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INLAND WATERWAYS TRANSPORT IN THE EUROPEAN UNION - FLOWING OR STILL STANDING?

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Abstract

Although the inland waterways transport (transport/navigation on rivers, lakes and canals) is, by its characteristics, an acceptable mode of transport, in some EU member states it is still unfortunately underestimated and insufficiently exploited. Cost-effectiveness, safety and eco-friendliness are the main characteristics of the inland waterway transport. The European Union emphasizes the reduction of traffic congestion, increased traffic safety, the use of environmentally friendly modes of transport and the use of alternative fuels as the goals of its transport policy. Developed inland waterway transport is therefore one of the possible solutions for the achievement of these goals. European Union has some 40,000 km of navigable waterways and 13 Member States have an interconnected waterway network, which is a great potential for the development of this mode of transport.

Although the European Union has provided a number of programmes and actions for inland waterway transport to encourage it and to increase the share of goods and passengers transported by inland waterways, the major results appear to be absent. The paper presents the significance and potential of EU inland waterway transport, relevant sources of law and their implementation, as well as activities and results of work in the field of inland waterway transport.

***Keywords**: Inland waterways transport (navigation), European Union, Transport policy, Advantagesnad disadvantages of inland waterway transport, Legal regulation*

1. Introduction

The European continent has been intersected by a large number of rivers. All of them have a long and turbulent history, but differ in their legal regulation (especially in matters of navigation), the political situation and relations between riparian states, the way they are exploited, problems and ultimately actions and programs implemented for them.

"Inland waterways include rivers, lakes and canals, and inland waterway navigation (inland waterway transport) includes navigation on rivers, lakes and canals of a certain depth and width that are settled, marked and open for transport. Inland waterways may be entirely within the territory of one state or can be spread on the territory of two or more states which will result in a more complex regulation of their use."[1] It should be noted that inland waterways need to be distinguished from international rivers, inland waterways of international importance, transboundary watercourses, etc.

In the European Union, 21 out of 28 Member States have inland waterways, 13 of which have an interconnected waterway networks.[2] Europe's waterway network consists of more than 40,000 kilometres of waterways. "The core network with rivers and canals of international importance (Class IV and higher) is formed by more than 12,000 kilometres of interconnected waterways, 444 locks and several hundreds of inland

[1]Činčurak Erceg, B., *Legal framework of European inland waterways and Croatian legislation on inland waterways navigation – problems of non-harmonized rules*, European Scientific Journal, Vol. 14, special edition, February 2018, p. 37.

[2]European Commission, Inland waterways, What do we want to achieve?, https://ec.europa.eu/transport/modes/inland_en, accessed 25. 5. 2019.

ports and transhipment sites. The remaining network is made up by smaller waterways."[3] Thus, the EU Member States have a great potential for the development of this mode of transport. The core network links the Netherlands, Belgium, Luxembourg, France, Germany and Austria. The main waterways consist of large rivers such as the Rhine and Danube that connect big cities, but many smaller towns and industrial areas are also easily accessible by numerous tributaries and canals. However, it should be recalled that the mentioned waterways do not flow only through Member States.

Different freights are transported on these rivers: bulk industrial goods, building materials, heavy materials, containers, oversized loads, chemicals, agricultural products, etc. Passenger transport should not be excluded. Large number of ports and landing places offer intermodal connections with road, rail, sea and air transport.

Inland waterway navigation due to its advantaged (which will be further discussed below) is an acceptable mode of transport. It is not surprising therefore that the EU has recognized the importance of this mode of transport. The European Commission encourages the use of inland waterways, and the importance of inland navigation is emphasized in White Paper: 'European transport policy for 2010: time to decide',[4] that was published in 2001. In this White Paper, the Commission proposed shifting of transport, as much as possible, to inland waterways. These goals were confirmed in the White Paper: 'Roadmap to a single European transport area – Towards a competitive and resource efficient transport system'[5] of 2011. Both White Papers emphasized the need to eliminate bottlenecks in order to improve navigability conditions on rivers and thus to eliminate the main infrastructure obstacles to the development of inland navigation in Europe.

However, looking at rivers in terms of transport, the amount of freight and the number of transported passengers, there are significant differences between Member States. By studying statistical data, it appears that the share of transported goods is not increased even though programs and projects for reviving this mode of transport have been implemented. A lot of criticisms goes to the inadequate legal regulation and non-harmonized rules. Whether there is a move or not question is what we will try to answer.

In this paper we will look at the advantages and disadvantages of inland waterway transport. The paper presents the significance and potential of EU inland waterway transport, important statistical data, relevant sources of law and their implementation, as well as activities and results of work in the field of inland waterway transport.

2. Advantages and disadvantages of inland waterway transport

The most important advantages of inland waterway transport are: economy, efficiency, reliability, safety and environmental friendliness. From the other side, disadvantages of this mode of transport are often referred to geographical limitations, inadequate infrastructure, relatively slow speed, inadequacy of the modern 'door-to-door' transportation conditions, less flexibility in comparison to road, rail and maritime transport and inadequate legal regulation.[6]

Inland waterway transport is regular, reliable and accurate because usually there are no problems with congestion (which occurs in road and rail transport), and the weather conditions do not usually have too much influence on its running.

