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IMPACT ASSESSMENT REPORT

Accompanying the document

Proposal for a Directive of the European Parliament and of the Council

amending Directive 2005/44/EC on harmonised river information services (RIS) on inland waterways in the Community

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Glossary

Term or acronym	Meaning	Definition
AIS	Automatic Identification System	AIS is an automatic communication and identification system that displays (on electronic charts) the position and orientation of other vessels in the vicinity
CCNR	Central Commission for Navigation on the Rhine	The CCNR is an international organization that is responsible for promoting the development and safety of inland navigation on the Rhine and its tributaries.
CEF	Connecting Europe Facility	The CEF is a European Union funding instrument that supports the development of trans-European infrastructure networks in the fields of transport, energy, and telecommunications.
CESNI	European Committee for Drawing Up Standards in the Field of Inland Navigation	The CESNI is an intergovernmental organization that develops technical and safety standards for inland navigation in Europe.
CEMT Class	Classification of European Inland Waterways	An inland waterway classification according to CEMT (European Conference of Ministers of Transport) concerning allowed vessels dimensions on a fairway.
CEVNI	European Code for Inland Waterways	CEVNI contains the core rules applicable to the traffic on inland waterways in the UNECE region such as marks and draught scales on vessels, visual signals on vessels, sound signals and radiotelephony, waterway signs and markings, rules of the road, berthing rules, signalling and reporting requirements as well as prevention of pollution of water and disposal of waste
DINA	Digital Inland Navigation Area	DINA is a concept to interconnect information between IWT’s stakeholders and with other transport modes.
ECDIS	Electronic Chart Display and Information System	ECDIS is a computer-based navigation system used on ships to display navigational information and provide real-time information about the ship's position, course, and speed.
EFTI	Electronic Freight Transport Information	eFTI is a digital system that enables the exchange of information related to freight transport

Term or acronym	Meaning	Definition
		between different actors in the supply chain.
EHDB	European Hull Database	The EHDB is a database kept by the European Commission in which the data of the vessels operating on European inland waterways is collected. The EHDB is used to support the proper functioning of river information services (RIS) in accordance with Directive 2005/44/EC.
EMSWe	European Maritime Single Window environment	The main aim of the EMSWe Regulation is to lay down harmonised rules for the provision of the information that is required for port calls, in particular by ensuring that the same data sets can be reported to each Maritime National Single Window in the same way. This Regulation also aims to facilitate the transmission of information between declarants, relevant authorities and the providers of port services in the port of call, and other Member States.
ENC	Electronic Navigation Charts	ENC are developed in accordance with the Inland ECDIS Standard for Electronic Chart Display in inland navigation.
ERDMS	European Reference Data Management System	The ERDMS is a database containing information and data necessary to efficient and harmonise implementation of RIS.
ERI	Electronic Reporting International	The ERI endeavour to harmonise and facilitate standardised electronic inland ship reporting in the EU.
ETA	Estimated Time of Arrival	The ETA, is a frequently used term globally to denote the time of coming. In the shipping & logistics industry, it is used to forecast when the shipment will arrive at its final port of destination.
GDPR	General Data Protection Regulation	The GDPR is a regulation implemented by the EU to protect the privacy and personal data of EU citizens.
IWT	Inland Waterway Transport	IWT refers to the transportation of goods and passengers using rivers, canals, and other inland waterways.

Term or acronym	Meaning	Definition
NtS	Notices to Skippers	The NtS serve to communicate information such as the status of the inland waterway infrastructure (i.e. bridges and locks), failures of aids to navigation, temporary blockages of waterway sections or other types of infrastructure, works, water level and water depth information, ice information and weather messages.
RIS	River Information Services	RIS are a set of digital services and tools designed to enhance the safety, efficiency, and sustainability of inland waterway transport.
RIS COMEX	RIS enabled Corridor Management Execution	A IWT platform aiming at the definition, specification, implementation and sustainable operation of Corridor River Information Services.
SDG	Sustainable Development Goal	The SDGs are a set of 17 goals established by the United Nations in 2015 as a blueprint for achieving a better and more sustainable future.
SME	Small and Medium-sized Enterprises	SMEs refers to businesses with a limited number of employees and relatively low revenue compared to larger enterprises.
SSMS	Sustainable and Smart Mobility Strategy	Comprehensive EU transport strategy adopted in 2020 which lays the foundation for how the EU transport system can achieve its green and digital transformation and become more resilient to future crises.
TEN-T	Trans-European Network - Transport	Key instrument for the development of coherent, efficient, multimodal, and high-quality transport infrastructure across the EU. It comprises railways, inland waterways, short sea shipping routes and roads linking urban nodes, maritime and inland ports, airports and terminals.
Tkm	Tonne-kilometre	Unit of measure of freight transport which represents the transport of one tonne of goods (including packaging and tare weights of intermodal transport units) by a given transport mode (road, rail, air, sea, inland waterways, pipeline etc.) over a distance of one kilometre.
UNECE	United Nations Economic	The UNECE is a regional commission of the

Term or acronym	Meaning	Definition
	Commission for Europe	UN.
VTT	Vessel Tracking and Tracing	It is one component of the “River Information Services” (RIS), contributing to more safety and better efficiency of inland navigation.

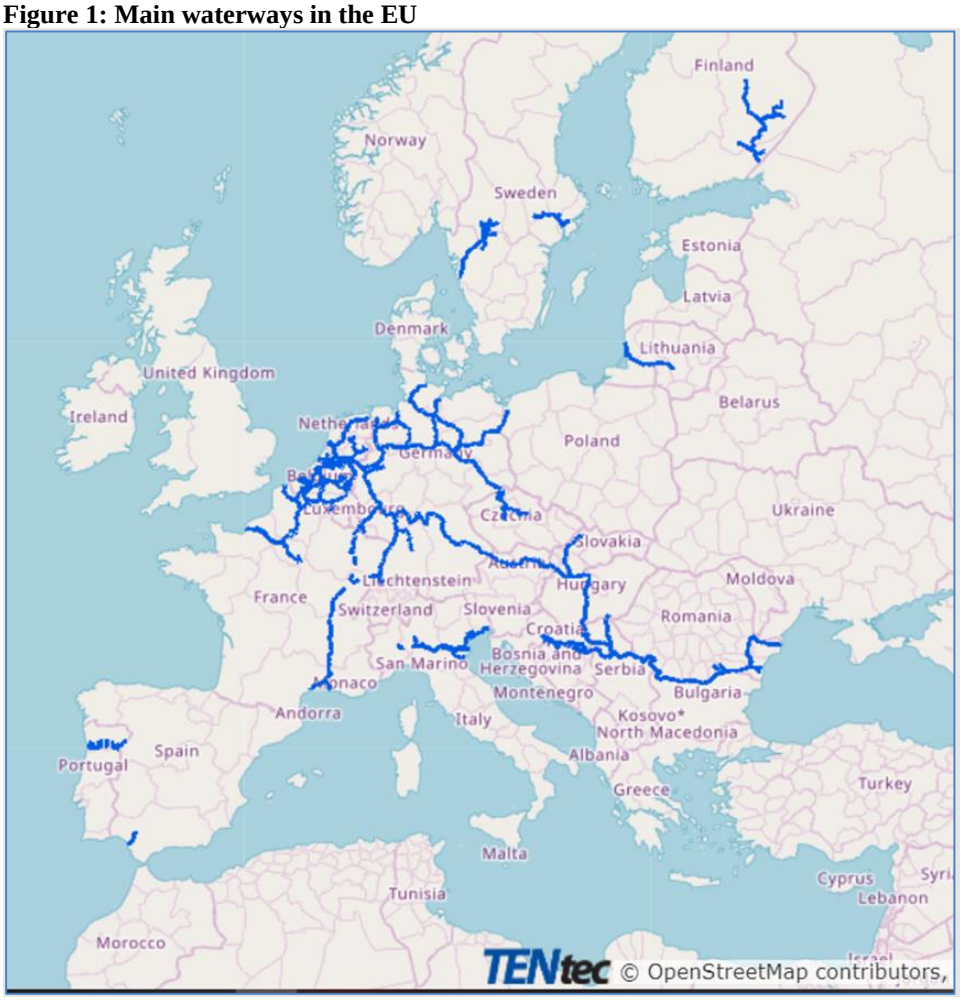
1 INTRODUCTION

1.1 Context

This Impact Assessment accompanies a legislative proposal for a revision of Directive 2005/44/EC on harmonised river information services[1] (hereinafter "the RIS Directive" or "the Directive").

The EU's inland waterways stretch over 42,286 kilometres (km) and are a key means of connecting seaports, cities and industrial centres[2]. The interconnected waterway network of 13,000 km covers 13 Member States[3] serving over 250 TEN-T inland ports in the TEN-T network. A map of the main waterways in the EU is provided below.

Figure 1: Main waterways in the EU



Source: European Commission

Inland Waterway Transport (IWT) plays an important role in the overall European transport system despite its relatively small size. In 2020, 131.7 billion tonne-kilometres (tkm) were transported through inland waters, making up 4.1% of the total freight transport volumes (with road accounting

[1] Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community, OJ L 255, 30.9.2005, p. 152–159.
[2] Source: EU transport in figures. Statistical pocketbook 2022 (europa.eu)
[3] Austria, Belgium, Bulgaria, Czechia, Germany, France, Croatia, Hungary, Luxembourg, the Netherlands, Poland, Romania and Slovakia.

for 54.9%, sea 29.1% and rail 11.9%)[4]. Dry cargo (in particular agricultural products, ore and metals, building materials, coal, etc.) accounted for 59.8% of IWT volume in 2020, liquid cargo (chemicals and petroleum products) for 28.1% and containers for 12.1%[5].

IWT handles 0.9% of the total imports and exports in terms of weight in the EU. Despite its geographically limited and focused network, it offers an important alternative to transport via road or rail for the European hinterland regions closest to inland waterways. Therefore, IWT is mainly in competition and often classified along with land transport modes[6], covering 6% of inland freight traffic and 0.01% of passenger inland traffic.

The development of inland waterway activity is highly dependent on geography (location of rivers), on the types of goods that are or can be transported, on the location of production and consumption sites in relation to the inland waterway network and on the availability of transhipment infrastructure. In this context, the sector faces limitations in terms of its structural market accessibility and growth potential related to two factors[7]:

- *Geography*. Contrary to road and rail, building new waterways is generally not an option. Therefore, the development of Inland Waterway Transport depends essentially on the respective locations of production and consumption sites in relation to the existing inland waterway network. Indeed, depending on each territorial context and the geographical distribution of each site the total cost of Inland Waterway Transport, including handling and last miles, may turn out to be very high.

- *Logistics*. Inland Waterway Transport is not always an option as IWT vessels cannot carry all kind of goods due to packaging issues (for instance pallets) or size of shipments.

Besides constraints due to geography and logistics, IWT faces some challenges to achieve its growth potential[8]. The growth of IWT can be ensured by meeting the objective of NAIADES III Communication[9], which suggests investing in the infrastructure and research, further digitalisation of the sector and improvements in the attractiveness for the crew. Some new and growing markets might trigger modal shift towards IWT, for example, waste/biomass transport, circular economy/new materials, urban logistics and passenger transport.

Connected to the geographical distribution of inland waterways, IWT traffic volumes concentrate in a few Member States, with Germany and the Netherlands accounting for 69% of overall EU IWT transport in 2020[10]. In terms of modal shares, IWT plays a significant role in the land freight

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[4] Source: *EU transport in figures. Statistical pocketbook 2022* (europa.eu)
[5] CCNR (2022). Thematic report an assessment of new market opportunities for inland waterway transport. Available at: https://inland-navigation-market.org/wp-content/uploads/2022/03/Thematic-report_20212022_EN_BD.pdf
[6] European Commission (2016), Staff Working Document Refit Ex-Post Evaluation of Combined Transport Directive 92/106/EEC Final Report, SWD(2016) 140 final
[7] European Commission (2020), Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures, including industrial policy measures, https://op.europa.eu/o/opportal-service/download-handler?identifier=4ec82fa8-0dc6-11eb-bc07-01aa75ed71a1&format=pdf&language=en&productionSystem=cellar&part=)
[8] The potential for growth of inland waterway transport (IWT), and its integration into the logistics chains, has been assessed in the context of Platina3 project (H2020 Research project: Market development and logistic integration (platina3.eu)).
[9] COM/2021/324 final
[10] Source: EU transport in figures. Statistical pocketbook 2022 (europa.eu)

transport activity[11] within the Netherlands (39.7%), Bulgaria and Romania (28% each) and a lower role in Belgium (10.9%), Luxemburg (8.2%), Germany (7.3%), Croatia (6.0%) and Hungary (4.7%). Furthermore, (freight) IWT tends to be rather limited in the land freight transport activity in Slovakia (2.9%), Austria and France (2.1% each)[12].

According to Eurostat, around 5,500 IWT freight transport companies are active in Europe (EU plus Bosnia-Herzegovina, Serbia and Switzerland), employing more than 23,000 persons. In addition, there are around 4,000 passenger companies which employ around 14,000 persons. Thus, it is a small sector when considering the overall number of transport companies. The sector is also small in terms of turnover, reporting a turnover of EUR 7 billion in 2020 (1% of the turnover of the transport sector)[13].

While no detailed data is available at EU level, one characteristic of the IWT sector is the high number of Small and Medium Enterprises (SMEs). According to the CCNR, the majority of IWT companies in Western Europe are small family owned operating one or two vessels, while companies in the Danube region are bigger as they derive from previously state-owned enterprises[14].

1.2 What are River Information Services (RIS)

Currently, RIS concern the provision of a range of services to support traffic and transport management in inland navigation[15]. The development of these services is based on four technologies[16], whose technical specifications govern how the relevant information is shared and presented among the RIS users.

Member States have set up RIS authorities, who are responsible for the implementation and maintenance of RIS. National RIS authorities inform vessel operators (skippers) about the situation on the rivers (current parameters of waterways like fairway depth, clearance under the bridges, closure of waterways due to accidents/works, lock closures, etc.). This helps operators in safe and efficient navigation. In managing traffic, authorities may request vessels to adapt their navigation (e.g. speed) to avoid bottlenecks. On the other hand, vessel operators report important elements to the national RIS authorities, such as their position, carriage of dangerous goods, etc.

Vessel operators need to (re)submit reports at various instances during their voyage, and when crossing a border. The exchange of information can take place by electronic means or radio and may vary depending on the situation and the country of navigation. Basic information on RIS (such as geographical positioning of bridges) is included in databases (e.g. RIS Index in ERDMS) which are updated by the Member States. Vessel operators communicate with inland ports (e.g. to announce their expected time of arrival) individually, often via radio, and there is almost no direct exchange of

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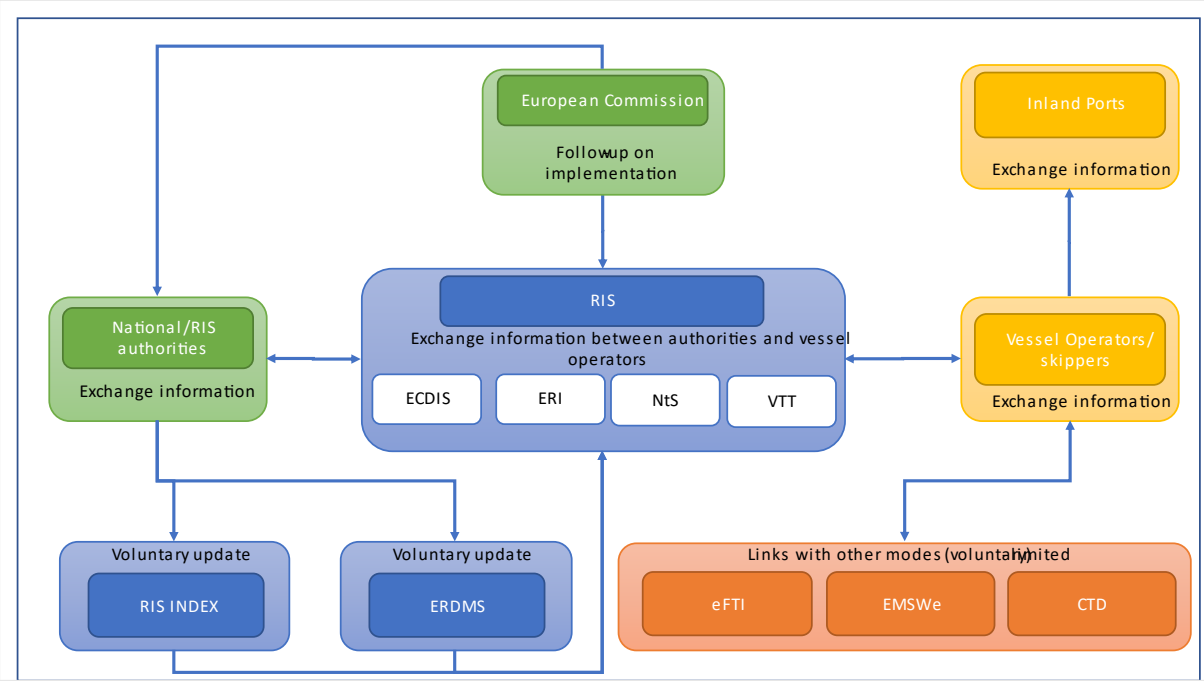
[11] Including road, rail, IWT and pipeline transport.
[12] Source: EU transport in figures. Statistical pocketbook 2022 (europa.eu)
[13] https://transport.ec.europa.eu/facts-funding/studies-data/eu-transport-figures-statistical-pocketbook/statistical-pocketbook-2023_en
[14] CCNR (2020) Marker Report 2014-2019, Main features and trends of the European Inland Waterway Transport Sector, Market-report-2014-2019_Web_BD.pdf (inland-navigation-market.org)
[15] This includes elements such as fairway information, traffic information, traffic management, calamity abatement support, information for transport logistics, information for law compliance, statistics and waterway charges and harbour dues.
[16] Inland Electronic Chart Display and Information Systems (ECDIS), Electronic Reporting International (ERI), Notices to Skippers (NtS), Vessel Tracking and Tracing (VTT).

information with other modes of transport.

Technical specifications for the provision of RIS are adopted by the Commission, with the assistance of RIS experts from the Member States. The Commission is also responsible for monitoring the overall implementation of RIS by Member States. Further technical information on RIS is included in Annex 9. The current setting of RIS in the EU is also illustrated in Figure 2 below.

Figure 2: Current setting of RIS in the EU



Source: European Commission

1.3 Political and legal context

International, national and regional context

A range of institutional actors play a role in the development and implementation of RIS activities in Europe. These include, at international level: the United Nations Economic Commission for Europe (UNECE), and the World Association for Waterborne Transport Infrastructure (PIANC[17]), which have developed non-binding standards and guidelines for RIS. At EU level the European Committee for drawing up Common Standards in the field of Inland Navigation (CESNI) was created by the European Commission and the Central Commission for Navigation on the Rhine (CCNR) to develop technical specifications and requirements for vessels, personal qualifications and digitalisation for IWT. Finally at regional area level, river commissions such as (CCNR), the Danube Commission, the Sava Commission and the Moselle Commission should play a role by facilitating the harmonisation of rules in IWT in the respective rivers. Of these the CCNR is developing and applying mandatory requirements and regulations for their Member States in line with the EU legislation.

[17] PIANC (formerly the Permanent International Commission for the Navigation Congresses) is known for the RIS guidelines which have been adopted through Commission Regulation (EC) 414/2007.

In addition, the Member States are involved in different platform and expert groups. These include the four temporary working groups of CESNI/TI (working group on information technologies) tasked with the development and updating of the technical specifications for the different RIS technologies[18].

EU policy context

The Commission's Communication on a Sustainable and Smart Mobility Strategy (SSMS)[19] sets out the EU vision for the transport system of the future. The SSMS recognises that significant steps have been taken to support the deployment of harmonised RIS to enable seamless transport and traffic management on the European inland waterways. The evolution of RIS needs however to take into consideration new requirements stemming from the digital transformation happening in the transport sector (e.g. smart shipping applications that increase performance of IWT operations, port information systems, autonomous ships for inland waterways, etc.). The revision of the RIS Directive has been announced under Flagship 6 of SSMS (Making connected and automated multimodal mobility a reality).

In 2018, the Council, in its conclusions on Inland Waterway Transport[20], invited the Commission to develop an implementation strategy for digitalisation, including River Information Services (RIS). Following the Council conclusions and the SSMS, the 2021 NAIADES III Communication[21] set out an action plan to boost the role of inland waterway transport in the EU mobility and logistics systems. The core objectives were to shift more cargo to Europe's rivers and canals, and to facilitate the transition to zero-emission barges by 2050. The importance for IWT to keep up with digital developments to improve the sector's competitiveness and ensure that it becomes an active part of broader multimodal chains was recognised. Besides the revision of the Directive, the Communication calls on Member States to implement smart traffic and management solutions based on RIS. It also considers that a permanent operational structure to provide a single point of access for RIS-based corridor information services developed by the Member States could be supported financially by the Connecting Europe Facility (CEF). The Communication confirms that the Commission will continue supporting CESNI through the Connecting Europe Facility, with the mandate of developing harmonised EU technical specifications for inland waterway transport.

The 2021 European Parliament report *"Towards future-proof inland waterway transport in Europe"*[22] stressed the need to further harmonise river information services. This should simplify procedures in regulating inland navigation, reduce problems arising from different interpretations of technical standards and the lack of comparable data, and allow for the speedy development and deployment of innovative solutions. In its 2022 conclusions on NAIADES III[23], the Council encouraged the Member States to continue and intensify their cooperation in the harmonised implementation of RIS. It invited the Commission to present a proposal for reviewing the RIS Directive, to establish the Directive as an effective tool supporting multimodal freight operations, with a particular focus on seamless cross-border connections and interoperability.

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[18] Inland Electronic Chart Display and Information Systems (ECDIS), Electronic Reporting International (ERI), Notices to Skippers (NtS), Vessel Tracking and Tracing (VTT).
[19] COM/2020/789 final
[20] https://data.consilium.europa.eu/doc/document/ST-13745-2018-INIT/en/pdf
[21] COM/2021/324 final
[22] https://www.europarl.europa.eu/doceo/document/A-9-2021-0231_EN.html
[23] https://data.consilium.europa.eu/doc/document/ST-14847-2022-INIT/en/pdf

RIS is not the only digital element for IWT. In accordance with the Directive on technical requirements for inland waterway vessels[24], the Commission maintains the European Hull Database (EHDB), containing selected information regarding inland waterway craft, including each vessel's unique European vessel identification number, its name, its dimensions and other data identifying the vessel. The Directive on the recognition of professional qualifications in inland navigation[25] also facilitates the electronic exchange of information about crew members by setting up a system of national registers and a database, kept by the Commission (European Crew Database - ECDB).

RIS has benefited from EU funding support, in particular EUR 29.6 million TEN-T funding for 19 actions during the period 2007-2013 (for projects of total cost of almost EUR 85 million) and some EUR 33 million CEF1 funding for 11 actions (of total cost of EUR 58 million) for the period 2014-2020[26]. Under CEF2 (2021-2027), so far, the EU has supported 1 RIS project with EUR 18.2 million (out of a total cost of EUR 36.4 million).

The RIS Directive

The legislative process to regulate RIS at EU level started in 2005 with the adoption of the RIS Directive. The Directive establishes a framework for the deployment and use of harmonised, interoperable and open RIS aiming to enhance safety, efficiency and environmental friendliness of inland waterway transport in the EU. It intended to facilitate interfaces with other transport modes, thus considering the multimodal potential of IWT. At the same time, however, the definition (Article 3) makes it clear that RIS is aimed at the exchange of information between authorities and between authorities and IWT companies, and not between one or more involved companies (no business-to-business exchange). It specifies though that RIS should be open for interfacing with commercial activities.

One of the objectives of RIS is to enhance the safety of inland navigation by optimizing the waterway and traffic related information exchange between vessels, locks and bridges, terminals, and ports. It does not deal with other traffic safety aspects, which are under the responsibility of the Member States through the European Code for Inland Waterways (CEVNI)[27], or national Police Regulations.

Within the EU framework established by the Directive, the Directive itself provides the general requirements of how RIS should be set up by the Member States, as well as the areas for which technical specifications need to be developed and the principles to be followed. The actual technical guidelines and specifications are developed by the Commission and are then adopted through secondary legislation. Five implementing acts have been adopted to provide the technical aspects of the RIS Directive's requirements to make up the RIS framework[28]. Member States are then responsible for implementing the Directive and applying the technical specifications in an efficient, expandable and interoperable way (e.g. establishing RIS centres and designating authorities to oversee its application and the exchange of cross-border data).

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[24] Directive (EU) 2016/1629.
[25] Directive (EU) 2017/2397.
[26] https://cinea.ec.europa.eu/our-projects_en
[27] This is elaborated within UNECE. The latest version is the sixth revision available here: https://unece.org/info/publications/pub/363912.
[28] Commission Regulation (EC) No 414/2007, Commission Implementing Regulation (EU) 2019/838; Commission Implementing Regulation (EU) 2018/2032; Commission Implementing Regulation (EU) 2019/1744; Commission Implementing Regulation (EU) 2018/1973.

The RIS Directive applies to Member States with cross-border inland waterways of Classification of European Inland Waterways (CEMT) class IV[29] and above (Article 2). In practice, these are 13 EU Member States: Austria, Belgium, Bulgaria, Croatia, Czechia, France, Germany, Hungary, Luxembourg, the Netherlands, Poland, Romania and Slovakia, which have all had transposed the Directive by 2011. Several other countries apply the Directive voluntarily (i.e. Spain, Italy, Portugal, Switzerland, Serbia, Moldova and Ukraine).

Synergies with other EU policy instruments

The TEN-T Regulation[30] establishes guidelines for the development of the trans-European transport network, which also consists of the infrastructure for inland waterway transport. Some of the Regulation's priorities deal with information and communication technology, such as implementing telematics applications (including RIS), while others deal with multimodal aspects, such as connecting inland port infrastructure to rail freight and road transport infrastructure. As regards IWT, the TEN-T network is based on a minimum classification (CEMT class IV and above), but unlike the RIS Directive, it is not limited to interconnected waterways (for example the Po in Italy, or the Douro in Portugal are part of TEN-T even if not within the scope of the RIS Directive). Therefore, the scope of these two acts is not identical. The European Commission adopted a legislative proposal[31] amending the TEN-T Regulation, where RIS is a requirement for the core network. Under the proposed revision of the TEN-T Regulation, RIS requirements will not be linked any more to the CEMT classification (which are based on parameters for the vessels), but will follow requirements based on the infrastructure (e.g. depth).

The RIS Directive requires continuity with systems of other modes and, in particular, with maritime transport (Article 1). In this regard, the regulation establishing a European Maritime Single Window environment[32] provides for a legal and technical framework for the electronic transmission of information about reporting obligations for ships calling at EU ports. Certain types of this information may be relevant to be further exchanged with IWTs.

The eFTI Regulation[33], established a legal framework that allows economic operators to share information in an electronic format (i.e. for the transport of goods by road, rail, inland waterways and air in the European Union) with enforcement authorities. Operators are not obliged to make regulatory information available electronically to a competent authority. However, when they choose to make this information available electronically, they must follow a set of requirements. Currently, there is limited interaction between RIS and eFTI, however, there are potential synergies, in terms of use of eFTI platforms for the exchange of cargo information required by RIS.

The new Alternative Fuels Infrastructure Regulation (AFIR)[34] introduces targets for shore-side electricity supply in inland waterway ports, and requires Member States to prepare national policy frameworks, which among others will contain planned initiatives for deployment of infrastructure for alternative fuels in inland waterway transport, such as for hydrogen and electricity. RIS can complement AFIR, by facilitating the exchange of information between inland vessels and ports

[29] 80-85 metres in length with tonnage of 100-1500 tonnes
[30] Regulation (EU) No 1315/2013.
[31] Proposal for a Regulation of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013, COM/2021/812 final
[32] Regulation (EU) 2019/1239.
[33] Regulation (EU) 2020/1056.
[34] Regulation (EU) 2023/1804.

equipped for such alternative fuels and, in particular, on the (real-time) availability of infrastructure. This in turn can support the uptake of these fuels by the IWT sector.

The RIS Directive enables the exchange of data, and certain elements (such as data relating to the position of the vessel) can be considered as falling under personal data. Two cross-cutting legislative instruments are relevant in the context of digital inland navigation: Regulation (EU) 2016/679 (the General Data Protection Regulation – GDPR) and Regulation (EU) 2018/1725 on processing of personal data by the Union institutions[35]. The GDPR sets forth a single set of rules across the EU to protect and empower all EU individuals with regard to the processing of their personal data, and to hold organisations processing personal data of individuals in the EU accountable for their processing activities. It gives powers to the competent data protection supervisory authorities to impose corrective measures, fines and penalties on companies that do not comply with these rules. Regulation (EC) No 45/2001, mentioned in the RIS Directive, was replaced by Regulation (EU) 2018/1725. A requirement of data protection acquis is to lay down a clear legal framework identifying personal data, which must be shared in situations where the sharing is necessary for an objective of public interest. However, it needs to be taken into consideration that the RIS Directive itself is not obliging the exchange or disclosure of personal data. The RIS Directive is a legal framework providing for the technical requirements, specifications and conditions which ensure the electronic exchange of this data if national or international regulations foresee such exchange. It can therefore only lay down requirements for organisational and technical data protection measures, should RIS be used to exchange also personal data to ensure protection of those data.

Synergies with other non-legislative tools

- At European level, the following central systems include IWT elements: The European reference data management system (ERDMS) is a publicly accessible database kept by the Commission, containing regularly updated data provided by the Member States necessary for the provision of RIS. It contains detailed information about the inland waterway infrastructure (e.g. bridges, locks, terminals), including geolocation (RIS Index), formats of Notices to Skippers in all languages, and unified UNECE coding for cargo and vessels necessary for reporting requirements. In addition, it includes reference data for the European Crew Database (ECDB), and information on the competent RIS authorities. This use of standardised lists and data makes the ERDMS an enabler of interoperability.
- The CEF-funded project RIS COMEX (2016-2022) is a partnership of 13 European countries[36] to develop selected RIS Corridor Services along 7 European inland waterway corridors. This project resulted in a common European RIS system called EuRIS providing reliable fairway, infrastructure, traffic and transport information services, including route and transport planning, for the waterways of the partner countries. In addition, within RIS COMEX another system was developed to tackle administrative barriers and reporting burden for 8 IWT European countries[37] through a common electronic reporting system called CEERIS. CEERIS enables vessel operators to easily fulfil all their reporting duties to the different authorities along their route within the participating countries by reporting-only-once with single-entering-of-data and digital-by-default. The 13 participating Member States and their authorities continue with the use of this

[35] The GDPR replaces the Data Protection Directive (Directive 95/46/EC). Data Protection Directive is currently referred to in the RIS Directive in relation to rules on privacy, security and the re-use of information.
[36] Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Luxembourg, the Netherlands, Romania, Serbia and Slovakia.
[37] Austria, Bulgaria, Croatia, Czech Republic, Hungary, Romania, Serbia and Slovakia.

system under a separate European Corridor Management Agreement[38]. The project has recently entered a second stage (RIS COMEX 2) with additional CEF funding[39], with Poland joining the partnership. It shall continue the work of the first stage by extending the quantity and quality of the related services and provided data, by extending the geographical scope to additional waterways and even to additional countries (Poland), as well as by focusing on interconnections and integrations of existing systems and services[40].

1.4 Evaluation of the RIS Directive

An evaluation of the Directive was carried out in 2021[41]. It found that overall, the Directive has been one of the main drivers of digitalisation in IWT, facilitating the introduction of information and communication technologies.

In terms of effectiveness the evaluation found that standardisation of RIS has been the strongest benefit brought about by the Directive. However, the degree of harmonisation differs across RIS technologies and services (e.g. most harmonisation was achieved in type approval and the least in electronic ship reporting). Moreover, RIS technologies are not utilised to the same extent in all countries and river corridors, which has led to a fragmented development of RIS. Therefore, higher benefits of digitalisation and data exchange are hindered by the lack of full harmonisation of data provided across the Member States.

The evaluation also pointed to a slow development of RIS. Public and private stakeholders reported on major inefficiencies in the adoption speed of the RIS implementing acts, resulting in permanently outdated technical specifications for the sector. In terms of efficiency, potential for simplification was thus identified for the adoption process of technical specifications. Stakeholders also suggested that an improved monitoring of the application of the Directive is required to speed up the development of RIS.

As regards the general objectives of the RIS Directive, the available data did not indicate that RIS had an impact on the growth of the inland navigation sector, on modal shift or on safety. There were some indications that RIS has reduced fuel consumption by 1.9%. Lack of evidence did not however allow to draw conclusions on the optimised use of existing infrastructure. Feedback from stakeholders showed that RIS may have a limited or even indirect impact on competitiveness, a potential for more efficient use of infrastructure (locks), and a positive impact on safety.

Although the evaluation assessed that the Directive is still relevant, it pointed to the fact that its primary focus on safety of navigation is no longer sufficiently aligned with sector's needs. More specifically, it does not support the need for improving the efficiency of inland waterway transport and its integration into the multimodal supply chains. In addition, it does not sufficiently address new technological challenges, such as automation of vessels, and the further digitalisation of the sector.

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[38] The agreement defines the governance structure, financing, sharing of costs, and other elements such as the "Partnership Coordinator" who manages the platform.
[39] https://cinea.ec.europa.eu/system/files/2023-06/Overview%20Selected%20Proposals_FINAL.pdf
[40] In this document, the term RIS COMEX is used to refer to the overall project (including RIS COMEX 2 and all applications, as EuRIS, CEERIS) as developed by the EU Member States
[41] SWD/2021/0050 final

The rationale for public intervention at EU level through the RIS Directive is rooted in the cross-border character of the inland waterway transport sector and contributes to avoiding fragmentation between different national or regional (e.g. between the River Commissions) RIS implementation approaches. Stakeholders considered that the same benefits could not have been achieved by comparable interventions at the international, regional or national level. However, higher benefits of digitalisation and data exchange are hindered by the lack of full harmonisation of data provided across the Member States.

Last but not least, it should be noted that the evaluation identified a considerable lack of reliable, sufficiently granular and comparable data (in particular for costs and benefits of implementation), which in turn limited the quantitative evidence supporting the findings. Thus, the findings had to rely primarily on qualitative analysis and input from stakeholders. The links between the conclusions of the evaluation and the impact assessment are summarised in Annex 7.

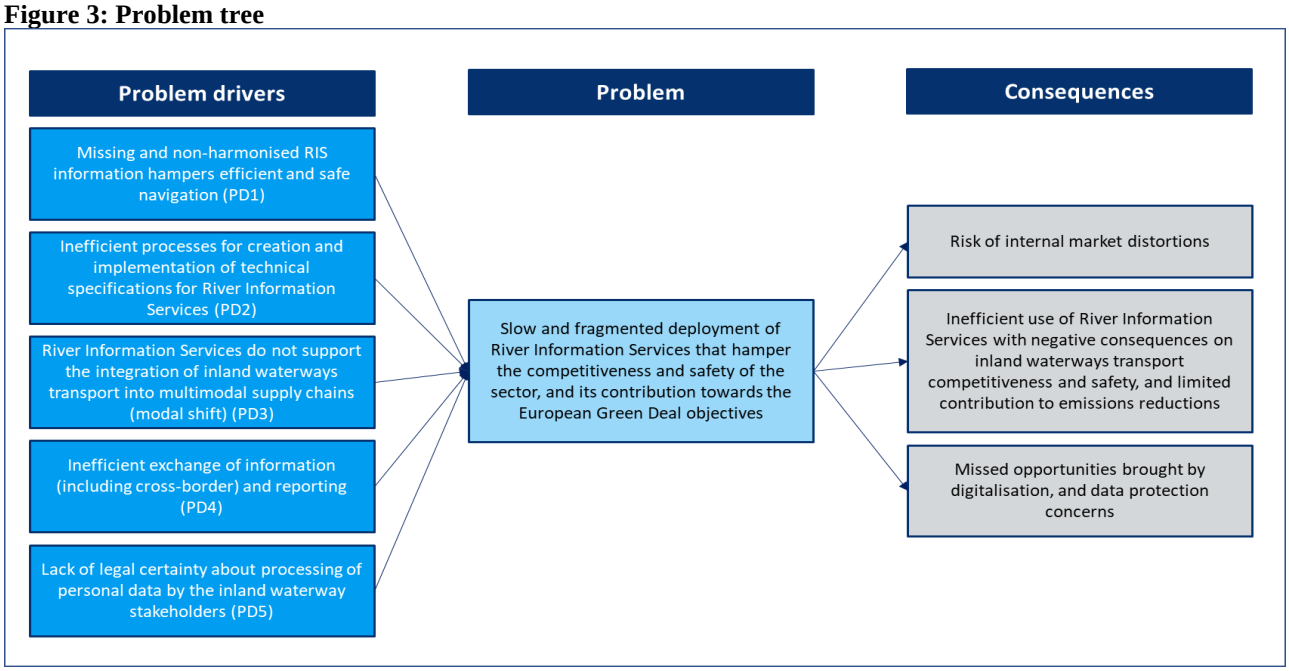
1.5 Sustainable Development Goals

The initiative contributes towards the objectives of the European Green Deal (EGD)[42] (in particular by supporting the shift away from road transport). The revision of the RIS Directive contributes towards Sustainable Development Goal (SDG) 9 ("Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation") and SDG 13 ("Take urgent action to combat climate change and its impacts").

2 PROBLEM DEFINITION

The key problem, corresponding drivers and consequences that are relevant for the revision of the Directive are presented in Figure 3 and further detailed below.

Figure 3: Problem tree



Source: European Commission

[42] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#documents

2.1 What is the problem?

Problem: slow and fragmented deployment of River Information Services that hamper the competitiveness and safety of the sector, and its contribution towards the European Green Deal objectives

Description of the problem

The main challenge that RIS faces today is the slow speed and the fragmentation in its deployment. The TEN-T corridor studies[43] report that the deployment of RIS infrastructure along the Core Network Corridors cover: 100% of the North Sea, Mediterranean and Rhine-Danube Corridors, 95% of the Atlantic Corridor, 90% of the East Mediterranean Corridor and 75% of the Mediterranean Corridor. Thus, despite 17 years since its introduction, it still has not reached 100% level of implementation. The identified differences in implementation relate to prioritisation by Member States of the most important waterways in their territories.

While the RIS evaluation[44] indicated a positive impact of the Directive in terms of harmonising RIS, it found that there is still room for improvement. This is because, when considering the implementation of the Directive, not all RIS technologies have reached the same level of implementation and maturity and not all RIS technologies have been fully utilised to the same extent in all countries and river corridors. For example, differences in deployment across Member States have been identified for the four key RIS technologies (inland ECDIS, Electronic Ship Reporting, Notices to Skippers, Vessel Tracking and Tracing). This is because Member States have not always followed the same timeline for implementation and/or because technical specifications have not always been applied or interpreted the same way. The evaluation identified that RIS equipment has reached a high level of type approval, which ensures equipment compatibility. Similarly, electronic charts are highly harmonised, which assists in navigation. On the other hand, the low harmonisation in electronic ship reporting and different national reporting requirements[45] result in resubmissions of electronic reports, with time and cost implications for operators. The impact assessment support study estimates that a resubmission of information is required in one out of three times that a vessel crossed a border during its voyage[46]. Therefore, the problem is not so much in relation to the situation within a certain Member State, but in how their heterogeneity affects the international nature of inland waterways.

The slow update of technical specifications has played an important role in the slow development of RIS. In the current setting of adopting implementing acts, it takes between 5 and 12 years until the technical specifications are prepared and introduced in the sector. This in turn reduces the efficiency of IWT operators due to the use of old technical specifications and technology (for example when radio is still used instead of electronic communication for reports between the ship and the

[43] https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t/ten-t-governance_en
[44] SWD(2021)0050 final
[45] For example, in the borders between Germany and Poland, between Germany and Czechia and on the Danube Member States. https://www.masterplandiwa.eu/
[46] Ramboll et al. (2024), *Impact assessment support study* shows that some 106,622 border crossings required repeated notifications in 2020 (around 30% of the total number of border crossings). It should be noted that due to the COVID-19 pandemic the number of border crossings in 2020 was particularly low (i.e. 19% lower than in 2015).

authorities)[47]. This contrasts with the approach followed in Directive (EU) 2016/1629 providing for technical requirements for inland vessels, which includes a direct reference to technical specifications developed by CESNI, leading to a regular update of technical specifications every two years. As technological development keeps accelerating, the slow update of technical specifications in the RIS domain becomes a more acute hindrance.

The DINA report (2017)[48] examined factors relating to digitalisation and their impact on the competitiveness of the sector compared to other transport modes. RIS was identified as playing an important role in IWT. Thus, if not properly deployed, RIS can hinder the competitiveness potential of the sector. The DINA report also found IWT to be falling behind other modes of transport in terms of digitalisation and development of intelligent systems for reasons ranging from legal, technical and commercial bottlenecks to sharing of data, the IT set-up of barge operators, and the limited size of the sector (making it difficult to achieve economies of scale for new solutions). So far, the modal split of IWT has remained fairly stable over the past 20 years and the evaluation was not able to conclude if RIS had any impact in this development.

In terms of increased environmental protection, the evaluation pointed to a very modest reduction in fuel consumption by vessels through the use of RIS. However, it can be argued that better planning of trips and increased awareness of the traffic situation, could lead to more efficient navigation (e.g. by slower steaming when anticipating a long wait at a lock, thus improving fuel consumption[49]).

The lack of quantitative data, also identified by the evaluation, does not allow for a more detailed and quantitative illustration of the evidence supporting the problem. As the evaluation noted, there is considerable lack of reliable, sufficiently granular and comparable data, which does not allow quantification of the magnitude of the problem. Due to the nature of inland waterway transport being concentrated in navigable waterways, and the scope of application of RIS, the problem is materialising only in those waterways where RIS is introduced and applied. It is thus highly geographically focused and specialised. When considering the size of the sector, the magnitude of the problem will be necessarily limited in any comparison with the rest of the transport sector.

Still, the immediately affected stakeholders consider this to be an important problem. The Members States that participated in the open public consultation (Austria, Belgium, Croatia, France, Germany, the Netherlands, Portugal and Romania) supported the need for revising the Directive. This view was also supported during the first stakeholder survey[50], where 9 out of 13 administrations indicated that no EU action would lead to negative developments in terms of RIS deployment. This position

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[47] Reporting formalities such as provision of voyage and cargo information to the responsible authorities are often done through VHF radio frequencies or, where there is no obligation, the reporting may even be submitted on paper: https://platina3.eu/download/digital-and-automated-infrastructure/?wpdmdl=975&refresh=646f9a8f1ada91685035663

[48] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report*

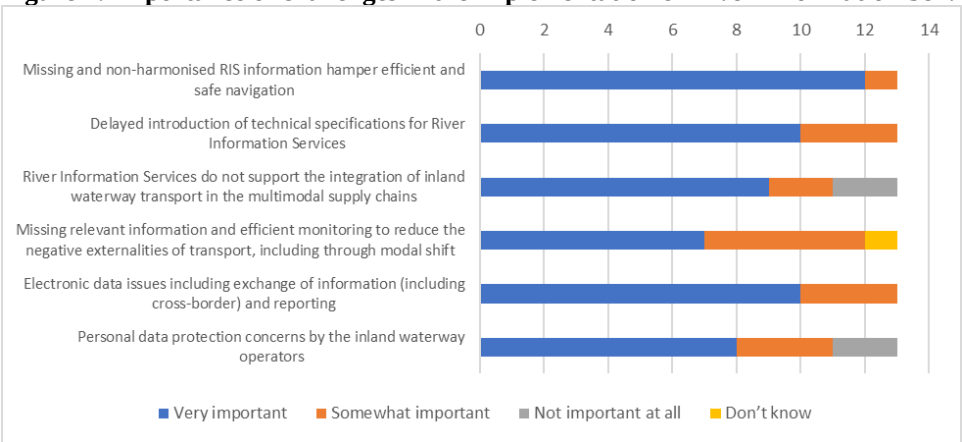
[49] The energy consumption of a barge depends, among other things, on the vessel's cruising speed, the resistance the vessel encounters from the water and the depth of the water. Several studies, including Hekkenberg (2017), European Journal of Transport and Infrastructure Research, 17 (4), 508-529, show a third-power relationship between the amount of propulsion energy required and speed.

[50] In the context of the impact assessment support study, two surveys were carried out. The first survey collected information on the identified problems and policy measures from various stakeholders (public bodies at international, European and national level, private sector companies/representative organizations, EU citizens). This survey was carried out between 1 August 2022 and 26 August. A second survey collected views of the stakeholders on the costs and benefits of each of the proposed policy measure. The second survey was carried out in second half of 2022.

was reiterated at the first DINA/NAIADES expert groups meetings. It should also be noted, as explained in section 1, that there has been a clear request from both the European Parliament and the Council to revise the RIS Directive.

The respondents to the stakeholder consultation, as explained in Annex 2, acknowledged the problem identified, mentioning clearly that full harmonisation and interoperability of RIS has not yet been achieved due to fragmented implementation. According to the open public consultation, stakeholders find that the identified problem (and the drivers) relate to actual challenges of the IWT, as shown in Figure 4 below.

Figure 4: Importance of challenges in the implementation of River Information Services (RIS) in Europe



Source: Open Public Consultation

Who is affected and how?

The problem identified affects different actors (vessel operators, navigation software service providers, national public administrations and society at large) in different ways:

- **Vessel operators** are confronted with time consuming notification processes to authorities, as e.g. repeated notifications are required when crossing borders. They are also faced with extra efforts and time spent to obtain accurate information for planning their voyage. Non-accurate information, in particular regarding the navigation conditions on the river, can have negative impacts on the actual voyage of the vessel in terms of timing (e.g. due to congestion at locks) or in rare situations contribute to accidents. Sub-optimal operation can translate into reliability issues for the services (e.g. vessel arriving later than planned), which, in turn, reduce the attractiveness of the sector for the freight shippers. Non-efficient navigation also translates into higher cruising speeds than necessary, which lead to increased fuel consumption and thus increased costs for the sector. Differences in standards between countries and the additional complications in terms of operations that these may require are hindering the provision of services and creating market distortions. An example is the closure of locks not linked to real-time information or the predictions on water level in some countries. This in turn reduces the reliability of IWT and its competitive position with respect to other modes, thus leading to market distortion at multimodal level.
- **Navigation software service providers** are dependent for the development of their IT solutions on access to accurate basic data. To ensure the accuracy of the data under the current framework, they need to allocate extra efforts to collect the data due to wrong or outdated information.
- **National public administrations** also face challenges, in particular when handling cargo reports in paper format, which require efforts to process them. Efforts are also required to

process repeated reporting, including those required when a vessel is crossing the border. In addition, incomplete information regarding the traffic in the waterways does not allow national authorities to efficiently manage traffic and may hinder their ability to react to emergency situations (e.g. in case of an accident if the dangerous cargo information has been submitted with errors).

- For the **society at large**, the overall challenges translate into external costs stemming from freight being transported on road.

A number of Member States, without navigable waterways or with waterways out of the scope of the Directive, are not affected by the problem. The Member States withing the scope of the Directive show significant differences driven by the size of their network, the number of ports and the level of traffic. For example, as explained in section 1, Germany and the Netherlands accounted for 69% of overall EU IWT transport in 2020[51]. In terms of national modal split, IWT plays a significant role in the land freight transport activity[52] within the Netherlands (39.7%), Bulgaria and Romania (28% each) and a lower role in Belgium (10.9%), Luxemburg (8.2%), Germany (7.3%), Croatia (6.0%) and Hungary (4.7%).

An important element of IWT is its cross-border dimension. Thus, the challenges are more important when a difference in a technical specification appears between two Member States with high volumes of traffic. Beyond this, there are no specific problems for regions, local authorities, private entities or individual EU areas.

What are the consequences of the problem?

The slow and fragmented deployment of RIS technologies has a number of consequences. The first one relates to the geographical dimension. For example, for the Notices to Skippers (NtS) the coverage has not reached 100% in all countries. This means that there are areas with gaps, where skippers do not receive the same level of information regarding the rivers and their condition. This, in turn, impacts the navigation efficiency of the vessel and may lead to safety risks for those areas. The second consequence has to do with missing technical specifications, where these have not been developed for Vessel Traffic and Tracing (VTT). In the absence of these technical specifications, Member States are making use of the Automatic Identification System (AIS) for their needs, but there is not harmonised way on how, when and for which systems it should be used. And while its use within a specific Member State may not be problematic, this can lead to challenges when the vessel is crossing a border.

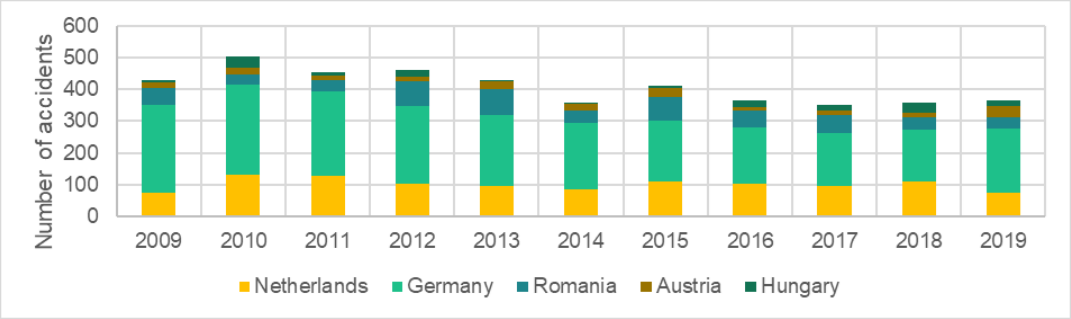
Regarding the slow update of technical specifications and what does this mean in view of technological developments, this can be illustrated by the reporting of cargo information. This is often done through VHF, which can lead to mistakes in the information provided. More up to date technical specifications could require the use of electronic exchange. Another illustrative example can be when the technical specification refers to specific software characteristics. When a new and improved version of the software is available, correcting possible challenges and introducing new functionalities, vessel operators are not able to benefit from this new version until the technical specifications have been updated.

[51] Source: EU transport in figures. Statistical pocketbook 2022 (europa.eu)
[52] Including road, rail, IWT and pipeline transport.

IWT is considered generally a safe mode of transport, but accidents can range from minimal incidents (e.g. a ship goes off course and collides with a bank or quay) to more serious collisions with bridges (where ships might completely destroy their wheelhouses).

Statistics on accidents in inland waterways transport are limited. Eurostat collects accident statistics from national statistical offices on a voluntary basis. Not many countries in the EU provide data on accidents and there is no clear evidence on a common methodology used among the countries (see Figure 5). In addition, the current Eurostat data does not provide information about the type or the causes of the accidents.

Figure 5: Accidents in IWT in selected Member States



Source: Scheepsongevallenregistratie Rijkswaterstaat and Eurostat

The German[53] statistics for 1995-2017 provide an indication of the main causes for accidents: grounding, ship gets stuck, collision between ships, collision with infrastructure and bridges, pounding of waves and other accidents. The most frequent types of accidents were the collision with infrastructure and bridges (38-40% of all accidents) and the collision between ships (18-19%). It should also be mentioned that a significant share of total accidents (15-20%) involve small pleasure boats. No information has been obtained from insurance companies.

Due to unavailability and unreliability of data on accidents, the RIS Directive evaluation was not able to identify a direct link between RIS and improved safety on waterways. However, the stakeholders had a positive view on its impact in this regard[54]. An example is the fragmented implementation (i.e. data is available in different national systems), which means that there is currently no harmonised system providing information on dynamic parameters for waterways. If the information is not up-to-date or the technical specifications applied between different Member States are not compatible, this creates workload for skippers (who need to anticipate and account for possible mistakes) and may lead to accidents (if for example skippers do not know exactly the height between the river and the bridge).

One could think that slow speed would have an impact on safety. However, as explained above, the risk to safety comes rather from the lack of accurate information and awareness of the situation on the river. In terms of the causes of accidents, groundings are linked with inaccurate knowledge of the depth of the river at a certain point and time. Likewise, collisions with bridges are caused when the distance between the river and the bridge is not well estimated and the wheel of the barge collides with the bottom of the bridge. Collisions between vessels can happen when vessels operators are not aware of each other when rounding river bends.

[53] Source: German Waterway and Shipping Administration and the Ministry of Transport

[54] 4 out of 24 interviewees and 3 out of 9 survey respondents (mainly vessel owners), highlighted improved safety as a benefit resulting from data on navigation and planning.

As regards environmental concerns**,** the EGD and the SSMS aim to reduce the environmental impact of the transport sector. IWT is expected to play its role. To this aim, the SSMS set a milestone for transport activity by inland waterways and short sea shipping to increase by 25% by 2030 and by 50% by 2050. Improving the environmental performance of the sector is also one of the aims of the Directive. As this is primarily a digital initiative, its environmental contribution is not expected to be high; however, it can still play a role. On the one hand, improved technology should lead to more efficient navigation resulting in reduced energy use, with clear impacts on emissions. On the other hand, improved reliability of the sector and better integration into the multimodal logistic chains is expected to shift freight from road to inland waterways. The evaluation pointed to a small reduction in fuel consumption (1.9%) through the use of RIS. There is nevertheless further potential for improvement, so that IWT increases its contribution towards greening the transport sector.

2.2 What are the problem drivers?

Problem driver 1 (PD1): Missing and non-harmonised RIS information hampers efficient and safe navigation

Users continue to receive fragmented or low-quality information from Member States via RIS, hampering efficient and safe navigation. This is manifested in terms of differences in the data quality of the underlying RIS. According to a stocktaking exercise of the situation in the Member States[55], the basic requirements of the Directive were implemented (in terms of setting up of RIS centres and introducing legislation regarding the four basic RIS key technologies). However, certain elements (like the ERDMS data), despite their importance, are not mandatory, which introduces gaps and reduces the quality of RIS. Furthermore, the Directive is not prescriptive in the technical aspects but sets the higher-level principles and relies on the implementing acts to define the details. The implementing acts, despite their level of detail, appear to leave a room for manoeuvre in their implementation by the Member States in practice. For example, blockages of locks may be reported in the Notices to Skippers (NtS) as a complete blockage in one country but only as partial in others. This leads ships operators to spend time to properly interpret and confirm the data, in order to avoid surprises when arriving at the lock. These discrepancies impact inland waterways in two ways. On the one hand efficient navigation is hindered, if the skippers require more time to plan their navigation or encounter unexpected delays due to the infrastructure not being available. It was estimated that in 2020 14,800 hours were "wasted" due to these discrepancies[56]. On the other hand, these differences can lead to accidents if they are not identified on time.

