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Developing the Transport Infrastructure of Central and Eastern Europe With a View to the Region's Convergence

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Abstract

The purpose of my study is to what extent EU co-financing projects have helped to bring the transport infrastructure of Central and Eastern Europe closer to the more developed countries. I will evaluate projects implemented in the CEF Transport Program in CEE countries on the basis of my research. A further aim of my paper is to respond to dilemmas of what is more worthwhile to develop super railways or airports in the region.

Keywords: Air Transport, Central and Eastern Europe, Connecting Europe Facility, Infrastructure, Intermodal transport, Railway transport, Transport projects

JEL: L9; L91; L92; L93;L98;O18;R5

1. Introduction

Eastern Central Europe has been and still is comprised of Poland, the Czech Republic, Hungary and Croatia (Herczegh, 1998). Since the dissolution of Czechoslovakia and Yugoslavia some have considered Slovakia, Slovenia, Romania, Bulgaria and the Baltic States to be part of the region, because of their shared, decades long socialist development. We also selected this broader interpretazion during the preparation of the present study, despite the often various cultural, social, economic differences. They have shared development trajectories until recently, primarily meaning the rate of economic development, and these countries have also all joined the European Union, and as a result of this they have become eligible for CEF subsidies.

The transport sector of the EU has arrived to a crossroads in our times. We have to develop a high performance infrastructure that will provide sufficient capacity for the economy, to adequately utilize opportunities for job creation and growth. At the same time, we have to make sure that the sector continues to provide competitive, innovative, cost-efficient and environment friendly transport solutions for users and integrates various modes of transport (European Commission, 2019a). The Trans-European Transport Network (TEN-T) is comprised of the planned European road, railroad, air and water transport networks. The Trans-European Transport Network (TEN-T) policy addresses the implementation and development of a uniform Europe-wide transport network, recognizing the importance of a strategic approach. Thus the TEN-T infrastructure development policy is closely connected to the implementation of the EU's transport policy and its further development (European Court of Auditors, 2017b). In 2015 the European Commission's Directorate-General for Mobility and Transport (MOVE) issued an assignment for the preparation of a study that analyzes the regulatory and administrative processes which obstruct the effective and successful planning of the TEN-T Core Network projects, and formulates recommendations to handle these

obstructions, including the suggested policy possibilities (Tractabel, 2016).

In the present study, after the general introduction of the Connecting Europe Facility (CEF) and the description of uniform recommendations, I will take an account of the transport projects subsidized by CEF in Eastern Central Europe between 2014 and 2018, and I will evaluate them in their entirety as well as separately for each mode of transport. A further objective of my study is to assess the most important development directions for the future. At the same time, I aim to answer the question whether it is more feasible to develop super-trains or airports.

2. Connec.ng Europe Facility

Connecting Europe Facility (CEF) has been providing funding for 3 sectors since 2014: the energy sector, the transport sector, as well as the information and communication technologies (Telecom) sector, based on Regulation (EU) No 1316/2013 of the European Parliament and of the Council (Regulations, 2013b). The investment priorities to be applied in the next decade in these 3 sectors are determined by CEF, such as Core Gas and Electricity Network Corridors, the use of renewable energy sources, Connected Transport Corridors and less polluting transport modes, high-speed broadband connections and digital networks (European Court of Auditors, 2017a). CEF investment projects will fill the missing connections of the European energy, transport and digital trunk networks. The Connecting Europe Facility is favourable to every member state, because it makes travel easier and more sustainable, increases European energy security, and at the same time enables the broader use of renewable energy sources, as well as facilitates cross-border cooperation between administrative bodies, enterprises and citizens. Besides funding, CEF also provides financial support for projects by innovative financial instruments, such as loan guarantees and project bonds. These instruments have a considerable effect on the use of the EU budget, they serve as catalysts to receive further financing sources from other actors of the private as well as public sector (European Commission, 2019b).

The CEF is divided into three sectors:

- CEF Energy
– CEF Telecom
– CEF Transport

One of the key priorities of CEF is enabling and strengthening the synergies between the three sectors. Actions across sectors may enable costs or results to be optimized through the pooling of financial, technical or human resources, thus enhancing the effectiveness of EU funding.