The number of accidents in inland waterway transport is low. This characteristic is particularly emphasized when carrying dangerous cargo. Although the accident rates vary from one river to another (the Danube has the higher accident rate than the Rhine), the number of accidents on inland waterways has decreased considerably over the past 20 years.[7]

[3] Commission Staff Working Document, Annex to the Communication from the Commission on the Promotion of Inland Waterway transport "NAIADES" – an Integrated European Action Programme for Inland Waterway Transport, Brussels, 17. 1. 2006, (COM/2006/6/F), p. 27.

[4] White Paper: 'European transport policy for 2010: time to decide', COM (2001) 370 of 12 September 2001

[5] White Paper: 'Roadmap to a single European transport area – Towards a competitive and resource efficient transport system', COM (2011) 144 final of 28 March 2011.

[6] Činčurak Erceg, B., *op. cit.* note 1, p. 37.

[7] CCNR Market Observation - Annual report Inland Navigation in Europe 2018, p. 125, http://www.inland-navigation-market.org/en/period/2018/, accessed 26. 5. 2019.

Inland waterway freight transport provides its customers with a very good value due to their low cost and efficient operations. A vessel with carrying capacity of 4000 tonnes corresponds to the capacity of 200 trucks of 20 tonnes or 100 railway wagons.[8] Most of the vessels can transport 127 tons of cargo per litre of fuel, while in comparison with railway and road transport this amount is 97 tons in railways and 50 tons of cargo in road transport per litre of fuel.[9]

"Differences in transportation costs between modes are to a certain extent determined by differences in the price of fuel and taxes, and the energy efficiency of the vehicles used. An important recent change in the attitude of policy makers is the idea that transportation costs should reflect true costs to environment and society. …Environmental effects of transportation fundamentally relate to the consumption of energy and the emission of several pollutants"[10]i. e. sulphur dioxide ($S0_2$), nitrogen oxides (NO_x), carbon dioxide ($C0_2$). The effects differs substantially between modes. "Compared to rail and inland waterways, road transportation produces about four times more nitrogen oxides, sulphur, and carbon dioxide per ton-mile. Transportation's true costs to society also include the effects of noise and light pollution, as well as accidents."[11]

As was correctly stated in the former European Conference of Ministers of Transport - Council of Ministers[12] report, Inland waterway navigation "can contribute to making transport more sustainable, particularly where it substitutes for road transport, but inland shipping and especially the development of waterways for navigation can have considerable environmental impacts."[13] However, waterway development works can have major impacts[14] on the ecological value, water quality, biodiversity. In some cases impacts may be insignificant but often major ecological damage can result. Therefore both strategies and policies – transport and environmental, must be jointly made and harmonised.

According to NAIADES II Communication, inland navigation stands to lose its comparative environmental advantage if no action is taken to further reduce air pollutant emissions.[15] The most representative vessel types in terms of their share of transport performance (large Rhine vessel and Rhine-Herne canal vessel) have lower CO_2 emissions than trucks, and about the same level of pollutant emissions. Although vessels emit relatively few greenhouse gases, they have rather high values for pollutant emissions, when compared to railways and trucks.[16]

Emission reduction measures for inland waterways transport exist, "but their application is often very costly, and therefore difficult to implement in a market structure with a high share of family businesses."[17]

New inland navigation vessels will certainly contribute to the reduction of adverse impacts on the environment.[18] Therefore we quote that the share of new vessels "that were equipped with at least one greening

According to CCNR Annual report for 2018, the number of collisions between ships follows a clear downward trend, which can be explained by the introduction of electronic devices and equipment. Still, "collisions with infrastructures and bridges remain a type of accident that still shows relatively high numbers."

[8]Radionov, N.; Ćapeta, T.; Marin, J.; Bulum, B.; Kumpan, A.; Popović, N.; Savić, I., *Europskoprometnopravo*,PravnifakultetSveučilišta u Zagrebu, Zagreb, 2011, p. 180.

[9]Centarzarazvojunutarnjeplovidbe (CRUP), *Priručnikzaunutarnjuplovidbu u RepubliciHrvatskoj*, Zagreb, 2006, p. 5.

[10]Ribbink, D., Van Riel, A. C. R., Semeijn, J., *Policy Decisions and Modal Choice: An Example from the European Union*, Transportation Journal, Vol. 44, No. 1, 2005, p. 34.

[11]*Ibid.*

[12] European Conference of Ministers of Transport (ECMT) evolved into the International Transport Forum (ITF) in 2006. About ITF, https://www.itf-oecd.org/about-itf, accessed 29. 5. 2019.

[13] European Conference of Ministers of Transport - Council of Ministers, Inland Waterways And Environmental Protection – Summary, CEMT/CM(2006)10/final, p. 2.

[14] "Foremost among the potential impacts are hydromorphological pressures. Altering the shape of river courses to improve navigation affects bottom and bank characteristics and the dynamics of sediment transportation." *Ibid.*

[15] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Towards Quality Inland Waterway Transport NAIADES II, {SWD (2013) 324 final}, COM/2013/0623 final of 10. 9. 2013, p. 2.

[16] European Commission, Central Commission for the Navigation of the Rhine, Market Report 2014-2017, Main features and trends of the European Inland Waterway Transport sector, 2018, pp. 57–58, https://www.inland-navigation-market.org/wp-content/uploads/2018/09/Market-report-2014-2017_Web.pdf, accessed 29. 5. 2019.

