERGY EFFICIENCY (OR TRANSPORT IN GENERAL) IS FEATURED

	Type of document	Action plan	Strategy	A summary of the transport related goals featured in the document	Evaluation
1.	environmental	National Environmental Protection Program 2009–2014 (Parliamentary Decree 96/2009 (XII. 9.))		- The European Commission's 2007 climate and energy package prescribes a biofuel share of at least 10% in terms of energy content within transport gas and diesel use. The Program's task is achieving this goal time-proportionately. - Establishing more sustainable municipal transport systems - Slowing down or stopping processes diminishing the modal share of individual and public transport, and improving this share. - Efficient harmonization of different transport vehicles and modes (individual and public). - Making individual motorized transport more environmentally friendly, especially restricting the environmental impact of passenger car transport. - Supporting, developing individual, non-motorized transport modes.	The goals pertaining to transport are in compliance with the goals of the EKFS, but they also touch on narrower fields as well, and are also rather general. The measures assigned to goals, divided into government and local government categories, offer more specific guidance. The document primarily lists transport planning and organization instruments (e.g. intermodality, the support of alternative transport modes, municipal mobility plans, public transport infrastructure development); possibilities related to technical factors of vehicles and alternative fuels are less pronounced. The program was created as a framework document, it does not contain a detailed list of tasks and allocated resources.
2.	energy		National Energy Strategy 2030 (Parliamentary Decree 77/2011 (X. 14.))	- Increasing the share of electric (road and rail) and hydrogen (road) fuel to 14%; and the share of agro-fuel to 15% by 2030 - Achieving a 10% share of renewable energy sources in transport by 2020	The energy strategy assigns a separate section to the future of transport, summarizing the possibilities of improving energy efficiency. These are the following: decreasing mobility needs, transferring to more efficient transport modes, optimization (better use of existing

				(EU target) - Significantly increasing of electric vehicles in transport, and increasing the modal share of public and rail transport	capacities), development of vehicles and alternative technologies. It also discusses the requirements for producing alternative fuels and regional infrastructure platforms (Ro-La) in relation to renewable energy sources. The strategy does not go beyond a brief introduction of instruments. There are few elaborate task definitions (an interesting example is the demonstration of market-ready electric, hydrogen and hybrid drives by 2015 in terms of model projects). The goals specified in the strategy are in accordance with the EKFS, and this document is similarly generalized, except for the 2030 target figures of transport energy use.
3.	renewable energy	Renewable Energy Action Plan 2010–2020 (National Ministry of Development)		Optional goals: - Supporting the procurement of public transport vehicles using fuels with high bio-fuel content - Supporting electric vehicles, financial subsidy constructions for zero emission vehicles, establishing charging network - Infrastructure helping the expansion of green public transport - Launching an electric mobility program	The major topic of the action plan is biofuels, detailing the elements of the compulsory mixing system. In terms of a vision for the future, the document contains only proposals, not specific targets. The most significant element that is in compliance with the EKFS and the other strategies is the proposal to replace the public transport vehicle pool with more energy efficient vehicles or ones driven by biofuel / alternative fuels. In other aspects it has little in common with the main strategy.
4.	energy efficiency	Hungary's 2nd National Energy Efficiency Action Plan until 2016, with regard to 2020 (Government Decree 1374/2011 (XI. 8.))		Decreasing transport-related energy consumption through the following targets: - Changing transport habits – target figure for 2016: 1.80 PJ - Shifting freight and personal transport from road transport to rail transport – target figure for 2016: 0.90 PJ	The action plan contains several specific issues, more than other similar Hungarian documents. One of its advantages is that it contains energy target figures for 2016 for the specified goal areas of action. However, there is a lack of specifics in terms of estimated costs of goals and the relevant authority, making it difficult to achieve the goals. The contents of the energy efficiency action plan are rather general, and in

				- Shifting from individual transport to public transport– target figure for 2016: 0.60 PJ - Diminishing the fuel consumption of road vehicles, increasing their efficiency, increasing the share of biofuels in fuel consumption – target figure for 2016: 1.30 PJ - Saving a total of 4.60 PJ by 2016	compliance with the EKFS, but the only more elaborately discussed topic in relation to the legislation pertaining to green procurement is the replacement of the pool of public transport vehicles.
5.	sustainable development		National Framework Strategy on Sustainable Development (Parliamentary Decree 18/2013. (III. 28.))	- Spatial organization that diminishes travel and transport needs, or satisfies them sustainably - Reviewing BAT (Best Available Technology) guidelines in terms of supporting attempts to optimize shipping distances - Supporting the creation of supply chains suited to local conditions - Supporting the increase of the share of biofuels in energy consumption	The resource-related problems listed in the National Framework Strategy on Sustainable Development include the increase of mobility needs, but there are no directly related response measures or goals. Personal and freight transport are not presented on their own merit, only as parts of other areas, therefore any goals related to transport are mentioned without reference to transport in the document. This is a step back from the National Sustainable Development Strategy approved in 2007.
6.	climate change		National Climate Change Strategy 2008–2025 (Parliamentary Decree 29/2008 (III. 20.))	- Compulsory CO_2 standards in road transport - Investment into appealing public transport vehicles and non-motorized modes of transport - Limiting the specific CO_2 emission for passenger cars at 120 grams by 2012 - Promoting second-generation biofuels and limiting the specific CO_2 emission for passenger cars at 100 grams by 2025	The strategy mainly lists suggestions and potential areas, instruments of involvement. These are on a wide scale, and the document refers to the National Energy Efficiency Action Plan. It does not include a detailed and scheduled set of targets. The instruments listed are in harmony with the goals of the EKFS, some are discussed more in depth, but there are no specific goals with deadlines in other relevant strategies.
7.	other		New Széchenyi Plan	- Realizing the "user pays" principle in operation by 2020 - Restricting the modal share of road	The plan's goals and instruments related to transport match the priorities of the EKFS, some are more articulated and detailed, but it lacks

				transport to maximum 50% - Achieving a 30% share of alternative energy use in road transport - Developing rail infrastructure, modernizing rail car fittings - Integrated schedule with related transport branches - Increasing the modal share of rail transport - Improving the navigability of the Danube - Integrating water transport in domestic personal transport, strengthening its role in freight transport - Developing ship pool from the "green budget" (environmental impact fees of other transport branches) - The development goal for public ports is the establishment of multi-modal connections - Increasing the share of urban public transport to 50% - Increasing the modal share of bicycles to 10% in Budapest, to 15–20% in bigger cities, to 20–50% in smaller municipalities - Launching a national electronic integrated ticket system in public transport	specifically defined tasks. The allocation of tasks and resources belongs to the Transport Operative Program, which is part of the New Széchenyi Plan, see sections 2 and 3.

5. SUMMARIZING EVALUATION

From the strategies and action plans analyzed, the Integrated Transport Development Strategy (EKFS) was the latest comprehensive transport framework document. However, its transport energy efficiency goals were not fully developed, complete with deadlines, responsible persons and budgets in any of the related strategies / action plans. None of the related documents reference the EKFS precisely, wherever specific, quantified targets are present, those are the given document's "own" goals.

In terms of assigning tasks and undertakings it should be noted that the Transport Operative Program (KözOP) contains more current and specific goals than the EKFS, and while it includes energy efficiency priorities as well, these could be much more efficient.

The currently prepared National Transport Strategy, which is supposed to become the top framework strategy after the Hungarian Transport Policy of 2004 and the EKFS of 2007, should regard the general strategic goals set in the EU's White Paper as minimum requirements. It is an important question what emphasis the new strategy will give to transport energy efficiency. This issue should be treated as a highlighted, separate area of action to provide it a unified framework. This would clarify how many approaches there are to transport energy efficiency, and how the seemingly separated areas can be aligned to achieve more efficiency through synergy.

In terms of practical implementation, it would be fundamentally important to harmonize the resources allocated to transport development and the energy efficiency related areas stressed in each strategy (shifting to rail freight transport, increasing the share of public transport, modernizing the public transport vehicle pool, supporting alternative transport modes, etc.) of public, thus to put an end to the dominance of road infrastructure development.

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CZECH REPUBLIC

1. GENERAL INFORMATION ABOUT THE TRANSPORT SYSTEM OF THE CZECH REPUBLIC

Country/Capital[20]	Czech Republic/Prague
Territory	78,867 km^2
Population/population density	10,548,527 capita, 133 capita/km^2
GDP / GDP per capita (year 2010)	153,465 EUR
Passenger vehicles/capita	0.43
Share of transport sector in national greenhouse gas emissions (year 2009)	13.9%, 18,512 Mt $CO_{2ekv.}$
Share of transport sector in national energy consumption (year 2009)	27.4 %, 281.6 PJ
Length of total road network, length of highway network	55,756.6 km, 740.9 km
Length of rail network	9,470 km
International transport role of country	Transit and export destination

1.1. Modal split

In the Czech Republic passenger car is the determinative transport method. Unlike the other three countries, data includes urban transport and air transport as well. Without sea and large rivers, waterways are less significant.

