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EVALUATION

of the

Directive 2005/44/EC on Harmonised River Information Services (RIS)

{SWD(2021) 51 final}

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Glossary

<i>Term or acronym</i>	<i>Meaning or definition</i>
AIS	Automatic Identification System
BICS	Barge Information and Communication System
BICS	Barge Information and Communication System
CCNR	Central Commission for the Navigation of the Rhine
CEF	Connecting Europe Facility
CEMT class	Inland waterway classification according to CEMT (European Conference of Ministers of Transport) Resolution No 92/2.
CESNI / TI	European committee for drawing up standards in the field of inland navigation; TI is the working group on information technology
EDI	Electronic Data Interchange
ELWIS	Elektronisches Wasserstraßen Informations System
ERDMS	European Reference Data Management System
ERI	Electronic Reporting International
ERINOT	Electronic Reporting International Notification (message)
EU	European Union
Fairway authority	Competent authority for safety of inland navigation
FTM	Fairway and traffic related message (Notices to Skippers)
GDP	Gross domestic product
GDPR	General Data Protection Regulation
ICEM	Ice message (Notices to Skippers)
ICT	Information and communication technologies
IEHG	Inland Electronic Navigational Charts Harmonization Group
IENC	Inland Electronic Navigational Charts
Inland ECDIS	Inland Electronic Chart Display and Information System
ISSG	Inter Service Steering Group
IWT	Inland waterway transport

MS	EU Member State(s)
NTS	Notices to Skippers
PIANC	World Association for Waterborne Transport Infrastructure
RIS	River information services
RIS authority	The authority with the responsibility for the management, operation and co-ordination of the RIS, the interaction with participating vessels and the safe and effective provision of the service.
RIS Index	A library of geographical entities for the purpose of electronic exchange of information for river information services. It contains a unique identification for each entity and several characteristics (attributes) assigned to this entity. The RIS Index is the de-facto implementation of Annex I of Directive 2005/44/EC.
RIS provider	The organisation or organisational unit assigned (typically by a RIS authority) to operate the RIS-System and to provide RIS-Services
Skipper	Boat master, shipmaster, master, master in charge and captain
TEN-T	Trans-European Transport Network
UNECE	United Nations Economic Commission for Europe
VTS	Vessel Traffic Services
VTT	Vessel Tracking and Tracing
WERM	Weather related message (Notices to Skippers)
WRM	Water level related message (Notices to Skippers)
Fairway authority	Competent authority for safety of inland navigation

1. INTRODUCTION

This report presents the findings of the **ex-post evaluation**¹ of the **Directive 2005/44/EC**² on harmonised **river information services** on inland waterways in the Union (“RIS Directive”).

Inland waterway transport (IWT) plays an important role for the transport of goods in Europe. More than 37,000 kilometres of waterways connect hundreds of cities and industrial regions. Thirteen out of twenty-seven Member States have interconnected waterway networks. Inland waterway transport makes a considerable contribution to the EU's transport system, despite its relative small size compared to other modes, while at the same time being an energy efficient mode contributing to the goal of a low carbon economy and to the **European Green Deal**³.

Initially, fairway authorities of Member States had been the main drivers of **digitalisation** in the IWT sector through the **introduction of information and communication technologies (ICT)**. The aim of fairway authorities had been to improve the flow of relevant fairway related information to skippers or barge operators, in order to provide services for traffic management and improve accident prevention within their respective territories. National stand-alone telematics services had been developed since the late 1980s. Over time, as Member States deployed their applications, this led to a **patchwork of national ICT systems in IWT across the EU**. The lack of coordination between Member States generated avoidable (ICT and administrative) costs for European IWT companies and hindered the functioning of the single market in the sector.

To reduce these **inefficiencies** - through improving the **interoperability** of national RIS systems, including its data exchange and communication - many different technical aspects needed to be harmonised across the European Union. This eventually led to the adoption of Directive 2005/44/EC on **harmonised river information services (RIS)** on inland waterways in the Union in 2005.

The Directive established the first **European framework of minimum requirements and technical specifications** for the provision and use of RIS. It defined the general **obligation** of the Member States to ensure the development and implementation of river information services in an efficient, expandable and interoperable way. It applies to Member States that are part of the European interconnected network of waterways.

Purpose and scope of this evaluation

The purpose of this evaluation is to generate an evidence base to support any further decisions related to the development of the legislative framework in this policy area, including a possible revision of the current Directive. As fifteen years have passed since the Directive entered into force in 2005, it was considered time to assess how well the RIS Directive has performed relative to original expectations⁴.

¹ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1171-River-information-services-on-inland-waterways>

² Official Journal of the European Union, OJ L 255, 30.9.2005, p. 152–159

³ https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

⁴ Although the original initiative had not been accompanied by an impact assessment at the time and no precise predictions were made on its performance, the Directive's objectives are clear enough to assess how well different aspects of the initiative have worked relative to expectations.

The evaluation is also part of the Commission's efforts to simplify EU laws and reduce unnecessary burden through its regulatory fitness and performance programme (**REFIT**⁵). It does this through assessing the Directive's actual effectiveness in reducing inefficiencies from national RIS systems and through looking into potential areas for simplification of the process through which updates to the union-wide specifications are being conceived.

In addition, it should be noted that Article 4(7) of the Directive states that *"the Commission shall take appropriate measures to verify the interoperability, reliability and safety of RIS"* and article 12(6) of the Directive requires that *"The Commission shall monitor the setting up of RIS in the Community..."*. In addition, the European Parliament called for *"a swift review of Directive 2005/44/EC on harmonised river information services (RIS) ..."*⁶ in its 2015 resolution on the implementation of the 2011 White Paper on Transport.

Scope of the evaluation - The evaluation covers all provisions of Directive 2005/44/EC.

Exclusion: The Directive also defines a number of obligations of the European Commission for the introduction of technical guidelines and specifications in the form of **Implementing Acts**. The evaluation of these Implementing Acts is not in scope. However, the evaluation does assess the process through which the Implementing Acts are produced and how they have contributed as a whole to the overall achievement of the objectives of the Directive.

The **evaluation period** spans from January 2005 to December 2018. Evidence for the evaluation has been collected only for this time period. Developments from 2019 have not been considered, as there has been a change in the institutional framework for RIS through the introduction of the CESNI/TI working group. In addition, revised implementing regulations for RIS entered into force from end of December 2018.

Geographical scope - The evaluation covers the full geographical scope of Directive 2005/44/EC⁷. It assesses all 13 EU Member States which have inland waterways falling within the scope of the Directive, namely Austria, Belgium, Bulgaria, Czechia, Germany, France, Croatia, Hungary, Luxembourg, the Netherlands, Poland, Romania and Slovakia. In addition, it covers Serbia and the Ukraine which have inland waterways of international importance⁸ and have applied the RIS Directive on basis of international agreements concluded with the EU⁹.

The evaluation follows the Commission's **Better Regulation Guidelines and Toolbox**¹⁰. The analysis is structured around the evaluation criteria of effectiveness, efficiency, relevance, coherence and EU added value.

⁵ https://ec.europa.eu/info/law/law-making-process/evaluating-and-improving-existing-laws/refit-making-eu-law-simpler-less-costly-and-future-proof_en#about-refit

⁶ European Parliament resolution of 9 September 2015 on the implementation of the 2011 White Paper on Transport: taking stock and the way forward towards sustainable mobility (2015/2005(INI)), OJ C 316, 22.9.2017, p. 155–172

⁷ It applies to the implementation and operation of RIS on all inland waterways of the Member States of class IV and above which are linked by a waterway of class IV or above to a waterway of class IV or above of another Member State, including the ports on such waterways.

⁸ European Agreement on Main Inland Waterways of International Importance (AGN), UNECE, 19 January 1996

⁹ Transport Community Treaty concluded by Serbia and EU-Ukraine Association Agreement

¹⁰ <https://ec.europa.eu/info/sites/info/files/better-regulation-toolbox.pdf>

- Under **effectiveness**, the evaluation assesses the actual changes the Directive has generated, particularly in view of its original objectives. In this context, the evaluation also examines how Member States have implemented the Directive and how the situation has evolved since the adoption of the Directive (including a mapping of the current RIS governance setup);
- Under **efficiency**, it assesses the actual costs and changes relative to the actual benefits the Directive has generated. Any potential for simplification and reduction of unnecessary regulatory costs is identified;
- Under **relevance**, the evaluation assesses whether the objectives of the Directive are still in line with the current needs or problems; how the situation/context as regards the provision of RIS in the EU has evolved and whether the Directive still matches current needs; whether its scope is still fit for purpose; whether the four key areas currently covered under the technical guidelines and specifications are sufficient to respond to the changed needs, given technological developments;
- Under **coherence**, it assesses whether the Directive and related Implementing Acts are internally consistent and whether the legislation is consistent with other EU interventions (including maritime policy and multimodal transport policy, as well as e-governance initiatives);
- Under **EU added value**, the evaluation assesses the added value delivered by or associated with the implementation of the Directive, over and above what reasonably could have been expected from national and regional policies and their implementation.

2. BACKGROUND TO THE RIVER INFORMATION SERVICES DIRECTIVE

Description of the initiative and its objectives

Directive 2005/44/EC establishes a **framework** for the deployment and use of harmonised, interoperable and open **river information services**. It applies to the Member States which have inland waterways falling within the scope of the Directive. There are currently 13 Member States that are part of the European network of waterways of class IV¹¹ or above.

The Directive defines the general **obligation** of the **Member States** in ensuring the development and implementation of river information services in an efficient, expandable and interoperable way, providing interfaces to transport management systems and commercial activities. Member States shall provide **the data necessary for the planning of voyages**, shall provide **electronic charts** (for waterways of class Va and above), shall provide **notices to skippers** in standardised, coded and downloadable messages and Member States shall enable competent authorities to receive standardised **electronic ship reports** from ships.

The RIS Directive stipulates that equipment and application need to be **type-approved** in order to ensure safety of navigation. Furthermore, it requires MS to designate **competent authorities** for the application of RIS and for the international exchange of data. The Directive also includes references to rules on the data protection, security and the re-use of information – applicable at the time of adoption.

In addition, in line with the RIS Directive, the **Commission** is required to **adopt technical guidelines and specifications** for five key areas of application. As a result, five implementing acts have been adopted in the timeframe covered by the evaluation. These Regulations supplement the RIS Directive and form with it the RIS framework:

1. Commission Regulation (EC) No 414/2007 concerning the technical guidelines for the planning, implementation and operational use of RIS (**RIS Guidelines**)
2. Commission Implementing Regulation (EU) No 909/2013 on the technical specifications for the **electronic chart display and information system** for inland navigation (Inland ECDIS),
3. Commission Regulation (EU) No 415/2007 concerning the technical specifications for **vessel tracking and tracing systems** (as amended by Commission Implementing Regulation (EU) No 689/2012),
4. Commission Regulation (EU) No 164/2010 on the technical specifications for **electronic ship reporting** in inland navigation, and
5. Commission Regulation (EC) No 416/2007 concerning the technical specifications for **notices to skippers**

The regulations referred to in points 2 to 5 have been amended in 2018 and 2019.

The RIS Directive contributes to four **general objectives**:

- increase competitiveness of the sector across Europe;
- optimise use of existing inland waterway infrastructures;
- improve safety and security in waterway transport;

¹¹ Classification of European Inland Waterways, UNECE Resolution No 30 of 12 November 1992

- reduce the sector's negative impacts on the environment.

The Directive was expected to deliver on two **specific objectives**, namely:

- to achieve a harmonised exchange of information between different actors that provide RIS; and
- to improve the interaction with other traffic management systems of other transport modes, in particular maritime vessel traffic management and information services.

and two **operational objectives**:

- to ensure interoperable systems for inland waterway transport services; and
- to set up a European legislative framework to establish and further develop guidelines and specifications for Member States.

The **intervention logic** in **Annex 4** describes the links and causal relationships between the problems and needs, external factors such as technological and policy developments, the general, specific and operational objectives that the legislative framework was designed to address, and the specific actions for addressing those problems and needs. No formal impact assessment had been carried out before the adoption of the Directive. The intervention logic has been derived from the Directive for the purpose of this evaluation.

The key **inputs elements** of the Directive are a number of requirements for both the Commission and the Member States. The Commission has to take measures to verify interoperability, reliability and safety of RIS (Article 4(7)) and to define technical guidelines and specifications (Article 5(1)). Member States have to implement RIS according to the specific provisions of Article 4 of the Directive, and have to ensure data protection rules and security measures (Article 9(2)).

Institutional framework

Technical specifications for RIS are based on the technical principles set out in Annex II of the RIS Directive and shall take account of the work carried out in this field by relevant international organisations. Besides the EU, a range of other institutional actors play a role in the development and implementation of RIS in Europe, at international level (UNECE¹², PIANC¹³), regional level (River Commissions - CCNR, Danube Commission, Sava Commission, and Mosel Commission), and local level (national competent authorities and RIS providers).

The Member States are engaged through different platforms and expert groups, including the four independent RIS Expert Groups that were tasked with the development and updating of the technical specifications for the different RIS technologies¹⁴. The RIS Expert Groups produced the standards including updates, but also technical clarification documents and other relevant documentation. The developed standards were delivered to

¹² The UNECE adopts resolutions for international standards for vessel tracking and tracing, electronic ship reporting, notices to skippers, electronic chart display and information systems and guidelines for RIS in general. RIS are on the agenda of the SC.3/WP.3 and inland Transport Committee of the UNECE.

¹³ PIANC has published the RIS guidelines, which are also enshrined in Commission Regulation (EC) No 414/2007. The RIS Guidelines are currently undergoing a major revision.

¹⁴ The four RIS Expert Groups are as follows: Expert Group on Electronic Chart Display and Information Systems (Inland ECDIS); Expert Group on Electronic Reporting International (ERI); Expert Group on Notices to Skippers (NtS); and Expert Group on Vessel Tracking and Tracing (VTT).

the European Commission, CCNR or other international bodies in order to make the standards legally binding. Participants of the RIS Expert Groups were representatives of governmental bodies, branch organisations, research institutes, consultants and the industry. All expert groups operated as independent bodies without a formal legal status. Since 2019, the work of the RIS Expert Groups has been gradually integrated into the work programme of the recently established CESNI working group on information technology (CESNI/TI)¹⁵.

Besides the public institutions, there are also expert groups within branch organisations working on RIS such as the IWT platform, with member organisations such as ESO¹⁶ and EBU¹⁷. Since 2018, ESO and EBU are cooperating in a more structured way within the Inland Waterway Transport Platform.

The institutional framework has changed since the publication of the RIS Directive, as Member States seek more cooperation with neighbouring countries to comply with the RIS standards and to allow for cross-border data exchange. Also, between the supranational and intergovernmental institutions such as the River Commissions, a stronger collaboration with the European Commission is realised through the CESNI.

¹⁵ CESNI/TI was established in June 2019 and its activities thus fall outside of the scope of the present evaluation.

¹⁶ European Skippers Organisation: branch organisation that represents the interest of independent vessel owner / operators and national organisations

¹⁷ European Barge Union: branch organisation that represents the interests of freight brokers and some larger IWT companies with multiple vessels

Baseline and points of comparison

When evaluating the RIS Directive, it is important to consider a baseline scenario in which the Directive had not existed over the evaluation period (and the likely relevant outcomes in that case), to help isolate the effects of the RIS Directive itself on the inland navigation sector.

This section briefly describes the situation before the RIS Directive was adopted in 2005, as well as relevant technological, policy and economic developments that shaped the sector during the evaluation period which affected the same output¹⁸ and outcome variables as the RIS Directive.

The situation prior to the adoption of the RIS Directive

In the early 2000s, the development of RIS technologies was spearheaded by a small number of countries, located primarily along the Rhine corridor (Germany and the Netherlands, but also Austria, Belgium and France). Examples of RIS developments prior to 2005 included The Barge Information and Communication System (BICS), Advanced River Navigation (ARGO), the German Electronic Waterway Information System (ELWIS) and IVS90, a ship reporting system used in the Netherlands, to name just a few.

The challenge to enable interfacing and communication among the various services and systems in different EU Countries into a single common operational concept triggered the adoption of the RIS Directive. Without the RIS Directive, a patchwork of ICT systems in IWT with limited to no interoperability across the EU would have persisted. This patchwork would have led to a fragmented implementation and provision of modern information services on the waterways and would have been a hindering factor for investments into the digitalisation of the sector. This fragmentation would have negatively impacted the user acceptance of information services, safety of navigation, and efficiency of transport operations and would have introduced additional administrative burden in cross-border operation.

To this extent, the RIS Directive aims at the harmonised implementation of various types of information services on waterways and transport activities on those waterways. RIS aim to support traffic and transport management in inland waterway transport, including interfaces with other transport modes. The implementation of RIS should not only improve safety and efficiency on the inland waterways but also enhance the efficiency of transport operations in general.

Developments that have shaped the sector since 2005

Since 2005, there have been substantive *policy, economic and technological developments* that may have helped or hindered developments in the use of RIS directly and that had an effect on the relevant outcomes of the inland navigation sector that were also targeted by the RIS Directive.

Policy developments

- The **institutional framework** (i.e. governance structure) has changed. Since 2015, the EU and the Central Commission for the Navigation of the Rhine (CCNR) started collaborating more closely on technical standards and requirements in inland navigation, through CESNI (European Committee for

¹⁸ In this context, outputs are the actions that contribute to achieving an outcome

Standards in Inland Navigation) working groups and committees. As the CCNR governs inland navigation on the Rhine, which is a river corridor with high traffic, its influence in standard setting is considerable. One standard for all (e.g. ES-TRIN¹⁹) replaces the dual regime based on mutual recognition in this area between the EU and the CCNR through CESNI. Following such a consolidation of standards is likely to increase the interoperability of RIS across borders, independent of the RIS Directive. However, as CESNI does not have regulatory powers and the consolidation of standards has only started recently, the magnitude of this effect will only become visible in the future.

- Internationally, organisations such as PIANC and the UNECE have also developed their **own sets of resolutions, guidelines and recommendations** on RIS during the evaluation period. These international organisations do not exist in a vacuum and collaborate with other institutional actors and expert groups within the RIS environment. As some organisations, like the Danube Commission, refer to RIS resolutions of UNECE, at least a low level of harmonisation in the implementation of RIS could have been achieved.
- At EU level, the general **transport agenda** has been focused on achieving a modal shift away from road to more sustainable transport modes. Legislation and actions taken in other transport areas are likely to have increased modal shift in favour of inland navigation, independent of any effect the RIS Directive had.

Economic developments

- The global economic crisis of 2008-2010 had a negative effect on the inland navigation sector. The **macroeconomic context** is very likely to have been a hindering factor for the deployment of RIS. Because of the economic downturn, a reduction or elimination of envisaged investments in technological improvements, projects and systems is likely to have occurred.

The following figure shows the monthly goods transport on the Rhine between January 2003 and December 2018 together with a 6-month moving average. Low-water periods are shaded in blue and are recognisable as V-shaped reductions of cargo traffic. The major part of the financial crisis (in 2008, 2009 and 2010) is marked in yellow.

The crisis also reduced Member State GDP and diverted **national funding** aimed at developing and implementing RIS technologies away from the sector.

¹⁹ European Standard laying down Technical Requirements for Inland Navigation vessels

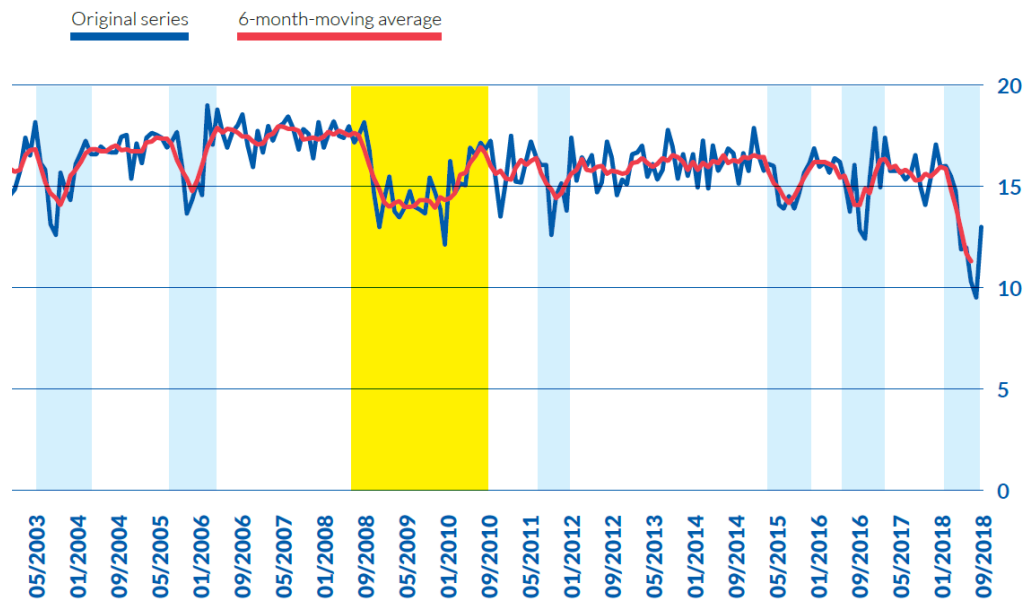


Figure 1: Monthly goods transport on the traditional Rhine (in million tonnes, 01/2003 - 12/2018), financial crisis and low-water periods²⁰

- High fuel prices during the evaluation period, leading vessel owners to lower speed to **reduce fuel consumption**, are likely to have had positive environmental effect unrelated to RIS technologies.

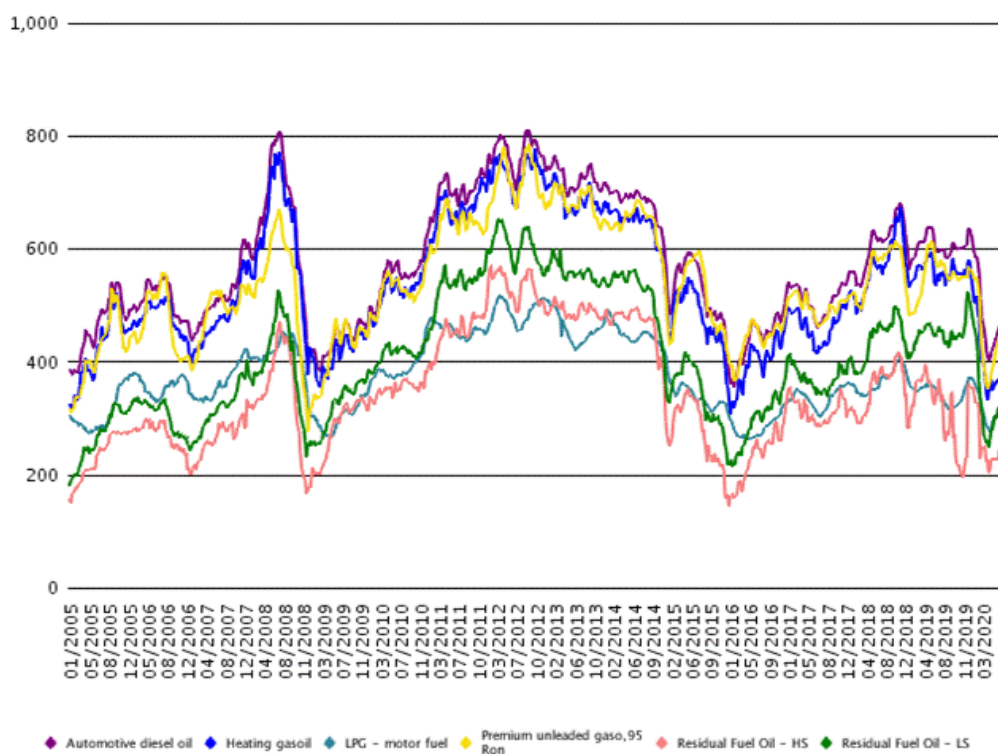


Figure 2: Consumer prices of petroleum products net of duties and taxes - EU weighted average²¹

²⁰ Source: CCNR, Annual Report 2019, Inland Navigation in Europe, Market Observation

²¹ https://ec.europa.eu/energy/data-analysis/weekly-oil-bulletin_en (DG ENER, oil bulletin)

Technological developments

- **Improvements in technology** greatly influence the use of RIS. Influencing factors are for example the availability of a variety of digital (handheld and other) devices, digitalisation of information and increasing availability of a variety of real time information and static data, developments in cellular data capacity and reduced prices. One of the results of these technological developments is a **shift in focus for IWT** - away from safety aspects towards increased modal share of inland waterway transport in multimodal supply chains as well as more efficient voyage and lock planning.
- Similarly, improvements in Automatic Identification System (AIS) technology might positively affect the level of safety in inland navigation and might become yet another impetus for the creation of solutions enabling **(semi)-autonomous sailing**. AIS is a ship borne radio data system, exchanging static, dynamic and voyage related vessel data between equipped vessels and between equipped vessels and shore stations.