[17]*Cf. ibid.*, p. 61.

[18] See Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile

measure (either concerning exhaust gas after treatment, hull form optimisation or propulsions systems optimization) increased between 2014 and 2016 from 54% to 61%. …However, the number of new vessels (31 in 2016) remains limited compared to the overall inland navigation fleet in Europe which is approximately 13,500 vessels."[19] Nevertheless, one should bear in mind that innovation contributing to environment does not make an excessive burden for shipping companies.

In this place we mention that according to Art. 15(3), point b, of the TEN-T guidelines[20] prescribes that rivers, canals and lakes are maintained so as to preserve good navigation status, while respecting the applicable environmental law.

From the above, we can conclude that the issue of environmental protection in the context of inland waterway transport is complex. Although there is an environmentally friendly mode of transport, there is still space for improvement.

Inland waterway transport has a limited network of waterways compared to railways and roads. Besides, the formation of large networks is long-lasting and impossible without significant investments.The use of inland waterway transport is also related to nautical restrictions: depths of the fairway and draught of the vessels. The water depths available in the fairway determine how many tonnes of goods may be carried on an inland vessel. The larger the draught, it will be possible to transport more cargo and thus reduce the unit price per tonne of cargo.[21] The technical limitations apply to fairways (their width and shape), locks, bridges and missing links that slow down or interrupttransport.[22]

With speeds up to 12 km/h[23] inland waterway transport is the slowest motorized mode of transport. However, a mass of freight which does not require high-speed transport can be transported on inland waterways.

Inland waterways navigation depends on water levels. Fairways may be temporarily closed due to high or low water levels. "Having a direct influence on the maximum loading degree of vessels, river water levels have an impact both on the volume transported and on the freight rate."[24] Icing in the winter season can also lead to the temporary closing of waterways. For example, "shipping on the Danube was interrupted for several days during the winters of 2005 and 2006 due to ice formation"[25] A possible reaction of the market to disrupted navigation services might be shifting to more environmentally harmful modes of transport.[26]

In our opinion, the mentioned disadvantages can be an obstacle to the development of inland waterway transport, but they should certainly be reduced.

3. Inland waterway transport and the inland navigation market in the European Union

In this chapter of the paper, we will briefly look at the state of the market of inland waterway navigation in the EU (length of waterways, amount of transported freight, number of passengers, etc.).

According to Statistical Pocketbook 2018, length of navigable canals, rivers and lakes regularly used for transport in EU 28 was 41 895 km in year 2016 (38611 km in year 1995).[27]As was already stated, despite the

machinery, amending Regulations (EU) No 1024/2012 and (EU) No. 167/2013, and amending and repealing Directive 97/68/EC, OJ L 252, 16. 9. 2016, pp. 53–117 .

[19] European Commission, Central Commission for the Navigation of the Rhine, *op. cit*. note 16, p. 3.

[20] Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No. 661/2010/EU, OJ L 348, 20. 12. 2013, pp. 1–128.

[21]Centarzarazvojunutarnjeplovidbe (CRUP), *op. cit.* note 9, pp. 21-22.

[22] On canal sections, dam dimensions limit the maximum dimensions of vessels and passing a dam is very long (30 to 60 minutes). *Cf. ibid*., p. 23.

[23]*Cf. ibid*., p. 90.

[24] European Commission, Central Commission for the Navigation of the Rhine, *op. cit*. note 16, p. 8. See also Christodoulou A., Demirel H., *Impacts of climate change on transport - A focus on airports, seaports and inland waterways*, Publications Office of the European Union, Luxembourg, 2018, p. 24.

[25] Christodoulou A., Demirel H., *op. cit.* note 24, p. 24.

[26]*Ibid.*

[27] European Commission, *Statistical Pocketbook 2018, EU Transport in figures*, Luxembourg, 2018, p. 85.

availability of inland waterway network in the EU and obvious advantages of the inland waterways transport, there is still a massive amount of capacity on the waterways that is not being exploited.

According to Eurostat inland waterway transport progressed by only 17% in nearly three decades.[28] "Looking at a longer period evolving over 20 years, the European Union inland navigation transport performance has increased at an average annual rate of 1% with a modal share remaining at around 6%. The inland navigation transport performance evolution is characterised by a small long-term increase, influenced by two main external factors: the economic situation affecting transport demand and the environmental conditions affecting available transport capacity."[29] According to the Mid-term progress report on the implementation of the NAIADES II action programme for the promotion of inland waterway transport (covering the period 2014-2017)[30]overall in Europe, the performance of inland navigation transport oscillated between 145 and 152 billion tkm over the last 5 years.

