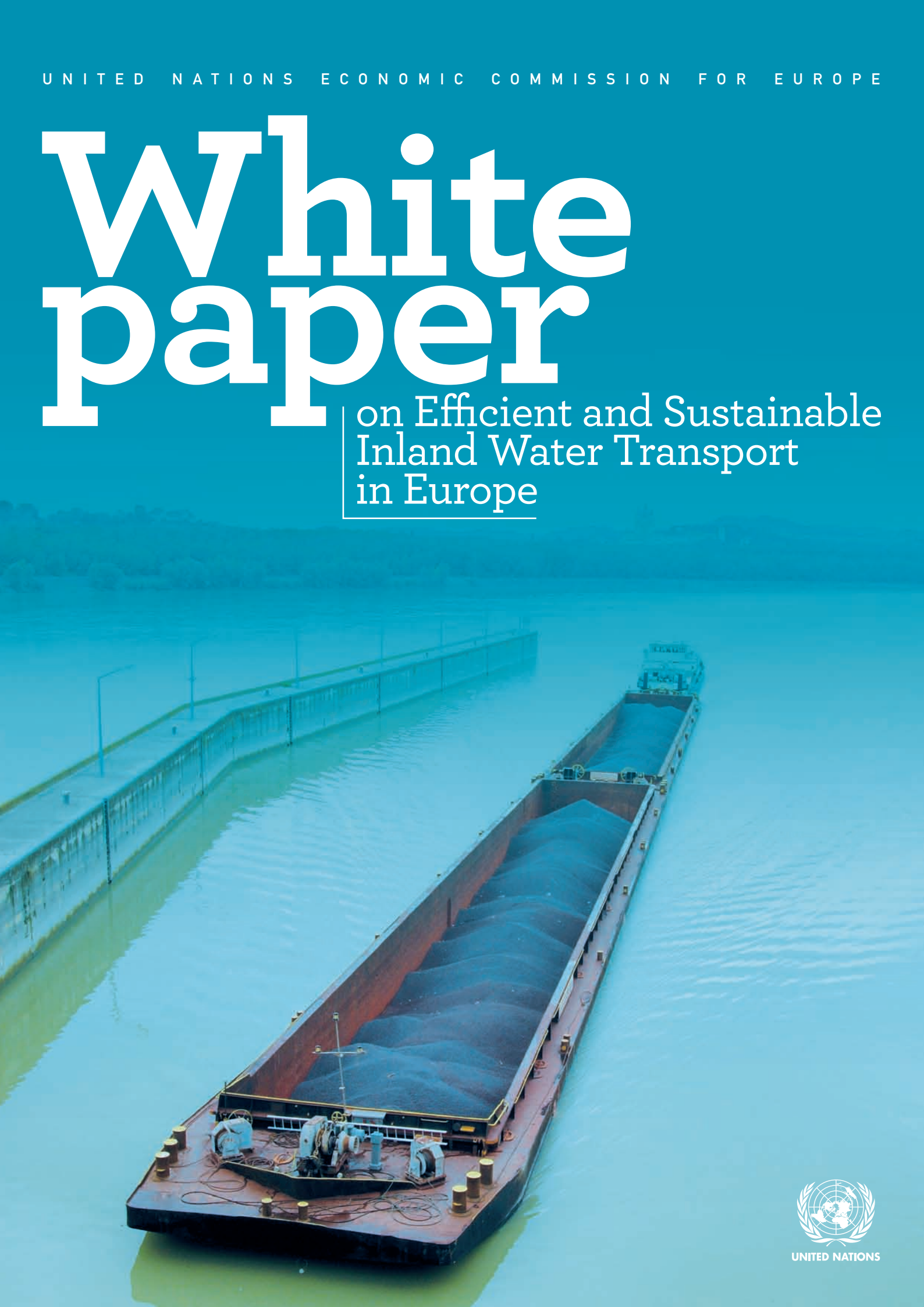
UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

White paper

on Efficient and Sustainable Inland Water Transport in Europe



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Inland Transport Committee
Working Party on Inland Water Transport

White paper on Efficient and Sustainable Inland Water Transport in Europe

New York and Geneva, 2011

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ECE/TRANS/SC.3/189

United Nations Economic Commission for Europe (UNECE)

The United Nations Economic Commission for Europe (UNECE) is one of the five United Nations regional commissions, administered by the Economic and Social Council (ECOSOC). It was established in 1947 with the mandate to help rebuild post-war Europe, develop economic activity and strengthen economic relations among European countries, and between Europe and the rest of the world. During the Cold War, UNECE served as a unique forum for economic dialogue and cooperation between East and West. Despite the complexity of this period, significant achievements were made, with consensus reached on numerous harmonization and standardization agreements.

In the post-Cold War era, UNECE acquired not only many new member States, but also new functions. Since the early 1990s the organization has focused on analyses of the transition process, using its harmonization experience to facilitate the integration of Central and Eastern European countries into the global markets.

UNECE is the forum where the countries of western, central and eastern Europe, central Asia and North America – 56 countries in all – come together to forge the tools of their economic cooperation. That cooperation concerns economics, statistics, environment, transport, trade, sustainable energy, timber and habitat. The Commission offers a regional framework for the elaboration and harmonization of conventions, norms and standards. The Commission's experts provide technical assistance to the countries of South-East Europe and the Commonwealth of Independent States. This assistance takes the form of advisory services, training seminars and workshops where countries can share their experiences and best practices.

Transport in UNECE

The UNECE Inland Transport Committee (ITC) facilitates the international movement of persons and goods by inland transport modes. It aims to improve competitiveness, safety, energy efficiency and security in the transport sector. At the same time it focuses on reducing the adverse effects of transport activities on the environment and contributing effectively to sustainable development. The ITC is a:

- Centre for multilateral transport standards and agreements in Europe and beyond, e.g. regulations for dangerous goods transport and road vehicle construction at the global level
- Gateway for technical assistance and exchange of best practices
- Promoter of multi-country investment planning
- Substantive partner for transport and trade facilitation initiatives
- Historic centre for transport statistics.

For more than six decades, ITC has provided a platform for intergovernmental cooperation to facilitate and develop international transport while improving its safety and environmental performance. The main results of this persevering and important work are reflected in more than 50 international agreements and conventions which provide an international legal framework and technical regulations for the development of international road, rail, inland water and intermodal transport, as well as dangerous goods transport and vehicle construction. Considering the needs of transport sector and its regulators, UNECE offers a balanced approach to and treatment of facilitation and security issues alike.

Contents

Executive summary

Inland water transport (IWT) is, on many European transport corridors, a competitive alternative and addition to road and rail transport, offering a sustainable and environment-friendly mode of transport in terms of energy consumption, noise and gas emissions. IWT is also often the most economical inland transport mode due to low infrastructure and external costs – a characteristic of crucial importance. However, IWT is often still under-used and suffers from infrastructure, institutional, legal and technical barriers, which call for pro-active policies by Governments and international bodies.

The United Nations Economic Commission for Europe (UNECE) works for smooth and efficient IWT across the region, as well as for further expansion of its network to take advantage of this safe and sustainable mode of transport. UNECE provides a unique platform and policy forum for its 56 member States, where technical and legal issues of IWT are addressed with emphasis on the Pan-European dimension of inland waterways and ports, intermodal linkages, cross-sectoral issues and establishment of common rules, regulations and benchmarks.

UNECE publishes herewith its second White Paper on Efficient and Sustainable Inland Water Transport in Europe that updates the analysis made in the first UNECE White Paper on trends in and development of inland navigation and its infrastructure issued in 1996. The UNECE White Paper is based on policy studies, ministerial declarations and input from European River Commissions and other international bodies and outlines key elements of a Pan-European strategy for efficient and sustainable IWT.

In 2007, 5.8 % of total goods transport in the 27 European Union (EU) countries was performed on inland waterways. Road and rail transport carried 76 % and 18 % respectively. In the Russian Federation, IWT accounts for around 2 % of total goods transport. The IWT importance varies significantly between and within countries, reflecting a strong influence of national and regional transport policies as well as economic and geographical factors. In terms of modal split, we witness today a slight decline of IWT share in comparison with the mid-1990s in most of the countries. This confirms the continuing increase of the share of road transport at the expense of inland navigation.

Fifteen years after the codification of the European network of inland waterways and ports of international importance in the 1996 European Agreement on Main Inland Waterways of International Importance (AGN), the UNECE White Paper describes the current capacity of the network, identifying major missing links and highlighting completed and planned major infrastructure projects. The ongoing major investment projects prove the feasibility of building high capacity canals connecting parts of the existing network.

The UNECE White Paper shows that there exists a significant degree of harmonization between the existing inland navigation regimes, achieved through constant coordination and cooperation among the institutions involved. It also shows the emergence of truly pan-European legally binding rules on standards and parameters for the construction and operation of inland waterways and ports of international importance, on the transport of dangerous goods and on unified rules on the contracts for the carriage of goods by inland waterways. However, there is still a need for further development of the IWT regulatory framework and for synergy between the inland navigation institutions both at policy and expert levels.

The UNECE White Paper also provides a comprehensive list of IWT advantages (superior safety, high versatility, good reliability, low costs, high energy-efficiency, good carbon footprint, low noise levels, low infrastructure costs, integration into supply chains, etc.). It also shows that IWT is still facing a number of traditional and new challenges. A common Pan-European policy and actions are of particular importance in key areas of IWT development, including infrastructure development, modernization of the fleet, use of river information services (RIS), market requirements, labour market challenges, climate change and enhancing the institutional and regulatory regimes. The UNECE White Paper therefore comes up with policy recommendations in these 7 priority areas to make IWT in the ECE region more efficient and sustainable:

UNECE Policy Recommendation No. 1: Make full use of pan-European mechanisms to coordinate the development of the E waterway network (promote the AGN, strengthen monitoring mechanisms and set up expert groups to further coordinate the development of the E waterway network);

UNECE Policy Recommendation No. 2: Coordinate and support measures to modernize the inland water fleet at the pan-European level (strengthen the work on pan-Europeans norms on technical requirements for inland water vessels; promote Europe-wide studies on the inland fleet, its modernization and efficiency and continue work on technical prescriptions for river-sea vessels);

UNECE Policy Recommendation No. 3: Promote the use of River Information Service (RIS) and other information communication technologies (ICT) (support a pan-European dialogue on the implementation and further development of RIS; support current efforts to set up an international hull data base, and encourage other uses of ICT to facilitate IWT operations);

UNECE Policy Recommendation No. 4: Respond effectively to new market requirements (raise awareness of IWT advantages in comparison with and/or in conjunction with other modes of land transport; improve cooperation between IWT, rail and road operators; raise awareness of international agreements on intermodal transport operations; support initiatives to improve the role of IWT in secure intermodal transport chains; and address the issue of inland waterway infrastructure pricing);

UNECE Policy Recommendation No. 5: Address the labour market challenge at the pan-European level (support the ongoing work of the EU and River Commissions on addressing labour market challenges and strengthen the image of IWT, continue work on harmonizing requirements for issuing certificates for boatmasters and crew members and on manning requirements for inland vessels; monitor and support the process of opening up national inland waterways of some UNECE countries);

UNECE Policy Recommendation No. 6: Tackle environmental challenges and the carbon footprint (ensure active participation of UNECE member countries in the United Nations Development Account project on the development and implementation of a monitoring and assessment tool for CO_2 emissions in inland transport to facilitate climate change mitigation; maintain a register of pertinent studies and events; support national and regional activities aimed at adapting IWT to the impact of climate change; and manage waste and reduce pollution of inland water vessels);

UNECE Policy Recommendation No. 7: Reinforce the institutional and regulatory framework at pan-European level (identify areas for further coordination, cooperation, transparency and harmonization of rules and regulations for IWT at the pan-European level; promote transparent and standard pan-European rules for inland water navigation, support the establishment of a pan-European legal framework for private law aspects of inland navigation; and monitor and support reforms to improve institutional arrangements in inland navigation).

Introduction

1. In 1996, the then Principal Working Party on Inland Water Transport of the UNECE published a "White Paper on trends in and development of inland navigation and its infrastructure" (TRANS/SC.3/138) to reflect its discussions on the development of a coherent navigable waterway network in Europe.

2. The White Paper analyzed the inland water transport (IWT) situation in Europe and presented the existing navigation on European inland waterways. The Paper also identified the factors having an impact on the perspectives for inland navigation and described the first steps in developing the network of European inland waterways through the establishment of the European Agreement on Main Inland Waterways of International Importance (AGN). The Paper highlighted the general trend towards the declining use of IWT, in the context of the rapid road transport expansion, and put forward policy recommendations aimed at stopping and reversing this trend.

3. The 1996 White Paper became a reference publication on IWT development in Europe. In 2006, the Transport Ministers at the third pan-European Conference on Inland Water Transport in Bucharest Ministers recognized the need for the promotion of inland waterway transport as a commercially attractive and environmentally compatible mode of transport through coordinated action. In the follow-up Action Plan for implementation of the decisions of the Bucharest Conference adopted on 8 February 2007 (ITC Resolution No. 258), the UNECE Inland Transport Committee considered that regular publication of a general policy document on advantages of IWT and progress in is development would help overcome market fragmentation of IWT in Europe and establish the principle of free navigation on inland waterways at the pan-European level. The Committee called on the UNECE to proceed to preparing the new White Paper in close cooperation with the European Commission, River Commissions and other major stakeholders.

4. The second edition of the White Paper was initiated in 2007 by the UNECE Working Party on Inland Water Transport (SC.3) with the goal to assess the situation of IWT in the ECE region, using the first White Paper as a benchmark for tracing the progress or lack of thereof in the IWT development. The overall objective of the new White Paper was identifying the key areas of pan-European cooperation which could further promote this largely under-used mode of transport. To reflect the increasing efficiency and sustainability concerns, the Working Party modified the title of the publication to "White Paper on Efficient and Sustainable Inland Water Transport in Europe".

5. The Paper was prepared under the guidance of SC.3 and benefited from supervision and advice from a special Peer Review Board, composed of representatives of the European Commission, River

Commissions and other competent organizations. The final draft was adopted, in principle, by the SC.3 fifty-fourth session (13–15 October 2010) and finalized at the special editorial meeting (16–18 February 2011). The final paper was submitted for the endorsement of the seventy-third session by the UNECE Inland Transport Committee of 1 to 3 March 2011.

6. In accordance with its scope and purpose, the present White Paper is structured as follows: Chapter 1 provides a brief introduction on the importance and performance of IWT in the ECE region, comparing it with the situation in the 1996 White Paper. Chapter 2 presents the current state of the European network of inland waterways of international importance, highlighting the changes in the extent and the quality of the network since its formalisation in 1996 in the AGN. Chapter 3 analyzes the institutional and regulatory aspects of inland navigation, identifying the main progress in this area and the remaining challenges. Building on the analysis provided in the first three chapters, the concluding Chapter 4 gives a general appreciation of the results of more than a decade of IWT polices, sets out key elements of a pan-European vision for efficient and sustainable inland water transport and suggests possible follow-up actions by SC.3. A special supplement on the IWT situation in the United States of America is included in the document in accordance with the decision of the SC.3 fifty-fourth session (ECE/TRANS/SC.3/187, para. 12).

Chapter 1

Importance and Performance of Inland Water Transport in the ECE region

7. Twenty-seven out of the fifty-six current UNECE member States possess inland waterways of international importance which play or could play an important role in international freight and passenger traffic. The current chapter gives a brief overview of the importance of IWT in the freight transport of the region and highlights the overall trend in its development since the publication of the 1996 White Paper.[1]

A. The place of inland water transport in international freight transport

8. The place of IWT in overall freight transport operations in UNECE member countries varies greatly both between the countries and within their borders. As shown in table 1 below, the amount of goods transported by IWT is usually fairly modest when compared with other modes of inland transport, such as rail and road.

Table 1
Freight transport in the selected UNECE countries (2007)
(million t-km)

	Inland waterways freight	*Road freight*	*Rail freight*	*Total inland freight transport*
Austria	2 597	18 648	21 371	49 842
Belarus	93	19 200	47 933	67 226
Belgium	9 006	42 085	8 148	60 733
Bulgaria	1 711	5 890	5 241	13 262
Croatia	109	10 502	3 574	15 966
Czech Republic	898	48 141	16 304	67 422
Finland	102	25 963	10 434	36 499
France	8 830	207 025	40 502	277 498
Germany	64 716	343 439	114 615	538 594
Hungary	2 212	13 174	10 137	31 246
Lithuania	11	20 278	14 373	35 694
Luxemburg	345	587	287	1 219
Netherlands	41 868	32 867	7 216	87 534
Poland	1 338	159 527	54 253	238 631
Romania	5 325	23 927	15 757	46 858
Russian Federation	86 027	205 849	2 090 337	3 523 108
Serbia	1 584	1 161	4 551	7 748
Slovakia	1 004	27 050	9 647	37 701
United Kingdom	140	175 851	21 300	207 520

Source: OECD.

[1] Due to limited space, this paper does not include a specific analysis of inland ports and particular issues in their development, although these are partially covered in the overall analysis of the E waterway network and its intermodal dimension.

9. The IWT in the European Union (EU) carried 144.6 billion t-km in 2007. Belgium (9 billion t-km), Germany (64 billion t-km) and the Netherlands (42 billion t-km) together accounted for 80 % of this traffic. In the Russian Federation the volume of cargo carried by IWT in 2007 was 153.4 million tonnes (as opposed to 108.9 in 2006), with a turnover of 86 billion t-km (57.7 in 2006). Of these, domestic carriage accounted for 131.6 million tonnes (87.9 in 2006) and international navigation 21.8 million tonnes (21.8 in 2006).[2] In Kazakhstan, the inland fleet in 2007 carried 1,288.8 thousand tonnes of cargo (1,260.4 thousand tonnes in 2006), with an overall freight turnover of 52.0 million t-km (39.9 million t-km in 2006). In the Ukraine; in 2007 15 million tonnes were transported by IWT with the turnover of 18 billion t-km out of a total freight turnover of 496.4 billion t-km.[3] In the United States of America in 2007, inland and intra-coastal waterway traffic reached 622 million tonnes with the turnover of 272 billion tonne-miles.

10. The IWT share of the total amount of transport operations (modal split) usually represents the importance of this mode of transport. Around 5.8 % of all goods transported in the 27 EU countries were carried on inland water vessels in 2007 (rail and road transport carry 76 % and 18 % respectively). However, countries with all year (round open and efficient navigable waterways have considerably higher shares of freight transport by inland waterways (Belgium (15 %), Germany (12 %) and the Netherlands (36 %)). In the Russian Federation, under difficult meteorological conditions, inland waterways account for around 2 % of total goods transport. But on certain segments of the cargo market its share is substantial: over 80 % of cargoes delivered to districts in the Far North are carried by IWT. In Ukraine this share is only 1.3 % with the heaviest use of IWT concentrated in the Kiev and Odessa regions. In the United States of America between 2000 and 2007, inland waterways averaged about 8 percent of all intercity freight tonne-miles, excluding pipelines.

Table 2
Modal split in the selected UNECE countries (2007)
(percentage in total inland freight t-km)

	Inland Waterways	*Road*	*Rail*
EU-27	5.8	76.2	18.0
Austria	4.2	60.9	34.8
Belgium	14.9	69.7	15.3
Bulgaria	4.8	70.0	25.1
Croatia	0.8	74.0	25.2
Czech Republic	0.1	74.7	25.3
Finland	0.3	73.9	25.9
France	3.4	80.9	15.7
Germany	12.4	65.7	21.9
Hungary	4.6	74.5	20.9
Lithuania	0	58.5	41.5
Luxemburg	3.4	93.8	2.8
Netherlands	35.1	59.4	5.5
Poland	0.1	73.5	26.4
Romania	9.8	71.3	18.9
Slovakia	2.7	71.8	25.5
United Kingdom	0.1	86.6	13.3

Source: Eurostat.

[2] Federal State Statistic Service, Russian Federation, 2009.
[3] More information on the situation of inland water transport in the selected UNECE countries, which are not members of the EU, is available in ECE/TRANS/SC.3/WP.3/2009/13.

11. In 2008–2009, transport performance on European inland waterways declined in the order of 15 to 25 % due to the economic and financial crisis that hit particularly the steel industry. This led to a severe reduction in transport demand for coal, iron ore, metal products and also for port hinterland transport of containers.

B. Evolution of inland water transport performance since mid-1990s

12. A comparison of IWT performance in absolute terms with the situation in 1990 as described in the 1996 White Paper reveals contrasting trends. The most significant growth can be observed in several Danube countries. The bulk of this growth is very recent and is linked to the end of the disruption of traffic on the Danube caused by the war. The growth in Romania (+71 %) relates to large-scale expansion and improvement of the port of Constanta and its satellite terminals at Midia, both served directly by IWT through the Danube-Black Sea Canal and its northern branch. The same applies to Bulgaria (+133 %), Croatia (+230 %) and Hungary (+76 %), however with smaller total volumes. The countries with stable networks and stable overall economic and political conditions on their IWT networks, show substantial growth over this period: Belgium (55 %), France (15 %) and the Netherlands (19 %) are in the fore, while Germany remained stable (1 %) after achieving higher growth than the other countries of the same group between 1990 and 1995. The high overall volume and the strength of this group are a good indicator of continuing IWT expansion, once the present economic and financial crisis is over. Altogether, these four countries account for some 50 % of the total freight transport by inland waterway in the countries listed in table 3, including the Russian Federation. The growth in Austria (27 %) relates both to the opening of the Main-Danube Canal and, lately, to the revival of through traffic on the Danube.

Table 3
Freight transport by inland waterway (1970-2007)
(1000 million t-km)

	1970	*1990*	*1995*	*2000*	*2005*	*2007*	*2007/1995 % change*
Belarus	1 224	1 805	133	26	90	93	-30
Belgium	6 734	5 448	5 807	7 313	8 719	9 006	55
Bulgaria	1 832	1 606	733	397	1 532	1 711	133
Croatia	253	527	33	63	119	109	230
Czech Republic			1 319	773	779	898	-32
Finland	0	70	77	118	75	102	32
France	12 728	7 581	7 649	9 110	8 905	8 830	15
Germany	48 813	54 803	63 982	66 466	64 096	64 716	1,15
Hungary	1 760	2 038	1 260	891	2 110	2 212	76
Italy	350	118	135	170	89	94	-30
Lithuania	120	164	18	1	1	11	-39
Luxemburg	300	336	331	373	337	345	4
Netherlands	30 741	35 662	35 098	41 271	42 225	41 868	19
Poland	2 295	1 034	876	1 173	1 277	1 338	53
Romania	1 346	2 090	3 107	2 634	5 146	5 325	71
Russian Federation	163 870	213 949	90 872	70 988	87 173	86 027	-5
Serbia	3 504	3 232	336	980	1 622	1 584	371
Slovakia			1 468	1 383	680	1 004	-32
Switzerland	139	196	160	124	124	128	-20
Ukraine		11 925	5 680	5 898	6 315	5 670	-0,2
United Kingdom	300	200	200	210	170	140	-30
Total	**277 602**	**344 447**	**221 320**	**212 806**	**234 344**	**233 808**	**6**

Source: OECD.

13. As documented in the 1996 White Paper, traffic levels in many Central and Eastern European countries showed a marked decline after their transition from centrally planned economies to market economies. See the figures for the Czech Republic, Lithuania, Poland, Russian Federation, Serbia, Slovakia and Ukraine. This situation has turned around and increases are observed today in practically all of these countries. The decline observed in Italy, Switzerland and the United Kingdom of Great Britain and Northern Ireland does not reveal any significant trend, since the traffic concerned – and the distances covered – are relatively small.

14. In terms of the modal split, however, there is a slight decline in comparison with the mid-1990s in most of the countries in the region.