The first Call for proposals to support synergy actions between the transport and energy sectors was launched in 2016, based on Regulation (EU) No 2016/1649 of the European Parliament and of the Council (Regulations, 2016).

3. CEF Transport

Connecting Europe Facility (CEF) is the financial instrument for the implementation of European transport infra-structure-policy. Its objective is to support projects aimed at the construction of the European transport infra-structure, or the renovation and modernization of existing infrastructure, as well as the main goals of the TEN-T policy (Regulations, 2013a):

TEN-T comprises two network ‘layers’:

- The Core Network includes the most important connections, linking the most important nodes, and is to be completed by 2030.

- The Comprehensive Network covers all European regions and is to be completed by 2050

CEF Transport focuses on cross-border projects and projects aiming at removing bottlenecks or bridging missing links in various sections of the Core Network and on the Comprehensive Network (link), as well as for horizontal priorities such as traffic management systems. CEF Transport also supports innovation in the transport system in order to improve the use of infrastructure, reduce the environmental impact of transport, enhance energy efficiency and increase safety.

The total budget for CEF Transport is €23.3 billion for the period 2014-2019, of which €11.3 billion was reallocated from the Cohesion Fund. INEA is responsible for implementing €23.7 billion of the CEF Transport budget in the form of grants during the same period. INEA - the Innovation and Networks Executive Agency - was responsible for the implementation of the CEF Transport budget.

4. Innovation and Networks Execu.ve Agency (INEA)

The Innovation and Networks Executive Agency (INEA) is the successor of the Trans-European Transport Network Executive Agency (TEN-T EA), which was created by the European Commission in 2006 to manage the technical and financial implementation of its TEN-T program. Headquartered in Brussels, INEA, officially commenced its operations on 1 January 2014, for the purpose of implementing certain elements of the Connecting Europe Facility, Horizon 2020 and other previous programs (TEN-T and Marco Polo 2007-2013) (European Court of Auditors, 2016).

CEF programs have been financed through INEA since January 2014 (Regulations, 2013c). In practice this means that INEA manages the budgets of most CEF programs, which as of now has totaled €28.5 billion (€23.3 billion for Transport, €4.7 billion for Energy and €0.5 billion for Telecom). In total the expected budget man-aged by INEA will be approx. € 35 billion for programs in the 2014-2020 period (€30 billion from CEF and €5 billion from H2020).

The principal transport projects with horizontal priority funded by CEF (INEA, 2019):

– European Railway Traffic Management System (ERTMS)
- Intelligent Transport Services (ITS)
– Motorways of the Sea (Motor-ways-of-the-Sea)
– New technologies and innovation (New-technologies-and-innovation)
- RIS, River information services, safe and secure infrastructure (/inea/en/connecting-europe-facility/ceftransport/projects-by-horizontal-priority/safe-and-secure-infrastructure)
– Single European sky - SESAR (Sin-gleeuropean-sky sesar)

5. CEF Transport projects through Core Network Corridors

In order to simplify the harmonized implementation of the core network, so-called "Core Network Corridors" have been introduced. These accumulate state and private resources, focus EU subsidies from CEF, particularly for the following (European Commission, 2019b):

– Removing bottlenecks
– Construction of missing cross-border connections
– Facilitating modal integration and interoperability
- Integration (as a continuous modal measure, these corridors must be integrated into the multimodal TEN-T rail cargo transport corridors)
- Promoting clean fuels
– Other innovative transport solutions
– Developing telematics applications for the use of an efficient infrastructure
- Integration of urban areas into TEN-T
– Increasing safety

In the Annex of the CEF Regulation 9 core network corridors are identified, which include the predetermined list of projects for possible EU financing for the period between 2014 and 2020, based on their added value to TEN-T development and expiration status (Regulations, 2013b).

- A Baltic - Adriatic 4,588 km
- B North Sea - Baltic 6,244 km
– C Mediterranean 9,355 km
– D Orient/East-Med 9,355 km
– E Scandinavian - Mediterranean 9,290 km
– F Rhine - Alpine 2,994 km
– G Atlantic 8,188 km
– H North Sea - Mediterranean
- I Rhine - Danube 5 802 km

6. European transport projects in Eastern Central Europe

Eastern Central European countries participated in 368 projects as beneficiaries, and received €10,373.2 million for their implementation co-financed by CEF Transport, between 2014 and 2019 the total value of these projects was €14.7 billion.