As we mentioned, there is a big difference between Member States in the amount of transported goods and passengers. Netherlands and Germany represent 71% of total European goods transport performance on European inland waterways. "More generally, the European Union Rhine countries (Belgium, Netherlands, France and Germany) represent about 85% of total inland navigation goods transport performance while the European Union Danube countries (Bulgaria, Croatia, Hungary, Austria, Romania and Slovakia) account for 15% of goods transport performance on European inland waterways. Other countries account for almost today less than 0.5% of European goods transport by inland navigation."[31]

The European Court of Auditors prepared a Special report 'Inland Waterway Transport in Europe: No significant improvements in modal share and navigability conditions since 2001'', in 2015[32] with its views and recommendations for inland waterway transport. The European Court of Auditors found that the policy objective of shifting traffic from roads to inland waterway transport and of improving navigability had not been achieved. Namely, the modal share of inland waterway transport did not increase significantly. Thus the Court considers that the EU inland waterway transport strategies have not been effectively implemented. Furthermore, the EU-financed projects examined were not always consistent with the inland waterway freight transport objectives and only a few of them improved navigability conditions.[33] In Court's opinion "this was partly due to weaknesses in the EU strategies for inland waterway transport (which were not based on sufficiently robust and comprehensive analysis) and to the unfocused use of limited resources at EU and Member State levels." The Court gave two recommendations: 1. in order to improve the effectiveness of the EU funding of inland waterway transport and to ensure better project performance[34] and 2. regarding the future development of the EU's strategy for inland waterway freight transport, and achieving better coordination between Member States.[35]

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[28] Eurostat, Goods transport by inland waterways, 2016, http://ec.europa.eu/eurostat/tgm/mapToolClosed.do?tab=map&init=1&plugin=1&language=en&pcode=ttr00007&toolbox=legend, accessed 8. 6. 2018. See also: European Commission, Statistical Pocketbook 2018, *op. cit.* note 27, p. 36.

[29] European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 3.

[30] European Commission, Commission Staff Working Document, Mid-term progress report on the implementation of the NAIADES II action programme for the promotion of inland waterway transport (covering the period 2014-2017), SWD (2018) 428 final, 18. 9. 2018, p. 3.

[31]"More generally, the European Union Rhine countries (Belgium, Netherlands, France and Germany) represent about 85% of total inland navigation goods transport performance while the European Union Danube countries (Bulgaria, Croatia, Hungary, Austria, Romania and Slovakia) account for 15% of goods transport performance on European inland waterways. Other countries account for almost today less than 0.5% of European goods transport by inland navigation."European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 5.

[32]European Court of Auditors,Special report No. 1/2015 'Inland Waterway Transport in Europe: No significant improvements in modal share and navigability conditions since 2001', of 3 March 2015, p. 7, https://www.eca.europa.eu/Lists/ECADocuments/SR15_01/SR15_01_EN.pdf, accessed 10. 6. 2019.

[33]*Ibid.*

[34] Member States should prioritise inland waterway projects which are on the corridors, rivers or river segments that provide the greatest and most immediate benefits. The Commission should focus its funding on those projects that are most relevant and for which there are already advanced plans in place to eliminate nearby bottlenecks. *Cf. ibid.* p. 8.

[35] The Commission should carry out in depth analyses of the potential market and benefits of inland navigation on different river segments and coordinate across Member States the implementation of the core TEN-T network; the Commission and Member States should agree to eliminate bottlenecks on corridors within the framework of the Connecting Europe Facility – this should take due account

As stated in Market Report 2014-2017, in Europe there were almost 10 000 inland waterway companies in 2014 (60% of the companies are active in goods and 40% in passenger transport). The Western European inland shipping sector is characterised by high fragmentation, with the majority of companies being small family businesses owning or operating one or two vessels. In the Danube region the companies are mostly bigger, „at present about 14 large companies, with more than 20 vessels each."[36] When we are talking about number of inland vessels, there are around 10,000 vessels in Rhine countries, and more than 3,000 vessels in Danube countries.[37] The total number of employees in the European Union is approximately 44,000 both for the transport of goods and for the transport of passengers on inland waterways.[38]

Inland waterways transport was traditionally reserved for the transportation of bulk industrial goods, building materials, heavy materials, oversized loads, etc. Future inland navigation development is mainly expected in new markets, e. g. in container transport, the circular economy, and city distribution.[39]

The Danube, together with the Rhine, is the most important European river for the cruise sector. In 2016, there were 335 active cruise vessels operating in the EU, which represented 39% of the worldwide river cruise fleet, compared to 24% in 2005, which is a big progress.[40] It was also great progress and in passenger transport. Between 2012 and 2016, the number of passengers on European river cruise vessels increased annually by 13% on average.[41]

The European Commission is promoting inland waterway transport through various funding and financing programmes, such as the Connecting Europe Facility (CEF), Horizon 2020, the European Fund for Strategic Investments and through the Cohesion policy. According to overview of CEF support for the period 2014-2017 to inland waterway transport 'The Connecting Europe Facility (CEF) Transport Inland Waterway Portfolio', CEF Transport has funded 641 grants worth €22.3 billion of EU contribution, with a total investment in the European economy of €46 billion. The current CEF Transport Inland Waterway action portfolio (composed of 52 actions selected under the 2014-2017 calls and receiving €1.7 billion in CEF Transport funding) includes actions concerning inland waterway infrastructure, inland ports, innovation and greening of inland waterway transport and river information services (RIS).[42]

4. Legal regulation of inland waterways transport

of the TEN-T objective of completing the core network by 2030; the Commission should propose the strengthening of the legal base in order to broaden the reporting requirements in relation to the navigation status of the waterways and require Member States to elaborate national inland waterway maintenance plans in a coordinated way. p. 8.

[36] European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 44.