It is difficult to assess the impact the RIS Directive itself had on the development of the inland waterway sector in Europe, to isolate its effect from the use of RIS technologies as such, and to estimate the likely state of affairs had the RIS Directive not been adopted. The impacts on the specific and general objectives were expected to be indirect, and it would be difficult to separate them from other influences in the field.

However, it can be plausibly assumed that the Directive contributed to the levelling of the playing field in inland navigation between the Rhine riparian states and the Danube riparian states. Chapter 5 provides further details on the progress made since 2005, and the degree to which this can or cannot be attributed to the RIS Directive.

3. IMPLEMENTATION / STATE OF PLAY

Relevant requirements of the RIS Directive

The RIS Directive lays down the requirements for the implementation of RIS towards the Member States in the scope of the Directive. The following Articles of the RIS Directive are of relevance for the analysis of the implementation status and the state of play.

Article 4(1): Member States shall take the necessary measures to implement RIS on inland waterways falling within the scope of the Directive (see also chapter 2).

Article 4(2): Member States shall develop RIS in such a way that the RIS application is efficient, expandable and interoperable so as to interact with other RIS applications and, if possible, with systems for other modes of transport. It shall also provide interfaces to transport management systems and commercial activities.

Article 4(3): In order to set up RIS, Member States shall:

(a) supply to RIS users all relevant data concerning navigation and voyage planning on inland waterways. These data shall be provided at least in an accessible electronic format;

(b) ensure that for all their inland waterways of class Va and above in accordance with the Classification of European Inland Waterways, in addition to the data referred to in point (a), electronic navigational charts suitable for navigational purposes are available to RIS users;

(c) enable, as far as ship reporting is required by national or international regulations, the competent authorities to receive electronic ship reports of the required data from ships. In cross-border transport, this information shall be transmitted to the competent authorities of the neighbouring State and any such transmission shall be completed before arrival of the vessels at the border;

(d) ensure that notices to skippers, including water level (or maximum allowable draught) and ice reports of their inland waterways, are provided as standardised, encoded and downloadable messages. The standardised message shall contain at least the information necessary for safe navigation. The notices to skippers shall be provided at least in an accessible electronic format.

Article 4(4): The competent authorities of the Member States shall establish RIS centres according to regional needs (see also Article 8).

Article 4(6): Member States, if appropriate in cooperation with the Community, shall encourage boat masters, operators, agents or owners of vessels navigating on their inland waterways and shippers or owners of goods carried on board such vessels to fully profit from the services, which are made available under this Directive. This is especially relevant for the implementation of Vessel Tracking and Tracing Systems (Inland AIS), not specifically required by the RIS Directive.

Article 8: Member States shall designate competent authorities for the RIS application and for the international exchange of data.

Description of the current situation

Transposition of the RIS Directive (Article 12)

The transposition deadline of the Directive was 20 October 2007. An “Evaluation on RIS implementation for the period 2006 – 2011”²² concluded that all countries had transposed the Directive into national legislation. According to this report, only four out of twelve²³ Member States achieved the transposition within the required timeframe of the Directive. The transposition section²⁴ for the RIS Directive on the EUR-Lex Portal provides a detailed overview of the national transposition measures communicated by the Member States.

Supply of data for navigation and voyage planning (Article 4(3a))

The minimum data requirements to be provided to RIS users as referred to in article 4(3a) are listed in Annex I of the RIS Directive, but no detailed technical specifications are provided. In order to harmonise the type of information and the format of data for navigation and voyage planning, a coding mechanism to capture the location and the characteristics of the objects has been elaborated by a **joint task force**²⁵. Since then, data for navigation and voyage planning is provided by national authorities through the *RIS Index*, which is also kept in the European Reference Data Management System (ERDMS)²⁶ that is operated by the European Commission.

All relevant Member States comply with the RIS Directive’s requirements for the provision of data for navigation and planning. Strictly speaking, there is no legal obligation for the Member States to supply this data in the form of the RIS Index. Nevertheless, the EC has been systematically monitoring the data supplied by Member States through the RIS Index to the ERDMS since 2015. In June 2020, the ERDMS contained data of more than 251.000 objects on the European waterways that are relevant for navigation and voyage planning (e.g. water level gauge stations, waterway axis indicators, lock chambers, bridges, harbours, berths, terminals).

The 2018 fact-finding study could establish (based on self-reported information) that all relevant Member States had provided their respective RIS Indices, though only 9 out of 13 were in line with the latest version (version 2.0) and the remaining 4 countries had not yet updated their RIS Indices to the most recent version.

In terms of the coverage of objects, self-reported data suggests that the 8 of the 13 Member States that provided answers to this question cover close to 100% of the priority objects on their waterways. It has to be assumed that Member States that did not answer the question or did not contribute to the survey cover objects to a lesser degree, as countries generally have an incentive to report their compliance rather than their non-compliance. It would have been disproportionate for the evaluation to systematically check the accuracy of this information for each Member State, however, some triangulation was possible using information collected through other targeted stakeholder consultation activities. It did not substantially change the findings.

²² <https://ec.europa.eu/transport/sites/transport/files/modes/inland/studies/doc/2014-07-evaluation-of-ris-implementation-main-report.pdf>

²³ Excluding Croatia, which became a Member State in 2013

²⁴ <https://eur-lex.europa.eu/legal-content/EN/NIM/?uri=celex:32005L0044>

²⁵ In June 2010 the voluntary RIS Expert Groups on Notices to Skippers and Electronic Reporting established the Joint Task Force on the RIS Index, based on the input of the PLATINA project

²⁶ https://webgate.ec.europa.eu/RIS/EUERDMS_WEB

As there is no European legislation for the RIS Index and its provision to the ERDMS, Member States are not legally obligated to update theirs in line with the agreed informal standards (i.e. the RIS Index Encoding Guide). Therefore, as long as data listed in Annex I of the Directive (i.e. in terms of the coverage of objects) is provided in an easily accessible electronic format by the Member States, either within the ERDMS or outside, they legally comply with the RIS Directive.

Making available of Electronic Navigational Charts (Article 4(3b))

The RIS Directive stipulates that in addition to the data concerning navigation and voyage planning, Member States are to ensure “*electronic navigational charts suitable for navigational purposes are available to RIS users*”.

In its Annex, the Directive further specifies that the technical requirements for electronic navigational charts (ENC) are to include all kinds of geographical objects necessary for safe navigation; integrate fairway water depth information; and integrating additional information from parties other than the competent authorities, provided it does not affect the minimum information required for safe navigation. It also stipulates that the charts are to be made available to RIS users, as well as to all relevant manufacturers of applications, against a reasonable cost-related charge.

All relevant Member States make electronic navigational charts available in line with the RIS Directive.

The information collected in the context of this evaluation suggests that electronic navigational charts are provided for all major European Inland Waterways. In June 2016, a total of 13,042 km of waterways had already been covered, with an additional 1,733 km planned at the time. In all cases, the minimum content is provided, only a few countries go beyond the minimum requirements.

As per self-reported data of RIS authorities in the 2018 fact-finding study, the coverage of electronic navigational charts on waterways of CEMT class Va and above is 100% in all relevant Member States, except the Netherlands, Poland and Slovakia²⁷.

Slovakia indicated 69% coverage because they make charts available only for the Danube and not for the stretch of the river Vah falling under CEMT class Va and VIa. The Netherlands indicated 90% of ENC coverage. It has the densest waterway network in Europe containing a variety of small and large waterways, therefore requiring more resources from its fairway authorities to comply with the requirements of the RIS Directive concerning electronic charts. Charts are provided for the majority of the main waterways in the Netherlands, while some shorter stretches are missing. As of 2018, these were planned for production.

Although a detailed fact-checking of the self-reported findings was not possible in the context of this evaluation (due to the disproportionate costs involved), the findings have been triangulated to a large extent by means of the targeted consultation activities. As none of the consulted stakeholders, including RIS authorities in any of the relevant Member States mentioned any missing charts for the relevant waterways, it is assumed that the self-reported information largely correctly reflects the state of implementation.

²⁷ The study listed Luxembourg as “not applicable” because they indicated that their charts are provided via the German ELWIS portal. As their stretch of the Mosel river which is applicable to the RIS Directive is shared with Germany, there is no need for both authorities to provide charts separately. As a result, coverage in Luxembourg is 100% as well.

All relevant Member States make the electronic charts available for download free of charge on their respective websites. Links to all of these websites containing downloadable charts are also provided on the IEHG Website²⁸ (Inland Electronic Navigational Charts Harmonization Group). All of these downloadable charts are compatible with free ECDIS Viewers (e.g. SevenCs) and can be viewed for informational purposes. To be able to use the charts for navigational purposes, a professional ECDIS viewer is needed on board. The table below provides details on the IENC implementation status.

Corridor	Country	Waterway	km	Minimum content	updates	Available for free	Version of standard
Rhine	France	Rhin	142	yes	yes	yes	2.3
		MOSELLE CANALISEE - de Neuves-Maisons à Apach	150				2.1
	Germany	Rhein-Herne-Kanal,	45,5	yes	yes	yes	2.3
		Rhein	555,4				
		Neckar	202,9				
		Mosel	242				
	Switzerland	Rhine	20,9		no information	yes	2.3
The Netherlands	Ijssel, Amsterdam-Rijnkanaal, Eemskanaal, Boven-Rijn, Waal	1743,4	104,5 km planned	depends on region	yes	2.3.6	
Danube	Austria	Danube	329	yes	yes	yes	2.3
		Donaukanal	17				
	Bulgaria	Danube	235	yes	last update 2018	yes	2.3
	Croatia	Danube	139	yes	no	yes	2.3
		Sava	382				
		Drava	23				
	Germany	Main-Donau-Kanal	171	yes	yes	yes	2.3
		Donau	213				
	Hungary	Donau	379	no	2018	yes	2.3
	Romania	Danube + branches	1487	yes	Macin+Sfantu	yes	mostly 2.3
	Serbia	Danube	588	yes	minimum once a year	yes	2.3
		Sava	210,8				
		Tisza	164				
	Slovakia	Danube	172	yes	planned	yes	2.3
	Ukraine	Danube	171	yes	minimum once a year	yes	2.0
Dnipro		983	yes	no information	under discussion	2.0	
North-South	Flanders	Schelde, Leie, Dender, Rupel, Ijzer, canals, ports	978,54 km/ 987,5 km ²⁹	yes	yes (once a year if necessary)	yes	2.3
	Wallonia	Canal, Maas, Samber, Leie, Haute Escaut, others	365,1	yes	no	yes	2.3
	France	Garonne, Grande Saone, Escaut, Oise, Seine, Rhone, Canal du Rhone au Rhin	766	yes	yes	yes	2.3 (Garonne 2.1)
	The Netherlands		730,4		depends on region	yes	2.3.6
East-West	Czech Republic	Elbe	223	yes	yes	yes	2.0
		Vltava	91,6				
	Germany	Oder	162,5	yes	yes	yes	2.3
		Elbe	619,2				
		Others	2236,62				
	Poland	Lake Dabie	9,5	yes	yes	yes	2.3
Odra		44,6					
West Oder		36,6					

²⁸ <https://ienc.openecdis.org/links>

²⁹ 978,54 km waterways and 987,5 km² port area / estuarial navigation

Corridor	Country	Waterway	km	Minimum content	updates	Available for free	Version of standard
		Canal Przekop Klucz-Ustowo	2,7				
		Parnica and canal Przekop Parnick	6,9				

Table 1: IENC implementation status according to IEHG (February 2019)

Implementation of Electronic Ship Reporting (Article 4(3c))

The provisions in the RIS Directive together with the Implementing Regulation on technical specifications for electronic ship reporting in inland navigation aim to facilitate electronic data exchange and should eliminate (or at least reduce) the number of resubmissions of vessel reports during an international voyage. The Implementing Regulation, for instance, specifies a set of codes for electronic reporting that allow for translation of information concerning cargo, origin and destination in any given language, which facilitates the electronic reporting and transmission process.

The RIS Directive mandates that Member States should “enable, as far as ship reporting is required by national or international regulations, the competent authorities to receive electronic ship reports of the required data from ships. In cross-border transport, this information shall be transmitted to the competent authorities of the neighbouring State and any such transmission shall be completed before arrival of the vessels at the border”. As such, it **does not make the submission of electronic ship reports mandatory**, but merely regulates their processing when they are submitted. The main change brought about by the RIS Directive in this context, therefore, is that it outlines the need for competent authorities to be able to receive the ship reports and to share them with the relevant neighbouring states.

In its Annex, the Directive further specifies that the technical specifications for electronic ship reporting in inland navigation should “(a) facilitate the electronic data exchange between competent authorities, between participants in inland as well as maritime navigation and in multi-modal transport where inland navigation is involved; (b) be standardised to ensure compatibility with maritime navigation; (c) be based on internationally accepted code lists and classifications, and (d) make use of a unique European vessel identification number”. The technical specifications for electronic ship reporting define four standard message formats through which the requirements of the Directive shall be implemented.

Based on self-reported information (see table below), **12 out of 13 Member States have implemented national systems for receiving electronic reports.**

All relevant countries support the ERINOT message³⁰, but there is limited to no support for the other messages, because of differing ship reporting requirements on national or international level. On international level, the use of the ERINOT message is compulsory since January 2010 on the Rhine for container ships with more than 20 containers on board or ships transporting containers with dangerous substances, regardless the number of containers.

For **submitting electronic reports** to the competent authorities, particularly on the Rhine and the Mosel the Barge Information and Communication System (BICS³¹) is supported by Member States. BICS is a dedicated reporting software application provided and maintained by Rijkswaterstaat, the fairway authority in the Netherlands. There is no wide

³⁰ for reporting of information on voyages, goods and number of persons on board

³¹ <https://www.bics.nl/>

spread use of BICS on the Danube. Instead, reporting parties submit their electronic reports to the authorities via dedicated web-interfaces.

Regarding cross-border exchange of electronic reports, data exchange of ERINOT messages has been implemented on the Rhine and the Mosel, although the full dataset is not always exchanged and skippers need to report a part of the information again when crossing a border. On the Danube the implementation of a cross-border exchange of electronic reports is even more limited to only two³² out of ten countries.

In conclusion, partly due to the fragmented technical, procedural, organisational and regulatory environment in the IWT sector, barge operators stated that they still need to file the same data multiple times to comply with different aspects of legislation and dealing with different jurisdictions in cross-border operations³³. However, the provisions of the RIS Directive for competent authorities to **be able to receive electronic ship reports** (in case ship reporting is required by national or international regulations) have been largely implemented. Along the Rhine and the Mosel, **electronic reports are also shared** with the relevant neighbouring states.

EU Member State	Supported in country? [Yes / No]	How is electronic reporting facilitated from user-perspective?			
		Website	Dedicated application	Other	Remarks
Austria	Yes	x	x		DoRIS portal https://portal.doris-info.at . In addition, it is possible to use a client application (e.g. BICS) that communicates through web services.
Belgium	Yes	x	x		Electronic submission through BICS (Flanders) for Wallonia the GINA application is mentioned, reporting through BICS is indicated as 'non-operational'
Bulgaria	Yes	x			BULRIS (http://eri.bulris.bg). In addition, R2D2 web services are supported.
Croatia	No				
Czech Republic	Yes	x	x	x	Desktop application SPS Dispatching Web application https://plavba.lavdis.cz/ Import of ERINOT messages received by e-mail (pilot operation)
France	Yes	x	x		BICS is currently available along the Rhine and will become available along the Mosel from December 2019. In the rest of France, the VELI website and mobile app should be used, although ERINOT is not yet supported (planned for the end of 2019)
Germany	Yes		x		BICS
Hungary	Yes	x			Reporting is in pilot operation through PannonRIS.
Luxembourg	Yes			x	Through BICS and the reporting system of Germany
Netherlands	Yes		x		BICS
Poland	Yes	x			Currently in test phase (https://eridgw.ris-odra.pl/eridgw/login)
Romania	Yes	x	x		Through the RoRIS system and BICS
Slovakia	Yes	x	x		Reporting is possible through SlovRIS. Interfaces are available to use BICS as well.

Table 2: Overview of electronic reporting systems in each relevant Member State (2018)

³² Austria and Slovakia (2018)

³³ see <https://ec.europa.eu/transport/sites/transport/files/studies/2017-10-dina.pdf>

Provision of standardised Notices to Skippers (Article 4(3d))

The RIS Directive stipulates that Member States shall ensure that “notices to skippers, including water level (or maximum allowable draught) and ice reports of their inland waterways, are provided as standardised, encoded and downloadable messages”.

According to the Directive, these standardised messages should contain “at least the information necessary for safe navigation” and be provided at least in an “accessible electronic format”.

In its Annex, the Directive further specifies that notices to skippers shall respect “a standardised data structure using predefined text modules and encoded to a high extent in order to enable automatic translation of the most important content into other languages and to facilitate the integration of notices to skippers into voyage planning systems”; and “the compatibility of the standardised data structure with the data structure of inland ECDIS to facilitate integration of notices to skippers in Inland ECDIS”

The following messages need to be provided by all RIS authorities on all waterways to which the Directive applies:

- fairway conditions and traffic (FTM), containing information on any limitations relating to a fairway or a specific location;
- water levels (WRM), containing the water level measurement at a specific location;
- ice (ICEM), containing information about the ice conditions for a fairway.
- weather-related messages (WERM), containing information about (dangerous) weather conditions on a fairway, may be provided but are optional.

All information important for the safety of inland navigation (e.g. obstacles that can pose safety risks) or voyage planning (e.g. unforeseen closure of locks) must be encoded. Additional information not relevant for safety or voyage planning (e.g. the cause of such a closure) can be provided using free text. The use of free text should be restricted to a minimum.

In 2018, the fact-finding study on the practical and operational measures in application of the RIS Directive recorded - based on self-reported data - **that all but three relevant Member States fully complied** with the requirements of the Directive on mandatory notices to skippers (containing information on FTM, WRM, ICEM) on the relevant waterways of CEMT class IV and above. The remaining three Member States reported that they made notices to skippers available, however they did not reach full coverage but only covered between 50% and 70% of the relevant waterways.

Coverage of NtS messages (in %) per Member State for class IV waterways and above and for smaller waterways											
EU Member State	Fairway & Traffic Message (FTM)		Water Related Message (WRM)		Ice Messages (ICEM)		Weather related messages (WERM) (optional)		Inter-national NtS data exchange		Remarks
	% Class IV and above	% Below Class IV	% Class IV and above	% Below Class IV	% Class IV and above	% Below Class IV	% Class IV and above	% Below Class IV	% Class IV and above	% Below Class IV	
Austria	100	n/a	100	n/a	100	n/a	Not published		100	n/a	All Austrian NtS messages are made available via standardised NtS Web Service Interface
Belgium	100	-	100	-	100	-	100	-	100	-	No Exchange of NtS. Data can be accessed through standardised 'web services. Flanders refers to VisuRIS. Wallonia sends NtS to The Netherlands.
Bulgaria	100	n/a	100	n/a	100	n/a	100	n/a	100	n/a	
Croatia	100	60	100	60	100	60	100	60	0	60	
Czech Republic	100	0	100	0	100	0	0	0	0	0	ICEM in pilot operation
France	100	100	100	100	100	100	100	100	100	100	International exchange by e-mail only; a webservice is planned for 2019.
Germany	100	100	100	100	100	100	n/a	n/a	100	--	
Hungary	70	0	70	0	70	0	70	0	70	0	Only on RIS covered areas
Luxembourg	100	n/a	100	n/a	100	n/a	No	n/a	No	n/a	
Netherlands	100	100	100	100	100	100	100	100	100	100	
Poland	48,3	0	48,3	0	48,3	0	48,3	0	0	0	
Romania	100	0	100	0	100	0	100	0	100	0	
Slovakia	69	0	69	0	69	0	69	0	69	0	Only for the Danube
Spain											Not applicable; Maritime messages apply.

Table 3: Coverage of Notices to Skippers per Member State – self reported data (2018)

However, additional evidence collected in the context of this evaluation points to some gaps in actual availability of the notices and therefore contradicts some of the self-reported data presented in the fact-finding study. Although all eleven Member State authorities interviewed indicated that the mandatory notices to skippers have, in general, been adequately made available in the relevant countries, three private sector interviewees stated that Hungary stopped providing notices to skippers digitally, and that the service level in Romania is limited. Two interviewees also mentioned that ports do not provide notices to skippers, or that their notices are not integrated in national-level portals.

Even in countries that provide notices to skippers on waterways as required by the Directive, there are a number of limits to the availability of those messages. Seven interviewees pointed out that some countries use too much free text rather than applying the XML coding, which in turn hinders the automatic translation and interoperability with ECDIS systems envisaged by the RIS Directive. Romania and Bulgaria were listed as examples, although the authorities in those countries did not comment on those concerns.

Vessel Tracking and Tracing Systems

The RIS Directive does not contain any specific obligations for the Member States to implement vessel tracking and tracing systems (VTT). However, in line with Article 4(6) Member States have decided to implement vessel tracking and tracing systems in order to encourage boat masters, operators, agents or owners of vessels navigating on their inland waterways to fully profit from the services, which are made available under the RIS Directive.

All relevant governmental actors, i.e. fairway authorities and competent authorities for traffic management and safety of navigation have recognised the need for automatically exchanging navigation data between vessels and between vessels and shore. Article 5 of the RIS Directive mentions that VTT plays an important role in the improvement of safety and efficiency in the inland navigation sector, for example by supporting on-board navigation, shore-based traffic monitoring as part of Vessel Traffic Services (VTS) and other tasks such as calamity abatement.

A Commission Regulation³⁴ sets out the technical specifications for vessel tracking and tracing systems according to Annex II of the RIS Directive. It provides the technical specifications for the Inland Automatic Identification System (AIS), which is a ship-borne radio data system, exchanging static, dynamic and voyage related vessel data between equipped vessels and between equipped vessels and shore stations. Inland AIS is fully compatible with the maritime AIS standard, therefore facilitating interfaces with other transport modes, in this case maritime transport. This is also fully in line with the specific objective of the RIS Directive: *“to improve the interaction with other traffic management systems of other transport modes, in particular maritime vessel traffic management and information services”*.