Figure 6 illustrates the status of electronic reporting system implementation and related international exchange of ERI messages among neighbouring countries. This is the area where the lowest harmonisation was found, especially due to different reporting requirements in the Member States resulting in resubmissions of electronic reports. It shows that in the Rhine catchment for example,

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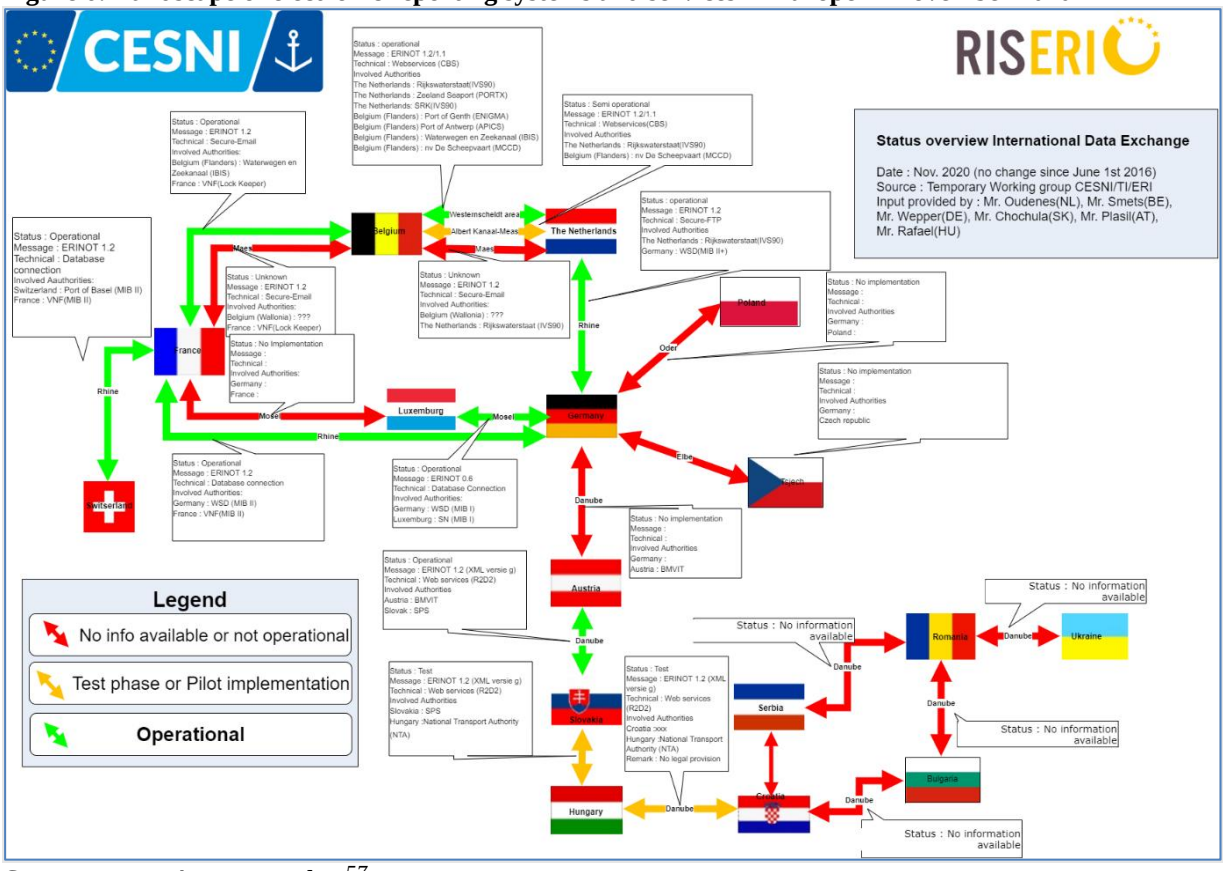
[55] European Commission (2014), RIS implementation survey and policy evaluation – Country Reports. https://transport.ec.europa.eu/system/files/2016-09/2014-07-ris-implementation-survey-and-policy-evaluation-country-reports.pdf

[56] Based on discussions with training institutes and validated by the sector (in the context of the stakeholders' consultation for the impact assessment) who indicated that of an average 15 minutes spent to prepare a cross border journey, 2.5 minutes are used for addressing such discrepancies. Considering the 355,406 border crossings in 2020, around 14,800 hours were spent, or around EUR 395,000. The weighted average of the tariff per hour for non-manual workers (ISCO 8 – Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS (EUR 26.7 per hour), based on Eurostat Structure of earnings survey (in 2022 prices), has been used to estimate the costs.

the electronic transmission of reports is generally positive, while in Eastern Europe (i.e. borders between Germany and Poland as well as Germany-Czech Republic) and on the Danube, it is comparatively less harmonised. Thus, the problem is more concentrated in the geographical areas where less IWT freight volumes are moved.

Figure 6: Landscape of electronic reporting systems and services in Europe in November 2020



Source: DIWA Masterplan[57]

This problem driver was indicated as very important by 12 out of 13 respondents in the Open Public Consultation (OPC). Furthermore, this was confirmed by the respondents to the first stakeholders' survey[58], who considered this driver as relevant to the problem (42 out of 65 respondents). The difference in data formats across countries, together with the unreliability of the RIS Index, as Member States update the information on a voluntary basis, were specifically mentioned as issues in the first survey. For example, 3 stakeholders representing international public bodies indicated that the RIS Index is not sufficiently reliable or clearly defined.

During the second stakeholder workshop[59] with skippers, it emerged that information on water

[57] Masterplan DIWA SuAc 2.4 Final Report RIS Enabled Corridor Management

[58] In the context of the impact assessment support study, two surveys were carried out. The first survey collected information on the identified problems and policy measures from various stakeholders (public bodies at international, European and national level, private sector companies/representative organizations, EU citizens). This survey was carried out between 1 August 2022 and 26 August. A second survey collected views of the stakeholders on the costs and benefits of each of the proposed policy measure. The second survey was carried out in second half of 2022.

[59] Two stakeholder workshops were organised during the stakeholders' consultation that focused specifically on the vessel operators and in particular skippers. Their aim was to validate estimates on costs and benefits

levels is also crucial for skippers to plan a voyage. They also flagged that missing and non-harmonised RIS information is one of the main drivers hampering efficient voyage planning. Experts participating in the meetings of the DINA and NAIADES Expert Groups[60] mentioned that the RIS Directive is in principle helpful but it should have been implemented better. On the other hand, the Commission did not receive formal complaints regarding its implementation that could have led to infringements. Experts also mentioned that the newly developed EuRIS portal should positively affect the missing and non-harmonised RIS information[61].

Problem driver 2 (PD2): Inefficient processes for creation and implementation of technical specifications for River Information Services

The current system of updating RIS technical specifications is based on implementing acts adopted by the Commission. With the current setting of working with sectoral experts to support the Commission, this process takes around 10 years, which is very lengthy, particularly in view of the pace of technological developments. For instance, the technical specifications for Notices to Skippers and for Vessel tracking and tracing systems, introduced in 2007, were updated in 2018 and 2019, respectively. The technical specifications for electronic reporting of 2010 were revised in 2019, while those on the electronic chart display and information system for inland navigation (Inland ECDIS) adopted in 2013, were revised in 2018. Moreover, the RIS Guidelines have not been revised since 2007.

Currently, the basic work on the preparation of technical specifications is undertaken by Member State experts who meet and discuss under different groups. These are then used as a basis for the Commission to prepare the relevant implementing acts. The self-organisation of the work by MS experts (with contributions from CCNR) seems to constitute an important bottleneck leading to a lengthy process (sometimes between 7-8 years) which has accordingly been criticised by stakeholders. In the stakeholders' consultation process accompanying the RIS evaluation, stakeholders expressed the view that the time between updates is too long, which may cause problems in terms of their relevance for the future. This is because outdated technical specifications do not ensure maintaining the highest level of efficiency and do not follow the developments in digital technology. An illustrative example relates to the technical specifications for Inland ECDIS (on points such as the resolution of digital maps, elements to be presented on maps, the way how they should be presented, etc.), where the efficiency of digital maps is linked directly with the technology used (graphic programmes).

In the OPC, 10 out of 13 respondents expressed the view that this a very important problem driver and 3 out of 13 respondents see it as a somewhat important driver. The first stakeholders' survey showed a similar picture, where 40 out of 65 stakeholders perceived problem driver 2 as important.

Besides the late introduction of technical specifications, the number of relevant implementing acts creates a challenge for the sector. Technical specifications are spread across various legislative measures, with negative consequences on their clarity and consequent uptake. This does not enable

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stemming from the proposed policy measures. The discussions revolved around subjects such as voyage planning, the availability of infrastructure for the digital waterway network and the Smart Shipping concepts.

[60] https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3505 and https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3497

[61] The aim of the expert group meetings was to gather views on the proposed policy measures, including their costs and benefits. The discussions revolved around subjects such as the scope of eFTI and RIS, the complaint handling mechanism, the involvement of CESNI in RIS and the use of personal data.

the timely uptake of RIS in line with evolving technical innovations for two reasons: a) even minor updates need to "wait" for the appropriate technical specification's turn and b) it multiplies the efforts and time required to prepare and adopt the implementing acts. Participants in the two stakeholder workshops organised during the stakeholders' consultation flagged the existence of a wide variety of technical specifications and technical specifications which need to be implemented to allow RIS to remain up to date with current technical developments. New developments and challenges (e.g. digital and green transitions, which were not in focus in 2005) may require additional data to be reported through RIS. To deal with these developments, the sector needs to adapt, for instance, through smart shipping approaches in the context of smart logistics framework. In this context, accurate information on waterway profiles, water levels and dimensions of structures form an absolute necessity. This could be provided through RIS services; however, the current inefficient processes for RIS technical specifications and delayed uptake of evolving technical innovation hinders the adoption of such technologies and makes IWT less competitive compared to other transport modes.

This problem driver is also linked to problem driver 1. The lack of a frequent and regular update of technical specifications does not allow for corrective action to be taken on time.

Problem driver 3 (PD3): River Information Services do not sufficiently support the integration of inland waterways transport into multimodal supply chains (modal shift)

The European Green Deal requires all transport modes, including inland waterway transport, to address the greening and digitalisation transition. This includes a better integration between different modes of transport into a seamless intermodal logistic chain. The RIS Directive anticipates the possibility or need for connecting RIS with systems of other modes, in particular with maritime transport. These links, however, have not been specified by the Directive or the implementing acts and no indication was identified that such connectivity exists at Member State level.

At the same time, the transport sector saw developments in other modes. For example, legal provisions for other cargo tools were introduced (2019 for EMSWe and 2020 for eFTI). The Directive lacks the framework to make the necessary links with these systems, and therefore cannot support the integration of IWT in the logistic chain.

The RIS evaluation concluded that the RIS Directive so far has focused on safety of navigation, while not enabling the integration of inland waterway transport into multimodal supply chains. In the OPC, 11 out of 13 respondents considered this as a very or somewhat important problem driver. This view was further supported by the respondents to the first stakeholders' survey, where 33 out of 65 respondents found problem driver 3 to be relevant.

The EU transport policy aims to promote less polluting and more energy efficient modes of transport, including for freight, and actions are taken to support intermodal transport. In addition, since the adoption of the RIS Directive, further developments have taken place in relation to synchro-modality, and tools have been developed to improve the efficiency of logistics supply chains. Initiatives such as EMSWe and eFTI, that offer opportunities to integrate IWT in the logistics chain, were developed after the adoption of the RIS Directive. Thus, the Directive does not provide the proper framework to make the necessary links. On the other hand, experts (representing Member State authorities and vessel operators) participating in the DINA and NAIADES expert group meetings, pointed to the different aims and scopes of the initiatives (e.g. eFTI has a clear role for logistic and cargo related information, while RIS is viewed more as a tool for safety and traffic management related information), and cautioned against mixing their purposes. Stakeholders participating at the dedicated workshops also expressed opposing views, with some seeing eFTI as

unrelated to RIS, while others considering that eFTI could be used by all modes (creating a one stop-shop solution).

The stakeholders participating in the first stakeholder workshop also shed some light on the need to find a common denominator between different navigation transport modes. In this context, ports play a crucial role as they provide the link between IWT and other modes such as road and rail. However, participants pointed out that technology standards in delivering information are heterogeneous across inland ports as they are developed individually. The smooth integration of IWT in intermodal transport requires efficient and accurate information exchange with inland ports. As an illustration, a vessel operators representative indicated during the workshop that skippers on tanker vessels need to know that ports have available capacity, as they often transport dangerous goods that can only be kept on board for a specific period of time. As this information is not foreseen in RIS, it increases the burden on skippers to plan their voyages. This view is confirmed by the network coverage of the EuRIS portal in Germany. For example, in ports such as Duisburg, Dusseldorf, Neuss, Mannheim and Karlsruhe, information on the dimensions of bridges over port basins and operating times is lacking. This causes the need for extra time when making voyage preparations as skippers need to look up the required information on individual port websites.

This lack of exchange of information with other modes is thus hindering the potential of IWT to perform in a multimodal chain and thus deliver on the objectives defined by the SSMS.

Problem driver 4 (PD4): Inefficient exchange of information (including cross-border) and reporting

An efficient exchange of information across borders between authorities is important for an efficient transport system. Despite improved Member State cooperation over time, not all reports are digitalised and, even when they are, Member States use different reporting applications that are not compatible with each other[62]. According to the evaluation, despite the adoption of the RIS Directive, there has been no substantial reduction in the number of resubmissions of electronic ship reports at borders due to differences in national reporting obligations. The number of resubmissions of electronic reports was estimated at 30% of total number of border crossings (i.e. 106,622 resubmissions in 2020). Each resubmission is estimated to require 15 minutes for vessel operators. Thus, vessel operators are estimated to have spent 25,841 hours for the resubmissions of electronic reports in 2020, equivalent to EUR 689,759[63].

In addition, based on the survey and the interviews with inland skippers it is estimated that inland skippers spend on average 10 minutes on reporting obligations in inland ports, with an estimated annual total cost of EUR 1.3 million in 2020[64]. A significant part of these costs stem from duplications that could be reduced or eliminated if a proper exchange of information between RIS and ports were in place.

All 13 respondents to the OPC found problem driver 4 to be very or somewhat important. In the

[62] Currently, five different platforms/systems are in operation: BIVS, NAMIB, SWING, GINA, VELI.
[63] The weighted average of the tariff per hour for non-manual workers (ISCO 8 – Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS (EUR 26.7 per hour), based on Eurostat Structure of earnings survey (in 2022 prices), has been used to estimate the costs.
[64] Considering the 294,774 port calls in 2020 and 10 minutes on average spent on reporting obligations per port call, around 49,129 hours were estimated to be spent on reporting obligations in ports, or around EUR 1.3 million. The weighted average of the tariff per hour for non-manual workers (ISCO 8 – Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS (EUR 26.7 per hour), based on Eurostat Structure of earnings survey (in 2022 prices), has been used to estimate the costs.

context of the first stakeholders' survey, 43 out of 65 respondents considered problem driver 4 to be relevant. In addition, 7 out of 25 respondents to a question on efforts spent on reporting (specifically inland waterway operators) indicated resubmission as a high burden. On the other hand, only 3 out of 13 national authorities that responded indicated high or medium costs for processing the electronic reports, 2 out of 13 indicated low costs and 1 authority indicated no costs at all. 7 out of 13 national authorities were not able to answer or indicated that it was not applicable to them.

The DINA (2017)[65] report outlined that during a journey on the Danube, more than 20 different forms have to be filled in different languages. The study estimated that filling in each form was taking ten to twenty minutes per border-crossing, depending on the type of trip.

There are some attempts to solve this problem on the ground through various reporting applications[66] or through elements of the RIS COMEX. However, their application is not harmonised as indicated in the first DINA/NAIADES expert group meeting due to, for example, challenges in having up-to-date information.

Problem driver 5 (PD5): Lack of legal certainty about processing of personal data by the inland waterway stakeholders

Several studies suggest that data protection concerns from the side of RIS stakeholders hinder the degree to which data from electronic ship reporting is shared between competent authorities. In fact, the RIS Directive currently only requires setting up national RIS that enables sharing of personal data if national or international law requires it (Article 4(3)c). It further refers to the data protection requirements of Data Protection Directive that is replaced by the General Data Protection Regulation (GDPR). RIS is basically a platform for data exchange providing harmonised technical specifications for data, but not the legal basis on which some personal data is actually collected and has to be submitted (e.g. border regulations, police regulations, etc.).

As it emerged during a targeted stakeholders' workshop, barge owners often live inside their barge. For family-owned companies, the vessel is the home of the skipper and the information about its position is often considered by vessel operators as personal data. In these cases, as explained during the specific workshop held for skippers, the exchange of information and identification of the position of the vessel is often restricted for fear of privacy rule violations. On the other hand, Member States or other authorities are reluctant to share RIS information to avoid potentially breaching privacy rules. This example indicates that both Member States and stakeholders seem to be unaware how far and for which purposes personal data is or could be lawfully exchanged via RIS. Currently there is no personal information exchanged through RIS and there are no actual concerns regarding Data Protection. The issue is therefore only the perceived risk, due to the lack of clarity, which leads stakeholders and Member States to be reserved in the context of exchange of information.

According to the evaluation, to address this issue Member States may conclude additional data exchange agreements for RIS purposes. In addition, to ensure legal certainty Member States should review their national laws and international commitments and ensure that personal data requests are always based on valid legal basis provided by law in line with the GDPR. The incomplete data on the position of surrounding vessels impairs the efficient voyage planning for skippers and may limit

[65] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.*
[66] Currently, five different platforms/systems are in operation: BIVS, NAMIB, SWING, GINA, VELI.

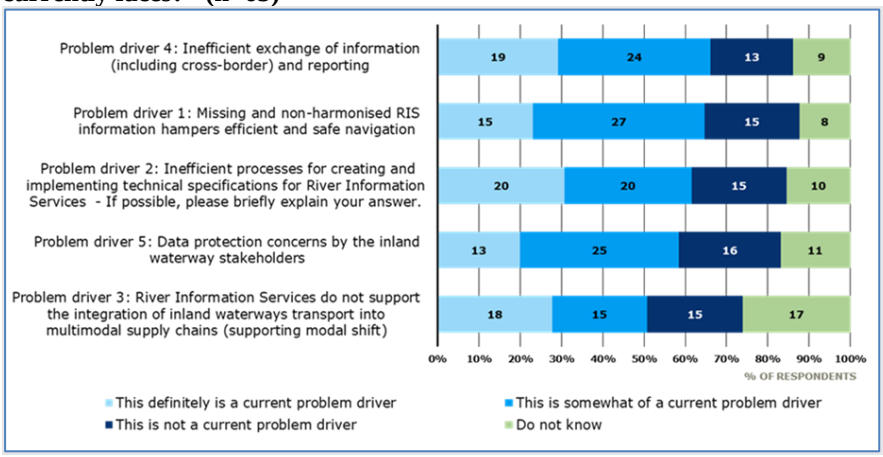
the situational awareness of national authorities who have a valid reason for having this information, for reasons of safety. Therefore, an update of the RIS Directive is needed to clarify what are the obligations under the RIS Directive and also clearly make transparent what is the legal basis for personal data exchange in the context of operating RIS.

In the OPC, 11 out of 13 respondents indicated that this problem driver is very or somewhat important. In the context of the first stakeholders' survey 38 out of 65 respondents found this problem driver to be definitely or somewhat relevant.

Views of stakeholders on the problem drivers

Stakeholders agree with the problem drivers as identified. As shown in Figure 7, the majority of stakeholders responding to the first stakeholders' survey considered all problem drivers to currently be an issue for the sector.

Figure 7: "In your view, are the problem drivers listed below problems which the IWT/ RIS sector currently faces?" (n=65)



Source: Ramboll et al. (2024) impact assessment support study, First survey to stakeholders

Regarding the importance of the problem drivers, the stakeholders clearly consider the efficient exchange of information as the most important element to tackle (see Figure 7). This is followed by the need to operate with more harmonised and updated standards. Data protection concerns were raised in particular by vessel operators, while integration with other modes was given the least importance among the problem drivers.

2.3 How likely is the problem to persist?

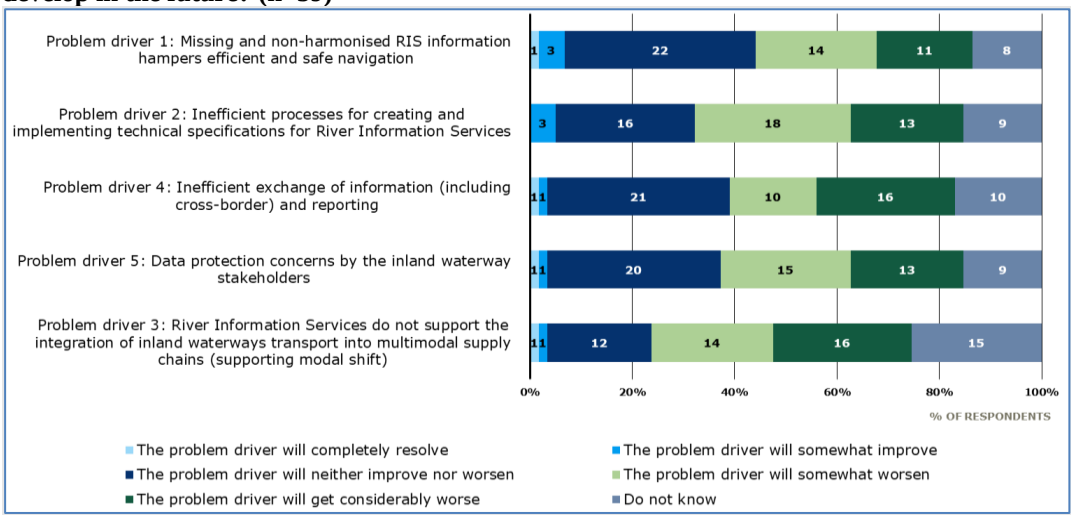
Considering the influence of the megatrends identified in the 2021 Strategic Foresight Report[67] and especially the megatrend[68] of *"Accelerating technological change and hyperconnectivity"*, the evolution of the problem has to been seen from the perspective of an increasingly connected world, with high levels of access to digital services. Without EU level intervention, the problem of slow and fragmented deployment of River Information Services is likely to persist over time and potentially to worsen. As technological development keeps accelerating, the fragmented deployment

[67] European Commission, 2021. *2021 Strategic Foresight Report*, Brussels, Belgium: Secretariat General, European Commission.
[68] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en

of RIS and the low and slow update of technical specifications can impact the competitiveness and safety of the sector, and its contribution towards the EGD objectives.

In the first stakeholders' survey, 20 out of 59 respondents considered that the problem will get considerably worse (15 of which were representatives of the IWT/RIS users or national public bodies) and 20 out of 59 that it will get somewhat worsen. Only 4 respondents argued that the problem will be partially or completely solved over time. The views are similar for each one of the problem drivers as summarised in Figure 8.

Figure 8: If the current RIS Directive is not revised, how do you expect the following problem drivers to develop in the future? (n=59)



Source: First stakeholder survey

The views expressed during the DINA/NAIADES Expert Group meeting of July 2022 were slightly more nuanced. Experts expected the problems and problem drivers to persist, or slightly worsen in case of no changes to the RIS Directive[69].

In the OPC, stakeholders expressed the view that without EU level intervention there will be a negative impact on the integration of IWT in the supply chain (11 out of 13 respondents indicated that they expect somewhat or strong negative developments), on the efficient use of RIS (10 out of 13 respondents), and on the digital transformation (10 out of 13 stakeholders). The views related to the impact on safety were roughly split as 7 out of 13 respondents considered this to lead to strong or somewhat negative developments. In terms of the environment, 8 out of 13 respondents considered that the impacts will either remain unchanged or somewhat improve, while internal market issues appeared to have been of least concern (10 out of 13 respondents indicated no or somewhat positive developments).

The issue of the better implementation of RIS, in particular for ensuring a better harmonisation of the technical specifications, was brought up by stakeholders (particularly vessel operators) during the consultation process. However, the practical tools for ensuring better implementation (i.e. a monitoring and feedback mechanism given that during this period no formal complaints were notified to the Commission) are missing from the current Directive.

[69] Experts were asked to rate their expectations on how the problem would develop in the absence of a revision to the RIS Directive. Attributed scores were between 1 and 5, with 1 representing the view that the situation would get much worse, and 5 representing the view that the situation would get much better. The average score of 2.7, with an even distribution across the different experts who responded during the workshop, indicated that expert group members expected the situation to either remain the same, or slightly worsen.

In addition, the issue related to implementation is only relevant for problem driver 1 and only as regards the non-harmonised application of the standards by the Member States. The other four problem drivers cannot be addressed through better implementation. The inefficient processes for the creation and implementation of technical specifications for RIS (problem driver 2) increase the risk related to the implementation and enforcement. It is worth noting that of 59 respondents to the first stakeholder's survey only 4 indicated that the problem would be resolved without a revision of the Directive (i.e. through better implementation)[70]. Similarly, among the RIS experts consulted during the DINA/NAIADES expert group meeting only 2 indicated the need for better implementation.

Furthermore, focusing solely on better implementation means that only the challenges and issues identified almost 20 years ago are considered. The sector is now confronted with a number of new issues that did not exist at the time of the adoption of the Directive and thus were not properly taken into account. These include: developments in technology and digitalisation (e.g. the shift from radio communication to an almost digital exchange of data), developments in other modes of transport (e.g. including systems like eFTI and EMSWe, and the whole digital structure that is developed under the SSMS), and overall developments in the policy framework (i.e. the European Green Deal). The evaluation found that the Directive is not sufficiently aligned to the sector's needs for improving efficiency, integrating the sector into the logistics chains and addressing new technological challenges.

3 WHY SHOULD THE EU ACT?

3.1 Legal basis

Title VI (Articles 90-100) of the Treaty on the Functioning of the EU (TFEU) establishes the EU's prerogative to make provisions for the Common Transport Policy. Article 91(1) of the TFEU provides that the Union has competence in the field of transport to common rules applicable to international transport to or from the territory of a Member State or passing across the territory of one or more Member States.

Within this legal framework, the EU provides for a coordinated and harmonised deployment of information and communication technologies on inland waterways that help to increase the safety and efficiency of transport by inland waterway, instead of relying on the uncoordinated action of individual Member States only.

3.2 Subsidiarity: Necessity of EU action

Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States. The necessity of EU action was recognised at the time of adoption of the RIS Directive[71], when RIS was being developed at different rates, with different technologies and applications throughout Europe, creating barriers to cross-border voyages. The aim of the Directive was to harmonise technologies across Europe to enhance cross-border transport, and to minimise coordination costs.

[70] Two experts (one representing vessel operators and one representing a Member State) considered that further efforts were needed in terms of better implementing current provisions in the Directive.
[71] Recital 12 of the RIS Directive

The rationale for EU action, in terms of harmonisation of technologies across Europe to enhance cross-border transport and to minimise coordination costs, has largely been unchanged since the adoption of the RIS Directive, with inland waterway transport continuing to have a strong cross border dimension. Thus, in the absence of EU action, differences in the level and nature of the provision of RIS between Member States, or in the approaches of the different River Commissions, can lead to barriers for the efficient and seamless operation of inland waterways and hinder their development in comparison with other transport modes.

Since the entry into force of Directive 2005/44/EC, the inland waterway sector has benefited from the provision of harmonised RIS. However, the level of harmonisation between Member States varies and the introduction of the necessary specifications has proved to be lengthy. In addition, the EGD calls for a further development of an automated and connected multimodal mobility. RIS should be more fit to address these new challenges, also in line with the Sustainable and Smart Mobility Strategy, which promotes the creation of a truly smart transport system, efficient capacity allocation and traffic management. The NAIADES III action plan indicated that, to support the objective of inland waterways being part of a seamless system of harmonised RIS by 2030, a revision of the legal framework on RIS would be necessary to close these harmonisation and interoperability gaps, and to contribute to improved data availability, and the reuse and interoperability of data, in line with the European Data Strategy.

The most affected Member States were the Rhine countries – the Netherlands, Belgium, Germany and France. Their views, as expressed in their response to the consultation activities for this impact assessment, showed that there is a need for EU legislative action and that there would be negative consequences if the legal system would stay the same. Furthermore, as explained in section 1, both the European Parliament and the Council, in their reaction to the NAIADES III Communication, expressly stated their interest for a revised Directive.

3.3 Subsidiarity: Added value of EU action

The 2021 evaluation concluded that the benefits of the Directive (in particular in terms of harmonisation) could not have been achieved at the national level, primarily due to high fragmentation of technical specifications and implementation practices. Stakeholders consulted during the evaluation indicated as areas of EU added value: the improved harmonisation, the standardisation through common technical specifications, the increased cross-border cooperation, more funding for the sector and an increase in perceived safety.

This initiative would provide additional EU added value by improving RIS efficiency (in terms of technical specifications, process of adoption, and improved exchange of information), but also in terms of integration of inland waterways in the multimodal supply chains. Furthermore, even though the problem is geographically limited, impacting Member States with connected navigable waterways, action at EU level is more likely to ensure that solutions are coherent and uniform for all Member States concerned. At the same time, it is through EU action that connectivity with other modes can be ensured. Furthermore, EU level action has an advantage over other international interventions such as the UNECE guidelines, due to its mandatory nature. Action at regional (i.e. River Commission level), in practice a form of enhanced cooperation, is also likely to lead to regional fragmentation, as each River Commission would focus on applying its own solutions, thus introducing barriers to the common market and be a step back in terms of harmonisation. The CEF funded RIS COMEX, could be considered as another form of enhanced cooperation, where the Member States on a voluntary basis decided to develop a platform for the exchange of RIS (as described in section 1). However as this is a voluntary initiative, the continuation of its membership

cannot be guaranteed, which could potentially lead to differences in the level of service provided to a vessel depending on whether the country it navigates through is part of RIS COMEX or not.

Stakeholders who responded to the evaluation's consultation activities noted that the same benefits would not have been achieved by comparable interventions at the international, regional or national level[72]. The stakeholders consulted in the context of this impact assessment expect the problem to persist in absence of EU level action. Additionally, no sources indicated that the same benefits could be achieved at the national level, as this would result in a high fragmentation of standards and implementation practices[73].

4 OBJECTIVES: WHAT IS TO BE ACHIEVED?

4.1 General objectives

Based on the analysis of the problem as described in section 2, the revision of the RIS Directive is guided by one general objective, that is: to provide an effective framework for the deployment and use of RIS. With such a framework in place, IWT can operate in a safe manner, in a competitive market environment, and contribute towards the EGD objectives.

This objective is in line with the SSMS that aims to enable seamless transport and traffic management on the European inland waterways, as well as to improving the sustainability of transport. In addition, it is in line with the goals of NAIADES III Communication in terms of improving the performance of RIS along with improving and re-using applications for links with other modes, and eventually preserving the competitive position of IWT.

RIS can contribute to connecting IWT to the logistics chain and to improving its competitiveness and modal split. However, it cannot achieve this in isolation as the competitiveness of the sector is also affected by factors such as lack of infrastructure developments and maintenance, lack of qualified staff, geographic limitations of IWT network, lack of investments and innovation[74]. In addition, it is not the objective of the revision to develop into a single digital tool for IWT, as RIS form part of a family of applications like the databases for crews and vessel information. All these cover separate needs and purposes. Furthermore, in terms of links with other modes, and to improve syncro-modality, it should not duplicate or aim to replace other existing tools, like EMSWe, or eFTI, but rather ensure that the necessary information flows seamlessly among these various solutions, as needed. In this regard, RIS is just one of the many pieces of the puzzle of the digitalisation of IWT.

The initiative contributes towards the objectives of the European Green Deal (EGD)[75] (in particular by supporting the shift away from road transport). The revision of the RIS Directive contributes towards Sustainable Development Goal (SDG) 9 ("Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation") and SDG 13 ("Take urgent action to combat climate change and its impacts").

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[72] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD%3A2021%3A50%3AFIN

[73] Ludden, V. et al., 2020: *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper.

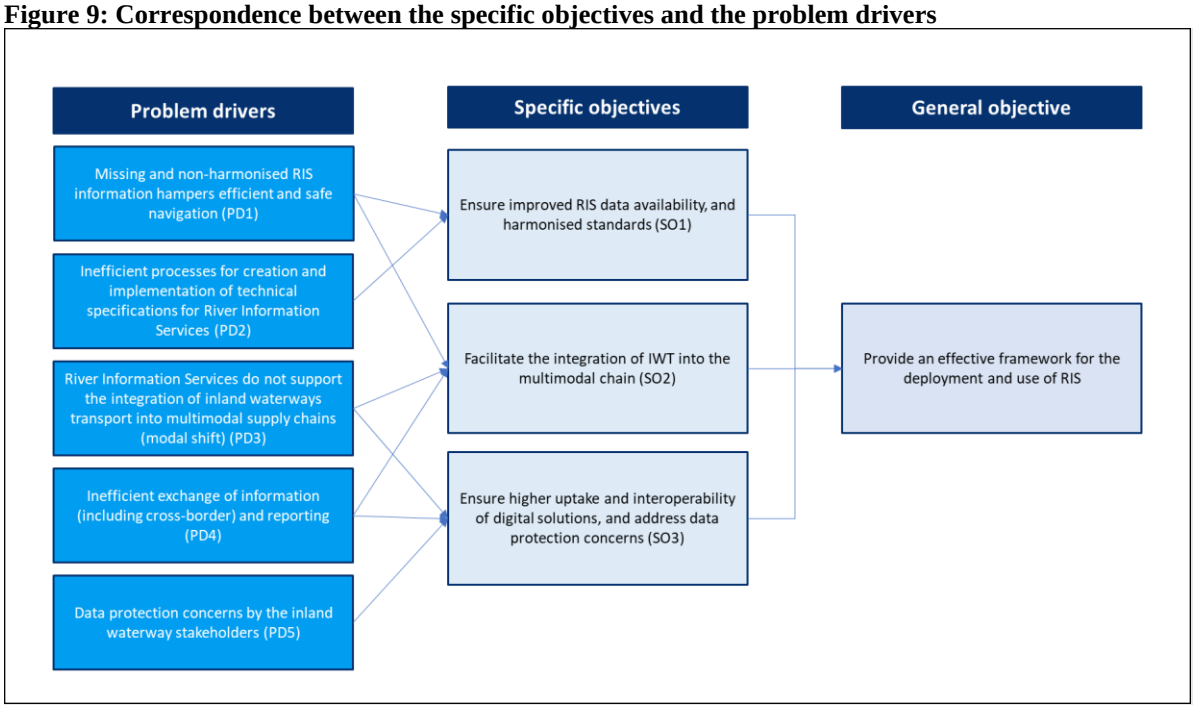
[74] European Commission (2020), Assessment of the potential of maritime and inland ports and inland waterways and of related policy measures, including industrial policy measures, https://op.europa.eu/o/opportal-service/download-handler?identifier=4ec82fa8-0dc6-11eb-bc07-01aa75ed71a1&format=pdf&language=en&productionSystem=cellar&part=

[75] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#documents

4.2 Specific objectives

The specific objectives (SOs) are discussed below. Their correspondence with the problem drivers are presented Figure 9.

Figure 9: Correspondence between the specific objectives and the problem drivers



Source: European Commission

SO1: Ensure improved RIS data availability, and harmonised standards

For RIS to function properly, this must be based on an appropriate operating environment where the required information is available to the users. The first objective therefore aims to address the areas where the technical performance of RIS was found not to be optimal. Improving the quality, efficiency and exchange of RIS data is an important element for addressing the current identified challenges, in terms of non-harmonised technical specifications ('standards') and lack of basic information and to improve the process for adoption of technical specifications. Improving the RIS information available to both vessels operators and authorities can increase the efficiency of the IWT and reduce the safety risks (PD1). In this context, the technical requirements and specifications need to be updated regularly and their application across Member States needs to be fully harmonised. Technological solutions develop fast and the RIS Directive needs to ensure that the process to introduce the necessary changes to the technical specifications can follow a similar pace (PD2).

SO2: Facilitate the integration of IWT into the multimodal chain

The second objective aims to prepare RIS to address the missing elements that hinder the sector from reaching its potential, and in particular its integration into the multimodal chains. This can be attained through improved quality and better shared information. In this regard RIS users need to have access to the appropriate and up-to-date information for all necessary elements (PD1). Furthermore, this information needs to be better exchanged within the sector itself, in particular when crossing a border, or when approaching an inland port, a lock or a moving bridge and reduce reporting requirements (PD4). Moreover, better exchange with the systems of other modes is needed to avoid duplications of systems and data flows (PD3).

SO3: Ensure a higher uptake and interoperability of digital solutions, and address data protection concerns

The IWT sector is part of the international logistics chains and needs to keep up with developments in other sectors to maintain its competitiveness. This objective will aim to increase the digitalisation in the sector and ensure a smooth flow of information A digital framework is needed to enable the seamless integration of IWT in multimodal supply chains and avoid reverse modal shift. This can only be done through improved links with the digital systems developed for other modes, in order to enable the exchange of information between them, while avoiding parallel or overlapping systems (PD3). This initiative should also provide the necessary incentives and assurances to remove the bottlenecks related to the inefficient exchange of information and reporting (PD4) and objections to data exchange due to concerns on data protections (PD5). It should clarify the type of data a Member State may collect and exchange via RIS and also clarify that RIS does not create an obligation to share personal data but only facilitates the exchange if there is a legal basis for the processing of personal data under relevant national, Union or international laws.

5 WHAT ARE THE AVAILABLE POLICY OPTIONS?

5.1 What is the baseline from which options are assessed?

The EU Reference scenario 2020 (REF2020) is the starting point for the impact assessment of this initiative. The REF2020 takes into account the impacts of the COVID-19 pandemic that had a significant impact on the transport sector. More detailed information about the preparation process, assumptions and results are included in the Reference scenario publication[76]. Building on REF2020, the baseline has been designed to include the initiatives of the 'Fit for 55' package proposed by the Commission on 14 July 2021 and of the REPowerEU package proposed by the Commission on 18 May 2022. The baseline scenario assumes no further EU level intervention beyond the current RIS Directive. The effects of projects such as RIS COMEX are however expected to continue over time in the baseline scenario. In this context, the RIS COMEX 2 that recently obtained funding through the Connecting Europe Facility, is reflected in the baseline. More details on the baseline scenario assumptions and results are provided in Annex 4.

The baseline also incorporates foresight megatrends[77] and developments captured in the 2022 Strategic Foresight Report[78]. It also considers the influence of the megatrends identified in the 2021 Strategic Foresight Report[79] and especially the megatrend[80] of *"Accelerating technological change and hyperconnectivity".* Among others, it captures the trend of increasing demand for transport as population and living standards grow as well as the links between the digital and green transition. In particular, the projected transport activity draws on the long-term population projections from Eurostat and GDP growth from the *Ageing Report 2021*[81] by the Directorate General for Economic and Financial Affairs.

In the baseline scenario, EU transport activity is projected to grow post-2020, following the recovery from the COVID pandemic. Road transport would maintain its dominant role within the

[76] EU Reference Scenario 2020 (europa.eu)
[77] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en#explore
[78] COM(2022) 289 final of 29 June 2022.
[79] European Commission, 2021. *2021 Strategic Foresight Report*, Brussels, Belgium: Secretariat General, European Commission.
[80] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en
[81] The 2021 Ageing Report : Underlying assumptions and projection methodologies

EU by 2050. Rail transport activity is projected to grow faster than for road, driven in particular by the completion of the TEN-T core network by 2030 and of the comprehensive network by 2050, supported by the CEF, Cohesion Fund and ERDF funding, but also by measures of the 'Fit for 55' package that increase to some extent the competitiveness of rail relative to road and air transport. Freight inland waterways activity represented 147 billion tonne-kilometres (tkm) in 2015, going down to 132 billion tkm in 2020. Following the post-COVID recovery, the freight inland waterways activity is projected to increase to 178 billion tkm in 2030 (21% increase relative to 2015) and 212 billion tkm in 2050 (44% increase for 2015-2050). The passenger segment of IWTs is expected to increase as well, with the number of passenger-kilometres projected to increase by 36% by 2030 compared to 2015 (53% increase for 2015-2050).

Despite the increase in terms of transport volumes, the modal share of freight IWT in land transport[82] is projected to decrease from 6.8% in 2015, to 6.3% in 2030 and to remain relatively stable, at 6.2% after that. The decrease in the modal share of IWT relative to 2015 is due to the reduction in the specific types of goods transported by inland navigation (petroleum products and coal), linked to the energy transition towards greener fuel sources, and due to the higher growth in the rail transport activity. The expected growth in the container segment, is not expected to reverse the trend. As regards passenger transport, the modal share of IWT only represents around 0.01% of land transport activity and is projected to remain relatively stable over time following the post-COVID recovery.

The number of passenger vessel journeys is projected to increase from 8,867 in 2015 to 12,043 in 2030 and 13,572 in 2050. The total number of tonnes transport is projected to grow roughly in line with the transport activity in tonne kilometres (from 545 million tonnes in 2015 to 690 million tonnes in 2030 and 813 million tonnes in 2050), while the number of tonnes per journey would continue to increase but at a slower pace than in the past[83]. The number of freight vessels journeys is projected to go up from 682,120 in 2015 to 717,838 in 2030 (5% increase for 2015-2030) and 731,234 in 2050 (7% increase for 2015-2050), following the recover from the COVID-19 pandemic.

Around 40% of the freight vessels journeys take place within one country, with the rest crossing on average 1.3 borders per journey. The share of border crossings in the number of vessel journeys is assumed to remain constant over time (at around 60%), in line with the historical developments. Thus, the total number of freight border crossings is projected to go up from 427,947 in 2015 to 432,442 in 2030 and 440,512 in 2050. For passenger vessels journeys, the share of border crossings is much higher (around 90%) and is assumed to remain constant over time. The total number of border crossings for passenger IWT is projected to increase from 8,344 in 2015 to 10,882 in 2030 and 12,264 in 2050.

The number of cargo vessels has decreased by 23% between 2003 and 2020[84], from 13,385 ships to 10,332. The overall downward trend in the number of cargo vessels is expected to reverse by 2030 (12,371 cargo vessels), driven by the increase in activity and the slower increase in the capacity of ships compared to the past, but then it is expected to stay relatively stable until 2050 (12,223 cargo

[82] Excluding pipeline transport.
[83] From 799 tonnes per journey in 2015 and 859 tonnes per journey in 2020 to 961 tonnes per journey in 2030 and 1,111 tonnes per journey in 2050.
[84] The year 2003 was chosen for the comparison because of data availability on the number of ships in both the Rhine, Danube and other river basins.

vessels) due to the increase in the productivity per vessel[85]. On the other hand, the number of passenger vessels had increased from approximately 160 ships in 2004 to 405 ships in 2021. When the day-tour ships and smaller cycle holiday ships are counted, around 2,553 passenger ships were estimated to operate in the EU in 2015[86]. The number of passenger vessels is projected to follow the increase in the number of passengers (3,467 vessels projected in 2030 and 3,908 in 2050). It should however be noted that the majority of these vessels are small or very small. In contrast to cargo vessels, no further growth in scale or productivity is expected for passenger shipping.

Energy use in freight IWT is projected to remain relatively stable by 2030 to its 2015 levels, despite the increase in activity, and to decrease to 895 ktoe[87] by 2050 (11% decrease for 2015-2050), thanks to the uptake of more fuel-efficient technologies including electrification. For passenger vessels, energy consumption is projected to increase by 11% by 2030 (132 ktoe), driven by the strong growth in activity, and only to slightly decrease by 2050 relative to its 2015 levels (112 ktoe). Overall, considering both passenger and freight, energy use in inland waterways transport is projected to remain relatively stable by 2030 to its 2015 levels and to go down by 10% by 2050, relative to 2015.

In the baseline scenario, CO_2 emissions from inland waterways transport are projected to decrease much faster than the energy use (21% decrease for 2015-2030 and 67% decrease for 2015-2050). This is because of the large-scale uptake of renewable and low carbon fuels, namely e-fuels, biofuels and electricity. In this context, it should be noted that the baseline scenario assumes the implementation of the European Climate Law to which all sectors, including the inland waterways sector, need to contribute. In terms of NOx emissions a similar trend is expected, reducing from 73 ktons in 2015 to just below 20 ktons in 2050. The amount of particulate matter emitted by inland navigation is also expected to reduce, from 3.8 ktons in 2015 to 1 kton in 2050. This is due to both electrification and the fact that the ships that continue to operate with internal combustion engines are becoming cleaner. In this context, it should also be noted that since 2020 new combustion engines are considerably cleaner, thanks to the implementation of non-road mobile machinery (NRMM) Regulation (NRMM Stage V)[88].

There is little consistent data on safety in the inland navigation sector, with available data coming from Eurostat and national databases for Bulgaria, Czechia, Germany, Croatia, Hungary, the Netherlands, Austria, Poland and Romania. In the baseline scenario, the projected evolution of the number of accidents is linked to the evolution of activity expressed in terms of vessel-kilometres. The number of accidents per vessel-kilometres is assumed to remain constant over time. Thus, the number of accidents is projected to increase to 535 in 2030 and 551 in 2050 in the baseline scenario (from 529 in 2015).

The baseline scenario reflects the projected higher energy prices driven by the Russian invasion of

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[85] This is assumed at 1.5% per year per ship/barge. This increase is justified by both technical and operational developments: for instance Smart And Autonomous Shipping which may result into a larger share of the fleet being able to sale 24/7 (in spite of labour shortages in the sector), increased attention to good navigational status of waterways (including 24/7 operation of bridges and locks on the major waterways) and scale enlargement in IWT of both companies (larger number of vessels per company) and vessels (larger load capacities for vessels), although at slower pace than in the past.

[86] Prominent (2017)

[87] The tonne of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one tonne of crude oil.

[88] Regulation (EU) 2016/1628.

Ukraine[89]. Beyond this aspect, it was however not possible to quantify the impact of the Russian invasion of Ukraine, as there is large uncertainty with respect to its impacts, in particular for the medium to long term. While its impact is felt in terms of trade (e.g., grain, bulk fertilizers and hydrocarbons) and in certain geographical areas, the impact on the baseline of this initiative is expected to be limited. The problem of slow and fragmented deployment of River Information Services that hamper the competitiveness and safety of the sector, and its contribution towards the EGD objectives, is likely to persist.

5.2 Policy measures and policy options

As a first step, a comprehensive list of possible policy measures was established after extensive consultations with stakeholders, expert meetings, independent research and the Commission's own analysis. This list was subsequently screened based on the effectiveness, efficiency and proportionality of the proposed measures in relation to the given objectives, as well as their legal and technical feasibility.

5.2.1 Discarded policy measures

A number of possible policy measures were considered during the impact assessment process but were discarded either because the problem was not susceptible to a solution by means of EU legislation or because proposing an action to address the issue at EU level will not yield additional results. An overview of the measures and a justification for them not being followed is presented in the Table 1.

Table 1: Overview of discarded measures

Policy Measure	Reason for discarding
Expand scope to all waterways	CEMT-class III waterways and below exist in Czechia, Croatia, France, the Netherlands, Poland, Belgium and Hungary. However, as there is very limited commercial navigation taking place on these waterways, bringing these waterways under the scope of the RIS Directive will result in significant administrative burden for RIS authorities and hardly any benefit for all stakeholders.
Create a role for the European Maritime Safety Agency (EMSA)	EMSA has a clearly defined role related to the safety of the maritime sector. RIS has a different scope which is not in line with the mandate of EMSA.
Provide incentives for IWT users to make better use of RIS	The private sector already uses RIS to a large extent. Financial support for RIS may be provided under the Connecting Europe Facility (CEF) and is thus out of scope of this impact assessment.
Embed the operation of the existing DINA expert group (E03505) into the Directive	The involvement of Commission expert groups is well defined in the decision-making process and no further requirements are necessary.
Integrate the Directives of River Information Services (RIS), Intelligent Transport Services (ITS) and the Maritime Vessel Traffic Monitoring and Information System (VTMIS) Directive into one integrated Directive.	While all of the mentioned Directives (RIS, ITS, VTMIS) handle digital aspects, they each have different scope and area of application and aim to cover different needs. The merging of separate legal obligations would not necessarily create a simplified system, but could increase complexity and legal challenges. Better interconnection between the digital systems developed should be pursued instead.

[89] SWD(2022) 230 final.

Policy Measure	Reason for discarding
Expand the set of shipborne navigation systems	This measure is out of scope of RIS and would be more appropriately covered under CEF.
Align investments in digital and physical infrastructure	This measure is out of scope of RIS and would be more appropriately covered under CEF.
Roll out of 5G in the framework of CEF along waterways	This measure is out of scope of RIS and would be more appropriately covered under CEF.
Link to cross-disciplinary digital information and operation systems for water- and waterway management	This is a technical element relating to the standards to be developed and is thus relevant for the implementing acts and not the main Directive itself.
Ensure that regulations and operational practices take interoperability of both sea and inland waterway systems (RIS/VTS) into account	The development of a common VTS system between maritime and IWT is beyond the scope of the RIS directive. Technical aspects for the interoperability of such services relate to the standards to be developed and are thus relevant for the implementing acts and not the main Directive itself.
Align with DIWA Masterplan	The work of DIWA is not concluded at the time of preparation of this report. However, several RIS related aspects discussed in the context of DIWA (like the need for better quality data, the links with eFTI, and the inland ports, aligning with the maritime and the central roles of CESNI and COMEX) have been taken on board. Moreover, DIWA makes numerous other recommendations that are of a technical nature and thus relevant for secondary legislation and not the main Directive itself.

Source: European Commission

5.2.2 Retained policy measures and policy options overview

The retained policy measures to address the problem and problem drivers identified in section 2 are provided in Table 2. A more detailed description of the policy measures is included in section 5.2.3.

The retained policy measures have been grouped in 3 policy options: policy option A (PO-A), policy option B (PO-B) and policy option C (PO-C). Table 2 presents the links of policy measures included in the policy options with the problem drivers and specific objectives.

Table 2: Overview of policy measures and policy options

Policy Measure	Problem driver	Specific objective	PO-A	PO-B	PO-C
PM1 - Increase the harmonisation of RIS through guidelines	PD1	SO1	**X**		
PM2 - Introduce a harmonised complaint mechanism (in Member States)	PD1	SO1	**X**	**X**	
PM3 - Introduce a new Performance Measurement Framework	PD1	SO1			**X**
PM4 - Strengthen requirements for RIS technical specifications by adding new specifications on data for navigation and voyage planning (RIS Index)	PD1, PD3	SO1, SO2		**X**	**X**
PM5 - Require electronic voyage plan reporting	PD1, PD3	SO1, SO2, SO3			**X**
PM6 - Introduce provisions for supplying data to the ERDMS and its operation	PD1, PD3	SO1, SO2	**X**	**X**	**X**
PM7 - Encourage cargo-related information exchange through the eFTI mechanism	PD1, PD3, PD4	SO2, SO3	**X**		
PM8 - Mandate cargo-related information to be exchanged through the eFTI mechanism	PD1, PD3, PD4	SO2, SO3		**X**	**X**
PM9 - Require information exchange through a RIS platform	PD1, PD3, PD4	SO1, SO2, SO3		**X**	**X**
PM10 - Involve CESNI in the development and adoption of technical	PD2	SO1	**X**	**X**	**X**

Policy Measure	Problem driver	Specific objective	PO-A	PO-B	PO-C
specifications					
PM11 - Link the RIS requirements with those of the TEN-T Regulation	PD3	SO2		**X**	**X**
PM12 - Develop new technical specifications for the exchange of information relating to IWT ports	PD3	SO2, SO3		**X**	
PM13 - Require the exchange of information with IWT ports according to new technical specifications	PD3	SO2, SO3			**X**
PM14 - Improve the harmonisation between RIS and information services for other modes of transport (e.g. maritime)	PD3	SO2, SO3		**X**	**X**
PM15 - Require sharing of all necessary cross-border data for traffic and transport management by the Member States	PD4	SO2, SO3			**X**
PM16 - Specify more clearly the cases for exchange of personal data	PD5	SO3	**X**	**X**	
PM17 - Develop templates and standards for the exchange of personal data	PD5	SO3			**X**

Source: European Commission

5.2.3 Description of the policy measures

A description of the policy measure is provided below:

- *Increase the harmonisation of RIS through guidelines (PM1).* This is a non-legislative measure. The Commission will develop interpretative guidelines for the application of the Directive and the different technical specifications[90]. The assistance of CESNI will be requested (through a study) to help identify the areas of most concerns or most frequent issues (e.g. the number of masts/radars transferring data between the vessels and RIS centres, the way the infrastructure should be placed and maintain (frequency of inspection). These guidelines will be made available to Member States, vessel operators and software providers and should remove ambiguities on technical specifications. Member States will then apply the technical specifications in line with the guidelines. No action is anticipated by the other stakeholders.

- *PM2: Introduce a harmonised complaint mechanism (in Member States).* Improved monitoring of the implementation of the Directive will help ensure that RIS is provided in a coherent and harmonised manner across the whole length of waterways concerned. As a way of addressing this from the "bottom-up", this measure relies on direct feedback from RIS users to indicate the areas where problems appear. Member States will be required to designate a (existing or new) competent governmental body to directly handle complaints filed by RIS users. To properly function, this body should be independent from RIS related authorities and would have the task to verify the complaints and request corrective action (e.g. correct wrong, outdated or non-standardised data). Vessel operators and software providers will be aware of whom to refer to. National authorities will have visibility of where they need to intervene.

- *PM3: Introduce a new Performance Measurement Framework.* In contrast to PM2, this measure aims to improve the monitoring (and thus the overall performance of the Directive), through a "top-down" approach. The Commission with the assistance of CESNI will develop key performance indicators such as the number of shipping messages issued in accordance with standards and interpretations from the most recent RIS encoding guide, and the number of electronic cargo reports received in relation to the number of voyages. Member States and other

[90] These guidelines are not the same as the "RIS Guidelines" as mentioned in Annex II of the Directive, and which form an integral part of the standards, originating from the work of PIANC, and which are in force through Commission Regulation (EC) No 414/2007.

relevant authorities will be required to report on these indicators on a regular basis (yearly). Having better information, the European Commission will be able to follow more closely the provision of RIS and identify cases where RIS implementation is fragmented. Based on this it will be requesting the responsible Member State to undertake corrective action. It will not require action from the side of vessel operators.

- *PM4: Strengthen requirements for RIS technical specifications by adding new specifications on data for navigation and voyage planning (RIS Index).* This measure aims to strengthen the requirements of the current RIS Directive by introducing new technical specifications ('standards') on data for navigation and voyage planning ('RIS Index'). It will improve traffic management in the EU waterways. The new technical specifications will ensure that information related to the efficiency of navigation is available and shared between the different actors. Member States will be required to create systems providing adequate information for skippers - a series of data including for instance clearance heights at bridges, fairway profiles and data on vessel traffic signs will have to be collected. Moreover, the system should also include information on the real-time traffic situation, such as current and expected waiting times at locks. Obtaining and sharing these data requires investment in both digital hardware and software (to monitor and report on the information mentioned above). Member States will also need to undertake digital hardware and software updates in order to provide the required information. Vessel operators and software providers will have access to the provided information for their purposes.

- *PM5: Require electronic voyage plan reporting*. This measure aims to improve traffic management and navigation efficiency in the waterways. Vessel operators already prepare and submit to the authorities their plan for the voyage at the start of the journey. However, with this measure the reporting will need to be made through electronic means, and be adapted for any changes, which will increase the reporting requirements. As a trade-off vessel operators will receive directions from national authorities to adapt their navigation to take into account of the situation in the waterways thus improving the voyage efficiency (e.g., through reduced speed of ships and less manoeuvring movements like, mooring at waiting jetties, leaving and entering the lock, etc.). National authorities will have to invest in software to receive, process and act upon the information transmitted by the vessels, but this will allow them to have greater visibility on the navigation situation, plan and manage traffic, and account for changes (e.g. instruct vessels navigate slower in case of bottlenecks).