Poland implemented the largest scale transport development projects, specifically 54, with funding in the value of €4,200 million. From this aspect Romania is the second with 33 projects with funding in the value of € 1,200 million, the third is the Czech Republic with 57 projects in the value of €1,100 million, while Hungary is in the fourth place with 45 projects in the value of €1,100 million (Figure 1.).

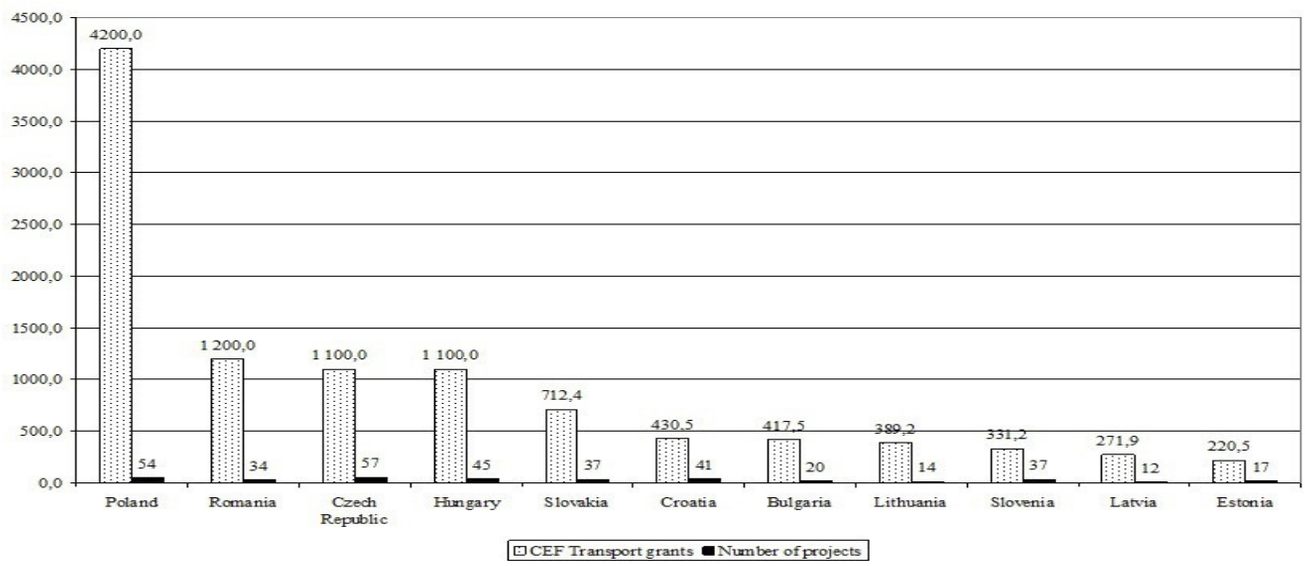

Figure 1: CEF transport grants and number of projects, 2014-2019, € million (European Commission, 2019)

Country	Rail	Road	Inland Waterways	Air	Maritime	Multimodal
Bulgaria	373.5	30.2	6.3	3.2	2.3	2.1
Croatia	266.1	28.7	10.4	25.8	98.1	1.4
Czech Republic	1,062.1	42.6	12.4	11.5	-	14.9
Estonia	189.0	5.2	-	3.2	23.1	-
Hungary	860.0	133.0	83.3	15.6	-	-
Latvia	259.0	9.4	-	2.6	0.9	-
Lithuania	342.9	23.4	-	9.6	13.2	-
Poland	3,505.5	510.1	-	13.1	147.8	35.1
Romania	1,130.3	16.1	58.8	17. 0	10.8	-
Slovakia	378.3	125.3	183.8	5.1	-	19.9
Slovenia	278.2	37.1	-	4.5	11.3	-
Total	8,644.9	961.1	355.0	94.2	307.5	73.4

Table 1: CEF CEF transport grants per transport mode, 2014-2019, € million (European Commission, 2019)

When inspecting the received funding according to modes of transport, it is evident that Eastern Central European countries primarily used CEF Transport funds for railway transport development projects, secondly for road transport development projects, thirdly for inland waterway transport development projects, and fourthly for sea transport development projects. The data also shows that these funds were least used for air transport development projects and multimodal type transport development projects.