[37] CCNR Market Observation - Annual report Inland Navigation in Europe 2018, p. 86, http://www.inland-navigation-market.org/en/period/2018/, accessed 8. 6. 2018.

[38] European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 50.

[39] NAIADES II mid-term progress report, *op. cit.* note 30, p. 3. Report on inland waterways also mentions new market opportunities for inland waterways such as biomass transport. See: Market Observation, Inland navigation in Europe, http://www.inland-navigation-market.org/en/2159-2/, accessed 4. 6. 2019.

Waterways could also ensure an alternative urban distribution of goods. Examples do exist, for the distribution of consumer goods in Paris by inland container barges. Inland waterways are also interesting for the transport of building materials for large infrastructure projects in big cities.European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 70.

[40] Twenty new river cruise vessels were put into service in 2016 in Europe, out of 31 newly constructed vessels worldwide, that is a significant share of 70%. European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 64.

[41] European Commission, Central Commission for the Navigation of the Rhine, *op. cit.* note 16, p. 3. According to Report on inland waterways, between "2002 and 2017, cruise vessel traffic on the Danube (at the German-Austrian border) increased by 89%, on the Rhine by 128%, and on the Main-Danube Canal by 295%." See: Market Observation, Inland navigation in Europe, http://www.inland-navigation-market.org/en/2159-2/, accessed 4. 6. 2019.

[42] European Commission, CEF support to inland waterways, 'The Connecting Europe Facility (CEF) Transport Inland Waterway Portfolio', State-of-play: June 2018, p. 3, https://ec.europa.eu/transport/sites/transport/files/studies/2018-06-cef-support-to-inland-waterways.pdf, accessed 9. 6. 2019.

Navigation on rivers in Europe is currently regulated by a variety rules passed by international institutions and bodies: specific river navigation commissions[43] (e. g. Danube Commission (DC),[44] Moselle Commission,[45] Central Commission for Navigation on the Rhine(CCNR),[46]International Sava River Basin Commission (ISRBC)[47]), United Nations Economic Commission for Europe (UNECE), the European Union for EU Member States as well as national legislation.

Platz and KeesRuijgrok concluded the UNECE, and not the European Union is responsible for the harmonisation of technical, professional, safety and infrastructure matters of inland waterways navigation in the whole of Europe, and therefore develops and provides corresponding legal and technical measures.[48]

The rules governing the navigation on European rivers are complex. Namely, the largest rivers in Europe, the Rhine and the Danube, are international rivers. Not only in the geographical, but also in the legal sense.[49] So, for them there is an international agreement regulating navigation on them. The resolutions of the CCNR are legally binding for its member states. The Danube Commission decisions and recommendations are not legally binding and need to be implemented into national legislation of its member states. In addition to international treaties (which mainly regulate navigation regimes,[50] protection of river environment,[51] but also issues relevant to inland waterway transport[52]), both EU and national legislation are in force. This fragmentation of the institution, numerous different regimes and rules certainly do not contribute to the harmonisation of rules in this mode of transport as well as its improvement. However, it seems that in recent years there has been a progress regarding harmonisation (see *infra*).

The private law applicable to inland water transport (contract law, liability rules) is still mostly national in character and its harmonisation at the international level is not sufficient. Measures to improve this situation have already been taken. European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) of 2000, provides a harmonised legal framework on the main aspects of the transport of dangerous goods. Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway (CMNI) of 2001 establishes uniform rules concerning contracts for the carriage of goods by inland waterway,

[43] The main difference between them is whether the regulations they make are binding or not.

[44] Danube Commission, http://www.danubecommission.org/, accessed 1. 6. 2019.

[45] Moselle Commission, moselkommission.org/, accessed 1. 6. 2019.

[46] Central Commission for Navigation on the Rhine, http://www.ccr-zkr.org/, accessed 1. 6. 2019.

[47] International Sava River Basin Commission, http://www.savacommission.org, accessed 1. 6. 2019.

[48] Platz, T. E. and KeesRuijgrok, K., *Inland waterways*, in Matthias Finger, M., Holvad, T. (Eds.), *Regulating Transport in Europe*, Edward Elgar Publishing, Cheltenham & Northampton, 2013, p. 177.

[49] According to Andrassy, Bakotić, Seršić and Vukas, today, strictly legal, the international river is considered only rivers whose regime is regulated by an international treaty (hence the name of the conventional river). Andrassy, J., Bakotić, B., Seršić, M., Vukas, B., *Međunarodnopravo 1*, 2. izmijenjenoizdanje, Školskaknjiga, Zagreb, 2010, p. 199.

[50] E. g. Convention regarding the Regime of Navigation on the Danube of 1948, (Official Gazette of the Republic of Croatia, International Agreements, No. 18/1998); Supplementary Protocol to the Convention regarding the Regime of Navigation on the Danube of 1998 (Official Gazette of the Republic of Croatia, International Agreements, No. 13/1998); Mannheim Convention for the Navigation of the Rhine of 1868 (RevidierteRheinschiffahrts-Aktezwischen Baden, Bayern, Frankreich, Hessen, Niederland und Preussen Rheinurkunden, vol. 2 (1860 - 1918), MartinusNijhof, 's-Gravengahe; Duncker&Humbolt, München and Leipzig, 1918., pp. 80. – 106) with additional protocols; Framework Agreement on the Sava River Basin of 2002 (Official Gazette of the Republic of Croatia, International Agreements, No. 14/2003, 5/2005) and Protocol on the Navigation Regime to the Framework Agreement on the Sava River Basin of 2002 (Official Gazette of the Republic of Croatia, International Agreements, No. 6/2004, 5/2005).