- PM6: *Introduce provisions for supplying data to the ERDMS and its operation*. The ERDMS contains basic information that is important for the provision of RIS. Currently though the level of accuracy of the information provided by Member States varies. This measure will require Member States to provide accurate and up-to-date data to the ERDMS so as to improve the quality of the contained information. This will create costs for the Member States as the frequency and/or content of their reporting will need to be increased. Vessel operators will make use of the provided information for navigation planning purposes and software providers for the development of their products. This information will also be made available to the RIS platform (PM9).

- *PM7: Encourage cargo-related information exchange through the eFTI mechanism.* This measure will require that standards are developed so that RIS cargo related information (i.e. electronic ship reports as specified in Commission Implementing Regulation 2019/1744) can be shared on a voluntary basis through the electronic freight transport information (eFTI) platforms. Before starting the voyage, vessel operators will upload the required information to eFTI, and will transmit through ERI to the relevant authorities the link to the eFTI with their information.

Member State authorities will, as appropriate, use the link to access the cargo information for their purposes. Member States will also have the option to transmit the eFTI links to their counterparts in other Member States. In PM7, the digital applications will be developed but not made obligatory for use. The Member States will need to develop the capacity to receive and process information through eFTI, and replace the processing of paper cargo reports with the electronic reports. Vessel operators will only need to upload the information once on eFTI, and then report to the authorities through ERI only the relevant link.

- *PM8: Mandate cargo-related information to be exchanged through the eFTI mechanism*. The difference of this measure with PM7 is that it will be now obligatory for vessel operators to use an eFTI platform for the transmission of the cargo information.

- *PM9: Require information exchange through a RIS platform*. A single digital platform that would act as the main exchange node for RIS information and basis for development of digital applications would help to streamline and improve the provision of RIS in the EU. As explained in section 1, 13 Member States[91] through an agreement and CEF funding have already developed the project RIS COMEX which in effect is a one stop shop platform for the exchange of RIS information and can fulfil the role of a RIS platform. Building on the success of this project, and in order to not duplicate efforts, this measure proposes to designate this platform as the main and central platform for RIS, where all functionalities will be built upon, and work in combination with other measures (e.g. PM4, PM6, PM8, PM12, PM14). Therefore, this impact assessment will make reference to and be based on information of RIS COMEX. By mandating the use of RIS COMEX, efficient use of EU funds is ensured, as the development was already supported under CEF, and any costs for the Member States (including for those like Spain, Italy and Portugal) will be limited to development and update of the necessary digital applications. It will be an important change for vessel operators, who will use a single platform of interaction instead of several portals and systems. Software providers will also have access to information from RIS COMEX platform for their product development.

- *PM10: Involve CESNI in the development and adoption of technical specifications*. This measure aims to tackle the long period that has so far been required to introduce new technical specifications for the sector. In this case, CESNI will be involved in the preparation of the technical specifications and provide regular updates as required. CESNI already has a working group dealing with RIS (CESNI/TI).

- *PM11: Link the RIS requirements with those of the TEN-T Regulation*. Currently, all interconnected waterways of CEMT class IV and higher (which refers to the size of the vessel they can accommodate) are within the scope of the RIS Directive. Member States may decide to include further waterways in this scope (for example Italy, Spain and Portugal). This scope does not match the TEN-T network, which with its current proposed revision will not refer any more to CEMT classification but will be based on the characteristics of the waterways themselves. As the TEN-T network covers the most important waterways it is therefore considered that an alignment of scope between the two is required.

- *PM12: Develop new technical specifications for the exchange of information relating to IWT ports*. Data related to ports is not easily available to vessel operators (for example, the

[91] Austria, Belgium, Bulgaria, Croatia, Czechia France, Germany, Hungary, Luxembourg, the Netherlands, Romania, Serbia and Slovakia

dimensions of bridges over port basins and operating times), or the ports do not always have the vessels' cargo and voyage information and this information has to be reported again at the ports. The aim of this measure is to develop new technical specifications for the exchange of information to and from IWT ports. Overall, PM12 would lead to better data quality for all, leading to simpler travel planning. National authorities and the ports will need to develop and maintain the necessary systems to share and process this information (exchange can be made through PM9). Under this measure, while inland ports will need to have developed the necessary digital infrastructure, vessel operators will only make use of it on a voluntary basis. Vessel operators will have access to improved and updated information regarding the situation in their inland port of destination (e.g. access constraints on opening of bridges, the availability of berths, the availability of clean fuels at the time of arrival).

- *PM13: Require the exchange of information with IWT ports according to new technical specifications.* The difference of this measure with PM12 is that it will be now obligatory for vessel operators to exchange information with inland ports through the provided systems.

- *PM14: Improve the harmonisation between RIS and the information services for other modes of transport (e.g. maritime).* Currently the RIS Directive envisages continuity with other modal traffic management services, in particular with maritime. However, no further details are included, and no technical standard has been developed along these lines. Therefore, this measure aims to strengthen the interoperability of RIS with other modes of transport, but not create new or duplicate existing systems. The Directive will provide a clear reference to the European Maritime Single Window environment (EMSWe) and introduce requirements for the exchange of information with RIS (e.g. regarding the ETA of a vessel to the port), along with the main principles and technical requirements for the links between the two systems. Similarly, a provision will also be included for links of RIS with systems of other modes (to be indicated by Member States). As identified in the PLATINA III project[92] such connections are important for the coordination of shipments and increasing the supply chain visibility for shippers and logistic providers. The technical specifications will be developed by CESNI (in collaboration with the standard setting entities for the other systems) and introduced through secondary legislation. A common data exchange mechanism (such as application programming interfaces) will be developed to enable both systems to access the data of one another. An important principle in their development will be to anticipate the possibility for links with other systems in the future.

- *PM15: Require sharing of all necessary cross-border data for traffic and transport management by the Member States.* Currently not all information provided by vessel operators to authorities is shared with the authorities of other Member States, which creates a challenge when crossing borders as in many cases the information needs to be retransmitted. This measure would require Member States to share cross-border all necessary data that is required for traffic and transport management. This includes for example information provided by vessel operators regarding the cargo, the position of the vessel, ERI information, but also the exchange of information between authorities such as changes in the navigation parameters, limitations of traffic, speed, etc. Member States will need to invest in digital tools, which will now be used to process reports. Vessel operators will only be required to report once (e.g. for the cargo report), as when a border is crossed the information will be exchanged between the authorities and not resubmitted by the vessel operator.

[92] https://platina3.eu/download/economic-barriers-to-modal-shift/?wpdmdl=1123&refresh=65100c29521071695550505

- *PM16: Specify more clearly the cases for exchange of personal data*. Due to concerns express by stakeholders on handling of personal data, and as it is not always clear on which basis the data is being processed and whether this is allowed, authorities are reluctant to process and transmit positioning information to other authorities. This in turn leads to resubmission of the information by the vessel operators to different national authorities or refusal to share information. Under this measure, the RIS Directive would provide more clarity on the specific cases and legal basis where exchange of personal data would be justified (e.g. for reasons of safety, to streamline the process, etc.). This measure is designed to work in complementarity with PM12, PM13 and PM15 as it covers a specific case (personal data) that they do not. Member States would therefore need to assess if personal data and accordingly consider how best to apply the provisions of GDPR to ensure that RIS information is shared efficiently. They would have to develop and maintain an application where the position of the vessel through AIS can be used for port-related matters, such as berth management and collection of port fees, and benefit from a simpler procedure of handing this information. Vessel operators will not be required to resubmit information (unless there is a change).

- *PM17: Develop templates and standards for the exchange of personal data*. The difference of this measure with PM16 is that it goes beyond in that it will develop and mandate new standards and technical specifications for the exchange of personal information when this is required by national or international legislation. It will thus provide a further step of harmonisation. The roles of all stakeholders is similar to that of PM16.

Expected importance of measures

The importance of the measures is linked to the importance of the problem driver they address, as well as their expected impact in addressing the driver. In this regard, ERDMS (PM6) and CESNI (PM10) are the most important measures. As they are both supported by the stakeholders, they are included in all policy options. The first is important as it will be the basis of accurate and up-to-date basic information on the rivers and in a sense the "IT library" for the functioning of RIS. It will contribute to addressing the lack of coherence of technical specifications and provide a basis for links with the multimodal system. In addition, further developments in digitalisation and information cannot take place unless this information is available (for example, an automated vessel will require accurate information on the gap between river and a bridge in order to navigate safely). PM10 is likewise of high importance as it will change the currently inefficient technical specifications setting and adoption procedure and ensure that they updated more regularly. It is a tried and tested measure as reference to CESNI technical specifications has already been introduced by Directive (EU) 2016/1629 laying down technical requirements for inland waterway vessels and by Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation. CESNI has been able to provide the necessary updates to these technical specifications on average every two years, which is a significant improvement compared to the current process for adoption of RIS technical specifications. Both these measures were considered to have high potential to address the respective problem drivers by the sector experts in the DINA/NAIADES expert group meeting.

Among the other measures, the introduction of a RIS platform (PM9) is very important. It is an existing EU funded project, providing reliable fairway, infrastructure, traffic and transport information services, including route and transport planning, for the waterways of the partner countries, as well as a common electronic reporting system. The system was developed voluntarily by 13 Member States with inland waterways, with EU funding, and in 2023 it has entered its second development stage. This measure will mandate the use application of RIS COMEX in all waterways covered by the Directive. It will thus develop into the IT backbone for the provision of RIS and one

upon which the other measures introducing new requirements (e.g. the links with inland ports) will be built. Vessel operators, national authorities and software providers will use this platform for all RIS interactions in the daily operations. Vessel operators will have to interact with one single system instead of each national one. By monitoring the flow and usage of RIS COMEX the Commission will benefit of a set of indicators to monitor the performance of RIS (as explained also in section 9). An important element is that by mandating the system, its operation and usage, a high standard of harmonisation is ensured and coverage of the whole relevant network.

The complaint handling mechanism (PM2) is also an important measure in that it will provide a path to identify and rectify problems in the implementation of the Directive and the secondary acts. This will be done based on a bottom-up approach, at a Member State level, thus enhancing subsidiarity. The Commission will benefit of an overview of the state of implementation.

Finally, the need to support the integration of inland waterways into the multimodal supply chains was identified as an important problem driver by the stakeholders. Two measures (i.e. adding new technical specifications for navigation and voyage planning (PM4), as well as with the systems of other modes (PM14)) address this problem driver. These measures aim to cover different aspects, and in particular the exchange of cargo information, the smooth operation with the inland ports (which are the transhipment centres for IWT cargo), and the direct links with other modes which can help streamline operations in the supply chain as a whole.

5.2.4 Description of the policy options

As explained in section 5.2.2, the measures were combined in three policy packages, which have been designed to address all policy drivers and contribute to all policy objectives. They differ in the level of ambition and obligations that they introduce. No alternative policy options or packages of measures were suggested by stakeholders.

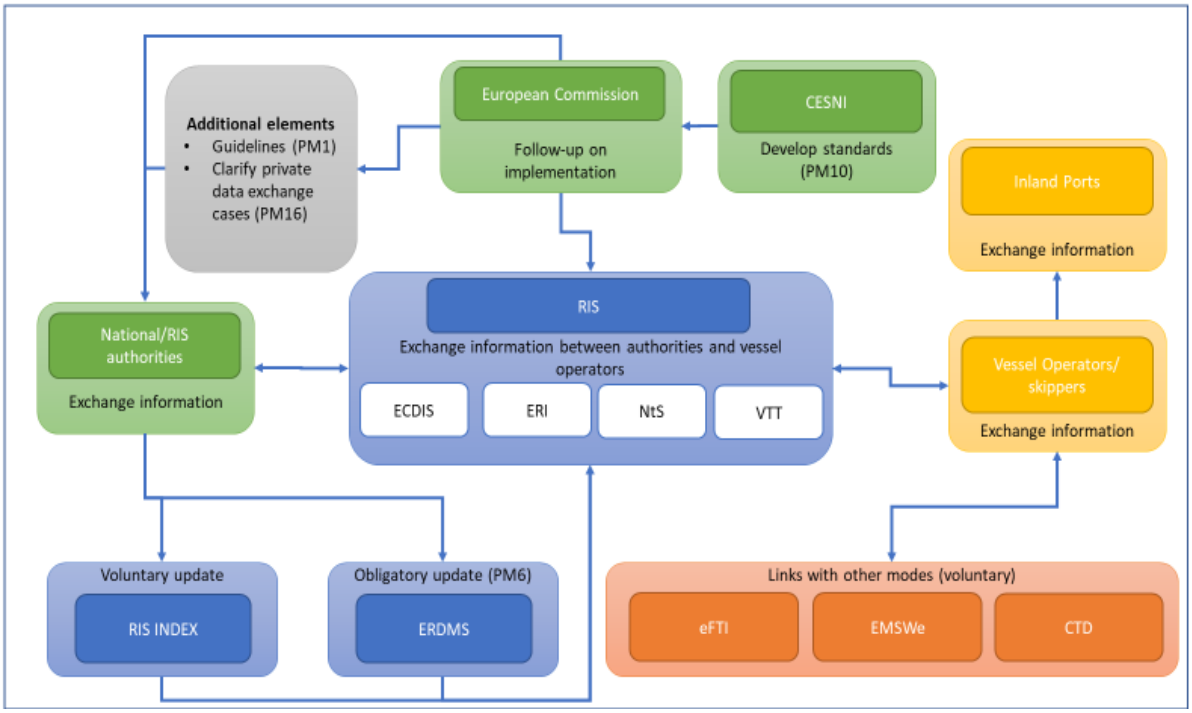
Policy option A (PO-A)

Policy option A proposes a basic update of the Directive addressing the basic identified shortcomings but without changing the scope. The overall structure of RIS, as regards the technology elements, and the way information is exchanged between stakeholders remains mainly the same (such as described in section 1). Interpretative guidelines on the technical specifications and their application by the Member States (PM1) play a central role, as a non-regulatory measure in this policy option. An important new element is also the introduction of CESNI with a role in the development of technical specifications (PM10). Member States will be required to increase the frequency by which they provide updates to the ERDMS (PM6), as well as to set up a complaint handling mechanism (PM2) for RIS users to report issues with the implementation to RIS (and will need to report in turn to the European Commission on an annual basis). Cargo-related information exchange will be encouraged through the eFTI mechanism (PM7). Finally, Member States will have to assess (based on provided clarifications under PM16) the extent to which personal data are concerned and ensure that they are processed in the appropriate way.

In terms of addressing the different specific objectives, for SO1 *(Ensure improved RIS data availability, and harmonised standards)*, the harmonisation aspect will be tackled by the interpretative guidelines (PM1), combined with the complaint handling mechanism (PM2) and the development of technical specifications by CESNI (PM10), whose updates should also correct possible issues (including unclarity) with existing technical specifications that affect harmonisation. Data availability will be tackled by the requirement to Member States to provide frequent updates to the ERDMS database (PM6). For SO2 (*Facilitate the integration of IWT into the multimodal chain)*, an up-to-date ERDMS database (PM6) is important to ensure that the latest information required for

the performance of IWT is available. Providing the cargo information through an eFTI platform, even on voluntary basis by the vessel operators (PM7), sets the basis for this information to be re-used by authorities and other RIS users, as appropriate, in planning and organising logistic operations. As regards SO3 (*Ensure a higher uptake and interoperability of digital solutions, and address data protection concerns)*, the option to exchange the cargo-required data through eFTI (PM7) would be an important step towards an interoperability of digital systems in a multimodal environment. Finally, PM16, as explained in section 5.2.3, is specifically designed to address the data protection concerns, by guiding Member States to take appropriate action.

Figure 10: RIS structure under PO-A



Source: European Commission

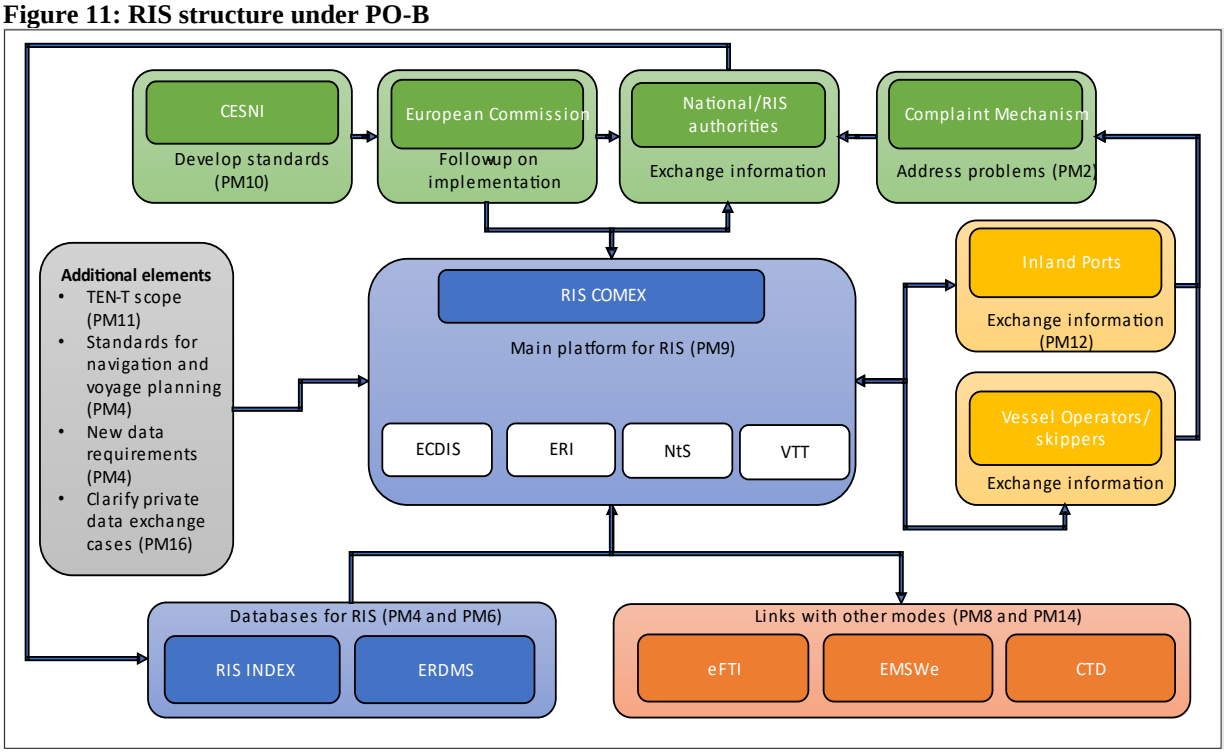
Policy option B (PO-B)

Policy option B, retains several measures from PO-A like the complaint mechanism (PM2), ERDMS requirement (PM6), CESNI (PM10) and the clarification regarding personal data (PM16). However, it goes beyond PO-A by adding elements on key areas of the Directive. It introduces an important change in the architecture of RIS, as it brings RIS COMEX (PM9) as the central node for the exchange of information and the provision of services. Unlike the baseline and PO-A, information now is not exchanged directly between the different users (like the vessel operator with inland ports) but it is done through the platforms and functionalities of RIS COMEX. New technical specifications on navigation and voyage planning (PM4), that are currently missing, are introduced and will provide additional information to vessel operators. The exchange of information takes also a more prominent role. The reporting of cargo information through eFTI becomes mandatory for vessel operators (PM8), who will now also have the option to exchange operational information electronically with inland ports (PM12). The exchange of operational information will also be possible with other modes of transport (PM14). RIS will focus on the most important waterways as its scope will match that of the TEN-T waterways (PM11).

In terms of addressing the different specific objectives, for SO1 *(Ensure improved RIS data availability, and harmonised standards)*, on top of PM2, PM6 and PM10 (discussed under PO-A), vessel operators will have access to more information regarding the situation in the waterways

(PM4), while RIS COMEX (PM9) will provide a single platform for information, replacing the need to refer to several national ones. For SO2 (*Facilitate the integration of IWT into the multimodal chain)*, measures PM4, PM6 and PM9 also contribute (in addition to addressing SO1). The voluntary exchange of information with inland ports (PM12) will allow those vessel operators that chose this option to exchange information necessary for logistic operations. This is also the case of standards and links with other modes in PM14. The mandatory reporting of cargo information through eFTI for vessel operators (PM8) will also contribute towards ensuring improved RIS data availability. Furthermore, by ensuring that the scope is the same as for the TEN-T, focus is put on multimodal operations. Finally, for SO3 (*Ensure a higher uptake and interoperability of digital solutions, and address data protection concerns)* in addition to PM8 (as the mandatory version of PM7), and PM16 (already included in PO-A), the use of RIS COMEX (PM9) will create a single platform simplifying the interaction with digital systems. The links with inland ports (PM12) and other modes (PM14), as described in section 5.2.3, are specifically designed to increase interoperability.

Figure 11: RIS structure under PO-B



Source: European Commission. Note: RIS COMEX includes also RIS COMEX 2 and all applications such as EuRIS and CEERIS

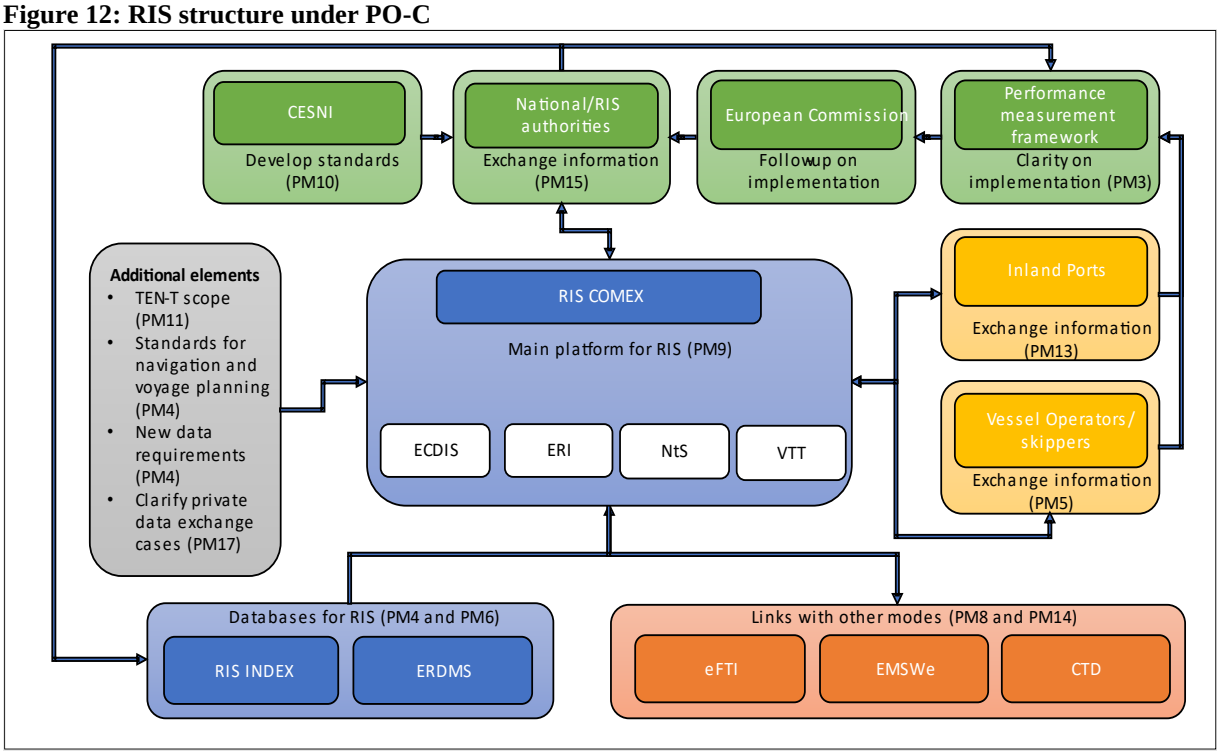
Policy option C (PO-C)

Policy option C adds two mandatory measures to PO-B, namely the electronic voyage planning (PM5) and the exchange of data with inland ports (PM13), which introduce a new framework for traffic management and for technical developments such as digitalisation and automation. It also introduces a new Performance Measurement Framework (PM13).

In terms of addressing the specific objectives, for SO1 *(Ensure improved RIS data availability, and harmonised standards)*, PO-C includes several policy measures as in PO-B (PM4, PM6, PM9 and PM10). In addition, the introduction of a performance measurement framework (PM3), to control the performance of RIS in a top-down approach, is proposed instead of the bottom-up approach used in the complaint handling mechanism (PM2 under PO-A and PO-B). A new requirement on electronic voyage plan reporting (PM5) will provide additional information on the current and

expected traffic in the waterways and allow national authorities to plan waterway traffic. For SO2 (*Facilitate the integration of IWT into the multimodal chain)*, measures PM4, PM6, PM8, PM9, PM11 and PM14 will perform the same way as for PO-B. A significant change is that now vessel operators will be required to electronically exchange operational information with inland ports (PM13); this was voluntary under PM12 in PO-B. Moreover, the requirement for Member States to share cross border data for traffic and transport management purposes (PM15) would directly facilitate the exchange of data not only within IWT, but also unlock potential for other modes. The electronic voyage planning (PM5) will also contribute towards SO2. Finally, for SO3 (*Ensure a higher uptake and interoperability of digital solutions, and address data protection concerns)*, on top of the measures discussed under PO-B (PM8, PM9 and PM14), by moving from a voluntary to a mandatory exchange of information with inland ports (PM13) will force, by design, vessel operators to take up this application. Mandating the cross-border sharing of data for traffic and transport management purposes (PM15) will force Member States to use electronic applications for this exchange. In addition, in relation to data protection PO-C would introduce specific templates and standards for the exchange of personal information (PM17) within RIS (compared to simple clarifications as in PM16 under PO-A and PO-B).

Figure 12: RIS structure under PO-C



Source: European Commission. Note: RIS COMEX includes also RIS COMEX 2 and all applications such as EuRIS and CEERIS.

6 WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

This section summarizes the main expected economic, social and environmental impacts of each policy option (PO)[93]. The proposed measures included in the policy options are assumed to be implemented from 2025 onwards, so that the assessment has been undertaken for the 2025-2050 period, and it refers to EU27. Costs and benefits are expressed as present value over the 2025-2050

[93] The analysis in this section is based on Ramboll et al. (2024), Impact assessment support study.

period, using a 3% discount rate. All costs and benefits are expressed in 2022 prices. Further details on the methodological approach are provided in Annex 4.

6.1 Economic impacts

This section provides the economic impacts of the policy options on the national public authorities, the European Commission and the private sector (vessel operators and RIS software services providers). It also provides an assessment of impacts on small and medium enterprises (SMEs), the functioning of the internal market and competition, competitiveness, digital by default, congestion and territorial impacts. The assessment of economic impacts draws on multiple data sources, including the targeted stakeholders' consultation (interviews and survey) and public consultation, and findings from desk research in the context of the impact assessment support study[94].

6.1.1 Impact on national public authorities

National public authorities include all Member States' bodies responsible for ensuring the implementation of RIS. All policy options are expected to lead to adjustment costs, administrative costs and administrative cost savings for national authorities (see Table 3 and Table 4). Each category of costs/costs savings is discussed below, while a detailed analysis including the estimates and the assumptions used for deriving the costs and costs savings for each policy measure included in the policy options is provided in Annex 4. Summary tables by policy option and policy measure, for 2030, 2040 and 2050 and expressed as present value over 2025-2050 relative to the baseline are also provided in section 3 of Annex 4.

One-off adjustment costs for national public authorities. All policy options are expected to lead to one-off adjustment costs for the national administrations (see Table 3). In **PO-A** these cover investment costs for setting up the complaint mechanism (PM2), investment costs for adapting existing data flows so that RIS cargo-related information is linked with eFTI (PM7) and costs for developing applications that would handle personal data (PM16), with a total cost estimated at EUR 5.6 million in 2025 relative to the baseline. More specifically, the costs for setting up the complaint mechanism (PM2) would amount to EUR 2.76 million in 2025, which is three times the recurrent annual costs for running the mechanism, based on the experience of European Maritime Safety Agency for setting up the e-certificate registry. Regarding investment costs for adapting existing data flows so that RIS cargo-related information is linked with eFTI (PM7), there are currently five systems in place: BICS (the Netherlands), eRIBa (Belgium), VELI (France), NAMIB (Germany), and CEERIS (Rest of Europe). Based on feedback from RIS authorities during the stakeholders' consultation process, the investment costs for adjusting each of these systems are estimated at around EUR 250,000 per system. Thus, the total one-off adjustment costs for PM7 would amount to EUR 1.25 million in 2025, relative to the baseline. The investment costs for developing applications that would handle personal data (PM16) are estimated at EUR 5,839 per port (in 2022 prices)[95]. For the 265 ports, the total one-off costs due to PM16 would amount to EUR 1.55 million in 2025 relative to the baseline.

In addition, **PO-B** would require investments in hardware and software to gather and share information for navigation and voyage planning (PM4), to implement new technical specifications for the exchange of information with ports (PM12), and to integrate RIS information systems with

[94] Ramboll et al. (2024), Impact assessment support study.
[95] Based on the DINA study (Source: European Commission (2017), Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes – Final report).

information systems of other modes (PM14). For PM4, based on interviews with the Dutch Directorate General for Public Works and Water Management (Rijkswaterstaat), the costs for the Netherlands are estimated at EUR 500,000. Extrapolating to the other twelve Member States, based on each country's share of the network in terms of length and infrastructure elements such as locks and bridges, the total one-off costs for PM4 are estimated at EUR 4.55 million relative to the baseline. To implement new technical specifications for the exchange of information with ports (PM12), investment costs per port are estimated at EUR 29,197 in 2022 prices, based on the DINA study[96]. Assuming that all 54 core ports of the European TEN-T network for which no RIS data is available would implement the new technical specifications, the total one-off costs due to PM12 would amount to EUR 1.58 million in 2025. For PM14, the IT investment costs are based on the CoRISma project and are estimated at EUR 3.14 million relative to the baseline[97].

The compulsory connection with eFTI (PM8) is assumed to have the same cost as the optional connection in PO-A (EUR 1.25 million), as the same digital requirements will apply. The inclusion of new Member States in RIS COMEX (PM9) will also require some investment costs, estimated at EUR 3.5 million. As a result, in PO-B the total one-off adjustment costs for national authorities are estimated at EUR 18.3 million in 2025 relative to the baseline.

PO-C has few common measures with PO-B (PM4, PM8, PM9 and PM14) that lead to the same adjustment costs. In addition, in PO-C investment costs are needed for developing the software that can process and convert the voyage plan notification messages from inland waterway operators into accurate lock predictions (PM5) and for software to exchange information with the authorities of other Member States (PM15). For PM5, building on estimates for the Netherlands from the Dutch Directorate General for Public Works and Water Management (Rijkswaterstaat), the costs for the other Member States have been derived based on the network usage and the size of the network in each Member State, relative to that of the Netherlands. The one-off costs due to PM5 are estimated at EUR 3.07 million in 2025 relative to the baseline. For PM15, investment costs are estimated at EUR 5 million, based on comparable projects in the rail freight sector (ELETA and EDICT). Compared to PO-B, mandating the exchange of information with ports (PM13)[98] increases the total costs compared to PM12, and similarly for the costs of development of personal data exchange templates (PM17[99] in PO-C, compared to PM16 in PO-A and PO-B).

Thus, the one-off adjustment costs in PO-C are estimated to be the highest, at EUR 28.2 million in 2025 compared to the baseline, followed by PO-B (EUR 18.3 million) and PO-A (EUR 5.6 million).

Table 3: One-off adjustment costs for national public authorities by policy option and measure in 2025, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM2	2.76	2.76	
PM4		4.55	4.55

[96] Source: European Commission (2017), Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes – Final report.
[97] CoRISMa was a TEN-T project running between January 2014 and December 2015 that studied and defined the next steps in the development of RIS.
[98] The investment costs per port are the same as in PM12, estimated at EUR 29,197 in 2022 prices. However, in PM13 they apply to 169 ports.
[99] The investment costs for such an application are estimated at EUR 10,219 per port (in 2022 prices) based on the DINA study. The total one-off adjustments costs for all 265 ports are thus estimated at EUR 2.71 million.

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM5			3.07
PM7	1.25		
PM8		1.25	1.25
PM9		3.50	3.50
PM12		1.58	
PM13			4.93
PM14		3.14	3.14
PM15			5.00
PM16	1.55	1.55	
PM17			2.71
Total one-off adjustment costs	**5.56**	**18.33**	**28.15**

Source: Ramboll et al. (2024), impact assessment support study

Recurrent administrative costs for national public authorities. Under **all policy options** (see Table 4), Member States will need to provide the information required by the RIS Directive to the ERDMS (PM6). For the Netherlands, PM6 is estimated to require additional 1.5 full time equivalents (FTE) relative to the baseline, based on the feedback received during the stakeholders' consultation. This has been extrapolated to the other Member States based on the size of their network in relation to that of the Netherlands. Assuming 240 working days per year and 7.3 hours of work per day on average and using the tariff per hour for non-manual workers (ISCO 8 – Plant and machine operators and assemblers) from Eurostat Structure of earnings survey, the recurrent administrative costs for national public authorities due to PM6 are estimated at EUR 0.66 million per year relative to the baseline from 2025 onwards.

Moreover, the complaint mechanism introduced by **PO-A** and **PO-B** is expected to generate administrative costs for handling the RIS related complaints (PM2). The recurrent administrative costs for PM2, totalling EUR 0.92 million per year from 2025 onwards, are estimated based on the costs for the Netherlands (EUR 150,000) provided by Rijkswaterstaat, and the network usage and the size of the network in each Member State relative to that of the Netherlands. Furthermore, PO-A and PO-B entail administrative costs of EUR 0.39 million per year for managing and maintaining the system of exchange of personal data (PM16)[100]. **PO-B** is additionally expected to result in recurrent administrative costs for maintaining and updating the system for the collection and update of data for voyage planning and navigation (RIS Index) on a regular basis (PM4), for managing the exchange with the ports (PM12), as well as with the systems of other modes (PM14). The recurrent administrative costs for PM4, PM12 and PM14 are assumed to be 25% of the investment costs in PM4, PM12 and PM14, respectively, based on the DINA study.

In **PO-C**, the common measures with PO-B (PM4, PM6 and PM14) would result in the same costs. In addition, PO-C would also lead to recurrent administrative costs for the collection and processing of data for the new Performance Measurement Framework (PM3)[101], higher costs for maintaining

[100] Recurrent administrative costs are assumed to be 25% of the investment costs in PM16 based on the DINA study, or EUR 1,460 per port.

[101] Based on two interviews with national authorities, it is estimated that each of the 13 Member States using inland waterways for commercial purposes would spend EUR 50,000 per year.

the information exchange systems with ports (PM13) and the systems for exchange of personal data (PM17), as well as the maintenance of the system for the electronic voyage plan reporting (PM5)[102].

Overall, PO-C is estimated to lead to the highest recurrent administrative costs, estimated at EUR 5.9 million per year relative to the baseline (see Table 4), followed by PO-B (EUR 4.3 million per year), and PO-A (EUR 2 million per year). Expressed as present value over 2025-2050, they are estimated at EUR 104.3 million in PO-C, EUR 75.3 million in PO-B and EUR 34.9 million in PO-A relative to the baseline (see Table 67 in section 3 of Annex 4).

Recurrent administrative cost savings for national public authorities. In **PO-A**, by introducing the information exchange of cargo data through eFTI (PM7), national public authorities are expected to benefit of reduced efforts as all cargo reports would be reported in an electronic manner (see Table 4). According to the estimates provided by the Dutch authorities, a total elimination of the paper reports would lead to a reduction in the effort required equivalent to 8 full time equivalents (FTE) relative to the baseline. Considering the voluntary system in PM7, a 50% reduction in the paper cargo reports is assumed, equivalent to 4 FTEs saved relative to the baseline in 2026. This is extrapolated to the other Member States based on their respective transport activity relative to that of the Netherlands. In addition, the growth in the number of paper cargo reports over time is also taken into account. The costs savings have been estimated assuming 240 working days per year and 7.3 hours of work per day on average and using the tariff per hour for non-manual workers (ISCO 8 – Plant and machine operators and assemblers) from Eurostat Structure of earnings survey. They are projected at EUR 0.62 million in 2030 and EUR 0.74 million in 2050, relative to the baseline.

In **PO-B** and **PO-C**, mandating cargo-related information to be exchanged through the eFTI mechanism (PM8) is expected to lead to higher costs savings (EUR 1.25 million in 2030 and EUR 1.47 million in 2050, relative to the baseline) than for PM7, due to the full elimination of the paper reports[103]. The use of RIS COMEX (PM9) in PO-B and PO-C will bring further costs savings of EUR 0.5 million per year, relative to the baseline, by gradually replacing the national platforms. **PO-C** will result in additional costs savings relative to PO-B through reduced efforts for controls at borders (PM15). Based on interviews during the stakeholders' consultation, border officers spend on average 5 minutes for these controls on each side of the border. Considering the labour cost per hour (EUR 26.7 per hour) and the number of vessels that cross borders where a control is established (87,420 on average), the administrative costs savings for national public authorities due to PM15 are estimated at EUR 0.39 million per year from 2026 onwards relative to the baseline.

Overall, PO-C is estimated to lead to the highest recurrent administrative costs savings, estimated at EUR 2.1 million in 2030 and EUR 2.4 million in 2050 relative to the baseline (see Table 4), followed by PO-B (EUR 1.8 million costs savings in 2030 and EUR 2 million in 2050), and PO-A (EUR 0.6 million costs savings in 2030 and EUR 0.7 million in 2050). Expressed as present value over 2025-2050, they are estimated at EUR 37.4 million in PO-C, EUR 30.6 million in PO-B and EUR 11.4 million in PO-A relative to the baseline (see Table 67 in section 3 of Annex 4).

[102] Recurrent administrative costs for PM5, PM13 and PM17 are assumed to be 25% of the investment costs in PM5, PM13 and PM17, respectively, based on the DINA study.

[103] According to the estimates provided by the Dutch authorities, a total elimination of the paper reports would lead to a reduction in the effort required equivalent to 8 full time equivalents (FTE) relative to the baseline.

Table 4: Recurrent costs and costs savings for national public authorities by policy option and measure in 2030, 2040 and 2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Administrative costs	**1.97**	**1.97**	**1.97**	**4.29**	**4.29**	**4.29**	**5.91**	**5.91**	**5.91**
PM2	0.92	0.92	0.92	0.92	0.92	0.92			
PM3							0.65	0.65	0.65
PM4				1.14	1.14	1.14	1.14	1.14	1.14
PM5							0.77	0.77	0.77
PM6	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM12				0.39	0.39	0.39			
PM13							1.23	1.23	1.23
PM14				0.79	0.79	0.79	0.79	0.79	0.79
PM16	0.39	0.39	0.39	0.39	0.39	0.39			
PM17							0.68	0.68	0.68
Administrative cost savings	**0.62**	**0.68**	**0.74**	**1.75**	**1.86**	**1.97**	**2.14**	**2.24**	**2.36**
PM7	0.62	0.68	0.74						
PM8				1.25	1.36	1.47	1.25	1.36	1.47
PM9				0.50	0.50	0.50	0.50	0.50	0.50
PM15							0.39	0.39	0.39
Net costs	**1.34**	**1.29**	**1.23**	**2.54**	**2.43**	**2.31**	**3.78**	**3.67**	**3.55**

Source: Ramboll et al. (2024), impact assessment support study

Net costs for national public authorities. All policy options result in net costs for national public authorities. Net recurrent costs are estimated to be the highest in PO-C (EUR 3.8 million in 2030 and EUR 3.6 million in 2050 relative to the baseline), followed by PO-B (EUR 2.5 million in 2030 and EUR 2.3 million in 2050) and PO-A (EUR 1.3 million in 2030 and EUR 1.2 million in 2050). These come in addition to the one-off costs of EUR 28.2 million in PO-C, EUR 18.3 million in PO-B and EUR 5.6 million in PO-A. Expressed as present value over 2025-2050 relative to the baseline (see Table 67 in section 3 of Annex 4), PO-C results in the highest net one-off and recurrent costs for national public authorities of EUR 95 million, followed by PO-B (EUR 63 million) and PO-A (EUR 29.1 million).

6.1.2 Impact on the European Commission

Adjustment costs for the European Commission. PO-A is expected to lead to one-off adjustment costs for the Commission, for the development of guidelines (PM1). The development of the guidelines is assumed to proceed in two steps. A study will be carried out to compile the required elements and propose several options for the establishment of the technical specifications. In a second stage, an expert group will use the findings of the study to draft the guidelines. The one-off costs of the study are estimated at EUR 400,000. The average cost for a two-day workshop hosted by European Commission (EC), where participants are reimbursed by the EC, is around EUR 30,000. Two of such in-person workshops may be required as well as two online meetings. Compensation for the experts contributing to the online meetings is estimated at EUR 5,000 for each meeting. Therefore, the one-off adjustment costs for the European Commission are estimated at EUR 0.47 million in 2025. No additional costs for the Commission are foreseen in PO-B and PO-C relative to the baseline.

6.1.3 Impact on businesses

The two categories of businesses expected to be affected by this initiative are the vessel operators and the RIS software service providers[104] (see Table 5 and Table 6). Detailed explanations on the estimates and assumptions used for deriving the costs and costs savings for each policy measure included in the options and each stakeholder group are provided in Annex 4. Summary tables by policy option, policy measure, and stakeholder group for 2030, 2040 and 2050 and expressed as present value over 2025-2050 relative to the baseline are also provided in section 3 of Annex 4.

Vessel operators

Administrative costs for vessel operators. Only **PO-C** is expected to lead to administrative costs for vessel operators (see Table 5). In PO-C, the recurrent administrative costs for vessel operators are due to the mandatory electronic voyage plan reporting (PM5), as vessel operators will need to spend more time in preparing these reports (estimated at around 1 hour per voyage). Based on replies by inland skippers in the context of stakeholders' consultation, preparing and communicating a voyage plan will take 34 minutes for the first notification and 14 minutes for follow-up notifications. The total number of vessel voyages (passenger and freight) is projected at 729,880 in 2030 and 744,806 in 2050 in the baseline. It is estimated that for these voyages 729,880 first notifications would be required in 2030 and 744,806 in 2050, as well as 1,416,312 follow-up notifications in 2030 and 1,518,409 in 2050[105]. Thus, the additional administrative costs due to PM5 are estimated at EUR 19.7 million in 2030 and EUR 20.6 million in 2050 relative to the baseline. Expressed as present value over 2025-2050 they are estimated at EUR 367.5 million relative to the baseline. For the purpose of the *'one in, one out' approach*, the average annual administrative costs per vessel voyage are estimated at EUR 27.1, while the average number of vessel voyages during 2025-2035 at EUR 727,100. The annual average administrative costs for 2025-2035 due to PM5 are thus estimated at EUR 19.7 million in PO-C.

As explained in section 1, the turnover of the sector was EUR 7 billion in 2020[106], and this is expected to grow over time in line with the projected transport activity. Therefore, the costs of PO-C are estimated to represent a very small share of the turnover, while PO-A and PO-B result in no additional costs for vessel operators.

Adjustment costs savings for vessel operators. **PO-A** is expected to bring adjustment cost savings to vessel operators in the form of reduced effort to plan their journey due to the guidelines (PM1) and due to the better RIS data as problems get resolved through the complaint mechanism (PM2). In the baseline scenario, the time required for preparing an international trip is estimated at 15 minutes and that for a domestic trip at 10 minutes. Based on discussions with training institutes in inland navigation (and validated by the sector in the targeted workshop), trip preparation time for international trips is expected to decrease by 2.5 minutes relative to the baseline from 2026 onwards due to PM1 and by 8% for international and domestic trips due to PM2 (1.2 minutes for international trips and 0.8 minutes for domestic trips). PM1 is expected to lead to adjustment costs savings of EUR 0.49 million in 2030 and EUR 0.5 million in 2050 relative to the baseline, while

[104] It should be noted that all the costs savings related to software have been assigned to the providers. However, depending on the relative negotiation power of vessel operators and software service providers, a part of these savings could potentially be passed on to vessel operators.
[105] For further details see Annex 4.
[106] https://transport.ec.europa.eu/facts-funding/studies-data/eu-transport-figures-statistical-pocketbook/statistical-pocketbook-2023_en

PM2 at costs savings of EUR 0.35 million in 2030 and EUR 0.36 million in 2050. Furthermore, improved quality of RIS data in the ERDMS (PM6) will reduce the time needed for voyage planning. Based on feedback from vessel operators, the time needed for voyage planning can be reduced by 20% due to PM6 (2 minutes saved for each domestic voyage and 3 minutes saved for each international trip) relative to the baseline, equivalent to costs savings of EUR 0.85 million in 2030 and EUR 0.86 million in 2050. Thus, total adjustment cost savings in PO-A are estimated at around EUR 1.7 million in 2030 and 2050 relative to the baseline (see Table 5), equivalent to EUR 29.6 million expressed as present value over 2025-2050.

PO-B includes the same benefits as PO-A for PM2 and PM6, with additional adjustment costs savings coming from reduced efforts for voyage planning due to better navigation information (PM4). The time needed for voyage planning can be reduced by 15% due to PM4 (1.5 minutes saved for each domestic voyage and 2.25 minutes saved for each international trip), based on feedback from vessel operators, equivalent to costs savings of EUR 0.63 million in 2030 and EUR 0.65 million in 2050. Savings for voyage planning will also materialise for skippers thanks to the centralisation of information in the RIS platform (PM9) and the better exchange with ports for planning their voyage (PM12). In PM9, a 50% reduction in the time required for preparing an international voyage is assumed (7.5 minutes) from 2026 onwards relative to the baseline, based on stakeholders' feedback, equivalent to costs savings of EUR 1.48 million in 2030 and EUR 1.51 million in 2050. With regard to PM12, an average of 5 minutes per port call is assumed for trip preparation for the ports' section in the baseline. In the process, important information should be retrieved, such as how deep the port is in relation to the depth of the channel, as well as where berths are and where loading/unloading can take place, etc. This information is difficult to obtain now. The new technical specification for ports will facilitate the voyage preparation for the ports' section. Based on stakeholders' input, PM12 could reduce the time for voyage planning by 21% per port call (1 minute saved), equivalent to costs savings of around EUR 0.17 million in 2030 and in 2050 relative to the baseline. Total adjustment costs savings in PO-B are estimated at EUR 3.5 million in 2030 and EUR 3.6 million in 2050 relative to the baseline (see Table 5), equivalent to EUR 72.1 million expressed as present value over 2025-2050.

In **PO-C**, savings for vessel operators for PM4, PM6 and PM9 are the same as in PO-B. In addition, the new performance measurement framework (PM3) is expected to bring savings in the time needed to plan the voyage due to more accurate information, while the electronic voyage plan reporting (PM5) will lead to operation costs savings (i.e. fuel costs savings) due to more efficient voyages. For PM3, the vessel operators that responded to the survey estimated that the time spent on planning trips will decrease by 4% on average relative to the baseline (0.6 minutes for each international trip and 0.4 minutes for each domestic trip) from 2026 onwards, equivalent to costs savings of around EUR 0.18 million in 2030 and in 2050. For PM5, operation costs savings for vessel operators are expected through reduced speed of ships and less manoeuvring movements (e.g. braking the ship, mooring at waiting jetties, leaving and entering the lock). These savings are mainly related to the crossing of locks and adaptation of the speed in the proximity of a lock (i.e. the last hour). The adjustment of speed in the proximity of a lock (i.e. during the last hour) is estimated to lead to 5% savings in fuel consumption. Based on statistics for the Netherlands, vessels cross on average 4 locks per trip. Also considering the total number of voyages and a consumption of 60 litres per hour of sailing, savings are estimated at around 0.9% of the energy consumption (9.3 kilo

tonnes of oil equivalent in 2030 and 8.3 kilo tonnes of oil equivalent in 2050), equivalent to costs savings of EUR 15.04 million in 2030 and EUR 15.24 million in 2050 relative to the baseline[107].

Better managing of cargo information and exchanges with ports for planning the voyage (PM13) is also expected to lead to adjustment costs savings. Based on stakeholders' input, PM13 could reduce the time for voyage planning per port call by 65% (3.2 minutes saved) relative to the baseline from 2026 onwards, equivalent to costs savings of EUR 0.52 million in 2030 and EUR 0.53 million in 2050. Thus, the total adjustment cost savings for vessel operators in PO-C are estimated at EUR 18.7 million in 2030 and EUR 19 million in 2050 relative to the baseline (see Table 5), equivalent to EUR 324 million expressed as present value over 2025-2050.

Administrative cost savings for vessel operators. All policy options result in administrative costs savings for vessel operators (see Table 5). In **PO-A**, skippers will spend less time in re-registering cargo information as reporting will be possible through eFTI (PM7). Around 30% of all cross-border trips are estimated to require repeated notifications. Based on the interviews and stakeholders' survey, repeated notifications take around 15 minutes per vessel operator. PM7 is expected to reduce the share of repeated notifications by 10 percentage points relative to the baseline from 2026 onwards, equivalent to administrative costs savings of around EUR 0.29 million in 2030 and in 2050.

Legal clarity for private data exchanges (PM16) will reduce re-reporting efforts in **PO-A** and **PO-B**. It is estimated that PM16 would lead to a decrease by 20% in the number of resubmitted reports to ports relative to the baseline (72,988 reduction in 2030 and 74,481 in 2050). The resubmission of electronic cargo reports to ports takes around 10 minutes per port call. Thus, the costs savings due to PM16 are estimated at EUR 0.32 million in 2030 and EUR 0.33 million in 2050 relative to the baseline[108]. For the purpose of the *'one in, one out' approach*, the average reduction in the number of resubmitted cargo reports over 2026-2035 due to PM16 has been estimated at 72,799 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings for vessel operators due to PM16 are estimated at EUR 0.32 million relative to the baseline.

Both **PO-B** and **PO-C** will bring administrative cost savings to vessel operators (savings in PO-C being higher) due to the reduction in the number of cargo reports resubmitted to inland ports (PM12 in PO-B and PM13 in PO-C, see Table 5). The time for preparing and re-submitting the reports is estimated at 10 minutes in the baseline. For PM12, administrative costs savings are expected for all 83 core TEN-T network ports. PM12 could reduce the number of resubmitted cargo reports by 31% relative to the baseline, equivalent to costs savings of EUR 0.51 million in 2030 and EUR 0.52 million in 2050. In PM13, all 262 inland ports of the core and comprehensive TEN-T network will be automatically receiving the (electronic) cargo reports and therefore, vessel operators will not have to resubmit them. Thus, the costs savings for PM13 are estimated at EUR 1.62 million in 2030 and EUR 1.66 million in 2050 relative to the baseline. For the purpose of the *'one in, one out' approach*, the average reduction in the number of resubmitted cargo reports due to PM12 over

[107] The projected average energy prices per tonne of oil equivalent (toe), from the baseline scenario developed with the PRIMES-TREMOVE model, have been used to estimate the adjustment costs savings. These average prices per toe take into account the projected development of the fuel mix, including biofuels, electricity and e-fuels.

[108] The weighted average of the tariff per hour for non-manual workers (ISCO 8 – Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS (EUR 26.7 per hour), based on Eurostat Structure of earnings survey, is used to estimate the costs.

2026-2035 is estimated at 114,006 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings for vessel operators due to PM12 during 2026-2035 are estimated at EUR 0.5 million relative to the baseline. For PM13, the average reduction in the number of resubmitted cargo reports over 2026-2035 is estimated at 363,996 per year relative to the baseline and the average annual administrative costs savings at EUR 1.6 million.

In PO-B and PO-C, administrative costs savings for vessel operators are also expected due to the use of eFTI for the cargo reporting that reduces resubmissions (PM8), as well as through the use of RIS COMEX as the single platform (PM9) (see Table 5). Around 30% of all cross-border trips are estimated to require repeated notifications. Based on the interviews and stakeholders' survey, repeated notifications take around 15 minutes per vessel operator. PM8 is expected to reduce the share of repeated notifications by 20 percentage points relative to the baseline from 2026 onwards, equivalent to costs savings of EUR 0.57 million in 2030 and EUR 0.59 million in 2050. In addition, when the use of RIS COMEX, including the CEERIS tool, becomes mandatory, vessel operators on the Danube will benefit from a single electronic notification of cargo data. Thus, PM9 is expected to reduce the share of repeated notifications by 8 percentage points relative to the baseline from 2026 onwards, equivalent to costs savings of EUR 0.22 million in 2030 and EUR 0.23 million in 2050. For the purpose of the *'one in, one out' approach*, in PM8 the average reduction in the number of repeated notifications over 2026-2035 is estimated at 88,397 per year relative to the baseline and the average costs saved per repeated notification at EUR 6.5. Thus, the average annual administrative costs savings for vessel operators due to PM8 during 2026-2035 are estimated at EUR 0.6 million relative to the baseline. For PM9, the average reduction in the number of repeated notifications over 2026-2035 is estimated at 34,448 per year relative to the baseline and the average annual administrative costs savings at EUR 0.2 million.

In addition, in **PO-C** vessel operators will also benefit from costs savings due to the reduction in the number of resubmissions of cargo reports when crossing borders (PM15) and to ports, driven by the improved clarity on the exchanges of information which may contain personal data (PM17). Considering the synergies with PM8 and PM9 (both included in PO-C), PM15 is expected to reduce the share of repeated notifications by 2 percentage points relative to the baseline from 2026 onwards, equivalent to costs savings of EUR 0.06 million in 2030 and EUR 0.07 million in 2050. In PM17, by clarifying instances when Automatic Identification System (AIS) data can and cannot be shared, it is estimated that the number of resubmitted reports to ports would decrease by 30% relative to the baseline from 2026 onwards, equivalent to costs savings of EUR 0.49 million in 2030 and EUR 0.50 million in 2050.

Total administrative costs savings for vessel operators (see Table 5) are estimated to be the highest in PO-C (around EUR 3 million in 2030 and in 2050) relative to the baseline, followed by PO-B (EUR 1.6 million in 2030 and EUR 1.7 million in 2050) and PO-A (around EUR 0.6 million in 2030 and in 2050). Expressed as present value over 2025-2050 they are estimated at EUR 51.9 in PO-C, EUR 28.5 million in PO-B and EUR 10.7 million in PO-A relative to the baseline scenario.

Table 5: Recurrent costs and costs savings for vessels operators by policy option and measure in 2030, 2040 and 2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Administrative costs	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**19.74**	**20.16**	**20.60**
PM5							19.74	20.16	20.60
Adjustment costs savings	**1.69**	**1.70**	**1.73**	**3.48**	**3.50**	**3.55**	**18.70**	**18.04**	**18.98**
PM1	0.49	0.50	0.50						

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
PM2	0.35	0.36	0.36	0.35	0.36	0.36			
PM3							0.18	0.18	0.18
PM4				0.63	0.64	0.65	0.63	0.64	0.65
PM5							15.04	14.36	15.24
PM6	0.85	0.85	0.86	0.85	0.85	0.86	0.85	0.85	0.86
PM9				1.48	1.49	1.51	1.48	1.49	1.51
PM12				0.17	0.17	0.17			
PM13							0.52	0.53	0.53
Administrative costs savings	**0.61**	**0.62**	**0.62**	**1.63**	**1.64**	**1.66**	**2.97**	**2.99**	**3.03**
PM7	0.29	0.29	0.29						
PM8				0.57	0.58	0.59	0.57	0.58	0.59
PM9				0.22	0.22	0.23	0.22	0.22	0.23
PM12				0.51	0.51	0.52			
PM13							1.62	1.63	1.66
PM15							0.06	0.06	0.07
PM16	0.32	0.33	0.33	0.32	0.33	0.33			
PM17							0.49	0.49	0.50
Net costs savings	**2.30**	**2.32**	**2.35**	**5.11**	**5.14**	**5.22**	**1.93**	**0.88**	**1.42**

Source: Ramboll et al. (2024), impact assessment support study

Net costs savings for vessel operators. Overall, all policy options are estimated to result in net costs savings for vessel operators. The costs savings are expected to be the highest in PO-B (EUR 5.1 million in 2030 and EUR 5.2 million in 2050) relative to the baseline, followed by PO-A (EUR 2.3 million in 2030 and EUR 2.4 million in 2050) and PO-C (EUR 1.9 million in 2030 and EUR 1.4 million in 2050). Expressed as present value over 2025-2050, they are estimated at EUR 100.6 million in PO-B, EUR 40.2 million in PO-A and EUR 8.4 million in PO-C relative to the baseline (see Table 62 in section 3 of Annex 4).