Table 4
Modal split in the selected UNECE countries (1995–2007)
(percentage in total inland freight t-km)

	Inland Waterways			*Road*			*Rail*		
	1995	*2000*	*2007*	*1995*	*2000*	*2007*	*1995*	*2000*	*2007*
EU-27		6.6	5.8		73.7	76.2		19.7	18.0
Austria	4.9	4.5	4.2	63.5	64.8	60.9	31.6	30.6	34.8
Belgium	9.7	10.9	14.9	77.4	77.4	69.7	12.9	11.6	15.3
Bulgaria		2.6	4.8		52.3	70.0	45.2	25.1	25.1
Croatia	1.0		0.8	38.4		74.0	60.6		25.2
Czech Republic	0.8	0.2	0.1	57.5	68.0	74.7	41.6	31.9	25.3
Finland	0.2	0.3	0.3	72.3	75.8	73.9	27.5	24.0	25.9
France	2.8	3.4	3.4	76.5	76.0	80.9	20.7	20.6	15.7
Germany	17.2	15.5	12.4	63.9	65.3	65.7	18.9	19.2	21.9
Hungary	6.1	3.1	4.6	58.3	68.1	74.5	35.6	28.8	20.9
Lithuania	0.1	0	0	41.6	46.6	58.5	58.2	53.4	41.5
Luxemburg	5.3	4.4	3.4	85.9	87.8	93.8	8.9	7.9	2.8
Netherlands	33.6	32.9	35.1	63.6	63.4	59.4	2.9	3.7	5.5
Poland	0.7	0.9	0.1	42.6	56.9	73.5	56.7	42.2	26.4
Romania	6.6	7.9	9.8	42.0	42.9	71.3	51.4	49.1	18.9
Slovakia	3.5	5.3	2.7	63.7	53.0	71.8	41.7	25.5	25.5
United Kingdom	0.1	0.1	0.1	92.3	90.0	86.6	7.6	9.8	13.3

Source: Eurostat.

15. A recent study of the EU countries and the non-EU Danube countries concluded on the existence of a global trend in the increasing importance of road transport at the expense of inland navigation. The study notes that the IWT share in the EU countries dropped by more than one per cent between 1995 and 2010. Among the four EU countries (Belgium, France, Germany and the Netherlands), representing around 88 % of the IWT market, the place of IWT deteriorated in all but one of them (Belgium). Some of the Danube countries (Romania and Serbia, above all) experienced a drastic decline in terms of the IWT share. While some long-term forecasts established for the EU predict 50 % increase of the modal split by 2030, other EU and national models are much more pessimistic, predicting, at best, that the current very modest market share will remain stable.[4]

[4] EU/CCNR, "Inland Navigation in Europe: Market Observation", 2010–2011, Fact Sheet 2: Evolution of the modal position of inland navigation, p. 32.

16. It is certain that the geographic factor has a defining impact on the IWT modal split at the national and regional levels. The two main international inland waterways in Western and Central Europe are the Rhine and the Danube where around 310 and 73 million tonnes of goods were carried in 2008 respectively. The Rhine and Danube riparian countries, present higher degrees of the IWT use.

17. However, expert studies reveal the importance of national and regional transport policies (in particular, infrastructure investment policies) and economic and geographical factors (proximity of raw material-intensive industries and power stations). For instance, the Danube countries perform quite differently while enjoying comparable natural conditions.[5]

18. This Paper analyses, in detail, the importance of the geographical factor and the local economic and political factors in the following chapter on the basis of the main network of inland waterways of international importance, as codified by the AGN.

[5] *Ibid,* p. 32.

Chapter 2

Current State of the European Network of Inland Waterways of International Importance

19. The adoption of the 1996 UNECE *White Paper on trends in and development of inland navigation and its infrastructure* took place in parallel with the final steps in adopting the AGN, opened for signature at the Office of the United Nations in Geneva on 1 October 1996. The AGN entered into force on 26 July 1999. As of February 2011, it counted seventeen Contracting Parties: Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Italy, Lithuania, Luxembourg, Republic of Moldova, Netherlands, Romania, Russian Federation, Slovakia, Switzerland and Ukraine.

20. The purpose and the mechanism of the AGN were described in the 1996 UNECE White paper and are briefly recalled here. Similar to the other so-called "UNECE infrastructure agreements" for road, rail and intermodal transport,[6] the AGN establishes an international legal framework laying down a coordinated plan for developing a network of inland waterways and ports of international importance. By acceding to the AGN, Governments commit themselves to developing and constructing their inland waterways and ports of international importance in accordance with the uniform technical and operational characteristics contained in the annex to the agreement. The existing and planned inland waterways and ports of international importance, corresponding to these characteristics, are listed in the annexes to the agreement.

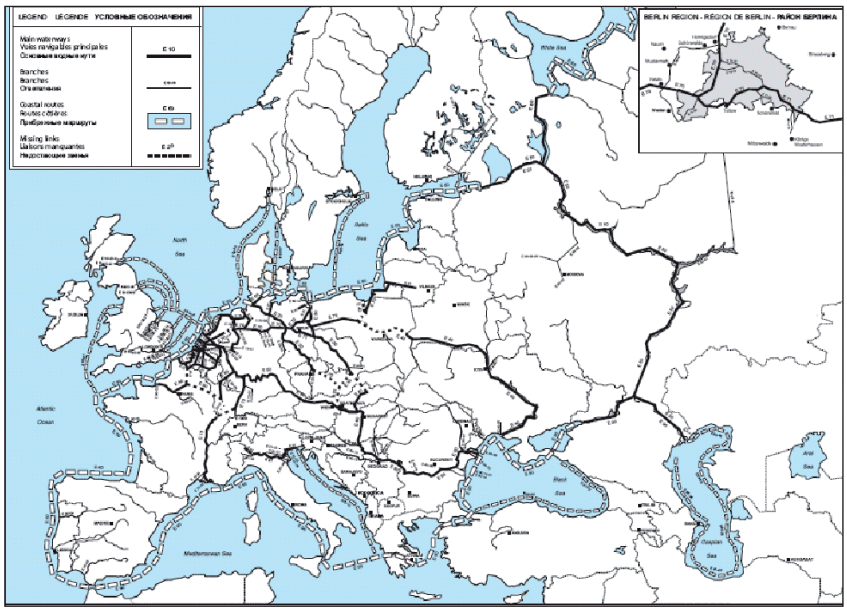
21. The AGN is maintained by the UNECE Working Party on Inland Water Transport and updated reflects the evolution of technical requirements and the latest infrastructure developments in the region. The agreement is complemented by a reference document (UNECE Inventory of Main Standards and Parameters of the E Waterway Network or "Blue Book") which contains detailed information on the technical characteristics of European inland waterways and ports of international importance (E waterways and ports) identified in the AGN. The Blue Book also contains a list of the most important bottlenecks and missing links in the E waterway network, with the goal to help countries focus their infrastructure development projects on the further development of an integrated inland navigation network.

22. In addition to the AGN, the Protocol on Combined Transport on Inland Waterways to the European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) establishes uniform requirements to be met by the infrastructures and services of combined transport using inland waterways. This Protocol entered

[6] Other UNECE infrastructure conventions include the European Agreement on Main International Traffic Arteries (AGR), of 15 November 1975, the European Agreement on Main International Railway Lines (AGC), of 31 May 1985, the European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) of 1 February 1991 and its Protocol on Combined Transport on Inland Waterways of 17 January 1997.

in force on 29 October 2009 and as of February 2011 counted nine Contracting Parties. It identifies 14,700 km of E waterways and terminals that are important for regular and international intermodal transport and correspond, as a minimum, to inland waterways of Class Vb.

Figure 1
Map of the AGN network

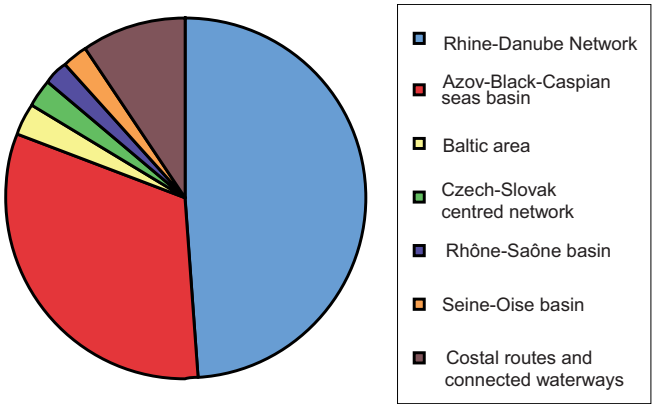


Source: UNECE secretariat, 2010.

23. Fifteen years after the adoption of the AGN, this chapter describes the current state of the AGN network in the six main subnetworks:

A. Rhine-Danube network (14,362 km or 47.6 % of the total length of the AGN network (30,177 km));
B. Azov-Black-Caspian seas basin (9,339 km or 30.9 %);
C. Baltic area (840 km or 2.8 %);
D. Czech-Slovak centred network (715 km or 2.4 %);
E. Rhône-Saône basin (679 km or 2.3 %);
F. Seine-Oise basin (632 km or 2.1 %); and
G. Costal routes and connected inland waterways (2,774 km or 9.2 %).

Figure 2
The subnetworks of the AGN network



Source: the UNECE Blue Book.

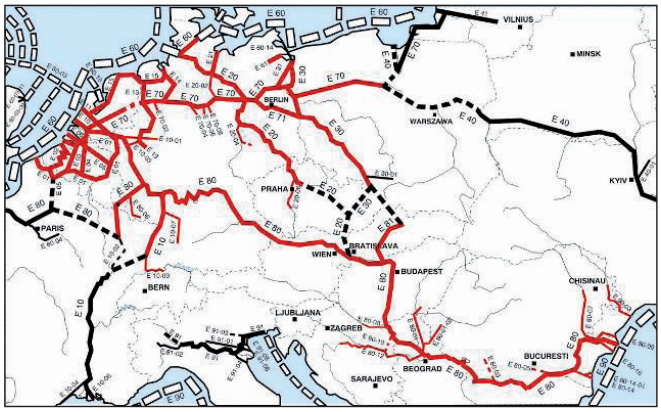
24. For each of the six subnetworks, this chapter presents the status and parameters of the existing inland waterway infrastructure in accordance with the AGN standards. The data on the network parameters are derived from the first revised edition of the UNECE Blue Book (ECE/TRANS/SC.3/144/Rev.1).

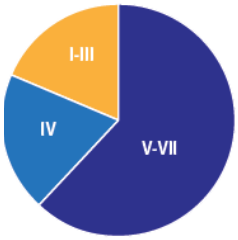
25. While Chapter 1 highlighted the importance of the geographical factor on the use of IWT and, thus, the benefits of analysing the use of IWT in the light of the location and parameters of existing of inland waterways, the analysis of each subnetwork will include information on the existing inland fleet and the IWT performance in terms of freight traffic.

A. The Rhine-Danube network

26. The Rhine-Danube network (routes E 10, E 80, E 70, E 20, E 30) came into existence in 1992 with the opening of the Main-Danube Canal, linking routes E 10 (north-south) and E 80 (east-west). This sub-network represents nearly half of the total length of AGN waterways (14,360 km out of total 30,177 km) and consists of the following waterway classes: Classes V–VII (8,913 km), Class IV (2,813 km) and Classes I–III (2,636 km).

Figure 3
The Rhine-Danube network





Rhine-Danube network
[Total: 14 360 km]

Source: the UNECE Blue Book.

27. More than a third of these inland waterways are below the AGN standards (i.e. below class IV) – from the point of view of vessel capacity and, also in terms of suitability for intermodal transport. It is important to underline that there are substantial differences in the quality of the infrastructure East and West of the Bavarian watershed, and this has an impact on the development of traffic, in addition to economic, political and regulatory factors. The essential – and durable – difference between the networks East and West of this divide lies in the character and density of the network. In addition to the Danube-Black Sea connections between which have existed for a long time (via Sulina arm (E 80) and the Danube-Constanta Canal (E 80-14)), it is also important to note the operational state of the deep-water fairway Danube-Black Sea through the arm of Kilia (E 80-09, carried out by Ukraine with due regard to the relevant international legal standards and national legislation as part of the International Transport Corridor VII.

1. Infrastructure

(a) Rhine basin

28. The Rhine basin is the most developed, maintained and utilized for the transportation purposes part of the AGN network. It is characterized by the highest population and waterway density and its share of the upper classes of inland waterways is considerably higher than on other European inland waterways.[7]

29. Infrastructure projects in the Rhine basin and East across northern Germany to Poland and the Baltic countries essentially aim to eliminate strategic bottlenecks and to increase the carrying capacity on routes converging on the Rhine. Construction on the Mittelland Canal route (E 70), for upgrading to class Vb, has been completed through to Berlin. It is now being followed-up with the Niederfinow enlargement by construction of a new barge lift. Work is ongoing on doubling of the locks on the Mosel and increasing its carrying capacity by deepening the channel for vessels drawing up to 3 m. The Rhine basin will soon acquire further density, improved operating conditions for carriers and new possibilities of supply, especially in container transport, by implementation of the Seine-Scheldt waterway project, including the 106 km long Seine-Nord Europe Canal (E 05, class Vb). The canal will provide a link from the Rhine basin to the currently isolated western part of E 80 and E 80–04. In the near future (2015), this isolated network will therefore become a subnetwork of the overall interconnected system.

30. A weakness of the existing main network interconnection with the new EU member States east of Germany is the poor overall condition of the inland waterways of Poland, i.e. route E 70 east of the Oder. Waterways of international importance (classes IV and Va) represent only 1.9 and 3.0 % respectively of the total length of 3,650 km of waterways in this country. The Polish Government identifies all the main routes (E 30, E 40 and E 70) as "basic bottlenecks" where upgrading from Class I, II or III to Class Vb is required, but at present none of these projects are on the agenda of the Polish Government. Poland can play an interconnecting role between the waterways of Western Europe and the waterways of the Russian Federation through the river Bug, but free-flow navigation poses serious problems of variable hydrological regimes and available depths. Moreover, environmental protection lobbies oppose major engineering works (whether free-flow or canalization). In this context, investment decisions are taken in some countries on the assumption that neighbouring countries will eventually make compatible infrastructure investments as per AGN, to provide a coherent overall network.

[7] PINE Study "Prospects of Inland Navigation within the Enlarged Europe" (Concise report) (September 2004), para. 21.

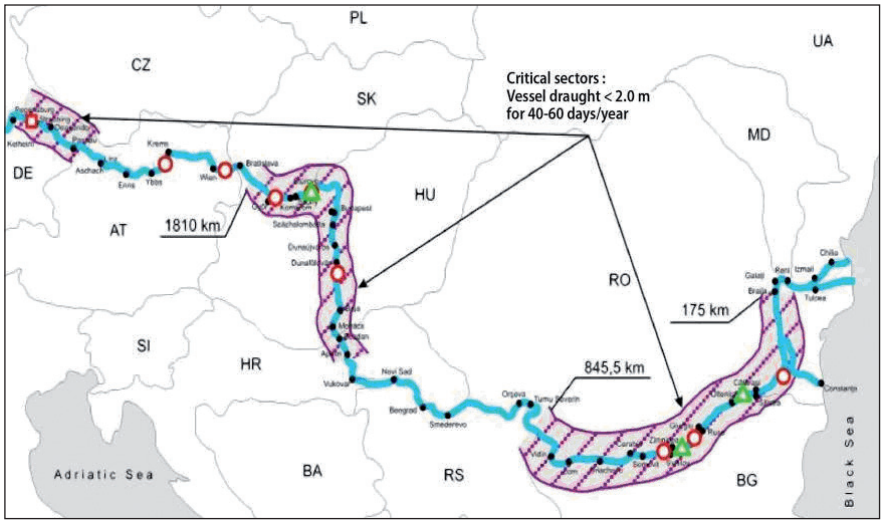
31. Less critical to the development of traffic is the E 70 "missing link" (Twente to the Mittelland Canal), which was included in the AGN, as a long-term project. Discussions in the Netherlands on this canal have lead to the conclusion that the project could only be realized at very high costs and very little gain and that there exists sufficient alternative routes for inland navigation. The Netherlands, therefore, supports deletion of this project from the AGN missing links. This position is shared by Germany.

(b) Danube basin

32. By contrast, the issues on the Danube relate to the intrinsic navigability and carrying capacity of the river itself and its tributaries and connecting waterways. Hence the strategic bottleneck of limited draughts in the Straubing-Vilshofen section of the Danube (currently guaranteeing no more than 1.55 m draught), and other sections offering less than the required 2.50 m in Romania/Bulgaria, Serbia and Hungary (for a variable number of days in the year, 7–15 in some cases, but up to 2 months or more). Eliminating these bottlenecks, to the extent possible, is the aim of the EU Priority Project 18 under the Trans-European Transport Network (TEN-T) programme. The project aims to establish uniform characteristics throughout the 3,000 km long waterway from the North Sea to the Black Sea. With the goal to maintain the fairway parameters on the entire course of the Danube, ensuring its economically beneficial exploitation by all participants of international navigation, it is necessary that all interested countries carry out the works on maintaining the river's navigational characteristics.

33. Figure 4 highlights the critical sectors on the Danube in terms of carrying capacity, identified by the Danube Commission (DC). In the 2010 working documents on the main directions on its nautical policy, DC stressed that major infrastructure works are required to qualify the entire waterway as part of the E waterway network, as defined by the AGN.

Figure 4
Critical sectors on the Danube in terms of its carrying capacity



Source: Draft "Principales directions et recommandations dans le domaine de la politique nautique sur le Danube", DC, Budapest, 2009.

34. A study involving all major stakeholders of the transport sector and environmental groups examined possible solutions. Works are already under way in the Austrian section of the Danube. The situation in Romania and Bulgaria is different as the countries are dealing with the application of EU environmental

regulations. The Straubing-Vilshofen project may represent a unique opportunity and a truly European project, to establish high-quality inland navigation infrastructure between the North Sea and the Black Sea.

35. The contrast in network penetration between the Rhine and the Danube basins is also pronounced, considering the very poor conditions of navigability on all the tributaries of the Danube, none of which provide service as "feeders" of the artery in the way that the canalized Mosel, Main, Neckar, etc, effectively "feed" traffic to the Rhine. The Sava to Sisak in Croatia is a basic bottleneck. Upgrading to Class Vb is the objective, but even the present Class III limit is not attainable for long periods. The Tisza in Hungary is not included in the AGN. The Váh in Slovakia is, like the Sava, a basic bottleneck with major infrastructure works required in the lower section connecting with the Danube. The Morava offers no potential for free-flow navigation. Accordingly, the Danube functions as an artery without branches, with the limitations that are implied.

36. A significant exception would be the Danube-Bucharest Canal in Romania (E 80–05), where the works interrupted in 1990 have recently resumed. In this context the Danube-Oder-Elbe missing links are also potentially of great importance, including the possible first phase consisting of a "branch" from the Danube to an inland port in Moravia at Breclav. In the current situation, many factors thus combine to make the Danube side of the pan-European AGN network less efficient for IWT than the Rhine basin west of the Bavarian divide.

2. Fleet

37. The infrastructure imbalance between the Rhine and the Danube also apply to the fleet, since the vast majority of vessels operating on this network belong to the Rhine fleet. The analysis made on the rather restrictive definition of International Vessel Registration (IVR) criteria, gives a total of nearly 9,000 goods-carrying boats, all certified for plying on the Rhine ("jauge du Rhin", Rhine Survey). Some 4,603 more boats[8] with 4.2 Mt capacity are counted by IVR as "national fleets". At the same time, it is important to note that the first step of the project on the deep-water fairway Danube-Black Sea includes ensuring 24-hour movement of seagoing vessels, "river-sea" vessels together with inland vessels and convoys. This creates the conditions for developing itineraries for Danubian Short Sea shipping (SSS) with the goal to establish stable interlinks between Western Europe and the Middle East.

38. The Central Commission for the Navigation of the Rhine (CCNR) adopted the following 2010 numbers for the Rhine fleet:

(a) 4,450 motor cargo vessels (6,050,000 tonnes capacity);
(b) 1,235 cargo barges (dry goods) (2,500,000 tonnes capacity);
(c) 1,170 motor tankers (2,200,000 tonnes capacity);
(d) 54 pushed tanker barges (105,000 tonnes capacity).

The Danube fleet in 2007 counted 3,962 inland vessels.[9]

(a) Rhine fleet

39. The first observation about the Rhine fleet is the rise in average size. Before 1970, the average size was class II barges (up to 1960), then class III. From 1970 to 1999, the average was class IV, then increasing to class V in the last decade. The number of vessels in this class almost doubled over a period of a few years.[10]

[8] 1,044 craft registered in Belgium, 1,532 in France, 250 in Germany, 1,759 in the Netherlands.
[9] Main indicators on the navigation on the Danube in 2007, the DC.
[10] The correspondence between the types of inland vessels and the class of the waterway, used here and in paragraph 41, is presented in details in Resolution No. 30 of the UNECE Principal Working Party on Inland Water Transport of 12 November 1992 on Classification of European Inland Waterways (TRANS/SC.3/131, pp. 167–172).

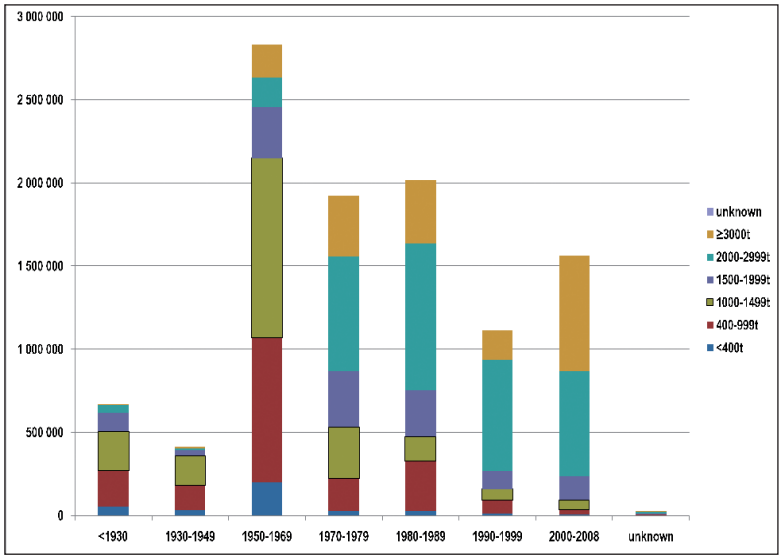
Table 1
Number of craft in the Rhine Fleet by year of build and size

31/12/2008	*Number of craft in the Rhine fleet, by year of build and size*							
Year/Class	*<400t*	*400-999 t*	*1 000-1 499 t*	*1 500-1 999 t*	*2 000-2 999 t*	*3 000 t & +*	*unknown*	*Total*
<1930	249	325	189	67	19	2	6	857
1930–1949	137	209	150	18	6	2	8	530
1950–1969	876	1 251	899	185	78	21	35	3 345
1970–1979	160	289	237	196	282	38	7	1 209
1980–1989	108	535	114	159	347	104	16	1 383
1990–1999	75	125	52	63	260	47	4	626
2000–2008	37	39	45	77	239	164	23	624
unknown	6	4	3	2	5	1	79	100
Total	**1 648**	**2 777**	**1 689**	**767**	**1 236**	**379**	**178**	**8 674**
	19 %	32 %	19 %	9 %	14 %	4 %	2 %	100 %

Source: IVR.

40. While only representing 4 % of the total number of craft, vessels of 3,000 tonnes or more aggregate 17 % of the capacity. Craft between 2,000 and 2,999 tonnes total 30 % of the capacity, with only 14 % of the fleet. The acceleration of this trend is revealed by the years of build: in the 1980s craft of 2,000 tonnes and more represented 30 % of the new builds, from 1990 onwards it was 49 % and 67 %, with respectively 75 and 85 % of the capacity. This is a deep-seated trend, and appears unlikely to stop. 1970 was clearly a turning point: since that date, very few craft of less than 400 t have been built. Yet, due to the very long life of IWT craft, the structure of the fleet will evolve slowly over time. As demonstrated by Figure 5, the period 1950–1969 towers above the rest: it is the period of reconstruction and the beginning of push-towing. By contrast, the period 1990–1999 shows a significantly reduced renewal rate of the fleet.

Figure 5
Evolution of the Rhine fleet in terms of its capacity



41. Another noticeable variable is the length of the vessels on the Rhine. A major breakthrough has occurred in this area since the publication of the 1996 White Paper. Starting from 1996, self-propelled craft 135 m long were authorized in the Rhine basin, and a number have been built, leading to the steep rise in average capacity as observed above. However, this creates a new category of boat, which could be termed "Vab" or "Va+" and which cannot use 110 m long locks (class Va).[11] Craft between 76.75 and 85.74 m belong to Class IV (RHK, or Johann Welker). Since 1970, they have been replaced as the most common boats by Class Va craft (from 85.75 to 110.74 m).[12]

Table 2
Number of craft in the Rhine fleet by year of build and length

31/12/2008	*Number of craft in the Rhine fleet by year of build and length*					
Year/Class	*<76.75 m*	*76.75-85.74 m*	*85.75-110.74 m*	*≥110.75 m*	*unknown*	*Total*
<1930	708	185	63	1	77	1 034
1930–1949	368	121	33	0	20	542
1950–1969	2 351	736	212	1	58	3 358
1970–1979	648	247	282	2	32	1 211
1980–1989	932	118	311	5	19	1 385
1990–1999	328	52	218	11	21	630
2000–2008	183	38	325	67	15	628
unknown	14	5	2	1	80	102
Total	**5 532**	**1 502**	**1 446**	**88**	**322**	**8 890**
	62 %	17 %	16 %	1 %	4 %	100 %

Source: IVR.