³⁴ Commission Regulation (EC) No 415/2007 of 13 March 2007 concerning the technical specifications for vessel tracking and tracing systems referred to in Article 5 of Directive 2005/44/EC of the European Parliament and of the Council on harmonised river information services (RIS) on inland waterways in the Community

All relevant Member States implemented vessel tracking and tracing systems in line with the RIS Directive. Amongst other national initiatives, one of the most important facilitators for the implementation of vessel tracking and tracing was the initiative of the Central Commission for Navigation of the Rhine (CCNR) to make Inland AIS mandatory on the Rhine starting from 2014. This gave an extra incentive to the riparian states to implement the technical specifications as referred to in the aforementioned Commission Regulation. In addition, EU funding programmes under TEN-T and CEF provided financial support to the Member States to equip vessels with the necessary Inland AIS devices. According to a survey of the CCNR (2017), 94% of the of vessel owners³⁵ on the Rhine has Inland AIS devices on board. This shows that the penetration in the market is almost at a maximum.

Designated competent authorities for the RIS application (Art. 8)

The following table provides an overview of the bodies in the Member States that are responsible for RIS implementation, i.e. the competent authorities for RIS. It furthermore gives an overview of the national RIS providers, which are providing the services to the end users. This information was extracted from the 2018 fact-finding study and is based on self-reported data from the Member States.

³⁵ sample n=1203

OVERVIEW OF RIS AUTHORITIES				
EU Member State	Body legally responsible for RIS implementation	RIS provider(s)	Other authorities / main stakeholders	Remarks
Austria	Federal Ministry of Transport, Innovation and Technology - Supreme Navigation Authority (Department navigation – technical and nautical affairs)	Viadonau is RIS provider and operates the system according to the Federal Waterways Act	- Other public agencies and lock operators provide information	Port related RIS applications are carried out either by viadonau or the Supreme Navigation Authority.
Belgium Flanders	- Department Mobiliteit en Openbare Werken (Department of Mobility and Public Works) of the Flemish government	- De Vlaamse Waterweg nv for inland waterways - Maritieme Dienstverlening en Kust is responsible for the RIS activities in the Scheldt.	The ports of Antwerp, Ghent, Oostende and Zeebrugge are responsible for RIS implementation in the ports. RIS activities for inland navigation are coordinated with and complementary to maritime navigation.	In the Scheldt area actions are coordinated through a Common Nautical Management authority with the Dutch infrastructure manager Rijkswaterstaat.
Belgium Port of Brussels	Government of the Brussels-Capital Region – department mobility and public works	Port of Brussels is responsible for the implementation of RIS in the port area (and subsequently thereby the Brussels' region)		The Port of Brussels is connected to the VisuRIS system of the Flemish RIS authorities.
Belgium Wallonia	Walloon Government (Gouvernement Wallon)	Direction de la Gestion des Voies Navigables (Waterways management department) of the Public Service of Wallonia		The ports of Liège, Namur, Charleroi and the 'Port autonome du Centre et de l'Ouest are <u>no RIS authorities as they do not manage</u> the waterways in their ports.
Bulgaria	Ministry of Transport, Information Technology and Communications – defines the policy on RIS construction and operation and has the role of main supervisor	Bulgarian Ports Infrastructure Company	- Executive Agency Maritime Administration (EAMA) - Executive Agency for Exploration and Maintenance of the Danube River (EA EMDR)	The Bulgarian RIS system (BULRIS) is operated by the Bulgarian Ports Infrastructure Company (BPIC) cooperated by EA EMDR and under control of the EAMA.
Croatia	Ministry of Maritime Affairs, Transport and Infrastructure	Croatian National RIS Centre, unit in the Agency for inland waterways, is responsible for all RIS activities in Croatia	Harbour Master's Offices	RIS operational tasks are being executed through the regional RIS centres which are formed within the Harbour Master's Offices
Czech Republic	Ministry of Transport, on behalf of the ministry the Czech Waterways Directorate is responsible for technological solutions and implementations such as the RIS infrastructure and its adjustments	According to the Inland Navigation Act the State Navigation Authority is the RIS provider.	- As regards RIS operation other parties are required for data provision as well. This refers mainly to waterway operators, Povodi Labe and Povodi Vltavy, state enterprises, which are under responsibility of the Ministry of Agriculture. - Czech Hydro-meteorological Institute is responsible for provision of water level and	

OVERVIEW OF RIS AUTHORITIES				
EU Member State	Body legally responsible for RIS implementation	RIS provider(s)	Other authorities / main stakeholders	Remarks
			discharge information.	
France	The Ministry of Transport	Voies Navigable de France (VNF)	Compagnie Nationale du Rhône (CNR) is the infrastructure manager of the 14 locks on large parts of the Rhône and Saône for which they have received a concession from the French government. CNR is a private company and is responsible for the implementation of RIS in their area. CNR also manages the port of Lyon.	The Ministry has several functions regarding RIS, for instance: managing the national database of ships, issues certificates for vessels and is therefore in charge of the connection with the European Hull Database. CETMEF (now called CEREMA), is the technical department of the French government, is in charge of the validation of RIS technology in France before making improvements operational.
Germany	The Federal Ministry of Transport and Digital Infrastructure	<ul style="list-style-type: none"> - The Federal Waterways and Shipping Agency is responsible for standardisation and implementation of RIS applications along waterways. - The Department Traffic Engineering Inland of the Waterways and Shipping Administration works on technical concept and development of RIS. - The RIS work is supported by a specialized department of the Waterways and Shipping Administration, the Traffic Technologies Centre. 	<ul style="list-style-type: none"> - River Information Services Centres in Duisburg, Oberwesel, Minden, Magdeburg and Gösselfthal. - Port authorities are responsible for the provision of RIS applications related to inland ports 	RIS operation in terms of information provision on ELWIS is organised decentral by Waterways and Shipping Offices and River Information Services Centres.
Hungary	<ul style="list-style-type: none"> - The Ministry of Innovation and Technology is legally responsible for the implementation of RIS, represented by: <ul style="list-style-type: none"> • Minister of State for Transport Policy • Deputy State Secretary of Transport • Department of Aviation and Watertransport • Unit of Inland Waterway Transport. - Department for Shipping Authority (DSA), part of Deputy State Secretary of Transport Authority Affairs, is acting as RIS Authority. 	The National Association of Radio Distress-Signalling & Info Communications (RSOE)	<ul style="list-style-type: none"> - Other involved parties in Hungary are the National Water Authority (OVF) responsible for the provision of water related information. - Hungarian Meteorological Service (OMSZ) - National Directorate General for Disaster Management (OKF). - Government Office of the Capital City Budapest, Department of Transport is acting as RIS and shipping authority 	
Luxembourg	Ministry of Sustainable Development and Infrastructure	Le service de la navigation		

OVERVIEW OF RIS AUTHORITIES				
EU Member State	Body legally responsible for RIS implementation	RIS provider(s)	Other authorities / main stakeholders	Remarks
Netherlands	Ministry of Infrastructure and Watermanagement	The Minister of Infrastructure and Watermanagement appointed the Director General of Rijkswaterstaat (executive agency for infrastructure of the Ministry) as the National RIS Authority (NRA).	Over 50 fairway managers: - Port authorities - Provincial departments - municipalities	The NRA sees to a coordinated implementation of RIS in the Netherlands and addresses all national waterway authorities that manages a waterway or port of ECMT class IV and above about this. <u>There are more than 50 fairway managers that are required to implement RIS.</u>
Poland	Ministry of Maritime Economy and Inland Navigation is responsible for the national RIS legislation. It acts as national navigation office.	Inland Navigation Office Szczecin	- Water management board - meteorological institute - other inland navigation offices	For RIS operation Inland Navigation Office in Szczecin established the active cooperation with regional waterway management board, meteorological institute and other inland navigation offices to gather required information.
Romania	Ministry of Transport/ Waterway Transport Department is responsible for the policy development of RIS in Romania. Within the Ministry/DG for Air & Waterway Transport, a dedicated Directorate for Naval Transport is dealing with all RIS related issues	Ministry of Transport assigned two RIS authorities in Romania: - Romanian Naval Authority (RNA) - Administration of the Navigable Canals (ACN)		
Slovakia	Ministry of Transport and Construction, Department of Water Transport is the main organisation with regard to the development of RIS in Slovakia	The Transport Authority (Dopravný úrad) is the RIS provider	- The Waterborne Transport Development Agency participates in development and implementation of new technologies and operational systems for waterways. - Slovak Water Management Enterprise (Slovenský vodohospodársky podnik, SVP) is responsible for the production of navigational charts. - Slovak Hydro-meteorological Institute (Slovenský hydro-meteorologický ústav, SHMÚ) is a specialized organization providing hydrological and meteorological services at the national and international level.	

4. METHOD

Short description of methodology

As a first step, the Commission conducted, with the support of an external contractor, an initial review of the state of implementation³⁶ for the period 2006-2011. This review concluded in 2014 with the publication of its results on the Inland Waterways Website of DG MOVE.

In 2017, the formal evaluation process following the Commission's Better Regulation Guidelines started with the publication of the evaluation roadmap³⁷ and the establishment of the Inter Service Steering Group (ISSG). The ISSG guided the evaluation process until the finalisation and publication of this Staff Working Document (details can be found in Annex I).

In 2018, in order to complement the 2014 study and to collect evidence that is more detailed on the actual state of implementation of RIS in the Member States, the Commission contracted a fact-finding study from the STC Group and TNO. This study on the practical and operational measures in application of the RIS Directive was an input for the evaluation of the Directive and is the key source of evidence of Section 3 (State of Play).

The external contractors Ramboll Management Consulting and the University of Antwerp carried out the evaluation support study between January 2019 and January 2020. The study presents an analytically robust ex-post assessment of the Directive.

Data collection and analysis

The main research tools included:

- **Desk research**/review of relevant documents (including legal texts, Member State reports, relevant previous support studies and deliverables from RIS deployment projects).
- **Targeted questionnaires** aimed at address factual gaps as identified in earlier stages of the study, and primarily to gather quantitative data. Two types of questionnaires were developed, one for national administrations / competent authorities and one for users of waterways. Overall, 15 responses were provided.
- **Interviews** to gather evidence in relation to evaluation criteria/questions for which qualitative data was judged an important source. Altogether 50 interviews were conducted.
- 14-week **Public Consultation** (on the Commission's "Have your say" website³⁸) running from 8 August 2019 until 13 November 2019. A total of 44 responses were received, including three position papers. Responses were gathered from twelve different countries. This includes ten out of the thirteen EU Member States to which the RIS Directive applies directly (Austria, Belgium, Bulgaria,

³⁶ <https://ec.europa.eu/transport/sites/transport/files/modes/inland/studies/doc/2014-07-evaluation-of-ris-implementation-main-report.pdf>

³⁷ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1171-River-information-services-on-inland-waterways>

³⁸ <https://ec.europa.eu/info/law/better-regulation/have-your-say>

Czechia, Croatia, France, Germany, Hungary, Netherlands, and Romania). The other two countries, with one respondent each, are Italy and the Ukraine (both voluntary implementers of the Directive).

- **Stakeholder views** gathered at five **workshops** and **events**, including the Open Shipping Days (Antwerp, Belgium, March 2019), the RIS Week (Galați, Romania, June 2019), the DINA Commission Expert Group (Brussels, Belgium, October 2019), the RIS Week (Liège, Belgium, November 2019) and the CESNI/TI meeting (Strasbourg, France, December 2019).
- **State of play assessment:** Triangulation between publicly available statistics, information gathered in the RIS implementation review 2006-2011, the fact-finding study from 2018 (latter two were key inputs), as well as the evaluation support study 2019, to determine the Directive's state of implementation across the EU (and relevant non-EU countries) and the state of deployment of RIS.
- **Detailed quantitative analysis of the Directive's impacts**, drawing on available statistics and collected quantitative evidence; including an (econometric) assessment of correlations between key sectoral variables and an indicative social cost-benefit analysis.

Ex-post assessment of the Directive in response to evaluation questions, triangulating all available (quantitative and qualitative) information, while accounting for stakeholder vested interests, uncertainty and gaps of evidence and limitations to attributability of impacts to the Directive.

More details on the stakeholder consultation activities can be found in Annex 2 and the stakeholder consultation report (part of the support study³⁹).

Limitations and robustness of findings

A number of limitations to the robustness of evidence have been identified. Despite best efforts to mitigate these limitations, they will, to some extent, have negatively affected the robustness of the evaluation findings. Key concerns identified are discussed below.

Concerning the assessment of the implementation and the state of play, the assessment is primarily based on ad-hoc **self-reported information from the Member States** that were provided for this evaluation. This information may be influenced by interests of the Member State or inconsistent across countries. To address these shortcomings to some extent, the state of play assessment relied heavily on triangulating (cross-checking) evidence with other sources to increase the robustness of findings. Nevertheless this limitation, in combination with a general lack of data (see next point) has substantially reduced the robustness of findings.

There is a considerable **lack of reliable, sufficiently granular and comparable data** that prevents a robust (quantitative) assessment of the effectiveness, efficiency, and EU added value of the RIS Directive. **Identified data gaps** include the following areas:

- **Costs associated with the implementation** of the RIS Directive at Member State level are difficult to distinguish from costs associated with the implementation of RIS as such. National authorities appear not to differentiate between the two. This makes it difficult to establish the attributable costs of the RIS Directive, i.e. to tell apart the additional costs caused by the Directive from

³⁹ <https://op.europa.eu/en/publication-detail/-/publication/e3752fc7-7ec0-11ea-aea8-01aa75ed71a1>

those that would have been incurred anyways as part of the baseline. Close to all findings on cost savings or additional costs due to the Directive are affected by this limitation and their robustness is reduced. The evaluation responses indicate in detail where conclusion could not be drawn.

- **Costs** associated with the implementation of RIS are also **not broken down**, which makes it impossible to separate the implementation costs of different key technologies. Although **investment costs** (e.g. setting up a website for notices to skippers) are straightforward to identify, the actual operating costs arising from the day-to-day management of all technologies are interwoven. Costs can therefore not be reliably attributed to them.
- At the level of **benefits**, data on effects is **not measured consistently over time and across countries**. Accident data, for instance, is not collected in all relevant Member States, and where it is, the type of data collected is not the same. Even within countries, e.g. Belgium, the number of accidents varied considerably over time - not because the rate of accidents changed considerably, but because the country changed its methodology. This is a further factor that hinders a reliable assessment of the efficiency of the RIS Directive as it introduces uncertainty into data used to estimate safety benefits across all countries over the evaluation period and as such affects the robustness of these estimates.
- The same is true for the data relevant for navigation and planning. Although Annex I of the RIS Directive stipulates the minimum data to be provided, it leaves room for interpretation as **to how this data should be measured and the required quality of data** (e.g. frequency of updates). This directly impedes the assessment of whether the Directive has led to an effective provision of the relevant data but is also a finding in itself (on effectiveness with respect to harmonisation), that is discussed later.

In summary, the **lack of common provisions for monitoring performance** towards the achievement of the RIS Directive's objectives very substantially hampered the assessment. Adequate monitoring would not only have set out a common approach to the measurement and the continuing recording and provision of data over time, but also ensured its availability for an assessment of the RIS Directive. A robust and detailed evaluation would have required such a monitoring framework to be in place from the start.

Concerning the **robustness of findings from the stakeholder consultations**, it was observed that the contributions are heavily **skewed towards RIS authorities and user representative organisations**, rather than RIS users themselves, despite concerted efforts made throughout the evaluation to achieve a balanced representation. It was very difficult to interact directly with the beneficiaries of the RIS Services, as there are hardly fora where e.g. skippers or vessel operators meet. It is unclear what impact this imbalance has had on the robustness of results but it is assumed to not have decisively reduced it.

Evidence from stakeholder consultations are also always associated with the risk that the information reflects the interests of the respondents. This bias in the evidence base will carry forward and undermine the robustness of the results. While some of this risk has been reduced through triangulation between sources, it could not be removed as the overall evidence of the evaluation is too limited (as described above) and many stakeholder groups hold exclusive information. Reassuringly, however, no clear pattern or correlation between the stakeholder groups and their answers have emerged in the

collected evidence. It is likely that contextual factors (geographical, economic and political aspects) dominate RIS-related experiences of stakeholders.

As the RIS Directive only applies to 13 Member States, the RIS sector in Europe consists of a **limited group of geographical stakeholders**. Geographically, different consultation activities reached different regional groups, but an overall balance was achieved. The survey questionnaire, for instance, yielded responses primarily from stakeholders in the Danube region, whereas the Public Consultation was skewed towards respondents from the Rhine region. Geographical balance was also sought through the selection of interviewees and ensured through a balanced event participation. As a result, all countries to which the RIS Directive directly applies have been covered through at least one of the consultation activities. Through complementary consultation activities initial geographical limitations could be addressed and the resulting risk of geographically biased results is considered minimal.

5. ANALYSIS AND ANSWERS TO THE EVALUATION QUESTIONS

5.1. Effectiveness

5.1.1. Question 1: Compared to what would have happened in the absence of the Directive, in quantitative and qualitative terms, to what extent have (a) **data for navigation and planning**, (b) **electronic navigational charts**, and (c) **notices to skippers** been **made available** by Member States, and **benefitted** the resource planning of users of the inland waterways?

Data for navigation and planning

(a1) **Availability** of data for navigation and planning:

The RIS Directive requires that Member States supply RIS users with “all relevant data concerning navigation and voyage planning on inland waterways” adding the requirement “at least in an accessible electronic format”⁴⁰. According to the RIS fact-finding study⁴¹, all relevant Member States reported to comply with the Directive’s requirements for making the data available.

Although the Directive’s Annex clearly states minimum data requirements⁴², it does not prescribe a standard the data have to adhere to. All Member States nevertheless provide most data in line with the **commonly agreed RIS Index**, although there are indications that the data is **not fully harmonised**. Fifteen respondents to the public consultation⁴³ raised this issue, noting a lack of harmonised reference data because of the different interpretations by Member States and the voluntary nature and complexity of the RIS Index and associated Encoding Guide.

According to seven RIS authorities, the voluntary nature of providing data, combined with tight public budgets, leads to a **deprioritisation** of the provision of relevant data. Three Western European RIS authorities⁴⁴ and one RIS developer specifically stressed the extent **of the data** to be measured which made the collection of accurate and up-to-date information burdensome, while a total of seven RIS authorities overall acknowledged **limitations** due to human and financial **resource constraints**⁴⁵.

This was further confirmed by seven other RIS authorities⁴⁶, who believe there is a **lack of precision in the Directive** as it does not elaborate on how, when or how often data should be provided or updated. Three of them specifically suggested that a **clearer legal basis** and/or **stronger enforcement of minimum standards** would help harmonise the provision of data throughout Europe.

⁴⁰ Article 4(3a), Directive 2005/44/EC

⁴¹ Fact-finding study on the practical and operational measures in application of the RIS Directive, 2018

⁴² Annex I, “Minimum Data Requirements”, Directive 2005/44/EC

⁴³ Table 7, page 54

⁴⁴ All three authorities are located in Western Europe, though we expect that this issue also exists in other Member States.

⁴⁵ Seven RIS authorities from all parts of Europe mentioned the lack of resources as a hindering factor in making data for navigation and planning available. Although not all of them specifically stated this to be an issue, two of the three who did are Western European countries with Gross Domestic Products above the EU average.

⁴⁶ RIS authorities from different parts of Europe share this opinion – no pattern emerges in terms of geographical location.

(a2) **Benefits** of data for navigation and planning:

Data for navigation and planning informs users of the waterways, who in turn can make more informed navigational decisions and better plan their voyages, provided the data is correct and up to date. Due to a lack of available cost data, there is no robust (quantitative) evidence on the fact that skippers being better informed due to the requirements has actually led to cost savings. Consultations have, however, returned some evidence: Five out of seven user questionnaire respondents (primarily vessel owners), who indicated they **make use of data** for navigation and planning, specified that the data had been useful to them⁴⁷. Three of the vessel owners specifically pointed to **improved trip planning** as a benefit brought about by improved availability of data. This was confirmed through interviews⁴⁸, where 15 out of 24 interviewees (nine private sector interviewees, four RIS authorities, and one RIS expert group chair) agreed that the data had been beneficial for resource planning. Even though this evidence base is very limited, these are indications that the correct and up-to-date information, that would not have been provided to this extent in the absence of the RIS Directive, has actually led to **more efficient sailing**.

There is no evidence on **social or environmental benefits** of data for navigation and planning. However, there are indications that the data **indirectly improves safety**, through its pivotal role in other RIS technologies (notably AIS and ENC's). Four out of twenty-four interviewees⁴⁹ and three out of nine user questionnaire respondents (mainly vessel owners), highlighted improved safety as a benefit resulting from data for navigation and planning.

Benefits from the improved provision of data for navigation and planning in Member States appear to have materialised at least to some extent but are hindered by the **lack of full harmonisation** of data provided across Member States. If current efforts towards harmonisation are continued, it is likely that the benefits of data for navigation and planning would **materialise in the future**⁵⁰.

Electronic navigational charts

(b1) **Availability** of electronic navigational charts:

The RIS Directive requires Member States to ensure that Electronic Navigational Charts (ENC) suitable for navigational purposes are available to RIS users⁵¹. As per the self-reported data contained in the RIS fact-finding study from 2018, all relevant Member States provide ENC⁵². However, the coverage of electronic charts for waterways of CEMT class Va and above (as mandated by the RIS Directive) is not yet at 100%. Although not required by the RIS Directive, most Member States also provide ENC for some smaller waterways, e.g. if they are considered relevant for traffic or if regional

⁴⁷ See Question 53 of the RIS user questionnaire, in section 5.3.5., Annex 1 “Findings from the survey questionnaires” of the Stakeholder Consultation Report

⁴⁸ See section 6.1 on benefits (EQ 1.4), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

⁴⁹ See section 6.1 on benefits (EQ 1.4), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

⁵⁰ A total of five interviewees, including three RIS authorities, a RIS developer and a skipper see potential in this regard. Two of them mentioned the expected progress of the RIS COMEX project in this regard: further harmonisation and provision of e.g. traffic information will have benefits for the sector as a whole in the future.

⁵¹ Article 4(3b), Directive 2005/44/EC

⁵² See Table 1, page 15

authorities in charge decide to make them available. This applies to all relevant Member States except for two, according to the RIS fact-finding study from 2018.

All relevant Member States, along with non-EU Member States that voluntarily implement the RIS Directive, make their charts **available free of charge** for download on their respective websites⁵³. There is no indication of incompatibility between the charts and the technical specifications for Inland ECDIS mandated by the relevant Implementing Acts.

Despite the positive fact that all relevant **Member States make electronic navigational charts available** free of charge, there are **differences** in their **quality** and **accuracy**. This can hinder the effectiveness of electronic navigational charts in achieving the expected benefits. As neither the RIS Directive nor its Implementing Acts include requirements related to the timeliness of information to be provided, Member States themselves decide how often to update charts. In most countries, this is done at least once a year. But there are several examples, where charts have not been updated since 2018⁵⁴. Four RIS authorities, two RIS developers, a user representative organisation and an international organisation pointed to complaints about charts not being sufficiently updated⁵⁵. According to that user representative organisation, there is a **notable difference between regions**, with Rhine countries updating their charts more frequently than those in the Danube.

Aside from the fact that updates are not mandated by the RIS Directive, **limited resources** are a **hindering factor** for competent authorities in Member States in making electronic charts available. Measuring and providing the necessary data requires significant time and money. Although limited quantitative details on the costs associated with this are available, seven of the thirteen relevant Member States highlighted it as an issue⁵⁶.

(b2) **Benefits** of electronic navigational charts:

Electronic navigational charts are **highly valued** by users of the waterways and RIS authorities alike as being a useful and beneficial tool for inland navigation. At the Common Issues meeting with all stakeholder groups in June 2019, 30% of participants ranked electronic navigational charts as the RIS instrument with the most positive impact on the sector⁵⁷. In the public consultation, 37 out of 44 respondents listed ENC as very useful or mostly useful⁵⁸. All nine surveyed skippers believed electronic charts to be useful for their day-to-day activities, and all interviewed stakeholders who expressed an opinion on the matter believe they have been useful and beneficial to skippers⁵⁹.