RIS software services providers

Adjustment costs savings for software services providers. Providers of RIS software services are expected to benefit of costs savings thanks to access to more and better quality data. More specifically, **PO-A** will lead to adjustment costs savings as the guidelines (PM1) and the provision of data to the ERDMS by the Member States (PM6) will reduce the efforts of introducing data in their systems and correcting mistakes. The complaint mechanism will also streamline the procedure of contacting authorities to report incorrect data (PM2). The average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices) in the baseline. Considering the evolution of the fleet in the baseline scenario the total costs for navigation software service providers for introducing the data into their systems are estimated at EUR 7.2 million in 2030 and EUR 7.3 million in 2050. According to feedback provided by the RIS software service providers (i.e. by the two navigation software service providers that serve around 90% of the market) during the second stakeholder survey, PM1 would allow to reduce the average cost per vessel by 1% relative to the baseline (i.e. EUR 4.52 saved per vessel) from 2026 onwards. PM6 is estimated to reduce the average cost per vessel by 2% relative to the baseline (i.e. EUR 9.04 saved per vessel), while PM2 by 0.5% (i.e. EUR 2.26 saved per vessel). The total adjustment costs savings for software services providers in PO-A are thus estimated at around EUR 0.3 million in 2030 and in 2050 relative to the baseline (see Table 6).

In **PO-B**, the costs savings due to PM2 and PM6 are the same as in PO-A. In addition, adjustment costs savings for software services providers are expected because of obtaining easier and better-quality data through the RIS Index (PM4), from RIS COMEX (PM9), from ports (PM12) and from better links with the systems of other modes (PM14). For PM4, based on stakeholders' feedback, the average cost reduction per vessel is estimated at 2% relative to the baseline (i.e. EUR 9.04 saved per vessel), equivalent to total costs savings of EUR 0.14 million in 2030 and EUR 0.15 million in 2050 (see Table 6). For PM9, the average cost reduction per vessel is estimated at 1% relative to the baseline (i.e. EUR 4.52 saved per vessel), while for PM12 at 0.75% (i.e. EUR 3.39 saved per vessel) and for PM14 at 0.25% (i.e. EUR 1.13 saved per vessel). Thus, total costs savings due to PO-B are estimated at around EUR 0.5 million in 2030 and in 2050 relative to the baseline (see Table 6).

In PO-C, besides the costs savings due to PM4, PM6, PM9 and PM14 that are the same as in PO-B, software services providers will benefit from access to more and better-quality data thanks to the new performance measurement framework (PM3) and the link with the inland ports (PM13). For PM3, the reduction in the average cost per vessel is estimated at 0.25% (i.e. EUR 1.13 saved per vessel), based on stakeholders' feedback, equivalent to total costs savings of EUR 0.02 million in 2030 and in 2050 relative to the baseline. For PM13, the reduction in the average cost per vessel is estimated at 1.25% (i.e. EUR 5.65 saved per vessel), equivalent to total costs savings of EUR 0.09 million in 2030 and in 2050 relative to the baseline. Thus, total adjustment costs savings for software services providers in PO-C are estimated at around EUR 0.5 million in 2030 and in 2050 relative to the baseline.

Expressed as present value over 2025-2050 relative to the baseline (see Table 64 in section 3 of Annex 4), the highest costs savings for RIS software services providers are estimated for PO-C (EUR 8.4 million), followed by PO-B (EUR 8.1 million) and PO-A (EUR 4.4 million).

Table 6: Adjustment costs savings for navigation software services providers by policy option and measure in 2030, 2040 and 2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
PM1	0.07	0.07	0.07						
PM2	0.04	0.04	0.04	0.04	0.04	0.04			
PM3							0.02	0.02	0.02
PM4				0.14	0.14	0.15	0.14	0.14	0.15
PM6	0.14	0.14	0.15	0.14	0.14	0.15	0.14	0.14	0.15
PM9				0.07	0.07	0.07	0.07	0.07	0.07
PM12				0.05	0.05	0.05			
PM13							0.09	0.09	0.09
PM14				0.02	0.02	0.02	0.02	0.02	0.02
Total adjustment costs savings	**0.25**	**0.25**	**0.26**	**0.47**	**0.47**	**0.47**	**0.48**	**0.49**	**0.49**

Source: Ramboll et al. (2024), impact assessment support study

6.1.4 Impact on new reporting obligations

For *national public administrations*, in **all policy options** Member States would need to provide all information required by the RIS Directive to the European Reference Data Management System (due to PM6), which contains regularly updated data necessary for the provision of RIS and is owned and operated by the European Commission. As explained in section 6.1.1, PM6 would lead to recurrent administrative costs for national public administrations estimated at EUR 0.66 million per year from 2025 onwards, equivalent to EUR 12.2 million expressed as present value over 2025-2050 relative to the baseline. It should however be noted that thanks to PM6 the time needed for

voyage planning can be reduced by 20%, leading to adjustment costs savings for vessel operators of EUR 0.85 million in 2030 and EUR 0.86 million in 2050, or EUR 14.8 million expressed as present value over 2025-2050 relative to the baseline. In addition, for software services providers the adjustment costs savings due to PM6 are estimated at EUR 0.14 million in 2030 and EUR 0.15 million in 2050, equivalent to EUR 2.5 million expressed as present value over 2025-2050 relative to the baseline[109]. Thus, the costs related to reporting obligations for national public authorities due to PM6 are outweighed by the costs savings for businesses (vessel operators and software services providers). In addition, **PO-C** requires Member States (measure PM3) to report to the Commission, on a regular basis, on key performance indicators (e.g. the number of shipping messages issued in accordance with standards and interpretations from the most recent RIS encoding guide, and the number of electronic cargo reports received in relation to the number of voyages). The recurrent administrative costs for national public administrations due to PM3 are estimated at EUR 0.65 million per year from 2025 onwards, or EUR 12 million expressed as present value over 2025-2050 relative to the baseline. At the same time, PM3 is estimated to lead to adjustment costs savings for vessel operators (around EUR 0.18 million in 2030 and in 2050, equivalent to EUR 3.1 million expressed as present value over 2025-2050 relative to the baseline) and software providers (around EUR 0.02 million in 2030 and in 2050, equivalent to EUR 0.3 million expressed as present value over 2025-2050 relative to the baseline).

For *businesses*, no reporting obligations arise in **PO-A** and **PO-B**. **PO-C** includes a requirement on electronic voyage plan reporting (PM5) for vessel operators. As explained in section 6.1.3, this requirement would lead to recurrent administrative costs for vessel operators estimated at EUR 19.7 million in 2030 and EUR 20.6 million in 2050, equivalent to EUR 367.5 million expressed as present value over 2025-2050 relative to the baseline. At the same time, PM5 is expected to result in energy savings for vessel operators estimated at EUR 15 million in 2030 and EUR 15.2 million in 2050, or EUR 248.7 million expressed as present value over 2025-2050 relative to the baseline.

6.1.5 Impacts on SMEs

According to Eurostat, around 5,500 IWT freight transport companies are active in Europe (EU plus Bosnia-Herzegovina, Serbia and Switzerland), employing more than 23,000 persons. In addition, there are around 4,000 passenger companies which employ around 14,000 persons. While no data is available at EU level for the number of Small and Medium Enterprises (SMEs) within the IWT sector, one characteristic of the IWT sector is the high number of SMEs. According to the CCNR, the majority of companies in Western Europe are small family owned operating one or two vessels, while companies in the Danube region are bigger as they derive from previously state-owned enterprises. For the software providers CESNI provides a list of around 20 companies as providers for ECDIS and inland AIS[110], while a Member State expert estimated the potential number to be up to 50 companies. A review of the information related to these companies, based on their public websites, indicates that the majority of them are SMEs, employing less than 250 employees. At the same time, it should be noted that two navigation software service providers serve around 90% of the market. Therefore, the initiative is considered "relevant" for the SMEs due to the high share of SME vessel operators and software companies within the IWT sector. It is not however considered

[109] Software service providers carry out quality checks on the data and correct erroneous data if necessary, when receiving complaints. Obliging RIS authorities to periodically update the data, the number of errors is expected to decrease. This would also reduce the efforts required for navigation software service providers to obtain correct data.

[110] Lists of approved authorities, firms, installations and equipment in the field of technical requirements for inland navigation vessels. (cesni.eu)

as “highly relevant” due to the small size of the IWT sector. The SME test has been therefore performed (see Annex 6).

As explained in section 6.1.3, all policy options are expected to result in net costs savings for vessel operators and navigation software services providers. More specifically, for vessel operators PO-B would result in net costs savings estimated at EUR 100.6 million, expressed as present value over 2025-2050 relative to the baseline, followed by PO-A (EUR 40.2 million) and PO-C (EUR 8.4 million). It should however be noted that PO-C would also result in additional administrative costs, relate to the obligation of reporting the electronic voyage plan (PM5), estimated at EUR 27.1 per vessel journey. However, even PO-C results in overall net costs savings for vessel operators due to the significant energy savings entailed by PM5 and costs savings entailed by other measures included in this option. When considering the impact of each measure, as explained in section 3 of Annex 4, for **vessel operators** this will primarily materialise in time saved for planning voyages and improvements in navigation efficiency (as they will be warned of bottlenecks and thus adapt their speed), and administrative costs in case of PM5 (included in PO-C) as their reporting obligations will increase. **Software services providers** would benefit of costs savings, as a result of higher quality data to be used in their software which will reduce their efforts to collect this information, of EUR 8.4 million in PO-C, EUR 8.1 million in PO-B and EUR 4.4 million in PO-A, expressed as present value over 2025-2050 relative to the baseline. Considering the very large share of SMEs among vessel operators and software services providers, most of these net costs savings are expected to be attributed to them although the available data did not allow a split of these costs savings between the two groups of operators (i.e. SME and others).

6.1.6 Impact on the functioning of the internal market and competition

All policy options are expected to have a positive impact on the functioning of the internal market. Improving the information exchange between the different actors in the IWT sector allows to deliver better inland transport services. By harmonising the provision of RIS between Member States, an important step is taken towards the completion of the single market as vessel operating in different parts of the EU will not be confronted with different operational requirements. Vessel operators that cross borders will also benefit from more standardised reporting requirements and high-quality of information. Thus, an important barrier is removed. PO-A would lead to limited impacts on harmonisation, and thus on internal market, while PO-B and PO-C will benefit vessel operators to a larger extent as they contain more detailed harmonisation provisions. Software services providers will also benefit from higher quality of underlying data which will help them in developing and offering competitive products. The better integration of IWT sector in the internal market will in turn increase its ability to compete for cross border carriage of goods.

6.1.7 Impact on competitiveness

As explained in section 1, IWT is quite active in the transport of non-time sensitive goods (e.g. bulk or liquid cargo). To increase the competitiveness of intermodal inland waterways transport, focus is needed on incentivising the transport of goods that are more time sensitive (i.e. typically the container market). For this market segment, reliability is important and IWT would need to match the higher reliability standards of road transport, which benefits from a reduced number of actors (door-to-door services, less handling) and higher flexibility (in particular compared to “network” modes, like IWT and rail).

Several policy measures are expected to have an impact on modal shift, away from road transport to intermodal inland waterway transport. In particular PM4 is expected to increase the efficiency in navigation, as improved data (e.g. on waiting times or obstacles) will improve navigation

performance. PM14 will have a similar effect through improved links with the systems of other modes (e.g. the estimated time of arrival will be available, which in turn will contribute to the optimisation of the logistics chain). This will lead to increased performance, predictability and reliability of the intermodal IWT sector, increasing the potential to attract freight from other modes. The impact of PM4 and PM14 (both included in PO-B and PO-C) on modal shift has been assessed together, due to the synergies between the measures.

No study has been identified that examines the issue of reliability in the IWT sector. However, a 2019 TRT study[111], examining the modal shift potential for rail, provides a good approximation for identifying the impact of improved reliability for intermodal IWT. Like IWT, rail is also a "network" mode (though with a wider network) and it also carries both time-sensitive and cost-sensitive goods. The study found that the lack of punctuality was the most important reason provided by the surveyed logistics operators and freight forwarders for not choosing rail instead of road. It further estimated (through a stated preference survey) the impact of an increase in reliability in shifting freight away from road (i.e. the cross elasticity). Given the similarities between rail and IWT, the fact that both compete against road, and in the absence of further specific research, the results of the rail study are used as a proxy for estimating the potential modal shift from road to IWT. In addition, sensitivity analysis has been performed and is presented in section 7.6.

As explained above, based on the results of a stated preference survey run as part of the 2019 TRT study, a linear correlation between punctuality and modal shift potential has been identified. More specifically, the study indicates that for each 10% increase in punctuality a 6.1% increase in transport demand could be expected. To determine the impact on reliability for the inland waterway sector, information on average waiting times at locks has been collected in the context of the impact assessment support study[112] and the impact on reliability has been derived based on desk-research[113]. In the baseline scenario, the total travel time for freight inland waterways transport is estimated at 12 million hours in 2025, 12.19 million hours in 2030 and 12.42 million hours in 2050, while the waiting time at 0.54 million hours in 2025, 0.55 million hours in 2030 and 0.56 million hours in 2050. The reliability of travel time in inland shipping is thus estimated at 95.5% in the baseline scenario. Information on the position of the ship and the expected arrival time of ships can increase the reliability by a maximum of 4.5%. Drawing on the correlation between the increase in punctuality and transport demand from the TRT study, the model shift potential is estimated at 2.7% relative to the baseline. This modal shift potential is only applied to intermodal transport[114], as not all goods transported by road may be suitable for transport by IWT, while the IWT network is much more limited compared to that of road. Drawing on the evolution of freight IWT activity in the baseline scenario, the model shift potential and the share of intermodal transport in IWT, the transport activity shifted from road to freight IWT in PO-B and PO-C is estimated at 0.35 billion tonne-kilometres (tkm) in 2026, 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050. More details are provided in Annex 4 (section 4).

Vessel operators suggested that measures such as exchange of information through the eFTI mechanism (PM7 in PO-A and PM8 in PO-B and PO-C) as well as links with ports (PM12 in PO-B and PM13 in PO-C) may also have a positive impact on increasing the competitiveness of the IWT sector. However, they impacts are expected to be more limited than those of PM4 and PM14. As no

[111] https://www.corridor-rhine-alpine.eu/files/downloads/others/Transport%20Market%20Study%202018.pdf
[112] An average waiting time per lock of 20 minutes and a reliability value of 43 minutes (i.e. variance of 23 minutes) have been estimated. A barge passes an average number of 4 locks per voyage.
[113] IMA (2021) of the Department of Public Works.
[114] Based on Eurostat data, around 7.7% of inland waterway transport is intermodal container transport.

quantitative input was provided by stakeholders and considering their limited expected impact, no further analysis was undertaken.

While the revision of the RIS Directive will make the EU inland waterway transport more efficient and reliable, including positive impacts on neighbouring countries such as Serbia and Ukraine which are already voluntarily applying RIS Directive, the initiative has no impact on the international competitiveness of the sector.

6.1.8 Impacts on innovation

The NAIADES III Action Plan indicates the need for the inland waterway transport sector to keep up with digital developments to improve the sector's competitiveness and ensure that it becomes an active part of a broader multimodal chain[115]. Innovation in inland navigation is both necessary to maintain its modal share and to improve its performance.

All policy options are expected to positively affect the IWT sector's capacity to innovate. By providing better quality RIS data they will lead to the provision of more accurate services and eventually set the basis upon which further digital applications can be developed (for example for planning and optimisation of navigation, avoidance of obstacles and warning of navigation hazards, etc.). In all policy options the introduction of cargo information through eFTI will increase the quantity and quality of information available in the eFTI platforms, which then could feed the development of business-to-business applications. In addition, in PO-B and PO-C the increased links and exchange of information with other modes has the potential to improve multimodality and will allow developers of logistics and travel planning and cargo management applications to include IWT in their solutions.

In the medium to long term, the information provided by RIS regarding navigation and the digital exchange of information will become an important basis for the development and operation of automated vessels and smart shipping[116]. As the availability of high-quality data is an essential prerequisite for the use automated inland vessels, the uptake of smart shipping is related to the policy measures aiming to create high-level quality data (PM6 and PM10 in all policy options, and PM4 and PM9 in PO-B and PO-C). PO-A is expected to have a limited impact on enabling the uptake of smart shipping as it will only promote better quality RIS data through provisions for supplying data to the ERDMS (PM6) and faster development of technical specifications by CESNI (PM10). In PO-B and PO-C, the new technical specifications on data for navigation and voyage planning (PM4) and the information exchange through the RIS COMEX platform (PM9) will

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[115] COM/2021/324 final

[116] Smart shipping is based on the concepts of automation and digitalisation (see Platina 3 Report on requirements towards digital and automated inland navigation tools from the infrastructure operator and user perspective D4.3). Smart shipping refers to the largely autonomous operation of inland vessels. It covers not only on-board technologies, but also the design of ports and waterways so that, using data collected by sensors, a ship can manoeuvre autonomously or prompt the crew to take action (see Smart Shipping: comprehensive automation in the maritime sector | Maritime transport and seaports | Government.nl)[116]. Smart shipping is still in the initiation phase (pilot projects and research). The main barrier to the uptake of smart shipping is IWT regulation (including crewing) which does not currently allow the commercial use of automated inland vessels. There are also no dedicated automation standards available (see Innovative Inland Navigation, https://repository.uantwerpen.be/docman/irua/d3e895/157179.pdf). The fact that smart shipping is still in its initiation phase means that at this stage only very limited data is available for the quantification of the innovation impact of the proposed measures on smart shipping. Therefore, the assessment of the innovation impact of the relevant proposed measures is conducted on a qualitative basis.

further enable the uptake of smart shipping. Overall, based on the analysis above PO-B and PO-C are expected to have higher positive impacts on innovation in the IWT sector than PO-A.

6.1.9 Digital by default

All policy options will have a positive impact on the application of the 'digital by default' principle. PO-A is expected to have a more limited positive impact relative to the baseline, driven by the improved quality of the underlying data for RIS (PM6), faster development of technical specifications by CESNI (PM10) and by encouraging the use of eFTI for data exchange (PM7). The positive impact of PO-B is assessed to be higher due to the introduction of RIS COMEX as the main platform for exchange of RIS information (PM9), a platform that is also the basis for the development of digital applications for other measures under consideration. Furthermore, by mandating the use of eFTI (PM8) and introducing better links with ports (PM12) and other modes (PM14), PO-B improves the interoperability of IWT through digital solutions. PO-C goes a step further, with higher positive impacts on digitalisation than PO-B and PO-A, as it requires electronic voyage plan reporting (PM5) and the exchange of cross-border data (PM15), and mandates electronic exchange with ports (PM13).

6.1.10 Impacts on congestion

As discussed in section 6.1.7, measures PM4 and PM14 (included in PO-B and PO-C) are expected to lead to higher use of freight IWT and a shift away from road transport, thus in turn reducing road congestion[117]. The reduction in the external costs of road congestion in PO-B and PO-C are estimated at EUR 4.7 million in 2030 and EUR 5.6 million in 2050 relative to the baseline (in 2022 prices)[118]. Expressed as present value over 2025-2050, this is equivalent to EUR 86.8 million in PO-B and PO-C. No impact on congestion is expected in PO-A. More details are provided in Annex 4 (section 4).

6.1.11 Territorial impacts

As explained in section 1, the interconnected waterway network of 13,000 km covers 13 Member States (Austria, Belgium, Bulgaria, Czechia, Germany, France, Croatia, Hungary, Luxembourg, the Netherlands, Poland, Romania and Slovakia) serving over 250 TEN-T inland ports in the TEN-T network. Thus, the initiative and the analysis is limited to the relevant Member States and their waterways.

The inland waterways transport sector is small in terms of market size (EUR 7 billion of turnover in 2020, compared to EUR 454 billion for road transport and EUR 61 billion for rail) and inland modal share (6% of freight inland traffic, compared to 77% for road transport and 17% for rail). In addition, the impacts of all policy options in terms of net costs savings for vessel operators are estimated at less than 0.1% of the annual turnover of the sector. As no significant impact is expected due to the initiative, a territorial impact assessment has not been performed. Nevertheless, it should be noted that the positive impacts due to the policy options are expected to be localised around the inland ports of the 13 Member States concerned, and within the rivers themselves. The positive impacts of the modal shift in terms of congestion, safety and environment will primarily materialise

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[117] IWT does not suffer congestion.

[118] The reduction in the external costs of road congestion are estimated based on the reduction in the road transport activity and the unit values from the 2019 Handbook on the external costs of transport (Source : Internalisation of transport external costs (europa.eu))

in the areas from which traffic is shifted away from road. Their magnitude is however also very limited, due to the small size of the sector.

6.2 Social impacts

The social impacts are assessed in terms of impacts on safety and fundamental rights.

6.2.1 Impacts on safety

In PO-B and PO-C, implementing new RIS technical specifications (PM4) and improving the links with the systems of other modes (PM14), induces higher use of IWT and a shift away from road transport (see section 6.1.7) that has an *indirect positive impact on road safety*. More specifically, the reduction in the road freight transport activity relative to the baseline (by 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050) is estimated to lead to a reduction in the external costs of accidents, estimated at EUR 6.3 million in 2030 and EUR 7.5 million in 2050[119]. Expressed as present value over 2025-2050, PO-B and PO-C are projected to result in savings in the external costs of accidents of EUR 115.8 million relative to the baseline. No significant impacts are expected in PO-A relative to the baseline.

In the baseline scenario the number of accidents in IWT is projected to increase from 529 in 2015, to 535 in 2030 and 551 in 2050, driven by the increase in the transport activity. According to Intergo (2021)[120], accidents in inland navigation are due to human error in 70 to 80% of the cases. Statistics published by Eurostat and Rijkswaterstaat indicate that most reported accidents involve grounding, collisions with infrastructure or collisions with other ships. Measures that aim to improve the situational awareness of the vessel operators (PM4 in PO-B and PO-C, PM5 in PO-C and PM6 in PO-A, PO-B and PO-C) should have a *positive impact on avoiding accidents in IWT*. The evaluation indicated that water level messages concerning bridge passages can avoid collision with infrastructure, and messages related to traffic can help avoid collisions between ships. Given that up to date and accurate under keel clearance heights are only made available for a very limited number of bridges, providing such information is expected to have a positive impact on the safety in the IWT sector. However, the evaluation did not succeed in quantifying such benefits. In addition, the information provided during the stakeholder consultation on the impact assessment did not allow to identify a clear indicator that could be used to reflect the impact of these measures on avoiding accidents. While a quantitative assessment was not possible, the impacts of PO-B and PO-C on safety in the IWT sector are expected to be higher than those of PO-A.

6.2.2 Impacts on fundamental rights

The policy options were assessed to determine if they have an impact on the fundamental rights and/or equal treatment of EU citizens. The starting point of the assessment of the fundamental rights is the Charter of Fundamental Rights of the European Union[121]. All policy options were assessed having regard to the relevant EU instrument and it was concluded that they maintain full respect for human and fundamental rights, and none will have any negative impact thereon. Furthermore, none

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[119] The 2019 Handbook on the external costs of transport (Source: https://op.europa.eu/en/publication-detail/-/publication/9781f65f-8448-11ea-bf12-01aa75ed71a1) has been used to monetise the costs. According to the Handbook, the external cost of a fatality in 2022 prices is estimated at EUR 3.9 million and that of a serious injury at EUR 0.6 million.

[120] Intergo (2021), Human factors root causes of accidents in inland navigation: Organisational Aspects, retrieved from: Report phase 2b organisational aspects __final_2.02 Main report (inlandwaterwaytransport.eu)

[121] OJ C 326 of 26.10.2012 p.2

of the policy options mandate the exchange of personal data, but only provide more clarity (through PM16 and PM17) on the conditions under which the handling of personal information by national authorities is allowed (PM16), or define the technical aspects of how such an exchange should be done through RIS if appropriate (PM17). This is fully in line with applicable legislation, thus increasing legal clarity for users of RIS services.

6.3 Environmental impacts

The environmental impacts are assessed in terms of impacts on CO_2 emissions, air pollution emissions, noise reduction and effects on habitats. More detailed information is provided in section 4 of Annex 4 (see Table 71 to Table 76).

CO_2 emissions. As explained in section 6.1.7, in PO-B and PO-C, implementing new RIS technical specifications (PM4) and improving the links with the systems of other modes (PM14) would result in higher use of IWT and a reduction in the road freight transport activity relative to the baseline (by 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050). This is expected to result in CO_2 emissions savings estimated at 22.5 thousand tonnes in 2030 and 5.6 thousand tonnes in 2050 relative to the baseline. PO-C is estimated to have further impact in reducing CO_2 emissions relative to PO-B through the reduced energy use of IWT vessels, as mandating electronic voyage planning (PM5) will increase the situational awareness in the fairways and thus lead to more efficient navigation. PM5 is estimated to result in 22.7 thousand tonnes of CO_2 emissions saved in 2030 and 9 thousand tonnes saved in 2050. Thus, the highest reduction in CO_2 emissions is estimated for PO-C (45.2 thousand tonnes saved in 2030 and 14.5 thousand tonnes saved in 2050), followed by PO-B with 22.5 thousand tonnes saved in 2030 and 5.6 thousand tonnes saved in 2050, relative to the baseline. Cumulatively, over 2025-2050, CO_2 emissions savings are estimated at 832.1 thousand tonnes in PO-C and 389.1 thousand tonnes in PO-B relative to the baseline. No significant impact on CO_2 emissions is expected for PO-A. Using the unit costs of CO_2 emissions from the 2019 Handbook on external costs of transport, the reduction in the external costs of CO_2 emissions for PO-C is estimated at EUR 5.4 million in 2030 and EUR 4.6 million in 2050, relative to the baseline, and for PO-B at EUR 2.7 million in 2030 and EUR 1.8 million in 2050 (see Table 7). Expressed as present value over 2025-2050, this is equivalent to EUR 105.2 million saved in PO-C and EUR 48.6 million in PO-B.

Air pollution. The drivers for the impacts on NOx and particulate matter (PM) emissions are the same as those for CO_2 emissions. PO-B is however expected to result in a limited increase in the NOx and PM emissions relative to the baseline (for NOx: 19.7 tonnes in 2030 and 21.3 tonnes in 2050, and for PM: 3.2 tonnes in 2030 and 1.6 tonnes in 2050), due to the modal shift from road transport to IWT. This is because in the baseline scenario road vehicles are projected to increase their performance in terms of air pollution emissions faster than the IWT vessels, thanks to the Euro standards. Cumulatively, over 2025-2050, PO-B would result in 603.2 additional tonnes of NOx and 60.8 additional tonnes of PM emissions relative to the baseline. PO-C results in additional energy savings relative to PO-B, due to better travel information and adaptation of travel speed (PM5), which reduces air pollution. Overall, in terms of NOx emissions, PO-C results in 367.6 tonnes saved in 2030 and 129.5 tonnes saved in 2050, while in terms of PM emissions it results in 17 tonnes saved in 2030 and 6.3 tonnes saved in 2050 relative to the baseline. Cumulatively, over 2025-2050, PO-C would result in 6,552.3 tonnes of NOx saved and 338.8 tonnes of PM emissions saved.

Using the unit costs of air pollution emissions from the 2019 Handbook on external costs of transport, PO-B is estimated to result in an increase in the external costs of air pollution emissions estimated at EUR 0.7 million in 2030 and EUR 0.6 million in 2050, while PO-C would result in a reduction in external costs projected at EUR 9.4 million in 2030 and EUR 3.3 million in 2050

relative to the baseline (see Table 7). Expressed as present value over 2025-2050, the increase in the external costs of air pollution in PO-B is estimated at EUR 13.1 million and the reduction in PO-C at EUR 127.6 million relative to the baseline. No significant impact on air pollution emissions is expected for PO-A.

Noise reduction. Modal shift from road transport to IWT in PO-B and PO-C, driven by the implementation of PM4 and PM14, is projected to reduce noise emissions along the European road network, as less heavy goods vehicles will be circulating on the roads. Drawing on the 2019 Handbook on external costs of transport, the reduction in the external costs of noise emissions is estimated at EUR 2 million in 2030 and EUR 2.4 million in 2050, relative to the baseline (see Table 7). Expressed as present value over 2025-2050, the savings in external costs are estimated at EUR 36.6 million relative to the baseline in PO-B and PO-C. No significant impact on noise reduction is expected for PO-A.

Habitats. Modal shift from road transport to IWT in PO-B and PO-C would contribute to improving habitat quality along the European road network, by reducing the disturbance created by road transport crossing fragile natural areas. With an increase in waterborne transport, more disturbance of habitats is expected along the rivers. However, drawing on the 2019 Handbook on external costs of transport, the modal shift is projected to result in net gain. The external costs related to habitats are estimated to reduce by EUR 2 million in 2030 and EUR 2.3 million in 2050, relative to the baseline (see Table 7). Expressed as present value over 2025-2050, this is equivalent to savings in external costs of EUR 36.2 million in PO-B and PO-C relative to the baseline. No significant impact on habitats is expected for PO-A.

Table 7: Impact on external costs of CO_2 emissions, air pollution emissions, noise and habitats relative to the baseline in 2030, 2040 and 2050 (in million EUR, 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
CO2 emissions	**0.0**	**0.0**	**0.0**	**-2.7**	**-3.1**	**-1.8**	**-5.4**	**-7.1**	**-4.6**
PM5							-2.7	-3.9	-2.9
PM4&PM14				-2.7	-3.1	-1.8	-2.7	-3.1	-1.8
Air pollution	**0.0**	**0.0**	**0.0**	**0.7**	**0.9**	**0.6**	**-9.4**	**-6.0**	**-3.3**
PM5							-10.2	-6.8	-4.0
PM4&PM14				0.7	0.9	0.6	0.7	0.9	0.6
Noise	**0.0**	**0.0**	**0.0**	**-2.0**	**-2.2**	**-2.4**	**-2.0**	**-2.2**	**-2.4**
PM4&PM14				-2.0	-2.2	-2.4	-2.0	-2.2	-2.4
Habitats	**0.0**	**0.0**	**0.0**	**-2.0**	**-2.1**	**-2.3**	**-2.0**	**-2.1**	**-2.3**
PM4&PM14				-2.0	-2.1	-2.3	-2.0	-2.1	-2.3
Total impact on external costs	**0.0**	**0.0**	**0.0**	**-5.9**	**-6.6**	**-5.9**	**-18.7**	**-17.4**	**-12.7**

Source: Ramboll et al. (2024), impact assessment support study; Note: negative values refer to a reduction in external costs and positive values to an increase relative to the baseline.

PO-B and PO-C are consistent with the environmental objectives of the ***European Green Deal*** and the ***European Climate Law***[122], while PO-A has no significant impact in this respect. PO-B and PO-C contribute towards Sustainable Development Goal 13 ('Take urgent action to combat climate change and its impacts'). ***No significant harm*** is expected on the environment in any of the policy options.

[122] Regulation (EU) 2021/1119

7 HOW DO THE OPTIONS COMPARE?

7.1 Effectiveness

The assessment of effectiveness looks at the extent to which the general and specific objectives (SO) of the intervention, as previously described, are met. Table 8 provides the links between policy objectives and assessment criteria.

Table 8: Links between objectives and assessment criteria

General objective	Specific objectives	Assessment criteria
Provide an effective framework for the deployment and use of harmonised River Information Services in the EU, that enables improvements in the competitiveness and safety of the sector, and its contribution towards the European Green Deal objectives	**SO1** - Ensure improved RIS data availability, and harmonised standards	Expected increase in harmonisation of RIS between Member States
	SO2 - Facilitate the integration of IWT into the multimodal chain	Expected increase in IWT operation performance Expected increase in exchanges with other transport modes
	SO3 - Ensure higher uptake and interoperability of digital solutions, and address data protection concerns	Expected simplification of the process for RIS data exchange Expected uptake of digital solutions

Source: European Commission

Each of the policy options addresses the problems identified, their drivers and the general and specific objectives, though the effectiveness in addressing the objectives varies between the options.

The specific criteria for assessing the extent to which the objectives are addressed were developed internally and approved by the Interservice Steering Group. To the extent possible, they focus on output variables that are quantified.

For **SO1** *(Ensure improved RIS data availability, and harmonised standards)*, the following criterion is included:

- Expected increase in harmonisation of RIS between Member States. The increase in harmonisation has been established as a clear requirement. Due to the lack of data it was not possible to assign a quantitative indicator (e.g. the number of discrepancies per Member State, per technical specification). As such, the impact on harmonisation is assessed qualitatively.

For **SO2** *(Facilitate the integration of IWT into the multimodal chain)*, the following criteria are used*:*

- Expected increase in IWT operation performance. The expected increase in the IWT operation performance due to a more efficient data exchange environment is assessed through indicators such as modal shift away from road and CO_2 emissions savings.

- Expected increase in exchanges with other transport modes. This criterion relates directly to the connection with other modes and it was only possible to assess it in a qualitative way.

For **SO3** *(Ensure higher uptake and interoperability of digital solutions, and address data protection concerns)*, the criteria used are:

- Expected simplification of the process for RIS data exchange. This criterion relates to how

information will be exchanged within the RIS environment as a whole and is assessed qualitatively.

- Expected uptake of digital solutions. This criterion looks at the impact on the level of digitalisation and the use of digital applications by the IWT sector, and is assessed qualitatively.

Regarding **SO1** *(Ensure improved RIS data availability, and harmonised standards)*, PO-A effectively contributes to *increasing the harmonisation* of *RIS*, as both national authorities and vessel operators will benefit from clear guidelines that will help reduce discrepancies. Higher quality and updated data will also be made available to RIS users through the ERDMS. Should data not be consistent, harmonised or simply not available, RIS users will have the opportunity to signal this to the national authorities through a clear mechanism. National authorities should take action to rectify the problem, thus improving the monitoring of implementation and the consistency of application. The nomination of CESNI as the development body for technical specifications should allow for faster updates, which would allow RIS users to benefit from improved information and services. PO-B is assessed to be more effective than PO-A because the introduction of RIS COMEX as the main data exchange platform will ensure a common platform for all users, who now have to work with separate systems for different Member States. In addition, PO-B will provide vessel operators with a new category of data, which will assist them in navigation and voyage planning. PO-C attains a slightly higher level of harmonisation than PO-B, as it introduces a performance monitoring framework specifically aiming to identify harmonisation gaps. The requirement to share traffic and transport management information cross-border by the Member States directly will also reduce the harmonisation challenges that vessel operators face, as they will only need to report once instead of whenever they cross a border.

Regarding **SO2** (*Facilitate the integration of IWT into the multimodal chain*), in terms of *expected impact on the operational performance of IWT*, PO-A will have a positive but limited impact as the guidelines will help reduce differences in implementation between Member States, which will facilitate operations for vessel operators. PO-B is assessed to lead to a moderate positive impact on the operational performance of IWT mainly as a result of the links with the other transport modes and the new technical specifications on navigation and voyage planning, resulting in an increase in the freight volumes shifted from road transport to IWT (by 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050) with benefits in terms of reduced CO_2 emissions (389.1 thousand tonnes of CO_2 saved cumulatively over 2025-2050, relative to the baseline). PO-C is expected to have a stronger impact on operational performance of IWT relative to PO-B, as in addition to modal shift (by 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050), the increased navigation performance through electronic voyage plan reporting will lead to reduced energy needs. PO-C thus results in 832.1 thousand tonnes of CO_2 saved cumulatively over 2025-2050, relative to the baseline. Finally, as regards the *exchanges with other modes of transport*, the impact of PO-A is considered positive but limited as PO-A only foresees a voluntary exchange of required cargo information through the eFTI platforms. PO-B has a moderate positive impact, as it makes the eFTI link mandatory, develops technical specifications for links with the systems of other modes (e.g. EMSWe) and with inland ports, and it aligns the scope of the Directive with that of the TEN-T network. While PO-C takes things one step further, by mandating the data exchange with ports, the overall positive impact is still considered as moderate because further steps (and initiatives) will need to be undertaken by other modes of transport.

Regarding **SO3** *(Ensure a higher uptake and interoperability of digital solutions, and address data protection concerns)*, in PO-A the regular updates of technical specifications (through CESNI) should *simplify the process of exchanging data through RIS* as users will operate under the most up to date technical specifications. PO-B will have a strong positive impact as RIS COMEX, by

acting as a one-stop-shop solution, will simplify the process through which RIS users exchange information. Similarly, PO-C will have a strong positive impact in addressing SO2 as the addition of electronic voyage plan reporting, introduces a new digital solution for traffic and transport management, while the introduction of specific forms for personal data exchange would further simplify reporting for vessel operators. With regard to the *expected uptake of digital solutions by the sector*, PO-A is expected to have a positive but limited impact by providing a basic level of update of technical specifications and ERDMS information and a voluntary eFTI platform use. In PO-B introducing the RIS COMEX as the main platform would have a moderate positive impact, as exchanges will be done digitally instead of using other means (like radio, as is sometimes now the case for reporting). Furthermore, use of eFTI becomes a requirement for reporting of dangerous goods information; thus all vessel operators will need to apply it. The links with other modes and inland ports increase the digital options available for RIS users and allow those users that see benefits for their operational needs to make use of them. PO-C will slightly increase the uptake of digital solutions relative to PO-B by introducing two mandatory elements, namely, the required reporting of voyage plans, and the requirement to share information with inland ports. Both measures, by design, will increase the use of digital solutions.

Risks related to implementation and enforcement requirements

In terms of overall risks relating to implementation and enforcement, the non-harmonised implementation was identified by the evaluation as a challenge. This challenge arises due to the lack of clearly defined data to be exchanged between transport modes, different interpretation of standards on voyage planning, etc.

Three measures were developed to address it (namely PM1, PM2 and PM3). Through RIS guidelines (PM1), the Commission will provide clear guidance on the technical specifications and how they should be applied. This is expected to increase the common understanding and application in PO-A. The complaint handling mechanism (PM2) in PO-A and PO-B will be an important tool which will provide a bottom-up way to identify these inconsistencies and to signal them to the appropriate authorities for action. Member State authorities will benefit of transparency on the issues identified and will be required by a functionally independent body to address them. This is expected to lead to a quick rectification of the issue. The relevant authorities will also need to inform the Commission on the number and type of complaints (including their outcome), which will allow to better monitor the overall implementation of the Directive, but also the performance of the complaint mechanism itself. The Performance Measurement Framework (PM3) is an alternative approach to PM2, included in PO-C, that is based on top-down monitoring. In this case, national authorities will be required to collect and report on a yearly basis to the Commission a set of indicators related to the performance of RIS on their territory. Through this Performance Measurement Framework, the Commission will have an overall picture of the implementation in each Member State and will be able to take action as required.

Thus, PO-C follows a more traditional approach for ensuring implementation and enforcement, with the disadvantage that is it heavily reliant on the collection and reporting of indicators. Even when not considering possible gaps or inconsistencies in the reported information, one has to factor in a natural time-delay from the moment the problem occurs, to the moment it is reported, assessed and finally acted upon. On the other hand, PO-B, with the inclusion of the complaint mechanism, has the advantage that problems will be signalled to the authorities sooner, and Member States will be able to act upon them faster, if possible, at their level, or be reported to the Commission for further action if it is of a more general or fundamental nature. Finally, PO-A would have a more positive outcome as it would combine the complaint mechanism with interpretative guidelines, thus adding an extra layer of clarity and guidance on how technical specifications should be applied.

Another relevant challenge that was identified by the evaluation is the long duration in setting and updating the technical specifications (which could take around 10 years). Late development or update of technical specifications could increase the risk related to the implementation and enforcement, as well as delay the introduction of new technology solution to IWT, which could bring operational benefits and other benefits (e.g. the development and use of application via tablets or other technical devices by the skippers or the authorities). The involvement of CESNI for RIS (PM10, included in PO-A, PO-B and PO-C) is expected to speed up the process of adoption of technical specifications. With CESNI planning and leading the work, it was possible to develop technical specifications for these Directives on average every 2 years, which is a big improvement compared to the current RIS setting. PM10 is supported by all stakeholder groups, it proved it can deliver, and it ensures control of the work by the Commission. As PM10 is applied in the same way to all policy options, it has no impact on their comparison.

7.2 Efficiency

Efficiency concerns the 'extent to which objectives can be achieved for a given cost (cost effectiveness)'. In all policy options, the benefits outweigh the increase in costs, relative to the baseline. The estimates of costs and benefits are summarised in Table 9.

Table 9: Summary of costs and benefits of policy options – net present value for 2025-2050 compared to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Vessel operators			
Administrative costs	**0.0**	**0.0**	**367.5**
Adjustment costs savings	**29.6**	**72.1**	**324.0**
Administrative costs savings	**10.7**	**28.5**	**51.9**
Software providers			
Adjustment costs savings	**4.4**	**8.1**	**8.4**
National authorities			
Adjustment costs	**5.6**	**18.3**	**28.2**
Administrative costs	**34.9**	**75.3**	**104.3**
Administrative cost savings	**11.4**	**30.6**	**37.4**
European Commission			
Adjustment costs	**0.5**	**0.0**	**0.0**
External costs savings			
Reduction in external costs of CO2 emissions		48.6	105.2
Reduction in external costs of air pollution emissions		-13.1	127.6
Reduction in external costs of noise emissions		36.6	36.6
Reduction in external costs of habitats		36.2	36.2
Reduction in external costs of congestion		86.8	86.8
Reduction in external costs of accidents		115.8	115.8
Total costs	41.0	93.6	499.9
Total benefits	56.1	450.4	930.0
Net benefits	15.1	356.7	430.1
Benefits to costs ratio	1.4	4.8	1.9

Source: Ramboll et al. (2024), impact assessment support study.

The major cost elements of the policy options are related to administrative costs for public authorities (in all policy options) and for vessel operators (in PO-C), and adjustment costs for public authorities (in all policy options). PO-C shows the highest total costs estimated at EUR 499.9 million, followed by PO-B (EUR 93.6 million) and PO-A (EUR 41 million), expressed as present

value relative to the baseline. PO-C is also estimated to result in the highest total benefits, estimated at EUR 930 million expressed as present value over 2025-2050 relative to the baseline, followed by PO-B (EUR 450.4 million) and PO-A (EUR 56.1 million).

Overall, all policy options result in **net benefits** relative to the baseline. PO-C shows the highest net benefits, estimated at EUR 430.1 million expressed as present value over 2025-2050, followed by PO-B (EUR 356.7 million) and PO-A (EUR 15.1 million). On the other hand, PO-B shows the highest benefits to costs ratio among the options (4.8), followed by PO-C (1.9) and PO-A (1.4). Thus, PO-B is assessed to be the most efficient among the policy options.

7.3 Coherence

Internal coherence. The internal coherence assesses how well the various provisions of the revised Directive fit together and work in a coordinated manner to achieve its objectives. It should be noted that this does not only concern the Directive itself, but also its accompanying secondary legislation (implementing acts) as well as interpretative guidelines.

Although all three policy options address the identified problem, they do so in different ways. All policy options foresee that the required technical details will be introduced through secondary legislation, and they all entrust the development of the technical specifications to CESNI. All policy options aim to improve the quality of RIS data by mandating the provision of required information to the ERDMS. In addition, PO-A addresses the problem by providing more flexibility to the Member States, as specific guidance will be provided through interpretative guidelines, aiming to reduce the existing fragmentation in the application of the provisions of the Directive. Furthermore, it encourages the use of eFTI but does not mandate it. Other than that, it introduces a harmonised complaint mechanism and provides more clarity for exchange of personal data. PO-B and PO-C propose amendments to the Directive for all aspects that require further harmonisation and thus ensure a higher degree of internal coherence than PO-A. PO-B follows a more targeted approach in the amendments proposed to the Directive, focusing on the improvement of the performance of the Directive and introducing a concrete structure for the provision of RIS (through COMEX), while allowing for improved links with other modes. PO-C envisages introducing further elements (such as mandating electronic voyage reporting and mandating cross border exchange of data). All policy options contain measures to improve the monitoring of the performance of RIS, and clarify cases of handling of personal data, with PO-C containing more detailed provisions due to its wider focus.

External coherence. The external coherence concentrates on the compliance of the Directive with key EU policy objectives and international legislation. All policy options have links to several EU instruments. PO-B and PO-C are consistent with the European Green Deal, SSMS and the NAIADES III Communication as they contribute to modal shift and the reduction of CO_2 emissions. By aiming to improve digital applications in IWT and aligning the scope of application to that of the TEN-T waterways, PO-B and PO-C are also coherent with the TEN-T policy, which among its priorities deals with information and communication technology, such as implementing telematics applications (including RIS), as well as with multimodal aspects, such as connecting inland port infrastructure to rail freight and road transport infrastructure. In addition, the CEF programme, under the TEN-T is providing funding for the development of RIS. The approach used in all the policy options in this regard is not to duplicate or develop overlapping tools and functionalities, but to enable and enhance links with those tools (through exchange of appropriate information), thus making best use of existing systems.

Furthermore, the AFIR is mandating On Shore Power Systems (OPS) in inland ports for allowing vessels to connect to electricity and not polluting the air by turning their engines at quays. It also

requires Member States to create plans to provide other clean energy sources in the future. Through PM12 (in PO-B) and PM13 (in PO-C) skippers will, among others, be provided with information if and when OPS installations are available for use in the port of their destination. They thus both work complementary in supporting the greening of IWT fleet. The eFTI Regulation established a legal framework that allows economic operators to share information with enforcement authorities in an electronic format (i.e. for the transport of goods by road, rail, inland waterways and air in the Union). All policy options are coherent with eFTI, as through PM7 and PM8 they introduce eFTI as the platform for exchange of cargo information.

Likewise, PO-B and PO-C are coherent with SDG 9 on industry, innovation, and infrastructure (specifically 9.1 "Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all"), as it promotes the shift of freight from road to inland waterways. They are also coherent with SDG 13 ("Take urgent action to combat climate change and its impacts"), as they lead to a decrease in CO_2 emissions.

Finally, the Directive does not make any provision on safety and traffic management on rivers that would fall exclusively under the responsibility of Member States or are developed by the River Commissions (Police Regulations).

7.4 Subsidiarity and proportionality

As highlighted in section 3 there is a clear need for EU action on the problem identified, and its drivers. The current Directive has not attained full harmonisation of RIS and experience with its implementation shows challenges with the timely introduction of technical specifications and with monitoring. Furthermore, the Directive needs to become fit for today's challenges related to digitalisation, intermodality and sustainability. Member States individually are not able to tackle the problem identified. To avoid a fragmented legal framework, there is a need for EU action. All policy options ensure a certain degree of harmonisation of the legal framework, in full respect of the subsidiarity principle. All policy options designate CESNI as the body responsible for the development of new technical specifications, which will involve Member States and sectoral experts, and improve collaboration with the River Commissions. Furthermore, PO-A and PO-B place the identification and eventual solution of problems in the implementation of RIS at the national level, and thus closer to the user than in PO-C.

All policy options are assessed to be proportionate as action at EU level is limited to what is necessary to achieve an improvement in the overall level of River Information Services offered to RIS users, through improved exchanges of better-quality information. PO-A and PO-B contribute to such improvement without imposing any cost for businesses and entailing only some adjustment and administrative costs for national public administrations. On the other hand, PO-C results in administrative costs for vessel operators (mostly SMEs) due to the requirement on the electronic voyage plan reporting. This specific measure results in additional administrative costs of EUR 367.5 million for vessel operators, expressed as present value over 2025-2050. It however also results in adjustment cost savings for vessel operators (EUR 248.7 million) due to the reduced fuel consumption. PO-B appears as the option providing the most balanced approach as it achieves a higher degree of harmonisation than PO-A, does not entail additional administrative or adjustment costs for businesses, but only costs savings. In this respect it is considered to be a more balanced option and thus more proportionate than either PO-A or PO-C.

7.5 Summary of the comparison of policy options

Table 10 provides a summary of the comparison of the options against the baseline scenario in terms of effectiveness, efficiency, coherence, subsidiarity and proportionality. The following ranking symbols have been used: from '+' (more effective/efficient/coherent/ proportionate than the baseline) to '+++' (much more effective/efficient/coherent/ proportionate than the baseline); from '-' (less effective/efficient/coherent/proportionate than the baseline) to '---' (much less effective/efficient/coherent/ proportionate than the baseline).

Table 10: Comparison of options in terms of effectiveness, efficiency, coherence, subsidiarity and proportionality relative to the baseline

Criteria	PO-A	PO-B	PO-C
Effectiveness	+	++	+++
Efficiency	+	+++	++
Coherence	++	+++	+++
Subsidiarity and proportionality	++	+++	++

Source: European Commission

7.6 Sensitivity analysis

As explained in section 6.1.7, sensitivity analysis has been performed in relation to the impacts of the policy options on the modal shift from road to IWT. Subsequently, the impacts on external costs and the efficiency of the policy options is assessed. More specifically, for the sensitivity analysis it is assumed that each 10% increase in punctuality would result in:

- 4.1% increase in transport demand (low case);
- 8.1% increase in transport demand (high case).

This is further compared with the central case estimate (6.1% increase in transport demand).

The impacts on the traffic shifted from road to IWT transport for the low case, central case and high case are presented in Table 11 below.

Table 11: Impact on freight inland waterways transport activity in the low case, central case and high case relative to the baseline

	2026	2030	2040	2050
Shift from road to freight IWT activity relative to the baseline (Gtkm)				
Low case	0.24	0.25	0.28	0.30
Central case	0.35	0.38	0.41	0.45
High case	0.47	0.50	0.55	0.59

Source: European Commission

Table 12 further presents the impacts on external costs of transport in the low case, central case and high case, due to shift from road to inland waterways traffic.

Table 12: External costs savings by policy option in the low case, central case and high case, expressed as present value over 2025-2050 compared to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Total external costs savings - low case		209.1	406.3
Reduction in external costs of CO2 emissions		32.7	89.2
Reduction in external costs of air pollution emissions		-8.8	131.9
Reduction in external costs of noise emissions		24.6	24.6

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Reduction in external costs of habitats		24.4	24.4
Reduction in external costs of congestion		58.3	58.3
Reduction in external costs of accidents		77.9	77.9
Total external costs savings - central case		311.0	508.3
Reduction in external costs of CO2 emissions		48.6	105.2
Reduction in external costs of air pollution emissions		-13.1	127.6
Reduction in external costs of noise emissions		36.6	36.6
Reduction in external costs of habitats		36.2	36.2
Reduction in external costs of congestion		86.8	86.8
Reduction in external costs of accidents		115.8	115.8
Total external costs savings - high case		413.0	610.3
Reduction in external costs of CO2 emissions		64.5	121.1
Reduction in external costs of air pollution emissions		-17.3	123.4
Reduction in external costs of noise emissions		48.6	48.6
Reduction in external costs of habitats		48.1	48.1
Reduction in external costs of congestion		115.2	115.2
Reduction in external costs of accidents		153.8	153.8

Source: European Commission

Finally, Table 13 presents the impacts on total benefits, net benefits and benefits to costs ratio by policy option in the low case, central case and high case. It shows that all policy options are expected to result in net benefits under the three cases considered. It also shows that the ranking of the policy options is not expected to change in the low case and high case relative to the central case estimates.

Table 13: Summary of costs and benefits of the policy options in the low case, central case and high case, expressed as present value over 2025-2050 compared to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Total costs	41.0	93.6	499.9
Total benefits			
Low case	56.1	348.4	828.0
Central case	56.1	450.4	930.0
High case	56.1	552.3	1,032.0
Net benefits			
Low case	15.1	254.8	328.1
Central case	15.1	356.7	430.1
High case	15.1	458.7	532.1
Benefits to costs ratio			
Low case	1.4	3.7	1.7
Central case	1.4	4.8	1.9
High case	1.4	5.9	2.1

Source: European Commission

8 PREFERRED OPTION

8.1 Identification of the preferred policy option and stakeholders views

Even though all policy options are in line with the general objective and include measures that address all specific objectives and problem drivers, they vary when assessed in terms of effectiveness, efficiency, coherence, subsidiarity and proportionality.

First, there is a difference in their *effectiveness*. As explained in section 7.1 and Table 10, PO-C is the most effective in addressing all the specific objectives. With regard to *efficiency*, PO-C only ranks second (after PO-B) with a benefit to cost ratio of 1.9 (relative to 4.8 in PO-B). PO-C shows the highest net benefits, and at the same time entails the highest level of costs. The total costs of PO-C are 434% higher than those of PO-B, while the total benefits are only 107% higher for PO-C compared to PO-B. The higher costs of PO-C are linked to the mandatory measures (primarily PM5 on the reporting requirements for voyage plans, and to a lesser extent PM13 and PM17) that entail administrative costs for vessel operators (due to PM5) and administrative and adjustment costs for national administrations (due to PM13 and PM17).

PO-B is assessed to be less effective than PO-C in addressing the specific objectives. However, the specific objectives are addressed in a more progressive and efficient way, entailing a higher benefit to cost ratio than PO-C (4.8 versus 1.9), and allowing a smooth transition for authorities and operators (due to fewer mandatory measures). Measures under PO-B are also easier and quicker to implement and closer to the user than those in PO-C.

PO-A is the least effective in addressing the specific objectives, and shows the lowest benefit to cost ratio among the options.

In relation to *internal coherence*, PO-B and PO-C propose amendments to the Directive for all aspects that require further harmonisation and thus ensure a higher degree of internal coherence than PO-A. In relation to the *external coherence* with other instruments and policies, all policy options are coherent with several EU instruments (see section 7.3 and Table 10). PO-B and PO-C show a higher degree of external coherence than PO-A as they directly align the scope of the Directive with that of the TEN-T Regulation. They support multimodality and the greening of the sector, in particular by increasing links with other modes and leading to modal shift away from road. They also both increase digitalisation in the sector by introducing and mandating the use of digital applications in RIS.

All policy options ensure a certain degree of harmonisation of the legal framework, in full respect of the *subsidiarity principle*. However, PO-A and PO-B place the identification and eventual solution of problems in the implementation of RIS at the national level, and thus closer to the user than in PO-C. All policy options are assessed to be *proportionate* as action at EU level is limited to what is necessary to achieve an improvement in the overall level of River Information Services offered to RIS users, through improved exchanges of better quality information. PO-B appears however as the option providing the most balanced approach as it achieves a higher degree of harmonisation than PO-A without additional costs for businesses and only some adjustment and administrative costs for national public administrations. On the other hand, although achieving a higher degree of harmonisation than PO-B, PO-C results in additional administrative costs for vessel operators (mostly SMEs) due to the requirement on the electronic voyage plan reporting, and it is thus assessed to be less proportionate than PO-B.