42. The split between self-propelled craft and dumb craft. Another point of interest is up until the second World War, most boats were towed. Then self-propulsion boats came in. From 1959, conventional towage was rapidly replaced by push-towing, a much safer and more efficient technique. Self-propelled vessels dominate the picture, since they total 60 % of units and capacity in the Rhine fleet. Since push-tows aggregate a number of barges, they can move large quantities of cargo, yet with smaller unit loads. It is more important that the barges (or lighters) should be of the same size, and this standardization concept has had a restraining influence on the development towards larger barges.[13]

[11] There are several such locks in France (Clévant on the Mosel/Meurthe, St Maurice, St-Maur on the Marne, Créteil, Bellerive and Janville on the Oise lateral canal), many in Belgium (Scheldt, Leie and Sambre waterways) and the Neckar in Germany, among others. Furthermore, they cannot use the existing turning basins on many waterways, designed for 110 m long craft or short push-tows, and acceptable for all long push-tows when split. Finally, few terminals are long enough to accommodate them under satisfactory conditions.

[12] The fact that some craft older than 1996 exceed 110.74 m is explained by lengthening or jumboisation, a procedure which is becoming common.

[13] Furthermore, it may be advantageous to combine in the same tow goods of different kinds, bringing economies of scale even to small consignments. Thus the average size of barges has not grown substantially, remaining on average well below 2,000 tonnes. The 100 m long/14 m wide barge which was widely envisaged as the vessel of the future in the 1980s has not caught on, and remains anecdotal (1 unit).

Table 3
Number of self-propelled craft in the Rhine fleet, by year of build and length

31/12/2008	*Number of self-propelled craft in the Rhine fleet, by year of build and length*					
Year/Class	*<76.75 m*	*76.75-85.74 m*	*85.75-110.74 m*	*≥110.75 m*	*unknown*	*Total*
<1930	578	159	54	0	64	855
1930–1949	281	113	27	0	14	435
1950–1969	1 591	702	189	1	21	2 504
1970–1979	70	209	258	2	4	543
1980–1989	36	72	243	4	4	359
1990–1999	27	35	173	11	3	249
2000–2008	40	26	266	67	9	408
unknown	2	4	2	1	29	38
Total	**2 625**	**1 320**	**1 212**	**86**	**148**	**5 391**
	49 %	24 %	22 %	2 %	3 %	100 %

Source: IVR.

43. However, a move towards 110 x 11.4 m barges, in parallel to 135 m self-propelled craft, is to be observed (30 units). There are only 49 barges with lengths between 90.75 and 109.74 m, which leaves 155 barges between 85.75 and 90.74 m. These are indeed small numbers compared to the Europa II type (76.5 x 11.4 m) barges which totals some 579 units, and its lengthened versions, up to 85.74 m long (182 units), which has become the reference, displacing the Europa I type (70 x 9.5 m), of which there remain only 43 units.

Table 4
Number of craft in the Rhine barge fleet, by year of built and length

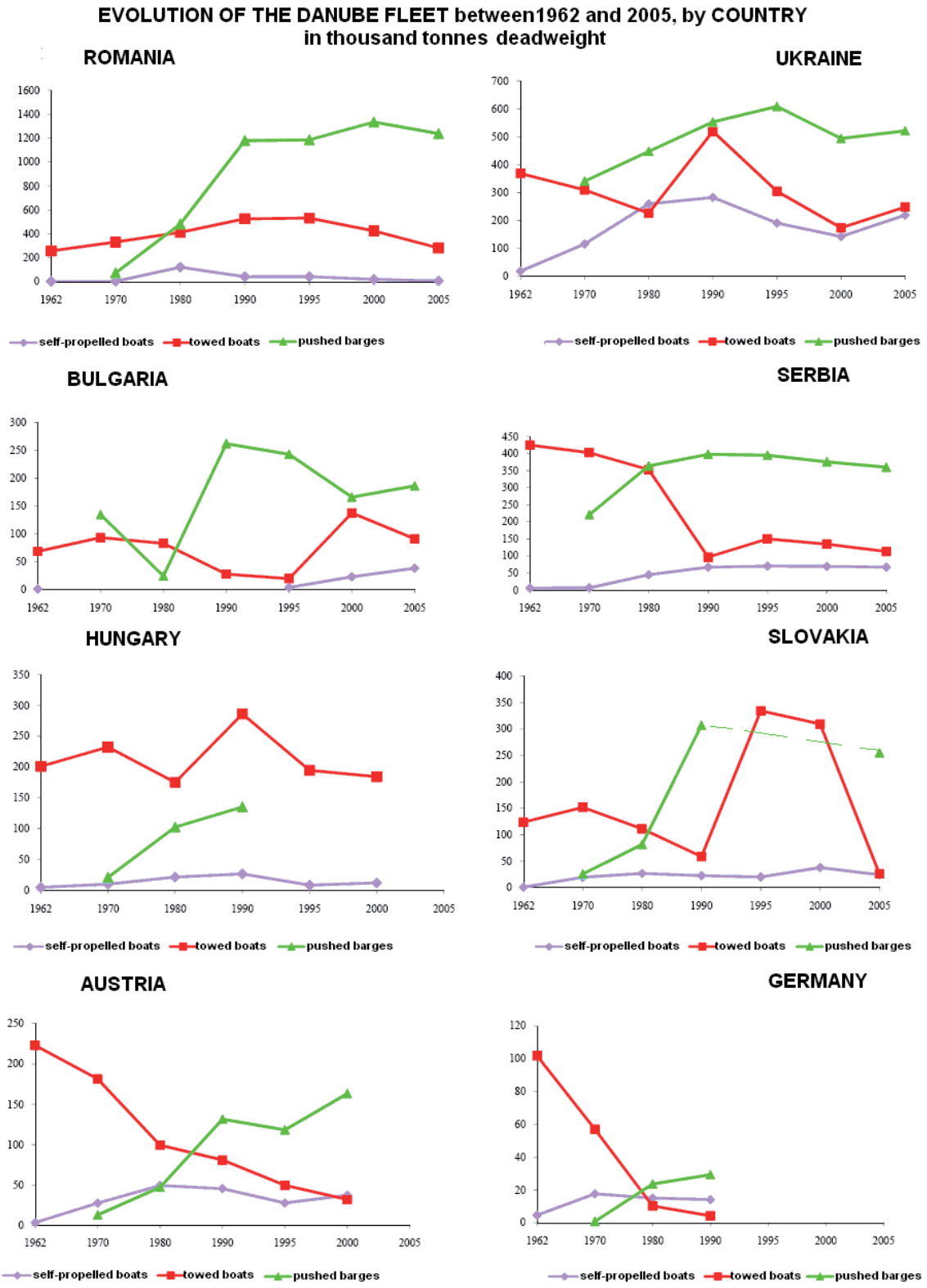
31/12/2008	*Number of craft in the Rhine barge fleet, by year of built and length*					
Year/Class	*<76.75 m*	*76.75-85.74 m*	*85.75-110.74 m*	*≥110.75 m*	*unknown*	*Total*
<1930	249	26	9	1	71	356
1930–1949	90	8	6	0	15	119
1950–1969	766	34	23	0	44	867
1970–1979	578	38	24	0	30	670
1980–1989	896	46	68	1	17	1 028
1990–1999	302	17	45	0	21	385
2000–2008	145	12	59	0	8	224
unknown	13	1	0	0	52	66
Total	**3 039**	**182**	**234**	**2**	**258**	**3 715**
	82 %	5 %	6 %	0 %	7 %	100 %

Source: IVR.

(b) Danube fleet

44. The capacity of the Danube fleet, as described by DC Statistics for the period between 1950 and 2005, has markedly grown (+36 %) from the 1970s, yet has reduced since 1990 and its peak of 5 million tonnes. The total capacity of the Danube fleet in 2007 was 3.84 million tonnes. Figure 6 shows the evolution of the fleet capacity by country. Table 5 reflects the evolution of the total capacity of the fleet over the years.

Figure 6



Source: DC, "Ouvrage de référence statistique pour la période 1950–2005", Budapest, 2008.

Table 5
Evolution of the total capacity of the Danube fleet by country between 1962 and 2005

	Boats in use														
	Tugs		*Pushers*		*Self-propelled craft*			*Towed barges*		*Pushed barges*		*Total*		
Years	*Number of units*	*Power in kw*	*Number of units*	*Power in kw*	*Number of units*	*Power in kw*	*Tonnes dwt*	*Number of units*	*Tonnes dwt*	*Number of units*	*Tonnes dwt*	*Number of units*	*Power in kw*	*Tonnes dwt*
1962	504	187 263	...	...	82	43 364	39 827	2 556	1 767 692	...	...	3 142	230 627	1 807 519
1970	717	214 285	100	120 300	180	125 227	199 733	2 631	1 758 722	668	829 488	4 296	459 812	2 787 943
1980	687	194 300	194	218 166	318	260 481	441 450	2 195	1 469 513	1 281	1 788 177	4 675	672 947	3 699 140
1990	634	177 708	364	393 624	423	314 754	499 973	2 190	1 598 708	2 143	2 993 692	5 754	886 086	5 092 373
2000	552	154 848	398	512 281	263	218 300	348 750	1 699	1 463 342	1 617	2 573 895	4 529	885 429	4 385 987
2005	292	86 834	404	436 255	342	216 507	358 087	900	825 459	1 949	2 598 564	3 887	739 596	3 802 680

Abbreviation: dwt: deadweight tonnes.

Source: DC, "Ouvrage de référence statistique pour la période 1950–2005", Budapest, 2008.

45. According to 2008 data, received from the DC secretariat, the cargo and passenger fleet in the Danube ports consists of 4,132 vessels (in 2007 – 4,127 vessels).[14] In 2008 the number of the fleet units increased by 0.1 %. The parity between cargo and passenger vessels remains in favor of the cargo fleet – 96.7 % and 3.3 % respectively to all numbers of the Danube fleet units. Thus the cargo fleet has grown by 0.3 %. About 70 % of the cargo fleet tonnage belongs to the pushed barges, less than 20 % to the towed barges and more than 10 % to the self-propelled vessels.

46. In 2008 the small increase in the cargo fleet (except for the pushed barges), from 3,984 units in 2007 to 3,996 units in 2008, was accompanied by the increase in its general capacity – from 799,034 kW to 811,350 kW. At the same time the general carrying capacity of the fleet decreased slightly from 3,876,889 tonnes to 3,874,066 tonnes.

47. As shown above, the vast majority of the fleet is pushed barges, rising from 30 % of total capacity in 1970 to 70 % in 2008. Modernized Europa II type barges will remain the main type of non-self-propelled vessel for container transport on the Danube over the next few years. The share of conventionally towed craft has been reduced by more than half over the same period, with the decline more marked since the year 2000. They still represent 20 % of the capacity. As well, they are sometimes lashed alongside pushed convoys, which is clearly the dominant technique. Self-propelled craft, contrary to the Rhine, are still a minority and this is not evolving.

[14] These numbers do not include the cargo and passenger fleet of Austria, the cargo fleet of Germany and the data on the capacity and carrying capacity of the Hungarian fleet. However, they take into consideration the quantitative data of the Hungarian vessels and the data provided by the Southern management of internal waterways and navigation of Germany on the passenger fleet on the Danube.

3. IWT Performance

48. The widely varying characteristics of the waterways across the network, from the Lower Rhine and Albert Canal (9,000 tonnes in terms of the vessel capacity) to "branches" E 20 and E 30, often limited to 1,000 tonnes, result in substantial variations in the price of IWT solutions.

(a) Rhine[15]

49. Around 310 million tonnes of goods are carried on the Rhine each year (208 million tonnes without taking into account the Rhine traffic in the Netherlands). Traffic in 2007 increased by 2.6 % mainly in the agricultural (4.6 %) and the metallurgic (15.7 %) sectors. Demand had been particularly strong for the transport of dry goods (4.4 %). At the same time, the Rhine navigation only moderately (+2.2 %) benefited from the general growth of the transport of containers. Moreover, tanker transport decreased in 2007 by 3.5 %, due to the general decrease (10 %) in the transport of oil products.

(b) Danube

50. In 2008 the total volume of the goods transported on the Danube reached the level of 79.1 million tonnes, which is almost 1 million tonnes less in comparison with the previous year (–1.2 %). Transportation between Danube ports represents 70 % of this traffic.

51. In 2008 the total turnover of goods in Danube ports (without the German ports on the Danube site) reached the level of 63.5 million tonnes, which represents 2.2 million tonnes or a 3.3 % reduction in comparison with the previous year (65.7 million tonnes).

52. The structure of goods turnover in the previous years in all Danube ports remains the same – more than 80 % in the turnover of the goods consists of raw and processed minerals; iron ore, scrap metal, blast-furnace production waste; blanks; cement, lime, processed construction materials; solid mineral fuel; grain; natural and artificial fertilizers; and oil products.

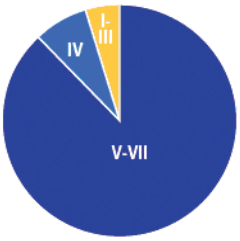
B. Azov-Black-Caspian seas basin

53. The most structured and uniformly developed subnetwork of the AGN network is formed by the E 50 waterway in the Russian Federation, along with the Belomorsko-Baltijskiy canal, the section of the Don river from Azov to Kalach and the Volga-Donskoi navigation canal,[16] associated with route E 40 in Ukraine (Dnepr to Kiev and Belarus). This network of 9,339 kms presents uniform characteristics with 88 % of the total length open to deep-draught river-sea shipping, and sub-standard (Class III) waterways representing less than 5 % of the length (the "branches" formed by the Dnestr/Nistru and Desna rivers).

[15] Since 2006 the IWT performance on the Rhine and in the EU is regularly analyzed and presented in the EC/CCNR biannual publication "Inland Navigation in Europe: Market Observation". Similar regular studies on other parts of the AGN network would be highly instrumental in supporting the overall analysis of the place of IWT in the ECE region.

[16] This includes the integral parts of the E 60 coastal route from Gibraltar to Saint-Petersburg and on to Arkhangelsk and of the E 90 coastal route from Gibraltar to Azov and Astrakhan.

Figure 7
Azov-Black-Caspian seas basin



Azov-Black-Caspian seas basin
[Total: 9 340 km]

Source: the UNECE Blue Book.

54. Interconnection with the rest of the AGN network depends on the following missing links: the link to the main network through Poland, and the E 40 (or E 41) missing link itself (Baltic-Black Sea Waterway). The waterway west link to Poland runs from the Ukrainian border near Chernobyl through Belarus via river Pripyat, the Dnieper-Bug canal, river Mukhovets and through the Polish border near Brest. This is a class IV inland waterway. However, hydraulic complexes, located on river Pripyat and the Dnieper-Bug canal, are outdated both physically and morally. The Republic of Belarus is therefore rebuilding the hydraulic complexes in accordance with the class Va standards. At the present time, three of them have been rebuilt, allowing the passage of vessels 110 m long, 12 m wide and with a draught of 2.2 m. Work is still in progress. On the other hand, there is no project in Poland, and this is likely to remain a missing link for the foreseeable future.[17]

55. While it is possible to consider the waterways of Ukraine as belonging to this interconnected network, because of river-sea shipping services via the Black Sea, there is no inland waterway link between the Russian and the Ukrainian parts of the AGN network. Accordingly, the following sections will present the parts of the AGN network in the Russian Federation and Ukraine separately.

[17] The Baltic-Black Sea waterway was considered at the forty-seventh session of the UNECE Working Party on Inland Water Transport in 2003 for possible inclusion into the AGN, but no positive decision was reached.

1. Infrastructure

(a) Russian Federation

56. The following bottlenecks are found on the E 50:

(a) The river Svir of the Volga-Baltic waterway: the second part of the Nizhne-Svirsky lock is planned to eliminate this bottleneck.

(b) The river Volga from the Gorkovsky hydroelectric complex to Nizhni Novgorod: to eliminate the insufficient draught it is planned to build a low-head hydraulic complex in the area of Boljshoe or increase the water level of the Tcheboksary Reservoir.

(c) The river Don below the Kochetovsky hydraulic complex: to eliminate the insufficient draught, the construction of a low-head hydraulic complex near the Bagaevsky village has been considered.

57. The 2010–2015 development strategy for the Russian transport system includes major investment projects: construction of a new low-head hydraulic complex in Nizhni Novgorod on the river Volga and a second parallel lock on Nizhne-Svirsky hydraulic complex on the river Svir of the Volga-Baltic waterway. Major repair and reconstruction of the inland waterways infrastructure in the European part of the Russian Federation, the Siberia and the Far East are also planned.

2. Fleet

(a) Russian Federation

58. In 2008, there were 28,215 vessels listed in the Russian River Register, including 1,066 river-sea vessels. These numbers include 17,694 self-propelled vessels, 10,521 dumb vessels, 6,807 dry cargo vessels, 1,705 tankers and 1,596 passenger vessels. The total fleet capacity amounted to 12,033 Mt. The average inland vessel age was 29 years, 28 years for river-sea vessels. Since 2003 systematic measures to renew the fleet were introduced and, as a continuation, began the process of building the vessels using the elements of the fleet in use. In 2007, over 2,000 companies were in shipping activities. Developing the inland fleet to meet the needs of a growing market is an integral part of the national strategy for IWT development.

(b) Ukraine

59. At the beginning of 2011, 1,048 vessels were in the Ukrainian inland navigation fleet, including 18 tankers and 276 dry cargo vessels, out of which 66 self-propelled.

3. IWT Performance

(a) Russian Federation

60. Every year, Russian IWT carries from 130 to 140 million tonnes of cargo, representing 80 to 90 billion t-km, some 20 million passengers representing 880 million passenger-kilometres. IWT accounts for about 2 % of freight transport in the country, but in certain segments its market share is quite substantial, e.g. over 80 % of cargoes delivered to districts in the Far North.

61. In 2007, 153.4 million tonnes or 86 billion t-km of cargo was carried by IWT in the Russian Federation. Domestic movements accounted for 131.6 million tonnes, and international movements 21.8 million tonnes. In 2007, Russian river ports handled 225 million tonnes of cargo, 17.6 % more than in 2006; this included 17.5 million tonnes of exports, 1.4 million tonnes of imports and 206.6 million tonnes of domestic cargo. Exports increased by 21.7 %, imports by 14.3 % and domestic cargo by 17.3 %. The growth in domestic IWT in 2007 is explained by a longer navigation season in the river basins and an increase of 12.5 % in the absolute volume of dry goods carried (principally cement, metals, timber and building materials), and also by an increase in the transport of timber rafts.

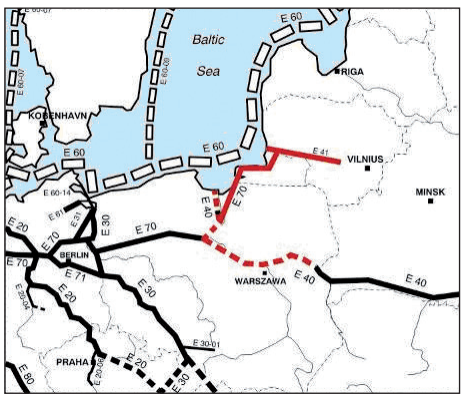
62. The Government of the Russian Federation together with the interested federal executive bodies has assigned to the Russian Ministry of the Transport a set of the measures to be carried out by 2015, which aim to open the inland waterways of the Russian Federation for the navigation of ships under the flags of the foreign states.

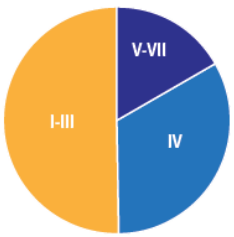
(b) Ukraine

63. In Ukraine, the volume of cargo carried by IWT has been regularly increasing since 2000, but the latest figure (14 million tonnes in 2006) is still far short of the 1990 level of 66 million tonnes. It represents a modal share of only 0.8 % in tonnage, and 1.3 % of the 6.3 billion t-km.[18] These figures remain well below the potential of inland navigation. In fact, between 1990 and 2000 the volume of cargo transported in Ukraine by inland navigation decreased more rapidly (-87 %) than the corresponding figure for all cargo (-75.4 %). However, all decrease occurred before 1995, and between 2000 and 2006 IWT grew more rapidly (by 69 %) than transport overall (19 %). This reflects the concern in recent years to develop a particularly advantageous mode of transport.

64. To increase the volume of cargo carried on inland waterways in domestic and international (including transit) carriage, besides adding inland and sea-river vessels to the national fleet and encouraging domestic vessel construction, planned measures include refining the State regulation system to make the domestic fleet more competitive in comparison with other modes of transport and setting economic conditions to stimulate the carriage of goods in transit.

Figure 8
The Baltic area





Baltic States, disconnected
[Total: 840 km]

Source: the UNECE Blue Book.

[18] The statistics of the former Soviet Republics often include t-km carried on foreign soil or at sea by the national fleets, which departs from the general methodology agreed upon by UNECE, and makes comparison difficult. Besides, some t-km may be counted twice, by the country of the carrier and by the country where the carriage takes place. This also occurs on the Danube.

C. The Baltic area

65. The Baltic area consists of the northern part of E 40, the eastern part of E 70 and E 41 and possibly Baltic-Black Sea waterway. The waterways below international standards represent 50 % of this subnetwork (840 km).

1. Infrastructure

66. Planning essentially concerns improving the Nemunas/Neman river navigation from Kaliningrad and Lithuania inland to Kaunas, which is the designated limit of route E 41. Plans are relatively modest, however, since they involve increasing the draught to 1.60 m at Kaunas dam prevents development of navigation beyond Kaunas towards Vilnius or Belarus, and there are currently no plans to bypass this obstacle.

67. The concept of a Baltic-Black Sea waterway, whether by extension of this route E 41 or by development of the Daugava river inland from Riga, remains hypothetical, in the absence of any support from the respective Baltic States of Lithuania and Latvia. Belarus is alone in promoting this waterway connection.

68. It should be noted that the Daugava (not on the AGN network) presents conditions of free-flowing navigability that are comparable to those of the Nemunas (downstream of the dam), and those of the Polish rivers. All these rivers are blocked by ice many months of the year. Only a deep-seated change in the conditions surrounding transport policies and environmental protection of rivers could change the prospects for this subnetwork, which is unlikely to evolve in the medium term.

69. Only very limited investments have been made in recent years on this network. Two countries – Lithuania and the Russian Federation (the region of Kaliningrad), essentially concentrated on the seaports and their approaches. Integration of this subnetwork with the main network depends on investments on basic bottlenecks in Poland. The establishment of inter-river basin transport connections “Dnepr-Daugava” and “Dnepr-Vistula-Oder” is also promising.

2. Fleet

70. The IWT fleet is negligible in Kaliningrad and Lithuania. In Poland it amounts (in 2007) to 107 self-propelled barges, average capacity 600 tonnes, and 428 barges for push-tows, average capacity 500 tonnes. This fleet operates on those Polish waterways that are interconnected with the German waterways and the Rhine basin. The relatively low deadweight relates to the current characteristics of the Oder and the Oder-Vistula Canal. In this subnetwork east of E 70, restrictions on depth limit IWT freight traffic: less than 1 % of inland freight movements in Poland, for example. The percentage is negligible in Lithuania, Latvia and the region of Kaliningrad (the Russian Federation).