There are indications that the availability of charts has benefitted the **resource planning** of waterway users as their availability provides users with the fairway information necessary to **efficiently and safely navigate** the waterways. As such, it allows users to plan their voyages, especially if they are not familiar with a route. Six RIS authorities

⁵³ <https://ienc.openecdis.org/links>

⁵⁴ <https://ienc.openecdis.org/links#overview-availability-of-inland-encs>

⁵⁵ See section 6.1 on benefits (EQ 1.4), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

⁵⁶ From Austria, Belgium, Czechia, Luxembourg, the Netherlands, Romania and Slovakia.

⁵⁷ See Question 7 in section 8.1., Annex 4 “Findings from the events attended” to the Stakeholder Consultation Report.

⁵⁸ See Figure 8, page 57

⁵⁹ See section 6.1 on benefits (EQ 1.5), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

along with four RIS developers are of the opinion that the RIS Directive led to improvements in voyage and resource planning.

Despite indications that resource planning has improved, there is **no conclusive evidence that this has resulted in cost or time savings**. Of the six skippers who provided input to the questionnaire, half indicate a “*small increase*” in costs associated with electronic navigational charts, and the other half indicate a “*small decrease*”⁶⁰.

Although there is no evidence to suggest a change in safety on inland waterways, there is a **clear perception that safety has improved** among RIS authorities and users alike. A survey carried out by the CCNR in 2017 found that 663 out of the 933 surveyed skippers believe that the implementation of Inland AIS and Inland ECDIS following the provisions of the Directive have contributed to safer and quicker navigation⁶¹. This benefit is applicable to the combination of position and identification information from Inland AIS with the Electronic Navigational Charts.

There is **no evidence** of any **environmental benefits** brought about by electronic navigational charts as a result of the RIS Directive. While five of the nine waterway users identified less fuel consumption as a benefit of the charts in the questionnaire⁶², there is little reason to believe that the availability of the charts themselves have had an impact in this regard. Again, **paired with AIS technology**, which inter alia includes information on traffic density, electronic charts are likely to have **more** of an **impact** in this regard.

Standardised Notices to Skippers

(c1) **Availability** of standardised notices to skippers:

The RIS Directive requires Member States to ensure that notices to skippers, including water level (or maximum allowable draught) and ice reports of their inland waterways, are provided as standardised, encoded and downloadable messages⁶³. According to the RIS fact-finding study⁶⁴, **all relevant Member States make mandatory notices to skippers** (containing information on FTM, WRM, ICEM) **available** on waterways of CEMT class IV and above to a large extent. However, in three Member States coverage of the relevant waterways has not reached 100% yet⁶⁵. In addition, three private sector interviewees stated that Hungary stopped providing notices to skippers digitally, and that the service level in Romania is limited⁶⁶. Two interviewees (port authority in Belgium and skipper in Romania) highlighted that **ports** do not adequately provide notices to skippers, or that their notices are not integrated in national-level portals⁶⁷.

⁶⁰ See Question 23 in section 5.3.3., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

⁶¹ CCNR, 2017, Inland AIS devices and electronic chart display systems on the river Rhine, Analysis of the online survey conducted in the context of evaluating the implementation of the mandatory installation

⁶² See Question 28 in section 5.3.3., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

⁶³ Article 4(3d), Directive 2005/44/EC

⁶⁴ Fact-finding study on the practical and operational measures in application of the RIS Directive, 2018

⁶⁵ See Table 3, page 19

⁶⁶ One skipper active in Romania explained that until recently, notices to skippers were printed, signed, and photographed, and the resulting pdf file uploaded to the Romanian RIS portal (RoRIS). Their quality has improved, but a quick scan of the portal shows that there is no automatic translation of all notices, indicating a lack of adequate encoding.

⁶⁷ See section 6.1 on availability (EQ 1.3), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

There are also indications that the notices to skippers are **not** always **in line** with the requirements of the Directive in terms of being encoded, downloadable, and following the common technical standards in the relevant Implementing Acts. Seven interviewees pointed out that some countries use too much free text rather than applying the standardised coding⁶⁸, which in turn hinders the automatic translation and interoperability with ECDIS systems envisaged by the RIS Directive. As a result, there is a **lack of consistency** across Member States in the degree to which notices to skippers are made available, which in turn **limits** the degree of **interoperability**. This in turn **hinders** the **effectiveness** of standardised notices to skippers.

Variance in the **means of distribution** makes notices **difficult to access** from a skipper's perspective. Skippers need to visit **several websites** to collect the necessary information for an international trip. There is limited automatic exchange of notices across borders. Only Austria and the Netherlands share notices automatically via their **web services** in line with the NtS standard version 4.0. Although it is not required by the Directive, cross-border exchange is encouraged. The **availability** of notices to skippers is reportedly **hindered** by the **complexity** of the **technical requirements**, which require time and technological know-how. There are indications that clearer or simpler guidelines for the encoding of NtS by the competent authorities might help, although they are already extensive, and regularly improved through the expert group on Notices to Skippers (from 2020, the CESNI temporary working group on Notices to Skippers). Three authorities from different countries⁶⁹ mentioned that the new technical specifications for Notices to Skippers regulated by Commission Implementing Regulation (EU) 2018/2032 are a great improvement.

Relatedly, two RIS authorities⁷⁰ highlighted that the **lack of enforcement of the Directive** is one of the reasons for the **non-harmonised approach**. Although a statement by two people is not sufficient to base conclusions on, this concern was raised more broadly by other respondents in the context of the RIS Directive in the **public consultation**⁷¹. Not a single respondent believes the EU properly implemented the monitoring of the application of the Directive, detailing that there is no visible enforcement or pressure towards the Member States to comply with its requirements. It is true that there is no formal framework in place for monitoring the implementation of the Directive and no infringement procedures have been launched against non-compliant Member States. However, the RIS implementation has been guided by a formal Committee (Article 11 in the Directive) and the Commission has launched several implementation support measures, including the platform for the implementation of the NAIADES action programme (PLATINA). In 2017 the Commission has created the DINA Expert Group that assists in the development of digital strategy for inland waterways, including RIS.

(c2) **Benefits** of standardised notices to skippers:

Findings do not allow robust conclusions on the extent to which standardised notices to skippers have brought about any economic, social, or environmental benefits. This is due to **limited quantitative evidence** available to support stakeholder claims. Nevertheless, it is apparent that the relevant **stakeholder group, namely the skippers**

⁶⁸ See section 6.1 on availability (EQ 1.3), Annex 2, "Findings from the interviews" of the Stakeholder Consultation Report.

⁶⁹ France, Slovakia, Serbia

⁷⁰ Austria, Belgium (Flanders)

⁷¹ See Figure 17, page 73

themselves confirm the usefulness of standardised notices to skippers, and that they are an **improvement** relative to the situation prior to the **RIS Directive**. Notices to skippers were listed as the second most useful RIS technology in the public consultation⁷². Of the seven waterway users that replied to the questionnaire, five confirmed that notices to skippers have been useful for them in their day-to-day activities⁷³. 23 interviewees⁷⁴ confirmed the benefits of notices to skippers, listing the automatic translation of encoded messages and the integration with Inland ECDIS software as main enabling factors in this regard.

The main benefits experienced by stakeholders are as follows:

- **Better voyage planning** resulting from the availability of real-time information on traffic, weather, water levels, etc., although this benefit only materialises when authorities provide up-to-date information in an accessible format;
- **Improved safety** and lower accident rate resulting from better planning through traffic information, as perceived by skippers and authorities alike;
- **Improved communication**, facilitated by the automatic translations of encoded notices to skippers, which is conditional to the messages being provided in line with the requirements of the Directive.

Although expected, there is **no robust evidence** to suggest that standardised notices to skippers have **led to time or cost savings** resulting from more efficient navigation and better information. There are **indications** that skippers still **waste time collecting notices** from **several websites** due to the lack of cross-border exchange of notices.

There is **no evidence of environmental benefits** of notices to skippers. Although four waterway users believe notices to skippers have led to a reduction in fuel consumption through better voyage planning⁷⁵, there is no further evidence to suggest this is indeed the case.

5.1.2. Question 2: Compared to what would have happened in absence of the Directive, in quantitative and qualitative terms, to what extent have **electronic ship reports** reduced **re-submissions** when crossing a border and led to **cost savings** for the users of the waterways and Competent Authorities?

The RIS Directive mandates that Member States should “enable, as far as ship reporting is required by national or international regulations, the competent authorities to receive electronic ship reports of the required data from ships. In cross-border transport, this information shall be transmitted to the competent authorities of the neighbouring State and any such transmission shall be completed before arrival of the vessels at the border”⁷⁶.

⁷² See Figure 8, page 60

⁷³ See Question 35 in section 5.3.3., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

⁷⁴ Including two European-level user associations, three national-level user associations and six RIS developers, as well as 11 public bodies.

⁷⁵ See Question 46 in section 5.3.4., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

⁷⁶ Article 4(3c), Directive 2005/44/EC

Despite the **lack** of reliable **quantitative evidence** indicating a change in resubmissions in cross-border transport, **evidence** collected **from stakeholders** strongly **suggests** that there has **not been a substantial reduction in resubmissions**, as vessel information still needs to be reported more than once on an international voyage. Although the questionnaire produced mixed results, with two RIS users indicating a small reduction in resubmissions and two indicating no change⁷⁷, the majority of interviewed stakeholders⁷⁸ believe that there has not been a decrease. The five interviewees⁷⁹, who indicate that there has been a decrease, note that this differs between countries/regions – two of them stating there has been a decrease on the Rhine because of the CCNR obligation to report electronically for container and tanker vessels, but not on the Danube⁸⁰. The evidence that there has not been a substantial reduction in resubmission of electronic reports is considered robust, because of the large number of interviewees who share the same views, and the examples⁸¹ given in support thereof.

The main hindering factor to electronic ship reporting is the **lack of harmonisation across countries**. The Directive does not mandate specific requirements or details on how electronic ship reports are to be shared. As a result, Member States have different legal reporting obligations, requiring different vessel information, which hinders the reduction of resubmission even if authorities share data across countries. Additionally, **data protection** concerns were said to **hinder** the degree to which **data** is shared between competent authorities. In order to ensure compliance with the provisions of the General Data Protection Regulation (GDPR)⁸², Member States need to conclude additional data exchange agreements for exchanging personal data for RIS purposes.

There is **no evidence of cost savings for users of the waterways, notably because there has not been a reduction in resubmissions**. Stakeholders are positive about the **potential** benefits from electronic ship reporting the RIS Directive could bring about⁸³. There is a strong indication that cost savings, among other (indirect) benefits such as efficient calamity abatement⁸⁴, **would materialise** if electronic ship reporting was **implemented in a harmonised, interoperable way**. Then, electronic ship reporting can also reduce the administrative burden for reporting multiple times the same information during a single voyage.

⁷⁷ It should be noted that there were more respondents from the Danube region to the questionnaire, so this can skew the results. See Question 74 in section 5.3.6., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report.

⁷⁸ This was stated by interviewees from all different stakeholder groups and different regions. A total of 28 out of the 33 who discussed electronic ship reporting voiced this opinion.

⁷⁹ Four RIS authorities (1 non-EU) and one RIS developer

⁸⁰ See section 6.1. on electronic ship reporting, Annex 2 “Findings from the interviews” to the Stakeholder Consultation Report.

⁸¹ According to one skipper, on a trip between Constanța and Budapest, he needs to report on his voyage and cargo around five times. Representative associations listed similar examples: several reports from Flushing to Liège; from Basel to Rotterdam; from Constanța to Rotterdam; and even within the same country, e.g. Romania and Bulgaria.

⁸² <http://data.europa.eu/eli/reg/2016/679/oj>

⁸³ See Question 62 in section 5.2.7., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

⁸⁴ Six national and international level interviewees mentioned that electronic reporting aids calamity abatement

5.1.3. Question 3: Compared to what would have happened in the absence of the Directive, in quantitative and qualitative terms, to what extent, with regard to the **type-approval of equipment, has the implementation of the Directive led to the **mutual recognition of RIS equipment** as foreseen in Art. 7.1?**

Article 7 of the RIS Directive details the provisions for type-approval of RIS equipment. It states that, where necessary for safe navigation and required by the relevant technical specifications, “*RIS terminal and network equipment and software applications shall be type-approved for compliance with those specifications before being put into service on inland waterways*”. Additionally, all type-approvals issued by the relevant bodies of the Member States are to be mutually recognised by all others⁸⁵.

Currently, only Inland ECDIS viewers in navigation mode⁸⁶ and Inland AIS transponders⁸⁷ are required to be type-approved in the EU. All type-approvals need to be carried out following the test standards referred to in the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN)⁸⁸.

The evaluation found that **a single entity** has been **carrying out all type-approvals** throughout the evaluation period (and before): the “Wasser- und Schifffahrtsverwaltung des Bundes, Fachstelle der WSV für Verkehrstechniken (FVT)” in Germany. Type-approved equipment includes six Inland ECDIS viewers and 46 Inland AIS devices, 24 of which conform to Test Standard 2.0 (CCNR) and are permitted to be installed on board⁸⁹. Four RIS authorities⁹⁰ and the CCNR specifically mentioned that this system works well, and that there is no need for other authorities to carry out their own type-approvals. This view may be representative.

None of the Member States experienced difficulties with mutual recognition of RIS equipment. All twelve interviewed stakeholders⁹¹ consider that mutual recognition of type-approved equipment works well. As such, it can be safely concluded that **type-approved RIS equipment is mutually recognised across Member States** as foreseen in Article 7 of the RIS Directive. However, the extent to which this is directly **attributable to the RIS Directive is unclear**.

The lack of evidence on the change in numbers of mutually recognised type-approvals before and after the implementation of the Directive makes it impossible to establish the size of the change in approvals. There is a **clear benefit of mutual recognition** of type-approved RIS equipment across Member States. There are indications that this mutual recognition of type-approved equipment, certified in Germany, saves other RIS authorities time and money that would otherwise be spent on approving equipment

⁸⁵ Article 7(3), Directive 2005/44/EC

⁸⁶ Commission Implementing Regulation (EU) 2018/1973 of 7 December 2018 amending Implementing Regulation (EU) No 909/2013 on the technical specifications for the electronic chart display and information system for inland navigation (Inland ECDIS) referred to in Directive 2005/44/EC of the European Parliament and of the Council.

⁸⁷ Commission Implementing Regulation (EU) 2019/838 of 20 February 2019 on technical specifications for vessel tracking and tracing systems and repealing Regulation (EC) No 415/2007.

⁸⁸ <https://www.cesni.eu/en/types/technical-requirements/>

⁸⁹ See <https://listes.cesni.eu/2030-en.html> and <https://listes.cesni.eu/2050-en.html>

⁹⁰ Czechia, France, Slovakia, Serbia

⁹¹ This includes RIS authorities from Austria, Belgium, Czechia, the Netherlands, Romania, Serbia, Slovakia and Switzerland, highlighting that mutual recognition works throughout the EU, and even beyond.

themselves⁹². However, there has been no quantified evidence of costs or time saved collected during this evaluation to reliably conclude this.

5.1.4. Question 4: Compared to what would have happened in the absence of the Directive, in quantitative and qualitative terms, to what extent has the Directive been overall effective in establishing an interoperable, harmonised RIS?

The overall aim of the RIS Directive is “to establish harmonised RIS in the Community”⁹³.

The majority of representatives from diverse stakeholder groups at the RIS Week in Galați agreed that the RIS Directive has **led to the establishment of a harmonised, interoperable RIS to some extent**⁹⁴. As overarching indicator consisting of findings from Questions 1-4, interviewed stakeholders largely agree that progress towards the establishment of harmonised and interoperable RIS has been made, but that the RIS Directive has not yet reached its full harmonisation potential. The degree of harmonisation differs **depending** on the different **RIS technologies**, with most harmonisation in type-approval of RIS equipment and electronic navigational charts, slightly less in data for navigation and planning and notices to skippers, and the least harmonisation in electronic ship reporting.

Despite the **lack of full harmonisation**, stakeholders agree that **harmonisation of RIS** has been the strongest **benefit** brought about by the Directive, indicating that the **progress** made so far is **highly valued**⁹⁵. If the Directive and its associated technical standards are fully implemented in all Member States, it is highly likely that harmonisation will further improve.

5.1.5. Question 5: Compared to what would have happened in the absence of the Directive, in quantitative and qualitative terms, to what extent, has the Directive had unintended economic, social, or environmental effects?

There is **no** strong, reliable **evidence** to conclude that the RIS Directive has brought about unintended positive effects. However, there are **indications** derived from qualitative assessments of stakeholders that it may have led to the following:

- **Unintended economic effect:** creation of new opportunities in the context of market developments such as (semi)-autonomous sailing. According to four interviewees from the public and private sectors, the RIS Directive paved the way for innovation in inland navigation. At the RIS Common Issues meeting in

⁹² This was mentioned by RIS authorities in Czechia, France and Slovakia

⁹³ Preamble (12), Directive 2005/44/EC

⁹⁴ 13 people believe it had “to a large extent”, 30 people “to some extent” and 10 people “to a limited extent”. Only 1 person believes the RIS Directive had not been successful in this at all. See Question 2 in section 8.1, Annex 4 “Findings from the events attended” to the Stakeholder Consultation Report.

⁹⁵ See section 6.5 on EU added value (EQ 20), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

Galati with representatives of diverse stakeholder groups, the audience poll confirmed that the Directive created “new and interesting opportunities”⁹⁶.

- **Unintended social effects:** creation of high-tech working places, the expansion of educational programmes to include RIS technologies, and the political salience of the inland navigation sector, within and beyond Europe. Three public sector interviewees at national and international level stated that the Directive had indirectly (i.e. through its promotion of the use of RIS), led to the creation of new educational programmes for students, that now include training on AIS and ECDIS. Two interviewees from RIS authorities in the Danube and the Rhine region stated that the Directive also created political awareness in some countries where inland navigation was not high priority in transport policy. However, they did not indicate that this was the case in their country, rather speculating that this might have occurred elsewhere in Europe.

There is no indication of unintended positive environmental effects of the RIS Directive. Consulted stakeholders did not highlight any positive environmental effects of the Directive beyond those that were intended or expected.

5.1.6. Question 6: At the level of its general objectives and compared to what would have happened in the absence of the Directive, to what extent (in quantitative and qualitative terms) has the Directive contributed to (a) **increased competitiveness** of the inland waterway sector across Europe; (b) an **optimised use** of existing **infrastructures**; (c) **improved safety** in river navigation; (d) **reduction** of the sector's **negative impacts on the environment**?

(a) Competitiveness

Competitiveness is expected to **improve through** the time and money saved by waterway users as a result of **better voyage planning, efficient ship loading** based on current fairway conditions, and **interoperability** with the full supply chain and other modes of transport in Europe.

The **econometric modelling**⁹⁷ as part of the evaluation support study⁹⁸ could **not prove** that the RIS Directive had an **impact** on the performance or growth of the inland navigation sector. Although there has been a positive trend in the growth of the inland waterway transport sector since the adoption of the RIS Directive, there is no significant evidence to show that the RIS Directive influenced this trend. Despite the fact that there is no quantitative evidence, some stakeholders believe the RIS Directive has affected the competitiveness of the sector to some extent. Eleven interviewees⁹⁹ believe the RIS Directive has influenced the competitiveness of the inland navigation sector to some extent. However, some of them think this effect is indirect, or not solely attributable to the Directive. Only two interviewees believe the RIS Directive has not had any positive

⁹⁶ See Question 8 in section 8.1, Annex 4 “Findings from the events attended” to the Stakeholder Consultation Report.

⁹⁷ The model was based on the total tonne.km transport quantity in the Netherlands, Belgium and Germany for the dry cargo sector. Although this does not allow for generalisation at the EU level, these countries constitute a large share of the market.

⁹⁸ See Annex 5, Final Report – Technical Annexes

⁹⁹ Including three RIS Expert Group chairpersons, two RIS authorities, two River Commissions, two international organisations and two RIS developers.

impact on the competitiveness of the sector. One of them is a private sector interviewee who was particularly concerned with the limited competitiveness of IWT in his country, and one was a public sector interviewee that believes RIS would have developed at the same pace without the Directive. Five other interviewees think the harmonisation brought about by the RIS Directive has improved the sector's competitiveness, compared to what could have been achieved by Member States or River Commissions¹⁰⁰.

The intended **increase in competitiveness** of the sector compared to other modes of transport has **not been achieved**, as the modal share of the sector has remained stable since 2005, consistently accounting for not more than 6.9% of total freight transport in Europe¹⁰¹. Stakeholders are hopeful that the Directive can have an impact on this shift in the future, when river information services are fully implemented.

(b) Use of infrastructure

Very **limited evidence on the use of infrastructure** is available, which makes it impossible to prove or disprove whether the RIS Directive optimised its use. RIS authorities were asked to provide details on lock, bridge and fairway utilisation, but no conclusive data was received. There is also no consensus in their qualitative assessments if utilisation has changed as a result of the RIS Directive, indicating that it is difficult to estimate without concrete data¹⁰².

Although twelve interviewees **believe** that the **use of existing infrastructure has been optimised**, it seems that RIS is not yet used for more efficient lock planning in most Member States¹⁰³. In many cases, locks operate on a first come - first serve basis, which simply does not allow for any advanced slot planning. Although user associations and RIS developers acknowledge a potential benefit, none of them indicated it was indeed happening in their Member State.

Nevertheless, three user representative organisations and two RIS developers do acknowledge the **potential for efficiency gains in the future**¹⁰⁴. Although not all of them believe the Directive specifically plays a role in this, one of them explained that work on lock and bridge **digitalisation will bring efficiency gains** in the context of the RIS COMEX project¹⁰⁵, which would not exist without the RIS Directive.

There are indications that there is a potential for RIS to achieve this, although in reality it has not promoted change in lock or terminal management in the Member States yet. The degree to which the Directive itself plays a role in this is unclear.

¹⁰⁰ See section 6.5 on EU added value (EQ 20), Annex 2, "Findings from the interviews" of the Stakeholder Consultation Report.

¹⁰¹ See more details in section 6.2.2.1 "Modal share" in Annex 6 "Ex-post social cost-benefit analysis", Final Report – Technical Annexes

¹⁰² See section 5.2.9, Annex 1 "Findings from the survey questionnaires" to the Stakeholder Consultation Report

¹⁰³ See section 6.1 on optimised use of infrastructures (EQ 6), Annex 2, "Findings from the interviews" of the Stakeholder Consultation Report.

¹⁰⁴ Idem

¹⁰⁵ RIS COMEX (until 2021) is a CEF funded multi-Beneficiary project of 13 European countries for the implementation and sustainable operation of Corridor RIS Services. RIS COMEX will realise a single point of access to RIS for private and governmental users. (<https://www.riscomex.eu>)

(c) Safety and security

Safety

This Directive was expected to reduce accidents and thus to increase safety through better information. There is **no statistical evidence** available to show that there has been a **decrease in the number of accidents** (and thus an increase in safety) over the 2005-2019 period, let alone that the RIS Directive played a role in this¹⁰⁶. Accident data is not measured consistently across countries and over time, so it is likely to be inaccurate. No legislation exists so far for the collection and publication of inland waterway accident statistics at EU level¹⁰⁷.