In conclusion **the analysis points at PO-B as the preferred policy option**, since it brings the best balance between the objectives that must be achieved and shows the best benefits to costs ratio

among the policy options. It ensures the proportionality of the intervention and is fully in line with the subsidiarity principle. In addition, it does not introduce burdens for the private sector.

The level of ambition of the preferred policy option is considered appropriate as it modernises the RIS Directive bringing it up to speed with digital developments, addresses all identified problem drivers, improves the position of IWT in the logistics chain and contributes to improving its environmental performance. Moreover, it attains these results by making use of and increasing links with existing solutions and initiatives, thus avoiding duplication of efforts. In terms of preparing the IWT sector for future developments such as smart shipping and automation, the preferred policy option establishes a central platform for RIS exchanges, which can provide the basis upon which new functionalities and services may be developed in the future.

Stakeholders widely supported the involvement of CESNI in the development and adoption of technical specifications. Stakeholders were also in agreement that RIS COMEX provides an important basis. A small number of RIS experts expressed the view that the Directive was sufficiently broad, and focus should rather be placed on implementation and on the introduction of guidelines. However, the majority of stakeholders across all groups envisaged the need for further adaptations to the Directive.

Differences in opinions appeared in particular between Member State authorities and vessel operators in terms of the costs and benefits of the complaint mechanism (Member States tended to be against) and of electronic voyage reporting (vessel operators tended to be against). The links with eFTI triggered some discussions, with some Member State autorities considering that they need to become mandatory, and vessel operators being more sceptical (while some saw this as a potential opening for business-to-business applications). Last but not least, there was a clear concern from the side of vessel operators (and in particular those representing SMEs) about the use of personal data (thought there did not appear to be a clear understanding of what would qualify as “personal data"). Some vessel operators went beyond the issue of personal data, expressing the view that they need to be in clear control of what information is shared, including business information. Member State authorities saw potential in exchanging personal data but it became apparent that some clarity on the conditions under which exchange is possible is required, as some of them pointed to potential conflicts with national legislation.

8.2 REFIT (simplification and improved efficiency)

This initiative is part of the Commission Work Programme 2023 under Annex II (REFIT initiatives), under the heading ‘A Europe fit for the Digital Age’. It has a REFIT dimension in terms of simplifying and harmonising the information exchange through RIS. The initiative will reduce administrative burden for vessel operators by reducing the need for re-registering cargo information and reporting cargo information to ports. The preferred policy option (PO-B) is estimated to result in administrative costs savings of EUR 28.5 million, expressed as present value over 2025-2050 relative to the baseline scenario.

Currently, vessel operators need to consult sever websites in different Member States to obtain the information they need in order to plan their voyage. In addition, differences in the application of the provisions of the Directive by the Member States means that the information required is not provided in a harmonised way. The preferred policy option will reduce this burden by introducing a one-stop-shop platform for exchange of RIS information (RIS COMEX). Other measures foreseen as part of PO-B will also reduce the time spent by vessel operators in planning their voyage (new technical specifications on data for navigation and voyage planning, provisions for supplying data to the ERDMS, new technical specifications for the exchange of information relating to IWT ports,

a harmonised complaint mechanism in Member States). This is expected to result in adjustment costs savings for vessel operators, estimated at EUR 72.1 million expressed as present value over 2025-2050, relative to the baseline scenario. In addition, RIS software services providers would benefit of access to more and better-quality data with adjustment costs savings estimated at EUR 8.1 million, expressed as present value over 2025-2050 relative to the baseline scenario.

Finally, in the preferred policy option (PO-B) no reporting obligations arise for businesses. For national public administrations, reporting obligations arise due to measure PM6. However, as explained in section 6.1.4, the costs savings for vessel operators and software service providers due to PM6 outweigh the administrative costs for national public administrations.

8.3 Application of the 'one in, one out' approach

PO-B is expected to lead to administrative costs savings for vessel operators, by reducing the need for re-registering cargo information and reporting cargo information to ports, estimated at EUR 1.6 million per year relative to the baseline. These administrative costs savings are driven by the exchange of cargo-related information through the eFTI mechanism (EUR 0.6 million)[123], the exchange of information through the RIS COMEX platform (EUR 0.2 million)[124], the new technical specifications for the exchange of information with IWT ports (EUR 0.5 million)[125] and legal clarity for personal data (EUR 0.3 million)[126]. There are no administrative costs for businesses under PO-B.

In addition, in PO-B the adjustment costs savings for vessel operators are estimated at EUR 72.1 million and those for software services providers at EUR 8.1 million, expressed as present value over 2025-2050 relative to the baseline.

9 HOW WILL ACTUAL IMPACTS BE MONITORED AND EVALUATED?

The initiative will be implemented in parallel with other initiatives under the European Green Deal and the SSMS. Taking those into account in the baseline, in particular for the multimodality aspects, the share of the IWT activity is expected to roughly remain stable over time. The environmental performance of IWT (especially in terms of CO_2 emissions) is expected to improve due to the large-scale uptake of renewable and low carbon fuels, namely e-fuels, biofuels and electricity. Safety is expected to stay within the same levels in the baseline.

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[123] For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of repeated notifications over 2026-2035 (simple average) has been estimated at 88,397 per year relative to the baseline and the average costs saved per repeated notification at EUR 6.5. Thus, the average annual administrative costs savings (simple average) for vessel operators are estimated at EUR 0.6 million relative to the baseline.

[124] For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of repeated notifications over 2026-2035 (simple average) has been estimated at 34,448 per year relative to the baseline and the average costs saved per repeated notification at EUR 6.5. Thus, the average annual administrative costs savings (simple average) for vessel operators are estimated at EUR 0.2 million relative to the baseline.

[125] For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of resubmitted cargo reports over 2026-2035 (simple average) has been estimated at 114,006 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings for vessel operators are estimated at EUR 0.5 million relative to the baseline.

[126] For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of resubmitted cargo reports over 2026-2035 (simple average) has been estimated at 72,799 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings (simple average) for vessel operators are estimated at EUR 0.3 million relative to the baseline.

The initiative is expected to complement these developments by updating and modernising the framework under which RIS is provided in the EU. This would allow more efficient exchange of information among RIS users and access to better quality information, which in turn should lead to improved operational performance, greater integration in the multimodal chain and a more harmonised IWT market.

The measures under this initiative have links with other initiatives, such as eFTI, which has introduced an environment for the voluntary handling of cargo information, EMSWe, which is a single window for reporting in the maritime sector, and the TEN-T which defines the important multimodal corridors in the EU. It also has links with AFIR which aims to provide green charging infrastructure for vessels. Furthermore, it has links with the CEF funded RIS COMEX project, developed by the Member States to improve the functionality of RIS.

The initiative will be successful if it brings an improvement in the overall RIS framework, in terms of the number, quality and way river information services are provided to all users, that results in an a visible progress of IWT performance. This would in turn improve the competitiveness and safety of the sector and its contribution towards the EGD objectives.

The level of progress needs to be seen, however, in the context of the size of the IWT sector, the geographic and other characteristics (described in section 1), and the overall nature and aim of this initiative.

Ultimately, a successful scenario is one where there is an increase of information exchnaged through digital means, where IWT has established links with other modes of transport, which would lead to a growing modal share of IWT and an increased number of river information services. This should also translate into a better environmental performance of the EU transport system.

The Commission will monitor the actual impacts of the legislation through different actions and a set of indicators allowing to measure progress in reaching the specific objectives. The monitoring actions will include the regular collection of publicly available information as well as information from RIS COMEX and the complaint mechanism. In addition, the existing Commission expert groups on DINA and NAIDES will be used as platforms to collect ad hoc feedback and information from the Member States and other stakeholders. The Commission may also encourage and support the exchange of best practices among Member States. In developing technical specifications, CESNI will also develop specific technical indicators to be monitored which will then become part of the secondary legal acts.

The overall success of the initiative, given its overall objectives, cannot be assessed based on a single indicator but rather on the attainment of the operational objectives. To measure the progress and the actual effects of the initiative, a list of operational objectives and indicators for assessing the progress towards them have been identified and are detailed Table 14.

Table 14: Operational objectives and indicators for monitoring progress

Operational objectives	Possible Indicators
Improve quality of RIS	Data availability in ERDMS and frequency of update by Member States Data availability in RIS Index and frequency of update by Member States Number and type of complaints received by national complaint handling bodies Number of corrective actions taken and average time to resolve complaints per year Frequency of introduction of technical specifications

Operational objectives	Possible Indicators
Improve exchange of data	Number of exchanges with eFTI Number of exchanges with EMSWe Number of exchanges with inland ports
Improve uptake of digital solutions	Number of RIS COMEX users Data availability in RIS COMEX Data availability in national platforms that participate in RIS COMEX Number of other systems linked with RIS COMEX
Improving performance of the IWT sector	Average waiting times at key points in the network Average time spent in reporting and voyage planning Average time spent in processing reports Tonne-kilometres (tkm) and passenger kilometres (pkm) transported by IWT Estimated emission levels
Improving logistics links	Volume of intermodal operations Modal share of IWT transport Tonnes of goods transported Number of persons transported Number of companies Number of people employed in IWT

Source: European Commission

The success of the RIS Directive can be measured against operational objectives as follows:

- The success in improving the quality of the RIS can be assessed based on the availability and quality of information using harmonised technical specifications. This can be measured through the availability and completeness of up-to-date data, which can be collected from the relevant databases. The number of complaints submitted by RIS users to the Member States is also an important indicator to show the level of harmonisation attained. DINA and NAIADES experts will also be consulted for relevant input, and CESNI will be requested to further develop specific technical indicators to be monitored.
- The success in improving the exchange of RIS data within the IWT sector and with other transport modes can be assessed based on the use of RIS COMEX and the information exchanged with other systems. Specific and technical indicators can be further developed with the assistance of CESNI and NAIADES and DINA experts and will be collected from these systems and national authorities.
- The success in increasing the uptake of digital solutions can be monitored though the yearly number of RIS COMEX users, the type and volume of information exchanged, and the number of systems linked (e.g. with ports). This information will be collected though the RIS COMEX and from the national authorities.
- The success in improving the performance of RIS can also be measured in terms of average waiting times at locks and other points along the river, average time spent in reporting and voyage planning (vessel operators) and handling of reports (for national public authorities), etc. This information can be collected from the national authorities and River Commissions, as well as from vessel operators and sectoral organisations (ad hoc studies). In addition, the environmental performance could be monitored through transport activity shifted from road transport to IWT and the associated reduction in emissions.
- The success of improving IWT position in the logistics chain can be measured by monitoring the increase in the volume of intermodal operations (containerised and non-containerised), the increase in the number of vessel operators that are involved in intermodal operations and the development in the modal split indicators. The information will be gathered from the sectoral

organisations, official statistics on volumes of operations by transport mode and changes in modal shares of freight transport.

Regarding the sources for the information to be collected (when, by whom), it should be noted that use will be made of publicly available or already collected data (e.g. modal share, volumes of goods transported) for several indicators. There are indicators relating to specific measures (e.g. exchanges through COMEX) which are technical indicators and are part of the design of each policy measure and will be refined as the technical specifications are developed in the secondary acts. For improving the quality of RIS, information on ERDMS and RIS index can be obtained directly and at any time from these systems by the Commission. The information on the complaint mechanism will be reported by the competent authorities on a yearly basis. RIS COMEX usage data will provide information that will be used for a number of indicators, such as the exchange of data within IWT and with other modes, and the uptake of digital solution. Relevant standards for statistics to be collected by the platform will be introduced by secondary legislation and can be compiled and reported on a yearly basis by the platform. For improving the performance of RIS, information will be reported by national authorities on a yearly basis from statistics on e.g. waiting times at locks. Information from vessel operators (e.g. average time for voyage planning) will be obtained through ad-hoc studies. General statistics (e.g. tonne-kilometres) will be obtained from Eurostat on a yearly basis. Eurostat will also be the source for the improvement of logistics performance and supplemented in this case by sectoral statistics as available.

The initiative will provide a legal framework for the development of more detailed rules, procedures and templates, which will be laid down in secondary legislation. Therefore, the implementation period should reflect the entry into effect of these acts. Five years after the end of the implementation date of all the relevant legislation (including the adoption and entry into effect of the necessary implementing and delegated acts), the Commission services should carry out an evaluation to verify to what extent the objectives of the initiative have been reached.

ANNEX 1: PROCEDURAL INFORMATION

1. LEAD DG, DECIDE PLANNING/CWP REFERENCES

The lead DG is the Directorate-General for Mobility and Transport DG MOVE, Unit D3: Ports and Inland Waterways

DECIDE reference number: PLAN/2021/11060

Item 5 in Annex II to Commission Work Programme 2023: A Union standing firm and united [127].

2. ORGANISATION AND TIMING

The impact assessment follows the ex-post evaluation Directive 2005/44/EC on Harmonised River Information Services (RIS)[128].

The impact assessment started in 2022, with the inception impact assessment published on 3 August 2021[129].

The impact assessment on a possible review of the RIS Directive was coordinated by an Inter-Service Steering Group (ISSG). The Commission Services participating in the ISSG were: Secretariat-General, Legal Service, DG Communications Networks, Content and Technology, DG Informatics, DG for Energy, DG Environment, the Joint Research Centre, DG Justice and Consumers, DG Regional and Urban Policy, DG Research and Innovation, and the European Climate, Infrastructure and Environment Executive Agency (CINEA).

The Inter-Service Steering Group met 6 times: on 16 September 2021, 3 March 2022, 4 June 2022, 12 September 2022, 30 January 2023, and 14th of July 2023. It was consulted throughout the different steps of the impact assessment process: notably on all stakeholder consultation materials and deliverables from the external contractor and on the draft Staff Working Document.

3. CONSULTATION OF THE RSB

The draft report was submitted to the Regulatory Scutiny Board on 30 August 2023. The RSB issued a positive opinion with reservations on 28 September 2023. The comments received from the Board have been addressed in the revised version of the impact assessment as detailed in the table below.

Table 15: Modifications of the impact assessment report in response to RSB comments

What to improve	Modifications to the impact assessment
(1) The report should better explain the magnitude of the problems. The problem definition should better distinguish the individual problems and their links with the problem	Section 1 has been expanded (including the addition of graphs) to better explain the specific context and characteristics of the IWT and RIS.

[127] COM(2022) 548 final
[128] SWD(2021) 50 final
[129] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13135-River-information-services-revision-of-EU-rules_en

drivers and consequences. The analysis should demonstrate, with more evidence, the urgency for the EU to act, reflecting the views of the most affected Member States. It should set out the main bottlenecks that have been delaying timely implementation of the new standards. The report should also differentiate between problems affecting specific Member States, regions, local authorities, private entities, or particular EU areas. It should better elaborate whether there are particular concerns regarding safety, data protection, or environmental and territorial concerns.	The description of the problem in section 2.1 has been improved to provide: more information and clarifications on data limitations, how stakeholders are affected, importance of challenges, and consequences of the problem in terms of safety and environment. Section 2.2 on problem drivers has been strengthened with further information, where available, on consequences for the Member States, main bottlenecks, personal data aspects and the views of stakeholders. Section 2.3 has been strengthened by including the views of stakeholders. Overall, the wording has been fine tuned, to improve the clarity of the text. The necessity of EU action has been further clarified in section 3.2. The specific objectives in section 4.2 have been simplified, to make it easier to assess their attainment.
(2) The policy options section should bring out clearly the available options, presenting genuine alternative approaches and bringing out the relevant policy choices. The presentation of the options should better explain how the policy measures would work in practice and which are the most important ones in ensuring the success of the initiative. It should also explain what would be the responsibility of each actor, i.e. Member States, regional authorities, private entities, etc. The option description and analysis should use a simpler language, making it less technical and more accessible for the non specialist readers.	A table providing an overview of discarded measures has been included in section 5.2.1, while a non-technical description of the different measures is included in section 5.2.3, along with the expected importance of the measures. Section 5.2.4 on the policy options has been redrafted in a less technical way, to improve clarity.
(3) The analysis should be clearer on how different estimates were calculated, where they come from and how robust and complete their assessment is. It should better assess the reliability of estimates on environmental and social impacts which appear to be attributed to increased punctuality, given that these drive the benefit-cost ratio. The report should be more explicit as to how this initiative would increase punctuality under each option, given that the study estimates cited as basis for the calculations were based on figures for railway and it is unclear to which extent these can be used in the present context.	Sections 6.1.1 to 6.1.3 have been revised, to better explain the link with Annex 4 in which the detailed calculations are provided. Section 6.1.4 has been added on the new reporting obligations. The analysis of the impacts on SMEs in section 6.1.5 and in Annex 6 has been expanded to include more detailed information. A new section on territorial impacts (section 6.1.10) has been added. Further explanations have been added on the reliability of the calculations for modal shift (and thus for environmental and social impacts) in section 6.1.7. In addition, sensitivity analysis has been performed and added in section 7.6, including the environmental and social impacts, as well as the impacts on the benefits to costs ratio. The effectiveness section (section 7.1) has been re-drafted, to take into account of the revised specific objectives. The description has been simplified for the non-technical reader. Section 7.3 on coherence has been expanded to include further details on the coherence with specific relevant initiatives. Section 8.1 has been strengthened to include further elaboration on the effectiveness of the preferred policy option in comparison with the other policy options, and the result of the cost-benefit analysis has been highlighted.

(4) The report should better explain what the initiative aims to accomplish exactly. To achieve this, the general and specific objectives should be better structured, split in order to fit with the problem drivers and expressed in SMARTer terms to ensure better measurement and monitoring of effectiveness and ultimately success of the EU action.	Section 9 has been reinforced and now discusses how success would look like in terms of an improved RIS framework, linking the achievements of this initiative with parallel complementary initiatives focusing on multimodality and environmental performance.

4. EVIDENCE, SOURCES AND QUALITY

The impact assessment is based on several sources, including:

1. The ex-post evaluation of the RIS Directive;
2. Stakeholder consultation activities (see Annex 2);
3. External support study carried out by an independent consultant (Ramboll Management Consulting, supported by Transport & Mobility Leuven and Panteia);
4. Commission experience in monitoring and implementing the Directive;
5. Commission expert groups for NAIADES and DINA (Digital Inland Navigation) The expert group meetings were held on 7th of July and 12th of December 2022.

ANNEX 2: STAKEHOLDER CONSULTATION (SYNOPSIS REPORT)

1 INTRODUCTION

This annex provides a summary of the outcomes of the consultation activities which have been carried out for the review of RIS Directive, including in the context of the external support study. It notes the range of stakeholders consulted, describes the main consultation activities and provides a succinct analysis of their views and the main issues they raised.

The objective of the consultation activities was to collect information and opinions of stakeholders on the key problems and associated drivers, definition of relevant policy objectives linked to those problem areas and the identification, definition and screening of policy measures that could eventually be incorporated into policy options for this impact assessment as well as gather information and opinions on their likely impacts. A consultation strategy, covering the stakeholder consultation activities, has been developed and further fine-tuned throughout the different phases of impact assessment process.

The main consultation activities included:

- Consultation on the Inception Impact Assessment (IIA) was conducted by the European Commission between August and September 2021. In total 21 respondents provided feedback.
- An Open Public Consultation (OPC), which was available in all EU languages, was conducted over the period 16 August 2022 - 22 November 2022. The OPC was aimed at gathering public opinion on the shortcomings and challenges in the implementation of the RIS Directive, and the possible ways in which the Directive could be revised. In total, 13 responses were received.
- 29 interviews were organised in the context of the impact assessment support study (during the period 25 October - 18 November 2022) with relevant stakeholders at the national level and with key stakeholders at the EU level particularly to support and refine the overall problem definition and possible policy options.
- 2 targeted surveys covered two different parts of the impact assessment: (i) First survey - views on the identified problems and their assessment of the policy measures; (ii) Second survey - views on the costs and benefits of each of the proposed policy measure. The respondents were asked to also distribute the survey to other relevant authorities or organisations that would be interested to complete the surveys. The survey was distributed to 229 stakeholders. In the first survey, there were 65 respondents, whereas in the second survey there were 13 respondents. Overall, the response rate for both surveys was 34 %. The first survey was launched on the 1st of August 2022 and has been closed on the 26th of August 2022. The second survey was launched on 24th November 2022 and was closed on 07th February 2023.
- 2 meetings were organised with experts from the Commission expert group on inland waterway transport (NAIADES implementation group) and the expert group on digital inland navigation (DINA expert group). The aim of the meetings was to gather and validate expert views on the problem drivers and on the list of proposed measures. The meetings were held on 7th of July and 12th of December 2022.
- Additional consultation activities as part of the consultation strategy, included a two-day targeted workshop organised on 26 and 27 January 2023 (to facilitate the participation of vessel operator representatives). The aim was to collect the feedback of RIS users on the potential costs or expected benefits stemming from the proposed policy measures. The

workshop was co-organised with one of the professional associations at the European Level (IWT Platform) and attended by staff of enterprises providing inland navigation and logistics ICT, representatives of networks of private businesses, members of the shipping sector associations and non-profit organisations for innovation in the inland navigation industry.

The information collected from stakeholders was key in identifying the problem and its drivers, in refining the design of the Policy Options (POs) as well as in assessing their economic, social and environmental impacts. Findings from the stakeholder consultation complemented the desk research carried out in the context of the impact assessment support study.

2 METHODOLOGY

The remainder of the annex presents the main findings from the analysis of stakeholder contributions to the consultation process. They are structured around the main elements of the intervention logic, namely problems and their drivers, key policy objectives as well as key needs and possible aspects of policy design.

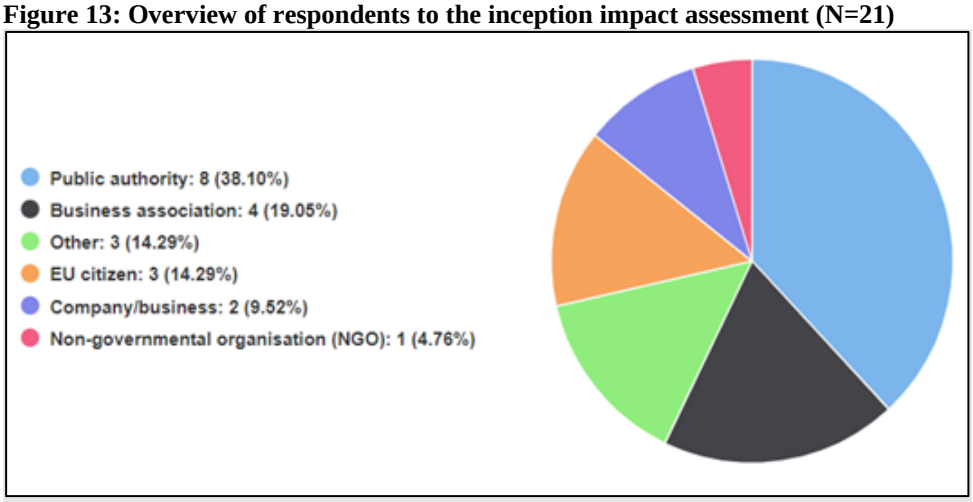
A mixed methods approach combining online surveys, targeted and follow up interviews, expert meetings and stakeholder workshops has been adopted to conduct the targeted stakeholder consultation activities, which have taken place gradually throughout the impact assessment process. This allowed to capture and fill in data gaps and provide evidence for the impact assessment. Interviews and meetings have been held mostly by videoconference.

2.1 Feedback on the Inception Impact Assessment

The consultation on the Inception Impact Assessment (IIA) was conducted by the European Commission in August 2021. The IIA was open to stakeholders and the general public to comment and provide feedback.

In total, 21 responses were received, originating from 11 countries, with the largest response rate originating from the Netherlands (4 out of 21). The main stakeholders which provided feedback were public authorities and business associations.

Figure 13: Overview of respondents to the inception impact assessment (N=21)



Source: Ramboll et al. (2024), impact assessment support study

As regards the replies provided, the following was noted:

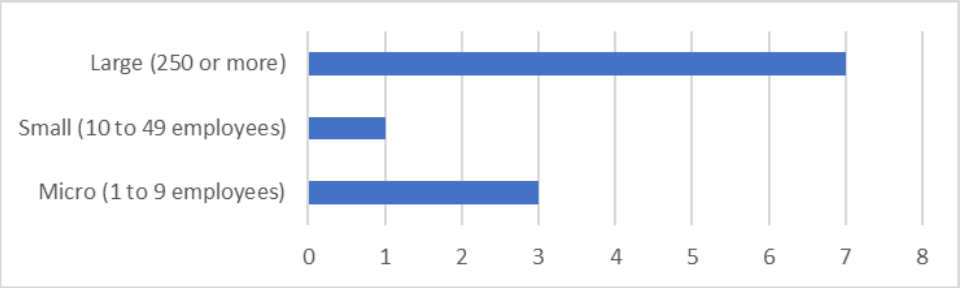
- Regarding the context, the problem definition and the subsidiarity check, the respondents largely welcomed and supported the need for the revision of the RIS Directive and considered it very timely considering the evolution of RIS. They acknowledged the definition of the problem, mentioning clearly that full harmonisation and interoperability of RIS has not been achieved due to fragmented implementation. Respondents from public authorities mainly mentioned problems of cross-border inefficiencies and data protection as the relevant ones, as well as inefficient processes for adopting RIS technical specifications. The respondents from the business sector emphasized that too much focus was placed on the needs of authorities, without the necessary level of involvement of the sector players and that the revision of the Directive needs to be oriented towards decreasing the administrative burden for the operators.
- Regarding the objectives and the policy options, the respondents welcomed the identified objectives and policy options, especially the part on facilitating interfaces with other transport modes (in particular maritime). Public authorities considered as very relevant the measure ensuring the efficiency and effectiveness of the processes and organisation design for the adoption of RIS technical specifications, enabling the sector to take up innovation in a timely way. The corresponding role of CESNI in that regard was clearly referenced by the respondents from public authorities, but also from the business sector.
- In terms of preliminary assessment of expected impacts, only two respondents commented. One respondent mentioned that the impacts listed in the document are valid, whereas some of them might need further checks. The other commented on the likely social impacts and raised doubt regarding the ability of skippers to adapt to new digital processes and requirements that are going to be imposed on small and medium sized barge owners.

2.2 Open Public Consultation

An Open Public Consultation was designed and implemented by the Commission over the period 16 August 2022 - 22 November 2022, to support the gathering of evidence for the impact assessment process. The public consultation aimed to gather public opinion on the shortcomings and challenges in the implementation of the RIS Directive and the possible ways in which the Directive could be revised. Out of the 13 responses received, 6 were from public authorities, 3 from business associations and 2 from company/business organisations. In terms of geographical distribution of the respondents, the largest response rate was from respondents in Belgium (3), followed by Austria and France (2 respectively).

Excluding the reply from the EU and a business association which did not provide this information, the breakdown of the size of the organisations/companies is presented in Figure 14.

Figure 14: OPC replies - breakdown of organisation size



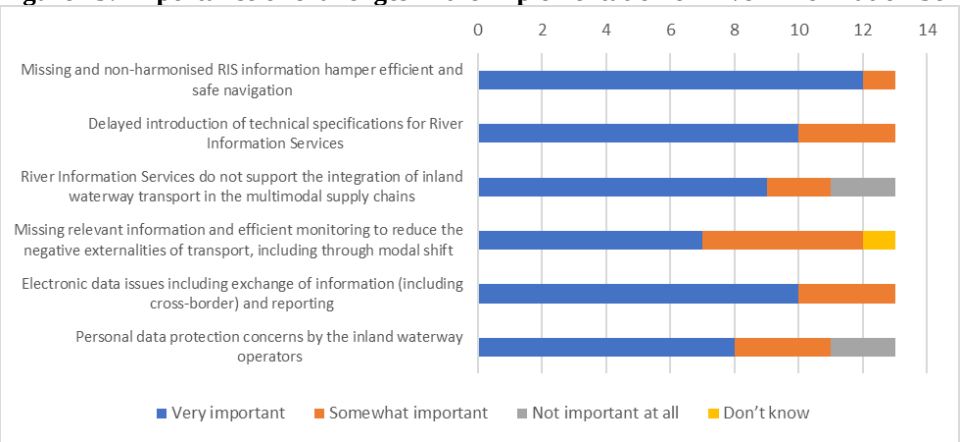
Source: Open Public Consultation

Within the Open Public Questionnaire, the respondents were requested to provide feedback on 4 main areas:

- problem drivers and the baseline;
- expected development of the inland waterway sector if the legal framework of RIS remains unchanged;
- areas where a revision of the RIS Directive would have the highest impact;
- priority areas of a possible revision of the RIS directive.

Regarding feedback on problem drivers and baseline, respondents were asked to provide their views on the importance of specific challenges in the implementation of the River Information Services (RIS) in Europe. The answers are provided in Figure 15.

Figure 15: Importance of challenges in the implementation of River Information Services (RIS) in Europe



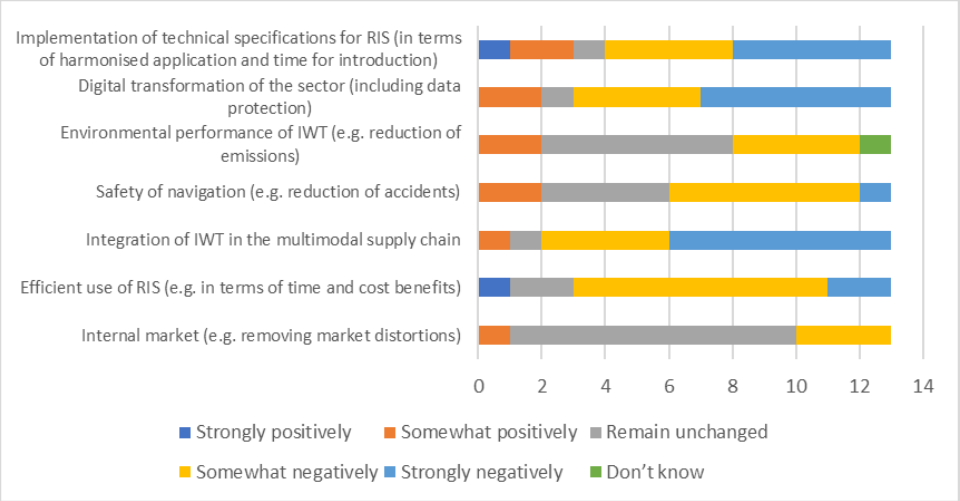
Source: Open Public Consultation

With regard to missing and non-harmonised RIS information hampering efficient and safe navigation, 12 of the 13 respondents consider this as a very important challenge, and 1 as somewhat important. Delayed introduction of technical specifications for River Information Services is considered as a very important challenge by 10 of the 13 respondents and as somewhat important by the other 3. Of the 13 respondents, 9 consider as a very important challenge that River Information Services do not support the integration of inland waterway transport in the multimodal supply chains, while 2 consider it as somewhat important and further 2 as not important at all. As far as missing relevant information and efficient monitoring to reduce the negative externalities of transport, including through modal shift, 7 out of 13 respondents consider this as a very important challenge, 5 out of 13 as somewhat important, while 1 respondent did not know. Electronic data issues including exchange of information (including cross-border) and reporting, were considered as very important challenges by 10 out of 13 respondents, and the rest 3 considered it as somewhat important. Personal data protection concerns by the inland waterway operators were viewed as a very important challenge by 8 out of 13 respondents, as somewhat important by 3 out of 13 respondents, and as not important by the rest (2). In addition, 5 out of 13 respondents indicated an additional challenge. Of those, 2 out of 5 considered it a very important challenge (which was further defined by 1 out of 2 as relating to data protection of movement of ships and by the other as relating to the standardisation of information), further 2 out 5 indicated as a non important challenge (further defined as the imprecision of minimum data

requirements concerning navigation and voyage planning), and 1 out of 5 respondents indicated "do not know" as an answer.

Regarding the expected development of the inland waterway sector if the legal framework of RIS remains unchanged, respondents were asked to provide their views on how they expect the inland waterway sector to develop, if the legal framework of RIS remains unchanged. The answers are provided in Figure 16.

Figure 16: Development of inland waterway sector if the legal framework remains unchanged

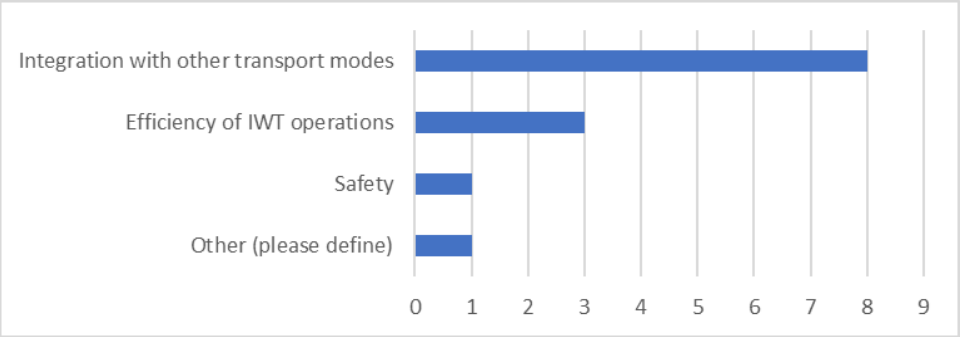


Source: Open Public Consultation

If the legal framework remains unchanged, 5 out of 13 respondents believe this will have a strong negative development in terms of the implementation of the RIS technical specifications, 4 out of 13 believe it will have a somewhat negative development, 2 out of 13 believe it will have a somewhat positive development, 1 out of 13 strongly positive and 1 out of 13 respondents believes that things will remain unchanged. Regarding the digital transformation of the sector, 6 out of 13 respondents anticipate a strongly negative development, 5 out of 13 a somewhat negative development, 2 out of 13 a somewhat positive development and 1 out of 13 respondents believes that things will remain unchanged. On the issue of the environmental performance of the inland waterway sector, 6 out of 13 respondents expect no changes, 4 out of 13 somewhat negative developments, 2 out of 13 somewhat positive and one respondent indicated no knowledge. In relation to safety of navigation 6 out of 13 respondents anticipate somewhat negative developments, 4 out of 13 that the situation will not change, 2 out of 13 that it will be somewhat positive and 1 out of 13 that it will become strongly negative. On the integration of inland waterway transport into the multimodal supply chain, 7 out of 13 expect a strong negative development, 4 out of 13 a somewhat negative development and of the remaining, 1 considers no change and 1 a somewhat positive development. Regarding the efficient use of RIS, 8 out of 13 expect a somewhat negative development, 2 out of 13 a strongly negative, 2 out of 13 that things will remain unchanged and 1 out of 13 a strongly positive development. As far as developments in the internal market are concerned, 9 out of 13 respondents expect no change, 3 out of 13 a somewhat negative development and 1 out of 13 a somewhat positive development.

Regarding areas where a revision of the RIS Directive would have the highest impact, participants were asked about the area where a possible revision of the RIS Directive should have the highest impact. The answers are presented in Figure 17.

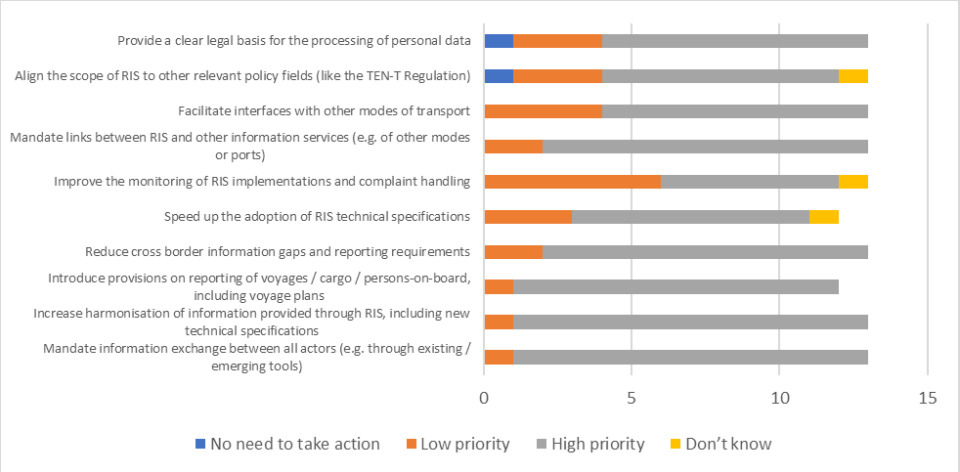
Figure 17: Areas where a revision of the RIS Directive would have the highest impact



Source: Open Public Consultation

Of the respondents, 8 out of 13 indicated the integration with other transport modes, 3 out of 13 the efficiency of inland waterway operations, and 1 out of 13 safety. In addition, 1 out of 13 respondents indicated another area of impact which was further described as standardisation of information. Regarding priority areas of a possible revision of the RIS directive, the replies are presented in Figure 18.

Figure 18: Priority areas of a possible revision of the RIS directive



Source: Open Public Consultation

From the replies of the participants, 9 out of 13 indicated the provision of a clear legal basis for the processing of personal data as a high priority, 3 out of 13 as a low priority and 1 out of 13 as no need to take action. On the alignment of the scope of RIS to other relevant policy fields, 8 out of 13 indicated this as a high priority, 3 out of 13 as low priority, 1 out of 13 as no need to take action and 1 out of 13 indicated do not know. Regarding the facilitation of interfaces with other modes of transport, 9 out of 13 considered this a high priority and 4 out 13 as low priority. 11 out of 13 respondents consider that a possible revision should mandate links between RIS and other information services as high priority and 2 out of 13 as low priority. Improvement of monitoring of RIS implementation and complaint handling was considered a high priority by 6 out of 13 respondents, as low priority by 6 out of 13 and 1 out of 13 did not know. Speeding up the adoption of RIS technical specifications was seen as high priority by 8 out of 12 respondents, as low by 3 out of 12 and 1 out of 13 did not know. Reducing cross border information gaps and reporting requirements, is considered as high priority by 11 out of 13 respondents and as low priority by 2 out of 13. As regards introducing provisions on reporting of voyages / cargo / persons-on-board, including voyage plans, 11 out of 12 respondents considered this a high priority and 1 out of 12 as low priority. As high priority is the increase of harmonisation of information provided through RIS, including new technical specifications seen by 12 out of 13 respondents, while 1 out 13 sees this as a low

priority. Mandating the exchange of information between all actors is considered as a high priority by 12 out of 13 respondents and as a low priority by 1 out of 13.

2.3 Interviews, surveys and targeted consultations

Overall, 29 interviews were conducted with relevant stakeholders at the national level and with key stakeholders at the EU level. The interview programme followed the results of the first survey. The interviews aimed to provide an opportunity for respondents to go into more details. The results fed into the assessment of impacts. Despite efforts to reach out to stakeholders, only 22% of those approached agreed to participate in interviews.

Table 16: Overview of interviews

Stakeholder group	Stakeholder type	No. of proposed interviews	No. of interviews
Public bodies: International level	Shipping Regulation / Technical Certification Authority	2	1
Public bodies: European level	River Commissions	2	3
	Other RIS related bodies	1	2
Public bodies: National level	Port Authorities	2	0
	National RIS authorities	15	10
	Calamity abatement support / agencies	1	1
Private sector companies / representative organisations	Professional Associations (European level) representing IWT operators and port operators	3	6
	Professional Associations (national level) and the IWT operators, navigation personnel and port operators they represent.	12	3
	Developers of RIS	2	3
Total		**40**	**29**
Response rate			**22%**

Source: Ramboll et al. (2024), impact assessment support study

Due to the low response rate to the interviews, a two days targeted back-to-back workshop was organised in order to obtain targeted feedback from RIS users, in particular skippers who broadly represent SMEs. Representatives of staff of enterprises providing inland navigation services, logistics and ICT, representatives of networks of private businesses (skippers) and members of the shipping sector associations (representing skippers) and non-profit organisations for innovation in the inland navigation industry, were invited to discuss estimates of potential costs or expected benefits stemming from the proposed policy measures to update the RIS Directive. In total, 10 out of the 35 persons invited took part in the workshops.

Furthermore, online surveys were paramount in reaching out to the relevant stakeholders and collecting their views and opinions on the identified problems and their assessment of the policy measures, as well as the costs and benefits of each of the policy measures. The first survey was structured and presented on the following key areas: problem and problem drivers, situation under the current RIS Directive, and feedback on the draft policy measures. The survey was distributed to 229 stakeholders, of which 65 have completed it. Out of these 65 respondents, in terms of the geographical scope of the countries where the stakeholders work in, the highest number of stakeholders' replies were received from the Netherlands (22 respondents), followed by Germany (11 respondents), Belgium (7 respondents) and Austria (5 respondents). 8 stakeholders responded that they work in more than one country, with 2 stakeholders working in the Netherlands, Belgium and Germany; 1 working in the Netherlands, Germany, Hungary, Slovakia, Belgium, Austria and Serbia; 2 working in an international organisation, 1 in the Sava Commission, 1 internationally between the Netherlands, France, Germany and Belgium, and 1 across Europe.

Furthermore, regarding the stakeholder categories of the respondents, the majority of the respondents were either inland waterway transport or RIS users (31 respondents) or national level public bodies (15 respondents).

The second survey focused on the potential costs and benefits for the stakeholders of the proposed policy measures in terms of economic, environmental, and social impacts. The survey was distributed to 229 stakeholders, of which 13 have completed it. As regards the geographical scope, the highest number of stakeholders work primarily in Germany (3 respondents), followed by Austria (2 respondents). In addition, two stakeholders responded that they work in more than one country, with 1 stakeholder working for an international organisation whose headquarter is in France, and 1 working across Europe. In terms of the stakeholder categories of the respondents, the majority of the respondents were either national level public bodies (3 respondents) or inland waterway transport or RIS users (3 respondents). 1 stakeholder chose "other type of professional association" and responded as a IWT operator for fleet and ports; whilst 1 stakeholder chose "other" and responded as a RIS operator.

With regard to the 2 meetings organised with experts of the Commission expert group on inland waterway transport (NAIADES implementation group) and the expert group on digital inland navigation (DINA expert group), the following key elements were gathered:

During the 1st meeting, which was attended by 26 participants, the discussions focused on the draft problems, draft problem drivers and draft policy measures. The results of the analysis of the inputs regarding the problem drivers showed that the opinion that prevailed among the participants was that if no revisions were made to the RIS Directive (i.e. the baseline scenario), problem drivers are likely to persist. Similarly, the findings on the expected development of the draft problem showed a similar pattern, with majority of votes saying that the situation will stay relatively the same. In relation to the policy measures, the measures which the participants ranked the highest according to their relevance/importance in addressing a given problem driver, were the measures related to increasing the level of harmonisation of RIS by providing guidelines for competent authorities; introducing provision for supplying data to the ERDMS and its operation; strengthening requirements by adding new standards for navigation and voyage planning (RIS INDEX).

During the 2nd meeting, which was attended by 18 participants, participants were asked to rank the 17 measures from the least costly to the most costly to implement, while the second

exercise asked them to rank these from the least beneficial for RIS users to the most beneficial.

As a general comment on the assumptions for the parameters substantiating the policy measures, experts stressed that the types of assumptions greatly depended on the actors that provided them. On the complaint mechanism, experts stressed that complaints and the costs thereof are not linked to objects but rather to RIS-related problems. A few experts also reckoned that the assumptions for the costs and impacts of the complaint mechanism were too wide as they included a wide scope of information linked to very different parameters. It was also suggested that a complaint mechanism should not be operated at the Member State-level, but rather at the corridor-level. For what concerns the performance measurement framework, it was stressed by the experts that its costs would greatly change depending on what the key indicators chosen for framework are and on whether the framework is based on a Member State- or corridor-level, suggesting a strong preference for the latter. Other important takeaways from the discussions related to the involvement of CESNI in adopting RIS standards, which was welcomed by the experts as it is expected to increase the swiftness of the adoption of RIS technical standards; support was given to the need to clarify the management of data, possibly allowing barge owners to autonomously decide who they share their data with. Also, the area which was emphasized as important was the protection of company data and the need of RIS-users for Member States to ensure that the illegal use of AIS data is fought against, as this data may disclose contractual relationships and sensitive commercial information.

3 ANALYSIS OF THE STAKEHOLDER CONSULTATION

The remainder of the annex presents the main findings from the analysis of stakeholder contributions to the consultation process. They are structured around the main elements of the intervention logic, including the problem areas and their drivers, the policy objectives as well as the key aspects of the design of possible policy measures. The impact assessment support study[130] contains the detailed presentation of findings from the targeted consultation activities.

3.1 Problem areas and policy objectives

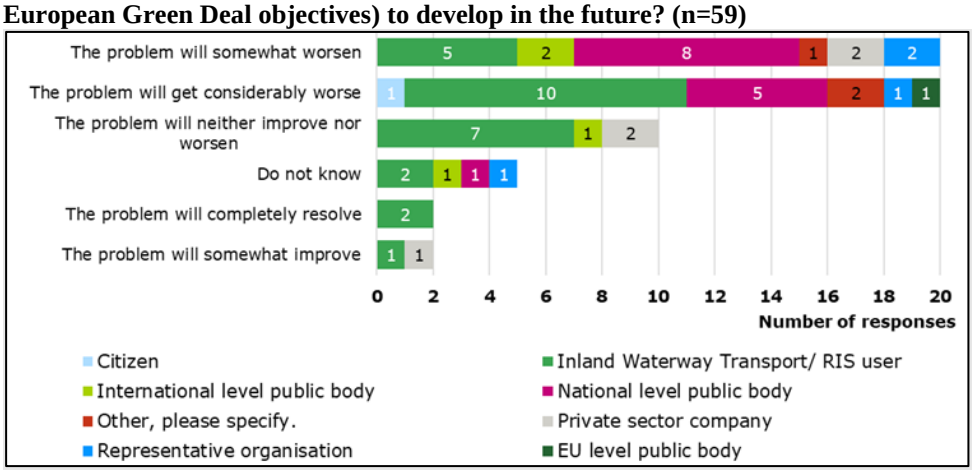
The impact assessment identified one main overarching problem to be addressed through a revision of the RIS Directive. As part of the interviews, stakeholders were asked to identify what they see as being the main problem to be addressed through a revision of the RIS Directive. Overall, the most salient topic was the difference in the level of implementation of RIS across Member States and the problems that subsequently arise in relation to harmonisation. This was raised by 3 out of 10 national RIS authorities, 2 out of 3 River Commissions, 1 out of 6 professional association at the EU level, 1 out of 3 professional association at the national level and 1 out of 3 developers of RIS. In particular, the lack of harmonised information was noted to bring about legal and organisational challenges, often stemming from lack of efficient communication between stakeholders.

Based on the feedback from interviews and the evaluation findings, the overall problem was defined as: “slow and fragmented deployment of River Information Services that hamper the competitiveness and safety of the sector, and its contribution towards the European Green

[130] Rambol et al. (2023), Impact Assessment support study for the revision of Directive 2005/44/EC on Harmonised River Information Services (RIS).

Deal objectives". As seen in Figure 19, 40 out of 59 respondents considered that the problem will somewhat or considerably worsen in the absence of EU level action.

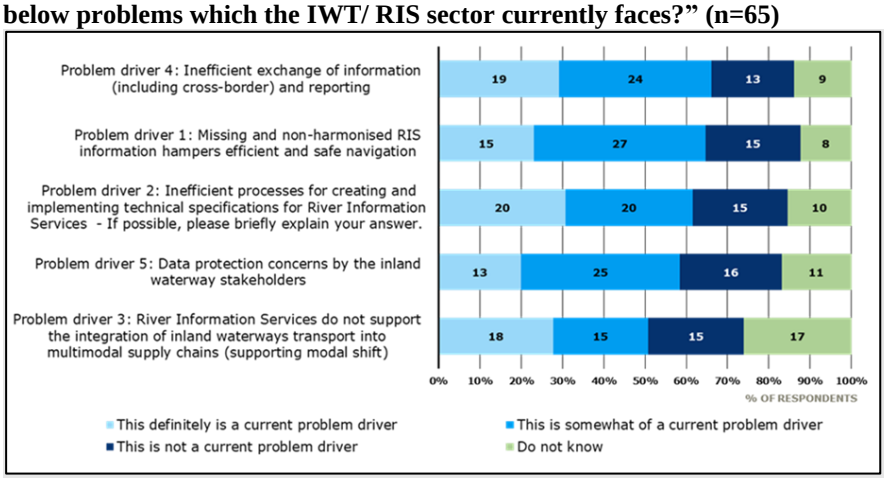
Figure 19: How do you expect the problem (slow and fragmented deployment of River Information Services that hamper the competitiveness and safety of the sector, and its contribution towards the European Green Deal objectives) to develop in the future? (n=59)



Source: First Survey

Based on the input from stakeholders, a series of problem drivers were developed to explain the main factors that contribute to the slow and fragmented deployment of RIS that hamper the competitiveness and safety of the sector. The main source of stakeholder input for the problem drivers stemmed from the first expert groups meeting and the first survey. Figure 20 and accompanying text provide a summary of the responses provided, showing that the stakeholders largely confirm the identified problem drivers, and provide an indication as to their importance.

Figure 20: Responses from the first survey to the question "In your view, are the problem drivers listed below problems which the IWT/ RIS sector currently faces?" (n=65)

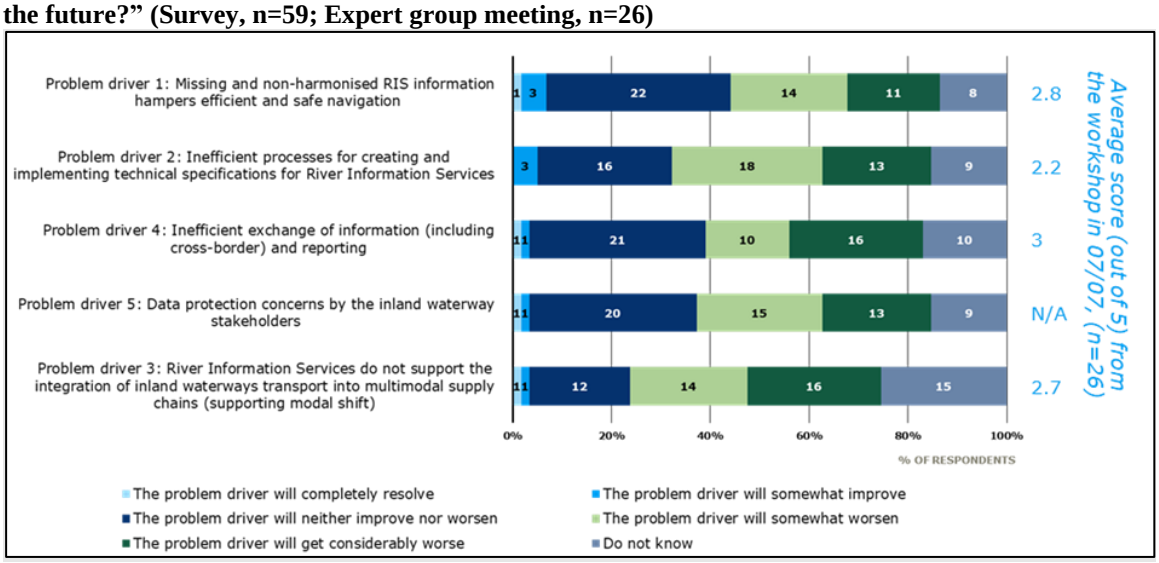


Source: First survey

There is no significant difference between the opinions of the stakeholders on the problem drivers. The majority of the stakeholders considered all problem drivers to be relevant. Problem driver 3 (Information Services do not support the integration of inland waterways transport into multimodal supply chains) was found to be an issue by slightly fewer stakeholders, 15 out of 56 stakeholders stating that it is not a current problem driver. Inland waterway transport/RIS users were consistent in their views across the different drivers, about half of them considered them to be "definitely a current problem driver". For problem driver

3, the most responses considering it "definitely a current problem driver" were from national public bodies.

Figure 21: Responses from the first survey and the DINA/NAIADES expert group meeting to the question "If the current RIS Directive is not revised, how do you expect the following problem drivers to develop in the future?" (Survey, n=59; Expert group meeting, n=26)



Source: First survey and DINA/NAIADES expert group meeting

In terms of stakeholder differences across the problem drivers during the first survey, the majority who responded "the problem will get considerably worse" for problem driver 5 were inland waterway transport/RIS users (9 out of 13 respondents), while for problem drivers 3 and 4 the majority were inland waterway transport/RIS users (7 respondents for problem driver 3 and 7 respondents for problem driver 4) and national level public bodies (6 respondents for problem driver 3 and 5 respondents for problem driver 4). Approximately half of the stakeholders who responded "the problem will get considerably worse" for problem driver 2 were inland waterway transport/RIS users (6 out of 13 respondents). For problem driver 1 there were no significant differences between the stakeholder groups in the survey responses, however in the expert group meeting, one national authority noted that the non-harmonisation aspect may be missing within the EuRIS portal, but it is dependent on the Member States. However, this view was disputed by one navigation authority which noted that in some countries it takes a long time for the information to be updated (weeks or months), which poses a big problem. One representative of a national authority expressed the view that "although the EuURIS portal as part of the RIS COMEX platform, provides a way to distribute and collect information, it does not solve the problem".

3.2 Potential policy measures

The stakeholder views on the list of policy measures are described in this section. Each policy measure was discussed in connection with one or more of the problem drivers. As part of the first survey stakeholders were asked about the extent to which they believed that the individual measures could address each of the identified problem drivers.

Under problem driver 1, the measures for the provisions of guidelines for competent authorities and the addition of new standards gathered support across all stakeholder groups. For the measures on the requirement of electronic voyage planning reporting, introduction of provisions for supplying data to the ERDMS and its operation, private sector organisations generally were less in favour. This was also true of the introduction of a new Performance

Measurement Framework, and complaint mechanism, of which international level organisations also were less in favour. The requirement of electronic voyage reporting also gathered more negative views from IWT and RIS users, as well as participants from the first expert group meeting.

Under problem driver 2, the measure for the inclusion of CESNI in the development and adoption of technical specifications by revising the governance structure and adoption procedure for technical specifications of the RIS Directive was broadly supported across each consultation method, with private sector companies however being split on the degree to which it could bring about positive change.

Under problem driver 3, for the measures of encouraging and requiring electronic voyage plan reporting, there was general support across stakeholder groups, with the exception of international level public bodies and private sector companies. Private sector companies were also less in favour of the measure to add new standards on data for navigation and voyage planning, revise the RIS guidelines as well as the introduction of provisions for supplying data to the ERDMS and its operation, which was also not supported by national RIS authorities. For the measure of linking RIS requirements with those of the TEN-T Regulation, there was general support across stakeholder groups with the exception of international level public bodies and private sector companies.

Under problem driver 4, for the measure on information exchange through eFTI and EMSWe mechanisms, despite agreement between national level public bodies and representative organisations, a more negative opinion was provided by IWT/RIS users and international level organisations. Similarly, international level organisations and private organisations were also less in favour of the measures for the encouragement of information exchange through the RIS COMEX platform and a centralised system for RIS data exchange by the Commission.

Finally, under problem driver 5, all of the measures proposed were positively received by stakeholders with the exception of international organisations which generally held the view that the measures would only address the problem to a small or to no extent.

Figure 22 to Figure 26 below show to what extent participants in the DINA/NAIADES expert group meetings considered that different draft policy measures would address the various identified problem drivers.