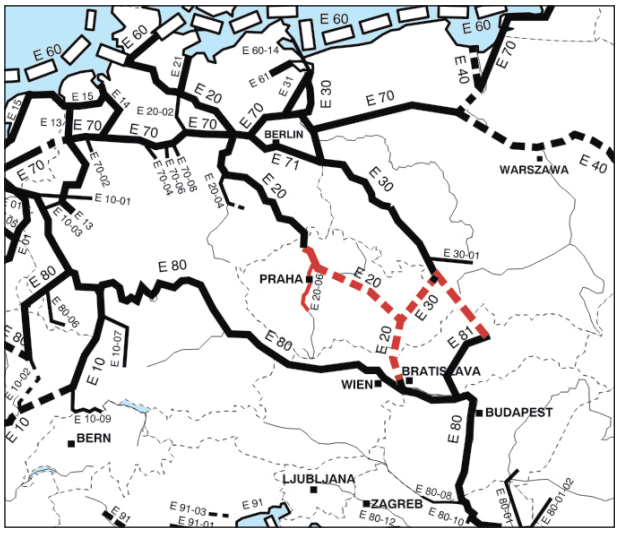
3. IWT Performance

71. This subnetwork carries the least traffic. The reason lies in the basic parameters coupled with severe draught restrictions on the free-flowing rivers. In fact, waterways below international standards represent 50 % of the length of this subnetwork.

D. The Czech-Slovak centred link

72. At the geographical core of the European waterway network and the AGN are the Czech and Slovak Republics. However, the most critical strategic bottlenecks, in the lower reaches of the river Elbe near the German border, and the most obvious missing links are located here.[19] This subnetwork of 714 km of routes E 20 and E 30 and southern extension, and E 81.

Figure 9
The Czech-Slovak centred network



Source: the UNECE Blue Book.

1. Infrastructure

73. The priority for the Czech Republic is improving navigation on the free-flowing river Elbe between the German border and Ústi nad Labem, where two relatively low-head dams (less than 6 m) and hydropower plants, with locks 200 by 24 m, are projected. The works are essential to provide the same draught as that available on the German side of the border. Development of inland shipping is seriously limited in the present situation, with available draughts of as little as 90 cm in low flow periods (compared to 1.30 m on the free-flowing Elbe in Germany). Slovakia's priority is finishing the Váh waterway construction and, subsequently, building the canal connection to rivers Oder and, if feasible, Vistula forming an international waterway E 30 in accordance with the AGN. This would create a Southern branch of the canal connection Baltic – Adriatic Sea – Danube along the intermodal corridors V and VI. The Southern connection would directly link the Danube with the Baltic ports and would integrate the Slovakian waterways to the waterway network of Belarus, Russian Federation and Ukraine. Slovakia also plans developing other inland waterways, located in the East of the country, i.e. rivers Laborec, Latorica and Bodrog. Navigating on river Bodrog with the following access to river Tisza in Hungary represents a real possibility.

74. The extension of routes E 20 and E 30 and connection south to the Danube make up the ambitious Czech project for the "Meeting of the Three Seas" (North Sea, Baltic and Black Sea). The project dates from 1901, and was originally to be completed by 1924. Until recently, the Czech Republic did not support the implementation of this project. However, in July 2009, it adopted its spatial development policy which recognized the need to develop waterways in the country in the next decade. Priorities were defined as the

[19] Missing links E 20 and E 30 are essentially within the Czech Republic.

river Elbe and Vltava, but provision is also made for possible implementation of the Danube-Oder-Elbe (DOE) "water corridor". The Government adopted a resolution which laid the basis for thorough examination of the need for these missing links at the international level. Specifically, it intends to discuss the path of this waterway with representatives of Austria, Germany, Poland, Slovakia and the European Commission, as well as other signatories of the AGN. These discussions are expected to lead to an international assessment of the possible construction, transport efficiency and investment demands for individual sections of the DOE water corridor. The results of this new approach to the project were to be resented to the Government by the end of 2010 for subsequent decisions.

75. All investments in the network have been blocked in recent years. Short-term investments concern the Elbe and Vltava, in particular the badly-needed lock and weir at Děčín, without which cross-border barge traffic with the port of Hamburg is stopped during low-water periods. Some of the investments planned in the short term are on smaller waterways, such as the upstream part of the Vltava and the Morava connected to the Bata Canal (both Class I). Both of these projected investments would be of value for waterway tourism rather than modern waterborne freight movements, and both are disconnected from the DOE water corridor project itself.

2. Fleet

76. The Czech fleet is made up of 68 self-propelled vessels and 249 barges for push-tows, with respective average capacities of 900 tonnes and 500 tonnes. All are currently engaged mainly in the limited domestic traffic, while the economic feasibility of transnational movements is seriously affected by the limited depths as indicated above. The Slovak fleet's main focus is transporting goods on the Danube. In 2009, it amounted to 228 inland vessels, including 42 pushers, 28 self-propelled vessels, 143 pushed barges (majority, of "Europa II" type) and 15 passenger vessels.

3. IWT Performance

77. Traffic has been very erratic, despite the high-quality infrastructure in the upper reaches of the Labe/Elbe, because of low waters in the Labe/Elbe as outlined above. Extreme floods have also brought difficulties, by the damages inflicted to embankments and training works, and some of the worst have taken place recently.[20] Also, part of the traffic between Hamburg and Prague moves by waterway up to Dresden, and then crosses the border by road. This can be explained by the fact that depth on the first 40 km of the Czech route is 0.4 m less than in the German part, making it very unprofitable to proceed upstream.

[20] Three epoch-making floods took place in 2002, 2006 and 2007, with smaller peaks in 1997 and 2010.

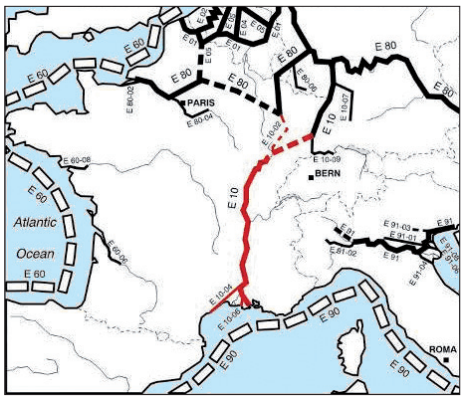
E. The Rhône-Saône basin

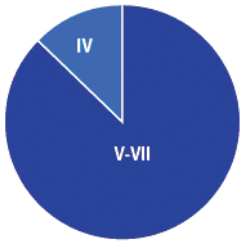
78. This small isolated network (679 km) consisting of route E 10 (south) offers excellent conditions for IWT development in the hinterland of the ports of Marseilles-Fos and Sète, through to Lyon and the inland port of Pagny near Dijon.

1. Infrastructure

79. The Rhône-Saône waterway network offers characteristics compliant with the AGN and with the standards for combined transport, with limited works to be completed to guarantee the required depth on the Saône and the required cross-section on the Rhône-Sète Canal.

Figure 10
The Rhône-Saône basin





The Rhône-Saône basin
[Total: 679 km]

Source: the UNECE Blue Book.

80. The difficulty of developing IWT to its full potential on this subnetwork lies in its isolation from the main network. From the early 1990s France focused its efforts on creating the Seine-Nord link connecting the Seine and the Benelux basins, thus designating the E 10 link as lower priority. The Rhine-Rhône project which had been planned since the late 1960s was then abandoned in 1997. After a few years of limited planning activity, the French Government, the Regions (led by Lorraine and Rhône-Alpes) and the national public corporation "Voies Navigables de France" (VNF) resumed studies of the link with the goal to organize a public debate in 2011 on the inland water connection between the Rhine and the Mediterranean. This connexion is included in the French legislation (a so-called "Grenelle" law) and in the 2010 national scheme for transport infrastructure.

81. As indicated above, only limited works remain to be completed to obtain full Class Vb characteristics throughout this subnetwork, and dredging in certain sections of the Saône, and widening and deepening of the channel of the Rhône-Sète canal, to Class IV capacity.

2. Fleet

82. The fleet specific to the Rhône-Saône basin is comprised of boats that are wider than 5.10m, or narrow enough but longer than the Freycinet locks (38.5 x 5.20 m), making it captive in the basin because every route out of the basin is Freycinet size. Presently, it totals 215,400 tonnes and 152 boats, out of which 134 boats, totalling 209,600 tonnes, were operating in 2008. The public transport part is regularly reported by VNF, while there are some 57 more private carrying of sand and gravel which are also captive.

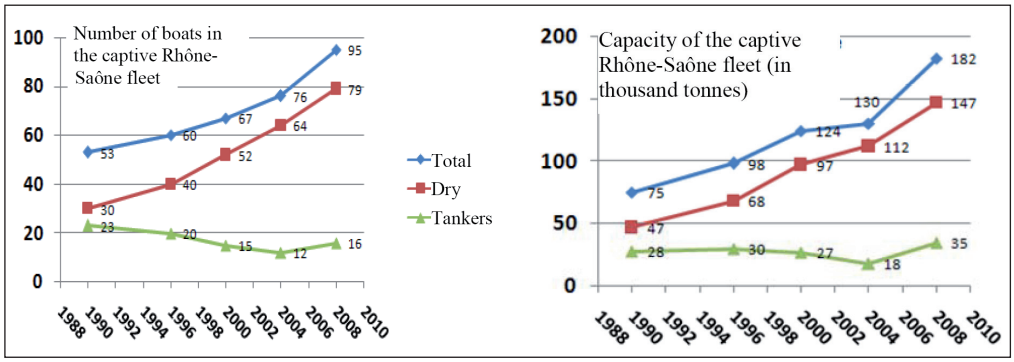
Table 6
Public transport craft present in 2008 in the Rhône-Saône basin

	No	*Tonnes*	*power kW*	*Average capacity (t)*
Dry cargo fleet	79	147 240	32 524	1 864
Self-propelled vessels	41	59 335	32 524	1 447
Pushed barges	38	87 905		2 313
Tanker fleet	16	35 322	8 290	2 208
Self-propelled vessels	7	13 898	8 290	1 985
Pushed tanker barges	9	21 424		2 380
Total	**95**	**182 562**	**40 814**	**1 922**

Source: VNF Lyon.

83. A first noticeable point is the very high average size of the fleet, nearly three times that of the French fleet overall. This is understandable, since all Freycinet-type barges, which lowers the average, are excluded, because they are not captive. Furthermore, the own-account fleet is not included in the statistics, and its average size is much lower (571 tonnes). This is driven by a logistics logic, a sand port needs only the amount of construction materials that it sells in a day, which is hardly 500 tonnes in France. Serving it with 2,000 tonnes barges would unnecessarily freeze a large investment to serve as floating storage, and no operator does this. The size and capacity of the fleet grew enormously in the last decade, in line with the growth of traffic.

Figure 11
The size and capacity of the Rhône-Saône fleet



Source: VNF.

3. IWT Performance

84. The growth of the Rhône-Saône fleet has been fuelled by the growing container traffic, and the numerous barges and self-propelled craft assigned to it. This is clearly a sector with a future, irrespective of local or global crises. On the other hand, the decline in the tanker fleet is noticeable. This results from two opposite trends: the release for civil transport of a NATO pipeline reduced drastically the amount of petroleum products to be carried, and led to the phasing out of many tanker vessels; new markets opened, particularly in chemicals and gas transport. The recent expansion in this sector has been accelerated by the pending obligation to operate vessels with double hulls for transport of dangerous goods; this has been taken as an opportunity to win new markets, with some success, thanks to the increased security it offers.

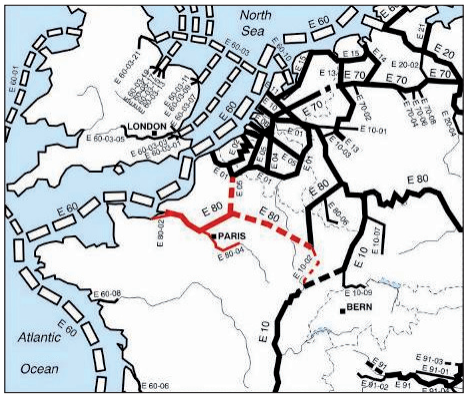
85. Prices offered, in comparison to rail, are broadly equivalent for regular volume traffic. Accordingly, the competition is fierce, but there have already been some cases of cooperation in order to stop cut-throat competition.21 Moreover, the future of the rail freight in France is quite uncertain in the context of the liberalization of the rail service, the quality of service offered by the infrastructure provider and the transporters and the strong passenger traffic development.

86. The growth in demand was estimated in the context of studies of the possible Saône-Mosel link (E 10–02). These concluded (in 2005) on three possible scenarios of evolution of demand on the route, analysing all road traffic between the French Departments on the waterways situated south of the new link and all the Departments on the waterways to the north of the link, plus Belgium, the Netherlands and the Rhine basin in Germany. Under the scenario most favourable to inland waterways (blue scenario) the potential annual traffic could reach 15 million tonnes. A new round of studies is currently ongoing with the view to organize a public debate in 2012.

F. The Seine-Oise basin

87. This subnetwork of 632 km includes route E 80, west, and missing link north to E 10.

Figure 12
The Seine-Oise basin



Seine-Oise basin
[Total: 632 km]

Source: the UNECE Blue Book.

[21] For instance, the Edouard Herriot port on the Rhône in Lyon is an advanced port of Fos/Marseille for both IWT and rail, with similar prices applied.

1. Infrastructure

88. The Seine-Oise waterway network offers characteristics compliant with the AGN and with the AGTC standards for combined transport. The major infrastructure project with far-reaching implications in this basin is the Seine-Nord Europe Canal implemented by VNF, which will eliminate the missing link between the Seine basin and the inland waterway network in the Nord-Pas de Calais region. Seine-Oise will then become in reality a route common to E 10 and E 80.

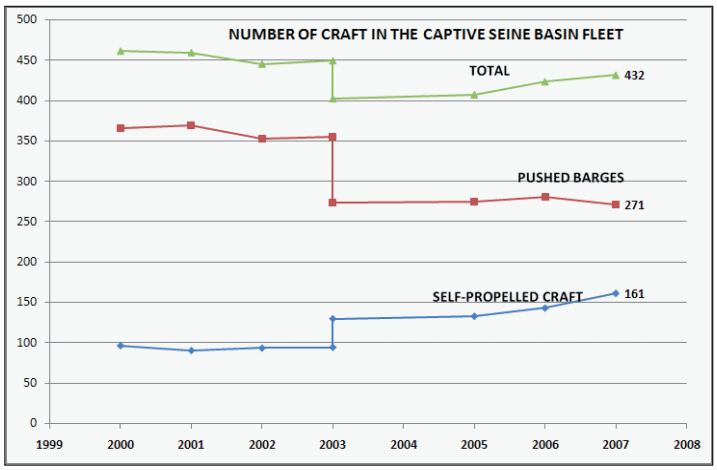
89. The expected benefits of the Seine-Nord Europe canal, to be operational by 2016, are significant. The canal will remove one of the major missing links on the European inland waterways connecting the Seine basin with its high traffic capacity and the rest of the European network of inland waterways of international importance. The canal will also connect seven major ports in the North of Europe (Havre, Rouen, Dunkerque, Ghent, Zeebrugge, Anvers and Rotterdam), raising their attractiveness and competitiveness in the context of growing maritime traffic. Finally, the canal will offer four multimodal platforms, whose loading/unloading, storing, transhipment capacities will effectively enable the integration of the rail and water traffic in the global logistic chain.

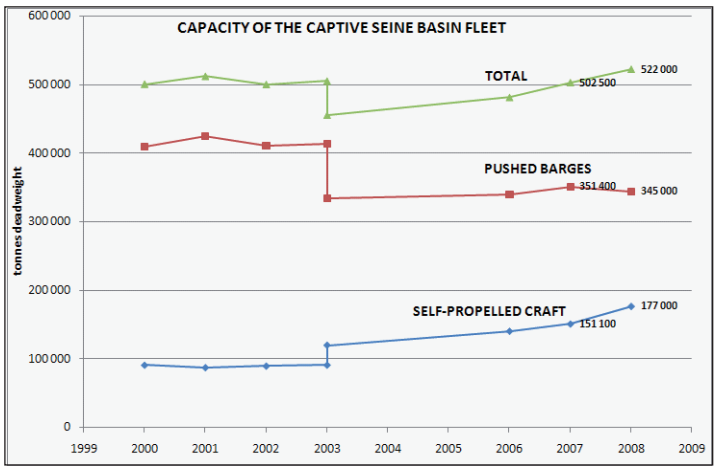
90. The feasibility, economic and public consultation stages of the project were completed in 2004 and the full project documentation was finalized in 2010. Work in the field began in mid-2006. The competitive stakeholder dialogue is crucial at the present stage to proceed with the economic, technical and financial development of the project, which requires inputs and commitment of all the parties contributing to financing and implementing the project (State, regions, users of the canal and its multimodal platforms, and private partners).

2. Fleet

91. The number of craft isolated in the Seine-Oise Basin is around 500 (craft wider than 5.8 m). The only connection at this size is Canal du Nord (6 m wide locks), all other canals being Freycinet type, with 5.2 m wide locks. A large share of the fleet is pushed craft, due to the importance of aggregates traffic towards Paris. The average size is larger than the overall French fleet, since there is no Freycinet craft (<400 tonnes).

Figure 13
The fleet in the Seine-Oise Basin





Source: VNF & secretariat estimates.

92. Some new craft are inducted into the basin from time to time, passing through the sea or carried on submersible barges, both ways being costly. In particular, there were a few 135 m craft, specialized in container transport, brought in this way. Yet, fleet owners are investing in the anticipation of the coming Seine-Nord Europe link, which will enable complete fluidity of the North-West European fleet and may bring in the Seine basin many craft attracted by higher freight.

3. IWT Performance

93. Freight rates are a little high compared to those on the Rhine, but this is offset by the less severe competition from rail as in other parts of Europe, because most of the tracks are overloaded with passenger trains around Paris. Competition is fierce with road transport, however, especially on account of the circuitous route taken by the Seine to reach the sea: 330 km from Gennevilliers near Paris, while it is less than 200 km as the crow flies. Yet it retains an appreciable share of the traffic, better than the French average, because of the quality of waterway depth (3.5 m draught). There is also a significant growth of container traffic on the Seine between Havre and Paris, despite the current lack of waterway connection between Port 2000 and the waterway. The share of the waterway in the total traffic of the port of Havre increases each year. In 2007,

170 million tonnes of total freight and almost a million containers (TEU) were transported on the north-south corridor. The Seine-Nord Europe canal will allow in 2016 capturing of around 230,000 containers on this route.

94. The modal share of road transport, which has the dominant market share (87 % versus 8 % for rail and 5 % for water transport), is explained by saturation of the railway network as indicated above, but also by the absence of interconnection of the high-capacity waterway network. The presence of high-capacity waterways has a major impact on the market share of IWT. On sections where high performance is possible, such as on the Seine, water transport has a significant market share (13 % of the movements studied). On the other hand, the constraint of capacity on the north-south waterway route (Canal du Nord limited to 650 tonnes) limits the water transport share on the existing route to just over 3 %. Once the Seine-Europe Nord canal is operational, the overall modal share of IWT will be tripled, reaching 10 %, the percentage being even higher for bulky goods (granulated goods, cereals, chemical products, containers).

95. The demand is expected to grow in line with EU projections. The traffic forecasts for 2020 on the Seine-Scheldt connection predict 10 % modal share of the waterway on the North corridor (17.1 million tonnes), which would mean the increase of the national modal share from 3 to 6 %. Construction materials, cereals, agro-industrial products, combustible materials and fertilizers, already dominant in inland navigation, but made more competitive and benefiting from improved logistics, are expected to constitute 60 % of the transported goods. The freight traffic by inland waterway would also be increasingly able to benefit from the ongoing growth in the maritime container traffic and from the expected relocation to France of the major distribution centres, currently located in Benelux. Various studies carried out between 2005 and 2010 identified the new market niches for inland navigation (chemicals, recycled goods, automobiles, heavy goods, inland containers, etc.), which are expected to contribute in the long run to a redistribution of the modal shift and alleviation of the urban traffic congestion.

G. Coastal routes and connected inland waterways

96. Infrastructure here relates to the ship canals incorporated in these routes (E 60 – Nord-Ostsee Kanal and E 90 – Corinth Canal), but above all to the port facilities enabling development of river-sea traffic or coastal shipping, notably under the “Motorways of the Sea” project promoted by the EU. This also covers the isolated inland waterways which are interconnected by these maritime routes: Guadalquivir estuary (E 60–2), waterways of the United Kingdom of Great Britain and Northern Ireland open to sea vessels (E 60–1 and E 60–3), Douro (E 60–04), Göta (E 60–07), Finnish waterways (E 60–11) and the Pô in Italy (E 91).

1. Infrastructure

97. There are by definition no system-wide investments on these routes. It is nevertheless of significance that investments are continuing or are being planned in order to increase the efficiency or the potential economic benefits of these combined river-sea routes. Some investments appear to concern only maritime traffic, but in reality may serve shipping throughout the AGN river-sea network. For example, the German Government’s investment of more than €400 million on the Kiel Canal (eliminating a 20 km bottleneck and building a third lock chamber at Brunsbüttel) will cut transport times and lower transport costs, primarily benefiting the German seaports with their substantial share of Baltic Sea trade, but also benefiting all river-sea operations from the North Sea through the Baltic Sea and into Finland and the Russian Federation. Other infrastructure investments of note are the new lock for access to the port of Sevilla, opened in October 2009 (route E 60–2, although this is more for maritime access than river-sea traffic) and projected improvements on the Saimaa

Canal in Finland (lengthening the operating season) and the deep-water fairway Danube-Black Sea with the maximum use of its natural capacity of the Ukrainian part of the Danube for ensuring the Danube-Black sea connection.

98. The status quo applies in the United Kingdom of Great Britain and Northern Ireland (e.g. ports of Goole on the Ouse, Manchester on the Manchester Ship Canal), on the Göta in Sweden (no enlargement now planned at Trollhättan) and in Italy (no progress on the Padua-Venice Canal).

2. Fleet

99. The technical innovation of "box-shaped" short-sea mini-bulkers enables river-sea transport to compete with roll-on/roll-off and container ships by avoiding the break of bulk at coastal seaports, according to a report published in 2002.[22] This has important regional consequences in hitherto land-locked or isolated areas with navigable rivers and canals. Door-to-door journeys by river-sea transport have potential for future growth, but the trend is hindered by the higher investment and operating costs of such vessels.

100. For the same reason, there has been very limited development under the EU "Motorways of the Sea" project. Why put the trailers on to Ro-Ro vessels for long transits, with the implied immobilization time, and the risks involved (ferries with their folding doors are intrinsically vulnerable), where 45–feet pallet-wide containers on regular maritime container lines could provide the equivalent transport service more efficiently and cheaply?

3. IWT Performance

101. Freight operations on the inland waterways of the United Kingdom of Great Britain and Northern Ireland are inevitably on a much smaller scale than those commonly encountered in mainland Europe. Nevertheless, there is some freight traffic in several areas, the main ones being:

(a) in London, on the River Thames;

(b) in the North-East of England on the Rivers Hull, Humber and Trent; and

(c) in the North-West of England on the River Mersey and the Manchester Ship Canal.

102. These are all areas where there is a viable interface with seagoing vessels. Little or no expansion of inland waterway transport in the United Kingdom is expected at the present time, particularly in view of the current economic climate.

103. The transport demand and supply throughout the maritime routes in Europe is beyond the scope of this report. The issue is to move towards combined investments – countries' investments in port and waterway infrastructure, and shipowners' investments in new vessels adapted to the changing demand – which will accelerate the trends observable today, and encourage investments in modern vessels optimizing the service to meet new demand sectors in particular (cf. pallet-wide containers as mentioned above).

104. Small coasters (up to 2000 or 3000 dwt) will continue to have a role to play in many river-sea services between points on the AGN network, and they would also benefit from certain investments (Saimaa Canal, dredging the entrance to the Douro, etc.).

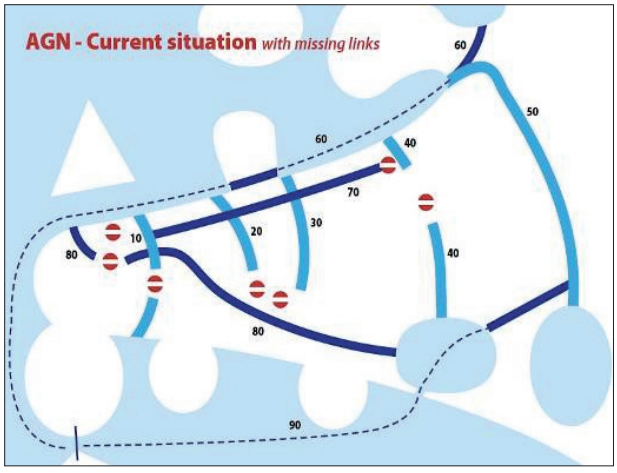
[22] Jean-Pierre Rissoan, "River-sea navigation in Europe", Laboratoire d'économie des transports à l'Université Lumière Lyon 2, 2002.