Passenger transport performance by types of transport (2010)[21]

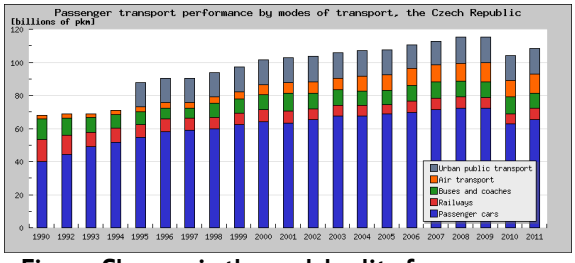
Passenger road transport – 60.58 %
Railway – 5.77 %
Public road transport – 9.62 %
Air transport – 9.62 %
Urban public transport – 14.42 %

Freight transport performance by types of transport (2009)[22]

Road transport – 78.41 %
Railway – 21.11 %
Water and air – 4.93 %

In 2010 the share of road and air transport decreased a little, probably as a delayed effect of the economic crisis (and also probably due to change of used methodology).[23]

The share of public land transport (railway, buses and urban public transport) between 2009 and 2010 rose from 27.4% to 30.7%, whereas passenger car transport has decreased from 62.7% to 59.2%. In 2010, 2.26 billion passengers used urban public transport. Of total individual transport performances, urban public transport makes up 14.5 %. This share is stable.[24]



7. Figure: Changes in the modal split of passenger transport (www.cenia.cz)

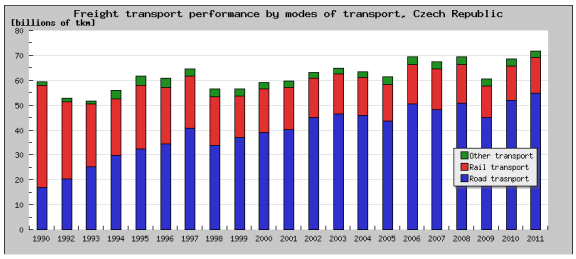
Of all EU countries, the Czech Republic sees the most travel by public transport: the average amount of kilometres per year per capita travelled on public transport by Czechs is 3010, second with 2900 are Austrians, third are Belgians with 2780, and fourth are Hungarians with 2690.[25]

In 2010 transport performance in freight transport rose by 13.8%; transport

[20] Data in the table: CENIA. Information system on statistics and reporting
Czech Statistical Office
[21] ibidem
[22] ibidem
[23] ibidem

[24] CENIA. Information system on statistics and reporting
Czech Statistical Office
[25] VCÖ-Studie,
http://www.vcoe.at/de/presse/aussendungen-archiv/details/items/Ausgabe2011-142

performance in freight transport by rail rose by 7.7% and on road by 15.3% a year. In river transport only freight transport is economically significant. Passenger river transport is rather used for fun and leisure time.[26]



8. Figure: Changes in the modal split of passenger transport (www.cenia.cz)

In the context of the EU, individual Czech road transport performance per capita is still a little bit lower than the EU average. But the number of registered cars continued to grow. Unfortunately the age of the car stock is constantly very high: in 2010 it even grew to 17.1 years on average. Thus emissions per unit of transport performance are higher than the EU average.[27]

1.2. Basic characteristics of transport network

1.2.1. Public road network

The density of roads and highways in the Czech Republic is quite sufficient, but the quality is weaker than in Western Europe. The density of railways is high, but the country lacks high-speed lines. Most lines are west-east oriented and operated by the state owned company "Ceske drahy".

9. Figure: Road network in the Czech Republic (http://sgzemepis.wz.cz/cesko.htm)

On highways, individual users are obliged to buy a "highway stamp" every year (roughly EUR 60 per car for the year in 2012). On highways and some sections of main roads vehicles above 3.5 ton are obliged to pay tolls. The size of the toll fee depends on the length of the route, the type of track and the vehicle's emission class. Unfortunately Czech carriers tend to bypass charged routes and instead go through villages and cities.

1.2.2. Railway network

The railway system is fairly dense in the Czech Republic. Over the last decades, though, the network has lacked investment, thus the modernisation of the country's railway tracks is very delayed in comparison with Western Europe. Over the last year many local lines have been closed because of an outflow of passengers.

10. Figure: Railway system in the Czech Republic (http://www.cdv.cz)

Two combi-tracks exist in the Czech Republic. Both start in Lovosice (northern Bohemia), and one terminates in Duisburg, the second in Hamburg.

1.2.3. Fuel consumption

The consumption of gasoline has stagnated since 2000, but the consumption of diesel has increased by 64.3% since 2001. In car transport the consumption of LPG (Liquefied petroleum gas) is stable, whereas the consumption of CNG (Compressed natural gas) has been increasing slowly.[28] In general in the Czech Republic alternative fuels are used rather sparsely.

[26] CENIA. Information system on statistics and reporting Czech Statistical Office
[27] ibidem
[28] ibidem

Advantages (+) and disadvantages (-):

- The Czech Republic is unfortunately not able to effectively regulate the boom in passenger car numbers. Especially in cities, car transport causes a huge health and noise problem. Emission limits are very often exceeded.[29]
- The car stock in the Czech Republic is very old and therefore consumes more fuel and produces more emissions.
- The age of the train stock is also very high, and the railway system is less efficient then it could be.
- The country lacks high-speed rail infrastructure.
+ The railway network is dense
+ Urban public transport system is fairly well developed and – in comparison with other countries – a bigger share of inhabitants uses it.
- The construction of road infrastructure is quite often accompanied by corruption (Czech highways are more expensive and inferior than the EU-15 average).
- The conditions for the operation of different types of transport are not equal: road transport users receive benefits; while the polluter pays principle is not implemented enough.
- Cycling infrastructure is very poor and often constructed in a way that is dangerous for the cyclist.
+ There is a strong freight transport company CD cargo (annually it transports up to 1 million tons of goods).
+ There is a dense network of sidings.
+ Tourist routes (for pedestrians) are very dense and of high quality.
- Toll routes need to be expanded.

2. PRIORITIES OF THE NATIONAL TRANSPORT STRATEGY

2.1. National transport strategy

The basic document is the Transport Policy of the Czech Republic. The current document was approved for the period 2005-2013 and was actualised in 2011.[30]

2.1.1. Main goal

The main goal of the transport policy is to create the conditions for the attainment of quality transport, based on the principles of competition and focused on its economic, social and environmental impacts in the framework of sustainable development, and to lay the foundations for the commencement of efficient changes related to the share of types of transport.

List of priorities (in bold) and appropriate goals:

The attainment of the appropriate division of transport performance among types of transport by ensuring equal conditions on the transport market

- Managing the growth of transport demands and the influence of globalization in transport.
- The harmonization of conditions of the transport market and charging of the user.
- The improvement of transport work in public passenger transport.
- The improvement of transport work in freight transport.
- The transformation of the railway sector.
- The improvement of transport services for users.

The attainment of quality transport infrastructure

- The maintenance and recovery of current transport infrastructure.
- The construction and modernization of transport infrastructure.

The attainment of finance in the transport sector

- The optimization of reimbursement for public services.
- Securing of finance for transport infrastructure.
- Financing of transport infrastructure recovery.
- Financing of research.

Improvement of internal and external transport security

- Security of road transport.
- Security of railway transport.
- Transport of dangerous substances.
- External security of transport.
- The protection of civil aviation against illegal acts.

[29] Czech Hydrometeorological Institute, www.chmi.cz
[30] http://www.mdcr.cz/cs/Strategie/Dopravni_politika/

Support to transport development in regions

- The development and construction of transport systems.
- The regulation and charging of transport in cities.
- Using the potential of non-motorized transport modes.

As mentioned above the Transport Policy is the umbrella document. Moreover priorities and goals are further elaborated in

- Strategy of support for transport accessibility (focused on public transport)
- General plan of transport infrastructure
- Strategy of development of cycling transport
- Innovative technologies
- National strategy of road transport security

2.2. General plan of transport infrastructure

The General plan of transport infrastructure was not developed sufficiently. Therefore the process of development of Transport Sector strategy was launched. So far the first phase was finished (it is short-term, until 2013), the second one is in process (will be long-term until 2030). This strategy focuses on transport infrastructure development of particular transport modes. The overall goal is to support the competitiveness among particular transport modes and use fully the positive aspects of the particular transport modes.