All of this is not favourable because as a result these countries were focusing the least exactly on the areas where development is the most dynamic nowadays and their lagging behind developed countries is the largest. Consequently, while in certain areas they have closed the gap somewhat compared to developed countries, they are lagging behind developed countries, thus their competitiveness will be reduced exactly in the areas that would be the most important for the future. Eastern Central European countries participated in 106 rail transport development projects as beneficiaries, and received €8,644.9 million for the implementation of these in the co-financing of CEF Transport between 2014 and 2019 (Table 1.).

In Eastern Central Europe, Poland used the highest value CEF funding for rail transport development projects, in the value of €3,505.5 million for the implementation of 23 various rail transport development projects. The total value of these projects was €4,639.4 million. The highest value rail transport development project realized by Poland was on the E20 railway, on the Warsaw-Poznan section, while the remaining works are being implemented on the Sochaczew-Swarzedz section (European Commission, 2019c).

The project commenced in November 2015 and will be completed in December 2020. The total cost of the project will be €614,308 million. The maximum amount of EU subsidy may be €461,776 million, 75.1% of the project's total cost.

Numerous significant development projects have been and are implemented with the co-financing of the European Union, which will considerably contribute in many areas to the cohesion of the transport infrastructure of Eastern Central European countries to the level of more developed countries. At the same time, by today it is also evident that these projects are insufficient for the complete cohesion of the region from multiple aspects, since they are focused less or not at all on the most competitive areas. Thus, for example, there are no projects at all among them that would facilitate the spread of super-fast rail transport, thereby the lagging behind of the region from this aspect will actually significantly increase in comparison with countries which are substantially ahead of us, such as Spain, France, Germany, Finland and Italy.

Another outstandingly important area is the development of air transport. Today this sector is one of the fastest developing transport sectors in the world. Currently, airports located in Western Europe and Southern Europe manage 64% of passenger air traffic. In recent years Eastern Central Europe has gradually grown its significance on the European market by increasingly dynamic development. Between 2000 and 2017 Eastern Central European airports achieved a growth rate in excess of 10.1% per year on the average. This fact can be mainly attributed to the rapid growth of Russian commercial airports, but other growing markets also contributed to this outstanding development, such as Bulgaria, Croatia, Poland, Romania and Ukraine. The growing presence of budget airlines on these markets, with improving economic conditions, has substantially expanded the European market in recent years. The regional airports of Bulgaria, Croatia, Poland, Romania and Ukraine have been very consciously making efforts to expand the accessibility and flight selection of airports. Despite this extraordinarily dynamic growth, the region currently only manages approx. 14% of the total air traffic of the Continent (Lucas, 2018).

The lagging behind of Eastern Central European countries in the area of air transport, similarly to high-speed rail transport, is one of the greatest in comparison with developed countries. Meanwhile, the least amount of financial resources and the least number of projects are devoted to the development of these areas, which will clearly result in the region falling behind ever further. This falling behind will be further intensified by the corona virus pandemic as well as the experts who for the sake of a climate friendly economy are openly arguing for the scaling back and the taxation of air transport.

The rather low ratio of multimodal transport development projects will result in the region falling behind further. In this area the lagging behind of Eastern Central European countries is already considerable in comparison with developed countries, thus the countries of the region should focus more on the implementation of these types of projects. In the case of Hungary, an addition problem is that as a result of the complete elimination of the sea transport branch of MAHART (Hungarian Shipping Company Ltd.) in 2003 and the termination of the connected ship building industry, we are not present at all in the life of the maritime transport sector, thus we will be unable to profit from the fruits of the expected dynamic development of the sector in the future. Even though the government announced the national sea transport strategy in 2012, currently there are no visible substantial signs of the comprehensive implementation of the strategy, except for the purchase of the land area needed for the Trieste seaport.