H. Conclusions: Policy trends and challenges ahead

105. What is particularly important to note in 2010, as compared to 1996, is the much more widespread awareness of IWT advantages, now also selling points to governments planning and building improved or new infrastructure. It is clear today that this heightened awareness is levering changes in investment decisions at the pan-European level, and this in turn is raising confidence among operators who are themselves investing at a higher rate than in the 1980s and 1990s. The clear trend is towards a consolidated share of the market for IWT throughout the main networks in sections A and B of this chapter. The smaller, less integrated networks, presented in sections C–F, offer infrastructure of adequate quality which may be expected to serve a greater role, wherever there is essential demand for economical transport of large volumes of bulk goods or liquids, or where conditions justify a waterborne leg in intermodal transport operations. In the Russian Federation, for instance, the current plans for increasing the role of IWT in the "North-South" international transport could lead to the increase of IWT transit transport up to 20 to 25 million tonnes. Accordingly, it may be observed that the efficient response of the profession to new transport demand has succeeded in breaking down the barriers which for long prevented the industry from working to its full potential and, in particular, the barrier of non-existent or incomplete infrastructure.

106. This drawback of the non-existent or incomplete infrastructure relates not to the IWT mode itself, nor to its competitive position, but to the impossibility of serving many AGN routes. Missing links make up nearly 1500 km, or 5.3 % of the E waterway network of 27,900 km. The percentage is small, but the impact of the interruptions significantly weakens the network as a whole. The following diagram represents the schematic geographic outline of the region covered by the AGN and the main AG corridors and highlights the missing links, showing clearly the limits of the network in the current situation.

Figure 14
Missing links in the AGN network



Source: UNECE secretariat, 2010.

107. The answer to this drawback lies in phased completion of the infrastructure. The impending start to works on the Seine-Nord Europe Canal, with locks up to 30 m deep and a network of ports, proves the feasibility of building high capacity canals connecting parts of the existing network with a significant economic cost-effectiveness, excellent environmental performance and strong acceptance by the regions involved in the project. It also shows that the methodology for estimating socio-economic benefits of such projects has changed in the last 10–15 years. The expansion of the scope of the analysis, the environmental advantages

of IWT and the positive impact on the local development have all contributed to the global benefits of such projects. It is important to note that one of the major factors, influencing the result of the cost-benefit analysis, is the reduction of the transport costs through the economies of scale. The benefits, therefore, are subject to strong influence by the overall transport policies, especially in terms of the internalization of the external costs. Therefore, consideration should be given to a reform of infrastructure pricing for the transport sector.

108. The threshold of acceptable infrastructure costs in relation to projected benefits, taking fully into consideration all the factors as appreciated under current criteria (in 2010), is being pushed higher. If this trend continues, then other more ambitious and more costly watershed connections may be expected to become economically feasible.

109. The EU has the advantage of considerable pooled resources devoted to Europe-wide evaluations and policy definition. The results of analyzes conducted for the 27 member States may be considered relevant for the entire AGN waterway network. In 2005 three-quarters of traffic flows in the EU were via roads, compared with half in 1970. Forecasts indicated that there would continue to be sustained growth in freight transport in the EU. In 2001, in its White Paper on transport policy, the Commission predicted an increase of 38 % in exchanges of goods by 2010, leading to an increase of 50 % in heavy goods road vehicles (HGV) traffic if no remedial measures were applied. This growth would have notable effects on the environment: the external costs generated by this sector (pollution, energy consumption, congestion of main roads, etc.) represent 8 % of Europe's Gross Domestic Product (GDP).

110. In the non-EU countries, such as Kazakhstan, the Russian Federation, and Ukraine increasing focus is on upgrading the inland infrastructure parameters. Significant investment in development (about 4.8 % of GDP) will be required to bring the Russian transport system to the desired level of quality. A number of investment projects have been drawn up under the federal programme for the modernization of the Russian transport system (2002–2010) and the Transport Strategy of the Russian Federation for the period until 2020. The Ukrainian transport policy foresees the modernization of the locks on the main national waterways and development of the sea and transport facilities in the Ukrainian Danube region. In Kazakhstan, national strategy aims at rebuilding the hydraulic engineering structures on inland waterway, upgrading the technical parameters of main navigable rivers and canals, such as Irtysh River and the Ural-Caspian canal, and integrating IWT in the Caspian regions of the country into the North-South international transit route.[23]

111. In reality, some remedial measures were taken, and have already resulted in a small but significant transfer of freight from road to IWT (while transfer from rail is marginal). The policy, embodied in the measures taken by national Governments in the transport sector, has produced in the first place a significant change in the image of IWT, which is taken into account as an essential component of future transport supply, instead of being confined to a marginal position, in a political and electoral "backwater".

112. Of course, growth has been fuelled in part by ongoing investments in the infrastructure, giving operators the confidence to invest in carrying capacity. This is typically the case in Germany, where east-west exchanges through the enlarged Mittelland Canal have increased significantly. But growth is also remarkable on the isolated high-capacity waterways in France.

113. This reveals that a new dynamic has been created in advance of major new investments, and in advance of completion of the European inland waterway network. The new dynamic is fuelled by several complementary phenomena:

[23] A more detailed account of the national IWT transport policies of these three countries is available in the 2009 secretariat study, ECE/TRANS/SC.3/WP.3/2009/13.

(a) Additional credibility given to the industry by the fact that new investments, such as the Seine-Europe Nord canal, are being prepared;

(b) Industry given extra motivation to seek and adopt IWT solutions through the “win-win” arguments of lower costs and eco-responsibility;

(c) The phenomenal growth in container movements by inland waterway, 30 years after the first such movements on the Rhine, gives IWT a “modern” image which it could hardly cultivate when major flows were coal to fuel thermal power plants;

(d) The water transport industry is assisted in logistics and in its communications with shippers and freight forwarders by modern technology;

(e) Waterway authorities have started energetically promoting the water transport industry, i.e. the major use of the infrastructure which they build, maintain and operate, as part of their mission in the public interest;

(f) As part of this new outreach, the waterway authorities are also promoting the professions of the water transport industry, particularly, that of barge skipper, to ensure that fleet capacity is maintained and increased in line with demand.

114. As a result, the IWT component of overall transport supply is now in the mainstream of transport policy definition and decisions, and this is a relatively new situation, which is likely to be confirmed in the coming years.

Chapter 3

The Institutional and regulatory framework for inland navigation in Europe

115. The 1996 UNECE White Paper on trends in and development of inland navigation and its infrastructure posited that there was no single inland navigation market in Europe, that instead it was composed of fragments based on different river basins and connecting canals and that the rules governing the access to the market are equally fragmented, diverse and partly non-existent.[24]

116. As in 1996, today several international bodies, with varying degrees of geographical scope, legislative mandate and substantive coverage, constitute the institutional framework for inland navigation in the ECE region. The resulting complex regulatory framework for inland navigation in Europe is often considered to be an impediment for IWT development. The present chapter aims to update the analysis of the institutional and regulatory aspects of inland navigation and describe the main developments in this area. Accordingly this chapter presents the European inland navigation institutions highlighting the commonalities and differences in their mandate and regional scope (section A), analyzes the main components of the existing regulatory framework for IWT operations (section B) and concludes by describing the priorities for its development, identified in the recent pan-European policy discussions (section C).

A. The institutional framework of the European inland navigation

1. Multilayered institutional landscape

117. As in 1996, inland navigation in the European part of the ECE region is currently regulated by a variety of intergovernmental institutions and bodies, including river-specific navigation commissions, the EU, UNECE and pan-European ministerial conferences.

118. The main European international rivers are managed by specially established navigation commissions entrusted with setting technical and legal standards for the navigation in their respective river basins. At present, there are four river navigation commissions in the ECE region.

119. The CCNR finds its origin already in the Final Act of the Vienna Congress in 1815 which included provisions related to the navigation on international rivers and, the Rhine, in particular. The Mainz Convention, concluded in 1831, was the first to regulate the navigation on the Rhine, followed by the 1868 Mannheim Convention for the navigation of the Rhine which, as amended by a number of later conventions and additional protocols, continues to be in effect. The membership of the CCNR has evolved over time and currently includes Belgium, France, Germany, the Netherlands and Switzerland. The main objectives of the CCNR are to promote the development of navigation on the Rhine and

[24] TRANS/SC.3/138, para. 92.

to guarantee a high level of safety for navigation and its environment. The decisions of the CCNR are legally binding for its member States. The CCNR is based in Strasbourg (France).

120. The Mosel Commission (MC) was established in accordance with the 1956 convention between France, Germany and Luxembourg on the canalization of the Mosel. The Commission met for the first time on 21 December 1962 – one and a half years after the completion of the project. Through the issuance of binding decisions, the Commission regulates the navigation on the Mosel, such as traffic rules, crew certificates, manning requirements and tolls. The Commission's headquarters are located in Trier (Germany).

121. The Danube Commission (DC) was established in accordance with Article V of the 1948 Belgrade Convention on the regime of navigation on the Danube. However, already in 1856, article XVI of the Parisian Treaty had created the European Danube Commission, which existed with the certain changes until the Second World War. In 2010, DC counts eleven member States: Austria, Bulgaria, Croatia, Germany, Hungary, Republic of Moldova, Romania, the Russian Federation, Serbia, Slovakia and Ukraine. The Contracting Parties commit to maintain the navigability of their respective sectors, undertake necessary works and not to create obstacles to navigation. DC issues decisions and recommendations which are not legally binding and need to be implemented through transposition into national legislation of its member States.

122. The International Sava River Basin Commission (the Sava Commission) was established in 2004 to implement the Framework Agreement on the Sava River Basin between the four riparian countries (Bosnia and Herzegovina, Croatia, Serbia and Slovenia). The goals of the Sava Commission are the establishment of an international regime of navigation on the Sava River and its navigable tributaries, of sustainable water management and measures to prevent or limit hazards. Decisions of the Sava Commission in the field of navigation are legally binding for its member States.

123. In the EU member States, inland navigation is increasingly governed by the EU legislation. In 2001 the European Commission (EC) published a White Paper on the "European Transport Policy for 2010: time to decide", emphasizing the impact of traffic congestion caused by the imbalance between transport modes and the need for integrating transport into sustainable development. The paper proposed a series of measures to revitalize alternative modes of transport to road, including IWT. The EU IWT policy was further elaborated in the 2006 EC communication on the "Navigation and Inland Waterway Action and Development in Europe" (NAIADES) Programme.[25] The programme included four major components for the period of 2006–2013: Markets, Fleet, Jobs and Skills and Image, and included concrete actions for each area.[26]

124. The EU also addressed the main technical, economic and legal issues of inland navigation, such as access to the market and the profession, state aid, competition, pricing, technical prescriptions applicable to inland vessels and the boatmasters' licences, through a number of specialized directives. Potential uncertainties as to the applicability of EU legislation to navigation on the Rhine, governed by the Manheim Convention, which precedes EU legislation and involves a third State (Switzerland),[27] are being resolved by progressive harmonization between the two regimes and close cooperation between the EC and the CCNR.

[25] See: COM(2006) 6 final of 17 January 2006.

[26] The communication was circulated by the Working Party on Inland Water Transport as document ECE/TRANS/SC.3/2006/5.

[27] R. Bieber, F. Maiani, M. Delaloye, *Droit Européen des transports*, Helbing & Lichtenhahn, Dossiers de droit européen, 2006, «Les transports par voie navigable», paras. 138–143.

125. At the pan-European level, pan-European Ministerial Conferences on Inland Water Transport, regularly organized during the last fifteen years, result in Ministerial declarations on the priorities for IWT development.[28] The latest declaration, adopted at Bucharest in September 2006, addressed a wide range of issues related to the harmonization and integration of the regulatory framework, coordinated development of inland waterway transport, infrastructure development and the environment.

126. The UNECE addresses the pan-European inland navigation issues both at technical and policy levels. A recognized centre for international land transport agreements, UNECE maintains over 50 international conventions which provide a legal framework and technical regulations for the development of international road, rail, inland navigation and intermodal transport as well as for the transport of dangerous goods and the construction of road vehicles. In the field of inland navigation, UNECE has prepared and maintains international conventions, such as the AGN, the 2000 European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN), as well as several conventions dealing with the international private law issues and liability in inland navigation.[29] The UNECE Working Party on Inland Water Transport (SC.3) addresses a large number of issues related to technical and safety standards in inland navigation and ensures their harmonized application by means international resolutions. The acceptance of these resolutions by UNECE member States is monitored regularly by the Working Party.[30] Many UNECE resolutions, such as UNECE Resolution No. 24 on the *European Code for Inland Waterways (CEVNI)* and UNECE Resolution No. 31 on *Recommendations on Minimum Requirements for the Issuance of Boatmaster's Licences in Inland Navigation with a view to their Reciprocal Recognition for International Traffic* have been accepted and implemented by a large number of countries.

127. The table below provides an overview of membership in the above-mentioned international organizations and bodies.

[28] These conferences include Ministerial Conference on Timely Issues of European Inland Waterway Transportation (Budapest, September 1991); Pan European Conference on Accelerating Pan European Co-operation towards a Free and Strong Inland waterway transport (Rotterdam, 5–6 September 2001) and Bucharest conference on Inland Navigation: a Key Element of the Future Pan European Transport System (Bucharest, 13–14 September 2006). The most recent Ministerial Declarations are available at: www.unece.org/trans/cd.html.

[29] The complete list of UNECE IWT conventions is available on the "Legal Instruments" webpage: www.unece.org/trans/main/sc3/sc3_legalinst.html.

[30] The complete inventory of UNECE Resolutions on Inland Water Transport and the secretariat's report on their acceptance are available at: www.unece.org/trans/main/sc3/sc3res.html.

Table 1
Membership in inland navigation organizations
(Only full membership)

	UNECE	*EU*	*CCNR*	*DC*	*SC*	*MC*
Austria	X	X		X		
Belarus	X					
Belgium	X	X	X			
Bosnia and Herzegovina	X				X	
Bulgaria	X	X		X		
Croatia	X			X	X	
Czech Republic	X	X				
Finland	X	X				
France	X	X	X			X
Germany	X	X	X	X		X
Hungary	X	X		X		
Ireland	X	X				
Italy	X	X				
Lithuania	X	X				
Luxembourg	X	X				X
Republic of Moldova	X			X		
Netherlands	X	X	X			
Poland	X	X				
Romania	X	X		X		
Russian Federation	X			X		
Serbia	X			X	X	
Slovakia	X	X		X		
Slovenia	X	X			X	
Switzerland	X		X			
Ukraine	X			X		
United Kingdom	X	X				
United States of America	X					

128. At the industry level, several organizations represent the interest of the various segments of the inland navigation sector at European level:

(a) The European Barge Union (EBU) represents the inland navigation industry, i.e. the national associations of barge owners and barge operators of eight leading European inland navigation countries;

(b) European Skippers Organisation (ESO) represents the private individual skippers;

(c) European Federation of Inland Ports;

(d) European River-Sea-Transport Union represents the interests of river-sea transport;

(e) International Transport Workers' Federation (ITF) represents the social and labour concerns;

(f) Inland Navigation Europe represents mainly the infrastructure operators and waterway administrations.

129. It can be considered, therefore, that in 2010, in addition to national regulations there are six international legal regimes governing inland navigation in Europe: the EU legislation, specific river regimes for the Rhine, Danube, Mosel and Sava and the UNECE regime. Almost all these regimes and intergovernmental institutions existed at the time of publication of the first UNECE White Paper on inland navigation in 1996. The only exception is the International Sava River Basin Commission founded in 2003 as a temporary body and transformed into a permanent organization in 2005.

130. However, with the several waves of EU enlargement, common EU legislation has extended to a larger number of countries with important inland waterways. With the last EU enlargement in 2007, more than 37 000 kilometres of waterways of 20 out of 27 EU member States are subject to the same legislation, with a notable exception of the Danube, a significant part of which remains outside the EU.

131. The revision of the Belgrade convention, initiated in 1993 to reflect the changes in the political and economic situation of the Danube and already referred to in the 1996 White Book, could have a significant impact on effectively harmonizing the navigation regime on the Danube, as one of the amendments under consideration consists in conferring to this River Commission the power to issue legally binding decisions. This is the case with other River Commissions. However, the negotiations on the revised text have not yet been completed.

2. The future of the European inland navigation institutions

132. The multilayered institutional landscape of inland navigation in the European part of the ECE region and the underlying different legal regimes for inland navigation have been subject to numerous studies, policy papers and Ministerial Declarations in the recent past.[31] While some studies and policy papers advocated a substantial change of the institutional landscape, i.e. creation of a new European institution to promote IWT development,[32] others favored continued harmonization of technical and legal rules for European inland navigation or a "silent revolution" to take place within the existing institutional setting to ensure uniformity in substance.[33] The regime of inland navigation in the ECE region remains an important topic for policy discussions and, as recently as in 2008, EC commissioned an impact assessment study of proposals aiming to modernize and reinforce the organizational framework for inland waterway transport in Europe".[34]

133. In 2004, a report of the European Framework for Inland Navigation (EFIN) Group (hereafter, the EFIN report) identified a number of difficulties in developing the full potential of inland navigation and argued that the existing institutional framework was not strong enough to attract sufficient political attention to the problems of inland navigation or to mobilize all resources necessary to develop the sector. The EFIN report advocated the establishment of a new European body for inland navigation to serve as an umbrella organization for the existing institutions. This body would include political, administrative and financial components and would include non-EU countries. The European Economic and Social Committee, in its 2006 opinion on the institutional framework for inland waterway transport in Europe (2006/C 185/18), supported the establishment of a pan-European Inland Navigation Organization, in which all European countries and organizations concerned, including EU, would cooperate within a single framework.

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[31] European Framework for Inland Navigation (EFIN) Group *"A new institutional framework for the European Inland Navigation" (October 2004), PINE Study "Prospects of Inland Navigation within the Enlarged Europe"* (September 2004), the UNECE *"Inventory of existing legislative obstacles that hamper the establishment of a harmonized and competitive pan-European inland navigation market, and proposals for solutions to overcome them"*, ECE/TRANS/SC.3/2005/1, January 2005, Opinion of the European Economic and Social Committee on the institutional framework for inland waterway transport in Europe (April 2006) and Declaration of the Ministers of the Member States of the Central Commission for Navigation of the Rhine, Basel, May 2006.

[32] EFIN Group "A new institutional framework for the European Inland Navigation"; Opinion of the European Economic and Social Committee on the institutional framework for inland waterway transport in Europe, October 2004.

[33] J.M. Woehrling, CCNR Secretary General, "Is the Legal Framework of European Inland Navigation Suitably Adapted?", *Strengthening Inland Waterway Transport: pan-European Co-Operation*, European Conference of Ministers of Transport (ECMT), 2006, paras. 36–41, available from: www.internationaltransportforum.org/europe/ecmt/pubpdf/06WatPaneurop.pdf.

[34] EC, "Report on the impact assessment of proposals aiming to modernize and reinforce the organizational framework for inland waterway transport in Europe" (October 2008). See: http://ec.europa.eu/transport/inland/studies/doc/2008_ia_modernise_inland_waterway.pdf.

134. In 2006, in its communication launching the NAIADES programme, EC envisaged stimulating the process of modernizing the organizational structure of inland waterway transport. In its first progress report on the NAIADES programme (COM(2007) 770 final), Brussels, 5 Dec. 2007) EC however declared that, under current circumstances, it was preferable to base the organizational framework on the existing institutional actors. This conclusion was drawn based on an impact assessment carried out by EC, which concluded that the modification of the organizational structure would not sufficiently contribute to removing the obstacles for the development of inland waterway transport in Europe.[35] The report on this impact assessment recommended to reinforce or to reorganize cooperation between EC and the River Commissions as the best means to address the challenges in IWT development.

135. The continued harmonization of existing international rules and regulations in IWT could eventually overcome the existing fragmentation of the institutional landscape in inland navigation sector.[36] This requires however that the necessary procedures and mechanisms are put in place and efficiently operated to ensure that, apart from specific and local exceptions, revised, updated and new rules and regulations in inland navigation are commonly agreed upon at the widest possible level and provide a model for implementation at subregional and national levels. Such a practical approach was suggested by many experts, including those involved in the 2005 UNECE *"Inventory of existing legislative obstacles that hamper the establishment of a harmonized and competitive pan-European inland navigation market, and proposals for solutions to overcome them"* (hereafter, the UNECE Inventory of legislative obstacles).

136. The next section on European regulatory framework for inland navigation reviews the content of the existing legal regimes applicable at EU, UNECE and River Commission levels and analyzes the extent to which they are harmonized.

B. The regulatory framework for inland navigation in Europe

137. Aimed at dealing with the main aspects of inland navigation, the inland navigation regimes of the EU, UNECE and River Commissions cover a large number of identical areas. As a result, the regulatory framework for inland navigation in the European part of the ECE region addresses a variety of issues, such as the standards and parameters of inland waterways, access to inland waterways, technical and safety requirements applicable to IWT, civil and public law aspects of IWT operations as well as environmental aspects of inland navigation.

138. The exact coverage and legal force of European inland navigation regimes vary according to the original mandate and the legislative mandate of each organization. The table in the annex contains a summary of the legal regimes applicable at EU, UNECE and River Commission levels, highlighting legally binding instruments where available. The following paragraphs provide an overview of the most important components of these regimes, such as standards and parameters of European inland waterways, access to market, technical and safety requirements applicable to IWT, civil and public law aspects of IWT operations as well as environmental aspects.

[35] Ibid.
[36] J.M. Woehrling, "Is the Legal Framework of European Inland Navigation Suitably Adapted?", paras. 36–41.

1. Standards and parameters of European inland waterways

139. The main international legal instrument which identifies the network of the European inland waterways of international importance remains the AGN. In addition to helping countries monitor and coordinate the development of the inland navigation network, the AGN also provides a reference tool for other agreements on inland navigation issues. For instance, the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) specifies that only the countries whose territory contains inland waterways, which form part of the AGN network, may become Contracting Parties to the Agreement.

140. River Commissions provide information on the status of their specific river basins, while the EU directives usually specify the geographical areas covered by their requirements.

2. Access to market

141. While the freedom of navigation on international inland waterways was proclaimed in such fundamental international instruments as the Final Act of the Vienna Congress of 1815, there is no international legal instrument establishing the freedom of access to all inland waterways in the ECE region. According to the recent studies, important restrictions in access still exist when it comes to some inland waterways in the ECE region.[37]

142. The EU regulations (EEC) 3921/91 and (EC) 1356/96 explicitly authorize EU IWT operators, who can prove a "genuine link" with a member State, to carry out transport operations both within EU countries other than their country of establishment (cabotage) and between EU countries. These two regulations do not affect the transport rights of vessels from non-EU countries that are Contracting Parties to the Mannheim Convention and the Belgrade Convention.

143. Article 4, paragraph 1 of the Mannheim Convention (as amended by Additional Protocol No. 2) reserves the right to carry out transport operations between points situated on the Rhine and its tributaries to vessels belonging to Rhine navigation, i.e. having a genuine link with one of the CCNR or EU member States. At the present time this concerns twenty eight states (27 EU member States and Switzerland) and includes the cabotage operations. Vessels not belonging to the Rhine navigation may carry out such transport only under conditions laid down by the CCNR. The CCNR has not specified such conditions in general terms, as only one individual request has been submitted to this date. Article 4 further specifies that the conditions for the transport of freight and persons by vessels not belonging to the Rhine navigation, between a point situated on the Rhine and its tributaries and a point situated in the territory of a third State, shall be laid down in agreements between this third State and the Rhine riparian State concerned.

144. While proclaiming the principle of freedom of navigation for vessels of all States in all border-crossing traffic on the Danube, the Belgrade Convention excludes vessels flying foreign flags from national transport operations (cabotage). The same principle is in force on the Sava River.

145. Finally, the national waterways of a number of non-EU countries still remain closed for international navigation (Kazakhstan, Russian Federation) or are open only on the basis of bilateral agreements (Ukraine).[38]

146. While the situation with respect to the rules on access to market has changed little since the analysis provided the first UNECE White Paper in 1996 and the more recent conclusions by the UNECE Inventory of legislative obstacles, a significant change took place with respect to the geographical scope of the EU

[37] EFIN Group "A new institutional framework for the European Inland Navigation", para. 37; the 2005 UNECE Inventory of existing legislative obstacles, paras. 5–7.