After finishing the second phase, the set up of Operational Programme Transport (EU Funds) will be accordingly reviewed.

One of the opening statements says:

„The problematic of road transport will be solved with regards to requirements of the European transport policy and the Strategy of sustainable development. That means that the needs of population regarding the road transport will be met, while with an alternative of public transport will be offered."

2.2.1. Priorities and measures

The list below contains the most important priorities and the planned related measures of the document.

Securing of environmental and health friendly transport services:

- Implementation of co-modality principles and use of comparative advantages of all transport modes
- Implementation of green corridors
- Optimization of logistic processes
- Implementation of integrated transport systems in individual transport
- R&D of new energy resources for transport and development of more efficient drive units
- Removal of old environmental burdens caused by transport infrastructure
- Increase of throughput of transport infrastructure for wild animals
- Implementation of anti-noise measures
- Securing of the compliance with emissions limit
- Support of energy efficiency projects
- Support of railway electrification
- Calm down of transport in cities, construction of bypasses
- Maximal use of all capacities of environmental friendly transport modes

Securing of continuity among different transport modes:

- Support of creation of public logistic centres that will enable the development of multimodal transport modes
- Support of multimodal and combined transport
- Implementation of transport systems for multimodal transport
- Support of new concepts of city supply on the principle of city logistics
- Support of systems for park and ride places and support for continuity of individual car and public transport

Increase of transport security and awareness;

Securing of conditions for high quality aviation;

Securing of conditions for quality river transport;

Support of development of non-motorised transport:

- Construction of cycling infrastructure
- Segregation of cycling transport from other transport modes
- Development and innovation of pedestrian zones

Support of modern public transport

- Rail transport should be the backbone of public passenger transport
- Development of vehicle stock for public transport
- Better standards in public transport

Better availability of the regions by a better road transport and rail transport

- Complete the Modernization of transit corridors
- Modernization of rail hubs
- Modernization of other railways

Quality improvement of rail transport

- Implementation of modern technologies in rail transport
- Development of services in rail transport
- Conditions for non-discriminating business for all carriers

There is also an accompanying strategy for support of logistics in order to create transport hubs of connected networks and create conditions for concentration of transport streams as a necessary condition for combined transport.

2.3. Subsidies

- The state subsidy programme (Ministry of Industry and Trade) is dedicated to support energy efficiency measures and the use of renewables, but none of the activities is explicitly focused on transport.
- Operational programme Transport (Ministry of transport): below in detail
- Programme for supporting efficiency and security in transport (Ministry of transport): the only environment related supported activity is hardware and software for the optimisation of the effective load of transport and route planning.
- Programme for modernisation of public buses (Ministry of transport).31

2.4. Operational Programme Transport

Priorities of the document:

- Modernization of rail network TEN-T
- Construction and modernization of highways and road network TEN-T
- Modernization of rail network not included in TEN-T
- Modernization of main roads not included in TEN-T
- Modernization and development of Prague subway and development of the management system of road transport in Prague
- Support of multimodal freight transport and development of inland river transport

3. ENERGY EFFICIENCY IN THE NATIONAL TRANSPORT STRATEGY

Energy efficiency as such is not mentioned in the transport policy document. The topic of energy efficiency is not a big issue for Czech decision makers in the field of transport.

3.1. The most important energy related terms and goals

- to minimise the negative impacts of noise and emissions from transport by appropriate measures in the infrastructure and by incentives to minimise noise from vehicles.
- in order to improve the quality of life in cities it is essential to reduce the emission of risk components in the air by creating good conditions for LPG cars and electro mobiles.
- strengthening the competences of technical supervision in the technical inspection of vehicles.
- removing environmental burdens caused by current infrastructure.
- minimising the negative impacts of transport on ecosystem stability in the landscape, its structure and function.
- reflecting the level of external costs in the charging for the use of transport infrastructure.
- solving the problem of noise limits.

The transport policy of the Czech Republic also includes a vision for 2014-2020. Of all the goals, those most relevant to the environment are given below.

3.1.1. Vision for 2014-2020

- Work on transport issues relevant to EU strategic goals.

[31] Ministry of transport. www.mdcr.cz

- Further harmonise the conditions of the transport market especially through the internalisation of externalities.
- Exercise the duty to pay tolls.
- Consistently exercise the principles of environment protection and the implementation of alternative energy sources.
- Continue the optimisation of the railway network, finish the construction of high-speed tracks.
- Realise measures for environmental protection and the protection of public health, realise measures to reduce transport-related GHG emissions.

3.2. Terminology in comparison with the EU White Paper

In the EU's strategic document many of the goals are very specific and progressive. In the Czech strategy, on the other hand, the goals are rather general and conservative. For example, the EU goal of removing oil dependency is not mentioned in the Czech strategy at all. The EU also requires a more significant reduction of GHG emissions and also states specific numbers, unlike the Czech strategy. Support for multi-modal transport is included in both documents, although again in the Czech strategy it is very general. The same is true for urban public transport, alternative fuels and railway development.

The following table contains a list of terms related to the environmental aspects of transport, their frequency and volume share in the EU's 2011 White Paper, and the Transport Policy. As the terminology of the EU and the Czech document are slightly different, a straight conclusion cannot be drawn in all aspects.

However, it is clear that energy efficiency is not among the priorities of the Transport Policy, as this phrase is entirely missing from it. Terms related to the climate change are also underrepresented, despite their significance on the field of transport. Only in the case of the phrase "sustainability" can the Transport Policy match the White Paper, nevertheless, only in absolute terms, as the rate is significantly lower.

	Transport Policy of the Czech Republic (63 pages)		EU White Paper (30 pages)	
	Occurrence	Rate	Occurrence	Rate
Energy efficient/efficiency	0	0	7	0,23
Sustainable/sustainability	23	0,37	26	0,87
Environmentally sound	5	0,08	0	0
Emission	2	0,03	37	1,23
Climate change	2	0,03	6	0,20
Greenhouse gases	3	0,05	11	0,37
Ecologic	6	0,10	0	0
Carbon	1	0,02	11	0,37
Energy resources	1	0,02	2	0,07
Energy intensity	1	0,02	0	0
Energy sound	1	0,02	0	0

4. OTHER DOCUMENTS IN WHICH TRANSPORT ENERGY EFFICIENCY (OR TRANSPORT IN GENERAL) IS FEATURED

All the documents are linked to each other, they include references. In general terms, the goals of the particular documents are coherent, but very general. Sometimes incoherencies are caused by documents that were not updated for some time (not all the strategies are actualised every few years: when we compare an old document with a new one, there tend to be some irregularities).

Of course, all ministries have to implement EU goals in their policies, but usually they do so at the minimum compulsory level (thus lacking more ambitious goals).

	Type of document	Action plan	Strategy	No. Reg. number, effect, issuer	Summarise the transport related goals featured in the given document.	Evaluation
1.	environmental		State environment policy	Ministry of environment, 2004-2010	Internalise externalities in transport, Support of public transport and railway, support of multimodal transport, reduce emissions and noise, in all strategy documents consider the support of eco-friendly ways of transport, support cycling and build cycling routes, support railway.	Coherent, but very general
2.	energy		State energy policy	Ministry of trade and industry, 2010	Increase the share of freight transport on railway to 40 % and of passenger transport on railway to 30 % in 2030, decrease the energy consumption of road and railway transport, meet the emission limits (in accordance with the EU goals), in most vulnerable regions monitor the dust concentration, higher the share of renewables, energy efficiency transport (nothing more specific).	More specific (quantified goals) – not able to evaluate coherency when the main transport policy document is without quantified goals
3.	energy efficiency and renewable energy		National programme for energy efficiency and renewables	Ministry of trade and industry, 2006-09	Energy efficiency and alternative fuels in transport.	Coherent, but general
4.	energy efficiency	National Action Plan in Energy efficiency (2^{nd})		Ministry of trade and industry,	Decrease the emission and energy intensity of new cars, modernization of trams, construction of infrastructure for multimodal transport, increase energy efficiency of rail transport.	The transport policy does not explicitly demand decrease of energy and emission intensity of new cars (but it has to be fulfilled anyway because of the EURO standards)
5.	sustainability/sustainable development		Strategy of sustainable development of	Ministry of environment, 2004-09	Good transport infrastructure, good transport service, conditions for sustainable mobility of passengers and	More focus on sustainability (at least a difference of used terms)

			the Czech Republic		freight, development of eco-friendly types of transport, development of multimodal transport, equal conditions for all carriers on transport the market.	
6.	sustainable development		Strategic framework for sustainable development in the Czech Republic	Ministry of environment, 2010	Reduce the independency on fossil fuel imports, finish the construction of TEN-T, build cycling routes, realize engineering and organisational measures to ensure the flow of road transport (and emission reduction), modernize railway, increase energy and economic efficiency of transport, prepare for oil peak, support public and multimodal transport, internalize externalities.	Explicitly, the transport policy does not include reducing independency on fossil fuels; the transport policy includes demand for efficient transport, but no explicitly demand for energy efficiency in transport; this framework has a broader context
7.	climate change		National programme for mitigation of impacts of climate change in the Czech Republic	Ministry of environment, 2004	Application of international technical standards for transport means, support of gradual shift of part of passenger and freight transport from road and air to railway, multimodal transport, construction of appropriate infrastructure for development of non-motorized types of transport, support of public passenger transport, development of infrastructure and implementation of integrated transport systems, improvement of organization and regulation of road transport, support of research and application of alternative fuel types, use of natural gas, construction of separated dense network of cycling routes as an emission-free every day alternative.	More focused on environmental friendly transport modes

5. SUMMARISING EVALUATION

For the transport sector, the Transport Policy is the main document. Several particular programmes focus on some fundamental parts, but none of them on energy efficiency or the environmental aspects of transport (one exception is a specific cycling strategy). There are also plenty of National action plans for particular regions and agglomerations.