7. Competition and/or cooperation between high-speed rail transport and air transport

The statistical data regarding the extent of high-speed rail transport lines are rather contradictory. There are different data to be analysed in every existing database for the same simple question: what is the length of high-speed rail transport lines in specific countries. Therefore, it is rather difficult to navigate between various databases. During my various data mining research studies regarding the subject, I have arrived to the conclusion that the data of UIC (International Union of Railways) can be regarded the most reliable in the subject, and contain the largest amount of information (such as including the lines under construction and planned lines). With the use of UIC's data, Table 2 compares the length of high-speed rail transport lines in specific countries, in kilometres in 2020. This means the length of high-speed rail transport lines and line sections where trains can travel at or beyond 250 kilometres per hour. High-speed rail transport line: A main

Country	In operation	Under construction	Planned	Long-term planning	Total
Spain	3,330	1,293	676	-	5,299
France	2,734	-	-	1,725	4,459
Russia	-	-	1,080	1,549	2,629
Germany	1,571	147	81	210	2,009
Poland	224	-	805	875	1,904
Italy	921	327	-	-	1,248
Finland	1,120	-	-	-	1,120
Czech Republic	64	-	666	318	1,048
Sweden	-	11	150	589	750
United Kingdom	113	230	320	-	663
Austria	254	281	71	-	606
Portugal	-	-	-	596	596
Lithuania	-	-	392	-	392
Norway	-	-	-	333	333
Latvia	-	-	265	-	265
Estonia	-	-	213	-	213
Belgium	209	-	-	-	209
Switzerland	144	15	-	-	159
The Netherlands	90	-	-	-	90
Denmark	56	-	-	-	56

Table 2: High speed lines in Europe, Length (km), based on the data reporting of UIC as of 27 February 2020

rail transport line which allows 200 km/h or faster 250 km/h speed rail transport, on special lines constructed for this purpose (Eurostat, 2019).

Based on UIC's data, in February 2020, the length of high-speed rail transport lines was the highest in Spain, with 3,330 kilometres. It is followed by France with 2,743 kilometres and Germany with 1,571 kilometres. The length of these special lines is longer than one thousand kilometres even in Finland, with 1,120 kilometres, while in Italy their length approaches one thousand kilometres (921 km).

There are already high-speed rail transport lines in 3 Eastern Central European countries, 254 kilometres in Austria, 224 kilometres in Poland and 64 kilometres in the Czech Republic. In Poland the 224 kilometre line was constructed between Grodzisk Mas and Opoczno, while in the Czech Republic a 64 kilometre section between Beroun and Plzen. In total, the lagging behind of Eastern Central European countries is still substantial in comparison with more developed European countries. At the same time it is favorable that from the aspect of planned rail lines a significant change can be observed in these countries, especially in Poland and the Czech Republic (Table 3).

It is also clearly favourable that the preparation of the feasibility study for the Budapest - Bratislava - Brno - Warsaw high-speed rail transport line has started, and the high-speed rail project connecting Budapest through Cluj-Napoca to Bucharest is under preparation (Jámbor, 2019). Another piece of good news is that the tender announced for the renovation of the Budapest-Belgrade rail line was completed successfully. According to the plans, the construction works may commence in the end of 2019 or in the beginning of 2020 (MTI, 2019).

It is beyond doubt that the new high-speed rail (HSR) line may have a great effect on the use of air travel services. Many authors devote their attention to the competition between these two mo-Based on UIC's data, in February 2020, the length of high-speed rail transport lines was the highest in Spain, with 3,330 kilometres. It is followed by France with 2,743 kilometres and Germany with 1,571 kilometres. The length of these special lines is longer than one thousand kilometres even in Finland, with 1,120 kilometres, while in Italy their length approaches one thousand kilometres (921 km).

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It is beyond doubt that the new high-speed rail (HSR) line may have a great effect on the use of air travel services. Many authors devote their attention to the competition between these two modes of transport, even though in most cases the new high-speed rail lines may also play a significant intermodal supplementary role in air transport. Givoni and Banister point out that high-speed rail lines may result in a kind of new and unique component in the system of air transport hubs (Givoni and Banister, 2006). High-speed rail lines may reduce the delays caused by crowded conditions at large airports in the case of shorter range flights, and supplement long range flights well (Clewlow, R. et al, 2012). Furthermore, the reduction of air transport servnices at hub airports is usually greater that at non-hub airports. Supplementary effects (higher demand of connecting passengers) will partially compensate for the reduction in passenger numbers caused by being in direct competition with high-speed rail (Albalate, D. et al, 2014).