[38] For more details on access to the waterways of these three countries, see ECE/TRANS/SC.3/WP.3/2009/13.

legislation. The last two waves of EU enlargement led to the inclusion of the inland waterways of Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia into the EU market.

3. Technical and safety requirements applicable to inland water transport

147. The technical and safety requirements applicable to IWT cover *inter alia,* rules of the road, requirements for the construction of inland vessels (technical prescriptions), requirement for issuing boatmaster certificates, rules on the transport of dangerous goods, rules on river information services (RIS) and recreational navigation. In most of these areas, EU, UNECE and River Commissions have adopted specific documents, listed in the annex. Despite the different organizational sources of the existing regulations and recommendations, the substance of these documents is significantly harmonized.

148. In terms of the rules of the road for inland navigation, the core uniform rules applicable to the traffic on inland waterways (marking on vessels, visual signs on vessels, sound signals and radiotelephony, waterway signs and markings, rules of the road, berthing rules, signaling and reporting requirements and prevention of pollution of water and disposal of waste) are contained in the UNECE Resolutions on *"European Code for Inland Waterways (CEVNI)"* and *"Signs and Signals on Inland Waterways (SIGNI)"*.[39] The first editions of CEVNI and SIGNI, adopted in 1962 and 1957, respectively, drew heavily on the provisions of the Policy Regulations in force on the Rhine, and were used as a basis for the elaboration of the DC "Basic provisions relating to Navigation on the Danube". The content of these resolutions evolves with the evolution of the River Commissions regulations ensuring a high degree of harmonization between these documents. The most recent significant revision of CEVNI, based on comparative analysis of the CCNR, DC, the Mosel and the Sava Commission's regulations, took place in 2008–2009.

149. In the requirements for the construction of inland vessels (technical prescriptions for inland vessels), the existence of several legal regimes has more serious repercussions. The 1996 White Paper noted that "the existence in Europe of different sets of regulations on technical requirements for inland navigation vessels, complemented with different national legislation in this regard, has so far thwarted efforts towards arriving at reciprocal recognition throughout Europe of national ship's certificates without additional surveying of foreign vessels."[40] This conclusion was reiterated in 2005 in the UNECE Inventory of legislative obstacles.[41] Indeed, as illustrated in the annex, all inland navigation bodies maintain their own instruments on technical prescriptions, even if some instruments are more or less equivalent in their content.[42] Moreover, Article 22 of the Mannheim Convention required until recently that every vessel coming to the Rhine obtain a certificate from one of the CCNR member States.

150. The situation has largely evolved since 1996. The progressive alignment between the EU technical prescriptions directive (Directive 2006/87/EC laying down technical requirements for inland waterway vessels) with CCNR requirements, as well as the adoption of the Seventh Additional Protocol to the Mannheim Convention which gives CCNR the competence to recognize the ship's certificates from the EU and third countries, allowed the official recognition by the CCNR in May 2008 of the equivalence between the EU

[39] It should also be noted that the UNECE maintains international legal norms on road traffic and road signs and signals, codified in the 1968 Convention on Road Traffic and the 1968 Convention on Road Signs and Signals, as well as the European Agreements of 1 May 1971 supplementing the conventions.

[40] TRANS/SC.3/138, para. 72.

[41] The 2005 UNECE Inventory of existing legislative obstacles, paras. 10–13.

[42] DC Recommendations in this area have, since the beginning, been drafted on the basis of the provisions of UNECE Resolution No. 61.

requirements and the CCNR Vessel Inspection Rules. The European Community ship's certificate, delivered in accordance with the EU Directive 2006/87/EC is, therefore, valid on most EU inland waterways, including the Rhine. With EU enlargement, this system extended its geographic scope to most European countries with inland navigation interests.

151. The issue remains, however, problematic as far as the non-EU States (which include a number of the Danube riparian countries) are concerned. The recognition of the non-EU member States' ship's certificate is subject to the additional measures to be adopted by the EC under article 18 of Directive 2006/87/EC. This recognition is to take place on a case-by-case basis, as no international or regional legally binding instrument governs the technical prescriptions for inland vessels of non-EU countries. The UNECE Resolution No. 61 *"Recommendations on Harmonized Europe-wide Technical Requirements for Inland Navigation Vessels"* sets pan-European standards in the area and is a basis for the DC requirements. The resolution provides a mechanism for recognizing of non-EU certificates, as long as the equivalence, to the largest extent possible, between the resolution and the EU Directive is ensured. But to this day, this mechanism remains largely under-used.

152. The situation is to some extent similar when it comes to the recognition of the boatmasters' certificates, as each inland navigation regime included specific provisions and, until recently, a special Rhine boatmaster certificate was necessary for navigating on the Rhine. However, the 2009 revision of UNECE Resolution No. 31 on "Minimum Requirements for the Issuance of Boatmasters' Licences in Inland Navigation with a view to their Reciprocal Recognition for International Traffic" and the related expert studies,[43] confirmed the convergence of existing EU, UNECE and River Commission requirements on minimum age, professional experience, professional knowledge and physical and mental fitness of the candidates. Moreover, in 2003 the CCNR initiated the recognition process of the boatmasters' certificates delivered by non-CCNR countries, as foreseen by Additional Protocol No. 7 to the Revised Convention for Rhine Navigation. The recognition is granted on a case-by-case basis and is subject to a number of conditions, such as an additional certificate of sector knowledge and medical certificates for persons more than 50 years old. However, at the present time a single EU boatmaster certificate does not exist. Moreover, for those waterways where special knowledge of local navigational conditions is required (both within and outside of the EU), methods must be agreed upon for candidates for boatmaster's certificates to acquire and to prove they have that knowledge in a simple way and at a low cost. The EU has recently started work on revising its Directive 96/50/EC on the harmonization of the conditions for obtaining national boatmaster's certificates for the carriage of goods and passengers by Inland Waterway in the Community with the goal to establish a single boatmaster certificate for the entire EU.

153. Regarding the transport of the dangerous goods on inland waterways, the 1996 UNECE White paper noted the absence of a pan-European Convention or other instrument of a binding character. Reference was made to the various UNECE, CCNR and DC instruments. Since then, the rules on the transport of dangerous goods on inland waterways have been codified in the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN), done in Geneva on 26 May 2000 under the auspices of UNECE and the CCNR. The agreement, which entered into force on 29 February 2008, provides a harmonized legal framework on the main aspects of the transport of dangerous goods, including provisions concerning dangerous substances and articles, provisions concerning their carriage in packages and in bulk on board inland navigation vessels or tank vessels, as well as provisions concerning the construction and operation of such vessels. As of February 2011, sixteen States are Contracting Parties to ADN.

[43] EC, DG TREN, *Final Report of the Impact Assessment and Evaluation study on a "Proposal for a legal instrument on the harmonization of boatmaster's certificates in inland waterway transport"* (2009).

154. Another new development since 1996 is the norms and regulations for the river information services (RIS), i.e. the harmonized information services to support traffic and transport management in inland navigation, including interfaces to other transport modes. Taking into account the variety of available technological solutions (VHF radio, mobile data communication services, Global navigation satellite system (GNSS), internet, etc.) emphasis in RIS is on services provided in facilitating information exchange between parties in inland navigation (e.g. fairway information services, traffic information services, traffic management, calamity abatement reports, information for transport logistics and information for law enforcement, etc.) Internationally harmonized standards on general RIS framework and specific RIS tools, such as Inland Electronic Charts Display and Information System (Inland ECDIS), electronic ship reporting, electronic data transmission to skippers, inland Automatic Identification (AIS) systems, elaborated and maintained by the international expert groups, constitute the basis of the existing EU, UNECE and River Commission instruments in this area.

155. To facilitate the exchange of information on: unique identification number, name, length, breadth of the vessel, single or double hull, etc. on the basis of international requirements on technical prescriptions and electronic reporting, in 2010 the EU PLATINA project initiated an EU vessel/hull database. The goal of the project was to provide a pilot service to "early" users and to gradually interconnect with additional vessel certification authorities and RIS.

156. Inland recreational navigation has become increasingly important in the last decade, for regional development. So far, the issue has been dealt with mainly on a national level or in UNECE Resolutions, such as Resolution No. 52 on the European Recreational Inland Navigation Network and Resolution No. 40 on the International Certificate for Operators of Pleasure Craft. However some aspects of recreational navigation are covered by rules of the road and technical prescriptions for inland vessels, such as the EU directive 2006/87/EC.

4. Civil and public law aspects of inland water transport operations

157. A number of international conventions on the civil and public law aspects of IWT operations have been elaborated under the auspices of UNECE with a view to facilitating international IWT operations and minimizing the risks of carriers. These conventions were all described in the 1996 White Paper and their content is only briefly recalled here.

158. The 1960 Convention relating to the Unification of Certain Rules concerning Collision in Inland Navigation governs the compensation for damage caused by a collision between vessels of inland navigation, to the vessels, to persons or to objects on board in the waters of one of the Contracting Parties. It also governs compensation for any damage caused by a vessel of inland navigation in the waters of one of the Contracting Parties, either to other vessels of inland navigation, to persons or to objects on board such other vessels, through the carrying out of, or failure to carry out a manoeuvre, or through failure to comply with regulations, even if no collision has taken place. It entered into force in 1966 and thirteen European countries are Parties to this Convention.

159. The 1965 Convention on the Registration of Inland Navigation Vessels lays down conditions for registering inland navigation vessels, for the transfer of a vessel from the register of one Contracting Party to the register of another Contracting Party and for the cancellation of a registration. Two Protocols are annexed to this Convention: Protocol No. 1 concerning the Rights *in rem* in Inland Navigation Vessels and Protocol No. 2 concerning the Attachment and Forced Sale of Inland Navigation Vessel. The Convention has been in force since 1982 and has been ratified by nine European countries.

160. The 1966 Convention on the Measurement of Inland Navigation Vessels provides for a procedure for measuring inland navigation vessels as well as the modality of certificates to be issued by measurement offices designated in the territory of each Contracting Party. The measurement of a vessel is designed to determine its maximum permissible displacement and, where necessary, its displacements corresponding to given waterlines. The measurement of vessels intended for the carriage of goods may also enable the weight of the cargo to be determined from the vessel's draught. The Convention entered into force in 1975 and sixteen European countries are Contracting Parties to it.

161. Several conventions, including the 1973 Convention relating to the Limitation of the Liability of Owners of Inland Navigation Vessels (CLN), the 1976 Convention on the Contract for the International Carriage of Passengers and Luggage by Inland Waterway (CVN) and the 1959 Convention on the Contract for the Carriage of Goods by Inland Waterways (CMN), have never been adopted nor ever entered into force due to an insufficient number of ratifications.

162. The Strasbourg Convention on Limitation of Liability in Inland Navigation (CLNI), signed in 1988 and entered into force on 1 September 1997 is the only European convention regulating overall liability that entered in force. CLNI establishes a system of caps limiting vessel owners' liability in case of loss caused during navigation. Vessel owners and salvors may limit their liability — whatever the basis of the liability, and provided it is not proved that there was willful misconduct on their part — through a fund constituted with a competent court or national authority, the amount of which is determined in accordance with the provisions of CLNI. The general limits agreed in CLNI set ceilings on the entirety of the damages payable for and arising out of the same occurrence, whatever the basis of the damages. However, only four States are currently Parties to CLNI: Germany, Luxembourg, the Netherlands and Switzerland.

163. Thus, as recently as in 2005, experts considered that the civil law applicable to IWT operations (contract law, liability rules) was mostly national in character and was not harmonized at the international level.[44]

164. In this area, major progress was achieved with the entry into force of the Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway (CMNI). This convention, elaborated under the auspices of UNECE, the CCNR and DC on 3 October 2008 and deposited with the Government of the Republic of Hungary, entered into force on 1 April 2000. CMNI establishes uniform rules concerning contracts for the carriage of goods by inland waterway, such as rights and obligations of the Contracting Parties, transport documents, the right to dispose of goods, liability of the carrier, claim periods and limits of contractual freedom. The convention counts fifteen Contracting Parties as of February 2011.

165. Moreover, the CCNR is currently working on the revision of the CLNI convention with the goal is to extend its liability regime, with the necessary amendments, to non-CCNR countries and to review the CLNI liability ceilings. The revision process is expected to finish by the end of 2011.

[44] The 2005 UNECE Inventory of existing legislative obstacles, para. 66; EFIN Study, para. 46.

5. Environmental aspects of inland navigation

166. While it is generally recognized that IWT is the most environmentally friendly mode of transport, compared to other modes of transport, the development needs of inland navigation encounter increasing opposition, due to concern for preserving the natural state of rivers and related ecosystems.

167. In the majority of cases, except for the Sava River, the environmental protection of the most important river basins in Europe has been entrusted to special river protection commissions, such as the International Commission for the protection of the Danube River (ICPDR) and the International Commission for the Protection of the Rhine, which do not address specifically the issue of navigational needs. The River navigation Commissions (CCNR, DC and the Sava Commission), however, are paying increasing attention to main environmental aspects of inland navigation, such as the prevention of pollution from inland vessels, waste management and the impact of infrastructure development on environment.

168. The issues of pollution prevention and waste management are addressed by several UNECE and River Commission instruments, such as special resolutions, the relevant provisions of the technical prescriptions for vessels and rules of the road. The CCNR imposed a general ban on discharging polluting substances in the Rhine and developed a special convention to regulate waste disposal issues (the 1996 Convention on Collection, Retention and Disposal of Waste Generated during Navigation on the Rhine and Other Inland Waterways). DC adopted in 2007 the recommendations on organizing the collection of waste from vessels navigating, which prohibits the discharge of polluting substances in the Danube. The same prohibition exists in Chapter 10 “Prevention of pollution of water and disposal of waste occurring on board vessels” of CEVNI. The member States of the Sava Commission signed in June 2009 a special Protocol to the Framework Agreement on the Sava River Basin on the prevention of water pollution caused by navigation, which foresees establishing a network of reception stations for waste from vessels in ports on the Sava River.[45]

169. Infrastructure development is much more complicated and depends largely on the current state of infrastructure on a specific waterway, creating more tensions on the waterways, that still need to undertake work to improve navigation conditions, such as the Danube and the Sava River, as opposed to the Rhine, where most major infrastructure projects have been completed in the past centuries. It should be noted that the major recent infrastructure projects, such as the Seine-Europe Nord Canal, underwent close consultations with local authorities and environmental associations and succeeded in reconciling the infrastructure development goals with the environmental and local development concerns.

170. The UNECE and EU have addressed issues related to the environmental impact assessment of navigation projects through such instruments as the Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention), the EU directives on the Environmental Impact Assessment (85/337/EEC) and on Strategic Environmental Assessment (2001/42/EC), as well as the Directive 2000/60/EC establishing a framework for Community action in the field of water policy. These instruments establish such principles as public and intergovernmental consultations at an early stage of planning infrastructure projects and strategic planning for river basin management and development.[46] Moreover, the UNECE, in cooperation with other United Nations regional commissions, is currently implementing the United Nations Development Account project on the development and implementation of a monitoring and assessment tool for carbon dioxide (CO_2) emissions in inland transport to facilitate climate change mitigation. The main objective of this

[45] International Sava River Basin Commission, Sava NewsFlash, No. 3, May 2009, page 11.
[46] For more details, see ECMT Report, Inland Waterways and Environmental Protection, Paris, 2006.

project, initiated in 2009, is to develop an information and analysis tool based on a uniform methodology for the evaluation of CO_2 emissions in the transport sector in order to enable all UN countries to optimize the use of energy sources in the sector, taking into consideration: road vehicles fleet, types of propulsion systems, transport infrastructure, sustainable energy sources, intermodal transport on railways and inland waterways and appropriate policy measures. The project will result in regional capacity building workshops on inland transport CO_2 emissions and on how to use the provided analysis tool in order to develop the future national strategies for inland transport and to support the policy decisions.

171. The Sava Commission in cooperation with DC and the International Commission for the protection of the Danube River developed and adopted in 2009 a Joint Statement on Guiding Principles on the Development of Inland Navigation and Environmental Protection in the Danube River Basin.

172. Improving the inland navigation infrastructure in a sustainable way is also part of the EU "NAIADES" programme. This work will build upon the ongoing dialogue between the international navigation and protection commissions for the Rhine and the Danube. Building on the abovementioned joint statement by the three River Commissions, with the support of the EU PLATINA project was elaborated a Manual on Good Practices in Sustainable Waterway Planning, which offers general advice on organizing and implementing a balanced and integrated planning process. The manual stresses that early integration of stakeholders (including those representing environmental interests) and of environmental objectives and wide communication are essential for a successful planning process. The Manual also suggests five general stages for preparing, executing and sustaining the integrated approach to be applied and interpreted in each IWT project. Project developers can use these steps to create a dedicated Road Map for the entire planning process of their IWT project. Though integrated planning and its implementation are rather new methods, there is a wide range of experience and practical examples in Europe demonstrating good practice, some of which are presented in the Manual as well next to a comprehensive overview of relevant policies and the legal framework to be observed, of modern waterway management concepts and of the new management tasks of waterway administrations in line with EU environmental directives.

C. Further development of the regulatory framework for inland navigation

173. The 1996 UNECE White paper analyzed the legal regimes of inland navigation, the existing technical and safety requirements and emphasized the need for unification of the navigation regimes to make IWT competitive.[47]

174. As shown in the previous paragraphs, significant progress has been made since the publication of the first UNECE White paper. Perhaps, the most significant changes in the inland navigation regulatory framework have been the emergence of truly pan-European legally binding rules on the identification of the network of inland waterways of international importance (AGN), the transport of dangerous goods (the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways) and unified rules on the contracts for the carriage of goods by inland waterway (the Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway). These international Conventions stemmed from the joint work of the UNECE and River Commissions and are open to participation by all UNECE member States. Moreover, as illustrated above, in the areas where no pan-European unifying legal instrument has been introduced (such as

[47] TRANS/SC.3/138, paras. 16–17.

the technical and safety requirements applicable to IWT) harmonization took place on the "substance" level and in the area of mutual recognition mechanisms.

175. However, the need for further development of the inland navigation regulatory framework is continuously reaffirmed both by experts and policy-makers.

176. The UNECE Inventory of legislative obstacles prioritized a series of obstacles of a legal nature, including:

(a) Restrictions on transport rights of "foreign" vessels;

(b) Restrictions on access to and use of inland waterways and ports;

(c) Existence of different regimes for technical regulations for vessels (ship's certificates);

(d) Existence of different regimes for boatmaster's licences, the size and composition of crews, and working and rest hours;

(e) Restrictions on the freedom of pricing and contracting;

(f) Restrictions on the freedom of movement of IWT workers;

(g) Restrictions on the right of establishment.

177. The September 2006 pan-European Ministerial conference on Inland Navigation in Bucharest resulted in a Ministerial Declaration which identified the following priorities to advance the regulatory framework of inland navigation in Europe:

(a) Maintain harmonization of technical requirements for inland waterway vessels, achieved through establishing equivalency between the rules of different organizations;

(b) Facilitate the free movement of crew members Europe wide and mutual recognition of boatmaster licences;

(c) Rationalize the requirements for the specific knowledge and experience needed for the navigation on certain river stretches;

(d) Harmonize job descriptions and create a European network to facilitate exchanges on national education programmes and vocational training;

(e) Support the ongoing harmonization of civil law in order to facilitate the full utilization of inland waterway transport in Europe through the Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway and the Strasbourg Convention on the limitation of liability in inland navigation;

(f) Coordinate and facilitate further exchange of information between national authorities, with the purpose of facilitating the inspection of vessels and avoiding duplication in controls.

178. The areas identified by the Bucharest Ministerial declaration are dealt with by the existing inland navigation regimes and the declaration calls mostly for the improvement/harmonization or the maintenance of the already existing legal regimes. The priorities identified in the declaration were endorsed by the UNECE Inland Transport Committee at its sixty-ninth session in February 2007.[48]

179. The above-mentioned EC "NAIADES" programme aims to improve the administrative and regulatory framework for inland navigation through, *inter alia,* screening for barriers in existing and new European and

[48] UNECE Inland Transport Committee, Resolution No. 258 containing the plan of action for the implementation of the decisions taken by the pan-European Conference on Inland Water Transport, 2007, (ECE/TRANS/192, Annex II).

national legislation and the harmonization of manning requirements, vessels and boatmasters' certificates, intermodal documentation, liability and loading units.

180. Synergy between the inland navigation institutions is essential for successfully carry out the tasks necessary for the development of inland navigation along the entire European network inland waterways. In this sense there is an undeniable need for a pan-European vision for efficient and sustainable IWT.

Chapter 4

A pan-European vision for efficient and sustainable inland water transport

181. In 1996, the UNECE White Paper on trends in and development of inland navigation and its infrastructure, hereafter the 1996 White Paper, highlighted the advantages of IWT compared with other modes of inland transport, identified a number of IWT shortcomings and put forward several policy recommendations to further utilize its potential.

182. Using the 1996 White Paper as a benchmark and based on the analysis provided in Chapters 1 to 3, this concluding chapter reviews the potential and challenges for IWT development and offers the policy recommendations that could be part of a pan-European vision towards efficient and sustainable IWT.

A. Inland Water Transport: Safe, Reliable, Efficient and Environment-friendly Transport Mode

183. The 1996 White Paper highlighted the advantages of IWT compared with other modes of inland transport, pointing out that:

- Inland navigation is the most economical inland transport mode in respect of uncovered external and infrastructural costs;
- Inland navigation is environment and thus, contributes to improving quality of life;
- Inland navigation is safe.

184. More recent analyzes confirm these major advantages in terms of safety, cost-efficiency and sustainability. These studies also emphasize that the traditional shortcomings of IWT, in particular, its limited reliability due to weather and hydrological conditions, are mitigated by the growing congestion challenges faced by other modes of transport.[49] Indeed, while "all other hinterland transport infrastructures are running close to full capacity in and around seaports across Europe, the waterways still have potential for further growth".[50] Recently, the EU PLATINA project advanced ten reasons to use IWT, including: safety, lowest environmental costs, time reliability, low infrastructure costs, high carrying capacity, high potential for intermodal networking, large amount of available capacity, suitability for transporting abnormal loads, possibilities for tailor-made transportation and efficient information and communications technology with the implementation of RIS.

[49] See reports from Inland Navigation Europe (INE), from the European Framework for Inland Navigation (EFIN) Group and the report on the prospects of inland navigation within the enlarged Europe (PINE).

[50] EU/CCNR, "Inland Navigation in Europe: Market Observation", 2008-1, Special Report: Barge transport in Europe: status quo and new perspectives, page 6.

185. Taking account recent research and operating requirements, the advantages of freight transport on inland waterways can be summarized as follows:

Superior safety	IWT operates away from populations and traffic. It is more than 50 times safer than road, more than 5 times safer than rail (in persons killed per tonne-km).
High versatility	IWT offers tailor-made services suitable for dry/liquid bulky, heavy and dangerous goods, containers and roll-on/roll-off services.
Good reliability	Few unpredictable traffic constraints due to accidents, ice, floods and low waters in Western and South-Eastern Europe.
Low costs	Considerably cheaper than road and rail main haul services (by 30 % to 60 %, depending on cargo and distance).
High energy-efficiency	For most bulk transport operations, 3–6 times less fuel consumption than road and up to 2 times less than rail.
Good carbon footprint	For most bulk transport operations, 3–6 times less CO_2 emissions than road and up to 2 times less than rail.
Low noise levels	Low noise emissions, mostly away from major populations.
Low infrastructure costs	Low investment and maintenance costs.
Supply chains and logistics	Low cost buffer stock and storage capability.
Good transport supervision	Effective tracking and tracing of vessels and cargo by using river information services (RIS).
No traffic restrictions	Few night, weekend and holiday traffic restrictions.
Dedicated transport network	Little interference with passenger traffic.
Untapped spare capacity	20–100 % short-term spare capacity on major corridors.

186. It is hence increasingly recognized that IWT represents a safe, reliable, efficient and environment-friendly mode of transport. As shown in Chapter 2, IWT offers still very considerable capacities for freight transport on major European transport corridors. The next section reviews progress in IWT development and identifies the remaining and new challenges in this area.