[51] Convention on Cooperation for the Protection and Sustainable Use of the Danube River (Danube River Protection Convention) of 1994 (Official Gazette of the Republic of Croatia, International Agreements, No. 2/1996); Convention on the Protection of the Rhine against Pollution by Chlorides of 1976 (ILM, vol. 16, No. 2/1977, pp. 265. – 275); Additional Protocol to the Convention on the Protection of the Rhine against Pollution by Chlorides of 1991 (UNTS, vol. 1840, br. 23469, p. 372.); Convention on the Protection of the Rhine of 1999 (https://www.iksr.org/fileadmin/user_upload/DKDM/Dokumente/Rechtliche_Basis/EN/legal_En_1999.pdf); Protocol on Prevention of the Water Pollution Caused by Navigation to the Framework Agreement on the Sava River Basin of 2009 (Official Gazette of the Republic of Croatia, International Agreements, No. 1/2010).

[52] European Agreement on Main Inland Waterways of International Importance – AGN) of 1996 (Official Gazette of the Republic of Croatia, International Agreements, No.; 16/1998); Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway (CMNI) of 2001 (Official Gazette of the Republic of Croatia, International Agreements, No. 10/2004); European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (AND) (Official Gazette of the Republic of Croatia, International Agreements, No. 5/2019).

such as rights and obligations of the Contracting Parties, transport documents, liability of the carrier, etc. From the other side at present there is no international treaty that regulates inland waterway transport of passengers.[53] The Convention on the limitation of liability in inland navigation (CLNI) of 2012 will entry in force on 1 July 2019[54] but covers only a limited number of countries.[55]The new CLNI of 2012 introduces an enlarged scope of application – it includes all inland waterways (the previous CLNI of 1988 was restricted in its application only to the River Rhine and Mosel); introduces increased limits, particularly in respect of injury and death of passengers, and damages arising from the carriage of dangerous goods.

4.1. Legal regulation of inland waterway transport in the European Union

Historically, the EU (or former EC/EEC) did not play a role in the regulatory framework of inland shipping.[56] Legal regulation of inland waterways transport in the framework of the European Union began in 1958 when, under the auspices of the European Coal and Steel, Agreement concerning freight rates and conditions for the carriage of coal and steel on the Rhine was adopted.[57] Since than many regulations have been adopted, covering the following areas: vessels, work (qualifications, working time), River Information System, market, environment, etc.[58]

Detailed analysis of the EU legal framework would exceed the scope and purpose of this paper. Therefore, in this place only recently adopted directives contributing to the harmonisation of legislation will be mentioned.

Directive (EU) 2016/1629 laying down technical requirements for inland waterway vessels was adopted on 16 September 2016.[59] In order to achieve harmonisation at Union level, and to prevent distortions of competition and varying levels of safety, the same technical requirements should be applied to the whole of the Union's inland waterways. According to Art. 1. the Directive establishes the technical requirements necessary to ensure the safety of craft[60] navigating on the inland waterways and the classification of those inland waterways. The Directive contains provisions on navigation certificates, vessel identification, inspection and altered technical requirements. The requirements for navigation certificates on inland waterways are identical across all Member States and lead to high level of safety. "The Directive takes account of the standards established by the 'European Committee for Inland Navigation Standards' (CESNI) and the new European standard laying down technical requirements for inland navigation vessels ES-TRIN 2017 has been incorporated into EU legislation via a Delegated Act.[61],,[62]

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[53] See Činčurak Erceg, B., *op. cit.* note 1, p. 45.

[54] CCNR, Strasbourg Convention on the limitation of liability in inland navigation, https://www.ccr-zkr.org/12050400-en.html, accessed 11. 6. 2019.

[55] Hungary, Luxembourg, Netherlands and Serbia. https://www.ccr-zkr.org/12050400-en.html,accessed 11. 6. 2019.

[56]Platz, T. E. and KeesRuijgrok, K., *op. cit.* note 48, p. 175.

[57]Činčurak Erceg, Biljana, *Međunarodnerijeke - plovidaizaštitariječnogokoliša*, Doctoral dissertation, Sveučilište u Zagrebu, Pravnifakultet, Zagreb, 2013, p. 153.

[58] The list of EU legislation in the field of inland waterways is available at: https://ec.europa.eu/transport/sites/transport/files/legislation/summary_of_eu_legislation_in_the_field_of_inland_waterways.pdf, accessed 4. 6. 2019.

[59] Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC OJ L 252, 16. 9. 2016, pp. 118–176. It is applicable from 7 October 2018.

[60] Pursuant to Art. 3, point a), 'craft' means a vessel or item of floating equipment. Art. 2(1) prescribes that the Directive applies to the following craft: (a) vessels having a length (L) of 20 metres or more; (b) vessels for which the product of length (L), breadth (B) and draught (T) is a volume of 100 cubic metres or more; (c) tugs and pushers intended for towing or pushing either craft referred to in points (a) and (b) or floating equipment, or intended for moving such craft or floating equipment alongside; (d) passenger vessels; (e) floating equipment.