Country	Status	Section			Max. Speed (km/h)	Date	Length (km)
Czech Republic	Planned	Praha	Poříčany	(RS1)	320	2027	22
Czech Republic	Planned	Poříčany	Světlá nad Sázavou	(RS1)	320	2030	71
Czech Republic	Planned	Světlá nad Sázavou	Velká Bíteš	(RS1)	320	2033	81
Czech Republic	Planned	Velká Bíteš	Brno	(RS1)	320	2030	32
Czech Republic	Planned	Brno	Přerov	(RS1)	200	2030	80
Czech Republic	Long-term planning	Brno	Přerov	(RS1)	320	2050	74
Czech Republic	Planned	Přerov	Ostrava	(RS1)	320	2028	73
Czech Republic	Planned	Modřice	Šakvice	(RS2)	320	2029	35
Czech Republic	Planned	Šakvice	Břeclav	(RS2)	200	2028	23
Czech Republic	Long-term planning	Šakvice	Břeclav	(RS2)	320	2050	23
Czech Republic	Planned	Praha	Beroun	(RS3)	200	2043	25
Czech Republic	In operation	Beroun	Plzeň	(RS3)	160	-	64
Czech Republic	Planned	Plzeň	Domažlice st.hr.	(RS3)	200	2027	58
Czech Republic	Planned	Praha	Litoměřice	(RS4)	320	2030	58
Czech Republic	Planned	Litoměřice	Ústí nad Labem	(RS4)	250	2045	23
Czech Republic	Planned	Ústí nad Labem	Dresden	(RS4)	200	56	56
Czech Republic	Long-term planning	odb. Nová Ves	Most	(RS4)	250	2040	85
Czech Republic	Planned	Praha	Poříčany	(RS5)	320	2027	29
Czech Republic	Long-term planning	Poříčany	Hradec Králové	(RS5)	320	2039	67
Czech Republic	Long-term planning	Hradec Králové	Trutnov st. hr.	(RS5)	250	2050	69
Estonia	Planned	Tallin	Border with Latvia		249	2026	213
Latvia	Planned	Border with Estonia	Border with Lithuania		249	2026	265
Lithuania	Planned	Border with Latvia	Border with Poland		249	2026	252
Lithuania	Planned	Kaunas	Vilnius		249	2026	140
Poland	In operation	Grodzisk/Maz	Opoczno	Zawiercie	200	2015	224

	Planned	Warszawa - Lodz	Kalisz/Ost-row	Poznan/ Wrocław	350	2030	448
Poland	Planned	Warszawa	Białystok	Elk	200	2030	277
Poland	Planned	Elk	Border Lithuania		250	2030	80
Poland	Long-term planning	Wroclaw	BorderCzech Republic		350	2030 after	148
Poland	Long-term planning	Poznan	Border Germany		350	2030 after	171
Poland	Long-term planning	Katowice	BorderCzech Republic		300	2030 after	61
Poland	Long-term planning	Naklo	Katowice/ Krakow		300	2030 after	138
Poland	Long-term planning	Warszawa	Gdansk		350	2030 after	357

Table 3: High speed lines in Eastern Central Europe (Details), Length (km), based on the data reporting of UIC as of 27 February 2020

8. Conclusion

Eastern Central European countries participated in 368 projects as beneficiaries, and received over €10 billion for their implementation co-financed by the CEF Transport fund between 2014 and 2019. When analysing the received funding, it is evident that Eastern Central European countries primarily used CEF Transport funds for railway transport development projects, secondly for road transport development projects, thirdly for inland waterway transport development projects, and fourthly for sea transport development projects. It can also be established that these funds were least used for air transport development projects and multimodal type transport development projects. Numerous significant development projects have been implemented. All of these will considerably contribute in many areas to the cohesion of the transport infrastructure of Eastern Central European countries to the level of more developed countries. At the same time, by today it is also evident that these projects are insufficient for the complete cohesion of the region from multiple aspects, since they are focused less or not at all on the most competitive areas. Thus, in the future the countries of the region should focus substantially more on the implementation of the types of projects, which will be of key importance in the medium and long term. They should devote by far more resources to the development of high-speed rail transport, air transport and multimodal transport networks and facilities, so their total lagging behind will not increase, but decrease in comparison with developed countries. In the case of Hungary, in addition to this, further efforts should be made to revive the sea transport sector, which has seen better days in the past.

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