There are **qualitative indicators** that the RIS Directive has nevertheless had a positive impact in this regard. The overwhelming majority of the **stakeholders** consulted, both public and private, **believe** the RIS Directive had a **positive impact on safety**¹⁰⁸. Of the fifteen waterway users and their associations consulted, eleven specifically highlighted an improvement in the degree of safety because of the RIS Directive. They explain that they feel safer because they are quickly made aware of threats to safe navigation, can use AIS to see other vessels and avoid collisions, and use electronic charts with the necessary details about the fairway to avoid collisions with infrastructure. A similar pattern emerged in the public consultation, where 42 respondents believe the RIS Directive to have contributed to enhanced safety in inland navigation¹⁰⁹. Not all stakeholders are convinced that this change is attributable to the RIS Directive rather than RIS as such.

Data Security

There are indications that Member States revisited their approach to data security because of the RIS Directive. Three interviewed RIS authorities¹¹⁰ specifically mentioned that the **RIS Directive had an impact on their legal approach** to data safety and security. Twenty respondents to the public consultation believe that data protection and data security is taken seriously enough in the RIS Directive, while eleven believe it is not¹¹¹. A main point of concern relates to websites¹¹² publishing vessel information originating from AIS and offering services that are in complete opposition to the Directive's articles concerning data protection and re-use of public information. Paired with the evidence collected in the context of Question 2 (i.e. the lack of international data exchange because of data protection concerns) this indicates that there is room to further streamline approaches to data security and protection and to improve GDPR enforcement¹¹³.

¹⁰⁶ See section 6.2.2.3 “Accidents” in Annex 6 “Ex-post social cost-benefit analysis”, Final Report – Technical Annexes

¹⁰⁷ Kriedel, N. (2019), Accidents and accidentology in inland navigation - existing and future data collection and analysis, Statistics and Market Observation, Central Commission for the Navigation of the Rhine (CCNR), findings presented on IVR congress in 2019, 21 p.

¹⁰⁸ See section 6.1 on improved river safety (EQ 6), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report.

¹⁰⁹ See Figure 7, page 64

¹¹⁰ Austria, Bulgaria, the Netherlands

¹¹¹ See Figure 14, page 69

¹¹² E.g. vesselfinder.com, marinetraffic.com and others

¹¹³ Communication from the Commission to the European Parliament and the Council, Data protection as a pillar of citizens' empowerment and the EU's approach to the digital transition - two years of application of the General Data Protection Regulation (COM/2020/264 final)

(d) Increased environmental protection

Although not directly attributable to a single RIS technology alone, there are quantitative and qualitative **indications** that the use of RIS has **reduced fuel consumption**, and thereby **reduced emissions and pollution**¹¹⁴. Thirteen interviewed stakeholders from the public and private sector acknowledged that RIS might lead to reduced fuel consumption through improved lock management and planning¹¹⁵. However, it is unclear whether this is directly attributable to the RIS Directive.

Interviewed stakeholders also acknowledged **environmental protection through more efficient calamity abatement** as a potential way for the RIS Directive to bring about positive change¹¹⁶. If information about a ship (i.e. through electronic ship reporting) is known, calamity abatement will be faster and more efficient, which can also reduce the impact an accident has on the environment. According to 29 respondents to the public consultation, calamity abatement has indeed improved since the introduction of the Directive¹¹⁷.

Nevertheless, the lack of solid evidence of a decrease in accidents resulting from the RIS Directive, and the lack of international exchange of electronic ship reports makes it unlikely that the RIS Directive had any significant impact in this regard.

¹¹⁴ See section 6.2.2.5 “Energy consumption” in Annex 6 “Ex-post social cost-benefit analysis”, Final Report – Technical Annexes

¹¹⁵ See section 6.1 (EQ 6), Annex 2, “Findings from the interviews” of the Stakeholder Consultation Report

¹¹⁶ Idem

¹¹⁷ See Figure 9, page 67

5.2. Efficiency

5.2.1. Question 7: What **costs/negative impacts** have been associated with the **preparation** of the **relevant Regulations** and how are they distributed amongst those involved? (excluding the comitology process for adopting Implementing Acts). Are there areas, including organisational aspects, with potential for efficiency gains?

The **European Commission** incurred costs associated with the preparation of the RIS Directive and associated Implementing Acts. The preparation of the RIS Directive itself reportedly involved one full time employee (FTE), and the preparation of the original Implementing Acts involved 1.5 FTE. It is difficult to establish whether the costs incurred were proportionate or disproportionate to the achieved overall benefits of the Directive, as it is hard to determine what proportion of the benefits accrues to this step of the process. There is no evidence, however, that there had been potential for efficiency gains specifically in this early part of the process.

The preparation of the Implementing Acts was done in cooperation with four **independent technical RIS expert groups**¹¹⁸. Costs for the products of these expert groups largely incurred for the members of the groups, comprising mainly public sector organisations. From 2015 until 2019, the Commission provided technical and administrative support to the RIS expert groups through an external contractor. Since the beginning of 2020, these expert groups work under the umbrella of CESNI, where the European Commission bears the majority of costs. Most interviewees, when asked this question, discussed the costs and inefficiencies associated with the implementation of the RIS Directive and Implementing Acts, rather than the preparation thereof. However, in conjunction with Question 13, six public sector interviewees commented on the **slow speed** of the European Commission **in adopting and revising the Implementing Acts** under the Directive¹¹⁹.

The **Member States** incurred costs associated with the preparation of the Implementing Acts, though it is unclear how much time and money was exactly spent on this. EU and non-EU Member States¹²⁰ respondents estimate an average of 4.5 FTE for the preparation of the implementing acts. Only three countries¹²¹ provided an indication of the monetary costs associated with this process, ranging from EUR 9,000 to EUR 40,000. This is an insufficient data sample to extrapolate to the European Union and over the evaluation period. However, there are indications that their **costs were not disproportionately high**: All six RIS authorities that provided input via the questionnaire indicated that there were no disproportionate costs.

Possible efficiency gains (relevant for the Commission's REFIT programme) through a simplification of the process through which updates to the union-wide specifications are being conceived are discussed further in Question 13.

¹¹⁸ Inland ECDIS expert group, ERI expert group, NtS expert group and VTT expert group

¹¹⁹ See section 6.2 on costs compared to benefits (EQ 13), Annex 2, "Findings from the interviews" of the Stakeholder Consultation Report

¹²⁰ Belgium, Austria, Slovakia, Czechia and Serbia

¹²¹ Czechia, Romania and Serbia

5.2.2. Question 8: What costs/negative impacts has the Directive given rise to in order to advance resource planning of users of the inland waterways through improved (a) data for navigation and planning, (b) electronic navigational charts and (c) notices to skippers? How do these compare to the benefits established?

(a) costs/negative impacts related to data for navigation and planning

RIS authorities incur substantial one-time **implementation costs** associated with making data for navigation and voyage planning available to waterway users. Five RIS authorities¹²² provided information on **one-off costs** for making data for navigation and planning available to comply with the RIS Directive. There is no consensus on the change in costs; two authorities reported a “*significant*” increase in costs, one a “*small*” increase, and two believe costs “*remained stable*”. Interviews further clarified that the one-off investment costs were relatively high due to the need to invest in human resources and software, as well as in new measurement systems in some cases¹²³. Reported one-off costs range from EUR 600,000 to EUR 2.9 million. As cost estimations were only provided by five authorities and vary considerably, it is not possible to reliably extrapolate this to estimate the total costs associated with making data for navigation and planning available across all Member States. Despite a lack of comprehensive cost data, the above indicates the RIS Directive has likely led to increased costs in this regard in the magnitude of several hundred thousand euros.

RIS authorities also **incur annual, ongoing costs** associated with keeping data up-to-date and accessible to users. Three out of the four RIS authorities who provided input through the questionnaire indicated that they incurred annual ongoing costs¹²⁴. Reported annual recurring costs range from EUR 17,000 to EUR 179,000. It is unclear, however, based on the limited evidence available, whether these costs increased or decreased over time. External factors, such as the costs of individual service providers and software in different Member States, are likely to influence this, making an EU-wide comparison difficult. Users of the waterways do not incur any one-time or annual ongoing costs in relation to data for navigation and planning, because the **data** is made available to them **free of charge**.

Four RIS authorities¹²⁵ believe that the costs are proportionate to the overall benefits but did not provide any additional evidence. Paired with the benefits accrued to them (i.e. better voyage planning resulting from more accurate and timely information), this implies that **benefits outweigh costs**. 11 out of the 13 public authorities who provided input to the public consultation believe the provision of data for navigation and planning requires “*medium effort*” to “*high effort*”, but that compared to the benefits this “*effort is adequate*”¹²⁶. There is no indication of social or environmental costs or resulting from the provision of data for navigation and planning.

¹²² From Austria, Belgium (Flanders), Czechia, Romania and Slovakia

¹²³ See Question 46 and Question 47 in section 5.2.6., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

¹²⁴ Idem

¹²⁵ Austria, Belgium (Flanders), Czechia, Romania

¹²⁶ See Figure 10 and Figure 11, page 67

(b) costs/negative impacts related to electronic navigational charts

Although not required by the RIS Directive, all RIS authorities make the charts available free of charge. RIS authorities incur **substantial one-time investment costs** associated with making electronic navigational charts available. Five out of six participants responded to this question through the questionnaires. Public sector respondents from five Member States¹²⁷ indicated that they incurred one-time costs associated with making electronic navigational charts available, notably through costs associated with investments in additional software tools or application development. Limited details on actual magnitude of the costs incurred were provided¹²⁸. Reported costs range from EUR 6,000 to EUR 1.5 Million¹²⁹. Although limited quantitative evidence is available, and the available data cannot be generalised across investment cases, it is reasonable to assume that these costs are substantial in all Member States.

After the initial investment, RIS authorities incur **annual ongoing costs** associated primarily with the updating of electronic navigational charts. This also implies that staff needs to be trained to create the charts, which costs time and money. Four out of six public sector organisations responded to this question¹³⁰: Three RIS authorities indicated they incurred ongoing costs related to electronic navigational charts as a result of the RIS Directive, ranging from EUR 4,200 to EUR 11,000 on average per year. According to the authorities in Austria, Czechia and Slovakia, costs for making electronic navigational charts available have increased somewhat over time. Austria specified, however, that this is not the result of the Directive, but rather technological evolutions in the production of the charts. In fact, they believe the **standardisation** of the charts through the RIS Directive **has lowered costs** throughout Europe due to harmonisation. Authorities in Belgium and Romania agree that costs decreased over time, as the initial production of charts is much more costly than keeping them up-to-date. The evidence obtained cannot be generalised across countries, because costs vary substantially, depending on the density of the national waterway network and the update rate of electronic navigational charts.

In summary, despite the substantial costs incurred by RIS authorities in making electronic navigational charts available, there are **strong indications that the costs are outweighed by the benefits** accrued to the sector as a whole, when considered together with the benefits reported in Question 1 (b2). None of the RIS authorities consulted through the interviews and targeted questionnaire believe costs associated with making charts available are disproportionately high. In the public consultation, three of them indicated that their provision required a *“high effort overall, considering benefits”*, although they did not specify whether this effort is disproportionately high. RIS authorities from ten countries¹³¹ specifically indicated, through the questionnaire, public consultation and interviews, that the benefits outweigh the costs. This was confirmed at the DINA Expert Group meeting, where all 15 participants agreed with this finding¹³².

¹²⁷ Primarily from the Danube region, except Belgium (Flanders)

¹²⁸ See Question 23 and Question 24 in section 5.2.4., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

¹²⁹ Based on an interview with the RIS authority in the Netherlands

¹³⁰ Austria, Belgium (Flanders), Czechia and Slovakia

¹³¹ Austria, Belgium, Bulgaria, Croatia, Czechia, France, Germany, Romania, Serbia, and Slovakia

¹³² 11 participants agree with the preliminary finding that the benefits of electronic navigational charts outweigh their costs, and 4 strongly agree. None of the participants disagreed with this finding. See Figure 217 in section 8.2, Annex 4 “Findings from the events attended” to the Stakeholder Consultation Report

This is substantiated by the fact that the **costs incurred by waterway users are marginal**. Through the questionnaire, a total of four user associations and two skippers indicated not having incurred any costs additional to what they would have spent in the absence of the RIS Directive¹³³. They need to invest in the necessary hard- and software to be able to use the charts for navigation, but those costs are low. All consulted users and their associations believe the **benefits outweigh these costs**.

No evidence of unintended social or environmental costs or negative impacts produced by the RIS Directive in the context of electronic navigational charts has been uncovered. None had been expected.

(c) costs/negative impacts related to notices to skippers

RIS authorities incurred **one-off compliance costs** for the software necessary to encode notices to skippers, or setting up a website for dissemination. Although there are countries where notices to skippers were already being provided digitally prior to the adoption of the RIS Directive (e.g. Belgium, Netherlands), changes needed to be made to bring the notices fully in line with the requirements of the Directive. As only four RIS authorities¹³⁴ provided one-off costs data, ranging from EUR 70,000 to EUR 422,000 from 2005 until 2019, a reliable generalisation of costs across all countries is not possible¹³⁵.

RIS authorities incurred **limited implementation costs on an annual basis**, ranging from EUR 1,000 to EUR 10,200. This includes software updates, as well as time and money spent making notices to skippers available. The former is considered negligible because most Member States were already providing them (albeit in paper format) prior to the adoption of the Directive. Such costs are incurred occasionally, when technical standards are updated. Although all Member States were asked to provide such data, limited year-on-year data was provided¹³⁶. The provided data is not comparable across countries and can therefore not be generalised across all relevant Member States. This is reportedly because RIS authorities do not distinguish between the time and money spent specifically on the provision of standardised notices to skippers compared to other RIS-related activities. Even if this data was adequately collected and made available, it is unlikely that it could be attributed to the RIS Directive as such, as that would require a comparison to costs incurred before its implementation.

Despite the lack of concrete quantitative data, some **indications on changes in costs** were provided. Among the six authorities that returned the questionnaire with an indication of costs for notices to skippers, three¹³⁷ believed the overall costs associated with the provision of notices to skippers had *“increased somewhat”* as a result of the RIS Directive, one believed they had *“increased significantly”*¹³⁸, and one believed they *“remained stable”*¹³⁹. They indicated that administrative costs decreased (due to digitalisation), while operational costs (e.g. software to publish notices online, keeping

¹³³ See Question 29 in section 5.3.3., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report.

¹³⁴ Austria, Belgium (Flanders), Czechia, Romania

¹³⁵ See Question 35 in section 5.2.5., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

¹³⁶ See Question 35 and Question 36 in section 5.2.5., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

¹³⁷ Romania, Slovakia, Czechia

¹³⁸ Belgium (Flanders)

¹³⁹ Austria

up with changing standards) increased. RIS users did not incur any additional costs as a result of the RIS Directive, as notices to skippers are made **available** to them **free of charge**.

Although there are costs for RIS authorities, all of them believe the **benefits** of standardised notices to skippers **outweigh their costs**. All six questionnaire respondents¹⁴⁰ believe that the costs for providing notices to skippers are proportionate to the benefits they bring to the inland navigation sector. In interviews, three of them¹⁴¹ further explained that this is because the costs are marginal, and yet notices to skippers are widely used by skippers. Although this is a limited number of interviewees, nobody indicated that costs are disproportionate to benefits. Of the 34 respondents to the public consultation, 27 ranked notices to skippers as the RIS technology for which the effort needed is most appropriate considering its benefits, with only two of them indicating the effort is high in comparison to the benefits¹⁴². This, combined with the evidence outlined under Question 1(c) makes it safe to assume that authorities and users highly value the standardised notices to skippers and believe their implementation is cost-effective.

No evidence of unintended negative social or environmental impacts or costs resulting from standardised notices to skippers in the context of the RIS Directive were identified. None had been expected.

5.2.3. Question 9: What costs / negative impacts has the Directive given rise to in order to advance cost savings through the reduction in **re-submission of electronic ship reports** when crossing a border? How do these compare to the benefits established?

RIS authorities incurred **one-time investment costs** related to setting up the necessary systems for receiving and processing electronic ship reports¹⁴³. Although none of the consulted authorities could provide a breakdown of the costs associated with receiving, processing and passing on electronic ship reports, there are some indications of the total costs associated with this process in four of the relevant Member States¹⁴⁴, ranging from EUR 260,000 to EUR 480,000 from 2005 until 2019. There seems to be no clear pattern across Member States in terms of the magnitude of these costs.

There seem to be **no significant recurring annual costs** that result specifically from provisions on electronic ship reporting, ranging from EUR 1,500 to EUR 2,000 in the year 2017 for the two RIS authorities¹⁴⁵ that provided input to this question. Three RIS authorities believe their costs “*remained stable*” over time, while one experienced a “*small increase*” and one a “*significant increase*”¹⁴⁶. A RIS authority in Flanders, who believes costs remained stable over time, detailed that recent investments in digitalisation will lead to cost savings in the future. This trend seems to be in line with the general view held by authorities – considering the limited data exchange between countries and the

¹⁴⁰ Austria, Belgium (Flanders), Czechia, Romania, Slovakia, Serbia

¹⁴¹ Czechia, Slovakia, Serbia

¹⁴² See Figure 11, page 67

¹⁴³ This was highlighted by authorities in Austria, Czechia, France, Luxembourg, the Netherlands, Romania, and Slovakia

¹⁴⁴ Austria, Belgium (Flanders), Czechia and Romania; see Question 57 and Question 58 in section 5.2.7., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

¹⁴⁵ Reported by Belgium and Romania

¹⁴⁶ Stated by Austria and Slovakia

inefficiencies brought about as a result, there is **considerable room to further reduce resubmissions** and thereby **save time and costs** for public authorities.

As presented under Question 2, users of the waterways are **expected** to experience **cost savings** because of **reduced resubmissions** of electronic ship reports. As resubmissions have not reduced in reality, these cost savings seemingly have not materialised yet.

In principle, there are **no substantial costs** associated with the **electronic ship reporting on the side of RIS users** – they only need a computer with internet access, which they likely have on board already and do not need to invest in specifically to comply with the RIS Directive. The costs savings are *supposed* to result from time saved by (1) submitting ship reports in an electronic format, and (2) this format being standardised so reports can be shared across relevant Member States so the originator of the report does not have to submit the information more than once.

According to four interviewees, **costs for skippers have decreased** as a result of the Directive because their administrative burden decreased. However, three of them represent RIS authorities and one is a RIS developer, so they may not be well-informed. In reality, most consulted waterway users and their representative organisations did not experience time savings as a result of the RIS Directive in this regard. Three private sector associations and an interviewee from a river commission, for example, stated that the **administrative cost have** in fact **increased**¹⁴⁷ because skippers need to resubmit e-ship reports more than once. An **increase in costs** in this respect **cannot be attributed to the RIS Directive**, as it does not make reporting mandatory for waterway users, and does not stipulate the type of information requested from them, which is left to the Member States themselves.

It is **unclear** whether the RIS Directive, through its provisions on electronic ship reporting, has created **benefits that outweigh the costs**. The six consulted stakeholders are divided – three RIS authorities from the Danube region believe their costs are proportionate to the benefits, while Belgium (Flanders) and Czechia do not¹⁴⁸. One RIS authority does not know. However, there is an **issue of attributability**, as the requirements for electronic ship reporting are largely left up to the Member States and the River Commissions.

There is **no evidence** suggesting the RIS Directive brought about any unintended **social or environmental costs or negative impacts** concerning the provisions on electronic ship reporting. On the contrary, it can be speculated that the digitalisation of ship reporting should reduce the amount of paper used in inland navigation, which would positively affect the environment.

¹⁴⁷ This is likely the result of the electronic reporting obligation on the Rhine for container ships since 2010. Hence, this is not attributable to the RIS Directive. See section 6.2., Annex 2 “Findings from the interviews” to the Stakeholder Consultation Report.

¹⁴⁸ See Question 63 in section 5.2.7., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

5.2.4. Question 10: What costs/negative impacts has the Directive given rise to in order to advance cost savings for users of the inland waterways brought about by changes in the way **equipment is type approved**? How do these compare to the benefits established?

The mutual **recognition of type-approved equipment** ensures a RIS related technical product only needs to be certified once to be used all across Europe, which is **beneficial for the market as a whole**.

As assessed under Question 3, there is only **one body in the EU issuing type approvals** for RIS equipment¹⁴⁹. Thus, they are the only ones who incur costs for issuing type approvals. Considering the fact that mutual recognition works well (see Question 3), other RIS authorities should not incur any additional costs. The consulted RIS authorities indeed indicated **not having occurred any one-time or recurring costs**¹⁵⁰, because they don't carry out their own type-approvals. On the contrary, they benefit with regards to the opportunity costs of not having to issue their own type-approvals themselves.

Due to a lack of data, there is **no evidence** to suggest that **RIS authorities have saved costs** through the mutual recognition of type-approved RIS equipment as established by the Directive. Although one authority believes this is the case, it is unlikely that cost savings have actually occurred, as these authorities would never have carried out their own type-approvals anyway.

Type-approval does imply **one-time costs for the private sector** that has to get the equipment type-approved. One RIS equipment producer estimated this to cost at around 5000 EUR per product. As no other interviewees could provide estimations of these costs, no quantitative evidence is available for a detailed assessment.

Given the fact that type-approvals are mutually recognised across Europe, all equipment only needs to be certified once. Developers save costs otherwise spent ensuring their product is approved in all Member States, which would in turn drive up costs for consumers. Given that RIS developers believe that **mutual recognition** of type-approved equipment has been **beneficial to the sector** as a whole (i.e. improved quality of products that is guaranteed to work across Europe, which safeguards investments, see Question 3), it can be assumed that they believe these **costs are outweighed by the benefits**.

There is **no evidence to suggest any unintended social or environmental costs** or negative impacts resulting from changes in type-approval as a result of the RIS Directive.

5.2.5. Question 11: What costs/negative impacts has the Directive given rise to overall in order to **establish an inter-operable, harmonised RIS**? How do these compare to the benefits established?

The establishing of a harmonised, interoperable RIS implies costs both for RIS authorities and users of the waterways. This section considers how the overall costs compare to the benefits achieved, at the level of the RIS Directive as a whole. Thus, it serves as a summary of Questions 8-10, with the addition of findings that apply to the

¹⁴⁹ Wasser- und Schifffahrtsverwaltung des Bundes, Fachstelle der WSV für Verkehrstechniken (FVT) in Germany

¹⁵⁰ See Questions 75 to 91 in section 5.2.8., Annex 1 "Findings from the survey questionnaires" to the Stakeholder Consultation Report

Directive more generally, rather than one of its components. This question presents a qualitative assessment, and is complemented by an attempt to assess costs compared to benefits quantitatively at the level of general objectives in Question 14.

It was found that the **costs** of RIS implementation **cannot be estimated** at the level of the RIS Directive as a whole. As detailed under Questions 8, 9 and 10, there is very **limited evidence** as to the **costs** associated with the implementation of the different aspects of the RIS Directive. In many cases, RIS authorities are unable to distinguish between the overall costs related to the implementation of the RIS Directive, let alone distinguish between costs associated with RIS as such and the RIS Directive specifically. As a result, the very limited quantitative evidence that was made available cannot be aggregated as it is too incomplete and not comparable, and neither can it be generalised to the level of the RIS Directive as a whole.

A **qualitative assessment** of the overall efficiency (i.e. costs compared to the benefits) of the RIS Directive has been undertaken¹⁵¹. It was found that benefits appear to outweigh costs incurred by RIS authorities. In the questionnaire, RIS authorities were asked to indicate the main benefits and costs associated with the implementation of the RIS Directive as a whole. The most often cited benefits of the Directive as a whole were as follows¹⁵²:

- harmonisation of equipment that can be used all over Europe through common technical standards;
- improved safety in inland navigation, including through a reduction in accidents;
- availability of fairway information;
- improved awareness and political salience of RIS;
- creation of a legal framework to justify costs and investments.