Figure 22: To what extent do you believe the individual measures below could help to address problem driver 1? (n=49)

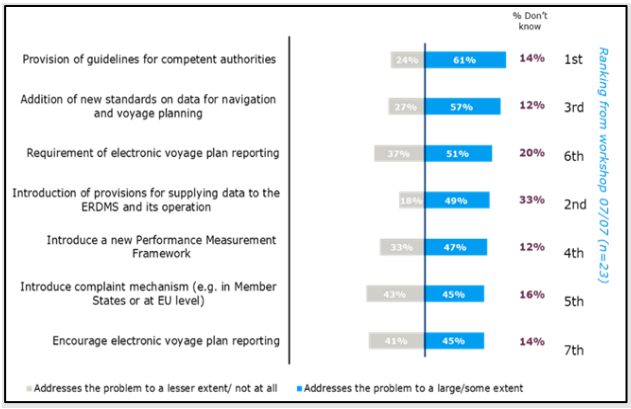


Figure 23: To what extent do you believe the individual measures below could help to address problem driver 2? (n=48)

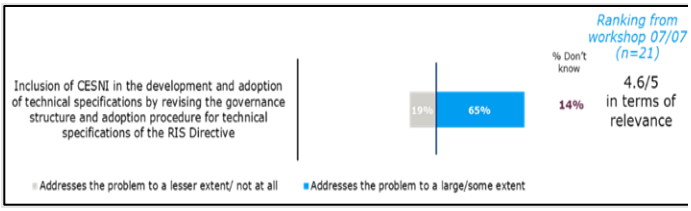


Figure 24: To what extent do you believe the individual measures below could help to address problem driver 3? (n=48)

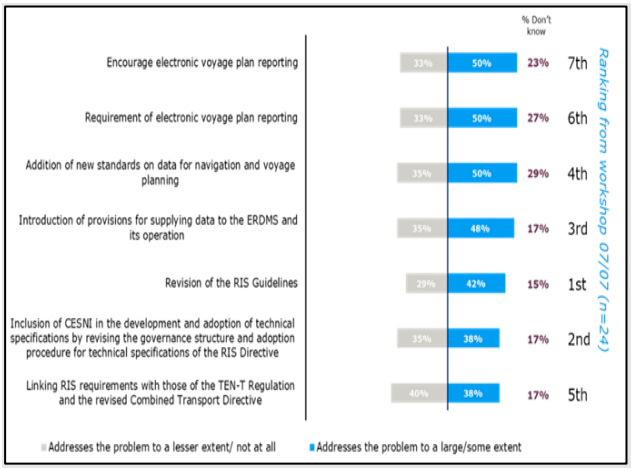


Figure 25: To what extent do you believe the individual measures below could help to address problem driver 4? (n=48)

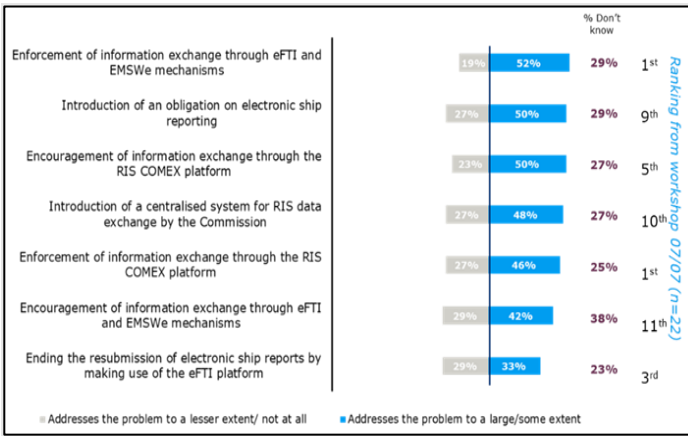
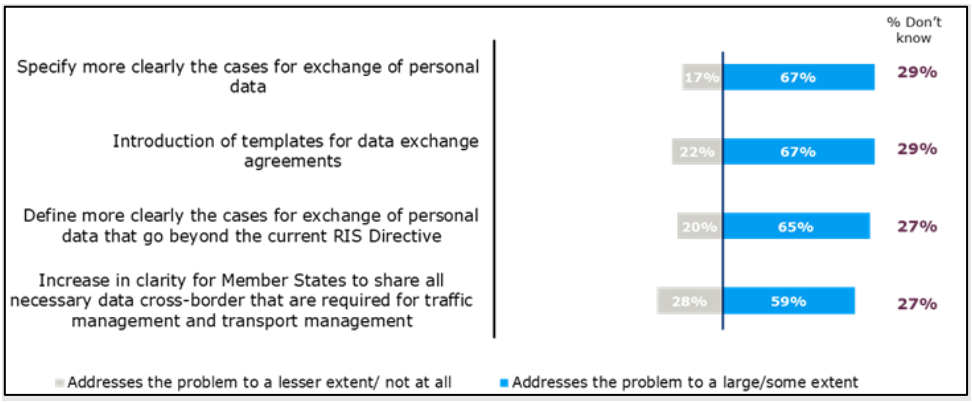


Figure 26: To what extent do you believe the individual measures below could help to address problem driver 5? (n=46)



Source: DINA/NAIADES expert group meeting

3.3 Differences among stakeholder groups and integration of consultation results

While the number of stakeholders consulted differs significantly across the different levels of governance, a concerted effort was made to consult all relevant stakeholder groups. While all groups were contacted, there was a limited response from IWT skippers and barge owners thus limiting their contribution in the triangulation of results.

The Open Public Consultation had a low response rate, while in the case of the interviews, the main stakeholder group targeted was that of national RIS authorities. In terms of geographical coverage, overall, there was noticeable bias with stakeholders from the Netherlands, Germany, Austria and Belgium. This bias was however to be expected, given the main transport/ river routes across Europe, as well as the most prominent stakeholders being EU or International associations/ organisations.

With regards to the surveys and interviews a slight bias towards greater representation of IWT/ RIS users was found in the overall sample size compared to other groups. This was however judged positively as the majority of those respondents indicated to work for SMEs. No weightings were applied in relation in the different sample sizes, but rather the data was triangulated, and biases were taken into account in the presentation of results.

From the different activities described above, triangulation of the data uncovered that the stakeholder views were largely divided across two broad points of view: 1) keep the RIS in its current form, but reinforce implementation across Member States, and 2) revise the RIS Directive and focus on greater implementation. Another diverging sets of views could be seen in the area of sharing of data where the public authorities were much more in favour of sharing of relevant data, while the operators and business associations were against data sharing as well as managing the data on a central level. These differing views were found in each of the consultation activities and have been taken into account and adequately represented in the analysis.

ANNEX 3: WHO IS AFFECTED AND HOW?

1. PRACTICAL IMPLICATIONS OF THE INITIATIVE

The revision of the Directive on River Information Services (RIS) aims at providing a framework for harmonised and updated RIS that will enable improvements in the competitiveness and safety of the sector, and its contribution towards the European Green Deal objectives.

The preferred policy option will improve the performance of RIS, provide for more and better quality data exchange, through a clear structure. It will support enhanced participation in intermodal operations and will bring legal clarity on the exchange for cross border operations.

The preferred policy option will promote digitalisation in the sector, improve links with other systems and tackle the identified challenges. In this respect the preferred policy option sets the basis and acts as an enabler for further developments to improve operational performance, intermodality, competitiveness and sustainability. The main stakeholder groups affected are: national public authorities, vessel operators, RIS software services providers and the European Commission.

The **national public authorities** will initially bear some upfront adjustment costs related to the setting up of the complaint handling mechanism, as well as for necessary software and hardware to improve the RIS Index and RIS COMEX, as well as links with other modes (eFTI, EMSWe) and inland ports. National public authorities will also bear recurrent administrative costs for maintenance and update of the above-mentioned systems. On the other hand, they will benefit from administrative cost savings through electronic processing of cargo information (instead of paper cargo reports) and the phase out of national platforms that would be gradually replaced by RIS COMEX.

Vessel operators will benefit from better quality information and reduced efforts to collect the necessary information to plan their voyage, which will bring adjustment costs savings. They will also benefit from administrative cost savings, as less efforts will be required to prepare and resubmit reports as these will be done with harmonised and standardised tools, like the one-stop-shop RIS COMEX, the eFTI platforms, and with inland ports.

Software services providers will benefit of adjustment costs savings due to improved access to better quality information, which will reduce the costs of their software applications.

The **society at large** will benefit from a reduction in the external costs of CO2 emissions, accidents, congestion, noise and habitats.

2. SUMMARY OF COSTS AND BENEFITS

I. Overview of Benefits (total for all provisions) – Preferred Option (PO-B)		
Description	***Amount***	***Comments***
Direct benefits		
Adjustment costs savings for vessel operators, expressed as present value over 2025-2050 relative to the baseline	EUR 72.1 million	Recurrent adjustment costs savings for vessel operators due to better quality information and reduced efforts to collect the necessary information to plan their voyage.

I. Overview of Benefits (total for all provisions) – Preferred Option (PO-B)		
Description	***Amount***	***Comments***
Administrative costs savings for vessel operators, expressed as present value over 2025-2050 relative to the baseline	EUR 28.5 million	Recurrent administrative costs savings for vessel operators, due to reducing the need for re-registering cargo information and reporting cargo information to ports. These administrative costs savings are driven by the exchange of cargo-related information through the eFTI mechanism, the exchange of information through the RIS COMEX platform, the new technical specifications for the exchange of information with IWT ports and legal clarity for personal data.
Adjustment costs savings for RIS software services providers, expressed as present value over 2025-2050 relative to the baseline	EUR 8.1 million	Recurrent adjustment costs savings for RIS software services providers due to improved access to better quality information, which will reduce the costs of their software applications.
Administrative costs savings for national public authorities, expressed as present value over 2025-2050 relative to the baseline	EUR 30.6 million	Recurrent administrative costs savings for national public authorities through electronic processing of cargo information (instead of paper cargo reports) and the phase out of national platforms that would be gradually replaced by RIS COMEX.
Indirect benefits		
Reduction in external costs of CO_2 emissions, expressed as present value over 2025-2050 relative to the baseline	EUR 48.6 million	Indirect benefit to society at large, due to the tonnes of CO_2 emissions saved, enabled by the higher use of IWT and the shift away from road transport. The reduction in the external costs of CO_2 emissions is estimated at EUR 48.6 million, expressed as present value over the 2025-2050 horizon relative to the baseline.
Reduction in external costs of noise emissions, expressed as present value over 2025-2050 relative to the baseline	EUR 36.6 million	Indirect benefit to society at large, enabled by the higher use of IWT and the shift away from road transport. The reduction in the external costs of noise emissions is estimated at EUR 36.6 million, expressed as present value over the 2025-2050 horizon relative to the baseline.
Reduction in external costs of habitats, expressed as present value over 2025-2050 relative to the baseline	EUR 36.2 million	Indirect benefit to society at large, enabled by the higher use of IWT and the shift away from road transport. The reduction in the external costs of habitats is estimated at EUR 36.2 million, expressed as present value over the 2025-2050 horizon relative to the baseline.
Reduction in external costs of road congestion, expressed as present value over 2025-2050 relative to the baseline	EUR 86.8 million	Indirect benefit to society at large, enabled by the higher use of IWT and the shift away from road transport. The reduction in the external costs of road congestion is estimated at EUR 86.8 million, expressed as present value over the 2025-2050 horizon relative to the baseline.
Reduction in external costs of road accidents (fatalities	EUR 115.8 million	Indirect benefit to society at large, due to the lives saved and injuries avoided,

I. Overview of Benefits (total for all provisions) – Preferred Option (PO-B)		
Description	***Amount***	***Comments***
and injuries), expressed as present value over 2025-2050 relative to the baseline		enabled by the higher use of IWT and the shift away from road transport and thus a reduction in the road freight transport activity relative to the baseline. The reduction in the external costs of road accidents is estimated at EUR 115.8 million, expressed as present value over the 2025-2050 horizon relative to the baseline.
Administrative cost savings related to the 'one in, one out' approach*		
Administrative costs savings for vessel operators - **average per year**[131] relative to the baseline	EUR 1.6 million on average per year	Recurrent administrative costs savings for vessel operators, due to reducing the need for re-registering cargo information and reporting cargo information to ports. They are estimated at EUR 1.6 million per year on average relative to the baseline, and they are driven by: the exchange of cargo-related information through the eFTI mechanism (EUR 0.6 million), the exchange of information through the RIS COMEX platform (EUR 0.2 million), the new standards and technical specifications for the exchange of information with IWT ports (EUR 0.5 million) and legal clarity for personal data (EUR 0.3 million).

II. Overview of costs – Preferred option (PO-B)						
	Citizens/Consumers		**Businesses**		**Administrations**	
	One-off	**Recurrent**	**One-off**	**Recurrent**	**One-off**	**Recurrent**
Direct adjustment costs, expressed as present value over 2025-2050 relative to the baseline	-	-	-	-	For national public administrations: EUR 18.3 million	-
Direct administrative costs, expressed as present value over 2025-2050 relative to the baseline	-	-	-	-	-	For national public administrations: EUR 75.3 million
Direct regulatory fees and charges	-	-	-	-	-	-
Direct enforcement costs	-	-	-	-	-	-
Indirect costs	-	-	-	-	-	-
Costs related to the 'one in, one out' approach						

[131] As explained in section 8.3, this is calculated as simple average over 2026-2035.

II. Overview of costs – Preferred option (PO-B)							
Total	Direct adjustment costs	-	-	-	-		
	Indirect adjustment costs	-	-	-	-		
	Administrative costs (for offsetting)	-	-	-	-		

3. RELEVANT SUSTAINABLE DEVELOPMENT GOALS

III. Overview of relevant Sustainable Development Goals – Preferred Option (PO-B)		
Relevant SDG	**Expected progress towards the Goal**	**Comments**
SDG 13 ("Take urgent action to combat climate change and its impacts")	389.1 thousand tonnes of CO_2 emissions saved cumulatively over the period 2025-2050.	The decrease in emissions is due to the modal shift of freight from road to inland waterway transport.
SDG 9 ("on industry, innovation and infrastructure"), specifically 9.1 "Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all"	Shift of freight transport from road to inland waterways by 0.38 billion tonnes-kilometres in 2030 and 0.45 billion tonnes-kilometres in 2050 relative to the baseline.	Indicator 9.1.2 "Passenger and freight volumes, by mode of transport" is used.

ANNEX 4: ANALYTICAL METHODS

1. Description of the analytical methods used

The main model used for developing the baseline scenario for this initiative is the PRIMES-TREMOVE transport model by E3Modelling, a specific module of the PRIMES models. The model has a successful record of use in the Commission's energy, transport and climate policy assessments. In particular, it has been used for the Staff Working Document accompanying the REPowerEU package[132], the impact assessments underpinning the "Fit for 55" package[133], the impact assessments accompanying the 2030 Climate Target Plan[134] and the Staff Working Document accompanying the Sustainable and Smart Mobility Strategy[135], the Commission's proposal for a Long Term Strategy[136] as well as for the 2020 and 2030 EU's climate and energy policy framework.

For the assessment of the impacts of the policy options an excel-based tool has been developed by Rambol et al. in the context of the impact assessment support study[137]. The tool draws on the Standard Cost Model for the assessment of the costs and costs savings and also includes an assessment of the environmental and social impacts. The excel-based tool builds extensively on data from Eurostat, the CCNR, and the analysis of stakeholders' feedback. The proposed measures which involve the amendment of the Directive are assumed to be implemented from 2025 onwards, so that the assessment has been undertaken for the 2025-2050 period and refers to EU27. Costs and benefits are expressed as present value over the 2025-2050 period, using a 3% discount rate.

PRIMES-TREMOVE model

The PRIMES-TREMOVE transport model projects the evolution of demand for passengers and freight transport, by transport mode, and transport vehicle/technology, following a formulation based on microeconomic foundation of decisions of multiple actors. Operation, investment and emission costs, various policy measures, utility factors and congestion are among the drivers that influence the projections of the model. The projections of activity, equipment (fleet), usage of equipment, energy consumption and emissions (and other externalities) constitute the set of model outputs.

The PRIMES-TREMOVE transport model can therefore provide the quantitative analysis for the transport sector in the EU, candidate and neighbouring countries covering activity, equipment, energy and emissions. The model accounts for each country separately which means that the detailed long-term outlooks are available both for each country and in aggregate forms (e.g. EU level).

In the transport field, PRIMES-TREMOVE is suitable for modelling *soft measures* (e.g. eco-driving, labelling); *economic measures* (e.g. subsidies and taxes on fuels, vehicles, emissions;

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[132] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131
[133] Delivering the European Green Deal | European Commission (europa.eu)
[134] SWD(2020)176 final.
[135] EUR-Lex – 52020SC0331 – EN – EUR-Lex (europa.eu)
[136] Source: 2050 long-term strategy (europa.eu)
[137] The analysis in this section is based on the Rambol et al. (2023), Impact Assessment support study for the revision of Directive 2005/44/EC on Harmonised River Information Services (RIS).

ETS for transport when linked with PRIMES; pricing of congestion and other externalities such as air pollution, accidents and noise; measures supporting R&D); *regulatory measures* (e.g. CO_2 emission performance standards for new light duty vehicles and heavy duty vehicles; EURO standards on road transport vehicles; technology standards for non-road transport technologies, deployment of Intelligent Transport Systems) and *infrastructure policies for alternative fuels* (e.g. deployment of refuelling/recharging infrastructure for electricity, hydrogen, LNG, CNG). Used as a module that contributes to the PRIMES model energy system model, PRIMES-TREMOVE can show how policies and trends in the field of transport contribute to economy-wide trends in energy use and emissions. Using data disaggregated per Member State, the model can show differentiated trends across Member States.

The PRIMES-TREMOVE has been developed and is maintained by E3Modelling, based on, but extending features of, the open source TREMOVE model developed by the TREMOVE[138] modelling community. Part of the model (e.g. the utility nested tree) was built following the TREMOVE model.[139] Other parts, like the component on fuel consumption and emissions, follow the COPERT model.

Data inputs

The main inputs to the PRIMES-TREMOVE model, such as for activity and energy consumption, come from the EUROSTAT database and from the Statistical Pocketbook "EU transport in figures"[140]. Excise taxes are derived from the DG TAXUD excise duty tables. Other data come from different sources such as research projects (e.g. TRACCS project) and reports. In the context of this exercise, the PRIMES-TREMOVE transport model is calibrated to 2005, 2010 and 2015 historical data. Available data on 2020 market shares of different powertrain types have also been taken into account.

2. Baseline scenario

In order to reflect the fundamental socio-economic, technological and policy developments, the Commission prepares periodically an EU Reference Scenario on energy, transport and GHG emissions. The socio-economic and technological developments used for developing the baseline scenario for this impact assessment build on the latest EU Reference scenario 2020 (REF2020)[141]. The same assumptions have been used in the policy scenarios

[138] Source : https ://www.tmleuven.be/en/navigation/TREMOVE

[139] Several model enhancements were made compared to the standard TREMOVE model, as for example: for the number of vintages (allowing representation of the choice of second-hand cars); for the technology categories which include vehicle types using electricity from the grid and fuel cells. The model also incorporates additional fuel types, such as biofuels (when they differ from standard fossil fuel technologies), LPG, LNG, hydrogen and e-fuels. In addition, representation of infrastructure for refuelling and recharging are among the model refinements, influencing fuel choices. A major model enhancement concerns the inclusion of heterogeneity in the distance of stylised trips; the model considers that the trip distances follow a distribution function with different distances and frequencies. The inclusion of heterogeneity was found to be of significant influence in the choice of vehicle-fuels especially for vehicles-fuels with range limitations.

[140] Source : https ://ec.europa.eu/transport/facts-fundings/statistics_en

[141] EU Reference Scenario 2020 (europa.eu)

underpinning the impact assessments accompanying the "Fit for 55" package[142] and the Staff Working Document accompanying the REPowerEU package[143].

2.1. Main assumptions of the Baseline scenario

The main assumptions related to economic development, international energy prices and technologies are described below.

2.1.1. Economic assumptions

The modelling work is based on socio-economic assumptions describing the expected evolution of the European society. Long-term projections on population dynamics and economic activity form part of the input to the model and are used to estimate transport activity, particularly relevant for this impact assessment.

Population projections from Eurostat[144] are used to estimate the evolution of the European population, which is expected to change little in total number in the coming decades. The GDP growth projections are from the Ageing Report 2021[145] by the Directorate General for Economic and Financial Affairs, which are based on the same population growth assumptions.

Table 17: Projected population and GDP growth per Member State

	Population			GDP growth	
	2020	2025	2030	2020-'25	2026-'30
EU27	447.7	449.3	449.1	0.9%	1.1%
Austria	8.90	9.03	9.15	0.9%	1.2%
Belgium	11.51	11.66	11.76	0.8%	0.8%
Bulgaria	6.95	6.69	6.45	0.7%	1.3%
Croatia	4.06	3.94	3.83	0.2%	0.6%
Cyprus	0.89	0.93	0.96	0.7%	1.7%
Czechia	10.69	10.79	10.76	1.6%	2.0%
Denmark	5.81	5.88	5.96	2.0%	1.7%
Estonia	1.33	1.32	1.31	2.2%	2.6%
Finland	5.53	5.54	5.52	0.6%	1.2%
France	67.20	68.04	68.75	0.7%	1.0%
Germany	83.14	83.48	83.45	0.8%	0.7%
Greece	10.70	10.51	10.30	0.7%	0.6%
Hungary	9.77	9.70	9.62	1.8%	2.6%
Ireland	4.97	5.27	5.50	2.0%	1.7%
Italy	60.29	60.09	59.94	0.3%	0.3%
Latvia	1.91	1.82	1.71	1.4%	1.9%
Lithuania	2.79	2.71	2.58	1.7%	1.5%

[142] Policy scenarios for delivering the European Green Deal (europa.eu)
[143] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131
[144] EUROPOP2019 population projections : Eurostat – Data Explorer (europa.eu)
[145] The 2021 Ageing Report : Underlying assumptions and projection methodologies The 2021 Ageing Report: Underlying Assumptions and Projection Methodologies | European Commission (europa.eu)

	Population			GDP growth	
	2020	2025	2030	2020-'25	2026-'30
Luxembourg	0.63	0.66	0.69	1.7%	2.0%
Malta	0.51	0.56	0.59	2.7%	4.1%
Netherlands	17.40	17.75	17.97	0.7%	0.7%
Poland	37.94	37.57	37.02	2.1%	2.4%
Portugal	10.29	10.22	10.09	0.8%	0.8%
Romania	19.28	18.51	17.81	2.7%	3.0%
Slovakia	5.46	5.47	5.44	1.1%	1.7%
Slovenia	2.10	2.11	2.11	2.1%	2.4%
Spain	47.32	48.31	48.75	0.9%	1.6%
Sweden	10.32	10.75	11.10	1.4%	2.2%

Beyond the update of the population and growth assumptions, an update of the projections on the sectoral composition of GDP was also carried out using the GEM-E3 computable general equilibrium model. These projections take into account the potential medium- to long-term impacts of the COVID-19 crisis on the structure of the economy, even though there are inherent uncertainties related to its eventual impacts. Overall, conservative assumptions were made regarding the medium-term impacts of the pandemic on the re-localisation of global value chains, teleworking and teleconferencing and global tourism.

2.1.2. International energy prices assumptions

Alongside socio-economic projections, transport modelling requires projections of international fuel prices. The table below shows the oil prices assumptions of the baseline and policy options of this impact assessment, that draw on the modelling underpinning the REPowerEU package[146].

Table 18: Oil prices assumptions

Oil	2015	2020	2030	2040	2050
in $'15 per boe	52.3	39.8	92.1	97.4	117.9
in €'15 per boe	47.2	35.8	83.0	87.8	106.3

2.1.3. Technology assumptions

Modelling scenarios is highly dependent on the assumptions on the development of technologies, both in terms of performance and costs. For the purpose of the impact assessments related to the "Climate Target Plan" and the "Fit for 55" policy package, these assumptions have been updated based on a rigorous literature review carried out by external consultants in collaboration with the JRC. Continuing the approach adopted in the long-term strategy in 2018, the Commission consulted on the technology assumption with stakeholders in 2019. In particular, the technology database of the PRIMES and PRIMES-TREMOVE models (together with GAINS, GLOBIOM, and CAPRI) benefited from a dedicated consultation workshop held on 11th November 2019. EU Member States representatives also had the opportunity to comment on the costs elements during a workshop held on 25th November 2019. The updated technology assumptions are published together with the EU

[146] SWD(2022)230 final.

Reference Scenario 2020[147]. The same assumptions have been used in the context of this impact assessment.

2.1.4. Policies in the Baseline scenario

Building on REF2020, the baseline has been designed to include the initiatives of the 'Fit for 55' package proposed by the Commission on 14 July 2021[148] and the initiatives of the RePowerEU package proposed by the Commission on 18 May 2022[149]. The baseline scenario assumes no further EU level intervention beyond the current RIS Directive. The effects of projects such as RIS COMEX are however expected to continue over time in the baseline scenario, as the continuation of the project RIS COMEX 2 was recently selected for CEF funding. In addition, the baseline scenario accounts for the proposed revision of the TEN-T Regulation[150].

The baseline also incorporates foresight megatrends[151] and developments captured in the 2022 Strategic Foresight Report[152]. Among others, it captures the trend of increasing demand for transport as population and living standards grow as well as the links between the digital and green transition. In particular, the projected transport activity draws on the long-term population projections from Eurostat and GDP growth from the *Ageing Report 2021*[153] by the Directorate General for Economic and Financial Affairs.

2.2. Baseline scenario results

Evolution of transport performance

In the Baseline scenario, EU transport activity is projected to grow post-2020, following the recovery from the COVID pandemic. Road transport would maintain its dominant role within the EU by 2050. Rail transport activity is projected to grow significantly faster than for road, driven in particular by the completion of the TEN-T core network by 2030 and of the comprehensive network by 2050, supported by the CEF, Cohesion Fund and ERDF funding, but also by measures of the 'Fit for 55' package. Freight rail traffic would increase by 42% by 2030 relative to 2015 (96% for 2015-2050). Freight inland waterways activity represented 147 billion tonne-kilometres (tkm) in 2015, going down to 132 billion tkm in 2020[154]. Following the post-COVID recovery, the freight inland waterways activity is projected to increase to 178 billion tkm in 2030 (21% increase relative to 2015) and 212 billion tkm in 2050 (44% increase for 2015-2050)[155].

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[147] EU Reference Scenario 2020 (europa.eu)
[148] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en
[149] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131
[150] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2021%3A812%3AFIN
[151] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en#explore
[152] COM(2022) 289 final of 29 June 2022.
[153] The 2021 Ageing Report : Underlying assumptions and projection methodologies
[154] Source: EU transport in figures. Statistical pocketbook 2022 (europa.eu)
[155] PRIMES-TREMOVE model provides the projections for inland waterways and domestic maritime at aggregate level. No split is available between the two. This is due to the fact that energy balances do not distinguish between the two modes (their energy use is provided together). In order to derive the transport activity for freight inland waterways, the share of inland waterways activity in total inland waterways and

Table 19: Projected inland waterways activity at EU level in the baseline scenario (in billion tkm/pkm)

	2015	2020	2030	2040	2050
IWT freight (billion tkm)	147	132	173	195	212
IWT passenger (billion pkm)	0.5	0.04	0.6	0.7	0.7

Source: Ramboll et al. (2024), impact assessment support study

The projected evolution of freight inland waterways activity by Member State is provided in Table 20. The highest shares of the freight inland waterways activity post-2030 are projected in Germany (around 40% of the total), the Netherlands (around 30%), Romania (around 11%), Belgium (around 7%) and France (around 5%). The other Member States would provide less than 5% of the freight inland waterways activity from 2030 onwards.

Table 20: Projected inland waterways activity by Member State in the baseline scenario (in billion tkm)

	2015	2020	2030	2040	2050
DE	55.32	46.34	69.94	76.77	85.29
NL	48.54	45.17	54.13	58.06	61.99
RO	13.17	13.64	19.32	21.26	23.57
BE	10.43	7.39	12.27	13.59	14.54
FR	8.52	6.99	8.30	8.61	8.74
BG	5.60	6.26	6.33	7.29	7.95
AT	1.81	1.61	2.41	2.55	2.59
HU	1.82	2.00	2.53	3.11	3.40
HR	0.88	0.90	1.12	1.33	1.46
SK	0.74	0.83	1.00	1.08	1.15
LU	0.24	0.20	0.27	0.33	0.36
FI	0.13	0.13	0.16	0.18	0.20
IT	0.06	0.12	0.15	0.16	0.16
SE	0.00	0.08	0.10	0.12	0.13
PL	0.09	0.08	0.15	0.21	0.24
CZ	0.03	0.02	0.04	0.04	0.05
EU	147.35	131.74	178.21	194.69	211.82

Source: Ramboll et al. (2024), impact assessment support study

The passenger segment of IWTs is expected to increase as well (see Table 19), with the number of passenger-kilometres projected to increase by 36% by 2030 compared to 2015 (53% increase for 2015-2050)[156]. The number of passengers on cruise vessels for the historical period is based on data from CCNR[157]. The activity in terms of passenger-kilometres has been derived assuming an average sailing distance per passenger in inland navigation of 350 kilometres.

Despite the increase in terms of transport volumes, the modal share of freight IWT in land transport[158] is projected to decrease from 6.8% in 2015, to 6.5% in 2025 and 6.3% in 2030. Post-2030, the modal share of freight IWT is projected to remain relatively stable over time, at 6.2% of land transport activity. The decrease in the market share of IWT relative to 2015 is

domestic maritime activity from Eurostat has been used. Post-2020, the share of inland waterways activity is assumed to remain constant over time at its 2020 levels, in line with historical developments.

[156] For the projection period, the passenger IWT activity is assumed to grow in line with that of inland waterways and domestic maritime activity from the PRIMES-TREMOVE model, while also taking into account the increasing share of passenger IWT between 2015 and 2019.

[157] Source: https://www.ccr-zkr.org/files/documents/om/om20_II_en.pdf

[158] Excluding pipeline transport.

due to the specific type of goods transported by inland navigation, i.e. petroleum products and coal that are expected to decrease their share over time driven by the energy transition, but also due to the higher growth in the rail transport activity. Although growth is expected in the container segment, this growth is only projected to counterbalance the decrease in fossil fuels trade post-2030. As regards passenger transport, the modal share of IWT only represents around 0.01% of land transport activity and is projected to remain relatively stable over time following the post-COVID recovery.

The number of passenger vessel journeys is derived based on the projected evolution of activity in passenger-kilometres, assuming an average sailing distance per passenger in inland navigation of 350 kilometres and an average capacity of vessels of 150 passengers[159]. In the baseline scenario, the number of passenger vessel journeys is projected to increase from 8,867 in 2015 to 12,043 in 2030 and 13,572 in 2050 following the recovery from the COVID-19 pandemic (see Table 21).

The total number of freight vessels journeys is estimated as the total number of tonnes transported by IWT divided by the number of tonnes transported per journey. The total number of tonnes transported is projected to grow roughly in line with the transport activity in tonne kilometres (from 545 million tonnes in 2015 to 690 million tonnes in 2030 and 813 million tonnes in 2050), while the number of tonnes per journey would continue to increase but at a slower pace than in the past[160]. For 2015 the total number of freight vessels journeys was estimated at 682,120, going down to 588,721 in 2020. Around 60% of vessels journeys took place within the Netherlands. Post-2020, the number of freight vessels journeys is projected to go up to 717,838 in 2030 (5% increase for 2015-2030) and 731,234 in 2050 (7% increase for 2015-2050), following the recovery from the COVID-19 pandemic.

Around 40% of the freight vessels journeys take place within one country, with the rest crossing on average 1.3 borders per journey. This means that in many cases these are journeys between neighbouring countries (e.g. the Netherlands-Belgium or the Netherlands-Germany) and to a much lesser extent journeys that pass through three or more countries (e.g. Belgium-the Netherlands-Germany or Ukraine-Romania-Bulgaria). The share of border crossings in the number of vessel journeys is assumed to remain constant over time (at around 60%), in line with the historical developments. Thus, the total number of freight border crossings is projected to go up from 427,947 in 2015 to 432,442 in 2030 and 440,512 in 2050. For passenger vessels journeys, the share of border crossings is much higher (around 90%) and is assumed to remain constant over time. The total number of border crossings for passenger IWT is projected to increase from 8,344 in 2015 to 10,882 in 2030 and 12,264 in 2050 (see Table 21).

Table 21: Projected evolution of vessel journeys and border crossings in the baseline scenario

	2015	2020	2030	2040	2050
Number of vessel journeys					
Freight	682,120	588,721	717,838	721,589	731,234
Passenger	8,867	827	12,043	12,940	13,572
Number of border					

[159] Cruise Ship Passenger Capacity | CruiseMapper

[160] From 799 tonnes per journey in 2015 and 859 tonnes per journey in 2020 to 961 tonnes per journey in 2030 and 1,111 tonnes per journey in 2050.

	2015	2020	2030	2040	2050
crossings					
Freight	427,947	354,659	432,442	434,702	440,512
Passenger	8,344	747	10,882	11,693	12,264

Source: Ramboll et al. (2024), impact assessment support study

In terms of vessels-kilometres, the freight inland waterways activity is projected to remain relatively constant over time (from 184 million vessels-kilometres in 2015 to 185 million vessels-kilometres in 2030 and 191 million vessels-kilometres in 2050). This is despite the growing number of tonnes transported, and can be explained by the increase in the number of tonnes per journey, as mentioned above[161]. For passenger IWT, the activity is projected to increase from 3.1 million vessels-kilometres in 2015 to 4.2 million vessels-kilometres in 2030 and 4.8 million vessels-kilometres in 2050.

Evolution of the fleet

The number of cargo vessels has decreased significantly between 2003 and 2020[162]. In 2003, there were 13,385 ships in the EU, but by 2020 their number has fallen to 10,332, a decline of 23%. The number of cargo vessels decreased because of scale enlargement (larger quantities per ship) and better functioning of the transport market (liberalisation). As the same time, the size of vessels is increasing, making up for the reduction in carrying capacity, which according to Eurostat decreases only by 3%. The overall downward trend in the number of cargo vessels is expected to reverse by 2030 (12,371 cargo vessels), driven by the increase in activity and the slower increase in the capacity of ships compared to the past, and it is expected to remain relatively stable until 2050 (12,223 cargo vessels) due to the increase in the productivity per vessel[163]. On the other hand, the number of passenger vessels had increased from approximately 160 ships in 2004 to 405 ships in 2021. When the day-tour ships and smaller cycle holiday ships are counted, around 2,553 passenger ships were estimated to operate in the EU in 2015[164]. The number of passenger vessels is projected to follow the increase in the number of passengers (3,467 vessels projected in 2030 and 3,908 in 2050). It should however be noted that the majority of these vessels are small or very small. In contrast to cargo vessels, no further growth in scale or productivity is expected for passenger shipping.

Table 22: Projected evolution of the fleet in the baseline scenario

	2015	2020	2030	2040	2050
Freight	11,792	10,332	12,371	12,270	12,223
Passenger	2,553	2,942	3,467	3,726	3,908
Total fleet	14,345	13,274	15,838	15,996	16,131

[161] From 799 tonnes per journey in 2015 and 859 tonnes per journey in 2020 to 961 tonnes per journey in 2030 and 1,111 tonnes per journey in 2050.

[162] The year 2003 was chosen for the comparison because of data availability on the number of ships in both the Rhine, Danube and other river basins.

[163] This is assumed at 1.5% per year per ship/barge. This increase is justified by both technical and operational developments: for instance Smart And Autonomous Shipping which may result into a larger share of the fleet being able to sale 24/7 (in spite of labour shortages in the sector), increased attention to good navigational status of waterways (including 24/7 operation of bridges and locks on the major waterways) and scale enlargement in IWT of both companies (larger number of vessels per company) and vessels (larger load capacities for vessels), although at slower pace than in the past.

[164] Prominent (2017)

Source: Ramboll et al. (2024), impact assessment support study

Evolution of energy use, CO_2 and air pollutant emissions

The evolution of energy consumption and emissions draws on the PRIMES-TREMOVE model projections, while accounting for the share of inland waterways transport in inland waterways and domestic maritime activity. Energy use in freight IWT is projected to remain relatively stable by 2030 to its 2015 levels, despite the increase in activity, and to decrease to 895 ktoe[165] by 2050 (11% decrease for 2015-2050), thanks to the uptake of more fuel-efficient technologies including electrification. For passenger vessels, energy consumption is projected to increase by 11% by 2030 (132 ktoe), driven by the strong growth in activity, and only to slightly decrease by 2050 relative to its 2015 levels (112 ktoe). Overall, considering both passenger and freight, energy use in inland waterways transport is projected to remain relatively stable by 2030 compared to its 2015 levels and to go down by 10% by 2050, relative to 2015.

In the baseline scenario, CO_2 emissions from inland waterways transport are projected to decrease much faster than the energy use (21% decrease for 2015-2030 and 67% decrease for 2015-2050). This is because of the large scale uptake of renewable and low carbon fuels, namely e-fuels, biofuels and electricity. In this context, it should be noted that the baseline scenario assumes the implementation of the European Climate Law to which all sectors, including the inland waterways sector, need to contribute.

In terms of NOx emissions a similar trend is expected. NOx emissions are projected to reduce from 73 ktons in 2015 to just below 20 ktons in 2050. The amount of particulate matter emitted by inland navigation is also expected to reduce, from 3.8 ktons in 2015 to 1 kton in 2050. This is due to both electrification and the fact that the ships that continue to operate with internal combustion engines are becoming cleaner. In this context, it should be noted that since 2020 new combustion engines are considerably cleaner, thanks to the implementation of non-road mobile machinery (NRMM) Regulation[166] (NRMM Stage 5).

Table 23: Projected evolution of energy use, CO_2 and air pollutant emissions in the baseline

	2015	2020	2030	2040	2050
Energy use (ktoe)	1,124	828	1,129	1,060	1,007
Freight	1,006	818	997	938	895
Passenger	119	10	132	122	112
CO_2 emissions (ktons)	3,476	2,416	2,745	2,182	1,084
Freight	3,109	2,387	2,424	1,930	963
Passenger	366	29	321	251	121
NOx emissions (ktons)	73	49	47	32	18
Freight	65	49	41	28	16
Passenger	8	1	5	4	2
PM emissions (ktons PM2.5)	3.8	2.6	2.4	1.6	1.0
Freight	3.4	2.5	2.2	1.5	0.8
Passenger	0.4	0.0	0.3	0.2	0.1

[165] The tonne of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one tonne of crude oil.
[166] Regulation (EU) 2016/1628.

Source: Ramboll et al. (2024), impact assessment support study; Note: PM stands for particulate matter emissions.

Evolution of the number of accidents

There is little consistent data on safety in the inland navigation sector, with available data coming from Eurostat and national databases for Bulgaria, Czechia, Germany, Croatia, Hungary, the Netherlands, Austria, Poland and Romania. In the baseline scenario, the projected evolution of the number of accidents is linked to the evolution of activity expressed in terms of vessel-kilometres. The number of accidents per vessel-kilometres is assumed to remain constant over time. Thus, the number of accidents is projected to slightly increase to 535 in 2030 and 551 in 2050 in the baseline scenario.

Table 24: Projected evolution of the number of accidents in the baseline scenario

	2015	2020	2030	2040	2050
Freight and passenger	529	433	535	539	551

Source: Ramboll et al. (2024), impact assessment support study

3. Impacts of policy measure in terms of costs and cost savings

This section explains the inputs used and provides the assessment of costs of the policy measures included in the policy options. The estimates take into account the synergies between the policy measures included in the policy options. The estimation of the costs draws on the impact assessment support study[167], including input collected through desk research and stakeholder interviews during the impact assessment process.

PM1: Increase the harmonisation of RIS through guidelines

Under this measure, the European Commission, supported by CESNI (European Committee for drawing up standards in the field of inland navigation), would develop a set of guidelines that will support Member States and stakeholders in better interpreting and applying the existing technical specifications[168]. This would increase the level of harmonisation of RIS by removing different interpretations or incomplete application of the technical specifications and will help to improve the quality of the information provided to the users through RIS, and help the sector to identify required information more easily.

[167] Ramboll et al. (2024), *Impact assessment support study*.

[168] These guidelines are not the same with the "RIS Guidelines" as mentioned in Annex II of the Directive, and which form an integral part of the standards, originating from the work of PIANC, and which are in force through Commission Regulation (EC) No 414/2007.

Adjustment costs for the European Commission

The development of the guidelines will proceed in two steps[169]. A study will be carried out to compile the required elements and propose several options for the establishment of the technical specifications. In a second stage, an expert group will use the findings of the study to draft the guidelines.

The one-off costs of the study are estimated at EUR 400,000. The average cost for a two-day workshop hosted by European Commission (EC), where participants are reimbursed by the EC, is around EUR 30,000. Two of such in-person workshops may be required as well as two online meetings. Compensation for the experts contributing to the online meetings is estimated at EUR 5,000 for each meeting. Therefore, the one-off adjustment costs for the European Commission are estimated at EUR 0.47 million.

Adjustment costs savings for navigation software service providers

The guidelines are expected to facilitate the work of navigation software service providers by reducing current inefficiencies, such as the ones caused by data inconsistencies between Member States. The improvement in the quality of the information provided through RIS under this measure is expected to lead to time savings for software service providers for introducing the data into their systems and thus to a reduction in their operation costs. In the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[170]. Considering the evolution of the fleet provided in section 2.2 of Annex 4, in the baseline scenario the total costs for navigation software service providers for introducing the data into their systems are estimated at EUR 6.9 million in 2025, EUR 7.2 million in 2030 and EUR 7.3 million in 2050. According to feedback provided by the RIS software service providers during the second stakeholder survey[171], PM1 would allow to reduce the average cost per vessel by 1% relative to the baseline (i.e. EUR 4.52 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 25. Expressed as present value over 2025-2050, they are estimated at EUR 1.25 million relative to the baseline (in 2022 prices)[172].

Table 25: Recurrent adjustment costs savings for navigation software service providers due to PM1 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	4.52	4.52	4.52

[169] Note that CESNI is financed by the Commission through a grant agreement. Therefore, these funds would be transferred from the Commission to CESNI, which would be in charge of the actual development of the guidelines.

[170] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

[171] The feedback has been provided by the two navigation software service providers, based in Belgium, that serve around 90% of the market.

[172] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

	2030	2040	2050
Adjustment costs savings for navigation software service providers (in EUR)	71,552	72,266	72,876

Source: Ramboll et al. (2024), impact assessment support study

Adjustment costs savings for vessel operators

The guidelines are also expected to benefit vessel operators by facilitating their trip planning. When travelling across the management areas of several RIS authorities, it will be easier to compare and interpret the data. In the baseline scenario, the time required for preparing an international trip is estimated at 15 minutes, according to the survey undertaken in the context of this impact assessment. Based on discussions with training institutes in inland navigation (and validated by the sector in the targeted workshop), trip preparation time is expected to decrease by 2.5 minutes relative to the baseline from 2026 onwards thanks to PM1. The recurrent adjustment costs savings for vessel operators are derived based on the time saved for the preparation of a trip, the labour cost per hour (EUR 26.7 per hour[173]) and the projected number of border crossings, and are provided in Table 26. Expressed as present value over 2025-2050, they are estimated at EUR 8.61 million relative to the baseline (in 2022 prices).

Table 26: Recurrent adjustment costs savings for vessels operators due to PM1 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of border crossings per year	443,324	446,395	452,776
Adjustment costs savings for vessel operators (in EUR)	493,057	496,472	503,570

Source: Ramboll et al. (2024), impact assessment support study

PM2: Introduce a harmonised complaint mechanism (in Member States)

Under this measure, Member States would need to designate a (existing or new) competent governmental body to directly handle complaints filed by RIS users. This body should be independent from RIS related authorities and would have the role to verify the complaints and request corrective action (e.g. correct wrong, outdated or non-standardised data). This would improve the overall quality of data (by identifying for example mistakes in the databases), and point to areas and instances where RIS users believe that the Directive is not properly implemented. Each Member State will be responsible for addressing problems in their waterways, and a specific provision will be included that collaboration with neighbouring Member States should be undertaken if the complaint has a cross-border element. The functioning of this mechanism requires that each Member State will assign appropriate resources depending on the expected number of complaints.

Administrative costs for national public authorities

Recurrent administrative costs are expected due to PM2, related to staff for managing the complaints (e.g. sending them to the right person and coordinating the whole process). Based on the network usage (expressed in tonne-kilometres) and the size of the network (i.e. the number of entries in RIS index from EU-RIS portal is used as a proxy) in each Member State, and using as reference value the costs for the Netherlands (EUR 150,000) provided by the

[173] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

Dutch Ministry of Infrastructure and Water Management (Rijkswaterstaat), the recurrent administrative costs to run the complaint mechanisms for all 13 European RIS-authorities are estimated at EUR 0.92 million per year from 2026 onwards relative to the baseline (in 2022 prices). Expressed as present value over 2025-2050, they are estimated at EUR 16.02 million relative to the baseline (in 2022 prices).

Table 27: Recurrent administrative costs for national public authorities due to PM2 relative to the baseline (in EUR, in 2022 prices)

	Usage (projected billion tkm in 2025)	Number of entries in RIS index from EU-RIS portal	Administrative costs (in EUR)
BE	11.5	18,279	63,624
BG	5.8	5,082	21,370
CZ	0.0	4,704	12,135
DE	63.2	65,760	260,217
FR	7.9	120,623	321,363
HR	1.0	5,634	15,969
LU	0.3	412	1,437
HU	2.3	4,531	14,958
NL	51.9	29,184	150,000
AT	2.2	4,705	15,215
PL*	0.1	2,235	5,896
RO	17.3	2,414	31,126
SK	1.0	2,056	6,672
Total	164	265,619	919,984

*Source: Ramboll et al. (2024), impact assessment support study; Note: * estimated RIS index.*

Adjustment costs for national public authorities

In addition, introducing a complaints procedure would involve one-off investment costs to set the system. Based on the experience of EMSA when setting up the e-certificate registry[174], these costs are estimated to be three times the recurrent annual costs for running the complaint mechanism or EUR 2.76 million in 2025.

Adjustment cost savings for navigation software service providers

The introduction of a complaints mechanism per country will facilitate the communication between navigation software service providers and authorities and lead to time savings for navigation software service providers. For instance, navigation software service providers often struggle to find the appropriate contact within RIS authorities, preventing an efficient exchange of information when they identify incorrect data. The complaints procedure will lead to easier contacts with authorities, enabling a faster (bottom up) handling of technical issues in the provision of RIS services and compliance with technical specifications. As explained under PM1, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[175]. According to feedback provided by the RIS software service providers during

[174] European Maritime Safety Agency (EMSA). European Union. Available at: https://european-union.europa.eu/institutions-law-budget/institutions-and-bodies/institutions-and-bodies-profiles/emsa_en

[175] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using

the second stakeholder survey[176], PM2 would allow to reduce the average cost per vessel by 0.5% relative to the baseline (i.e. EUR 2.26 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 28. Expressed as present value over 2025-2050, they are estimated at EUR 0.63 million relative to the baseline (in 2022 prices)[177].

Table 28: Recurrent adjustment costs savings for navigation software service providers due to PM2 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	2.26	2.26	2.26
Adjustment costs savings for navigation software service providers (in EUR)	35,776	36,133	36,438

Source: Ramboll et al. (2024), impact assessment support study

Adjustment cost savings for vessel operators

In addition, the filing of complaints by vessel operators is expected to lead to improvements in RIS data. In the baseline scenario the time required for preparing an international trip is estimated at 15 minutes and that for a domestic trip at 10 minutes, according to the survey undertaken in the context of this impact assessment. Based on discussions with training institutes in inland navigation (and validated by the sector in the targeted workshop), trip preparation time is expected to decrease by 8% due to PM2 (1.2 minutes for international trips and 0.8 minutes for domestic trips) relative to the baseline from 2026 onwards. The recurrent adjustment costs savings for vessel operators are derived based on the time saved for the preparation of a trip, the labour cost per hour (EUR 26.7 per hour[178]) and the projected number of domestic trips and border crossings, and are provided in Table 29. Expressed as present value over 2025-2050, they are estimated at EUR 6.16 million relative to the baseline (in 2022 prices).

Table 29: Recurrent adjustment costs savings for vessels operators due to PM2 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of domestic trips per year	286,557	288,134	292,030
Number of border crossings per year	443,324	446,395	452,776
Adjustment costs savings for vessel operators (in EUR)	352,763	355,056	360,048

Source: Ramboll et al. (2024), impact assessment support study

the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

[176] The feedback has been provided by the two navigation software service providers, based in Belgium, that serve around 90% of the market.

[177] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

[178] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

Administrative cost savings for vessel operators

Vessel operators that may lodge a complaint would benefit of administrative costs savings relative to the baseline due to the use of a structured mechanism. However, these costs savings are expected to be limited and are not further estimated.

PM3: Introduce a new Performance Measurement Framework

This measure aims to improve the monitoring of the implementation of the RIS Directive, by requiring Members States and relevant authorities to report to the Commission, on a regular basis, on key performance indicators (e.g. the number of shipping messages issued in accordance with standards and interpretations from the most recent RIS encoding guide, and the number of electronic cargo reports received in relation to the number of voyages). This should partly address the issue of lack of available data identified by the evaluation. The key performance indicators will be developed by the European Commission with the assistance of CESNI. Member States will have to undertake the collection of the required data. Having better information, the European Commission will be able to follow more closely the provision of RIS and identify cases where RIS implementation is fragmented. Based on this it will be requesting the responsible Member State to undertake corrective action. As a result, RIS users are expected benefit from improved harmonised RIS services.

Adjustment costs for the European Commission

Setting up the structure of the new performance measurement framework will be done in the context of the existing working groups, for example CESNI and PIANC. They will identify the data necessary for the new framework and set up the terms of reference. This task can be considered within the mandate of those working groups and, therefore will not lead to additional costs relative to the baseline.

Administrative costs for national public authorities

National public authorities will face recurrent administrative costs to collect and process the data and report it to the Commission on an annual basis. Based on two interviews with national authorities, it is estimated that each of the 13 Member States using inland waterways for commercial purposes would spend EUR 50,000 per year. Thus, total administrative costs for national public authorities are estimated at EUR 650,000 per year from 2025 onwards. Expressed as present value over 2025-2050, they are estimated at EUR 11.97 million relative to the baseline.

Adjustment cost savings for navigation software service providers

The new Performance Measurement Framework will allow to monitor the implementation of the Directive and, ultimately, collect more accurate information. As explained above, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[179]. According to

[179] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

feedback provided by the RIS software service providers during the second stakeholder survey[180], PM3 would allow to reduce the average cost per vessel by 0.25% relative to the baseline (i.e. EUR 1.13 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 30. Expressed as present value over 2025-2050, they are estimated at EUR 0.31 million relative to the baseline (in 2022 prices)[181].

Table 30: Recurrent adjustment costs savings for navigation software service providers due to PM3 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	1.13	1.13	1.13
Adjustment costs savings for navigation software service providers (in EUR)	17,888	18,066	18,219

Source: Ramboll et al. (2024), impact assessment support study

Adjustment cost savings for vessel operators

The new Performance Measurement Framework will allow to monitor the implementation of the Directive and, ultimately, collect more accurate information. Consequently, vessel operators will save resources when preparing their journeys. As explained above, in the baseline scenario, the time required for preparing an international trip is estimated at 15 minutes and that for a domestic trip at 10 minutes, according to the survey undertaken in the context of this impact assessment. The vessel operators that responded to the survey estimated that the time spent on planning trips will decrease by 4% on average due to PM3 relative to the baseline (approximately 0.6 minutes for each international trip and 0.4 minutes for each domestic trip) from 2026 onwards. The recurrent adjustment costs savings for vessel operators are derived based on the time saved for the preparation of a trip, the labour cost per hour (EUR 26.7 per hour[182]) and the projected number of domestic trips and border crossings and are provided in Table 31. Expressed as present value over 2025-2050, they are estimated at EUR 3.08 million relative to the baseline (in 2022 prices).

Table 31: Recurrent adjustment costs savings for vessels operators due to PM3 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of domestic trips per year	286,557	288,134	292,030
Number of border crossings per year	443,324	446,395	452,776
Adjustment costs savings for vessel operators (in EUR)	176,381	177,528	180,024

Source: Ramboll et al. (2024), impact assessment support study

[180] The feedback has been provided by the two navigation software service providers, based in Belgium, that serve around 90% of the market.

[181] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

[182] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

PM4: Strengthen requirements for RIS technical specifications by adding new specifications on data for navigation and voyage planning (RIS Index)

This measure aims to strengthen the requirements of Annex I of the current RIS Directive by introducing new technical specifications ('standards') on data for navigation and voyage planning ('RIS Index'), and strengthen provisions under Article 4, paragraph 3, for the supply of such data by the Member States. This will improve the quality of the basic data provided in RIS and will benefit in particular skippers who will have better and up-to-date information, reducing the time needed to plan their voyage. This measure also introduces new additional requirements into the RIS Directive that require Member States to ensure that information relating to the efficiency of navigation (e.g. current and expected waiting times at bridges and locks) is shared. This information will assist vessel operators during navigation. Member States will need to undertake digital hardware and software updates in order to provide the required information. The detailed technical specifications that will be required will be adopted at a later stage, through secondary legislation. This measure will also facilitate the adoption of 'smart shipping'[183] systems for the automation of navigation.

Adjustment costs for national public authorities

To enable more efficient navigation a series of data including for instance clearance heights at bridges, information on fairway profiles and digitisation of vessel traffic signs will have to be collected. Moreover, the system should also include information on the real-time traffic situation, such as current and expected waiting times at locks. Obtaining and sharing these data requires investment in both digital hardware and software (to monitor and report on the information mentioned above). Based on interviews with Rijkswaterstaat this measure is estimated to lead to one-off adjustment costs of EUR 500,000 in the Netherlands alone. Considering each country's share of the network in terms of length and infrastructure elements such as locks and bridges (i.e. using as proxy the number of entries in RIS index from EU-RIS portal), these costs have been extrapolated for the other twelve Member States. For the 13 Member States, total one-off adjustment costs are estimated at EUR 4.55 million. The breakdown by Member State is provided in Table 32.

Table 32: One-off adjustment costs for national public authorities due to PM4 relative to the baseline (in EUR, in 2022 prices)

	Number of entries in RIS index from EU-RIS portal	One-off adjustment costs (in EUR)
BE	18,279	313,168
BG	5,082	87,068
CZ	4,704	80,592
DE	65,760	1,126,645
FR	120,623	2,066,595
HR	5,634	96,525
LU	412	7,059
HU	4,531	77,628

[183] 'Smart shipping' is a general term referring to different technologies to facilitate navigation. CCNR has classify them in five levels: Level 1.Steering assistance, Level 2.Partial automation (steering and propulsion, designed to reduce fuel consumption), Level 3.Conditional automation (including collision avoidance), Level 4.High automation (context-specific automation of all dynamic navigation tasks), Level 5.Full automation (unconditional automation of all dynamic navigation tasks). In addition, Level 0 refers to no automation even when warning and intervention systems such as radars assist the helmsman.