B. Assessing (more than) a Decade of Inland Water Transport Policies (1996–2010)

187. The 1996 UNECE White Paper observed that "From being one of the very first modes of transport in human history, inland navigation now plays a comparatively modest role in total inland transport performance in European UNECE member countries". Analyzing the barriers to IWT development, the White Paper stressed the negative impact of several factors, including the limited geographic extension of IWT, need for a higher degree of organization of the production/transport chain, slowness and lower reliability than that of other inland modes.

188. The UNECE White Paper also noted that there were, however, good reasons to believe that IWT, similarly to rail transport, has prospects for further development on the European continent, as "the over-proportioned growth of road transport [would give] rise to concern for both the public at large and Governments with regard to negative aspects concerning the environment, safety, congestion, etc." In order to utilize the potential of IWT, the 1996 UNECE White Paper contained recommendations to:

- Develop a pan-European network of inland waterways and ports of international importance,
- Encourage modern methods of navigation,
- Eliminate administrative, technical and legal barriers for navigation by inland waterways of international importance,

- Develop the main principles governing navigation on the network of European inland waterways of international importance and harmonize provisions relating to the access to the international inland navigation market, and
- Promote transport by inland waterways through the use of economic instruments, such as incentives and taxation, and taking into account external costs of the various modes of transport. [51]

189. As pointed out in the previous chapters of this paper, considerable progress has been achieved in most of these fields.

190. First of all, a consistent and comprehensive pan-European network of inland waterways and ports of international importance is now codified in the AGN which identifies the current status of the pan-European inland waterway network and facilitates harmonized and coordinated planning of infrastructure projects. Chapter 2 illustrates and analyzes the progress achieved up to today.

191. Second, as described in Chapter 3, use of state-of-the art methods of navigation have become possible through new technical requirements of inland vessels and modern port infrastructures, including the introduction of RIS, which increases safety, reliability and transparency and competitiveness of navigation, especially for transporting dangerous, heavy and bulky goods.

192. Third, the elimination of administrative, technical and legal barriers for inland navigation is also an area where important efforts have been made at national and international levels. In 2005, the UNECE *"Inventory of existing legislative obstacles that hamper the establishment of a harmonized and competitive pan-European inland navigation market, and proposals for solutions to overcome them"* identified a series of legal obstacles and suggested ways to resolve them.[52] More recently, a detailed Study on Administrative and Regulatory Barriers in the Field of Inland Waterway Transport, carried out for the EC, identified around 180 regulatory and administrative obstacles faced by shippers, skippers and vessel operators and proposed general directions for solutions. The first annual report on the follow-up to this study has been released and most of the possible solutions would require joint action by the EU, River Commissions and UNECE.

193. Fourth, as shown in Chapter 3, while there is no single comprehensive institutional and regulatory framework applicable on all E waterways listed in the AGN, progress has been made in almost all technical and legal areas and harmonized pan-European conventions were established for the transport of dangerous goods and in the field of civil liability for the carriage of goods by inland waterways.

194. Finally, the issue of promoting transport by inland waterways using economic instruments, such as incentives and taxation taking account of external costs of the various modes of transport, has been addressed by several expert and policy discussions. The 2005 Round Table on "Pan-European Co-operation towards Strong Inland Waterway Transport: On the Move", organised by the ECMT, together with the UNECE, CCNR and DC, addressed the issue of IWT charging and pricing. The Round Table discussed the most appropriate methodologies for calculating the real costs incurred by inland shipping, identified pros and cons of charging for the use of inland waterway infrastructure, particularly in terms of the IWT competitiveness and the legal principle of freedom of navigation. The Round Table also noted that taking into account the low environmental impact of inland waterways and much lower infrastructure costs than in other modes, the introduction of infrastructure charging in the whole transport system would put inland navigation in a favourable position in comparison to other modes. The participants concluded that the introduction of charging for inland waterway

[51] The 1996 UNECE White Paper, paras. 38–40.
[52] See ECE/TRANS/SC.3/2005/1.

infrastructure could be both a threat and an opportunity to IWT.[53] Based on these expert discussions, at the 2006 Bucharest Pan-European Conference, the Transport Ministers affirmed that establishing a framework for infrastructure charging and internalization of external costs, should be applied to all modes on an equal basis allowing a level playing field between transport modes and that the consequences for traffic flows on inland waterways should be carefully considered.

195. At the same time, while progress has been made in the above areas, IWT still has a lot of spare capacity and a rather modest market share in the ECE region, apart from the transport corridors along the Rhine. As a result, most of the policy recommendations in the 1996 UNECE White Paper, agreed upon more than a decade ago, are still valid and applicable today.

196. Indeed, considerable challenges remain to be addressed by the IWT industry, governments and international organizations, as testified in the latest Ministerial declarations and dedicated studies carried out by experts and policy makers.

197. The importance of a harmonized policy and legal framework for the development of IWT at the pan-European level has been underlined repeatedly. At the 2006 Pan-European Conference on Inland Water Transport in Bucharest, Transport Ministers emphasized that "challenges for pan-European inland waterway transport are closely interrelated and need to be structurally considered as a whole by all States engaged or interested in inland navigation whether they are a member of the EU or not". The 2004 Report from the European Framework for Inland Navigation (EFIN) identified several structural problems in developing IWT[54] and argued that these challenges could only be addressed at the pan-European level and, ideally, by a specialized organization. The report on the Prospects of inland navigation within an enlarged Europe (PINE report), also released in 2004, elaborated detailed recommendations in the fields of legislation, infrastructure, ports, information systems, human resources, fleet, market sector and image of IWT and allocated specific roles to the UNECE, the EU, States, River Commissions, professional organizations and national, regional and local administrations.

198. Pan-European policies and actions appear to be of particular importance and impact in the following seven areas.

(a) **Infrastructure development**: Chapter 2 highlighted the new dynamic in UNECE member countries in favour of integrated inland waterway networks embodied in the AGN. This new dynamic is confirmed by major investment programmes. These efforts remain however modest in relation to the potential capacity of the network. During 1995–2005 investments in transport infrastructure throughout the 15 EU countries amounted to €800 billion, of which 64 % for roads, 32 % for rail, 3 % for ports and only 1.4 % for inland waterways. Studies have shown that the increase in IWT has been achieved despite inadequate characteristics of the infrastructure. They suggest that a small transfer of available investment funding in favour of inland waterways to address these infrastructure bottlenecks could produce a over-proportionate impact on modal split. The challenge is to obtain these results on a pan-European basis and not just in those countries where transport policies have already evolved in this direction.

(b) **Modernization of the fleet**: This is also a major objective, particularly for liquid petroleum and other dangerous cargoes, but also to allow more efficient container transport and that of other specialized cargo, along with harmonized safety and technical requirements and commonly accepted rules on the size of inland

[53] Strengthening Inland Waterway Transport: Pan-European Co-Operation, ECMT, 2006, p. 82.

[54] Notably, stagnating investments in inland navigation, increasing constraints linked to the environmental protection, loss of the sector's attractiveness in the eyes of qualified workers and decline of administrative supervision of inland navigation by Ministries and operational services in most countries.

vessels' crews. There is also an increasing need to improve the environmental performance of inland vessels. Fleet modernization is a priority in all UNECE member States. As mentioned before, this is a major component of the EU NAIADES programme. It is also of particular importance for navigation growth on the Danube and international and national waterways beyond the EU, as demonstrated by the recent discussions within the Danube Commission on the DC navigational strategy and the national transport policies in Kazakhstan, Russian Federation and Ukraine.[55]

(c) **Use of River Information Service (RIS)**: Closely linked to fleet modernization is the use of RIS, which is currently being introduced in all UNECE member countries concerned with inland navigation. By harmonizing information services to support traffic and transport management in inland navigation, including interfaces to other transport modes, RIS contributes to a safe and efficient transport process and utilizing the inland waterways to their fullest extent. To this purpose, inland navigation vessels must to be equipped with Very High Frequency (VHF) radiotelephone stations, radars, Global Positioning System (GPS) receivers, Inland Electronic Charts Display and Information System (Inland ECDIS) equipment and Inland Automatic Identification (AIS) transponders. Measures should also be undertaken by competent authorities to establish relevant shore-based infrastructure and services, such as RIS and Vessel Traffic Services (VTS) centers, GNSS differential correction stations, etc.

(d) **Market requirements**: Transport demand increasingly requires efficient intermodal transhipment terminals to allow seamless road – rail – IWT chains. While road and rail transport infrastructures, particularly along major European North-South corridors are increasingly congested, IWT still offers untapped capacities in the order of 20 to 100 % in many UNECE countries, 24 hours a day, 7 days a week. However, adequate capacity on inland waterways alone is not sufficient to increase its market share and modal split vis-à-vis road and rail transport. In order to capture and stay in growth markets and market niches, such as for biomass, containers, bulky and heavy goods or for waste and recycling materials, the IWT industry needs to comply with the increasingly sophisticated needs and requirements of supply chain and distribution managers and must better integrate into seamless door-to-door transport chains, including efficient transhipment operations and terminal hauls. To achieve this double objective of conquering new markets and better integration in intermodal transport and logistic chains, it is of paramount importance to better link IWT with maritime shipping. One way to achieve this objective, as well as alleviating the congestion in the maritime traffic would be to promote and regulate the use of river-sea vessels — the inland vessels carrying out international runs between river and sea ports of the various countries and coastal runs between river and sea ports of the same country. However, at present the EU, River Commissions and UNECE instruments do not foresee special technical requirements for these vessels, even though the work in such provisions is currently ongoing in the UNECE. Another particular challenge in this area relates to reducing the waiting time for loading/unloading goods from inland vessels in the sea ports.[56]

(e) **Labour market challenges**: Adequate transport and logistics policies are needed to improve the attractiveness of the profession and intensify continuous training of staff. IWT operators constantly modernize and enlarge boats, develop new transhipment techniques, set up regular container transport lines and make greater use of information technologies to ensure perfect traceability of goods for their customers, etc. In the past decade a marked shift has been in this direction, with operators of inland vessels becoming increasingly

[55] ECE/TRANS/SC.3/WP.3/2009/13, paras. 8, 25 and 66.

[56] For example, fast and reliable treatment of barges in seaports (e.g. through dedicated barge terminals) is essential for increasing the role of barge transport in the container traffic. EC/CCNR, Market observation for inland navigation in Europe, 2008–1, "Barge transport in Europe: status quo and new perspectives", page 17.

transport organizers, providing value-added or door-to-door transport services for complete logistical supply and distribution chains. This however requires skilled human resources and harmonized training standards that are available and applicable on all inland waterways in the pan-European region. Some UNECE member countries struggle with a shortage of skilled personnel which hampers growth where it is most needed.[57] Efforts are made to train younger generations, yet this move has to date been insufficient to counterbalance retirements. Besides, living on board small craft is not attractive for young couples and a change in boatmen's way of life is required. Accompanying and supporting such change will be one of the challenges of the profession and of State policies. Furthermore, while using the foreign workforce is one of the increasingly used solutions for the labour shortage market in many UNECE countries, this practice creates an additional challenge for maintaining the attractiveness of the sector by providing an opportunity to undermine the social protection of the skilled workforce.

(f) **Climate change**: Global warming and carbon emissions have become a key issue for the future of IWT in Europe. First, because IWT can be one of the solutions towards reducing the carbon emissions of the transport sector through a modal shift from road transport, wherever possible. However, in order to maintain this competitive edge, efforts are required to ensure that the continuing reduction of CO2/t-km (CO2 intensity) in road transport is paralleled by similar progress in IWT. Second, the disappearance of Alpine glaciers leaves major European rivers, such as the Rhine and Danube at the mercy of dry spells and there is a possibility that IWT will be impacted by large variations and reduced water depths. At the same time, as demonstrated during the 2009 CCNR Congress "Navigation on the Rhine and Climate Change – a Challenge and an Opportunity", there are also scenarios in which the effect of climate change on rivers will be quite minimal.58 When studying the possible effects on inland navigation all possible scenarios must be considered. At the same time, it is essential for IWT to work on maintaining and increasing its advantage in environmental friendliness through research and innovation, considering, for instance, the use of alternative fuels.

(g) **Enhancing the institutional and regulatory regime**: Chapter 3 highlighted the complex institutional landscape in the ECE region and analyzed the underlying different legal regimes for inland navigation. While no substantial changes to the institutional landscape of inland navigation in the region are foreseen, permanent and inclusive consultation and coordination mechanisms are essential to enable Governments and others stakeholders to coordinate their policies and regulations and to further harmonize still disparate rules and legal regimes.

C. Towards efficient and sustainable inland water transport in the ECE region

199. As in 1996, the present UNECE White Paper identifies and describes a number of policy recommendations that could be part of a pan-European vision for efficient and sustainable IWT.

[57] Recent studies of the IWT labour market in the EU, for instance, showed that the current technical developments in terms of larger vessels and investments in vessels with new capacity, as well as the likely increase in transport volume in the long-term, will require additional personnel in all areas covered by inland navigation. At the same time, due to the age structure of the current IWT workforce, a large chunk of the labour force is expected to leave the sector over the next ten to twenty years. (EC/CCNR, Market observation for inland navigation in Europe, 2009–1, "Thematic Report: Inland Navigation Labour Market", page 8).

[58] Interim results of the research programme KLIWAS (Klima, Wasser, Schifffahrt) which deals with the consequences of the climate change on waterways and inland navigation in Germany projected no significant changes in discharges of the Rhine during summer until 2050. However, discharges during winter could increase.

200. These recommendations are based on recent studies and policy declarations, such as the Ministerial Declaration adopted by the 2006 Bucharest Pan-European Conference on Inland Waterway Transport (and the follow-up Resolution No. 258 of the UNECE Inland Transport Committee adopted on 8 February 2007), as well consultations with the EC, River Commissions and competent international and regional organizations.

201. The recommendations focus on the seven priority areas identified in the previous section:

(a) Infrastructure development;
(b) Fleet modernization;
(c) Use of river information services;
(d) Market requirements;
(e) Labour market challenges;
(f) Climate change;
(g) Institutional and regulatory issues.

Policy Recommendation No. 1 Make full use of pan-European mechanisms to coordinate the development of the E waterway network

202. The AGN provides a strategic tool and coordinated international plan for the development and construction of a network of inland waterways of international importance (E waterway network) which Contracting States intend to undertake as part of national programmes. Administration of the AGN includes the collection of information about actual and planned parameters of European inland waterways as well as important bottlenecks and missing links.[59] The maintenance of a coherent and comprehensive E waterway network requires that all national, regional and EU infrastructure development plans are duly reflected in the technical annexes of the AGN with a focus on missing links and strategic bottlenecks that currently hinder the development of IWT operations at the pan-European level.

203. Based on the analysis in Chapter 1, there exists a number of possible priority projects that could be further reviewed, such as:

- Construction of the Seine-Nord Europe Canal and associated activities under the overall Seine-Scheldt TEN-T programme (EU TEN-T priority project 30);
- Deepening of the Danube Straubing-Vilshofen (EU TEN-T priority project 18);
- Construction of an Elbe low-head weir and locks between Decín and the German border as well as a new lock at Prelouc;
- Doubling of locks on the Volga-Don canal and other investments planned on routes E 50 and E 90 through the Russian Federation;
- Improving navigability of the free-flowing navigable rivers in Poland and upgrading of the Oder-Vistula waterway when technically and environmentally feasible to enhance the value of investments in the Havel-Oder Waterway east of Berlin;
- Improving navigability of the Sava River and other navigable tributaries of the Danube to enable these branches to effectively "feed" traffic to the main artery – Danube – in the way that the Moselle, Main, Neckar provide traffic to the Rhine.

[59] This information is regularly published by the UNECE in its Inventory of Main Standards and Parameters of the E Waterway Network ("Blue Book") and the Inventory of Most Important Bottlenecks and Missing Links in the E Waterway Network (Resolution No. 49).

204. Of particular importance in the development of the AGN network is the connection between short-sea shipping and the inland waterways. Future infrastructure projects need to address the basic and strategic bottlenecks, missing links and the lack of transhipment infrastructure facilities to provide for seamless transport operations in this field.

205. In order to prepare and review freight transport scenarios at the pan-European level and to evaluate potential demand and supply in IWT on the AGN network, ad hoc committees, expert groups or round tables could be convened, as appropriate.[60] Such work could be undertaken by experts from representative groups of UNECE member countries, with the European Commission, River Commissions and other concerned intergovernmental and non-governmental organizations.

Proposed UNECE actions:

(a) Invite the following UNECE member countries that have not yet done so to ratify the AGN: Belgium, France, Germany and Poland, addressing where possible the concerns which they may have regarding the implications of ratification.

(b) Further strengthen the monitoring mechanism to review and update the development of the AGN network, its inland navigation ports of international importance as well as applicable technical and operational parameters. In particular, strengthen the UNECE work on maintaining of its Inventory of Main Standards and Parameters of the E Waterway Network ("Blue Book") and the Inventory of most important bottlenecks and missing links in the E Waterway Network (Resolution No. 49) by coordinating this work with relevant IWT infrastructure related programmes, such as the Trans-European Transport Network (TEN-T) of the EU;

(c) Invite SC.3 to host a forum in close coordination with other international bodies to avoid any duplication, for ad hoc committees, expert groups or round tables to further coordinate the development of the E waterway network. Invite UNECE countries to support this work by nominating ad hoc or permanent national experts.

Policy Recommendation No. 2 Coordinate and support measures to modernize the inland water fleet at the pan-European level

206. Chapter 2, showed a particular need to modernize the inland water fleet on inland waterways in the Danube basin and on the Eastern interconnected network. Modernization requirements arise generally from reasons of efficiency and sustainability of IWT as well as regulatory action from UNECE member States and River Commissions. Moreover, there is a strong need to address the financial burden of fleet modernization, as the lack of capital seriously handicaps modernization and environmental improvement of the inland fleet.

207. The current work of the EU NAIADES programme, UNECE and the River Commissions in this field needs to be continued and, if possible, intensified. The pan-European dialogue on harmonization of technical requirements for inland vessels is crucial and innovative solutions should be explored. In particular, the models for joint working groups, such as the EU/CCNR joint working group on technical prescriptions for inland vessels and the UNECE/CCNR joint working group on the transport of dangerous goods could be used and extended in terms of substance and geographic coverage to involve all stakeholders at the pan-European level.

[60] For instance, ITC Resolution No. 258 envisaged the economic studies of the Danube–Oder–Elbe Connection and the Dnieper–Vistula–Oder Waterway connection.

208. The potential contribution to increasing the market share of inland navigation should be addressed and promoted through the elaboration of technical requirements for such vessels and taking into account the safety concerns and the market requirements.

Proposed UNECE actions:

(a) Strengthen UNECE work on maintaining pan-Europeans norms on technical requirements to inland vessels, taking due account of and contributing to, to the extent possible, the work of the EU/CCNR joint working group on technical prescriptions for inland vessels; possibly integrating the UNECE work on technical prescriptions for inland vessels with the EU/CCNR joint working group should be considered.

(b) Promote international studies of the European inland fleet and consider Europe-wide specific studies on fleet modernization and enhancing of its efficiency;

(c) Continue SC.3 work on elaborating technical prescriptions for river-sea vessels;

(d) Support countries in exchanging their experiences on addressing the financial implication of modernizing their inland fleet.

Policy Recommendation No. 3 Promote the use of River Information Service and other information communication technologies (ICT)

209. Particular support should be provided to further developing and implementing RIS which plays a crucial role in ensuring safety and reliability of inland navigation.[61] International groups of experts play an important role in elaborating relevant technical standards, such as Inland ECDIS, standard for notices to skippers and for electronic ship reporting in inland navigation, guidelines and criteria for vessel traffic services on inland waterways and standard for tracking and tracing on inland waterways using AIS.

210. Equal support should be brought to other ICT initiatives to facilitate IWT operations and increase their safety. The above-mentioned European hull database for inland vessels should significantly simplify the exchange of information between vessels, between vessels and RIS and other competent authorities. Moreover, international databases could facilitate the inspections of inland vessels, enabling competent authorities to target their inspections based on an agreed upon set of criteria. An example of such as system is the IBISnet system used by Aquapol.

211. The evolution of RIS and other ICT-driven innovation necessitates constant adaptation of relevant international rules and regulations for inland navigation, such as, for instance, the European Code for Inland Waterways (CEVNI), in which a special provision on the use of AIS was introduced in 2009 and may be expanded in the near future.

212. Finally, information exchange on the progress and challenges introducing RIS and other related features, such as electronic ship reporting should occur at the widest possible international level to promote the use of harmonized standards and ensure the interoperability of the introduced systems.

[61] The use of ICT in enhancing the overall performance of transport sector is addressed in the UNECE Strategic Note on Intelligent Transport System, currently undergoing public consultation. More information is available at: www.unece.org/trans/events/2011/ITS_Public_Consultation.html.

Proposed UNECE actions:

(a) Support a pan-European dialogue on the implementation and further development of river information services (RIS);

(b) Participate in the work of relevant international expert groups and reflect the results of their discussions in the RIS related resolutions of SC.3, as well as other relevant instruments, such as the European Code for Inland Waterways;

(c) Support and facilitate current efforts within the EU to set up an international hull data base that, in order to be effective, requires including and maintaining non EU- inland vessels data;

(d) Encourage other uses of ICT for facilitating IWT operations and inspections of inland vessels and elaborate and promote the harmonized rules and criteria in this area.

Policy Recommendation No. 4 Respond effectively to new market requirements

213. The container traffic boom on the Rhine shows that inland waterways could play an important role in transporting high-value manufactured goods and could thus contribute to reducing congestion on major European transport corridors. Europe's network of inland waterways links the maritime ports with nearly all of its economic centres. This should provide ample opportunities for cost-effective and sustainable IWT hinterland transport solutions to inland hubs as part of global and regional supply chains that reduce the need for precious port space as well as costly investments in new road and rail transport infrastructures in port hinterlands.[62] Logistic innovations can be stimulated through the improvement of transhipment facilities and more efficient operations and cargo handling of inland ports and terminals and through the use of RIS. In particular, measures need to be taken to facilitate IWT operations in sea ports by improving legal, administrative and logistical procedures.

214. As illustrated by the ongoing works on the Seine-Europe Nord canal, the use of a multimodal platform contributes to higher competitiveness of this mode of transport along with its better integration in the global supply chain. Thus, relevant international legal agreements, such as European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) and its inland navigation related protocol, can and should be used to promote intermodality.

215. Furthermore, to fully integrate the global logistic chain it is also paramount to make sure that the IWT provides the same level of security as other modes of transport, and, very importantly, the maritime transport, which is subject to the International Ship and Port Security (ISPS) Code. The introduction of the ISPC code already imposes new constraints on the access of inland vessels to maritime terminals. In the near future other modes of transport (road, in particular) will also be subject to increased security standards.

216. Finally, as expert discussions described above revealed, introducing charging for inland waterway infrastructure may not be detrimental to IWT competitiveness. Further studies on this issue should be complemented by incorporating national best practices in the considerations, such as the approach of the Seine-Europe Nord Canal, where charging is foreseen.

[62] The 2010 UNECE Study on *Hinterland connections of seaports* (ECE/TRANS/210) investigated the ways in which seaports and their hinterland connections can help improve supply chain performance, by removing bottlenecks and improving the efficiency and sustainability of port hinterland links in UNECE countries. The study is available at: www.unece.org/trans/publications/other_hinterland.html.

Proposed UNECE action:

(a) Continue raising awareness of the IWT advantages in comparison with and/or in conjunction with other modes of transport at high-level policy events, such as the annual sessions of the UNECE Inland Transport Committee or an international conference for countries with vested interest in inland navigation;

(b) Improve cooperation between IWT, rail and road operators through joint meetings and other activities of UNECE bodies and organs dealing with inland water, road, rail and intermodal transport and logistics;

(c) Promote intermodality in IWT operations by promoting the relevant international agreements, such the Protocol on Combined Transport on Inland Waterways to the European Agreement on Important International Combined Transport Lines and Related Installations (AGTC);

(d) Support all other initiatives aiming to improve the role of IWT in secure intermodal transport chains, in particular, as an efficient and safe intermediary between hinterland and sea ports;

(e) Address at the expert and policy levels, the issue of inland waterway infrastructure pricing and its impact on IWT use and competitiveness.

Policy Recommendation No. 5 Address the labour market challenge at the pan-European level

217. It is crucial to follow-up on the 2006 Bucharest Ministerial Declaration, which called for facilitating the free movement of crew members Europe-wide as well as the mutual recognition of boatmasters' licenses. In this declaration, Ministers also stressed the importance of specific knowledge and experience needed for navigation on certain river stretches, the harmonization of job descriptions and the need for creating a European network that facilitates the exchanges on national educational programmes and vocational training.