[61] Commission Delegated Directive (EU) 2018/970 of 18 April 2018 amending Annexes II, III and V to Directive (EU) 2016/1629 of the European Parliament and of the Council laying down technical requirements for inland waterway vessels C/2018/2214, OJ L 174, 10. 7. 2018, pp. 15–19.

[62]NAIADES II mid-term progress report, *op. cit.* note 30, p. 9. "It is the first time that the requirements are established by making reference to the ES-TRIN standard drawn up by a new international committee of experts - the European Committee for drawing up Standards in Inland Navigation (CESNI)." European Commission, Vessels, https://ec.europa.eu/transport/modes/inland/vessels_en, accessed 6. 6. 2019.

The European Union extends the availability of information on vessels and certificates via its database[63]- European Hull Database[64](EHDB) in order to support administrative measures for maintaining safety and ease of navigation and to ensure application of this Directive.
Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation[65] was adopted on 12 December 2017.[66]The Directive sets up a harmonised system of the conditions and procedures for the certification of the qualifications of persons involved in the operation of a craft navigating on Union inland waterways, as well as for the recognition of such qualifications in the Member States. According to Art. 2, the Directive applies to deck crew members, liquefied natural gas experts and passenger navigation experts on the types of craft listed in Art. 2(1) on any Union inland waterway. It aims to improve safety, to remove barriers to labour mobility, to develop the skills and employability of young people and to offer better career prospects to all crew members, as well as to facilitate the transition of experienced workers from other sectors.[67]

For the purpose of this paper Directive 2005/44/EC on harmonised river information services (RIS) on inland waterways in the Community[68] has to be mentioned. It establishes rules on the use of harmonised river information services (RIS), which are designed to ensure the safety, efficiency and environmental friendliness of inland waterways in the EU. RIS simplifies the exchange of information between public and private parties involved in river transport. It also facilitates the integration of inland waterway transport in the intermodal transport chain, which is a prerequisite for a higher modal share of inland waterway transport. Meanwhile, there was an important IT and technological development. RIS has been included in the Digital Inland Waterway Area (DINA)[69] of 2017, whose aim is to interconnect information systems on infrastructure, people, vessels, management and cargo in the inland waterway transport sector and to connect this information with other transport modes. For that reason, the European Commission started to evaluate the Directive 2005/44/EC and it is still under evaluation.

4.2. NAIADES II Action Programmeand its progress

The European Commission is promoting inland waterway transport through various programmes. The policy to promote inland waterway transport in Europe is contained in the NAIADES[70] (Navigation And Inland Waterway Action and Development in Europe) Action Programme (2006-2013) and the platform for its implementation - PLATINA project, launched in 2008. NAIADESincludes numerous actions and measures to improve transport on inland waterways. The NAIADES focuses on five strategic areas: improving market conditions, modernising the fleet, developing the human capital, strengthening the image and amending the infrastructure.
Both, NAIADES and PLATINA were extended, NAIADES II for the period 2014-2020 and PLATINA II for 2013 – 2016. According to NAIADES II Communication, the economic and environmental prospects for inland navigation have continued to worsen. Therefore, the Commission has decided to update and renew the

[63] European Commission, Vessels, https://ec.europa.eu/transport/modes/inland/vessels_en, accessed 6. 6. 2019.
[64] See Art. 19. of the Directive.
[65] Directive (EU) 2017/2397 of the European Parliament and of the Council of 12 December 2017 on the recognition of professional qualifications in inland navigation and repealing Council Directives 91/672/EEC and 96/50/EC, OJ L 345, 27. 12. 2017, pp. 53–86.
[66] According to Art. 36, the Commission shall adopt the implementing and delegated acts referred to in the Directive by 17 January 2020. Member States, according to Art. 39(1) shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 17 January 2022.
[67] EUR-Lex, Recognition of professional qualifications in inland navigation, https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32017L2397, accessed 6. 6. 2019.
[68]Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community, OJ L 255, 30. 9. 2005, pp. 152-159.
[69] See more European Commission, Digital Inland Waterway Area - Towards a Digital Inland Waterway Area and Digital Multimodal Nodes, Luxembourg, 2017, https://ec.europa.eu/transport/sites/transport/files/studies/2017-10-dina.pdf, accessed 12. 6. 2019.
[70] Communication from the Commission on the promotion of inland waterway transport "NAIADES" - an integrated European action programme for inland waterway transport {SEC (2006) 34}, COM/2006/0006 final, of 17 January 2006.

NAIADES programme until 2020, and to align it with the Transport White Paper.[71] The NAIADES II policy package 'Towards quality inland waterway transport'[72] is the second European Action Programme aimed at moving more freight transport onto Europe's waterways while reducing emissions and creating quality mode of transport. Key areas for policy actions in the field of inland waterway transport are: quality infrastructure, quality through innovation, smooth functioning of the market, environmental quality through low emissions, skilled workforce and quality jobs, integration of inland navigation into the multimodal logistics chain.

To support the coordination, implementation and monitoring of the NAIADES II action programme, the Commission launched in 2015 a programme support action (PSA) to implement the TEN-T[73] core network related to sea ports, inland ports and inland waterway transport.