	Number of entries in RIS index from EU-RIS portal	One-off adjustment costs (in EUR)
NL	29,184	500,000
AT	4,705	80,609
PL*	2,235	38,292
RO	2,414	41,358
SK	2,056	35,225
Total	265,619	**4,550,764**

*Source: Ramboll et al. (2024), impact assessment support study; Note: * estimated RIS index.*

Administrative costs for national public authorities

Both the hardware and software used for the exchange of the collected data will need to be updated and maintained on a regular basis. The annual maintenance costs are assumed to be 25% of the investment costs, based on the DINA study[184]. Thus, the recurrent administrative costs for national public authorities are estimated at EUR 1.14 million per year from 2026 onwards. The breakdown by Member State is provided in Table 33. Expressed as present value over 2025-2050, they are estimated at EUR 19.81 million relative to the baseline (in 2022 prices).

Table 33: Recurrent administrative costs for national public authorities due to PM4 relative to the baseline (in EUR, in 2022 prices)

	Administrative costs (in EUR)
BE	78,292
BG	21,767
CZ	20,148
DE	281,661
FR	516,649
HR	24,131
LU	1,765
HU	19,407
NL	125,000
AT	20,152
PL	9,573
RO	10,340
SK	8,806
Total	**1,137,691**

Source: Ramboll et al. (2024), impact assessment support study

Adjustment cost savings for navigation software service providers

Navigation software service providers are currently building their own smart software to offer added value to their customers. For instance, including more data via AIS stations at bridges on waterways with variable water levels (free flowing rivers) can improve the service. As explained above, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[185]. Based on feedback from software services providers in the context of stakeholders'

[184] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.* According to the study, the maintenance of digital tools e.g. as a result of service level agreements and license fees, represents approximately 20% of the initial technology investment. Another 5% is attributed to the governance of the required standards and the coordination of the implementation.

consultation, PM4 would allow to reduce the average cost per vessel by 2% relative to the baseline (i.e. EUR 9.04 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 34. Expressed as present value over 2025-2050, they are estimated at EUR 2.5 million relative to the baseline (in 2022 prices)[186].

Table 34: Recurrent adjustment costs savings for navigation software service providers due to PM4 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	9.04	9.04	9.04
Adjustment costs savings for navigation software service providers (in EUR)	143,104	144,532	145,751

Source: Ramboll et al. (2024), impact assessment support study

Adjustment cost savings for vessel operators

PM4 would make new data available for vessel operators including longer and more accurate water level predictions, current and predicted underpass heights at bridges and current and predicted waiting times at locks. Based on feedback from vessel operators in the context of the stakeholders' consultation, the time needed for voyage planning can be reduced by 15% due to PM4 relative to the baseline. This corresponds to 1.5 minutes saved for each domestic voyage and 2.25 minutes saved for each international trip from 2026 onwards. The recurrent adjustment costs savings for vessel operators are derived based on the time saved for the preparation of a trip, the labour cost per hour (EUR 26.7 per hour[187]) and the projected number of domestic voyages and border crossings and are provided in Table 35. Expressed as present value over 2025-2050, they are estimated at EUR 11.09 million relative to the baseline (in 2022 prices).

Table 35: Recurrent adjustment costs savings for vessels operators due to PM4 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of domestic voyages	286,557	288,134	292,030
Number of border crossings per year	443,324	446,395	452,776
Adjustment costs savings for vessel operators (in EUR)	634,973	639,100	648,087

Source: Ramboll et al. (2024), impact assessment support study

PM5: Require electronic voyage plan reporting

While PM4 deals with information provided by the Member States to vessel operators, PM5 focuses on requiring vessel operators and skippers to report their voyage plan (ERIVOY) to

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[185] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

[186] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

[187] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

competent authorities at the start of their journey and update this with any further changes to their estimated time of arrival. This would allow authorities to provide (more accurate) feedback on estimated waiting times at locks and advised navigation speeds. Optimising vessel speed would lead to fuel savings and thus lower emissions and operation costs. In addition, inland ports and traffic managers at locks and bridges can better channel traffic, reducing delays and increasing efficiency.

Adjustment costs for national public authorities

The standards for ERIVOY messages have already been implemented by the software service providers. National public authorities would need to develop a software that can process and convert the voyage plan notification message (ERIVOY) from inland waterway operators into accurate lock predictions. The Dutch Directorate General for Public Works and Water Management (Rijkswaterstaat) estimated the one-off investment costs for the development of such software at EUR 500,000. Based on the network usage (expressed in tonne-kilometres) and the size of the network (i.e. the number of entries in RIS index from EU-RIS portal is used as a proxy) in each Member State, and using as reference value the investment costs for the Netherlands (EUR 500,000), the one-off adjustment costs for all 13 European RIS-authorities are estimated at EUR 3.07 million in 2025 relative to the baseline (in 2022 prices).

Table 36: One-off adjustment costs for national public authorities due to PM5 relative to the baseline (in EUR, in 2022 prices)

	Usage (projected billion tkm in 2025)	Number of entries in RIS index from EU-RIS portal	One-off adjustment costs (in EUR)
BE	11.5	18,279	212,080
BG	5.8	5,082	71,235
CZ	0.0	4,704	40,449
DE	63.2	65,760	867,391
FR	7.9	120,623	1,071,211
HR	1.0	5,634	53,230
LU	0.3	412	4,791
HU	2.3	4,531	49,860
NL	51.9	29,184	500,000
AT	2.2	4,705	50,717
PL*	0.1	2,235	19,655
RO	17.3	2,414	103,755
SK	1.0	2,056	22,239
Total	164	265,619	3,066,613

*Source: Ramboll et al. (2024), impact assessment support study; Note: * estimated RIS index.*

Administrative costs for national public authorities

The implementation of a new software implies maintenance costs for software and hardware. The annual maintenance costs are assumed to be 25% of the investment costs, based on the DINA study[188]. Thus, the recurrent administrative costs for national public authorities are estimated at EUR 0.77 million per year from 2026 onwards. The breakdown by Member State

[188] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.* According to the study, the maintenance of digital tools e.g. as a result of service level agreements and license fees, represents approximately 20% of the initial technology investment. Another 5% is attributed to the governance of the required standards and the coordination of the implementation.

is provided in Table 37. Expressed as present value over 2025-2050, they are estimated at EUR 13.35 million relative to the baseline (in 2022 prices).

Table 37: Recurrent administrative costs for national public authorities due to PM5 relative to the baseline (in EUR, in 2022 prices)

	Administrative costs (in EUR)
BE	53,020
BG	17,809
CZ	10,112
DE	216,848
FR	267,803
HR	13,308
LU	1,198
HU	12,465
NL	125,000
AT	12,679
PL	4,914
RO	25,939
SK	5,560
Total	**766,653**

Source: Ramboll et al. (2024), impact assessment support study

Administrative costs for vessel operators

The mandatory voyage plan reporting for inland navigation would lead to recurrent administrative costs for vessel operators. The analysis assumes that the ERIVOY messages would be added to the ERINOT messages[189].

Based on replies by inland skippers in the context of stakeholders' consultation, preparing and communicating a voyage plan will take 34 minutes for the first notification and 14 minutes for follow-up notifications. For freight IWT, the number of first notifications per year is equal to the projected number of voyages. For deriving the number of follow-up notifications, it is assumed that barges are deployed an average of 5.5 days per week and the average voyage duration is 5 days. Hence, each voyage includes one loading day, three sailing days and one unloading day. This means that each voyage entails one initial notification and two follow-up notifications. For passenger IWT, similarly to freight, the number of first notifications per year is equal to the projected number of voyages. For calculating the number of follow-up notifications for passenger IWT, 214 sailing days per year have been assumed (April-October period). The number of initial and follow-up notifications for freight and passenger IWT is provided in Table 38. The total recurrent administrative costs for vessel operators have been derived considering the labour cost per hour (EUR 26.7 per hour[190]), the number of initial and follow-up notifications and the time for preparing the first and follow-up notifications and are provided in Table 38. Expressed as present value over 2025-2050, they are estimated at EUR

[189] The electronic cargo report (ERINOT) report contains information on origin and destination of the voyage, the amount and type of cargo and the number of persons on board. This can optionally include an ETA at destination. An ERIVOY message is much more comprehensive.

[190] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

367.5 million (EUR 86.26 million for passenger IWT and EUR 281.25 million for freight IWT).

Table 38: Recurrent administrative costs for vessels operators due to PM5 relative to the baseline (in EUR, in 2022 prices)

	2025	2030	2040	2050
Number of first notifications	718,186	729,880	734,529	744,806
Passenger	11,567	12,043	12,940	13,572
Freight	706,619	717,838	721,589	731,234
Number of follow-up notifications	1,377,507	1,416,312	1,472,098	1,518,409
Passenger	670,888	698,475	750,508	787,175
Freight	706,619	717,838	721,589	731,234
Recurrent administrative costs (in million EUR)	19.3	19.7	20.2	20.6
Passenger	4.3	4.5	4.8	5.1
Freight	15.0	15.3	15.3	15.5

Source: Ramboll et al. (2024), impact assessment support study

Adjustment costs savings for vessel operators

Operation costs savings for vessel operators are expected due to PM5 through reduced speed of ships and less manoeuvring movements (e.g. braking the ship, mooring at waiting jetties, leaving and entering the lock). These savings are mainly related to the crossing of locks and adaptation of the speed in the proximity of a lock (i.e. the last hour). The adjustment of speed in the proximity of a lock (i.e. during the last hour) is estimated to lead to 5% savings in fuel consumption relative to the baseline from 2026 onwards. Based on statistics for the Netherlands, vessels cross on average 4 locks per trip. Also considering the total number of voyages and a consumption of 60 litres per hour of sailing, savings are estimated at around 0.89% of total energy consumption. The energy savings in ktoe and the recurrent adjustment costs savings (fuel savings) relative to the baseline for 2030, 2040 and 2050 are provided in Table 39[191]. Expressed as present value over 2025-2050 they are estimated at EUR 248.72 million.

Table 39: Recurrent adjustment costs savings for vessels operators due to PM5 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Energy savings (ktoe)	9.3	8.8	8.3
Adjustment costs savings (million EUR)	15.0	14.4	15.2

Source: Ramboll et al. (2024), impact assessment support study

PM6: Introduce provisions for supplying data to the ERDMS and its operation

Under this measure, Member States would need to provide information required by the RIS Directive to the European Reference Data Management System (ERDMS), which contains regularly updated data necessary for the provision of RIS, and is owned and operated by the European Commission (DG MOVE). Integration of the RIS-data in ERDMS with RIS COMEX is foreseen, and data should be aligned. This measure mostly affects RIS users and navigation software service providers and would make it easier for navigation software

[191] The projected average energy prices per toe from the baseline scenario developed with the PRIMES-TREMOVE model have been used to estimate the adjustment costs savings. These average prices per toe take into account the projected development of the fuel mix, including biofuels, electricity and e-fuels.

service providers to collect the right data and pass it on to the industry. Member States will have to undertake efforts to ensure that the required information is provided and up-to-date.

Administrative costs for national public authorities

No additional investment costs are expected due to PM6 relative to the baseline. Member States already have access to a reference database containing all RIS objects. However, the level of accuracy of this data vary across Member States.

At present, there are no obligations regarding reference data. Some RIS authorities still provide outdated or even incorrect data about objects on the European waterways network. PM6 would require Member States to periodically update their data. Thus, PM6 is expected to lead to recurrent administrative costs for national public authorities relative to the baseline. Based on the feedback received during the stakeholders' consultation, for the Netherlands PM6 is estimated to require additional 1.5 full time equivalents (FTE) relative to the baseline. This has been extrapolated to the other Member States based on the size of their network (i.e. the number of entries in RIS index from EU-RIS portal is used as a proxy) in relation to that of the Netherlands. Assuming 240 working days per year and 7.3 hours of work per day on average[192], and using the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) from Eurostat Structure of earnings survey, the recurrent administrative costs for national public authorities are estimated at EUR 0.66 million per year relative to the baseline from 2025 onwards. Expressed as present value over 2025-2050, they are estimated at EUR 12.18 million.

Table 40: Recurrent administrative costs for national public authorities due to PM6 relative to the baseline (in EUR, in 2022 prices)

	Number of entries in RIS index from EU-RIS portal	Additional number of FTEs	Administrative costs (in EUR)
BE	18,279	0.94	51,390
BG	5,082	0.26	2,123
CZ	4,704	0.24	5,326
DE	65,760	3.38	175,907
FR	120,623	6.20	318,739
HR	5,634	0.29	4,537
LU	412	0.02	1,013
HU	4,531	0.23	3,578
NL	29,184	1.50	80,758
AT	4,705	0.24	12,505
PL*	2,235	0.11	1,859
RO	2,414	0.12	1,574
SK	2,056	0.11	2,198
Total	265,619		661,507

*Source: Ramboll et al. (2024), impact assessment support study; Note: * estimated RIS index.*

Adjustment cost savings for navigation software service providers

Software service providers carry out quality checks on the data and correct erroneous data if necessary, when receiving complaints. Obliging RIS authorities to periodically update the

[192] Hours of work - annual statistics - Statistics Explained (europa.eu)

data, the number of errors is expected to decrease. This would also reduce the efforts required for navigation software service providers to obtain correct data. As explained above, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[193]. Based on feedback from software services providers in the context of stakeholders' consultation, PM6 would allow to reduce the average cost per vessel by 2% relative to the baseline (i.e. EUR 9.04 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 41. Expressed as present value over 2025-2050, they are estimated at EUR 2.5 million relative to the baseline (in 2022 prices)[194].

Table 41: Recurrent adjustment costs savings for navigation software service providers due to PM6 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	9.04	9.04	9.04
Adjustment costs savings for navigation software service providers (in EUR)	143,104	144,532	145,751

Source: Ramboll et al. (2024), impact assessment support study

Adjustment cost savings for vessel operators

Based on feedback from vessel operators in the context of the stakeholders' consultation, the time needed for voyage planning can be reduced by 20% due to PM6 relative to the baseline. This corresponds to 2 minutes saved for each domestic voyage and 3 minutes saved for each international trip from 2026 onwards. The recurrent adjustment costs savings for vessel operators are derived based on the time saved for the preparation of a trip, the labour cost per hour (EUR 26.7 per hour[195]) and the projected number of domestic trips and border crossings, and are provided in Table 42. Expressed as present value over 2025-2050, they are estimated at EUR 14.79 million relative to the baseline (in 2022 prices).

Table 42: Recurrent adjustment costs savings for vessels operators due to PM6 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of domestic voyages	286,557	288,134	292,030
Number of border crossings per year	443,324	446,395	452,776
Adjustment costs savings for vessel operators (in EUR)	846,631	852,133	864,116

Source: Ramboll et al. (2024), impact assessment support study

[193] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

[194] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

[195] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

PM7: Encourage cargo-related information exchange through the eFTI mechanism

This measure will require that technical specifications are developed so that RIS cargo related information (i.e. electronic ship reports) can be shared on a voluntary basis through the electronic freight transport information (eFTI) platforms. This includes both authority to ship and authority to authority information. The standards will be developed but not made obligatory for use. The mandatory reporting requirements for specific ships would still apply (i.e. ships transporting dangerous goods). The Member States will need to develop the capacity to receive and process information through eFTI.

Adjustment costs for national public authorities

PM7 will require national public authorities to adapt existing data flows so that RIS cargo-related information is linked with eFTI. There are currently five systems in place: BICS (Netherlands), eRIBa (Belgium), VELI (France), NAMIB (Germany), and CEERIS (Rest of Europe). Based on feedback from RIS authorities, the investment costs for adjusting each of these systems are estimated at EUR 250,000 per system. Thus, the total one-off adjustment costs are estimated at EUR 1.25 million in 2025 relative to the baseline.

Administrative cost savings for vessel operators

PM7 would lead to recurrent administrative costs savings for inland shipping skippers. Interviews with waterway managers during the stakeholders' consultation have revealed that incorrect reference information, such as regarding the loading/unloading location, coding of the cargo or hull information, is the cause of errors in data exchange. These errors force the skippers to re-register upon a border crossing. Repeated notifications are estimated to occur in 20% of international trips in the Rhine catchment area and in all international trips (100%) in the Danube catchment area. Taking into account the number of trips in both catchment areas, it is estimated that 30% of all cross-border trips require repeated notifications. Based on the interviews and stakeholders' survey, repeated notifications take around 15 minutes per vessel operator. PM7 is expected to reduce the share of repeated notifications by 10 percentage points relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[196]), the administrative cost savings for vessels operators due to PM7 relative to the baseline are provided in Table 43. Expressed as present value over 2025-2050, they are estimated at EUR 5.01 million relative to the baseline.

Table 43: Recurrent administrative costs savings for vessels operators due to PM7 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of border crossings requiring repeated notifications in the baseline	132,997	133,918	135,833
Reduction in the number of repeated notifications due to PM7 relative to the baseline	44,332	44,639	45,278
Administrative costs savings for vessel operators due to PM7 (in EUR)	286,792	288,778	292,912

Source: Ramboll et al. (2024), impact assessment support study

[196] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

Administrative cost savings for national public authorities

The information exchange through the eFTI mechanism leads to the replacement of the paper cargo reports with the electronic reports. The number of paper cargo reports is assumed to grow in line with the transport activity in the baseline scenario. According to the estimates provided by the Dutch authorities during the interviews, a total elimination of the paper reports would lead to a reduction in the effort required equivalent to 8 full time equivalents (FTE) relative to the baseline. Considering the voluntary system in PM7, a 50% reduction in the paper cargo reports is assumed, equivalent to 4 FTEs saved relative to the baseline in 2026. This is extrapolated to the other Member States based on their respective transport activity (expressed in tkm) relative to that of the Netherlands. In addition, the growth in the number of paper cargo reports over time is also taken into account. Assuming 240 working days per year and 7.3 hours of work per day on average[197], and using the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) from Eurostat Structure of earnings survey, the recurrent administrative costs savings for national public authorities are provided in Table 44. Expressed as present value over 2025-2050, they are estimated at EUR 11.45 million relative to the baseline.

Table 44: Recurrent administrative costs savings for national public authorities due to PM7 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
BE	51,247	56,765	60,735
BG	3,926	4,522	4,933
CZ	60	72	82
DE	277,928	305,078	338,957
FR	32,572	33,811	34,329
HR	1,341	1,590	1,751
LU	997	1,214	1,315
HU	2,965	3,655	3,988
NL	222,516	238,676	254,861
AT	9,523	10,068	10,229
PL	183	261	293
RO	18,712	20,591	22,821
SK	1,596	1,716	1,825
Total	623,566	678,018	736,120

Source: Ramboll et al. (2024), impact assessment support study

PM8: Mandate cargo-related information to be exchange through the eFTI mechanism

This measure goes beyond PM7 in that it will mandate that all RIS cargo related information (i.e. electronic ship reports) are shared through the electronic freight transport information (eFTI) platforms, for exchanges between authority / authority and authority / ship. This should lead to higher benefits than PM7 as more vessel operators will report cargo information in this way.

Adjustment costs for national public authorities

PM8 will require national public authorities to adapt existing data flows so that RIS cargo-related information is linked with eFTI. There are currently five systems in place: BICS

[197] Hours of work - annual statistics - Statistics Explained (europa.eu)

(Netherlands), eRIBa (Belgium), VELI (France), NAMIB (Germany), and CEERIS (Rest of Europe). Based on feedback from RIS authorities, the investment costs for adjusting each of these systems are estimated at EUR 250,000 per system. Thus, the total one-off adjustment costs are estimated at EUR 1.25 million in 2025 relative to the baseline.

Administrative cost savings for vessel operators

Similarly, to PM7, PM8 would lead to recurrent administrative costs savings for inland shipping skippers. Interviews with waterway managers during the stakeholders' consultation have revealed that incorrect reference information, such as regarding the loading/unloading location, coding of the cargo or hull information, is the cause of errors in data exchange. These errors force the skippers to re-register upon a border crossing. Repeated notifications are estimated to occur in 20% of international trips in the Rhine catchment area and in all international trips (100%) in the Danube catchment area. Taking into account the number of trips in both catchment areas, it is estimated that 30% of all cross-border trips require repeated notifications. Based on the interviews and stakeholders' survey, repeated notifications take around 15 minutes per vessel operator. PM8 is expected to reduce the share of repeated notifications by 20 percentage points relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[198]), the administrative cost savings for vessels operators due to PM8 relative to the baseline are provided in Table 45. Expressed as present value over 2025-2050, they are estimated at EUR 10.01 million relative to the baseline.

Table 45: Recurrent administrative costs savings for vessels operators due to PM8 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of border crossings requiring repeated notifications in the baseline	132,997	133,918	135,833
Reduction in the number of repeated notifications due to PM8 relative to the baseline	88,617	89,230	90,506
Administrative costs savings for vessel operators due to PM8 (in EUR)	573,281	577,246	585,501

Source: Ramboll et al. (2024), impact assessment support study

For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of repeated notifications over 2026-2035 has been estimated at 88,397 per year relative to the baseline and the average costs saved per repeated notification at EUR 6.5. Thus, the average annual administrative costs savings for vessel operators are estimated at EUR 0.57 million relative to the baseline.

Administrative cost savings for national public authorities

As explained for PM7, the introduction of the exchange of information will reduce the need to handle paper cargo reports. Making it compulsory will fully eliminate the paper reports. According to the estimates provided by the Dutch authorities during the interviews, a total elimination of the paper reports would lead to a reduction in the effort equivalent to 8 full time equivalents (FTE) relative to the baseline in 2026. This is extrapolated to the other Member States based on their respective transport activity (expressed in tkm) relative to that

[198] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

of the Netherlands. In addition, the growth in the number of paper cargo reports over time is also taken into account. Assuming 240 working days per year and 7.3 hours of work per day on average[199], and using the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) from Eurostat Structure of earnings survey, the recurrent administrative costs savings for national public authorities are provided in Table 46. Expressed as present value over 2025-2050, they are estimated at EUR 22.89 million relative to the baseline.

Table 46: Recurrent administrative costs savings for national public authorities due to PM8 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
BE	102,495	113,529	121,470
BG	7,852	9,043	9,866
CZ	121	144	165
DE	555,856	610,155	677,913
FR	65,143	67,622	68,658
HR	2,683	3,181	3,503
LU	1,994	2,428	2,630
HU	5,929	7,309	7,976
NL	445,031	477,352	509,722
AT	19,046	20,137	20,458
PL	366	522	587
RO	37,424	41,182	45,643
SK	3,192	3,431	3,650
Total	1,247,133	1,356,036	1,472,240

Source: Ramboll et al. (2024), impact assessment support study

PM9: Require information exchange through a RIS platform

This measure envisages the use of a single digital platform for the exchange of RIS information. Given the existence of RIS COMEX and to avoid duplication of efforts, this measure would require Member States to exchange information through the RIS COMEX platform. RIS COMEX was a CEF funded multi-beneficiary project aiming at the definition, specification, implementation and sustainable operation of Corridor RIS Services. Following the project conclusion in 2022, the 13 participating Member States[200] of the connected European Inland Waterway Network and their authorities continue the use of the system under a separate European Corridor Management Agreement[201]. The result of the RIS COMEX project is thus currently used on a voluntary basis by the Member States that apply RIS, as a one stop shop of exchange of data. For example, through the EuRIS - European River Information Services platform (www.eurisportal.eu) waterway users can plan their travel and arrival times across Europe in one environment, without the need to consult numerous websites and information sources (especially when crossing borders). The project is entering a second phase (RIS COMEX 2) as in June 2023 it was selected for CEF funding with Poland joining as a partner. This indicates the interest of the Member States to continue with this platform as a basis for RIS. RIS COMEX 2 shall continue the work of the first stage

[199] Hours of work - annual statistics - Statistics Explained (europa.eu)

[200] The current partnership consists of the following countries: Austria, Belgium, Bulgaria, Croatia, Czechia France, Germany, Hungary, Luxembourg, the Netherlands, Romania, Serbia and Slovakia.

[201] The agreement defines the governance structure, financing, sharing of costs, and other elements such as the "Partnership Coordinator" who manages the platform.

(RIS COMEX) by extending the quantity and quality of the related services and provided data, by extending the geographical scope to additional waterways and even to additional countries (Poland), as well as by focusing on interconnections and integrations of existing systems and services.

PM9 will mandate the use of RIS COMEX[202], ensuring that a common structure is in place - one where all additional functionalities will be built upon. In this respect, PM9 will be the basic element for implementing the exchange of RIS information and works in combination with other measures of this initiative (e.g. PM4, PM6, PM8, PM12, PM14). By mandating the use of RIS COMEX, efficient use of EU funds is ensured, as the development was already supported under CEF, and duplication of efforts (e.g. by developing another system) is avoided.

Adjustment costs for national public authorities

One-off investment costs for national public authorities are expected due to PM9. They cover those countries that were not part of the initial RIS COMEX project (e.g. Italy, Spain, Portugal) and who will need to develop the necessary digital applications. They also cover elements in RIS COMEX that will need to be updated/completed (for example, the inland waters of a maritime character in Germany are missing). The one-off adjustment costs for national public authorities are estimated at EUR 3.5 million in 2025 relative to the baseline.

Administrative costs savings for national public authorities

The ultimate aim of PM9 is to replace the national platforms that currently coexist. This can only happen if the functionality of RIS COMEX is equivalent to that of the national platforms and can also serve a broader purpose, such as providing information on waterways exclusively navigable for recreational navigation. When this is achieved, it is expected that the existing national platforms would be phased out. PM9 would thus lead to recurrent administrative costs savings estimated at EUR 500,000 per year from 2030 onwards. Expressed as present value over 2025-2050, they are estimated at EUR 7.71 million relative to the baseline.

Adjustment cost savings for navigation software service providers

Using RIS COMEX as a central platform will benefit navigation software providers, as they can obtain information from a central place, instead of referring to various individual platforms of the European RIS authorities. As explained above, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[203]. Based on feedback from software services providers in the context of stakeholders' consultation, PM9 would allow to reduce the average cost per vessel by 1% relative to the baseline (i.e. EUR 4.52 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software

[202] While RIS COMEX has resulted in different applications, this measure uses the term RIS COMEX to refer to the overall results of the project as applied by the EU Member States.

[203] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 47. Expressed as present value over 2025-2050, they are estimated at EUR 1.25 million relative to the baseline (in 2022 prices)[204].

Table 47: Recurrent adjustment costs savings for navigation software service providers due to PM9 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	4.52	4.52	4.52
Adjustment costs savings for navigation software service providers (in EUR)	71,552	72,266	72,876

Source: Ramboll et al. (2024), impact assessment support study

Adjustment cost savings for vessel operators

PM9 is expected to lead to significant recurrent adjustment costs savings for vessel operators for voyage planning. While several national RIS portals had to be consulted by a vessel operator for voyage planning in the baseline, all relevant information is now offered by a single portal within RIS COMEX (EuRIS portal). In the baseline scenario the time required for preparing an international trip is estimated at 15 minutes. In PM9, a 50% reduction in the time required for preparing an international voyage is assumed (7.5 minutes) from 2026 onwards relative to the baseline, based on stakeholders' feedback. The recurrent adjustment costs savings for vessel operators are derived based on the time saved for the preparation of a trip, the labour cost per hour (EUR 26.7 per hour[205]) and the projected number of border crossings and are provided in Table 48. Expressed as present value over 2025-2050, they are estimated at EUR 37.16 million relative to the baseline (in 2022 prices).

Table 48: Recurrent adjustment costs savings for vessels operators due to PM9 relative to the baseline (in million EUR, in 2022 prices)

	2030	2040	2050
Number of border crossings per year	443,324	446,395	452,776
Adjustment costs savings for vessel operators (in million EUR)	1.48	1.49	1.51

Source: Ramboll et al. (2024), impact assessment support study

Administrative cost savings for vessel operators

CEERIS was developed under the RIS COMEX banner. This tool should enable vessel operators on the Danube to benefit of a one-stop-shop application for electronic reporting of cargo and voyage data. When the use of RIS COMEX, including thus the CEERIS tool, becomes mandatory, vessel operators on the Danube will benefit from a single electronic notification of cargo data. Based on the interviews and stakeholders' survey, repeated notifications take around 15 minutes per vessel operator. PM9 is expected to reduce the share of repeated notifications by 8 percentage points relative to the baseline from 2026 onwards.

[204] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

[205] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

Considering the labour cost per hour (EUR 26.7 per hour[206]), the administrative cost savings for vessels operators due to PM9 relative to the baseline are provided in Table 49. Expressed as present value over 2025-2050, they are estimated at EUR 3.9 million relative to the baseline.

Table 49: Recurrent administrative costs savings for vessels operators due to PM9 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of border crossings requiring repeated notifications in the baseline	132,997	133,918	135,833
Reduction in the number of repeated notifications due to PM9 relative to the baseline	34,534	34,773	35,271
Administrative costs savings for vessel operators due to PM9 (in EUR)	223,407	224,953	228,175

Source: Ramboll et al. (2024), impact assessment support study

For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of repeated notifications over 2026-2035 has been estimated at 34,448 per year relative to the baseline and the average costs saved per repeated notification at EUR 6.5. Thus, the average annual administrative costs savings for vessel operators are estimated at EUR 0.22 million relative to the baseline.

PM10: Involve CESNI in the development and adoption of technical specifications

To ensure faster development of technical specifications, this measure will designate CESNI (the European Committee for drawing up standards in the field of inland navigation) as the relevant body for developing RIS related technical specifications. CESNI has already been designated in this role in Directive (EU) 2016/1629 on Technical Requirements for inland waterway vessels and Directive (EU) 2017/2397 on professional qualifications in inland navigation.

Adjustment costs for national public authorities / European Commission

There is already a CESNI working group responsible for RIS technical specifications. Therefore, PM10 can be understood as formalising a mandate to CESNI[207] for the development of the technical specifications. In this context, this is a task that can be considered within the mandate of the working group and, therefore it is not expected to lead to additional costs relative to the baseline even if the work programme should be adapted.

Adjustment cost savings for vessel operators

Vessel operators might benefit from faster application of technical specifications fostered by stronger engagement of CESNI. This is, however, hard to quantify and the magnitude of the effect is expected to be limited.

[206] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

[207] Note that CESNI is financed by the Commission through a grant agreement. Therefore, the funds are transferred from the Commission to CESNI.

PM11: Link the RIS requirements with those of the TEN-T Regulation

This measure would seek at aligning the scope of the RIS Directive with the scope of the TEN-T Regulation. Currently, all interconnected waterways of CEMT class IV and higher (which refers to the size of the vessel they can accommodate) are within the scope of the RIS Directive. Member States may decide to include further waterways in this scope (for example Italy, Spain and Portugal). This scope does not match the TEN-T network, which with its current proposed revision will not refer any more to CEMT classification but will be based on the characteristics of the waterways themselves.

Under PM11, the scope of the RIS Directive is aligned with that of the TEN-T Regulation, which corresponds to the waterways of international importance. The waterways currently in the scope of the RIS Directive have a length of 14,400 km while the waterways under TEN-T have a length of 13,000 km. As a consequence, up to 1,400 km of waterways would potentially not be covered by the RIS provisions. Under this measure, Member States would still be able to voluntarily extend the RIS requirements to other parts of their network beyond what is in the TEN-T network.

The majority of these waterways appear to be in the Netherlands, which already applies RIS. During the interviews the Dutch authorities indicated that they already now compile information outside the scope of the current RIS Directive. As the majority of the 1,400 km that would fall out of scope of the new Directive are within the Netherlands, it is assumed that they will remain in the network on a voluntary basis. Furthermore, given the international nature of IWT traffic, it is unlikely that a vessel operator operating in the Dutch network will not (even partly) enter waterways covered under RIS, and would thus be confronted with the requirements of the Directive. Moreover, for waterways that are currently voluntarily in RIS (e.g. in Italy, Spain and Portugal) and are currently in the TEN-T network, their participation will become obligatory.

Therefore, it is assumed that the change of scope brought by this measure will not lead to a net change in the kilometres coverage, and thus no further economic impacts are considered.

PM12: Develop new technical specifications for the exchange of information related to IWT ports

Data related to ports is not easily available to vessel operators (for example, the dimensions of bridges over port basins and operating times). This is the case even in RIS COMEX, where for example port basins along the German Rhine are missing (this includes important ports for inland navigation such as Duisburg, Dusseldorf, Neuss, Mannheim and Karlsruhe). As this information is missing, skippers have to look up the required information independently on port authority websites. This leads to extra time for voyage preparations. In addition, information is not exchanged with the ports. Thus, the ports do not always have the vessels' cargo and voyage information and this information has to be reported again at the ports.

The aim of this measure is to develop new technical specifications for the exchange of information to and from IWT ports. These technical specifications will be developed by CESNI and be introduced through a secondary legislation at a later stage. PM12 will provide real time information for transhipment capacity, berths, etc. It will also provide real time information on the availability of alternative fuels (at least the infrastructure that the

Alternative Fuels Infrastructure Regulation[208] requires), which might increase the uptake of clean technologies by vessels and the utilisation of the infrastructure in the ports[209]. In addition, port infrastructure will be better mapped in many areas where it is currently labelled as empty or as "caution areas" on maps. Overall, PM12 would lead to better data quality for all, leading to simpler travel planning. Under PM12, data exchange with IWT ports would be voluntary, but if RIS users do share data, the technical specifications will need to be applied.

Adjustments costs for national public authorities (ports)

While vessel operators would be able to use this feature on a voluntary basis through RIS, implementation of the new technical specifications and technical specifications at port level is required for making it possible. It was assumed that all 54 core ports of the European TEN-T network for which no RIS data is available would implement the new technical specifications. The DINA study[210] estimates at EUR 25,000 the investment cost per port (in 2017 prices) for developing information systems. This is equivalent to EUR 29,197 in 2022 prices. Applying this cost to the 54 ports, the total one-off adjustment costs for national public authorities are estimated at EUR 1.58 million relative to the baseline (in 2022 prices).

Administrative costs for national public authorities (ports)

Once the systems are established, national authorities are expected to incur recurrent administrative costs for managing and maintaining the data. According to the DINA study[211] these represent around 25% of the one-off investment costs[212]. Thus, the administrative costs for national authorities are estimated at EUR 394,159 per year from 2026 onwards relative to the baseline. Expressed as present value over 2025-2050, they are estimated at EUR 6.86 million relative to the baseline (in 2022 prices).

Adjustment costs savings for navigation software services providers

Navigation software services providers currently encounter lots of difficulties to collect data on inland ports. If all inland ports provided reference data and keep this data updated, this would lead to time savings for navigation software suppliers. As explained above, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[213]. Based on feedback from software services providers in the context of stakeholders' consultation, PM12

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[208] Regulation (EU) 2023/1804.

[209] To be noted that AFIR provides a minimum requirement for inland ports in the TEN-T Network to invest in on-shore power supply connection. Such ports may decide to provide infrastructure beyond these minimum requirements.

[210] European Commission (2017), Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.

[211] European Commission (2017), Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.

[212] According to the study, the maintenance of digital tools e.g. as a result of service level agreements and license fees, represents approximately 20% of the initial technology investment. Another 5% is attributed to the governance of the required standards and the coordination of the implementation.

[213] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

would allow to reduce the average cost per vessel by 0.75% relative to the baseline (i.e. EUR 3.39 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 50. Expressed as present value over 2025-2050, they are estimated at EUR 0.94 million relative to the baseline (in 2022 prices)[214].

Table 50: Recurrent adjustment costs savings for navigation software service providers due to PM12 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	3.39	3.39	3.39
Adjustment costs savings for navigation software service providers (in EUR)	53,664	54,199	54,657

Source: Ramboll et al. (2024), impact assessment support study

Adjustment costs savings for vessel operators

For trip preparation, an average of 5 minutes per port call is assumed in the baseline. In the process, important information should be retrieved, such as how deep the port is in relation to the depth of the channel, as well as where berths are and where loading/unloading can take place. Other relevant questions are whether there is shore power available in the port and whether the vessel can be turned around in the port. Finally, other relevant questions are whether bridges in the harbour need to be considered, how high they are when closed and if the bridges can be opened, how these openings can be requested and what the operating times are. This wide amount of information is difficult to obtain now.

The new technical specification and specification about ports will facilitate the voyage preparation and planning for the ports' section. Given that there are 54 core network ports (along the Rhine and Danube) for which data is not yet provided (out of a total of 262 ports) and considering that half of the trips start/end in a port, PM12 could reduce the time for voyage planning by 21% per port call (1 minute saved) relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[215]), the adjustment costs savings for vessels operators due to PM12 relative to the baseline are provided in Table 51. Expressed as present value over 2025-2050, they are estimated at EUR 2.92 million relative to the baseline.

Table 51: Recurrent adjustment costs savings for vessels operators due to PM12 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of port calls	364,940	367,264	372,403
Adjustment costs savings for vessel operators (in EUR)	167,309	168,375	170,731

Source: Ramboll et al. (2024), impact assessment support study

[214] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

[215] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

Administrative costs savings for vessel operators

Currently, (electronic) cargo reports are not passed on to inland ports. This means that vessel operators have to report again when entering a port. PM12 would remove the need of reporting again to the ports. If ports would start applying these standards, reports could be forwarded, and part of the administrative burden could be alleviated.

Administrative costs savings are expected for all 83[216] core TEN-T network ports. The time for preparing and (re)submitting the reports is estimated at 10 minutes in the baseline. Taking into account that half of the trips start/end in a port, PM12 could reduce the number of resubmitted cargo reports by 31% relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[217]), the administrative costs savings for vessels operators due to PM12 relative to the baseline are provided in Table 52. Expressed as present value over 2025-2050, they are estimated at EUR 8.88 million relative to the baseline.

Table 52: Recurrent administrative costs savings for vessels operators due to PM12 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Reduction in the number of resubmitted cargo reports due to PM12 relative to the baseline	114,302	115,030	116,639
Administrative costs savings for vessel operators due to PM12 (in EUR)	508,499	511,738	518,898

Source: Ramboll et al. (2024), impact assessment support study

For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of resubmitted cargo reports over 2026-2035 has been estimated at 114,006 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings for vessel operators are estimated at EUR 0.5 million relative to the baseline.

PM13: Require the exchange of information with IWT ports according to new technical specifications

In contrast to PM12, where the exchange of information is voluntary, this measure will require that the exchange of certain data (transhipment capacity, availability of alternative fuels, availability of berths, etc.) between vessels and IWT ports uses the new technical specification. These will be developed through a secondary legislation.

Adjustment costs for national public authorities (ports)

In PM13, both core and comprehensive ports of the TEN-T network will have to implement the technical specifications. In total, there are 54 core TEN-T network ports and 115 comprehensive TEN-T network ports for which no RIS data is available. The DINA study[218] estimates at EUR 25,000 the investment cost per port (in 2017 prices) for developing

[216] This goes beyond the 54 ports that do not provide data. It is assumed that the core inland ports, due to their importance will be the ones to voluntarily take up this measure.
[217] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.
[218] European Commission (2017), Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.

information systems. This is equivalent to EUR 29,197 in 2022 prices. Applying this cost to the 169 ports, the total one-off adjustment costs for national public authorities are estimated at EUR 4.93 million relative to the baseline (in 2022 prices).

Administrative costs for national public authorities (ports)

Once the systems are established, national authorities are expected to incur recurrent administrative costs for managing and maintaining the data. According to the DINA study[219] these represent around 25% of the one-off investment costs[220]. Thus, the administrative costs for national authorities are estimated at EUR 1.23 million per year from 2026 onwards relative to the baseline. Expressed as present value over 2025-2050, they are estimated at EUR 21.48 million relative to the baseline (in 2022 prices).

Adjustment cost savings for navigation software service providers

As in PM12, if all inland ports provided reference data and keep this data updated, this would lead to time savings for navigation software suppliers. Based on feedback received in the context of stakeholders' consultation, the mandatory provision of reference data by all 182 inland ports of the comprehensive TEN-T network, in addition to the 83 core TEN-T ports, would allow to reduce the average cost per vessel by 1.25% relative to the baseline (i.e. EUR 5.65 saved per vessel) from 2026 onwards. As explained above, in the baseline scenario, the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[221]. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 53. Expressed as present value over 2025-2050, they are estimated at EUR 1.56 million relative to the baseline (in 2022 prices)[222].

Table 53: Recurrent adjustment costs savings for navigation software service providers due to PM13 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	5.65	5.65	5.65
Adjustment costs savings for navigation software service providers (in EUR)	89,440	90,332	91,095

Source: Ramboll et al. (2024), impact assessment support study

[219] European Commission (2017), Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.

[220] According to the study, the maintenance of digital tools e.g. as a result of service level agreements and license fees, represents approximately 20% of the initial technology investment. Another 5% is attributed to the governance of the required standards and the coordination of the implementation.

[221] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

[222] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

Adjustment cost savings for vessel operators

PM13 is expected to lead to recurrent adjustment costs savings for vessel operators for the trip preparation. In the baseline, an average of 5 minutes per port call is assumed for trip preparation for the ports' section. There are currently 262 ports in the TEN-T network (core plus comprehensive network). A total of 93 inland ports already provide RIS data while 169 inland ports do not provide RIS data (54 from the core network and 115 from the comprehensive network). Under PM13, all those 169 inland ports will have to report RIS data. Given that half of the trips start/end in a port, PM13 could reduce the time for voyage planning by 65% per port call (3.2 minutes saved) relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[223]), the adjustment costs savings for vessels operators due to PM13 relative to the baseline are provided in Table 54. Expressed as present value over 2025-2050, they are estimated at EUR 9.14 million relative to the baseline.

Table 54: Recurrent adjustment costs savings for vessels operators due to PM13 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of port calls	364,940	367,264	372,403
Adjustment costs savings for vessel operators (in EUR)	523,616	526,951	534,324

Source: Ramboll et al. (2024), impact assessment support study

Administrative cost savings for vessel operators

Under PM13, all 262 inland ports from the core and comprehensive TEN-T network will be automatically receiving the (electronic) cargo reports and therefore, vessel operators will not have to resubmit them. Considering the labour cost per hour (EUR 26.7 per hour[224]), the administrative costs savings for vessels operators due to PM13 relative to the baseline are provided in Table 55. Expressed as present value over 2025-2050, they are estimated at EUR 28.35 million relative to the baseline.

Table 55: Recurrent administrative costs savings for vessels operators due to PM13 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Reduction in the number of resubmitted cargo reports due to PM13 relative to the baseline	364,940	367,264	372,403
Administrative costs savings for vessel operators due to PM13 (in EUR)	1,623,521	1,633,861	1,656,721

Source: Ramboll et al. (2024), impact assessment support study

For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of resubmitted cargo reports over 2026-2035 has been estimated at 363,996 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings for vessel operators are estimated at EUR 1.6 million relative to the baseline.

[223] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

[224] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

PM14: Improve the harmonisation between RIS and the information services for other modes of transport (e.g. maritime)

Currently the RIS Directive envisages continuity with other modal traffic management services, in particular with maritime. However, no further details are included, or technical specifications have been developed along these lines. Therefore, this measure aims to strengthen the interoperability of RIS with other modes of transport. To do so, this measure does not aim to create new or duplicate existing systems, but will include a clear requirement in the Directive to create links with systems of other modes like EMSWe[225]. In addition, a common data exchange mechanism (such as application programming interfaces) should be developed to enable both systems to access the data functionality of one another. Technical specifications to implement these links and ensure compatibility between systems will be developed at a second stage through CESNI and introduced through secondary legislation.

Adjustment costs for national public authorities

IT investments by the national public authorities will be needed to integrate RIS information systems with information systems of other modes. The IT investment costs are assumed to be similar to that of the CoRISma project[226]. Expressed in 2022 prices, the one-off adjustment costs for the national public authorities are estimated at EUR 3.14 million.

Administrative costs for national public authorities

The annual maintenance costs are assumed to be 25% of the IT investment costs, based on the DINA study[227]. Thus, the recurrent administrative costs for national public authorities are estimated at EUR 0.79 million per year from 2026 onwards. Expressed as present value over 2025-2050, they are estimated at EUR 13.68 million.

Adjustment cost savings for navigation software service providers

PM14 will result into maritime charts (ECDIS) and inland charts (Inland ECDIS) being better aligned and thus to time savings for software service providers. As explained above, in the baseline scenario the average cost for software service providers for introducing the data into their systems is estimated at EUR 452 per year, per vessel (in 2022 prices)[228]. According to feedback provided by the RIS software service providers during the second stakeholder

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[225] European Maritime Single Window environment, established by Regulation (EU) 2019/1239.

[226] CoRISMa was a TEN-T project running between January 2014 and December 2015. CoRISma studied and defined the next steps in the development of River Information Services: RIS enabled Corridor Management on inland waterways aiming at mutually sharing information services among waterway authorities but also sharing those with waterway users and logistic partners in order to optimise the use of inland navigation corridors within the network of European waterways. The European Commission contributed EUR 1,083,204 to the CoRISma project with a co-financing rate of 41% (expressed in 2014 prices).

[227] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.* According to the study, the maintenance of digital tools e.g. as a result of service level agreements and license fees, represents approximately 20% of the initial technology investment. Another 5% is attributed to the governance of the required standards and the coordination of the implementation.

[228] Ludden, V. et al., (2020): *Study supporting the evaluation of Directive 2005/44/EC on Harmonised River Information Services (RIS)*. Ramboll, University of Antwerp and DLA Piper. The average cost in the study is expressed in 2019 prices. For the purpose of this impact assessment, it has been transformed in 2022 prices using the harmonised consumer price index for Belgium from Eurostat because the two navigation software service providers that serve around 90% of the market are based in Belgium.

survey[229], PM14 would allow to reduce the average cost per vessel by 0.25% relative to the baseline (i.e. EUR 1.13 saved per vessel) from 2026 onwards. The recurrent adjustment costs savings for navigation software service providers for 2030, 2040 and 2050, relative to the baseline, are provided in Table 56. Expressed as present value over 2025-2050, they are estimated at EUR 0.31 million relative to the baseline (in 2022 prices)[230].

Table 56: Recurrent adjustment costs savings for navigation software service providers due to PM14 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of vessels	15,838	15,996	16,131
Average costs savings for navigation software service providers per vessel (in EUR)	1.13	1.13	1.13
Adjustment costs savings for navigation software service providers (in EUR)	17,888	18,066	18,219

Source: Ramboll et al. (2024), impact assessment support study

PM15: Require sharing of all necessary cross-border data for traffic management and transport management by Member States

Currently not all information provided by vessel operators to authorities is shared with the authorities of other Member States, which creates a challenge when crossing borders as in many cases the information needs to be retransmitted. As an illustrative example, cargo reports are not always transmitted to the next country in the journey, which then is not aware that a vessel with dangerous cargo is approaching its area. For example, this does not happen at the borders between the Netherlands and Wallonia, France and Wallonia, France and Luxembourg, Austria and Germany, and all other borders in the Danube area except of the Austrian-Slovakian border.

This measure would require Member States to share cross-border all necessary data that is required for traffic and transport management. This includes for example information provided by vessel operators regarding the cargo, the position of the vessel, ERI information, but also the exchange of information between authorities such as changes in the navigation parameters, limitations of traffic, speed, etc. This way PM15 aims at facilitating the international exchange of RIS-related data making the planning of journeys more accurate and faster. Under this measure, all the data authorities require would be submitted once the journey starts and then re-shared by the authorities, as well as information generated during the journey.

This measure does not deal with exchanges not made due to personal data concerns, while they are handled by measures PM16 and PM17.

Adjustment costs for national public authorities

The one-off adjustment costs (i.e. investment costs to develop the necessary digital tools that will allow the exchange between the national authorities) for national public authorities due to

[229] The feedback has been provided by the two navigation software service providers, based in Belgium, that serve around 90% of the market.

[230] Part of these costs savings benefiting software provides may be passed through to the vessel operators, although it is not possible to assess the share of the costs savings passed through.

PM15 are estimated at EUR 5 million in 2025 relative to the baseline. The estimate is based on comparable projects in the rail freight sector (ELETA and its successor EDICT[231]).

Administrative cost savings for national public authorities

PM15 is expected to reduce the staff required at borders. Based on different sources summarised in Table 57, it has been estimated that around 87,420 vessels cross borders where a control in established. Based on the interviews during the stakeholders' consultation, border officers spend on average 5 minutes for these controls on each side of the border. Considering the labour cost per hour (EUR 26.7 per hour[232]), the administrative costs savings for national public authorities are estimated at EUR 388,908 per year from 2026 onwards relative to the baseline. Expressed as present value over 2025-2050, they are estimated at EUR 6.77 million relative to the baseline (in 2022 prices).

Table 57: Border crossings and controls

Border	Location	Source	Number of vessels
NL <-> BE	Lanaye	Voies Hydrauliques Wallone[233]	13,718
BE <-> FR	French border, Meuse	Voies Hydrauliques Wallone	1,040
BE <-> FR	French border, Escaut	Voies Hydrauliques Wallone	7,555
FR <-> LU	Grevenmacher lock	Lu Stat[234]	4,828
DE <-> AT	Aschach lock	Statistic.at[235]	3,939
SK <-> HU	Gabcikovo lock	Common Danube Report 2018[236]	13,361
HU <-> HR			13,361
HR <-> RS			13,361
RS <-> RO	Iron Gate I	Common Danube Report 2018	13,363
DE <-> CZ	Locks Usti Nad Labem	Idnes.cz[237]	1,000
DE <-> PL	Schiffshebewerk Niederfinow	Verkehrsbericht 2021[238]	1,894
Total			**87,420**

Source: Ramboll et al. (2024), Impact assessment support study

[231] ELETA: Electronic Exchange of ETA Information; EDICT: Enhanced Data Interoperability for Combined Transport Stakeholders

[232] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

[233] http://voies-hydrauliques.wallonie.be/opencms/opencms/fr/nav/navstat/navstat.do?path=tr&per=2022&vn=21&val=N&display=T&pas=A&col=CLA

[234] https://lustat.statec.lu/vis?lc=en&fs[0]=Topics%2C1%7CEnterprises%23D%23%7CTransport%23D6%23&fs[1]=Topics%2C2%7CEnterprises%23D%23%7CTransport%23D6%23%7CMaritime%20and%20fluvial%20transport%23D63%23&pg=0&fc=Topics&df[ds]=ds-release&df[id]=DF_D6401&df[ag]=LU1&df[vs]=1.0&pd=2015%2C&dq=.A.&ly[rw]=SPECIFICATION%2CDIRECTION&ly[cl]=TIME_PERIOD

[235] https://www.statistik.at/en/statistics/tourism-and-transport/freight-transport/freight-transport-on-inland-waterways

[236] http://www.plovput.rs/file/danube-stream/common-danube-report-2018.pdf

[237] https://www.idnes.cz/bydleni/architektura/strekov.A120322_110822_architektura_web

[238] https://www.gdws.wsv.bund.de/SharedDocs/Downloads/DE/Verkehrsberichte/Verkehrsbericht_2021.pdf?__blob=publicationFile&v=4

Administrative cost savings for vessel operators

PM15 (included in POC) will eliminate the need for vessel operators to resubmit the electronic cargo reports for border crossing where this is still required (i.e. in 30% of the border crossings in the baseline). Vessel operators would only have to report their voyage once to a RIS authority, which then automatically transfers the voyage report to other RIS authorities when the vessel enters the management area of the subsequent authority. However, considering the synergies with PM8 and PM9 (both included in POC), PM15 is expected to reduce the share of repeated notifications by 2 percentage points relative to the baseline from 2026 onwards[239]. Based on the interviews and stakeholders' survey, repeated notifications take around 15 minutes per vessel operator. Considering the labour cost per hour (EUR 26.7 per hour[240]), the administrative cost savings for vessels operators due to PM15 relative to the baseline are provided in Table 58. Expressed as present value over 2025-2050, they are estimated at EUR 1.11 million relative to the baseline.

Table 58: Recurrent administrative costs savings for vessels operators due to PM15 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of border crossings requiring repeated notifications in the baseline	132,997	133,918	135,833
Reduction in the number of repeated notifications due to PM15 (considering the synergies with PM8 and PM9) relative to the baseline	9,846	9,914	10,056
Administrative costs savings for vessel operators due to PM15 (in EUR)	63,696	64,136	65,054

Source: Ramboll et al. (2024), impact assessment support study

PM16: Specify more clearly the cases for exchange of personal data

Currently the main challenge regarding the personal data in RIS relates to the information on the position of the vessel through AIS (Automatic Identification System). As explained in problem driver 5, vessel operators (in particular SMEs) who also reside in the vessel, consider that information regarding the position should be considered personal data. Due to these concerns, and as it is not always clear on which basis the data is being processed and whether this is allowed, authorities are reluctant to process and transmit positioning information to other authorities. This in turn leads to resubmission of the information by the vessel operators to different national authorities or refusal to share information.

Under this measure, the RIS Directive would provide more clarity on the specific cases and legal basis where exchange of personal data would be justified (e.g. for reasons of safety, to streamline the process, etc.). This would provide legal clarity both for Member States and other stakeholders, and thus allow a reduction in the number of resubmissions. The expectation is that if it is made clear in which cases AIS data can and cannot be shared, the

[239] As explained, in the baseline scenario 30% of the border crossings require to resubmit the electronic cargo reports. PM8 reduces the share of repeated notifications by 20 percentage points relative to the baseline and PM9 by another 8 percentage points. Therefore, the elimination of the need to resubmit the electronic cargo reports in PM15 (in combination with PM8 and PM9) leads to a reduction in the share of repeated notifications by 2 percentage points relative to the baseline.

[240] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

procedure for collecting port charges will become simpler. Barges will no longer have to report in ports, authorities will have to make less effort to identify vessels. Therefore, economic impacts are assessed for these two categories of stakeholders.

This measure is designed to work in complementarity with PM12, PM13 and PM15 as it covers a specific case (personal data) that they do not.

Adjustment costs for national public authorities (ports)

For PM16 to be implemented, all TEN-T inland ports would have to develop an application where the position of the vessel through AIS can be used for port-related matters, such as berth management and collection of port fees[241]. The investment costs for such an application are estimated at EUR 5,839 per port (in 2022 prices) as identified in DINA study[242]. The total one-off adjustments costs for all 265 ports are thus estimated at EUR 1.55 million in 2025 relative to the baseline.

Administrative costs for national public authorities (ports)

PM16 is also expected to lead to recurrent administrative costs for managing and maintaining the systems. Based on the DINA study they are assumed to be 25% of the investment costs, or EUR 1,460 per port. Thus, total recurrent administrative costs are estimated at EUR 386,860 per year relative to the baseline from 2026 onwards. Expressed as present value over 2025-2050, they are estimated at EUR 6.74 million relative to the baseline.

Administrative costs savings for vessel operators

Making clear in which cases AIS data can and cannot be shared, the procedure for collecting port charges would become simpler. Barges would no longer have to report in ports and authorities would have to make less effort to identify vessels. Currently, there are 120 ports in Europe where port dues are levied, mainly located in the Netherlands and some on the Rhine and Danube. It is estimated that if the cases for data-sharing would be better clarified the number of resubmitted reports to ports would decrease by 20% relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[243]), the administrative costs savings for vessels operators due to PM16 relative to the baseline are provided in Table 59. Expressed as present value over 2025-2050, they are estimated at EUR 5.67 million relative to the baseline.