For the energy sector, the State energy policy is the main document. Other documents such as National Action Plans are subordinated.

For the environment sector, the State environment policy is the main document.

EU legislation takes precedence, and the Czech Republic is obliged to implement it. The main target numbers (i.e. 20% of renewables) are also taken from the basic EU documents.

The main document does not always have the most powerful impacts. Documents for particular topics are more detailed and include quantified goals.

Recommendations:

- Invest in the modernisation of railway infrastructure; build high-speed tracks that are capable of competing with road and air transport.
- Invest more in and support urban public transport so that it helps to solve the problem of exceeding emission limits in cities.
- Implement tolls in city centres and/or low-emission zones.
- Invest in cycling routes.
- Internalize externalities so there are fair conditions on the transport market.

6. SOURCES

- CENIA – Information system on statistics and reporting Czech Statistical Office
- www.mdcr.cz (Ministry of Transport)
- Transport Policy of the Czech Republic for the period 2005-2013, actualised in 2011, Ministry of Transport, approved by the governmental resolution nb.565 on July 20 2011 (http://www.mdcr.cz/cs/Strategie/Dopravni_politika/)
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- State environment policy 2004-2010, Ministry of Environment, 2004
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- National Action Plan in Energy Efficiency (2nd), Ministry of Trade and Industry, 2011
- Strategy of sustainable development of the Czech Republic 2004-09, Ministry of Environment, 2004
- Strategic framework for sustainable development in the Czech Republic, Ministry of Environment, 2010
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- http://sgzemepis.wz.cz/cesko.htm
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POLAND

1. GENERAL INFORMATION ON THE TRANSPORT SYSTEM OF POLAND

Country/Capital[32]	Poland/Warsaw
territory	312,679 km^2
Population/population density	38,200,037; 120.92/ km^2
GDP / GDP per capita in 2011	386.12 billion/ 10,108.20 EUR
Passenger vehicles/capita	451/1000 inh.
share of transport sector in national greenhouse gas emissions (2009)	10.8 % (or tons if available)
share of transport sector in the national energy consumption	final energy consumption - 24%, 15.5 Mtoe
length of total road network, length of highway network	273,759.8 km (with hard surface only)/ 857.4km highways/ 674.7 km expressways
length of rail network	20,228 km
international transport role of country	transit country

1.1. Modal split

In Poland, passenger car usage is on the highest level of the V4 countries and railway is on the lowest. As Poland is the only maritime country of the four, in freight transport waterways has a significant role.

Passenger transport (2010)[33]

Passenger car transport – 85.6%
Railway – 5.4 %
Public road transport – 6.5%
Air transport – 2.5%

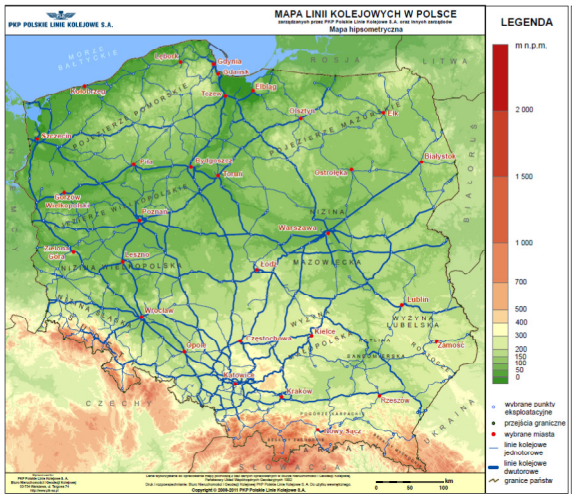
Freight transport (2010)[34]

Road transport – 76.19 %
Railway – 16.67%
Maritime – 6.71%
Inland waterways – 0.32%
Air – 0.11%

1.2. Basic characteristics of transport network

1.2.1. Railway network

The density of the railway network is high in the Western regions and very low in the (North-) Eastern regions. Railway stations in the Eastern regions are often located outside the city centre. There are cities of over 100,000 inhabitants without regular railway services. The length of the railway network may be misleading when judging the state of Polish railways, as many of the railway lines are without regular railway services and in a sorry state. These account for about 7000 km of lines.



11. Figure: Main railway system of Poland, showing double-track (bold) and single-track lines (thin).[35]

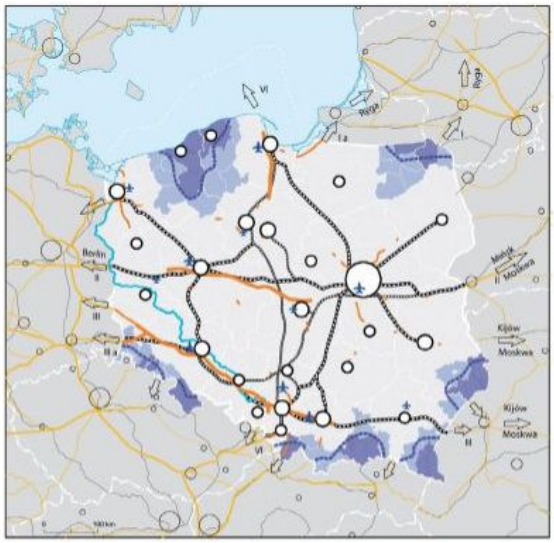
1.2.2. Public road network

About half of the roads are in a bad state. This relates to about 40% of national roads and about 50% of other categories. Many national roads lead through the centres of major cities. National roads are rich in speed limits because they run through built-up areas, but the control of speed limits is rather poor.

[32] Data in the table: Central Statistical Office
[33] ibidem
[34] ibidem
[35] www.plk-sa.pl

12. Figure: Main road system of Poland – main (red) and secondary (khaki) national roads[36]

There is no regular line of Ro-La transport. Intermodal transport routes arriving in Poland from Western countries become road transport routes at the border.



13. Figure: Transport system of Poland. Railways above 120 km/h: black; highways and expressways: orange[37]

2. PRIORITIES OF THE NATIONAL TRANSPORT STRATEGY

The main document of the Polish transport strategy is the National Transport Policy 2006-2025, prepared by the Ministry of Infrastructure (available in Polish only).

2.1. Main priorities:

- radical upgrade of the road system (all categories), development of highways and express roads – primarily through financial support from the state;
- to increase the competition among railway operators in order to improve the state of the railway system; to make railway transport more efficient; to improve the rail infrastructure and diminish the cost of access– with some financial support from the state;
- to make the transport system safer, with special focus on lowering the number of deaths in road accidents;
- to improve the quality of public urban transport and its competitiveness in relation to individual road transport; to improve the conditions for pedestrians and cyclists with special attention to the handicapped;
- to improve the quality and competitiveness of public transport in metropolitan areas, through better organization of railway systems and infrastructure – with some financial support from the state;
- development of intermodal system with public support – a particularly neglected area;
- development of air transport market – to remove barriers for small operators and regional airports – with some financial support from the state;
- to enhance the role of airports and seaports by making them more accessible;
- to support operators in making their offer available on a European and transcontinental scale;
- to improve the functioning of inland water transport through modernizing the infrastructure and supporting operators in fleet renovation.

2.2. The most important issues

- improvement of infrastructure in the most important transport corridors;
- improvement of the transport systems in metropolitan areas as important transport nodes;
- supporting operators in competing in trans-European and transcontinental transport.