218. As shown in Chapter 3, UNECE as well as the EU and the River Commissions address these issues. Important achievements have been reached in this field in the past decade. The River Commissions have, in particular, intensified their work on the mutual recognition of the boatmasters' certificates and other crew documents and, thus have made progress in facilitating the circulation of crew members. Specific working time arrangements for the IWT sector, job profiles, the manning requirements, improvement of the on-board working and living conditions, as well as social dumping and unfair competition are currently under consideration within framework of the EU European Sectoral Social Dialogue. The jobs and skills component of the EU NAIADES programme seeks to make IWT more attractive to the workforce and increase investments in human capital.

219. However, further efforts at the pan-European level are required to cope with the predicted shortage of skilled labour in IWT, to identify remaining obstacles and devise appropriate strategies. In this context, the goal of making the IWT profession more attractive to the qualified workforce could be achieved by both facilitating access to the profession by persons with transferable work experience (from maritime, fishing or other transport industry) and by making it possible for IWT professionals to access the other professional occupations linked to inland navigation.

Proposed UNECE actions:

(a) Support and promote the ongoing work of the EU and River Commissions to address labour market challenges and strengthen the image of IWT, with particular emphasis on social, economic and safety implications of the current labour practices, such as the use of the foreign workforce;

(b) Continue work on harmonizing requirements for issuing certificates for boatmasters and crew members, as well as the manning requirements for inland vessels based on relevant SC.3 resolutions and consider the establishment of a pan-European legal regime in these areas;

(c) Monitor and support the process of opening up national inland waterways of some UNECE countries, particularly the Russian Federation and the Ukraine, to vessels flying foreign flags and support the activities of these countries to promote and implement Pan-European rules of navigation on their waterways.

Policy Recommendation No. 6 Tackle environmental challenges and the carbon footprint

220. The environmental aspect of the inland navigation needs to be addressed at the pan-European level. In this area, building on the work of the River Commissions for navigation and environment of the Danube, the Rhine and the Sava, pan-European guidelines, recommendations or standard procedures to measure the environmental impact of IWT should be developed and could possibly be enshrined at a later stage into existing international agreements.

221. Moreover, the results of regional studies and meetings on the impact of climate change on IWT infrastructure, such as the studies and conferences organized by CCNR, should be widely disseminated.

222. Several solutions for reducing CO_2 emissions can be considered (i.e. improve in the vessel design or establish CO_2 quotas). It would be particularly important to support the studies which aim to identify what solutions exist and how efficient they are in terms of reducing CO_2 emissions. This would enable the inland navigation actors to choose the most appropriate solution for this clean mode of transport. It would also be necessary to take into account the fact that some measures which aim to reduce the sulphur and nitrogen oxides (i.e. the possibility to equip the vessels with the liquefied natural gas engine) entail elaborating new technical prescriptions for inland vessels.

223. Finally, the short and long-term consequences of national, regional or EU environmental legislation should be analyzed for its impact on IWT and to allow the sector to keep its competitive edge as an environmentally-friendly mode of transport. Dialogue and cooperation between national and regional navigation authorities and the river protection commissions should be strengthened to identify possible joint studies and other actions.

Proposed UNECE actions:

(a) Encourage active participation of UNECE member countries in the global United Nations Development Account project on the development and implementation of a monitoring and assessment tool for CO2 emissions in inland transport to facilitate climate change mitigation, making use of the expertise available in UNECE member countries, River Commissions, intergovernmental and non-governmental organizations;

(b) Maintain a register of pertinent studies and events in cooperation with the member States, EU, River Commissions, river protection commissions and other international competent bodies;

(c) Continue to support the activities of member States, the European Commission and the River Commissions aimed at adapting IWT to the impact of the climate change, at managing waste and reducing pollution by inland vessels and other environment related issues;

(d) Support and encourage research and innovation activities, aimed at maintaining and further increasing the IWT competitive edge in environmental performance, including research on the measures to reduce the CO2 emissions by inland vessels and on alternative fuels for inland vessels.

(e) Make sure that the measures aimed at reducing the environmental impact of inland vessels are duly reflected in the updates of the international norms on technical prescriptions for inland vessels.

Policy Recommendation No. 7 Reinforce the institutional and regulatory framework at pan-European level

224. As illustrated in Chapter 3 and, despite what may be perceived as a complex institutional framework and regulatory architecture governing IWT in Europe, significant progress has been made in harmonizing and simplifying the European regulatory regime for inland navigation. Following the publication of the 1996 UNECE White Paper, pan-European rules for the transport of dangerous goods and civil liability in IWT operations have been established. Good communication and cooperation between existing institutions and international expert groups, working under the auspices of the United Nations, EU, River Commissions and regional and national administrations, have been key factors in this fruitful progress towards an unified and transparent regime for inland navigation in the ECE region.

225. Building on these experiences, continued efforts are required to further harmonize or unify rules and regulations, streamline procedures and establish mechanisms that allow an efficient maintenance and updating of the regulatory framework governing IWT at the pan-European level in line with market requirements, safety and environmental considerations.

226. Several models could be used as examples and best practices for adequate pan-European rules and procedures for IWT. Such models have existed for many years in the field of air and maritime transport at the global level based on the international treaties applicable in all States that have ratified them. Also, international road transport is governed by global agreements governing rules of the road, road safety and the construction of vehicles as well as by pan-European regulations, such as the Convention on the Contract for the International Carriage of Goods by Road, establishing standard and transparent contractual provisions of civil liability.

227. Similarly, international rail transport is ruled by two major international agreements (Convention concerning International Transport by Rail and Agreement on International Railway Freight Communications). Work is underway within UNECE to harmonize and possibly unify these railway regimes through the preparation of contractual model provisions providing seamless international rail transport from the Atlantic to the Pacific. Also, model rules and regulations govern the transport of dangerous goods by all modes of transport at the global level, while implementation at national and EU level is ensured through modal conventions, such as ADN for IWT.

228. These examples might be used to develop a vision and strategy to reinforce and further develop the regulatory framework for IWT at the pan-European level and to establish a level playing field with other transport

modes. Given the complexity of national, subregional (EU) and river rules and regulations in IWT, priority should be given to advance solutions in fields where harmonization is already widely achieved and where it is important to establish mechanisms to ensure a continuity of harmonized maintenance and implementation.

229. Inland navigation rules could possibly be a good starting point, as CEVNI developed on the basis of applicable River Commissions regulations, already provides a common regulatory framework at the pan-European level. In order to ensure continued relevance and applicability of CEVNI and to reduce parallel work, it has been proposed to discuss whether CEVNI could be upgraded to an internationally legal instrument. However, as SC.3 recently noted, the goal of promoting the harmonized rules of navigation could also be achieved through other, more flexible, mechanisms.[63]

230. One such mechanism could be transforming CEVNI into the Model Regulation for pan-European inland water navigation whose general provisions applicable to all inland waterways are transposed and applied by subregional bodies or River Commissions, in line with similar procedures applicable for the construction of vehicles or the transport of dangerous goods. In addition, adequate maintenance solutions need to be put in place that provide efficient "bottom-up" mechanisms for amendment proposals (from Governments, the EU and River Commissions) as well as adequate "top-down" and monitoring procedures ensuring harmonized implementation at national, subregional and river basin level. The necessity to complement CEVNI with specific rules on local navigational conditions gives River Commissions a crucial role in ensuring efficiency and safety in inland navigation.

231. Another important area of increased coordination and cooperation relates to the 1988 Strasbourg Convention on Limitation of Liability in Inland Navigation (CLNI), originally only open for participation of CCNR member States, but currently revised to enable participation by third countries. The efforts of CCNR in this field could be supported to allow this Convention to become of pan-European or even global importance.

232. However, adequate resources are necessary to enable the existing IWT institutions to better cooperate and coordinate their activities and reap synergies.

Proposed UNECE action:

(a) Identify, in close cooperation with, specifically member States, the European Commission and the River Commissions, areas for this further coordination, cooperation, transparency and harmonization of rules and regulations for IWT at the pan-European level and determine practical measure to streamline and coordinate the activities of the institutions involved;

(b) In close cooperation with River Commissions, promote CEVNI as the basis for transparent and standard rules for inland water navigation at the pan-European level and develop appropriate mechanisms that ensure streamlined and effective maintenance and monitoring of its provisions;

(c) Support all efforts to establish a pan-European legal framework for private law aspects of inland navigation, such as the implementation of the international conventions existing in this area;

(d) Monitor and support, where possible, reforms to improve institutional arrangements in inland navigation, such as the revision of the 1948 Belgrade Convention on the regime of navigation on the Danube, as well as advocate for and support any measures aimed at the provision of the adequate human and financial resources to the existing IWT institutions;

(e) Promote the use of harmonized pan-European rules for the transport of dangerous goods codified in the UNECE legal instruments and, in particular, the ADN agreement.

[63] Report of the UNECE Working Party on Inland Water Transport on its fifty-first session, ECE/TRANS/SC.3/178, para. 24.

Annex

European inland navigations regimes

Note: Instruments that are not legally binding are highlighted in italics. N/A indicates the absence of recommendations or regulations.

Content of the regulatory framework	*UNECE*	*EU*	*CCNR*	*DC*	*SC*	*MC*
1. General provisions						
1.1 Standards and parameters of inland waterways	European Agreement on Main Inland Waterways of International Importance (AGN), done in Geneva on 19 January 1996	N/A	N/A	N/A	Detailed parameters for waterway classification on the Sava River (Decision 26/06, as amended by Decision 13/09).	N/A
1.2. Access to market	N/A	EU regulations (EEC) 3921/91 and (EC) 1356/96	Mannheim convention (as amended by Additional Protocol No. 2)	The Belgrade Convention	Framework Agreement on the Sava River Basin	Convention on the canalisation of the Mosel (1956)
2. Technical and safety requirements						
2.1 Rules of the road	*Resolution No. 24 – CEVNI: European Code for Inland Waterways*	N/A	Police Regulations for the Navigation of the Rhine	*Basic Rules of Navigation on the Danube*	Navigation Rules on the Sava River Basin (Decision – 30/07)	Police Regulations for the Navigation of the Mosel
2.2 Technical requirements for inland vessels	*Resolution No. 61 – Recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessels*	Directive 2006/87/EC laying down technical requirements for inland waterway vessels	Rhine Vessel Inspection Regulation	*Recommendations on Technical Requirements for Inland Navigation Vessels.*	Technical Rules for Vessels in the Sava River Basin	Police Regulations for the Navigation of the Mosel

Content of the regulatory framework	*UNECE*	*EU*	*CCNR*	*DC*	*SC*	*MC*
2.3 Requirements for issuing the boatmasters' certificates	*Resolution No. 31 – Recommendations on Minimum Requirements for the Issuance of Boatmaster's Licences in Inland Navigation with a view to their Reciprocal Recognition for International Traffic*	Council Directive 96/50/EC on the harmonization of the conditions for obtaining national boatmaster's certificates for the carriage of goods and passengers by Inland Waterway in the Community (1996)	The Regulations concerning Navigation Personnel on the Rhine (RPN)	*The Danube Commission (DC) Recommendations on the Establishment of Boatmasters' Licences on the Danube (1995).*	Rules on minimum requirements for the issuance of boatmaster's licences on the Sava river basin (Decision – 32/07)	Police Regulations for the Navigation of the Mosel
2.4 Requirements on transport of dangerous goods	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways concluded at Geneva on 26 May 2000	Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways concluded at Geneva on 26 May 2000	*Regulations for the transport of dangerous substances on the Danube*	Rules for the transport of Dangerous Goods in the Sava River Basin (Decision 12/10)	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways concluded at Geneva on 26 May 2000
2.5 River information services	*Resolution No. 57 – Guidelines and Recommendations for River Information Services*	Directive 2005/44/EC on harmonized river information services (RIS) on inland waterways in the Community	Protocol 22, Guidelines and Recommendations for River Information Services (2001–II–19)		Vessel Tracking and Tracing Standard (Decision 03/09) Inland ECDIS Standard (Decision 04/09)	
2.6 Recreational navigation	*Resolution No. 40 – International Certificate for Operators of Pleasure Craft*					
3. Civil and public law aspects of inland water transport operations						
3.1 Contract for the carriage of goods	Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway (CMNI)		Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway (CMNI)	Budapest Convention on the Contract for the Carriage of Goods by Inland Waterway (CMNI)		

Content of the regulatory framework	*UNECE*	*EU*	*CCNR*	*DC*	*SC*	*MC*
3.2 Limitation of liability in inland navigation			The 1988 Strasbourg Convention on Limitation of Liability in Inland Navigation (CLNI)			
3.3 Rules concerning collision of inland vessels	Convention relating to the Unification of Certain Rules concerning Collisions in Inland Navi-gation, of 15 March 1960					
3.4 Registration of inland vessels	Convention on the Registration of Inland Navigation Vessels, of 25 January 1965	Directive 2006/87/EC laying down technical requirements for inland waterway vessels	Police Regulations for the Navigation of the Rhine			
3.5 Measurement of inland vessels	Convention on the Measurement of Inland Navigation Vessels					
4. Environmental aspects of inland navigation						
4.1 Pollution by inland vessels	*Resolution No. 21 – Prevention of Pollution of inland Waterways by vessels*		Rhine Police Regulations (Chapter 15)	*Recommendations on organization of the collection of waste from the vessels navigating on the Danube (CD/SES 72/8, 2009)*	*Protocol on the prevention of water pollution caused by navigation (not yet in force)*	
4.2 Waste management	*Resolution No. 24 – European Code for Inland Waterways (Chapter 10: Prevention of Pollution of Water and Disposal of Waste Occurring on Board Vessels)*		The 1996 Convention on Collection, Retention and Disposal of Waste Generated during Navigation on the Rhine and Other Inland Waterways	*Recommendations on organization of the collection of waste from the vessels navigating on the Danube (CD/SES 72/8, 2009)*	*Protocol on the prevention of water pollution caused by navigation (not yet in force)*	

Content of the regulatory framework	*UNECE*	*EU*	*CCNR*	*DC*	*SC*	*MC*
4.3 Environmental impact of IWT infrastructure development	Convention on Environmental Impact Assessment in a Transboundary Context (ESPOO Convention)	Environmental Impact Assessment Directive 85/337/EEC; Strategic Environmental Assessment (SEA) Directive 2001/42/EC; Directive 2000/60/EC establishing a framework for the Community action in the field of water policy				

Supplement

Beyond Europe: inland water transport in the United States of America

Introduction

1. At its fifty-fourth session, the Working Party on Inland Water Transport (SC.3) welcomed the intention of the representative of the United States of America (USA) to contribute to the UNECE White Paper on Efficient and Sustainable Inland Water Transport in Europe by providing factual information on the use of Inland Water Transport in his country and the priorities in its development (ECE/TRANS/SC.3/187, para. 12).

2. This information, received during the consideration of the White Paper by the seventy-third session of the UNECE Inland Transport Committee on 1–3 March 2011 is published herewith as a supplement to the White Paper, adopted by SC.3.

3. To facilitate the comparison between the analysis of the European part of the UNECE region, presented in the rest of the White paper and the situation in the USA, the supplement follows the general structure of the White paper, and, namely:

A. Importance and Performance of Inland Water Transport

B. Status and parameters of the inland waterway network; navigation density and inland fleet

C. The institutional and regulatory framework

D. Current IWT priorities and strategies

A. Importance and Performance of Inland Water Transport

4. Of the 25,000 miles (40,200km) of inland, intracoastal, Great Lakes and coastal waterways and channels in the United States, approximately 12,000 miles (19,300km) constitute the active inland and intracoastal waterway system maintained for commercial navigation by the U.S. Army Corps of Engineers. This network includes nearly 11,000 miles (17,700km) of the "fuel-taxed inland waterway system." Commercial waterway operators on these designated waterways pay a fuel tax of 20 cents per gallon, which is deposited in the Inland Waterways Trust Fund. This fund pays half the cost of new construction and major rehabilitation of the inland waterway infrastructure.

5. Inland and intra-coastal waterway traffic (designated for reporting purposes as "internal" traffic) in the United States reached 624 million tonnes in 2005, 628 million in 2006, 622 million in 2007, and 588 million in 2008. The decline in 2008 was indicative of the economic recession beginning to impact commercial freight transportation across all modes in the United States. Inland waterway tonne-miles were 274 billion in 2005, 280 billion in 2006, 272 billion in 2007, and 261 billion in 2008.

Between 2000 and 2007, inland waterways averaged about 8 percent of all intercity freight tonne-miles in the U.S., excluding pipelines.

6. Most inland waterway cargo in the United States consists of dry and liquid bulks. In 2008 coal was about 31 percent, petroleum 25 percent, crude materials and minerals 18 percent, farm products 12 percent, chemicals 8 percent, and all other 6 percent.

B. Status and parameters of the inland waterway network; navigation density and inland fleet

7. The largest interconnected component of the U.S. inland waterway system includes the Mississippi River and its major navigable tributaries, like the Ohio, Illinois, Missouri, Tennessee and Arkansas Rivers, plus the Gulf Intracoastal Waterway (GIWW), a protected shallow water route along the U.S. coast of the Gulf of Mexico from Florida through Texas to the Mexican border. The GIWW connects Gulf Coast ports, such as Mobile, New Orleans, Baton Rouge, Houston, and Corpus Christi, with major inland ports, including Memphis, St. Louis, Chicago, Minneapolis, Cincinnati and Pittsburgh. The Mississippi River from Baton Rouge to the Gulf of Mexico allows ocean shipping to connect with the barge traffic, thereby making this segment vital to both the domestic and foreign trade of the United States.

8. The U.S. inland waterway system also includes two physically separate and distinct systems from the main Mississippi/GIWW network. In the Pacific Northwest, the Columbia-Snake River System allows navigation 465 miles (750 km) inland to Lewiston, Idaho. Along the Atlantic Coast, the Atlantic Intracoastal Waterway (AIWW) and the Intracoastal Waterway Jacksonville to Miami (IWW) allow protected shallow draft navigation for 1,142 miles (1,840 km) from the Chesapeake Bay in Virginia to south of Miami, Florida.

9. The Mississippi River and tributaries are authorized and generally maintained to a minimum 9-foot (2.7 m) channel depth, with greater depth available on many waterways through much of the year. The Lower Mississippi between the mouth of the Ohio River and the deep draft channel at Baton Rouge generally has a 12-foot depth available (3.6 m), as does the GIWW. The Columbia-Snake Waterway in the Pacific Northwest provides a 14-foot (4.3 m) channel. The AIWW is authorized for a 10-foot (3.0 m) channel, but generally lesser depths are maintained due to limited commercial use.

10. Barge navigation is supported by 192 locks with 238 chambers, including a small number of deep draft lock chambers. Over 1,900 cargo handling docks are located on inland waterways. Many of the 192 locks serving navigation include multi-purpose dams. For example, 46 lock-associated dams currently produce hydropower. The highest lift lock on the U.S. inland waterways is John Day Lock and Dam on the Columbia River at 110 feet (33.5 m). Commercial towing companies operating on U.S. inland waterways are restricted to vessels constructed in the United States and manned by U.S. crews.

11. As of 2008, the U.S. inland and intracoastal waterway fleet included 31,238 barges and 2,789 “pushboats”. Most inland waterway commerce relies on a pushboat (or “towboat”) pushing sets of barges lashed together as a single operating “tow”. Average tow sizes depend on the dimensions of the waterways. On waterway segments with locks lengths of 600 to 1 200 feet (183 to 366m), tows of 15 barges are common. Smaller waterways may have tows of 4 to 6 barges, while on the open river stretches of Lower Mississippi tows with 40 barges or more are possible. Of the 31,238 barges about 40 percent are dry covered hoppers (like grain,

steel and some minerals), 26 percent are dry open hoppers (like coal or gravel), 19 percent are deck barges, and 15 percent are tankers. The small remainder is a mix of specialty equipment.

C. Institutional framework and legal regime

12. For the U.S. inland waterway system, the U.S. Army Corps of Engineers has responsibility to construct and maintain the locks, dams, channels and other physical infrastructure necessary to operate the network. The U.S. Coast Guard has responsibility for aids to navigation, vessel inspection and certification, and safety and security, including emergency response. Private companies are generally responsible for vessel construction, manning and operations associated with the conveyance of commercial cargo. Landside port facilities may be either privately owned and operated, or may be associated with local public entities that invest in ports in support of economic development.

13. There are no barriers to entry into the conveyance of cargo on U.S. inland waterways other than requirements that vessels be built in U.S. shipyards and manned by trained and qualified by U.S. crewmen. Vessels and crew must meet licensing and certification requirements enforced by the U.S. Coast Guard. There are numerous facilities offering training and many towing companies provide their own training programs. Vessels must follow established procedures when passing through locks, but there are no lockage fees and lock usage is open to all, including recreation vessels (although Government and commercial vessels have priority).

D. Current IWT priorities and strategies

14. U.S. inland waterway infrastructure is aging. As of 2010, about 57 percent of the commercially active locks were more than 50 years old. Other than an upturn in 2009-10 as part of a one-time economic stimulus investment, funding levels for waterway operations and maintenance (O&M) have declined over the past decade in constant dollar terms, even as the system has continued to age. O&M funding, which is entirely federal, averaged just over US$500 million annually between 2005 and 2008 in current dollars, but has declined from $504 million in 1995 to $386 million in 2008 in constant dollar terms. One indicator of infrastructure deterioration has been a doubling in the number of hours of lock “unavailability” since the mid 1990s, both scheduled (for maintenance) and unscheduled (for closures due to mechanical breakdown or other unanticipated events). The Corps has developed system maintenance plans to target limited funds on the highest priority projects to help ensure the integrity and reliability of inland navigation infrastructure with the highest impacts on traffic volumes and the movement of critical cargo.

15. Another challenge is the replacement and modernization of locks that are aged and deteriorated, or undersized for current traffic volumes. Since 1986, infrastructure modernization has been cost-shared 50/50 between federal funds and fuel taxes paid into the Inland Waterways Trust Fund by private companies moving cargo on U.S. inland waterways. As of 2009 10 larger replacement locks and 10 major rehabilitations of existing locks have been completed, at an investment of over $2.5 billion. Another 8 locks and 8 major rehabilitations are underway, representing a cumulative investment of over $7 billion over the next decade or so. Additional projects are authorized but not yet funded. The primary challenge now is the depletion of the Inland Waterways Trust Fund. Most inland waterway lock modernization projects have been paused while mechanisms to recapitalize the fund are debated through the political process.

16. In terms of the inland waterway vessel fleet, private firms engaged in cargo movement continue to invest in modernization through new construction and the scrapping of aged equipment. The number of covered hopper barges in the fleet built prior to 1982 has declined from more than 7,500 in 2000 to just over 2,300 in 2009, while new vessel construction continues. Vessel retirements have been about equal to new construction in recent years, largely stabilizing the size of the inland waterway fleet in the U.S. Barge companies tend to weigh their investments in fleet modernization depending on market conditions, shipping rates and return on investment, and perceived prospects for growth.

17. Significant investment is needed to maintain and improve the operational integrity of U.S inland waterway infrastructure. As noted previously, O&M funding has generally declined in constant dollar terms even as the system ages and requires increased maintenance. Funding is increasingly targeted toward sustaining the most critical system components in terms of risks and consequences – physical and economic – of component failure. Many lock modernization and major rehabilitation projects are being delayed while long-term funding mechanisms are resolved in the political arena.

18. At the same time, U.S. domestic highway and rail freight traffic are projected to nearly double over the next 20 to 30 years. Both modes are at capacity in many critical bottleneck locations, so congestion and delays will only grow. The inland waterways generally have excess capacity and could provide an alternative for many freight cargoes, particularly if the system is perceived as reliable and if lock modernization projects underway and authorized resolve capacity problems at a relatively small number of chokepoints. The Maritime Administration of the U.S. Department of Transportation has identified a number of “Marine Highway” corridors where pilot projects are proposed to demonstrate the feasibility of shifting more cargo to inland and coastal waterways as an alternative to growing overland freight congestion. Inland waterways also have documented environmental advantages by moving more cargo with less fuel and fewer emissions than other modes. But sustaining and improving U.S. inland and intra-coastal waterways will be a challenge under current budget constraints. Innovative financing, such as public-private-partnerships, will need to be explored, and other approaches and models employed with success internationally need to be assessed.