In terms of **negative consequences**, only two of the six RIS authorities provided input. They highlighted a lack of harmonisation and occasionally outdated standards, as well as the lacking legal basis for international data exchange as problems. One RIS authority explicitly noted that there were no negative consequences.

Three out of six **RIS authorities** indicated that the benefits outweigh their costs. Two believe that costs are instead disproportionate to the benefits, and one respondent chose the “*do not know*” option¹⁵³. Considering the fact that the individual measures of the Directive are considered as being overall efficient (as discussed under Questions 8, 9 and 10), it can be concluded that RIS authorities **believe the benefits of the RIS Directive outweigh its costs**.

Concerning the inland waterway users, benefits largely outweigh their costs. In the questionnaire, inland waterway users and their representative organisations were asked to

¹⁵¹ A quantitative assessment of costs compared to benefits at the level of the general objectives of the RIS Directive is included under EQ 14

¹⁵² See Question 15 in section 5.2.3., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

¹⁵³ See Question 17 in section 5.2.3., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

indicate the main benefits and costs they believed to be brought about by the RIS Directive. The most often cited benefits were as follows¹⁵⁴:

- improved safety;
- better access to information;
- better communication;
- improved planning and management;

Two of them also specifically mentioned reduced costs as one of the benefits of the Directive. However, two others indicated that costs had increased because of the Directive, as initial investments were required. Nevertheless, the fact that the costs for waterway users at the level of the different inputs are marginal, and their benefits are substantial, it is safe to conclude that the benefits for waterway users largely outweigh their costs.

In summary, there are strong indications that the **overall costs the Directive** has given rise to in order to establish inter-operable, harmonised RIS **are outweighed by the benefits** accrued to the sector as a whole.

5.2.6. Question 12: Has the Directive had **unintended negative economic, social or environmental **effects**?**

Similar to Question 5, it is possible that additional *unexpected* negative effects occurred through the RIS Directive. This question assesses whether any such unintended effects, notably negative economic, social or environmental effects occurred.

No evidence was found of **unintended negative economic effects** brought about by the RIS Directive.

In terms of **unintended negative social effects** by the RIS Directive, consulted stakeholders provided a number of examples.

Three interviewees¹⁵⁵ highlighted **data protection issues** that come with digitalisation of the sector, e.g. illegal online vessel tracking. One of them explained that digitalisation makes the sector more vulnerable to cyberattacks and blackouts. In turn, they believe this negatively affects the reputation of the sector, though there is no concrete evidence to back up this claim. The possibility of negative effects on the privacy of skippers and the availability of sensitive information as a result of RIS were already identified in the 2006 SPIN-TN assessment of RIS implementation¹⁵⁶, though it was not quantified or estimated.

Another negative social effect following digitalisation in inland navigation through RIS mentioned by two interviewees is the **possible deskilling** of skippers and boat masters. They believe the RIS technologies have become unmissable in skippers' lives, especially for younger people, which can lower resilience and create problems if something is not working or e.g. electronic charts are not up to date. According to one interviewee, this is intensified by the fact that the RIS Directive only applies to waterways of CEMT class

¹⁵⁴ See section 5.3.2., Annex 1 "Findings from the survey questionnaires" to the Stakeholder Consultation Report

¹⁵⁵ One RIS authority, one international organisation and one user representative organisation

¹⁵⁶ viadonau, Assessment of the Implementation of River Information Services in Europe. Working Paper, 2006, p. 18.

IV and above, which can lead to a decrease in safety and efficiency on smaller waterways because many people no longer can sail without technology on board.

There is no concrete evidence on this increased risk, however, experiences of sectoral stakeholders are highly relevant in this regard and future evaluations could revisit the risk.

No evidence was found of any **unintended negative environmental effects** brought about by the RIS Directive.

5.2.7. Question 13: Is there a potential for simplification and reduction of regulatory burden in the process?

This question assesses the extent to which there are any unnecessary costs associated with the implementation of the RIS Directive, and identifies ways in which these can be minimised or simplified. Although not directly covered in the question, the administrative costs associated with implementing the Directive, both for RIS authorities and RIS users, are also covered here.

Most RIS authorities believe there are **no disproportionate administrative costs** associated with the implementation of the RIS Directive. Three authorities believe the costs have been substantial but state that they are not disproportionate to the outcomes. They highlighted costs associated with changing national regulations, the need for RIS experts, internal coordination and coordination with other countries in case of cross-border voyages. One national authority from outside of the EU expects the administrative costs to increase further with the introduction of CESNI working groups, while another authority from an EU Member State expects costs to decrease because of further advancements in digitalisation.

Nevertheless, there is a widespread agreement among authorities that there is **administrative burden that can be further reduced**. The most notable bottleneck is found in international data exchange. As detailed under Questions 1 and 2, there is still a lack of cross-border data exchange, e.g. for electronic ship reporting. If this exchange is facilitated, it is expected to save the authorities time currently spent receiving and processing the information.

A suggested possible solution to this may be to **re-use public sector information** and **improve access to private sector data for public authorities** with a view to lowering the administrative burden of collecting and analysing necessary data¹⁵⁷. Four different authorities highlighted a need to work together across borders through projects and potentially a single portal to share data and information.

A similar pattern emerges on the side of **waterway users**. They were divided on the degree to which the RIS Directive affected their **administrative costs** – four skippers did not experience any change, while two experienced an increase in costs and two a decrease in costs. Those who noted a decrease in administrative costs detailed that this was the result of less administrative paperwork. An increase in costs was associated with

¹⁵⁷ See COM(2018) 232 final – Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Towards a common European Data Space” and “Good Navigation Status – towards achieving a Good Navigation Status” (EU Commission – STC-Nestra) January 2018.

spending on new equipment, training to be able to use the equipment, and time spent on cargo declaration.

Although six interviewed **user representative organisations** believed there is **no disproportionate administrative burden**, they mentioned there is room for **simplification** (e.g. for multiple reporting, booking slots at locks, and paperwork). The identified underlying problems are the existing ‘declaration-based’ reporting system, limited cross-border data exchange and the limited re-use of data by authorities¹⁵⁸. However, the issue of data exchange may be difficult to address through the RIS Directive. Rules on voyage, cargo and persons-on-board reporting are left up to the Member States and River Commissions, which is why different requirements persist.

A clear potential for reduction of **regulatory burden** emerges from the **slow update and adoption process of technical standards**. There seems to be agreement among stakeholders that the RIS Directive suffers from a **lack of flexibility and slow implementation**¹⁵⁹, in that it takes a long time for technical standards to be updated, which is not in line with the speed of digitalisation and technological advancements. According to one RIS authority: “The procedure for the updating of the technical specifications is much too complicated and the Commission has not been able to publish the specifications within the timeframe defined by the Directive. A simplified and faster procedure is urgently needed”. As a consequence of this slow update and adoption process, the sector permanently works with **outdated standards**, which **hinder its competitiveness** compared to other modes of transport. This imposes a cost on the sector that likely could be reduced through changes to the process. This finding on a potential for simplification is particularly relevant in the context of the **European Commission’s effort to reduce unnecessary burden and simplify EU law** (REFIT programme).

5.2.8. Question 14: What **costs/negative impacts** has the Directive given rise to in order to advance its **general objectives** and how do these compare to the benefits established under Question 6 (benefits-at level of general objectives)?

The evaluation did not attempt to produce a **cost** estimate of total RIS implementation costs **at an aggregated** level of its **general objectives**, as the underlying evidence base is too incomplete and too many strong assumptions would have had to be made. As the general objectives of the Directive (i.e. increase competitiveness, optimise the use of infrastructure, improve safety and security, and increase environmental protection) are long-term outcomes rather than direct results of investments, it is impossible to granulate the costs associated with their achievement specifically. Nevertheless, based on the total investment costs and the benefits established under Question 6, one can assess the overall cost-benefit ratio in this respect.

In order to carry out a cost-benefit analysis, benefits needed to be quantified and compared to the monetary costs incurred. However, not all expected benefits were supported by evidence (see Question 6) or could be identified by the available data. For instance, accidents at EU level could not be calculated and quantified because there is no

¹⁵⁸ European Commission (2017), Digital Inland Waterway Area - Towards a Digital Inland Waterway Area and Digital Multimodal Nodes.

¹⁵⁹ This was highlighted in interviews with two RIS authorities, two River Commissions, and a RIS developer. It was also highlighted in open text responses to the public consultation given by five respondents.

EU-wide methodology to monitor and report on such data, which makes an aggregation of national level data (which is also not available for all relevant Member States) highly unreliable.

Nevertheless, the benefits accrued by a reduction in fuel consumption and resulting reduction in emissions could be quantified¹⁶⁰, and have been used to inform the cost-benefits analysis.

There are **estimations** that the **RIS Directive** has **experienced a “return on investment”** considering the benefits to environmental protection, although attribution and causation are highly uncertain. With a total investment cost set at EUR 52.090.984¹⁶¹, and based on the assumptions that 40% of RIS users use their equipment for the purpose of fuel reduction and that there is an average annual fuel reduction of 1.86%, the cost-benefit ratio is 3.11197. This positive ratio holds true as long as at least 12% of all equipped vessels use the on-board RIS equipment for fuel consumption reduction. As soon as less than 12% of all vessels do this, the “business case” becomes negative, meaning that the total investment costs have not yet been outweighed by these benefits.

Although the other **expected benefits** (improved competitiveness, optimised use of infrastructure, and increased safety) could not be attributed to RIS or the RIS Directive, the fact that stakeholders believe there may be an impact is nevertheless relevant to consider. In the above assessment these additional possible benefits have been disregarded. As such, it can be assumed that the **positive “business case”** stemming from the “return on investments” produced by the improved environmental protection of RIS is further magnified **when considering additional benefits** such as increased safety and infrastructure use.

It should once again be noted that none of these benefits can confidently be attributed to the RIS Directive rather than RIS technologies as such. There is no doubt that the Directive has had a substantial impact on the use of RIS especially in those countries¹⁶², where inland navigation has played a less prominent role before the introduction of the Directive. However, it is impossible to prove that these advancements would not have occurred without the RIS Directive.

¹⁶⁰ See section 6.2.3 “Calculation of identified benefits” in Annex 6 “Ex-post social cost-benefit analysis”, Technical Annexes to the Evaluation Support Study.

¹⁶¹ This amount covers all projects since 1996 that were finished before 2009 and are considered crucial for the implementation of the RIS Directive. The number is based on data from TEN-T / CEF funding for RIS between 1995 and 2022, in EUR (current prices).

¹⁶² The Danube countries and Czechia and Poland

5.3. Relevance

5.3.1. Question 15: Do the **original objectives**, incorporated in the RIS Directive and in the five related RIS regulations, **match the needs of the sector** today and in the near future? Please take into account legal, technological and market developments.

The **overarching objective** of the Directive is “*to establish harmonised RIS in the Community*”¹⁶³, whereas “*the development of RIS should be based on objectives such as safety, efficiency and the environmental friendliness of inland navigation (...)*”¹⁶⁴. This should be fulfilled by implementation of tasks like “*traffic and transport management, environment and infrastructure protection and the enforcement of specific rules*”¹⁶⁵. Additionally, the RIS Directive established RIS “*with a view to enhancing safety, efficiency, and environmental friendliness and to facilitating interfaces with other transport modes*”¹⁶⁶. This would indirectly contribute to increase the competitiveness of inland navigation in Europe.

The evaluation shows that the **needs of the IWT sector** and the **RIS Directive’s objectives are aligned**. This was not only confirmed by several sources in desk research¹⁶⁷, but also by all stakeholder groups. Of the 38 interviewed stakeholders from different stakeholder groups, the overwhelming majority agrees that the RIS objectives are still relevant (37), and will remain relevant in the future (19). It appears that not all objectives are regarded as being equally important. Respondents¹⁶⁸ to the user questionnaire consider increased safety as being the most salient and relevant objective of the RIS Directive, followed by enhanced efficiency of inland navigation, optimised use of infrastructure and environmental protection. While safety is the primary need for skippers, efficiency is fundamental for port authorities and RIS operators. Several interviewees reported that the better integration of inland waterway transport into multimodal supply chains is a key objective, which will become more important in the future. Only three of the six questionnaire respondents considered this objective to be relevant¹⁶⁹.

The **objectives remain relevant**, notably because they have not been fully achieved. A considerable number of the stakeholders consulted believe that the objectives of the RIS Directive not only remain relevant for the future, but also **require a shift in focus** in order to be fully achieved. 13 out of 27 interviewees, both from the public and private sectors, mentioned this. Notable in this regard are the need for **further harmonisation** (12) and **standardisation** (4), as reported by both, interviewed RIS authorities and RIS users.

According to 28 out of 44 interviewees, **new needs** have emerged as a result of **technological developments**. Most notable are technological changes, such as the

¹⁶³ Preamble (12), Directive 2005/44/EC

¹⁶⁴ Preamble (6), Directive 2005/44/EC

¹⁶⁵ Idem

¹⁶⁶ Article 1 (1), Directive 2005/44/EC

¹⁶⁷ The complete list of documentary sources can be found in in Annex 3 of the Technical Annexes to the Evaluation Support Study

¹⁶⁸ The respondents include three vessel owners, a ship design and consulting company, a member of a port business association, and a skipper

¹⁶⁹ A vessel owner, a ship design and consulting company and a member of a port business association. See section 6.3, Annex 2 “Findings from the interviews” and question 98 in section 5.3.8., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report

automation of vessels (12), the further digitalisation in the IWT sector including the need for more and better data (17), and technical innovation of RIS related software and hardware (13). These technological advances require further cross-border cooperation and data exchange (5). In relation to the emergence of these new needs, several documentary sources and consulted stakeholders from the relevant Member States pointed to a key issue in the legal framework of the Directive: the RIS Directive leaves too much room for interpretation, and it is too slow to adapt to technological advancements. This in turn, is thought to prevent the Directive to fully achieve its current and future objectives, and therefore, to potentially lose relevance because of it¹⁷⁰. As also highlighted in Question 13, stakeholders consider the **process for updating technical RIS standards too heavy and slow**.

New needs have emerged as a result of **market developments**. An increase in political salience of RIS, and hence the development of the sector, has prompted the necessity to provide specific **training and education** on the new tools and technologies used in the sector. This need emerged through both desk research and questionnaires¹⁷¹. In parallel, new needs involving all transport modes have emerged. Green, smart and congestion-free transport and logistics are the key concepts on which the whole transport sector will be focusing. This is also stipulated by the **European Green Deal**¹⁷² communication of the European Commission. It is therefore essential that the IWT sector responds and adapts to these changes. A few initiatives have already emerged, calling for a single window enabling traffic, route, voyage and logistics planning. To summarise, in the coming years traffic management will **shift from safety management to an operational service that supports the logistic** transport chain in a more effective and efficient way¹⁷³.

The **RIS guidelines and technical standards are still relevant** and necessary but **need to be more flexible to keep up with new needs**. Most of the 44 respondents to the Public Consultation agree that the technical specifications for key RIS technologies (in order of magnitude: Inland ECDIS (39), Notices to Skippers (39), Inland AIS (37), Electronic Ship Reporting (37) and the RIS guidelines (34)) are still relevant and needed today, even in light of technological developments since 2005¹⁷⁴.

As outlined under Question 13, there are strong indications that the **technical standards are not updated quickly enough**, which may cause problems in terms of their continued relevance in the future because the sector constantly uses **outdated standards**. Additionally, as detailed by respondents to the public consultation, there may be scope to add **additional standards**, most notably with regards to **data for navigation and planning**¹⁷⁵. As discussed under effectiveness (EQ1a), the minimum requirements for the provision of this data are considered too vague, and lead to differences in interpretations across Member States. Introducing more detailed technical requirements (including provisions on the ERDMS), was suggested by stakeholders as a possible solution to this problem, as discussed under efficiency with reference to the REFIT programme.

¹⁷⁰ See section 6.3, Annex 2 “Findings from the interviews” to the Stakeholder Consultation Report

¹⁷¹ See Question 11 in section 5.3.2., Annex 1 “Findings from the survey questionnaires” to the Stakeholder Consultation Report.

¹⁷² The European Green Deal, COM(2019) 640 final, 11.12.2019

¹⁷³ Based on input from 3 position papers submitted during public consultation

¹⁷⁴ See Figure 15, page 75

¹⁷⁵ See Table 8, page 77

5.4. Coherence

5.4.1. Question 16: To what extent is the **RIS legislation** (in scope of this evaluation) **internally coherent**? Are there any internal inconsistencies?

From the perspective of an internal legal consistency-check, the RIS Directive and its Implementing Acts provide **consistent minimum requirements** to enable cross-border compatibility of national systems. 19 of the 20 interviewees from different stakeholder groups, who knew the Directive and Implementing Acts well enough to provide an opinion¹⁷⁶, stated they had not come across any internal inconsistencies.

The assessment shows that the **Directive and its Implementing Acts form a consistent legal framework** for the achievement of the Directive's objectives. The main mechanisms of the Directive, namely the establishment of certain requirements for data communication and RIS equipment as well as the imposition of a minimum level of RIS services through the Implementing Regulations, are consistent and set forth in a logical manner.

In summary, **no conflicts** were identified.

5.4.2. Question 17: To what extent is the Directive **consistent** with the relevant **international obligations of the Member States**?

A careful review of the legal text of the Directive shows **a strong and successful effort to maintain consistence and guarantee enough interaction** between the RIS Directive and other pre-existing relevant international obligations of the Member States. New requirements introduced by the RIS Directive *“should build on work carried out in this field by relevant international organisations such as the International Navigation Organisation (PIANC), the Central Commission for Navigation on the Rhine (CCNR) and the United Nations Economic Commission for Europe (UNECE)”*¹⁷⁷ and that *“the Commission shall take due account of measures developed by relevant international organisations, such as PIANC, CCNR and UNECE.”*¹⁷⁸.

17 out of 28 interviewees, belonging to a variety of stakeholder groups, believe that the **RIS Directive is consistent with other relevant obligations of the Member States**. They specifically highlighted consistency between the Directive and the relevant UNECE resolutions (4) and the requirements of the River Commissions (e.g. CCNR, Danube Commission, Sava Commission) (5), and PIANC Guidelines (3)¹⁷⁹. The intention to maintain consistency between the Directive and obligations provided by relevant international organisations is further confirmed by the Commission's active engagement with these organisations. One example includes the establishment of CESNI together with the CCNR and the cooperation within CESNI, both at the level of expert groups and standardisation of procedures.

Nevertheless, a few interviewees highlighted **apparent contradictions or inconsistencies** in this regard (5). Member States still have **different police regulations**

¹⁷⁶ 10 out of the 30 stated they did not know the Directive and Implementing Acts well enough to provide an opinion.

¹⁷⁷ Preamble (3), Directive 2005/44/EC

¹⁷⁸ Article 1(2), Directive 2005/44/EC

¹⁷⁹ See section 6.4, Annex 2 “Findings from the interviews” to the Stakeholder Consultation Report

(3), which lead to **different requirement for electronic ship reporting** for example. In this regard, one interviewee belonging to an unknown stakeholder group believes that the Directive leaves too much room for interpretation and implementation highlighting not an inherent inconsistency of the Directive with international obligations of Member States, but rather a need for more specific guidelines to avoid national laws interfering with the proper functioning of the RIS Directive.

5.4.3. Question 18: To what extent is the Directive **consistent** with **other EU legislation** in the areas of (a) inland waterway transport policy; (b) EU transport legislation; (c) other EU legislation in areas outside transport policy?

A careful analysis of the Directive's legal text uncovers **several interactions** (see below) between the RIS Directive and other EU legislation in the areas of (a) inland waterway transport policy; (b) EU transport legislation; (c) other EU legislation in areas outside transport policy.

The RIS Directive took in due consideration **pre-existing legislation** in these fields. Additional legislation in these sectors came into being after the introduction of the RIS Directive. Within the area of **EU inland waterway transport policy**, the clear interaction between the RIS Directive and the Directive on the recognition of professional qualifications in inland navigation (EU) 2017/2397¹⁸⁰ emerged, both through desk-research and targeted interviews. In addition, consistency between the RIS Directive and the Directive on technical requirements for inland waterway vessels (EU) 2016/1629¹⁸¹ was confirmed.

The **RIS Directive is consistent with EU transport legislation** as it complies **with** the goals laid out in the **White Paper on Transport**¹⁸². A key goal of the strategy is to optimise the performance of multimodal logistic chains and facilitate modal shift of road freight to waterborne transport. The RIS Directive responds to the necessities highlighted in the paper and is meant to play a key role to help achieve its goals.

The RIS Directive is consistent with EU legislation in areas outside transport policy. The **Directive is in synergy** with the Commission communication of 26 August 2010, "**A Digital Agenda for Europe**"¹⁸³. The communication identifies and highlights the fragmentation of the Digital market, the lack of interoperability and the rise in cybercrime as major threats to the full development of the Union's digital economy.

Overall, the RIS Directive has been found to be consistent with the key priorities of a **political agenda** focusing on increasing the competitiveness of the whole transport sector, whilst reducing its environmental footprint and increasing its degree of digitalisation.

¹⁸⁰ Directive (EU) 2017/2397 of the European Parliament and of the Council of 12 December 2017 on the recognition of professional qualifications in inland navigation and repealing Council Directives 91/672/EEC and 96/50/EC

¹⁸¹ Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC,

¹⁸² White Paper on Transport: Roadmap to a Single European Transport Area, 28 March 2011

¹⁸³ COM(2010)245 final, A Digital Agenda for Europe, 26 August 2010

In summary, **no external inconsistencies have been found** between the Directive and the EU legislation in the areas of (a) inland waterway transport policy; (b) EU transport legislation; (c) other EU legislation in areas outside transport policy.

5.5. EU Added Value

5.5.1. Question 19: What are the **benefits of intervening at EU level**, over and above what could have been reasonably expected from interventions at international level (UNECE structure), regional level (river commission) or local level alone? In other words, what is the **rationale of public intervention at EU level** underpinning the Directive?

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**. Desk research and stakeholder consultations highlighted the same factors that justify an intervention at the EU level rather than at a regional or national level. All of the 31 interviewees that provided answers to this question agree that the RIS Directive, as a public intervention at EU level, is justified and reasonable given its intended objectives. The rationales for EU intervention highlighted by interviewees are similar: the inland navigation sector is inherently international and interconnected (18), so legislation should not stop at borders. In line with this, the Directive sought to avoid fragmentation between different national approaches that could result from RIS management at Member State level (8). Interviewees therefore acknowledge that common standards (5) and central legislation (6) are justified, useful and necessary¹⁸⁴.

There is strong agreement among interviewees that the same **benefits** could not have been achieved by comparable interventions at the international, regional or national level. At the **international level**, this is because the guidelines provided by international bodies, such as UNECE, are not mandatory. Therefore, they would not necessarily prevent fragmentation in the sector.

Views regarding what **benefits** could be achieved at the **regional level** are slightly more divided. Six respondents indicated that interventions by River Commissions would potentially be able to provide the same benefits as the RIS Directive; however, four of them reiterated that a community level response is still to be preferred¹⁸⁵. They explained that the **River Commissions have a considerable degree of authority** and could probably implement RIS by themselves, although this would lead to **fragmentation at corridor level** – different River Commissions are unlikely to work together in the way that is incentivised by the RIS Directive.

There are **no indications** that the same **benefits** could be achieved **at the national level**: all evidence suggests that intervening at the national level would be counterproductive, as this would result in a high fragmentation of standards and implementation practices. Fragmentation would be particularly likely to occur in the areas of type-approval of equipment, increase in the number of resubmissions of electronic ship reports for international voyages, information comparability and accessibility issues. This would consequently impose significant monetary losses and a decrease in efficiency for both users and competent authorities.