[36] http://www.berlin.polemb.net/?document=858
[37] National Spatial Development Conception (2011)

The Policy implementation takes place separately in each transport branch. Therefore we have subsequent operational documents:

- **Program for construction of national roads 2011-2015**:
  Enumerates the investments to be done and shows their costs only; the plan does not pay attention to energy issues; an EIA report has been prepared which did not state any far-reaching conclusions relating to climate and energy issues
- **Multi-annual program for the modernization of railways 2010-2013:**
  Enumerates the investments to be done and shows their costs only; the plan does not pay attention to energy issues, an EIA report has been prepared which did not state any far-reaching conclusions relating to climate and energy issues)
- **Master plan for the railway sector up to 2030**:
  More advanced plan for the railway sector dealing with the economic organization of the whole sector; one of the aims is to make the transport sector more sustainable through making railway more competitive and efficient; there are some indicators directed towards environmental matters (but not energy issues) like: reduction of the external costs of transport; reduction of railway noise)

There are no separate plans for navigation and air transport; actions in these sectors are implemented on a case by case basis.

3. ENERGY EFFICIENCY IN THE NATIONAL TRANSPORT STRATEGY

The issue of energy efficiency or sustainability is not explicitly mentioned in the document. There is a chapter dedicated to transport and the natural environment which does not go beyond the usually used slogans about the necessity of:

- going along with the EU climate policy;
- paying attention to the EU nature protection policy;
- long-term transport planning;
- promoting non-motorised transport;
- internalizing external costs of transport;
- increased focus on environmental matters in infrastructure management and design;
- integrating transport policy with spatial planning etc.

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The document is only 54 pages long and it barely uses the terms "efficiency", especially "energy efficiency" (once in the whole document), "sustainability" (used a few times in the document), etc. The terms "low carbon" or "carbon neutral" are not mentioned in the document.

In my opinion, the authors of the document refrained from using the terms mentioned above deliberately. They wanted to keep the policy's sustainable direction without using too many slogans. The policy does include many sustainable proposals, esp. the need to minimize the demand for transport and to promote energy efficient means of transport. These rules, however, are too general and there are no accountable indicators and goals set for their implementation. In effect, the document is weak and can serve as a basis for any transport policy (it is highly dependent on interpretation), not only a sustainable one.

The document was prepared before the 2011 EU White Paper on transport, so it does not correspond with it directly. Because the transport policy of Poland is very general in its goals, rules and actions it might be interpreted in a way which largely corresponds with the EU 2011 transport policy.

4. OTHER DOCUMENTS IN WHICH TRANSPORT ENERGY EFFICIENCY (OR TRANSPORT IN GENERAL) IS FEATURED

	Type of Document	Action plan	Strategy	Summary of the transport related goals featured in the given document.	Relevance, coherence, relation to main transport strategy
1.	environmental		Environmental policy	Opening the Ro-La line between the Eastern and Western borders of Poland by 2010 (not realised); reduction of transport noise is proposed to be achieved through the introduction of car-free zones, replacing old vehicles with new ones, the construction of noise barriers and setting speed limits. No more transport specific goals are set.	Consistent with transport policy. Gives higher priority to different goals than transport policy. So far irrelevant to what is going on in reality.
2.	energy		Energy policy	Achieving a 10% share of biofuels in transport fuel consumption in 2020 by raising the obligatory bio-component share in fuels (administrative instruments). No more transport specific goals are set.	Relevant to transport policy, but goals set are not stated in the transport policy.
3.	renewable energy	National action plan for renewable energy		Promotion of biofuels and bio-components in transport up to 2020 – up to a 10.5% share. Electric cars are expected to have a very low share by 2020. Energy consumption will rise the most in the transport sector among all sectors until 2030.	Partially consistent with transport policy. Some of its goals are not stated in transport policy.
4.	energy efficiency	National action plan for energy efficiency		In the transport sector around 10,000 GWh should be saved by 2016. Mainly through more efficient management of transport flows, the modernization of vehicles used in public transport and promotion of eco-driving.	Seems to be inconsistent with the transport policy. Sets out goals that have not been stipulated in the transport policy.
5.	regional development		National Strategy for Regional Development	The goal for transport is to provide the transport infrastructure necessary for regional development, to increase the connectivity between main cities and on an international level, and to increase mobility. The main actions involve the construction of high quality infrastructure for fast movement of goods and people (highways,	Consistent with transport policy, but sets out more ambitious goals that are even less energy efficient than those in the transport policy.

				high speed railways), but also the promotion of efficient public transport. By 2020 68% of people will be able to reach the corresponding regional centre within 60 minutes by road transportation.	
6.	space		National Spatial Development Conception	Enhancement of the transport accessibility of the country through construction of new transport infrastructure. It is at the same time proposed to minimize car transport in cities by increasing the role of public transport, especially metropolitan railway systems. The road system connects all the main cities by highways or expressways (with full rings around all cities) and high speed railway lines. Upgrade of infrastructure is deemed as the main efficiency effort. The share of railway in the modal split rises, but air transport also becomes more significant.	Consistent with transport policy and even more ambitious in construction of infrastructure.
7.	economic		National Development Strategy	The overall aim is to make transport more efficient. The goals are: making transport management more efficient; modernization and construction of new infrastructure; unblocking city transport systems. Through implementing the strategy, the accessibility of Poland and Polish regional centres should improve and more environmentally friendly transport options should appear. The document usually talks about an "effective, but sustainable" Polish transport system. In the text there is also room for action aimed at reducing traffic accidents on roads.	Consistent with transport policy
8.	European funding		Operational Programme Infrastructure and Environment	Contains 4 transport priorities: road and air TEN-T network, environmentally friendly transport, transport safety and national transport networks. Overall division of funds is 85% to road transport and 15% to rail transport (without taking into account air and water transport). Urban public transport financing issues are significant. The	Consistent with transport policy goals.

				program allows not only for the construction of infrastructure, but also for renovation of transport fleet.	
9.	macro-regional		Strategy for development of Eastern Poland	Transport priorities lie in the construction of new high quality infrastructure to connect the region with Poland and Europe. The main infrastructures should be road, rail and air. The new infrastructure should be constructed with the aim of minimizing negative environmental effects. Transport connections should be enhanced in every aspect: internal, external, regional, national, rail or road.	Consistent with transport policy.

5. SUMMARIZING EVALUATION

The environmental and energy policies aim the highest, but they are also the least specific of the above documents. They only set the directions of the future government policy. As we may see they are very reluctant about setting transport goals, which shows how much the sectors are divided (not integrated) in governmental policy.

The main documents should be: the National Development Strategy, the National Spatial Planning Conception and the National Strategy for Regional Development, but as they have been offered for public consultation only recently, they are not yet the most important. They usually remain on a very general level and in effect can be interpreted in various ways. The plurality of priorities results in the difficulty of ascertaining which of them are actually the most important.

The second level of documents consists of the action plans. They contain important goals and some specific indicators to be reached within a certain time.

The Operational Programs make up the third grade of documents, but they are usually the most powerful documents that contain the greatest number of the strongest indicators and goals. These documents have the most power in the distribution of funds for the realization of these goals.

The Operational Program is the most powerful and most likely to be realized.

In the framework of sustainable transport these are the most important pros and cons of Polish transport policy:

Pros:

- An effort to upgrade the national railway system; the rail system is at least formally well developed.
- Quite good promotion and financing of public transport in the cities; public transport in cities is strong and constantly under development, but only few cities managed to stop the decrease of public transport's share in the modal split;
- There are some efforts to make road transport safer and funds dedicated to these goals, but the majority of actions concentrate on the inefficient approach of appeals rather than "hard" actions;
- High internalization of the external costs, especially in rail transport.

Cons:

- Very high priority of constructing new infrastructure, especially highways and expressways; this priority is achieved even by compromising the quality;
- Very limited funds dedicated to the maintenance of both the railway and road systems. Transport infrastructure is in large part in a bad state, even the newer elements are neglected (e.g. new train stations);
- Low commitment to limiting road transport growth, especially through direct measures (traffic calming, traffic speed control, car free zones, taxation)
- Very low willingness to manage and finance the regional/interregional public transport, both railway and bus.

Recommendations or suggestions in terms of policy orientation and decision making procedures for the development of future policies

- To make more funds available for and give priority to the maintenance of the existing infrastructure rather than the construction of new connections;
- To make more effective steps towards curbing road transport, especially in the cities.