Table 59: Recurrent administrative costs savings for vessels operators due to PM16 relative to the baseline (in EUR, in 2022 prices)

	2030	2040	2050
Number of port calls	364,940	367,264	372,403
Reduction in the resubmission of electronic cargo reports to ports relative to the baseline	72,988	73,453	74,481

[241] This application is considered as separate/has other functionality to those under PM12 and PM13, as these last ones do not consider AIS among the information to be shared.
[242] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.*
[243] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

	2030	2040	2050
Administrative costs savings for vessel operators due to PM16 (in EUR)	324,704	326,772	331,344

Source: Ramboll et al. (2024), impact assessment support study

For the purpose of the application of the 'one in, one out' approach, the average reduction in the number of resubmitted cargo reports over 2026-2035 has been estimated at 72,799 per year relative to the baseline and the average costs saved per resubmission at EUR 4.4. Thus, the average annual administrative costs savings for vessel operators are estimated at EUR 0.32 million relative to the baseline.

PM17: Develop templates and standards for the exchange of personal data

This measure will develop and mandate new standards and technical specifications for the exchange of personal information when this is required by national or international legislation. This measure goes beyond measure 16, in that it will not only clarify the cases when personal data can be exchanged, but will define the exact templates and standards to be followed when such an exchange can take place, in line with existing legal provisions. It will thus provide a further step of harmonisation. It would also provide information on why this is proportionate (i.e. on what is aimed to be achieved) and why it is the least intrusive way to exchange personal data to achieve its goals).

Adjustment costs for national public authorities (ports)

For PM17 to be implemented, all TEN-T inland ports would have to develop an application where the position of the vessel through AIS can be used for port-related matters, such as berth management and collection of port fees[244]. The application would need to additionally accommodate harmonised features (e.g. templates and standards to be followed) relative to PM16. The investment costs for such an application are estimated at EUR 10,219 per port (in 2022 prices) as identified in DINA study[245]. The total one-off adjustments costs for all 265 ports are thus estimated at EUR 2.71 million in 2025 relative to the baseline.

Administrative costs for national public authorities (ports)

PM17 is also expected to lead to recurrent administrative costs for managing and maintaining the systems. Based on the DINA study they are assumed to be 25% of the investment costs, or EUR 2,555 per port. Thus, total recurrent administrative costs are estimated at EUR 677,005 per year relative to the baseline from 2026 onwards. Expressed as present value over 2025-2050, they are estimated at EUR 11.79 million relative to the baseline.

Administrative cost savings for vessel operators

By clarifying instances when AIS data can and cannot be shared, the procedure for collecting port charges would become simpler. In Europe, port dues are levied in 120 ports, which are primarily located in the Netherlands, but some also along the Rhine and Danube. It is estimated that if the cases for data-sharing would be better clarified the number of resubmitted

[244] This application is considered as separate/has other functionality to those under PM12 and PM13, as these last ones do not consider AIS among the information to be shared.
[245] European Commission (2017): *Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes. Final report.* These investment costs are 75% higher than those in PM16.

reports to ports would decrease by 30% relative to the baseline from 2026 onwards. Considering the labour cost per hour (EUR 26.7 per hour[246]), the administrative costs savings for vessels operators due to PM17 relative to the baseline are provided in Table 60. Expressed as present value over 2025-2050, they are estimated at EUR 8.51 million relative to the baseline.

Table 60: Recurrent administrative costs savings for vessels operators due to PM17 relative to the baseline (in EUR, in 2022 prices)

	2025	2030	2040	2050
Number of port calls	359,093	364,940	367,264	372,403
Reduction in the resubmission of electronic cargo reports relative to the baseline		109,482	110,179	111,721
Administrative costs savings for vessel operators due to PM12 (in EUR)		487,056	490,158	497,016

Source: Ramboll et al. (2024), impact assessment support study

Summary of costs and costs savings

Drawing on the detailed explanations by policy measure and stakeholder group above, Table 61 to Table 68 provide a summary of the costs and costs savings by policy option, policy measure and stakeholder group.

Table 61: Recurrent costs and costs savings for vessels operators by policy option and measure in 2030, 2040 and 2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Administrative costs	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**19.74**	**20.16**	**20.60**
PM5							19.74	20.16	20.60
Adjustment costs savings	**1.69**	**1.70**	**1.73**	**3.48**	**3.50**	**3.55**	**18.70**	**18.04**	**18.98**
PM1	0.49	0.50	0.50						
PM2	0.35	0.36	0.36	0.35	0.36	0.36			
PM3							0.18	0.18	0.18
PM4				0.63	0.64	0.65	0.63	0.64	0.65
PM5							15.04	14.36	15.24
PM6	0.85	0.85	0.86	0.85	0.85	0.86	0.85	0.85	0.86
PM9				1.48	1.49	1.51	1.48	1.49	1.51
PM12				0.17	0.17	0.17			
PM13							0.52	0.53	0.53
Administrative costs savings	**0.61**	**0.62**	**0.62**	**1.63**	**1.64**	**1.66**	**2.97**	**2.99**	**3.03**
PM7	0.29	0.29	0.29						
PM8				0.57	0.58	0.59	0.57	0.58	0.59
PM9				0.22	0.22	0.23	0.22	0.22	0.23
PM12				0.51	0.51	0.52			
PM13							1.62	1.63	1.66
PM15							0.06	0.06	0.07
PM16	0.32	0.33	0.33	0.32	0.33	0.33			
PM17							0.49	0.49	0.50

[246] Weighted average of the tariff per hour for non-manual workers (ISCO 8 - Plant and machine operators and assemblers) in the 13 Member State in the scope of RIS. It is based on Eurostat Structure of earnings survey and expressed in 2022 prices.

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Net costs savings	**2.30**	**2.32**	**2.35**	**5.11**	**5.14**	**5.22**	**1.93**	**0.88**	**1.42**

Source: Ramboll et al. (2024), impact assessment support study

Table 62: Recurrent costs and costs savings for vessels operators by policy option and measure, expressed as present value over 2025-2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Administrative costs	**0.00**	**0.00**	**367.50**
PM5			367.50
Adjustment costs savings	**29.56**	**72.12**	**323.99**
PM1	8.61		
PM2	6.16	6.16	
PM3			3.08
PM4		11.09	11.09
PM5			248.72
PM6	14.79	14.79	14.79
PM9		37.16	37.16
PM12		2.92	
PM13			9.14
Administrative costs savings	**10.68**	**28.47**	**51.89**
PM7	5.01		
PM8		10.02	10.02
PM9		3.90	3.90
PM12		8.88	
PM13			28.35
PM15			1.11
PM16	5.67	5.67	
PM17			8.51
Net costs savings	**40.24**	**100.59**	**8.37**

Source: Ramboll et al. (2024), impact assessment support study

Table 63: Adjustment costs savings for navigation software services providers by policy option and measure in 2030, 2040 and 2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
PM1	0.07	0.07	0.07						
PM2	0.04	0.04	0.04	0.04	0.04	0.04			
PM3							0.02	0.02	0.02
PM4				0.14	0.14	0.15	0.14	0.14	0.15
PM6	0.14	0.14	0.15	0.14	0.14	0.15	0.14	0.14	0.15
PM9				0.07	0.07	0.07	0.07	0.07	0.07
PM12				0.05	0.05	0.05			
PM13							0.09	0.09	0.09
PM14				0.02	0.02	0.02	0.02	0.02	0.02
Total adjustment costs savings	**0.25**	**0.25**	**0.26**	**0.47**	**0.47**	**0.47**	**0.48**	**0.49**	**0.49**

Source: Ramboll et al. (2024), impact assessment support study

Table 64: Adjustment costs savings for navigation software services providers by policy option and measure, expressed as present value over 2025-2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM1	1.25		
PM2	0.63	0.63	
PM3			0.31
PM4		2.50	2.50
PM6	2.50	2.50	2.50
PM9		1.25	1.25
PM12		0.94	
PM13			1.56
PM14		0.31	0.31
Total adjustment costs savings	**4.38**	**8.13**	**8.44**

Source: Ramboll et al. (2024), impact assessment support study

Table 65: Recurrent costs and costs savings for national public authorities by policy option and measure in 2030, 2040 and 2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Administrative costs	**1.97**	**1.97**	**1.97**	**4.29**	**4.29**	**4.29**	**5.91**	**5.91**	**5.91**
PM2	0.92	0.92	0.92	0.92	0.92	0.92			
PM3							0.65	0.65	0.65
PM4				1.14	1.14	1.14	1.14	1.14	1.14
PM5							0.77	0.77	0.77
PM6	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
PM12				0.39	0.39	0.39			
PM13							1.23	1.23	1.23
PM14				0.79	0.79	0.79	0.79	0.79	0.79
PM16	0.39	0.39	0.39	0.39	0.39	0.39			
PM17							0.68	0.68	0.68
Administrative cost savings	**0.62**	**0.68**	**0.74**	**1.75**	**1.86**	**1.97**	**2.14**	**2.24**	**2.36**
PM7	0.62	0.68	0.74						
PM8				1.25	1.36	1.47	1.25	1.36	1.47
PM9				0.50	0.50	0.50	0.50	0.50	0.50
PM15							0.39	0.39	0.39
Net costs	**1.34**	**1.29**	**1.23**	**2.54**	**2.43**	**2.31**	**3.78**	**3.67**	**3.55**

Source: Ramboll et al. (2024), impact assessment support study

Table 66: One-off adjustment costs for national public authorities by policy option and measure in 2025, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM2	2.76	2.76	
PM4		4.55	4.55
PM5			3.07
PM7	1.25		
PM8		1.25	1.25
PM9		3.50	3.50
PM12		1.58	
PM13			4.93

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM14		3.14	3.14
PM15			5.00
PM16	1.55	1.55	
PM17			2.71
Total one-off adjustment costs	**5.56**	**18.33**	**28.15**

Source: Ramboll et al. (2024), impact assessment support study

Table 67: Recurrent and one-off costs and costs savings for national public authorities by policy option and measure, expressed as present value over 2025-2050, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Adjustment costs	**5.56**	**18.33**	**28.15**
PM2	2.76	2.76	
PM4		4.55	4.55
PM5			3.07
PM7	1.25		
PM8		1.25	1.25
PM9		3.50	3.50
PM12		1.58	
PM13			4.93
PM14		3.14	3.14
PM15			5.00
PM16	1.55	1.55	
PM17			2.71
Administrative costs	**34.9**	**75.3**	**104.3**
PM2	16.02	16.02	
PM3			11.97
PM4		19.81	19.81
PM5			13.35
PM6	12.18	12.18	12.18
PM12		6.86	
PM13			21.48
PM14		13.68	13.68
PM16	6.74	6.74	
PM17			11.79
Administrative cost savings	**11.45**	**30.60**	**37.37**
PM7	11.45		
PM8		22.89	22.89
PM9		7.71	7.71
PM15			6.77
Net costs	**29.05**	**63.02**	**95.04**

Source: Ramboll et al. (2024), impact assessment support study

Table 68: One-off adjustment costs for the European Commission by policy option and measure in 2025, relative to the baseline (in million EUR, in 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM1	0.47		
Total one-off adjustment costs	**0.47**	**0.00**	**0.00**

Source: Ramboll et al. (2024), impact assessment support study

4. Impacts on modal shift and external costs

As explained in section 1, IWT is quite active in the transport of non-time sensitive goods (e.g. bulk or liquid cargo). To increase the competitiveness of intermodal inland waterways transport, focus is needed on incentivising the transport of goods that are more time sensitive (i.e. typically the container market). For this market segment, reliability is important and IWT would need to match the higher reliability standards of road transport, which benefits from a reduced number of actors (door-to-door services, less handling) and higher flexibility (in particular compared to "network" modes, like IWT and rail).

Several policy measures are expected to have an impact on modal shift, away from road transport to intermodal inland waterway transport. In particular PM4 is expected to increase the efficiency in navigation, as improved data (e.g. on waiting times or obstacles) will improve navigation performance. PM14 will have a similar effect through improved links with the systems of other modes (e.g. the estimated time of arrival will be available, which in turn will contribute to the optimisation of the logistics chain). This will lead to increased performance, predictability and reliability of the intermodal IWT sector, increasing the potential to attract freight from other modes. The impact of PM4 and PM14 (both included in PO-B and PO-C) on modal shift has been assessed together, due to the synergies between the measures.

No study has been identified that examines the issue of reliability in the IWT sector. However, a 2019 TRT study[247], examining the modal shift potential for rail, provides a good approximation for identifying the impact of improved reliability for intermodal IWT. Like IWT, rail is also a "network" mode (though with a wider network) and it also carries both time-sensitive and cost-sensitive goods. The study found that the lack of punctuality was the most important reason provided by the surveyed logistics operators and freight forwarders for not choosing rail instead of road. It further estimated (through a stated preference survey) the impact of an increase in reliability in shifting freight away from road (i.e. the cross elasticity). Given the similarities between rail and IWT, the fact that both compete against road, and in the absence of further specific research, the results of the rail study are used as a proxy for estimating the potential modal shift from road to IWT. In addition, sensitivity analysis has been performed and is presented in section 7.6.

Based on the results of a stated preference survey run as part of a 2019 TRT study[248], a linear correlation between punctuality and modal shift potential has been identified. More specifically, the study indicates that for each 10% increase in punctuality a 6.1% increase in transport demand could be expected. To determine the impact on reliability for the inland waterway sector, information on average waiting times at locks has been collected in the context of the impact assessment support study and the impact on reliability (90% value) has been derived based on desk-research[249].

Table 69: Average waiting times at locks and impact on reliability, in minutes

	Average waiting time	90% value
Oranjesluizen	18	42
Houtribsluizen	18	38
Margrietsluis	19	36
Gaarkeukensluis	16	32
Oostersluis	22	45

[247] https://www.corridor-rhine-alpine.eu/files/downloads/others/Transport%20Market%20Study%202018.pdf
[248] https://www.corridor-rhine-alpine.eu/files/downloads/others/Transport%20Market%20Study%202018.pdf
[249] IMA (2021) of the Department of Public Works.

	Average waiting time	90% value
Delden	32	82
Grave	21	42
Sint Andries	21	45
Weurt	16	36
Schijndel	20	41
Hansweert	14	30
Krammersluizen	25	53
Kreekraksluizen	20	45
Volkeraksluizen	24	40
Average	**20**	**43**

Source: Ramboll et al. (2024), impact assessment support study

The table shows an average waiting time per lock of 20 minutes and a reliability value of 43 minutes (i.e. variance of 23 minutes). Moreover, a barge passes an average number of 4 locks per voyage[250,251]. In the baseline scenario, the total travel time for freight inland waterways transport is estimated at 12 million hours in 2025, 12.19 million hours in 2030 and 12.42 million hours in 2050, while the waiting time at 0.54 million hours in 2025, 0.55 million hours in 2030 and 0.56 million hours in 2050. Based on this, the reliability of travel time in inland shipping is estimated at 95.5% in the baseline scenario. Information on the position of the ship and the expected arrival time of ships can increase the reliability by a maximum of 4.5%. Drawing on the correlation between the increase in punctuality and transport demand from the TRT study, the model shift potential is estimated at 2.7% relative to the baseline. This modal shift potential is only applied to intermodal transport[252], as not all goods transported by road may be suitable for transport by IWT, while the IWT network is much limited compared to that of road. Drawing on the evolution of freight IWT activity in the baseline scenario, the model shift potential and the share of intermodal transport in IWT, the transport activity shifted from road to freight IWT is estimated at 0.35 billion tkm in 2026, 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050.

Table 70: Impact on freight inland waterways transport activity relative to the baseline

	2026	2030	2040	2050
Freight IWT activity in the baseline scenario (Gtkm)	167.0	178.2	194.7	211.8
Travel time in the baseline (million hours)	12.04	12.19	12.26	12.42
Waiting time in the baseline (million hours)	0.54	0.55	0.55	0.56
Reliability	95.5%	95.5%	95.5%	95.5%
Effect of more reliable travel planning	4.5%	4.5%	4.5%	4.5%
Modal shift potential	2.7%	2.7%	2.7%	2.7%
Shift from road to freight IWT activity relative to the baseline (Gtkm)	0.35	0.38	0.41	0.45

Source: Ramboll et al. (2024), impact assessment support study

Environmental impacts and external costs

The CO_2 emissions reductions are driven by the combined effect of PM4 and PM14 on the shift from road to inland waterways transport, and by the energy savings in PM5. To calculate the CO_2 emissions reductions due PM4 and PM14, the changes in the transport activity relative to the baseline and the CO_2 emissions intensity for freight inland waterways transport

[250] Rijkswaterstaat's Basic Travel File (2019), including around 375,000 trips.
[251] At trip level, the variance is estimated at 47 minutes.
[252] Based on Eurostat data, around 7.7% of inland waterway transport is intermodal container transport.

and road transport (expressed in tCO2 per tkm) have been used. The CO_2 emissions intensity draws on the baseline scenario developed with the PRIMES-TREMOVE model. It should be noted that the CO_2 intensity for both road transport and IWT reduces significantly over time in the baseline scenario, driven by improvements in energy efficiency and the uptake of renewable and low carbon fuels. For PM5, the CO_2 emissions savings have been derived based on the energy savings and the CO_2 intensity expressed in tCO2 per ktoe from the baseline scenario developed with the PRIMES-TREMOVE model. The reduction in the external costs of CO_2 emissions has been calculated based on the CO_2 emissions savings and the unit costs from the 2019 Handbook on external costs of transport.

A similar approach has been used for air pollutant emissions.

Table 71: Impact on CO_2 emissions relative to the baseline in 2030, 2040 and 2050 (kt of CO2)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
CO_2 emissions (kt)	**0.0**	**0.0**	**0.0**	**-22.5**	**-14.3**	**-5.6**	**-45.2**	**-32.3**	**-14.5**
PM5							-22.7	-18.0	-9.0
PM4&PM14				-22.5	-14.3	-5.6	-22.5	-14.3	-5.6

Source: Ramboll et al. (2024), impact assessment support study

Table 72: Cumulative impact on CO_2 emissions for 2025-2050 relative to the baseline (kt of CO2)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
CO_2 emissions (kt)	**0.0**	**-389.1**	**-832.1**
PM5			-443.0
PM4&PM14		-389.1	-389.1

Source: Ramboll et al. (2024), impact assessment support study

Table 73: Impact on air pollutant emissions relative to the baseline in 2030, 2040 and 2050 (tonnes)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
PM emissions (in tonnes)	**0.0**	**0.0**	**0.0**	**3.2**	**2.5**	**1.6**	**-17.0**	**-11.1**	**-6.3**
PM5							-20.3	-13.6	-7.9
PM4&PM14				3.2	2.5	1.6	3.2	2.5	1.6
NOx emissions (in tonnes)	**0.0**	**0.0**	**0.0**	**19.7**	**29.2**	**21.3**	**-367.6**	**-231.5**	**-129.5**
PM5							-387.3	-260.7	-150.8
PM4&PM14				19.7	29.2	21.3	19.7	29.2	21.3

Source: Ramboll et al. (2024), impact assessment support study

Table 74: Cumulative impact on air pollutant emissions for 2025-2050 relative to the baseline (tonnes)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
PM emissions (in tonnes)	**0.0**	**60.8**	**-338.8**
PM5			-399.6
PM4&PM14		60.8	60.8
NOx emissions (in tonnes)	**0.0**	**603.2**	**-6552.3**
PM5			-7,155.5
PM4&PM14		603.2	603.2

Source: Ramboll et al. (2024), impact assessment support study

Table 75: Impact on external costs of CO2 emissions, air pollution emissions, noise and habitats relative to the baseline in 2030, 2040 and 2050 (in million EUR, 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
CO2 emissions	**0.0**	**0.0**	**0.0**	**-2.7**	**-3.1**	**-1.8**	**-5.4**	**-7.1**	**-4.6**
PM5							-2.7	-3.9	-2.9
PM4&PM14				-2.7	-3.1	-1.8	-2.7	-3.1	-1.8
Air pollution	**0.0**	**0.0**	**0.0**	**0.7**	**0.9**	**0.6**	**-9.4**	**-6.0**	**-3.3**
PM5							-10.2	-6.8	-4.0
PM4&PM14				0.7	0.9	0.6	0.7	0.9	0.6
Noise	**0.0**	**0.0**	**0.0**	**-2.0**	**-2.2**	**-2.4**	**-2.0**	**-2.2**	**-2.4**
PM4&PM14				-2.0	-2.2	-2.4	-2.0	-2.2	-2.4
Habitats	**0.0**	**0.0**	**0.0**	**-2.0**	**-2.1**	**-2.3**	**-2.0**	**-2.1**	**-2.3**
PM4&PM14				-2.0	-2.1	-2.3	-2.0	-2.1	-2.3
Total reduction in external costs	**0.0**	**0.0**	**0.0**	**-5.9**	**-6.6**	**-5.9**	**-18.7**	**-17.4**	**-12.7**

Source: Ramboll et al. (2024), impact assessment support study

Table 76: Impact on external costs of CO2 emissions, air pollution emissions, noise and habitats relative to the baseline – expressed as present value over 2025-2050 (in million EUR, 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
CO2 emissions	**0.0**	**-48.6**	**-105.2**
PM5			-56.6
PM4&PM14		-48.6	-48.6
Air pollution	**0.0**	**13.1**	**-127.6**
PM5			-140.7
PM4&PM14		13.1	13.1
Noise	**0.0**	**-36.6**	**-36.6**
PM4&PM14		-36.6	-36.6
Habitats	**0.0**	**-36.2**	**-36.2**
PM4&PM14		-36.2	-36.2
Total reduction in external costs	**0.0**	**-108.4**	**-305.7**

Source: Ramboll et al. (2024), impact assessment support study

External costs of congestion

The reduction in the external costs of road congestion has been calculated based on the reduction in the road transport activity and the unit costs of congestion from the 2019 Handbook on external costs of transport[253].

Table 77: Impact on external costs of congestion relative to the baseline in 2030, 2040 and 2050 (in million EUR, 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Congestion	**0.0**	**0.0**	**0.0**	**-4.7**	**-5.1**	**-5.6**	**-4.7**	**-5.1**	**-5.6**
PM4&PM14				-4.7	-5.1	-5.6	-4.7	-5.1	-5.6

Source: Ramboll et al. (2024), impact assessment support study

[253] Internalisation of transport external costs (europa.eu)

Table 78: Impact on external costs of congestion relative to the baseline – expressed as present value over 2025-2050 (in million EUR, 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Congestion	**0.0**	**-86.8**	**-86.8**
PM4&PM14		-86.8	-86.8

Source: Ramboll et al. (2024), impact assessment support study

External costs of accidents

The reduction in the external costs of accidents has been calculated based on the reduction in the road transport activity and the unit costs per fatality and serious injury from the 2019 Handbook on external costs of transport. According to the Handbook, the external cost of a fatality in 2022 prices is estimated at EUR 3.9 million and that of a serious injury at EUR 0.6 million.

Table 79: Impact on external costs of accidents relative to the baseline in 2030, 2040 and 2050 (in million EUR, 2022 prices)

	Difference to the Baseline								
	PO-A			PO-B			PO-C		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Accidents (Road)	**0.0**	**0.0**	**0.0**	**-6.3**	**-6.9**	**-7.5**	**-6.3**	**-6.9**	**-7.5**
PM4&PM14				-6.3	-6.9	-7.5	-6.3	-6.9	-7.5

Source: Ramboll et al. (2024), impact assessment support study

Table 80: Impact on external costs of accidents relative to the baseline – expressed as present value over 2025-2050 (in million EUR, 2022 prices)

	Difference to the Baseline		
	PO-A	PO-B	PO-C
Accidents (Road)	**0.0**	**-115.8**	**-115.8**
PM4&PM14		-115.8	-115.8

Source: Ramboll et al. (2024), impact assessment support study

ANNEX 5: COMPETITIVENESS CHECK

1. OVERVIEW OF IMPACTS ON COMPETITIVENESS

Dimensions of competitiveness	Impact of the initiative (++ / + / 0 / - / -- / n.a.)	References to sub-sections of the main report or annexes
Cost and price competitiveness	+	Sections 6.1.3 and 6.1.7, and Annex 4
Capacity to innovate	+	Sections 6.1.8 and 6.1.9
International competitiveness	0	Section 6.1.7
SME competitiveness	+	Section 6.1.5 and Annex 6

2. SYNTHETIC ASSESSMENT

2.1. Cost and price competitiveness

The preferred policy option will bring improvements in the operational efficiency of inland waterway operations, including the efficiency of vessel operators. These are mainly a result of measures enabling better planning of operations and a reduction in the resubmissions of reports (PM2, PM4, PM6, PM9, PM16), as well as of measures enabling better exchange of cargo information through eFTI and with inland ports (PM8 and PM12). As indicated in section 6.1.3, administrative costs savings for vessel operators are estimated at EUR 28.5 million in PO-B, expressed as present value over 2025-2050 relative to the baseline, and adjustment cost savings at EUR 72.1 million. Overall, the preferred policy option results in net costs savings for vessel operators estimated at EUR 100.6 million.

In addition, providers of RIS software services are expected to benefit of costs savings thanks to access to more and better-quality data. As indicated in section 6.1.3, the adjustment costs savings for RIS software services providers are estimated at EUR 8.1 million in PO-B, expressed as present value over 2025-2050 relative to the baseline.

As explained in section 6.1.7, the competitiveness of the IWT is expected to improve relative to the road transport sector in PO-B. The transport activity shifted from road to freight IWT in PO-B and PO-C is estimated at 0.35 billion tonne-kilometres (tkm) in 2026, 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050.

2.2. International competitiveness

While the revision of the RIS Directive will make the EU inland waterway transport more efficient and reliable, including positive impacts on neighbouring countries such as Serbia and Ukraine which are already voluntarily applying RIS Directive, the initiative has no impact on the international competitiveness of the sector.

2.3. Capacity to innovate

The preferred policy option will positively affect the IWT sector's capacity to innovate. By providing better quality RIS data it will lead to the provision of more accurate services and

eventually set the basis upon which further digital applications can be developed (for example for planning and optimisation of navigation, avoidance of obstacles and warning of navigation hazards, etc.). In addition, PO-B will have a positive impact on digitalisation by promoting the electronic exchange of data. The increased links and exchange of information with other modes has the potential to improve multimodality and will allow developers of logistics and travel planning and cargo management applications to include IWT in their solutions. The introduction of cargo information through eFTI will increase the quantity and quality of information available in the eFTI platforms, which then could feed the development of business-to-business applications. In the medium to long term, the information provided by RIS regarding navigation and the digital exchange of information will become an important basis for the development and operation of automated vessels.

2.4. SME competitiveness

Given that SMEs constitute a very large share of both vessel operators and RIS software services providers, the assessment in section 2.1 of Annex 5 (cost and price competitiveness) is also relevant for SMEs. In particular, most of net costs savings are expected to be attributed to SMEs although the available data did not allow a split of these costs savings between the two groups of operators (i.e. SME and others). Hence, the preferred policy option has a positive impact on competitiveness of SMEs, in particular those engaged in cross-border as well as intermodal operations, by improving their operational efficiency and facilitating their inclusion in the logistics chain.

ANNEX 6: SME TEST

Step (1) of SME test (identification of affected businesses). According to Eurostat, around 5,500 IWT freight transport companies are active in Europe (EU plus Bosnia-Herzegovina, Serbia and Switzerland), employing more than 23,000 persons. In addition, there are around 4,000 passenger companies which employ around 14,000 persons. While no data is available at EU level for the number of Small and Medium Enterprises (SMEs) within the IWT sector, one characteristic of the IWT sector is the high number of SMEs. According to the CCNR, the majority of companies in Western Europe are small family owned operating one or two vessels[254], while companies in the Danube region are bigger as they derive from previously state-owned enterprises[255].

Software services providers for RIS applications are highly specialised and serve a niche market. According to Article 7 of the RIS Directive, RIS equipment including software needs to be type approved. The Directive requires that Member State authorities responsible for type-approval are notified to the Commission, however there is no concrete information as to the actual number of the software providers that have been approved. CESNI provides a list of around 20 companies as providers for ECDIS and inland AIS[256], while a Member State expert estimated the potential number to be up to 50 companies. A review of the information related to these companies, based on their public websites, indicates that the majority of them are small companies employing less than 250 employees.

Step (2) of SME test (consultation of SME stakeholders). SMEs constitute a significant share of the stakeholders involved in the consultation activities. In the first stakeholder survey, of the 37 respondents identified as "inland waterway transport/RIS user", 7 indicated they work alone, 23 in a company of less than 20 people, 3 in a company between 10 and 50 people, 2 in a company between 50 and 250 people and only 2 in a company above 250 people. Regarding the RIS software or systems developers, their participation to the overall stakeholder consultation was more limited, with 3 representatives taking part in interviews and the same number responding to the first stakeholder survey.

The second survey had a much smaller response rate, but even so of the 5 respondents identified as "inland waterway transport/RIS user", 3 were from companies of less than 250 people. The Open Public Consultation had a limited response rate (only 13 replies), and of the 2 identified as "skippers/barge owners" one indicated working for a company with less than 10 people and 1 for a company with less than 50 people. In addition, 2 of the 11 associations interviewed during the stakeholder consultation were representing barge owners and skippers (also representing SMEs) and were also participating in the two DINA/NAIADES expert group meeting organised. Furthermore, two back-to-back workshops specifically focused on RIS users and in particular skippers, where 4 out of 10 participants represented SMEs or associations of companies which include SMEs.

Despite the low response rate during the consultation process, the multiple and targeted approaches used are assessed to have identified adequately the specific needs and challenges for SMEs.

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[254] Indicatively for 2017, the number of companies employing less than 10 persons represented 97% in the Netherlands, 96% in France and 82% in Germany.

[255] CCNR (2020) Marker Report 2014-2019, Main features and trends of the European Inland Waterway Transport Sector, Market-report-2014-2019_Web_BD.pdf (inland-navigation-market.org)

[256] Lists of approved authorities, firms, installations and equipment in the field of technical requirements for inland navigation vessels. (cesni.eu)

Step (3) of SME test (assessment of the impacts on SMEs). As explained in section 6.1.3, all policy options are expected to result in net costs savings for vessel operators and navigation software services providers. More specifically, for **vessel operators** PO-B would result in net costs savings estimated at EUR 100.6 million, expressed as present value over 2025-2050 relative to the baseline, followed by PO-A (EUR 40.2 million) and PO-C (EUR 8.4 million). It should however be noted that PO-C would also result in additional administrative costs, despite the overall net costs savings.

When considering the impact of each measure, as explained in section 3 of Annex 4, for **vessel operators** this will primarily materialise in time saving for planning of voyages and improvements in navigation efficiency, and administrative costs in case of PM5 (included in PO-C). The detailed calculations of the costs savings for each measure (and costs for PM5) are provided in section 3 of Annex 4. Below, more explanations are provided on the drivers of the costs savings or costs (in case of PM5) for vessel operators in each policy measure.

More specifically:

- Vessel operators will be faced with less discrepancies in the information they receive from national authorities as a result of the interpretative guidelines (PM1). This will reduce the time required to compare and interpret information from different authorities and thus to plan their voyage, as they should now have more clarity on e.g. when a lock is fully closed in both directions or partially closed in one of the directions of navigation.

- The complaint handling mechanism (PM2) will provide vessel operators full clarity on the relevant competent authority in each Member State for handling RIS related complaints. Costs for submitting such complaints are estimated to be negligible as they can be done through an online form. By reporting problems (e.g. wrong data, standard inconsistencies) they will benefit of an overall improvement in the quality of RIS, which translates in better quality information and time savings for voyage planning. On the other hand, the Performance Measurement Framework (PM3) will not require action from the side of vessel operators and provide benefits in terms of improved RIS services, as potential problems with the implementation of RIS are reduced.

- The strengthened requirements for RIS technical specifications (PM4) will also lead to a reduction in the voyage planning time, as vessel operators will receive better quality information regarding e.g. water level predictions, current and predicted underpass heights at bridges and current and predicted waiting times at locks. In addition, due to the increase in efficiency of navigation, vessel operators will experience an increase in freight volumes (that will be shifted away from road transport).

- The requirement to vessel operators and skippers to report their voyage plan (ERIVOY) to competent authorities at the start of their journey, and update this with further changes to their estimated time of arrival (PM5), will increase the time spent in preparing and reporting on the voyage plan and follow up notifications, thus creating an administrative burden. On the other hand, this will improve navigation efficiency and result in energy savings.

- Updated and more accurate ERDMS data (PM6) will improve the quality of the necessary information for voyage planning, thus reducing the time required for its preparation.

- In PM7 and PM8, an eFTI platform will be developed for vessel operators to inform the national authorities about dangerous goods they may carry. Should they choose to do so on voluntary basis (PM7), or be required to do so (PM8) they will only need to upload the information once on eFTI, and then report to the authorities through ERI only the relevant link. This once-only principle will reduce

mistakes in reporting regarding e.g. the loading/unloading location, coding of the cargo or hull information, which can force the skippers to re-register upon a border crossing.

- The use of RIS COMEX (PM9), as the main platform for RIS exchanges, will be an important change for vessel operators, as they will benefit of a single platform of interaction instead of several portals and systems, reducing the time for voyage planning and notifications.

- The involvement of CESNI in the development of technical specifications will have only an indirect impact on vessel operators, as the development and rollout of necessary technical specifications will be more frequent compared to the situation today.

- The change of scope of RIS, to bring the focus on the TEN-T waterways (PM11), will not have direct impacts on vessel operators as the overall area of application of RIS is hardly expected to change.

- The exchange of information with inland ports (either voluntary under PM12 or mandatory under PM13) will benefit vessel operators through improved and updated information regarding the situation in their inland port of destination (e.g. access constraints on opening of bridges, the availability of berths, the availability of clean fuels at the time of arrival). This will facilitate the planning of the voyage and reduce the need of (re)submitting reports.

- The exchange of information with other modes (PM14) will benefit vessel operators by better integrating them into the logistics chain. Vessel operators are expected to experience an increase in freight volumes, that will be shifted away from road transport.

- In PM15, vessel operators will benefit of reduced reporting (e.g. for the cargo report)[257], as when a border is crossed the information will be exchanged between the authorities and not resubmitted by the vessel operator.

- In PM16 and PM17, by making clear in which cases AIS data can and cannot be shared, the procedure for collecting port charges would become simpler and reduce the number of resubmissions. The difference between PM16 and PM17 is limited for vessel operators, as PM17 only further defines the exact templates and standards to be followed when such an exchange takes place, in line with existing legal provisions.

Software services providers would benefit of costs savings of EUR 8.4 million in PO-C, EUR 8.1 million in PO-B and EUR 4.4 million in PO-A, expressed as present value over 2025-2050 relative to the baseline. For software service providers, the main impact relates to the quality of the basic information that they can introduce in their software. Higher quality information will reduce the need for additional efforts to collect the required data and thus their costs. Several measures will provide updated and more accurate data to different extent (i.e. the interpretative guidelines (PM1), the complaint mechanism (PM2), the Performance Measurement Framework (PM3), the technical specifications for navigation and voyage planning (PM4), updates to the ERDMS (PM6), RIS COMEX (PM9), the exchange of information with inland ports (PM12 and PM13) and the improved links with other modes (PM14)). The calculation of the costs savings by measure is provided in section 3 of Annex 4.

[257] As currently not all information provided by vessel operators to authorities is shared with the authorities of other Member States, this creates a challenge when crossing borders as in many cases the information needs to be retransmitted.

Considering the very large share of SMEs among vessel operators and software services providers, most of these net costs savings are expected to be attributed to them although the available data did not allow a split of these costs savings between the two groups of operators (i.e. SME and others). In addition, the increase in intermodal transport in PO-B and PO-C is expected to have a positive economic impact on the SMEs involved.

Step (4) of SME test (minimizing negative impacts on SMEs). It should be noted that a key issue highlighted by the respondents to the stakeholders' consultation is the need to simplify the procedures they have to follow during navigation. In fact, all policy options aim to address this issue (also for SMEs) through two important measures: (i) the provision of accurate and updated data to ERDMS (PM6 in PO-A, PO-B and PO-C), (ii) the improvement of RIS index data and the technical specifications for navigation and voyage planning (PM4 in PO-B and PO-C). As a result, the quality of information for vessel voyage planning will improve and the process simplified. In addition, the development of standards by CESNI (PM10 in PO-A, PO-B and PO-C) will ensure that technical specifications are up-to-date, thus facilitating operations. Software services providers will benefit from better quality data which will reduce their efforts to develop their products. The introduction of a complaint mechanism (PM2 in PO-A and PO-B) will be an important tool for SMEs to report to relevant authorities the problems they identify in the network during their daily operations. Respondents identified as or contributing on behalf of SMEs vessel operators also pointed to the need to simplify and reduce the burden for reporting. PO-B and PO-C aim to facilitate the work for skippers (and by extension the family-owned SMEs) in this regard. By introducing requirement for the use of RIS COMEX as the main tool for exchange of information (PM9 in PO-B and PO-C), vessel operators will benefit of a one-stop-shop for the exchange of information with authorities. Importantly, this could develop into a platform for further development of digital applications. This is also important for software services providers who will adapt their products for one platform instead of many national ones. New technical specifications for exchanging information with ports (PM12 in PO-B) would also facilitate the contact with ports and improve operations. The requirement for electronic voyage reporting (PM5 in PO-C) also aims to improve navigation conditions. However, skippers reported concerns on the efforts required by this measure during the stakeholder consultation. Last but not least, personal information is particularly important for those family-owned companies, for which the vessel is at the same time their home. PM16 and PM17 aim to address the legal uncertainty, without increasing obligations or intruding in fundamental rights (something that SME representatives highlighted during the stakeholder consultation).

ANNEX 7: CONCLUSIONS OF THE EVALUATION

The links between the conclusions of the ex-post evaluation and the impact assessment are summarised in the table below.

Main ex-post evaluation conclusions	How it is covered in this IA
Conclusions on effectiveness	
The degree of harmonisation differs between RIS technologies. RIS technologies are not utilised to the same extent in all countries and river corridors. Monitoring of the implementation of the Directive is weak. There is no indication of a modal shift towards inland navigation occurring as a result of the RIS Directive.	Policy measures are defined: to strengthen the degree of harmonisation, to further align Member States' implementation of RIS, to strengthen the monitoring of the implementation, and to improve the role of RIS in supporting the integration of IWT in the multimodal chain.
Conclusions on efficiency	
The findings show that there is potential for simplification, to address the slow update and adoption process of technical standards.	Policy measures are defined to simplify the update and adoption of technical specifications.
Conclusions on relevance	
The RIS Directive and its implementing acts are still relevant; however, its primary focus on the safety of navigation is no longer sufficiently aligned with the sector's needs. More specifically, it does not support the need for improving the efficiency of inland waterway transport and its integration into the multimodal supply chains. In addition, it does not sufficiently address new technological challenges, such as automation of vessels, and the further digitalisation of the sector.	Policy measures are defined to increase the IWT multimodal potential, its efficiency and technological challenges.
Conclusions on coherence	
The Directive and its implementing acts form a consistent legal framework. Both internal coherence and coherence with other EU legislation is ensured.	The proposed measures are coherent with the RIS Directive and with other EU legislation.
Conclusions on EU added value	
The rationale for public intervention at EU level through the RIS Directive is rooted in the cross-border, international character of the inland waterway transport sector and contributes to avoiding fragmentation between different national or regional (e.g. between the River Commissions) RIS implementation approaches. Stakeholders considered that the same benefits could not have been achieved by comparable interventions at the international, regional or national level. However, higher benefits of digitalisation and data exchange are hindered by the lack of full harmonisation of data provided across the Member States.	Several policy measures are defined to further align Member States' implementation of RIS, which would result in even further integration of RIS.

Source: Ramboll et al. (2024), impact assessment support study

ANNEX 8: EFFECTIVENESS OF THE DIFFERENT POLICY OPTIONS

This annex provides more detailed explanations on the assessment of effectiveness of the policy options, complementing the analysis in section 7.1.

Key impacts expected						
✗✗	✗	O	✓	✓✓	✓✓✓	
Strongly negative	Negative	No or negligible impact	Positive	Moderately positive	Strongly positive	Unclear

	PO-A	PO-B	PO-C
Specific policy objective 1: Ensure improved RIS data availability, and harmonised standards			
Expected increase in harmonisation of RIS between Member States	Positive impact on increasing the harmonisation of RIS. The introduction of interpretative guidelines for the implementation of RIS (PM1) is expected to reduce the problems and increase the level of harmonisation of RIS. The impact is however expected to be limited as the guidelines are not mandatory and may not address all issues. This is supplemented by the complaint handling mechanism (PM2) through which vessel operators will be able to identify areas where harmonisation is lacking and signal this to the relevant authorities. It is expected that authorities will take corrective	Strong positive impact on increasing the harmonisation of RIS. PO-B shares the same benefits as PO-A in terms of improving harmonisation thanks to the complaint handling mechanism (PM2), data availability in ERDMS (PM6), and CESNI (PM10). In place of guidelines, PO-B is strengthening the requirements for RIS index and introduces technical specifications for navigation and voyage planning (PM4). An important step forward is making the RIS COMEX the main data exchange platform (PM9) as this will create a "one-stop-shop" solution for RIS users and de-facto increase	Strong positive impact on increasing the harmonisation of RIS. PO-C will integrate the benefits of PO-A and PO-B and in addition, by requiring electronic voyage plan reporting (PM5) and setting the relevant technical specifications it will strengthen the harmonised implementation as regards this information. Unlike PO-A and PO-B, PO-C will base the monitoring of implementation on a specific performance monitoring framework (PM3) that will be designed to collect the necessary information (including technical data) that would point to areas where harmonisation needs to be

	action, thus further increasing harmonisation. Both these measures are expected to have a limited positive impact on the time vessel operators spend in preparing a voyage. Furthermore, requiring Member States to provide regularly data to the ERDMS (PM6) will increase the quality of the underlying information provided to the users. The nomination of CESNI for developing RIS technical specifications (PM10) is expected to increase the rate of development of new technical specifications and ensure that they are up-to-date.	harmonisation as interactions will now take place through this platform. As this platform is already used on voluntary basis in the baseline, the benefits compared to the baseline are expected to be limited. However, the legal certainty that comes with the requirement for its use ensures harmonisation as interaction with national systems will be limited if not completely replaced.	improved. In addition, Member States will be required to share all necessary data for traffic and transport management cross-border (PM15) thus reducing the need for re-submissions of reports to different national systems.
Specific policy objective 2: Facilitate the integration of IWT into the multimodal chain			
Expected increase in IWT operation performance	Positive impact on increasing IWT operational performance. The introduction of guidelines (PM1) will reduce the harmonisation problems in implementation among Member States. As a results vessel operators will be faced with less inconsistent information and procedures, which will facilitate their operational performance and reduce efforts.	Moderate positive impact on increasing operational performance. PO-B is expected to increase the operational performance of IWT as the strengthening of RIS Index and the new technical specifications on navigation and voyage planning (PM4), and the increased links with the systems of other modes (PM14), are expected to improve the planning and efficiency of operations, which will ultimately lead to better inclusion of inland waterways transport into the logistics chain. These measures are estimated to lead to a shift of freight from road transport to IWT, estimated at 0.38 billion tkm in 2030 and 0.45 billion tkm in 2050 relative to the baseline. As a result, CO2 emissions are projected to decrease by 389.1 thousand tonnes during 2025-2050 (cumulatively), relative to the	Strong positive impact on increasing operational performance. PO-C includes the same benefits as PO-B. In addition, by requiring electronic voyage plan reporting (PM5), it will allow competent authorities to better manage traffic which in turn will allow vessel operators to navigate in a more efficient manner which translates in reduced fuel consumption. Overall, in PO-C CO2 emissions are projected to decrease by 832.1 thousand tonnes during 2025-2050 (cumulatively), relative to the baseline.

		baseline.	
Expected increase in exchanges with other transport modes	Positive but limited impact on exchanges with other transport modes. In PO-A the links with other modes are introduced through the option for skippers to submit the required cargo information (dangerous goods) though an eFTI platform (PM7). This will allow authorities to consider this information for intermodal transport purposes. To the extent this is voluntary and the potential for further use of this information is unknown this is expected to have a positive but limited impact.	Moderate positive impact on exchanges with other transport modes. In PO-B the links for data exchanges with other transport modes are improved. First, the use of the eFTI platforms becomes a requirement for the exchange of the necessary cargo information (PM8). In addition, PO-B includes a requirement for introducing technical links with the systems used by other modes (PM14). Furthermore, technical specifications for the exchange of information with inland ports through RIS (PM12) are introduced, to be used on a voluntary basis. Finally, harmonising the scope of RIS with that of TEN-T (PM11) will provide a positive signal in terms of intermodality.	Strong positive impact on exchanges with other transport modes. In PO-C the links for exchanging information with other modes are slightly strengthened compared with PO-B, as the exchange of information with inland ports through RIS is mandatory (PM13). The overall impact is however considered to be moderate as further steps will need to be undertaken by other modes (and other initiatives) for the full impact to materialise.
Specific policy objective 3: Ensure higher uptake and interoperability of digital solutions, and address data protection concerns.			
Expected simplification of process for RIS data exchange	Positive impact on the simplification of the process for RIS data exchange PO-A will simplify the process for data exchange as through the use of updated technical specifications (PM10). Furthermore, by clarifying the legal basis and when and how personal data can be handled by national administrations (PM16) will result in further simplification of the process.	Strong positive impact on the simplification of the process for RIS data exchange PO-B further simplifies the process of data exchange, by introducing RIS-COMEX as the main platform (PM9), as now RIS users will have to mainly interact with one platform instead of several national ones.	Strong positive impact on the simplification of the process for RIS data exchange In addition to PO-B, PO-C also harmonises the voyage plan reporting through electronic means (PM5) which should facilitate the processing of this information. In addition, by requiring that traffic and transport management data is shared cross-border (PM15), the number of resubmissions should be reduced. PO-C also envisages the introduction of specific forms for the sharing of personal data (PM17) which would simplify the process.

Expected uptake of digital solutions	Positive but limited impact on the uptake of digital solutions. PO-A will have a positive but limited impact on the uptake of digital solutions. The use of the eFTI platforms for the exchange of information (PM7) is expected to provide a simplified option to vessel operators.	Moderate positive impact on the uptake of digital solutions. In PO-B, the use of RIS COMEX (PM9) will be an important development as the simplification in the use of RIS will help vessel operators to accept digital solutions. Furthermore, as reporting dangerous goods through eFTI (PM8) will become mandatory it will de facto increase the use of digital systems. The technical technical specifications for links with other modes (PM14) and those for inlands ports (PM12) will further increase the digital options available for RIS users.	Moderate positive impact on the uptake of digital solutions. PO-C will increase the uptake of digital solutions relative to PO-B by introducing two mandatory elements, namely, the required reporting of voyage plans (PM5), and the requirement to share information with inland ports (PM13). Despite these measures, the overall impact is still considered as moderate.

Source: European Commission

ANNEX 9: OVERVIEW OF RIS

RIS are the information services to support traffic and transport management in inland navigation[258]. RIS aim at contributing to a safe and efficient transport process and utilising the inland waterways to their fullest extent. RIS are already in operation in manifold ways. RIS include interfaces with other transport modes on sea, roads and railways. Under the current legal framework, RIS does not include business to business commercial activities, but should be open to interface with such activities. RIS collect, process, assess and disseminate fairway, traffic and transport information so that they provide the following services:

- **Fairway Information Services:** Fairway[259] information is one-way information: shore to ship or shore to stakeholder's office and includes geographical, hydrological and administrative information related to the waterway infrastructure and fairways in the RIS area that is required by the RIS users to plan, execute and monitor a voyage.
- **Traffic Information Services:** information to support the safety and efficiency of traffic and navigation on inland waterways.
- **Traffic Management:** operational service that supports traffic management processes in inland navigation.
- **Calamity Abatement Support:** operational service that facilitates the actions necessary to limit the consequences of a calamity (or accidents and incidents).
- I**nformation for Transport Logistics:** operational service that supports transport logistic processes in inland navigation.
- **Information for Law Compliance:** facilitates legal compliance for the waterway users and supports relevant agencies responsible for inland navigation law enforcement.
- **Statistics:** information on traffic and transport in inland navigation that is required to support statistical processes.
- **Waterway Charges and Harbour Dues:** information needed to facilitate the calculation and collection of waterway charges and harbour dues.

The provision of RIS is based on four key technologies described below, and their relationship with the services is summarised below:

- **Inland Electronic Chart Display and Information System (Inland ECDIS**): on-board computer system for the display of electronic inland navigation charts and additional information on the vessel's environment, contributing to the safety and efficiency of inland navigation by reducing the workload of the skipper and increasing situational awareness.
- **Notices to Skippers (NtS)**: The Notices to Skippers serve to communicate information from national and local fairway authorities regarding the waterway, such as the status of the inland waterway infrastructure (i.e. bridges and locks), failures of aids to navigation, temporary blockages of waterway sections or other types of infrastructure, works, water level and water depth information, ice information and weather messages.
- **Electronic Ship Reporting International (ERI)**: ERI enables electronic data interchange for reporting purposes to and between competent authorities.

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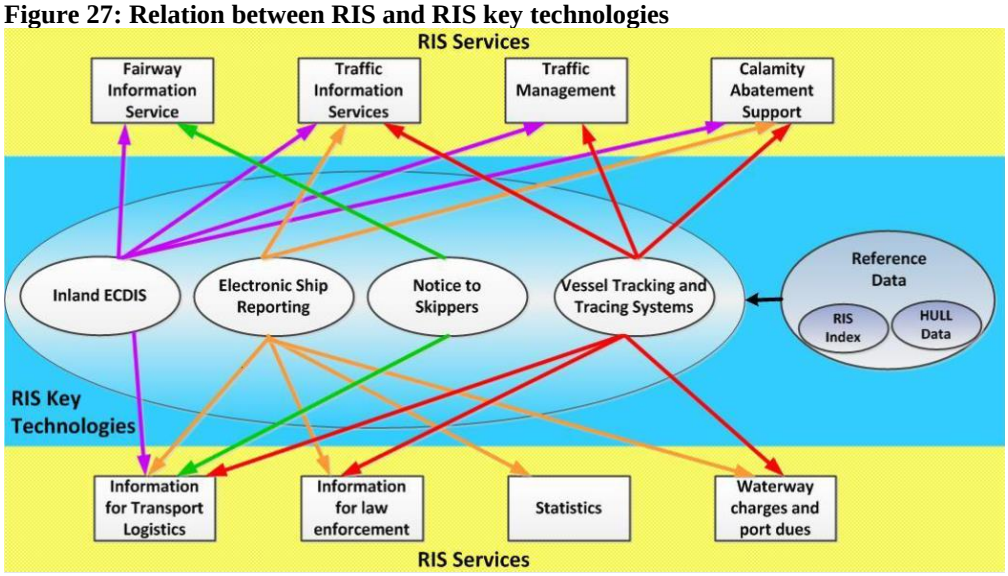
[258] Inland navigation relates to all types of inland waterways such as rivers, canals, lakes, inland ports, etc. For simplicity, the terms rivers or waterways may be used in this impact assessment report, but they should be understood as referring to the overall inland waterways.
[259] The fairway is the navigable channel in a body of water.

- **Vessel Tracking and Tracing System (VTT)**: VTT supports on-board navigation, Vessel Traffic Management (VTM) from shore, calamity abatement, transport management, enforcement and waterway dues and port infrastructure charges[260].

Figure 27: Relation between RIS and RIS key technologies



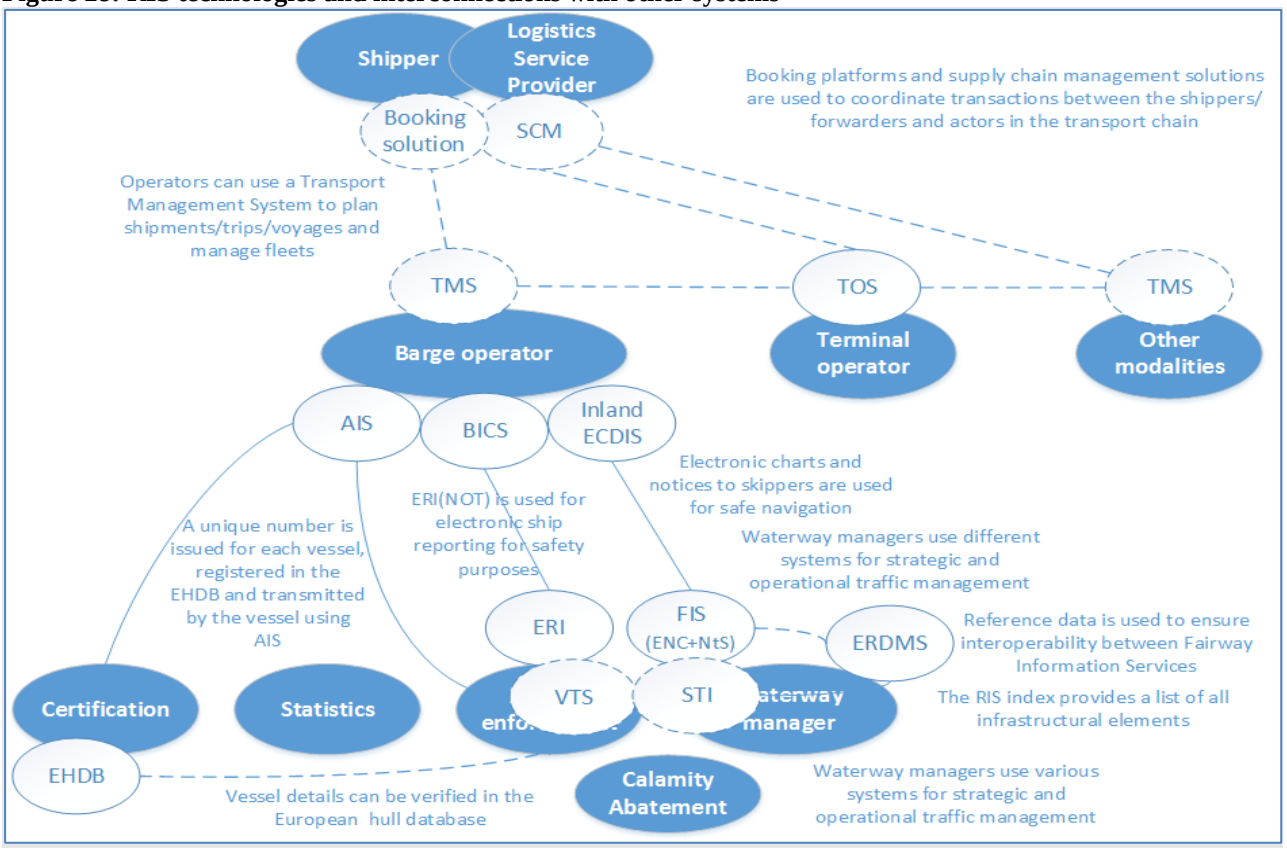
Source: PIANC (2011) Guidelines and Recommendations for River Information Services

Besides the RIS key technologies, RIS relies on basic technologies (such as radar and radiotelephone services), which, for many decades, have been vital to navigation.

The current RIS structure and its interconnection with other systems is summarised in Figure 28.

[260] This information exchange is supported by Inland AIS (Automatic Identification System), a broadcast system based on the transmission of very high frequency radio signals between shipborne AIS stations (mobile stations) and shore AIS stations. Each type of transmission is standardised to be transmitted and received by Inland AIS equipment.

Figure 28: RIS technologies and interconnections with other systems



Source: European Commission (2017): Digital inland waterway areas. Towards a digital inland waterway area and digital multimodal nodes, Final report; Note: The dotted lines indicate mandatory systems/technologies/data exchanges which are widely implemented and used; the dotted lines indicate systems/technologies/data exchanges used by some actors