¹⁸⁴ See section 6.5, Annex 2 “Findings from the interviews” to the Stakeholder Consultation Report

¹⁸⁵ Idem

Input gathered from the Public Consultation¹⁸⁶ confirm the above findings from desk research and interviews.

5.5.2. Question 20: In light of the above rationale, what **evidence** is there on **actual EU added value** having been created, also in terms of order of **magnitude** of the added value?

It is challenging to distinguish between *desired*, *perceived* and *observed* EU added value of the RIS Directive. The *desired EU added value* is what is intended to be achieved through the introduction of the RIS Directive, as enshrined in and operationalised through the Directive's key objectives, **most notably to establish harmonised RIS** in the Union (see Question 19). The *perceived EU added value* is that reported by different stakeholders based on their experience of using RIS and regardless of whether this EU added value has been measured or not. The *observed EU added value* is that which only includes measured positive impacts linked to the introduction of the RIS Directive.

All sources consulted point to the same result: the RIS Directive has **considerable perceived EU added value**, i.e. brought about benefits that could not have been achieved by interventions at national, regional or international level. The main EU added value resulting from the RIS Directive can be summarised as follows: improved harmonisation; standardisation through common technical standards; increased cross-border cooperation; and more funding for the sector.

Harmonisation and standardisation quite clearly emerge as the **main benefits** brought about by the RIS Directive. Especially in the Danube region, there are indications that many of the services would not have been implemented to the extent they have been if the RIS Directive had not given certain countries the necessary impetus to invest in inland navigation. As mentioned by a RIS Authority in a Danube country: "*The EU RIS Directive has been the crucial trigger for the wide implementation of Electronic Navigational Charts, Notices to Skippers, Inland AIS and Electronic Ship Reporting at European level. These services are well received and appreciated by the inland navigation sector*"¹⁸⁷. Thus, the RIS Directive also led to **more cohesion** in the inland navigation sector in Europe. Evidence on harmonisation and standardisation for other regions is less pronounced. There are indications that the Rhine region would have been able to establish harmonised RIS without the RIS Directive.

For all regions, the **Directive's effect was amplified** by that of **European funding instruments**, particularly by the TEN-T and CEF programmes. For the period 1995-2018 (all funding instrument, including still ongoing projects), the EU co-financed with EUR 113 Million¹⁸⁸ (current prices) or 45% of the actual total costs of all RIS related initiatives. The evaluation has not attempted to separate the effect of the Directive from that of the funding. It seems safe to say that the Directive was necessary to bring forward the EU added value in this area, which then materialised in close interaction with the funding instruments. All stakeholder groups of all regions agree that there has been progress towards the **achievement of a harmonised interoperable RIS**, as described under Question 4.

¹⁸⁶ See Figure 16, page 80 and Table 10, page 81

¹⁸⁷ Results from the Public Consultation, see Table 10, page 81

¹⁸⁸ See section 6.2.1 "Investment costs" in Annex 6 "Ex-post social cost-benefit analysis", Technical Annexes to the Evaluation Support Study

Cross-border collaboration between RIS authorities (incl. fairway authorities), RIS providers and stakeholders in the inland waterway transport chain can be identified as an EU added value, especially in terms of the increased possibility for public-private collaboration. Acting at the EU level rather than at the regional or local level is seen by all stakeholders as beneficial in terms of **higher availability of funding** to support implementation and development activities. It emerged that the inland waterway transport sector has benefited from increased market and political awareness since the introduction of the RIS Directive. This, in turn, guaranteed a place for the sector in the EU political agenda among its key priorities. This resulted in higher funding, materialised and operationalised through several projects¹⁸⁹ (e.g. IRIS Europe, RIS COMEX) that allow for the continuous development of the sector.

The RIS Directive is *perceived* to have brought about other benefits, although it is unclear whether they constitute an EU added value of the EU intervention specifically. Interviewees and questionnaire respondents also *perceive* that the IWT sector has benefitted from increased competitiveness; optimised use of infrastructure; improved safety during cross-border voyages. However, these perceptions can neither be supported nor discarded by the available evidence (see Question 14).

Increased safety, for instance, is considered a key EU added value of the RIS Directive. Most respondents mentioned safety as a key benefit for the IWT sector resulting from the introduction of the RIS Directive. No analytic evidence has been found, which suggests that the increase in safety is a perceived benefit rather than an actual one (see Question 6 and Question 14). It should be noted, however, that although it was most frequently mentioned as the EU added value of the RIS Directive, there is no proof that the same perception of increased safety would not have been established in the absence of the RIS Directive, i.e. if RIS was implemented by Member States or River Commissions themselves.

To conclude, the **findings on the EU added value** of the RIS Directive are **uncertain and somewhat limited** by the difficulty of attributing *actual* (observed) *EU added value* on the basis of evidence on *perceived EU added value* reported by stakeholders. Nonetheless, the findings confirm the non-negligible **positive perception** that RIS users have of the **Directive's EU-wide effects on the IWT sector**. The most notable finding is the strongly perceived impulse provided towards **standardisation and harmonisation** of river information services across Europe, as a result of the **common EU-wide technical standards** introduced by the RIS Directive, and an increase in perceived safety.

¹⁸⁹ <https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/projects-by-horizontal-priority/river-information-services-%28ris%29>

6. CONCLUSIONS

Effectiveness

The Directive's expected core benefits originate in cost savings for the IWT sector (relative to the baseline) from a reduction in avoidable costs due to non-harmonised national RIS systems. The effectiveness findings therefore provide evidence on the extent of the actual regulatory fitness of the Directive and are relevant for future policy making and in the context of the **European Commission's REFIT programme**.

Data concerning navigation and voyage planning

Evidence on the **availability of data concerning navigation and voyage planning** suggests that all relevant Member States comply with the RIS Directive's requirements for making this data available in an electronic format, whereas the Directive does not specify this format. Therefore, Member States make this data available in different formats such as the RIS Index, Electronic Navigational Charts, electronic (dynamic and static) information on national websites, etc. There is clear evidence for a **lack of standardisation** of this data and a lack of precision in the Directive, as it does not provide technical specifications for a harmonised provision of data concerning navigation and voyage planning. As regards to **benefits**, collected evidence indicates that data for navigation and voyage planning is **beneficial for resource planning** in inland waterway transport and has led to **moderate improvements in trip planning**. There is no robust evidence that data concerning navigation and voyage planning has actually led to cost savings. Higher benefits of data for navigation and voyage planning are hindered by the lack of a full harmonisation of data provided across the Member States.

Standardised electronic navigational charts

Evidence on the **availability of standardised electronic navigational charts (ENC)** suggests that all relevant Member States provide ENC for waterways of high significance. Member States have not reached full compliance with the requirements of the RIS Directive yet, as coverage of ENC for waterways of CEMT class Va and above is not at 100%. However, most Member States also provide ENC for smaller waterways outside of the requirements of the RIS Directive, for example if these waterways are considered relevant for traffic or if regional authorities in charge decide to make them available. Despite the positive fact that all relevant Member States make electronic navigational charts available **free of charge**, there are **differences** in their **quality and accuracy**. As regards to quality, the RIS Directive framework does not contain, for example, any detailed requirements concerning update rates for charts. Four RIS authorities, two RIS developers, a user representative organisation and an international organisation pointed to **insufficient update rates** of ENC, with indications that Rhine countries update their charts more frequently than the countries along the Danube. Seven of the thirteen relevant Member States indicated **limited resources** (human, financial and technical) as a **hindering factor** for making ENC available in higher quality and accuracy. As regards to **benefits of ENC**, there are indications that the availability of standardised electronic navigational charts has **benefitted the resource planning** of waterway users allowing them to navigate more efficiently and safely. Especially in combination with position and identification information from Inland AIS, there is a clear **perception** of waterway users that **safety has improved** through standardised electronic navigational charts. Despite indications that resource planning has improved, there is no conclusive evidence that this has resulted in cost or time savings.

Standardised notices to skippers

Evidence on the **availability of standardised notices to skippers** suggests that not all relevant Member States make the mandatory notices to skippers available electronically on waterways of CEMT class IV. In three Member States, coverage of the relevant waterways has not reached 100% yet. Stakeholder consultations further unveiled that Hungary stopped providing notices to skippers digitally, that the service level in Romania is limited and that ports do not adequately provide notices to skippers. There are indications that notices to skippers are not always in line with the requirements of the Directive in terms of being encoded, downloadable, and following the common technical standards. The reported variance in their distribution makes notices to skippers difficult to access from a skipper's perspective. Without the proper on-board application, skippers need to visit several websites to collect the necessary information for an international trip. As a result, there is a **lack of consistency across the Member States** in the degree to which notices to skippers are made available, which in turn **limits** the degree of **interoperability**. This in turn hinders the effectiveness of standardised notices to skippers. As regards to **benefits**, stakeholder consultations indicate better voyage planning, improved safety and improved communication as the main benefits of standardised notices to skippers. There is **no robust evidence** to suggest that standardised notices to skippers have led to **time** or **cost savings** resulting from more efficient navigation and better information. There are indications that skippers still waste time collecting notices from several websites due to the fragmentation in accessibility of notices.

Electronic Ship Reporting

There is a **lack of robust quantitative evidence** indicating a change in resubmissions of electronic ship reports in cross-border transport. **Qualitative evidence** collected from stakeholders strongly **suggests** that there has **not been a substantial reduction in resubmissions**, as vessel information still needs to be reported more than once on an international voyage. Only on the Rhine, there are some observations that a limited reduction in resubmissions of electronic ship reports has occurred. This is directly attributable to the electronic reporting obligation for container and tanker vessels by the CCNR. The main **hindering factor** for an effective reduction of resubmissions of electronic ship reports attributable to the RIS Directive is the **lack of harmonised reporting requirements across countries**. The Member States have different legal reporting obligations, requiring different vessel information, which hinders the reduction of resubmission even if authorities share data across countries. Additionally, data protection concerns were said to hinder the degree to which data is shared between competent authorities. There is **no evidence of cost savings** for users of the waterways and competent authorities, notably because there has not been a reduction in resubmissions.

Type approval of equipment and mutual recognition of type approvals

The evaluation found that a **single entity carries out all type-approvals**, the “Wasser- und Schifffahrtsverwaltung des Bundes, Fachstelle der WSV für Verkehrstechniken (FVT)” in Germany. Type-approved equipment includes 6 Inland ECDIS viewers and 46 Inland AIS devices, 24 of which conform to Inland AIS Test Standard 2.0 (CCNR). Based on the collected evidence it can be concluded that **type-approved RIS equipment is mutually recognised across the Member States** as foreseen in Article 7 of the RIS Directive. There is a **clear benefit** of mutual recognition of type-approved RIS equipment across the Member States. There are indications that this mutual recognition

of type-approved equipment certified in Germany **saves** other RIS authorities **time and money** that would otherwise be spent on approving equipment themselves. However, there has been no quantitative evidence collected for a reduction in costs or time during this evaluation.

Overall effectiveness of the RIS Directive in establishing interoperable, harmonised RIS

Based on the findings from the previous paragraphs, the **degree of harmonisation** differs **depending on the RIS technologies**. According to the evidence, most harmonisation was achieved in type-approval of RIS equipment and electronic navigational charts, slightly less in data for navigation and planning and notices to skippers. The least harmonisation was achieved in electronic ship reporting, especially due to different reporting requirements in the Member States resulting in resubmissions of electronic reports. A highly positive harmonisation effect of the Directive was achieved through the implementation of **tracking and tracing systems**, even though this is not mandated by the Directive. The evidence showed as well that RIS technologies are not utilised to the same extent in all countries and river corridors. Despite the lack of full harmonisation and differences in use of RIS in countries, consulted stakeholders agreed, that **standardisation of RIS** has been the **strongest benefit** brought about **by the Directive**. Not a single respondent from the public consultation believed that the EU properly implemented the **monitoring** of the setting up of RIS, thus the application of the Directive.

There is **no** robust **evidence** that the RIS Directive has brought about **unintended positive effects**, although there are indications that it led to the creation of new opportunities in the context of market developments (e.g. autonomous sailing), as well as the creation of new workplaces, amongst others in informatics.

About the **achievement** of its **general objectives**, the evidence is mixed. There is **no** robust **evidence** that the RIS Directive had an impact on the **growth of the inland navigation sector** or led to the **optimised use of existing infrastructure**. There are indications that it has promoted environmental protection through a **decrease in fuel consumption**, although the degree to which this is fully attributable to the RIS Directive is difficult to measure. Despite the absence of consistent accident data across the Member States, there is a **clear perception** among all stakeholder groups that the RIS Directive has contributed to **improved safety** in inland navigation.

Efficiency

The Member States and the EU incurred costs for the **preparation** of the **RIS Directive** and its **implementing acts**, but there is no robust evidence that costs were proportionate or disproportionate to the achieved outcome. The preparation of the Implementing Acts was done in cooperation with four independent technical RIS expert groups, comprising mainly public sector organisations of EU and non-EU Member States alike. Costs largely incurred for the members of these groups. Consulted public and private sector stakeholders reported on major **inefficiencies** in the **adoption speed** of the implementing acts and their revision under the RIS Directive, resulting in permanently **outdated standards** for the sector.

Evidence suggests that RIS authorities incurred **substantial one-time implementation** costs associated with making **data for navigation and voyage planning** available to waterway users, ranging from EUR 600,000 to EUR 2.9 million per country (based on limited samples). RIS authorities also incur **annual, ongoing costs** associated with keeping data up-to-date and accessible to users, ranging from EUR 17,000 to EUR 179,000 per country (based on limited samples). Paired with the benefits accrued to data

for navigation and voyage planning, public and private stakeholders believe that **benefits outweigh costs**.

To make **electronic navigational charts** (ENC) available, evidence confirms that RIS authorities incurred **substantial one-time investment costs**. Based on limited quantitative evidence, reported one-off costs range from EUR 6,000 to EUR 1.5 Million per country. RIS authorities also incur **annual ongoing costs** associated primarily with the updating of electronic navigational charts. Limited quantitative evidence indicates ongoing costs ranging from EUR 4,200 to EUR 11,000 on average per year per country. The evidence obtained cannot be generalised across countries, because **costs vary substantially**, depending on the density of the national waterway network and the update rate of electronic navigational charts. Paired with the benefits accrued to standardised electronic navigational charts, public and private stakeholders believe that **benefits outweigh costs**.

Concerning **standardised notices to skippers** (NTS), evidence confirms that RIS authorities incurred **one-off costs** for making NTS available electronically. Limited quantitative evidence indicates one-off costs ranging from EUR 70,000 to EUR 422,000 from 2005 until 2019 per country. Based on limited samples, RIS authorities incurred **costs on an annual basis**, ranging from EUR 1,000 to EUR 10,200 per country. Due to the limited quantitative evidence, a reliable generalisation of costs across all countries is not possible. Costs also vary substantially, depending on the density of the national waterway network. Paired with the benefits accrued to standardised notices to skippers, public and private stakeholders believe that **benefits outweigh costs**.

Evidence suggests that RIS authorities incurred **one-off costs** for setting up the necessary systems for receiving and processing of **standardised electronic ship reports**. Limited quantitative evidence indicates one-off costs ranging from EUR 260,000 to EUR 480,000 from 2005 until 2019 per country. Based on limited quantitative evidence collected from two RIS authorities, **recurring annual costs** range from EUR 1,500 to EUR 2,000 (year 2017). There seems to be no clear pattern across countries in terms of the magnitude of these costs. It is **unclear** whether the RIS Directive, through its provisions on electronic ship reporting, has created benefits that outweigh the costs. Considering the **limited data exchange** between countries and the inefficiencies brought about as a result, there is considerable room to further **reduce resubmissions** and thereby **save time and costs** for public and private stakeholders.

Concerning type **approval of RIS equipment**, evidence confirms that RIS authorities have **not incurred any one-time or recurring costs**. Type-approval does imply **one-time costs for the private sector** to get the equipment type-approved, with one RIS equipment manufacturer estimating EUR 5,000 per product. Evidence suggests that type-approvals of RIS equipment are mutually recognised across Europe, and that **benefits outweigh costs**.

As explained in the previous paragraphs and as detailed under Questions 8, 9 and 10, there is very limited evidence concerning the overall costs the Directive caused **to establish interoperable, harmonised RIS**. Most RIS authorities are unable to differentiate between the overall costs related to the implementation of the RIS Directive, let alone distinguish between costs associated with RIS as such. As a result, the very **limited quantitative evidence** cannot be aggregated and generalised to the level of the RIS Directive. A **qualitative assessment** of the overall efficiency, based on evidence from the stakeholder consultations, indicates that **overall costs** of the RIS Directive are **outweighed by the benefits** accrued to the sector as a whole.

No evidence was found of unintended **negative economic** and **environmental effects** caused by the RIS Directive. Two interviewees mentioned a potential reduction in navigation skills of skippers as a **negative social effect** of digitalisation in inland navigation through RIS.

Evidence shows a clear **potential for simplification and reduction of regulatory burden** emerging from the **slow update and adoption process of technical standards**. There is an agreement among public and private stakeholders that the RIS Directive suffers from a **lack of monitoring** and a **slow implementation**, as it takes too long for technical standards to be updated. Consequently, the sector permanently works with **outdated standards**. This finding on a potential for simplification is particularly relevant in the context of the European Commission's effort to enhance the regulatory fitness of EU law (REFIT programme).

The evaluation did not attempt to produce a **cost estimate of total RIS implementation costs** at an aggregated level of the **general objectives of the Directive**, as the underlying evidence base is incomplete and many strong assumptions would have had to be made. Concerning a cost-benefit ratio of the RIS Directive, estimations were made of the benefits accrued by a reduction in fuel consumption and a resulting reduction in emissions. With a total investment cost set at EUR 52 Million, a **positive cost-benefit ratio** prevails as long as at least 12% of all equipped vessels use the on-board RIS equipment for fuel consumption reduction. Details can be found under Question 14.

Relevance

Evidence suggests that there has been a **high degree of alignment** between the **objectives** laid out in the **Directive** and the **needs of the inland waterway transport sector** over the assessment period. However, stakeholder consultations unveiled a **paradigm shift** of digitalisation in inland navigation. While the Directive primarily focuses on the **safety of navigation**, the sector now has a stronger need for **improving its efficiency** and establishing **stronger links with other modes of transport**.

New needs have emerged in the IWT sector since 2005. These needs arise from **technological changes**, such as the automation of vessels and infrastructure, the further digitalisation in the sector including the need for more interoperable services and better data, and technological innovation for RIS related software and hardware. New needs have emerged from **market developments**. Evidence suggests a necessity for providing specific **training and education** on the new tools and technologies used in the sector.

Overarching new needs for all transport modes have emerged. **Green, smart and congestion-free transport and logistics** are the key concepts for the whole transport sector, stipulated by the **European Green Deal** communication¹⁹⁰ of the European Commission. The relevance of the RIS Directive is further illustrated by the fact that the Commission may consider to include data collected and published under the RIS Directive in the mobility category of the list of **high-value datasets** under the **Open Data Directive** (Directive (EU) 2019/1024).

Evidence from the stakeholder consultations confirms that the **guidelines and technical standards** in the framework of the RIS Directive **are still relevant** and necessary. There are strong indications that the technical standards are **not updated fast enough**, which will **reduce their relevance** in the future because the sector constantly uses outdated

¹⁹⁰ https://ec.europa.eu/info/publications/communication-european-green-deal_en

standards. However, outdated standards do not lead to a lack of harmonisation, if the **implementation** of existing standards is **sufficiently monitored**.

Coherence

The evaluation shows that the **main mechanisms** of the Directive, namely the establishment of technical requirements, specifications and conditions for data communication and RIS equipment as well as the imposition of a minimum level of RIS services through the Implementing Regulations, **are consistent** and set forth logically.

The review of the legal text of the RIS Directive shows a strong and successful **effort to maintain consistency** and guarantee adequate interaction between the Directive and other **international legal requirements** applicable to inland waterway transport. Collected evidence suggests that the Directive is consistent with other international legal requirements applicable to inland waterway transport. Stakeholder consultations unveiled that **different inland navigation regulations** (for example concerning reporting requirements) in the Member States could lead to different interpretations of the provisions in the RIS Directive. This shows a need to ensure that national law and Member States' international obligations do not interfere with the proper functioning of the RIS Directive.

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. Evidence from the stakeholder consultations confirms that the RIS Directive is justified and relevant as a public intervention at EU level, to avoid fragmentation between different national RIS implementation approaches. There is strong agreement among stakeholders that the same **benefits could not have been achieved** by comparable **interventions at the international, regional or national level**. Although they prefer an EU level approach, a limited number of stakeholders from the Rhine region indicated that **interventions at the regional level** by River Commissions could provide similar benefits as the RIS Directive. There are no indications that the same benefits could be achieved at the **national level**.

Harmonisation and standardisation quite clearly emerge as the **main benefits** brought about by the RIS Directive. Especially in the Danube region, there are indications that many of the services would not have been implemented to the extent they have been, if the RIS Directive had not given certain countries the necessary **impetus to invest in inland navigation**. Thus, the RIS Directive also led to **stronger cohesion** in the inland navigation sector in Europe.

For all regions, the Directive's effect was amplified by that of **EU funding instruments**, particularly by the TEN-T and CEF programmes. For the period 1995-2018 (all funding instrument, including still ongoing projects), the EU co-financed with EUR 113 Million (current prices) or 45% of the actual total costs of all RIS related initiatives. The evaluation has not attempted to separate the effect of the Directive from this EU co-financing. It seems safe to say that the **Directive was necessary to bring forward the EU added value** in standardisation and harmonisation of RIS across Europe, which then materialised in close interaction with the funding instruments.

To conclude, the **RIS Directive has a clear EU added value**, even though it is difficult to quantify the findings on the EU added value of the RIS Directive because of the difficulty of attributing **actual (observed) EU added value** based on evidence on **perceived EU added value** reported by stakeholders. Nonetheless, the findings confirm

the non-negligible **positive perception** that RIS users have of the Directive's EU-wide effects on the IWT sector. The most notable finding is the strongly perceived **impulse** provided **towards standardisation and harmonisation of river information services** across Europe, as a result of the common EU-wide technical standards introduced by the RIS Directive, and an increase in perceived safety.

Annex 1: Procedural information

1. LEAD DG, DeCIDE PLANNING/CWP REFERENCES

- The lead Directorate-General is DG MOVE.
- The evaluation was validated in Decide under reference PLAN/2017/1955.

2. ORGANISATION AND TIMING

- The evaluation roadmap was published on 31 October 2017.
- The evaluation was launched on 8 November 2017 with the first meeting of the Interservice Steering Group, consisting of the following Commission Services and Agencies: MOVE, SG, SJ, JRC, JUST, REGIO, ENV, RTD, CNECT, DIGIT and INEA. The group discussed the outline of the evaluation, including the evaluation roadmap and the drafts of the intervention logic, evaluation questions, consultation strategy and the terms of reference for an external study to support the evaluation.
- The Commission contracted an external consultant to carry out the study to support the evaluation. This work started in January 2019 and concluded in January 2020. The kick-off meeting for the support study was held on 1 February 2019
- The Interservice Steering Group discussed the inception report for the support study on 20 March 2019. The revised inception report was accepted on 25 April 2019. The review process for the data collection tools continued afterwards and was concluded on 27 May 2019.
- On 5 June 2019, a stakeholder workshop was held at the Common Issues Meeting during the RIS Week in Romania to present the evaluation and to consult with the more than 90 participants from the inland waterway transport sector. The results from the workshop were reflected in the evaluation and the support study.
- The Interservice Steering Group discussed the interim report for the support study on 13 July 2019 and approved a revised version on 25 September 2019.
- The Commission conducted a public consultation on the evaluation from 8 August to 13 November 2019.
- The preliminary findings of the support study were presented and discussed at the DINA Expert Group on 11 October 2019. The feedback from the expert group was reflected in the evaluation and the support study.
- The Interservice Steering Group discussed the draft final report for the support study on 14 November 2019. All final deliverables of the support study, including the final report, the executive summary, all technical annexes and the stakeholder consultation report were approved on 4 March 2020.