6. SOURCES

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- http://www.plk-sa.pl/linie-kolejowe/siec-linii-kolejowych-w-polsce/mapy/
- http://www.berlin.polemb.net/?document=858
- Central Statistical Office, http://www.stat.gov.pl/gus/index_ENG_HTML.htm
- National Transport Policy 2006-2025
- National Environmental Policy for 2009-2012 with a perspective to 2016, Ministry of Environment, no English version found, accepted in the parliament in May 2009, Warsaw, 2009
- National Energy Policy to 2030, Ministry for Economy, accepted by the government in November 2009, no English version found, Warsaw, 10 November 2010
- National Action Plan for Renewable Energy Sources, Ministry for Economy, no English version found, accepted by the government in December 2010, Warsaw, 2010
- National Action Plan for Energy Efficiency, Ministry for Economy, no English version found, version from the public consultation held in 2011, Warsaw, 2011
- National Strategy for Regional Development, Ministry of Regional Development, no English version found, accepted by the government in July 2010, Warsaw, 2010
- National Spatial Development Conception up to 2030, Ministry of Regional Development, no English version so far, official version, Warsaw, January 2011
- National Development Strategy up to 2020, Ministry of Regional Development, no English version so far, the version from public consultation, Warsaw, November, 2011
- Operational Program Infrastructure and Environment 2007-2013, Ministry for Infrastructure, no English version found, version accepted by the European Commission in December 2011
- Strategy for development of Eastern Poland by 2020, Ministry for Regional Development, accepted by the government in December 2008

SLOVAKIA

1. GENERAL INFORMATION ON THE TRANSPORT SYSTEM OF THE SLOVAK REPUBLIC

Country/Capital[38]	The Slovak Republic/Bratislava
Territory	49 033 km^2
Population (06/2011)/population density	5,440,078 Capita, 111 capita/ km^2
GDP (2010)/ GDP per capita in 2011	65,905,500,000 EUR, 12,115 EUR/capita
Passenger vehicles (12/2011)/capita	1,749,271 PV; 0,322 PV/capita
share of transport sector in national greenhouse gas emissions[39]	6,997,699 tons
share of transport sector in the final energy consumption (2009)	21% (81.895 PJ of 388.725 PJ)
length of total road network, length of highway network (as of 01/01/2011)	17,985 km/416 km
length of rail network (12/2010)	3,622 km
international transport role of country	export and transit country

1.1. Modal split

Like the other V4 countries, passenger car is the most important transport method. There is data only from Slovakia on the rate of the public and non-public transport that shows the dominance of the latter, with a roughly three-quarter share. The Danube provides an important solution for freight transport.

Passenger transport[40]

Public – 24.4%
Non-public – 75.6%

Passenger transport (2011, based on passenger-kilometres)[41]

Passenger cars – 77.3%
Public road transport – 15.7%
Railway – 7%

Freight transport (2010, based on tonne-kilometres)[42]

Railway transport – 21.51%
Road transport[43] – 72.74%
Inland waterway transport – 5.75%
Air transport – 0.02%

1.2. Basic characteristics of transport network

The transport infrastructure of the Slovak Republic consists mainly of road and rail transport network.

1.2.1. Public road network

According to the standards STN 73 6100 roads are classified as follows:

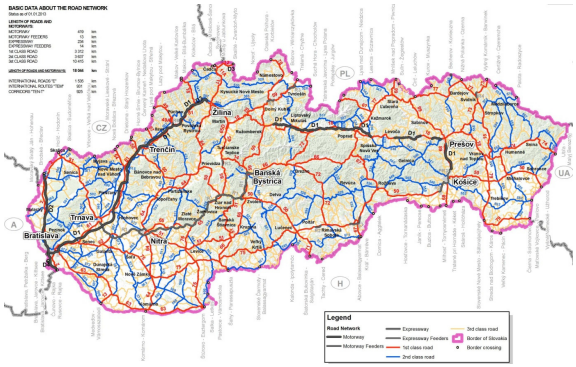
- High capacity Roads
  - highways (D1- D4)
  - expressways (R1- R8)
  - routes (I., II and III. Class)
- Urban roads
- Specific roads

Length of road network in the SR (in km)

	2010
Operated motorways	416
Motorways feeders	11
Expressways	190
1st class roads	3 318
2nd class roads	3 543
3rd class roads	10 048
Urban roads	25 942

[38] Data in the table: The Statistical Office of the Slovak Republic
[39] Carbon dioxide
[40] Elaborated on the basis of data from The Statistical Office of the SR
[41] Eurostat
[42] Elaborated on the basis of data from The Statistical Office of the SR
[43] For hire or reward and own account

14. Figure: Length of highways in SR (http://www.cdb.sk)



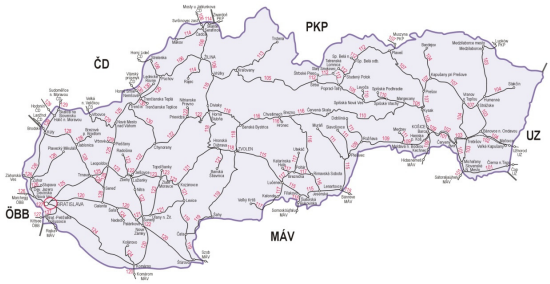
15. Figure: Road network of the Slovak Republic (http://www.cdb.sk)

16. Figure: Network of highways and expressways of the Slovak Republic (http://www.ndsas.sk)

1.2.2. Railway network

In the field of rail transport in the SR the following separate entities are on the market, providing the described activities:

- ŽSR (Železnice Slovenskej Republiky) mainly attends to the administration and the operation of the railroad;
- ŽSSK (Železni ná Spolo nos Slovensko) provides services in the field of passenger rail transport;
- ŽSSK Cargo provides services in the field of cargo transport.



17. Figure: Network of railroads of the Slovak Republic (http://www.zsr.sk)

1.2.3. Inland waterway transport network

Transport corridor No. VII – Danube passes through Slovakia. The Rhine-Main-Danube waterway, which connects the North Sea with the Black Sea, to which the SR is connected, is of great importance.

1.2.4. Air transport

Air transport is provided by various airports in Bratislava, Košice, Poprad-Tatry and Žilina.

2. PRIORITIES OF THE NATIONAL TRANSPORT STRATEGY

The transport strategy is built up of several documents in Slovakia.

2.1. Transport Policy of the Slovak Republic by 2015[44]

The Transport Policy of the Slovak Republic by 2015 defines a global objective and a number of specific objectives that include specific measures for the transport sector in Slovakia to ensure the sustainable development of mobility. This development is conceived as successfully satisfying the increasing transportation needs considering travel time and quality on the long-term and at the same time reducing its negative impacts on the environment.

The objectives of the transport policy is to create transparent conditions and to minimize the risks in the context of access to transport markets and the transport infrastructure; and furthermore to satisfy the constantly increasing transport needs of the society (transportation costs and persons) considering the travel time and quality and at the same time to reduce the negative effects of

[44] Government Resolution no. 445/2005, English version unavailable

transport on the environment. The aim is to ensure sustainable development, which includes economic development, social solidarity and the environmental acceptability.

The global objective defined above should be achieved through the following specific objectives:

1. setting up transparent and harmonized conditions of competition in the transport market;
2. ensuring the modernization and development of transport infrastructure;
3. providing sufficient funding for the transport sector;
4. reducing the negative impacts of transport on the environment;
5. improving the quality and the development of services in transport;
6. increasing road safety and security;
7. promoting research and development in transport;
8. managing the impacts of globalization.

In each section of the specific objectives the priorities and measures for the various modes of transport are defined. A direct link with the energy intensity of transport can be detected in the case of two specific objectives: „ensuring the modernisation and development of transport infrastructure" and „reducing the negative effects of transport on the environment".

2.1.1. Ensuring the modernisation and development of transport infrastructure

The requirements for the development of the infrastructure in order to achieve sustainable mobility are defined under this goal, whereas the requirements should be based on all of the available analyses, including the strategic analysis of the effects on the environment.

2.1.2. Reducing the negative effects of transport on the environment

Reducing the negative effects of transport on the environment is one of the main preconditions to achieving sustainable mobility, while taking into account the objectives of the EU as well as the objectives at the national level.

From the perspective of ecological transportation it is necessary to introduce and develop the use of alternative, renewable energy sources in transport, and to focus more on the promotion and development of non-motorised and ecological transport modes.

2.2. Transport Development Strategy of the Slovak Republic by 2020[45]

The strategy is the principal strategic document which defines the basic objectives and priorities of transport development in Slovakia, and furthermore tools and resources necessary to achieve the objectives. It also is in accordance with the global and the specific objectives defined in the Transport Policy of the Slovak Republic by 2015. The transport development strategy forms the basis of the further development of conceptual documents of the Ministry of Transport, Construction and Regional Development.