In September 2018, The European Commission has published a mid-term progress report on the EU inland waterway action programme NAIADES II[74] and a report on digital inland navigation (DINA). The NAIADES II mid-term report presents progress achieved up to 2017 and the on-going actions for implementing NAIADES II until 2020.[75] Mid-term progress report as the major factors that affected the performance of inland navigation mentions: adverse hydro-meteorological conditions have affected operating conditions during certain periods in key sections of the inland waterways network (low water levels or flooding, ice) and lack of timely maintenance; limited economic recovery in the main sectors using inland navigation transport services; inadequate infrastructure, (including locks, bridges, minimum draught levels or river information systems (RIS) and bottlenecks on the trans-European transport network (TEN-T)).[76]Despite these difficulties, the inland navigation sector has generally proved to be resilient over the last 5 years. "The inland navigation sector's share of EU transportation modes has remained steady at around 6% at the EU level."[77] The mid-term report specifically refers to infrastructure, functioning of the market, environment, jobs which were discussed previously in this paper. In the mid-report, the European Commission emphasizes that most of the foreseen actions regarding regulations, policy and financing have been achieved. Finally, it further identifies on-going actions for further implementation of the NAIADES II programme until 2020 (preparation of acts, continuation of activities related to programs and projects, cooperation with commissions and other organizations as well as relevant bodies, research, etc.).

So, despite the fact that a lot has been done, and that plans for future activitiesexsist, there is still a lot of work in front of the legislator and other stakeholders. The end of the NAIADES II program is approaching (year 2020), and it remains to see what will be the results of its implementation.

5. Conclusion

Although the inland waterways transport is an acceptable mode of transport, in some EU member states it is still unfortunately underestimated and insufficiently exploited. Although it has many advantages its modal

[71] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Towards quality inland waterway transport NAIADES II, {SWD (2013) 324 final}, COM/2013/0623 final of 10. 9. 2013, p. 3.

[72] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Towards quality inland waterway transport NAIADES II, {SWD (2013) 324 final}, COM/2013/0623 final of 10. 9. 2013.

[73] Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU, OJ L 348, 20.12.2013, pp. 1–128. as well as Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010, OJ L 348, 20. 12. 2013, pp. 129–171 are also important for the development of the inland waterways. Regulation (EU) No 1315/2013 contains provisions on Inland waterways components (see Art. 14), transport infrastructure requirements(see Art. 15) and priorities for inland waterway infrastructure development (see Art. 16).

[74]NAIADES II mid-term progress report, *op. cit.* note 30.

[75] European Commission, Towards quality inland waterway transport – State of Play, https://ec.europa.eu/transport/modes/inland/news/2018-09-20-towards-quality-inland-waterway-transport_en,accessed 6. 6. 2019.

[76]NAIADES II mid-term progress report, *op. cit.* note 30, pp. 2-3.

[77]*Ibid.*

share in the total of goods transported is rather stable - 6%. However, this modal share varies a lot between Member States. It is not easy to explain these differences and draw conclusions. Factors that certainly affect the results are availability and quality of the waterways network, available port infrastructure, presence of industries requiring inland navigation transport, user habits, but also political and historical elements.

European inland waterways are also faced with certain infrastructural difficulties. Definitely, the prerequisite for a high modal share of inland waterway transport is the adequate demand and above all the availability of efficient infrastructure - fairways and ports. Removal of bottlenecks and missing links as well as good infrastructure maintenance is necessary. Still, despite its importance, maintenance is often neglected. Therefore, greater investments are needed (for better maintenance of infrastructure, modernisation, etc.), but also for connecting with other modes of transport. Continuous investment in infrastructure along with the promotion of the use of inland waterway transport should bring positive change.

However, some positive changes have occurred. Most has been done in areas of modernisation of vessels, growth of passengers transport, and the introduction of modern information and communication technologies in inland navigation. Between 2012 and 2016, the number of passengers on European river cruise vessels increased annually by 13% on average It is assumed that the increase in the number of passengers will continue and that river tourism will develop ever more. Although the volume of goods transported has not increased significantly over the last 20 years, there is still hope that changes may occur here. Some of the ideas are the use of inland waterways for urban transport, and transportation of biomass, transportation of building materials for large infrastructure projects in big cities, etc.

When talking about legal regulation of inland waterway transport, fragmentation of the institution, numerous different regimes and rules are still present. However, it seems that in recent years there has been some move towards harmonisation of rules. Adopted Directive (EU) 2016/1629 laying down technical requirements for inland waterway vessels and Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation contribute to the to the harmonisation of legislation. Furthermore, the European Commission started to evaluate Directive 2005/44/EC on harmonised river information services (RIS) on inland waterways in the Community.

However, work on improving legislation is still necessary. The private law applicable to inland water transport (contract law, liability rules) is still mostly national in character and its harmonisation at the international level is not sufficient. Although the European Union is trying to create favourable conditions for inland waterway transport, it should not be forgotten that the major river basins extend beyond the borders of the EU. Therefore, a wider - international, not just European cooperation is needed.

The advantages of inland navigation are not sufficiently spread among the public and the transport industry. As a key activity for the development of inland waterways transport, it is certainly promotional activities aimed at shippers, traders, manufacturers, companies, forwarders. The economic, safety and environmental benefits of the inland waterway transport should be emphasized.

We can conclude that inland waterways transport in the European Union is flowing, although not fast.

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