2.2.1. Chapter 4.4 "Strategic area – clean and energy efficient and safe transport operation"

This chapter relates to energy efficiency and environmental acceptability. **Its priorities for reducing greenhouse gas emissions:**

- implementation of an integrated approach to reducing greenhouse gas emissions (CO_2) through the following fields:
  - infrastructure (removal of bottlenecks in urban transport, traffic management);
  - work (promoting environmentally friendly modes of transport, integrated transport systems, driving techniques, e.g. "ecodriving", mobile equipment, e.g. modernization, tires);
- supporting of projects that are aimed at creating appropriate conditions for increasing energy efficiency in the rail sector;
- favouring vehicles with lower emissions through tax policy and transport infrastructure charging;
- The Gradual inclusion of aviation into the emissions trading system in accordance with the EP and Council Directive 2009/29/EC of 23 April 2009 amending Directive 2003/87/EC

[45] Governmental Resolution no. 158/2010, English version unavailable

- In water transport the supporting of the renewal of vessels to enable the use of low emission power trains and auxiliary engine for carriers.
- Implementation of the decision of the EP and Council 406/2009/EC of 23 April 2009 on the Member States' efforts to reduce greenhouse gas emissions to meet the Community's greenhouse gas emission reduction by 2020.

The strategy also refers to the support the procurement of clean and environmentally friendly vehicles: *"In addition, the EP and Council Directive 2009/33/EC of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles (transposition of the December 4, 2010), whereby the contracting authority will be required in the procurement of vehicles to address energy and environmental impacts of operation of the vehicle during its lifetime: energy consumption and costs of emissions (carbon dioxide (CO_2), nitrogen oxides (NO_x), non-methane hydrocarbons (NMHC) and particulate matter), either by setting technical specifications for energy and environmental performance or including energy and environmental impacts to the award criteria".*

2.3. Development of Public Transport Prior To Individual Motoring[46]

The main goal of this resolution is the elimination of the negative effects of individual motoring and the promotion of public passenger transport (PPT). The document includes partial goals and strategic areas in relation to the promotion of PPT focused on reducing the energy consumption of PPT and decreasing the environmental impacts; chapter 4.1.3, specifically relates to the promotion of fleet renewal.

2.3.1. The priorities of the document regarding environmental protection

- Supporting the fleet renewal by green vehicles in public transport (creating contracts to benefit public interest, state support at regional and national level);
- Promoting the purchase and operation of clean and energy efficient vehicles by public authorities through public procurement in accordance with the directive on the promotion of clean and energy-efficient road transport vehicles (directive 2009/33/EC), where the economic cost includes the lifetime external costs (energy consumption, carbon dioxide emissions and pollutant emissions associated with vehicle operation);
- Providing economic incentives to purchase cleaner vehicles, including support for building new infrastructure for the distribution of alternative fuels (CNG).

2.3.2. Cohesion with higher level documents

The document 'Development of Public Transport Prior To Individual Motoring' is a strategic tool for achieving the objectives of the Transport Policy of the Slovak Republic by 2015 (document A) in the field of passenger transport. It can be considered as an implementation tool of the transport policy.

However, as it was adopted in 2008, two years before Transport Development Strategy of the Slovak Republic by 2020, it cannot be considered as an implementation tool of the Transport Development Strategy of the Slovak Republic by 2020 (document B).

Chapter 2 of the document in (Transport policy of the SR and EU in the field of public transport services) refers to the transport policy and priorities defined therein.

The Transport Policy of the Slovak Republic by 2015 defines the following priorities in the field of public transport services:

- the ensuring of competition in the procurement of transport services;
- modernization and development of transport infrastructure;
- provision of sufficient resources to finance public transport;
- reducing negative impacts on the environment;
- improving the quality of transport services as well as improving road safety and security.

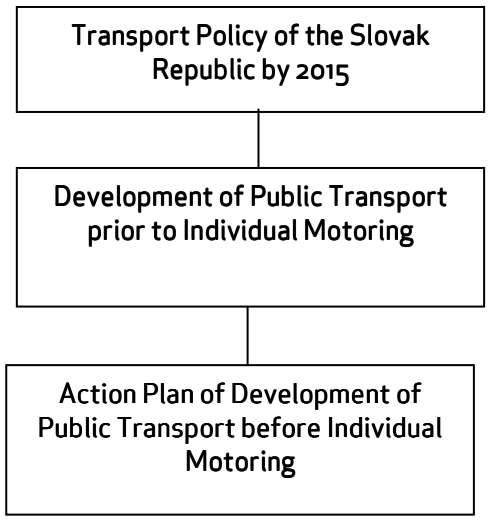
[46] Government Resolution no. 675/2008, English version unavailable

2.4. Action Plan for the Development of Public Transport Prior to Individual Motoring

The Action plan was developed to achieve the objectives of the document 'Development of Public Transport Prior To Individual Motoring' (C). It was elaborated by the Ministry of Transport, Construction and Regional Development of the Slovak republic was and approved by Government Resolution no. 184/2009 in March 2009.

The Action Plan for the Development of Public Transport Prior to Individual Motoring contains 13 measures to improve PPT. The measures are elaborated along with specific targets to ensure the implementation of the action plan. It also includes specific responsibilities for each task. The tasks are defined up to the end of 2010. The following measures are related to ecology and the efficiency of transport system (see table):[47]

2.4.1. Hierarchy between the strategic documents



	Measure	Partial goal	Deadline of implementing measure
no. 9	Modernizing the railway rolling stock for regional, inter-regional and suburban transport	Quality improvement of transport services	2013
no. 10	Supporting vehicles with lower emissions through transport infrastructure charging	Increasing performance, efficiency, ecology and traffic safety	continuously
no. 11	Ensuring compliance with the Directive on the promotion of clean and energy efficient road transport vehicles in the framework of public procurement, inclusion of the economic cost of the external lifetime costs	Stimulating the market of clean and energy efficient vehicles	according to directive
no. 13	Gradual implementation of intelligent transportation system (ITS) elements in passenger transport	Reducing congestion in road transport, increasing the quality of travelling and traffic safety, reducing carbon dioxide emissions, particularly in urban areas	2013

[47] Authors on the basis of the Action Plan of Development of Public Transport prior to Individual Motoring

2.5. Support programme for the development of intelligent transport systems – the national programme of traffic information[48]

The Program defines the requirement for the establishment of a national traffic information system, which is based on a uniform system of collection, processing, sharing, distribution and use of traffic information.

One of the goals among the comprehensive solutions is also to reduce negative impacts on the environment and reducing energy intensity in transport. Intelligent transport systems (IDS) are an element of these comprehensive solutions.

3. ENERGY EFFICIENCY IN THE NATIONAL TRANSPORT STRATEGY DOCUMENTS

3.1. Transport Policy of the Slovak Republic by 2015

Energy efficiency is featured only briefly in this document in relation to negative and environmental impacts of transportation on the environment and society. Energy efficiency of transport is not one of main and specific goals of the document.

3.2. Transport Development Strategy of the Slovak Republic by 2020

Energy efficiency is directly included in chapter 4.4. Energy efficiency is featured shortly in relation to the elimination of environmental impacts of transportation in the Slovak republic conditions, e. g. the application of bio-fuels in the field of road transport, the preferring of modernization of vehicles and vehicle fleets. The chapter as well as the entire document relates to energy efficiency only marginally.

3.3. Development of Public Transport before Individual Motoring

Energy efficiency is not the main topic of the document. The main topic is the preferring of public passenger transport against individual motoring. Energy efficiency is the result of the substitution of individual motoring performance by PPT performance as a secondary effect.

3.4. Action Plan of The Development of Public Transport prior to Individual Motoring

Energy efficiency is not the main topic of the document. Main topic is the preferring of public passenger transport prior to individual motoring. Energy efficiency is the result of the substitution of individual motoring performance by PPT performance.

3.5. Support programme for the development of intelligent transport systems – the national programme of traffic information

Energy efficiency is mentioned as the result of optimizing road transport operation and fuel consumption. Optimizing the road transport operation will be supported by using the National traffic information system.

3.6. Terminology in comparison with EU White paper

The following table contains a list of terms related to the environmental aspects of transport, their frequency and volume share in the EU's 2011 White Paper, and the two main Slovakian policy papers concerning transport. For the comparison, both had to be analysed, as the terms that were taken into account occur diversely in the papers.

According to the small number of the considered terms, the conclusion can only be limited. However, the result show that while environmental commitment is not so intense in the national documents than in the White

[48] Government Resolution no. 22/2009, English version unavailable

Paper, the values related to the term "energy efficiency" are more or less equal.

	Transport Policy of the Slovak Republic by 2015 (41 pages)		Transport Development Strategy of the Slovak Republic by 2020 (47 pages)		EU White Paper (30 pages)	
	Occurrence	Rate	Occurrence	Rate	Occurrence	Rate
Sustainable/sustainability	16	0,39	n/a	n/a	26	**0,87**
Environmental	14	0,34	n/a	n/a	14	**0,47**
Reduction of negative impacts	15	0,37	n/a	n/a	6	**0,20**
Efficiency	n/a	n/a	64	0,73	11	**0,37**
Energy efficiency/efficient	n/a	n/a	9	0,19	7	**0,23**

4. OTHER DOCUMENTS IN WHICH TRANSPORT ENERGY EFFICIENCY (OR TRANSPORT IN GENERAL) IS FEATURED

There are either no cross-sector relationships between these documents, or the strategies and action plans of other sectors are in related to transport only through general terms without measurable indicators.

Strategies and action plans were issued in different years; each has its own period and own range and detail of objectives.

The Energy Efficiency Action Plan for the years 2011 to 2013 contains in chapter 4.6 Transportation references to the Transport Policy of the Slovak Republic by 2015 and legislation in the field of transport sector.

	Type of Document	Action plan	Strategy	Summarize the transport related goals featured in the given document.	Characteristics
1.	environmental	National Environmental Action Programme II (Government Resolution no. 350/1996)	Strategy, principles and priorities of the state environmental policy (National Council resolution no. 339/1993 and Government Resolution no. 619/1993)	- modernization of transport, reducing its negative impacts on the environment and elimination of bottlenecks in the road transport infrastructure - protection of air and ozone layer (application of fuel and non-polluting modes of transport (e.g. gas, electricity, unleaded petrol)	- No measurable objectives for transport sector; - no references to the strategic documents in the field of transport (no relation to the transport strategy)› - declaratory objectives and measures.
2.	energy		Energy Policy of the Slovak Republic (Government Resolution no. 29/2006)	Appendix 3 Renewable energy and alternative fuels in transport: - usage of renewable and unconventional fuels for road transport; - one of the main attributes is to reduce dependence on oil use of alternative types of motor fuels and increasing energy efficiency of individual transport modes.	- It defines the objectives and priorities of energy policy of the Slovak Republic for the 2020 and outlook to 2030 - One of 11 priorities in the field of transport is to encourage use of alternative fuels in transport. - No direct relation to the transport strategy
3.	renewable energy	National Action Plan for Renewable Energy (Document by the Ministry of Economy of the Slovak Republic		- The main priority of the Energy Policy approved in 2006 is increasing the share of renewable energy sources (RES) in electricity and heat in order to create adequate additional resources needed to cover domestic demand. - The document appoints heat, electricity and transport as the main areas involved in the prospect of producing and using energy from renewable sources by 2020.	- 10% share of RES consumption in transport sector by 2020; - A significant increase in 2nd generation biofuels is expected by 2020, which could greatly contribute to achieving the 10% RES target of in transport; - There is a presumption that even if the market will be gradually commissioned with electric vehicles after 2015, its contribution to achieving the target will be lower than in the case of 2nd generation

					biofuels.
4.	energy efficiency	Energy Efficiency Action Plan 2008-2010 (AP I, Government Resolution no. 922/2007) Energy Efficiency Action Plan 2011-2013 (AP II, Government Resolution no. 301/2011)	Energy Policy of the Slovak Republic (Government Resolution no. 29/2006)	- Appendix 3 (Energy Policy): Renewable energy and alternative fuels in transport - the document defines 11 key priorities for achieving energy policy objectives, and 11th priority is supporting alternative fuels in the transport sector - chapter 4.6 Transportation: the goal is reduction, respectively minimization of energy consumption in transport sector	- Most of the planned measures in Action Plan II to reduce energy savings in transport follow Action Plan I. - Overall, the expected savings in AP II in the transport sector are 899 TJ, which represent 11% of the total planned savings (8 362 TJ). - Please find achieved and projected energy savings are in tables below.
5.	sustainability/sustainable development	Action plan for sustainable development in the SR 2005-2010 (Government Resolution no. 574/2005)	National Sustainable Development Strategy (Government Resolution no. 978/2001)	- sustainable mobility - promoting waste reduction and measures to reduce energy consumption of the economy of the SR	- There is no relationship to the strategic documents in the field of transport. - There are no measurable objectives for the transport sector. - The strategy and action plans are not actualized.
6.	climate change	National Biofuel Development Programme (Government Resolution no. 1022/2005)		- achieving EU objectives - the fulfilment of obligations in relation to climate change (Kyoto Protocol - reducing GHG emissions)	- Application of the European Parliament and Council Directive 2003/30/EC on the promotion of biofuels or other renewable fuels for transport; - One of the objectives is to ensure the supply of fuels with more favourable impact on the environment and to promote the use of renewable energy; - No measurable objectives; - Declaratory objectives and measures;
7.	regional development		National strategy	- integrated and environmentally	- The transport system is considered

			of regional development of the SR (Government Resolution no. 296/2010)	acceptable transport, reducing energy consumption of transport and increasing the availability and attractiveness of the territory - transport infrastructure	as the barrier of region development, mainly due to the inadequate road infrastructure. - Problems in the field of transport are defined per every transport mode in detail for the regions of the SR (8 regions). - There are no references to the strategic documents in the field of transport. - Proposals of measures are only declaratory. - It has no relation to the transport and no measurable objectives strategy

5. SUMMARIZING EVALUATION

5.1. Transport Development Strategy of the Slovak Republic by 2020

The strategy is the basic document which defines the basic objectives and priorities of transport development in Slovakia, and furthermore the tools and resources necessary to achieve the objectives. It forms the basis for further development of conceptual documents of the Ministry of Transport, Construction and Regional Development.

The transport strategy makes reference to the policy documents adopted by the Government, in particular:

- Spatial Development of Slovakia 2001 (Government Resolution no. 1033/2001 and its binding part of the Statement of the Government Regulation no. 528/2002)
- Transport Policy of the Slovak Republic by 2015 (Government Resolution no. 445/2005)
- National Strategic Reference Framework for 2007-2013 (Government Resolution no. 1005/2006)
- Operational Programme Transport for 2007-2013 (Government Resolution no. 1007/2006, Commission Decision of 13 September 2007)
- The construction of the selected superior road transport infrastructure PPP (Government Resolution no. 753/2007)
- Modernization and renewal of railway rolling stock in Železni ná spolo nos Slovensko (the Slovak Railway Operator) (Government Resolution no. 1085/2007)
- Development of Public Transport before Individual Motoring (Government Resolution no. 675/2008)
- The support for the development of intelligent transport systems - National Traffic Information System (Government Resolution no. 22/2009)
- General program implementation NAIADES SR (Government Resolution no. 642/2009).

5.2. Transport Policy of the Slovak Republic by 2015

Transport policy up to 2015 does not contain the exact procedures for achieving the specific objectives. The specific objectives suggest areas and possibilities only on a theoretic level, without featuring concrete figures or data and values measurable in any way.

Documents of this type should contain the measurable and achievable data assigned to the given objectives, or they should refer to other legislation to specify the document.

6. SOURCES

- The Statistical Office of the Slovak Republic, http://portal.statistics.sk
- Slovak Road Administration, http://www.cdb.sk
- National Motorway Company of Slovakia, http://www.ssc.sk
- Railways of the Slovak Republic, ŽSR, http://www.zsr.sk
- Transport Policy of the Slovak Republic by 2015 (Government Resolution no. 445/2005, English version unavailable)
- Development of Public Transport Prior To Individual Motoring (Government Resolution no. 675/2008, English version unavailable)
- Action Plan of Development of Public Transport prior to Individual Motoring; Ministry of Transport, Construction and Regional Development of the Slovak republic; approved by Government Resolution no. 184/2009 in March 2009.
- Support programme for the development of intelligent transport systems – the national programme of traffic information (Government Resolution no. 22/2009, English version unavailable)
- National Environmental Action Programme II (Government Resolution no. 350/1996
- Strategy, principles and priorities of the state environmental policy (National Council resolution no. 339/1993 and Government Resolution no. 619/1993)
- Energy Policy of the Slovak Republic (Government Resolution no. 29/2006)
- National Action Plan for Renewable Energy (Document by the Ministry of Economy of the Slovak Republic
- Energy Efficiency Action Plan 2008-2010 (AP I, Government Resolution no. 922/2007)
- Energy Efficiency Action Plan 2011-2013 (AP II, Government Resolution no. 301/2011)
- Energy Policy of the Slovak Republic (Government Resolution no. 29/2006)
- Action plan for sustainable development in the SR 2005-2010 (Government Resolution no. 574/2005)
- National Sustainable Development Strategy (Government Resolution no. 978/2001)
- National Biofuel Development Programme (Government Resolution no. 1022/2005)
- National strategy of regional development of the SR (Government Resolution no. 296/2010)

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