3. EVIDENCE, SOURCES AND QUALITY

- The evaluation relies mostly on the support study¹⁹¹ on the ex post evaluation conducted by an external contractor.
- Additional evidence was gathered from the Member States through an external fact-finding study on the practical and operational measures in application of the RIS Directive. This study is not publicly available, as it primarily served as input to the support study and the evaluation.

¹⁹¹ https://ec.europa.eu/transport/modes/inland/studies/inland_waterways_en

Annex 2: Stakeholder consultation

Introduction

The evaluation included various stakeholder consultation activities to gather both qualitative (opinions, views, suggestions) and quantitative information (data, statistics). Most of the activities were part of the evaluation support study, which concluded in January 2020.

This annex provides an overview of the consulted stakeholder groups and a summary and analysis of their responses. The consultation covered all aspects of the evaluation¹⁹² and addressed key target groups using different methods, such as:

- the evaluation roadmap;
- a public consultation ;
- targeted consultations, including in-depth interviews for EU and international case studies, group discussions with experts and a study visit to a RIS Centre;
- stakeholder workshops; and
- meeting with the DINA Commission Expert Group.

The Commission held additional meetings with several stakeholders in the course of preparing the evaluation, e.g. during the RIS Week in autumn 2017.

Consultation methods

Publication of the evaluation roadmap

The evaluation roadmap¹⁹³ was published on 31 October 2017 and was open for feedback until 28 November 2017. No responses were received through the feedback mechanism.

Public Consultation

A public consultation was launched on the Commission's website on 8 August 2019 and was open for responses until 13 November 2019 (14 weeks)¹⁹⁴. Together with the steering group, DG MOVE prepared a general questionnaire asking stakeholders for their opinions on the effectiveness, efficiency, relevance and EU added value of the Directive.

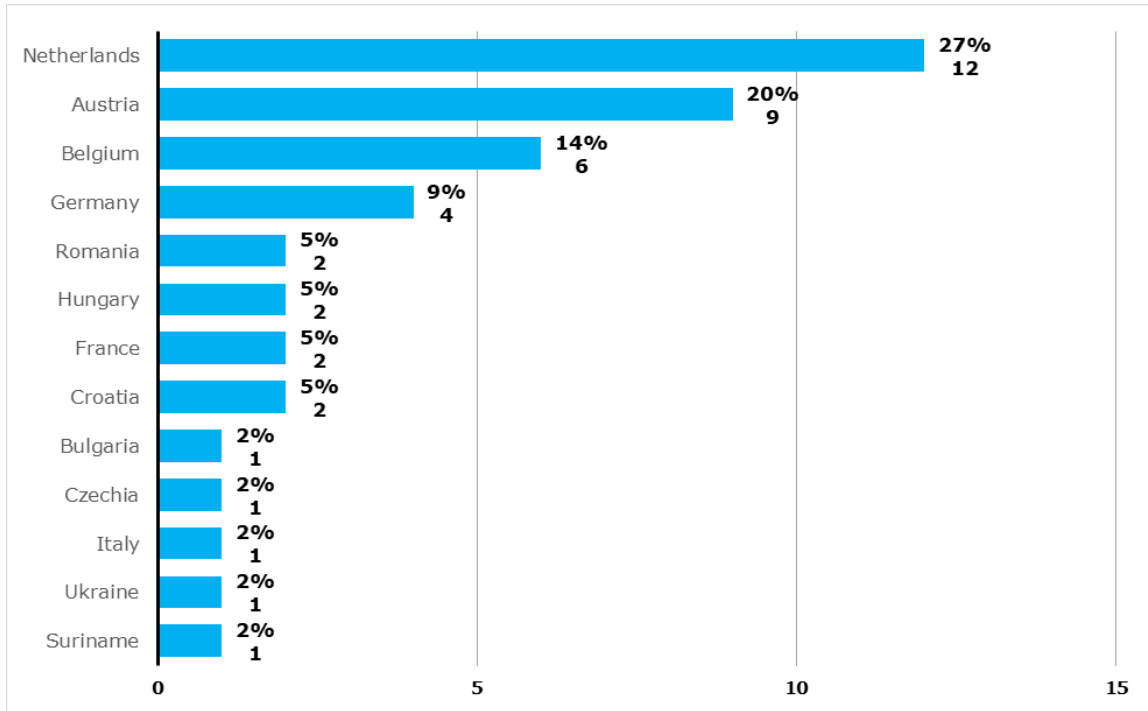
The external contractor summarised the results of the consultation in a detailed report¹⁹⁵.

¹⁹² More detail can be found in the stakeholder consultation report as part of the support study

¹⁹³ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1171-River-information-services-on-inland-waterways>

¹⁹⁴ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/1171-River-information-services-on-inland-waterways/public-consultation>

¹⁹⁵ <https://op.europa.eu/en/publication-detail/-/publication/e3752fc7-7ec0-11ea-aea8-01aa75ed71a1>



N=44

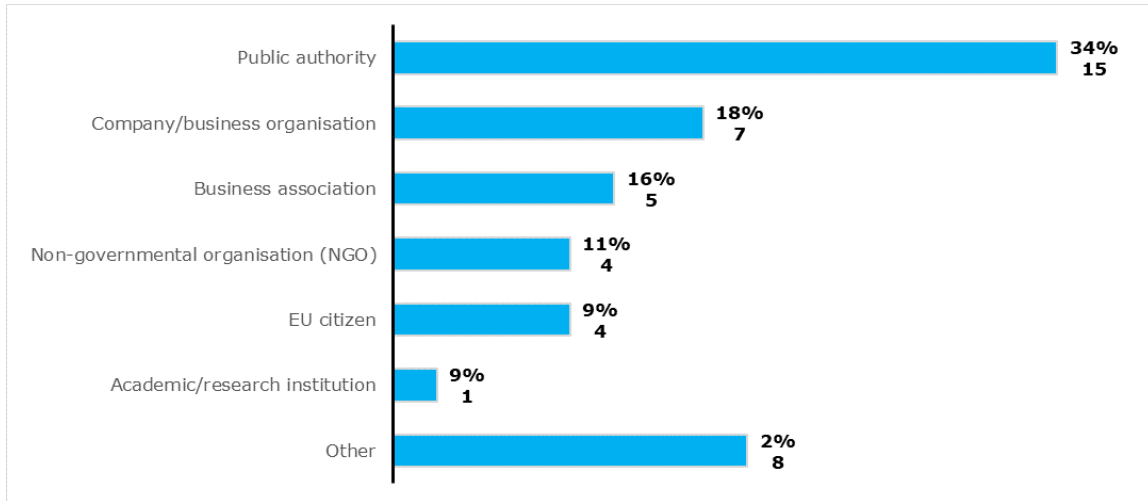
Figure 3: Public Consultation participants by main country of operation/residence

Responses were gathered from thirteen different countries. This includes ten out of the thirteen EU Member States to which the RIS Directive applies directly (Austria, Belgium, Bulgaria, Czechia, Croatia, France, Germany, Hungary, Netherlands, and Romania). The other three countries, with one respondent each, are Italy, Ukraine (both voluntary implementers) and Suriname¹⁹⁶.

Respondents indicated the type of stakeholder group they represent. The largest group of responses was collected from public authorities (15 of 44), followed by “others” (8 of 44), companies/business organisations (7 of 44), business associations (5 of 44), NGOs (4 of 44) and EU citizens (4 of 44). No responses were received from academia or research organisations, consumer organisations, environmental organisations, trade unions, or non-EU citizens.

The eight respondents who chose the option “other” clarified their role within inland navigation further. In fact, two of them fit into the category of public authorities, two are skippers, three are advisors/consultants, and one is an Inland ENC producer.

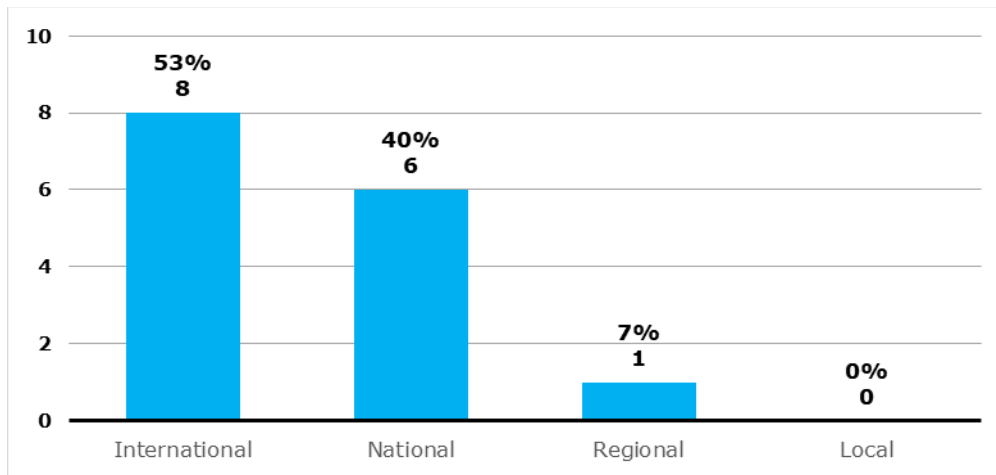
¹⁹⁶ There are reason to believe this person is not actually from Suriname and that this was an error. The organisation they represented in their answers is based in Spain.



N=44

Figure 4: Classification of questionnaire respondents

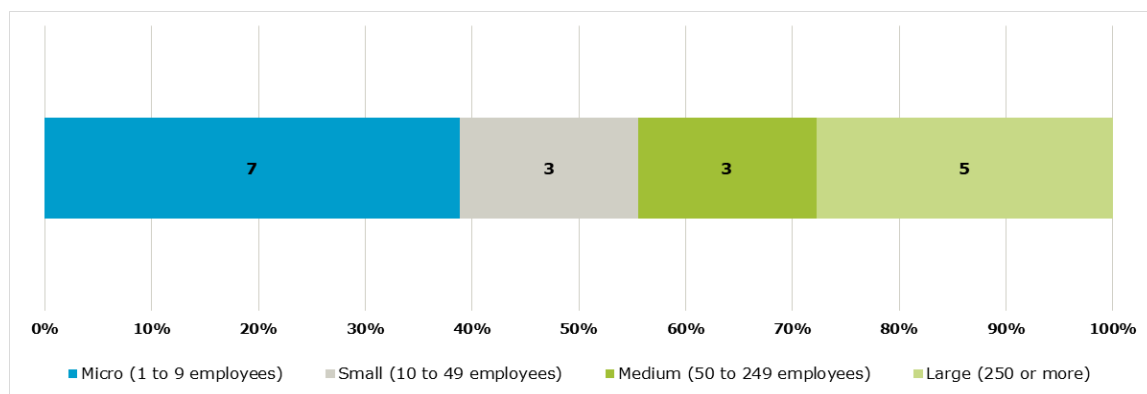
In terms of the scope of the organisations that responded to the questionnaire, the majority operate at international or national level. No responses were received from local level organisations.



N=15

Figure 5: Geographical scope of organisations

Of the 44 respondents, 20 chose their publication privacy settings as public, meaning that they agreed to publication of the size of their organisation. Out of those 20 organisations, 18 indicated their size. Seven of them (39%) were micro enterprises, three (17%) were small and medium and five organisations (28%) were large.



N=18

Figure 6: Size of organisations

In addition to the responses to the questionnaire, three separate position papers were submitted and these have also been analysed.

Targeted questionnaires

Targeted questionnaires aimed to fill factual gaps as identified in earlier stages of the evaluation, and primarily gather quantitative data. Two types of questionnaires were developed:

- for national administrations / competent authorities, and
- for users of waterways

To disseminate the questionnaires to relevant stakeholders, i.e. national authorities and private sector representative bodies/users, a combination was applied of DG MOVE's contacts in the area, the contacts of the experts at the University of Antwerp, and national authorities' and national associations' member contacts. National associations disseminated the questionnaire to their members and provided a consolidated response to the users' questionnaire.

Category of stakeholder	Type of stakeholder	Name of stakeholder/representative association	Questionnaires received
Public body: national level (Austria, Belgium (Flanders), Czechia, Romania, Serbia, Slovakia) ¹⁹⁷	Competent Authority	De Vlaamse Waterweg nv (BE)	1
	National Administration	Federal Ministry of Transport, Innovation and Technology (AT)	1
	Competent Authority	Romanian Naval Authority (RO)	1
	National Administration	Ministry of Transport and Construction (SK) ¹⁹⁸ Questionnaire was filled by the competent Authorities that operates RIS in the Slovak Republic	1
	National Administration	Ministry of Transport/ Czech Waterways Directorate (CZ)	1
	National Administration	MCTI – Directorate for Inland Waterways (Plovput) (RS)	1
Private body: national	Vessel owner	Member of Reederei Jaegers	1

¹⁹⁷ Many RIS authorities and competent authorities filled the questionnaire together. Six questionnaires were returned, but in reality, they cover nine authorities.

¹⁹⁸ The competent authorities that operate in the Slovak Republic filled the questionnaire.

Category of stakeholder	Type of stakeholder	Name of stakeholder/representative association	Questionnaires received
association, skippers	Ship design and consulting company	Member of Pro Danube International	1
	Member of a port business association	Member of Constanta Port Business Association	1
	Vessel Owner	Member of the association of shipowners and river operators in Romania (AAOFPR)	1
	Vessel owner & shipper	Member of Slovak Shipping and Ports JSC	1
	Skipper & Vessel Owner	N/A	1
	Skipper	N/A	1
	Port Authority	Hamburg Port Authority	1
	Skipper and Vessel owner	Comité des Armateurs Fluviaux (Fr)	1
Total			15

Table 4: Overview of responses to the targeted questionnaire

Interviews

The interviews aimed to gather evidence in relation to evaluation criteria/questions for which qualitative data was an important source. The external contractors carried out 50 interviews in total, as presented in the table below.

Category of stakeholder	Type of Stakeholder	Name of stakeholder	Planned	Conducted
Public bodies: International level	Shipping Regulation / Technical Certification Authority	World Association for Waterborne Transport Infrastructure (PIANC) European Committee for drawing up Standards in the field of Inland Navigation (CESNI) United Nations Economic Commission for Europe – SC.3 (UNECE)	2	3
Public bodies: European level	River Commissions	Central Commission for Navigation on the Rhine (CCNR) Danube Commission Sava Commission	4	3
	RIS expert groups	RIS expert groups (ECDIS) RIS expert groups (ERI) RIS expert groups (NtS)	2	3
Public bodies: National level	Port authorities	Port of Antwerp Port of Hamburg Administration of ports on Danube and maritime	3	4
	National RIS authorities (13 in scope of Directive)	Bundesministerium für Verkehr, Innovation und Technologie - Oberste Schifffahrtsbehörde (AT) Flemish Government - Departement Mobiliteit en Openbare Werken (BE)	13	13 ¹⁹⁹

¹⁹⁹ One of the interviewees in this category formerly worked for one of the national RIS authorities. Although recently retired, he was involved in the earlier stages of implementation of the RIS Directive and thus had valuable insights to share.

Category of stakeholder	Type of Stakeholder	Name of stakeholder	Planned	Conducted
		Ministry of Transport (BG) Ministry of Transport (CZ) Voies Navigables de France (FR) Bundesministerium für Verkehr und digitale Infrastruktur (DE) Ministry of Transport: Romanian Naval Authority (RO) Ministry of Transport (LU) Inland Navigation Office in Szczecin (PL) Rijkswaterstaat (NL) National Transport Authority (SK)		
	National RIS authorities (voluntary implementers)	Plovput Beograd - Directorate for Inland Waterways (Serbia) Basel Port Authority (CH)	2	2
	Public authorities e.g. transport management	Via Donau – Österreichische Wasserstraßen-Gesellschaft mbH (AT) De Vlaamse Waterweg (BE)	2	2
	Calamity abatement support / agencies	CALRIS	2	1
Private sector companies / representative organisations	Professional Associations: European level	European Skippers Association (ESO) European Barge Union (EBU) European IWT Platform European Federation of Inland Ports (EFIP) Inland Navigation Europe (INE)	5	5
	Professional Associations: National level	Pro Danube International, including Danube Ports Network (AT) Central Bureau for the Rhine and IWT (NL) Koninklijke BLN-Schuttevaer (NL) Central Bureau for Inland Barging (CBRB) (NL) Polish Inland Shipowners Association (ZPAS) (PL) Asociatia Armatorilor si Operatorilor Portuari – Fluviali din România (RO) ITS Romania (RO)	8	7
	Developers of RIS	Periskal (BE) Tresco Engineering (BE) Bureau Telematica Binnevaart (NL) Innovative Navigation (DE) Nauticast GmbH (DE) KDU - Knowledge Design Unit (RO)	7	6
	Users of the waterways (skippers)	Trading Line (RO)	0	1
Total			50	50

Table 5: Overview of the interview programme

Study visit to a RIS Centre

In August 2019, the external contractors visited the RIS Centre in Evergem, Belgium. They met with De Vlaamse Waterweg, who presented their work on VisuRIS²⁰⁰, and plans for the future development of RIS in Flanders. They underlined the importance of

²⁰⁰ <https://www.visuris.be/>

cross-border collaboration through projects such as RIS COMEX (CEF co-financed), and SWING (Single Window Inland Navigation). The visitors witnessed first-hand how e.g. notices to skippers are created digitally and made available to all users online and how calamity abatement works in practice. Additionally, the visit shed light on the possibilities of RIS data use in the future, e.g. for lock planning.

Stakeholder workshops

Open Shipping Days (Antwerp, Belgium, March 2019)

As the Open Shipping Days took place during the early stages of the Inception Phase of the project, the external contractors used this event as a networking opportunity to meet several key stakeholders in an informal setting and increase the awareness of the study among (mostly Belgian) IWT community.

RIS Week (Galați, Romania, June 2019)

The external contractors attended the RIS Week and conducted an interactive workshop during the Common Issues Day. Gathering of many RIS-stakeholders in the same place allowed explaining the evaluation process, interacting with the stakeholders and undertaking a group-polling exercise with the more than 90 session attendees. The details of the session and the analysis of the polling exercise carried out at the event are presented as Annex to the Stakeholder Consultation Report.

RIS Week (Liège, Belgium, November 2019)

The external contractors presented the preliminary results of the support study as part of the ‘Strategic Developments’ session during the Common Issues Meeting. More than 100 attendees participated in this session.

CESNI/TI meeting (Strasbourg, France, December 2019)

The external contractors presented the final findings and conclusions of the support study during the CESNI/TI²⁰¹ meeting in December. The event took place after the submission of the draft Final Report of the support study to DG MOVE. For that reason, this event served a purpose of disseminating the finalised study findings.

Consultation with the Commission’ DINA Expert Group

The DINA Expert Group meeting²⁰² took place on 11 October 2019 after the preliminary findings and conclusions of the support study have been developed. The external contractors led a structured workshop during this expert group meeting, in which the participants voted on a selection of preliminary findings, expressing their level of agreement with them. The online voting results were then presented in real-time to the participants and each result was briefly discussed. The details of the session and the analysis of the polling exercise carried out at the event are presented as Annex to the Stakeholder Consultation Report.

²⁰¹ <https://www.cesni.eu/>

²⁰² <https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeeting&meetingId=17331>

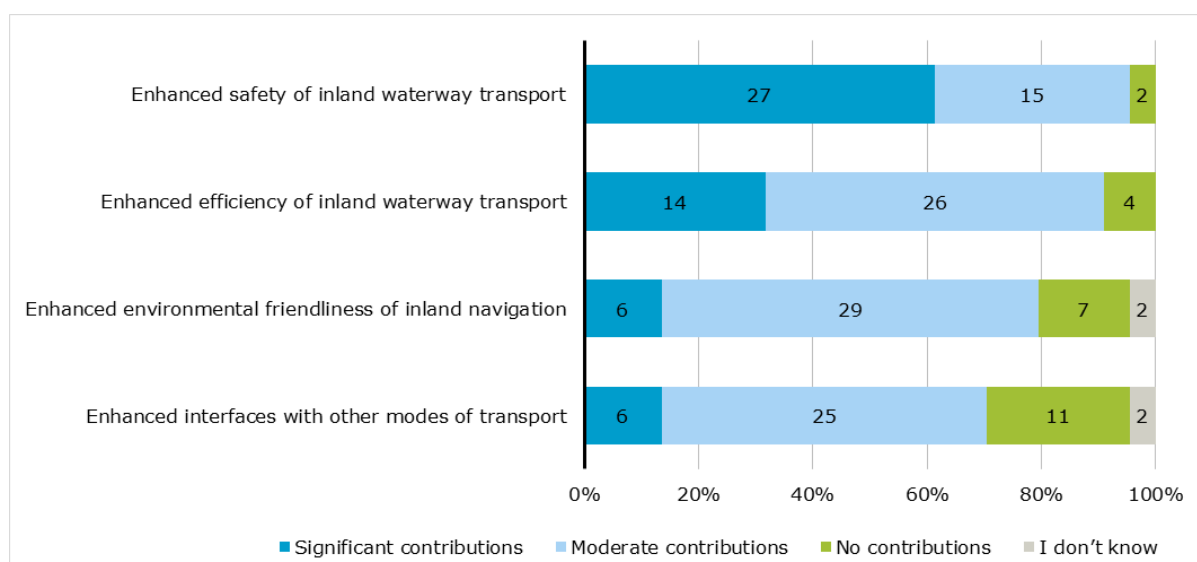
Results of consultation activities

The remainder of the report presents the main findings from the public consultation process.

Contribution of the RIS Directive to its main goals

Overall, respondents were positive about the contributions made by the RIS Directive towards the achievements of its goals. Almost all respondents acknowledge that the Directive contributed, at least to some extent, to the achievement of enhanced safety (42/44), enhanced efficiency (40/44), enhanced environmental friendliness of the sector (35/44) and enhanced interfaced with other modes of transport (31/44).

Enhanced safety in inland waterway transport was clearly considered to have been the main goal to which the RIS Directive contributed. For efficiency, environmental friendliness and interfaces with other modes of transport, on the other hand, the majority of the responses indicate only a moderate contribution. This implies that respondents believe the effect in these cases is less direct or requires more work.



N=44

Figure 7: Question 1 - To what extent has the RIS Directive contributed to the following goals?

Two respondents provided further clarification to this question, summarised as follows:

Answer category	Examples ²⁰³
Need for more harmonised approach (n=2)	<p>“RIS is necessary in order to contribute to the above-mentioned goals. The limits reside in the application and follow-up at EU level. A harmonised approach, coordination and implementation between Member States is required to reach the goals across borders and prevent new islands, which have now emerged.”</p> <p>“Unfortunately, the RIS Directive has made only a limited contribution to the above objectives, because there are still too many freedoms for the Member States ... Consequently, many islands have emerged ... RIS is indeed necessary to be able to contribute to the above objective, only the approach and follow-up by Europe is</p>

²⁰³ The two responses were similar: both made reference to the creation of “islands” within Europe, and both made reference to the RIS COMEX project as a step in the right direction. One of them was submitted by a RIS provider in Belgium and the other one by a European level association.

Answer category	Examples ²⁰³
	insufficient to date.” [translated]

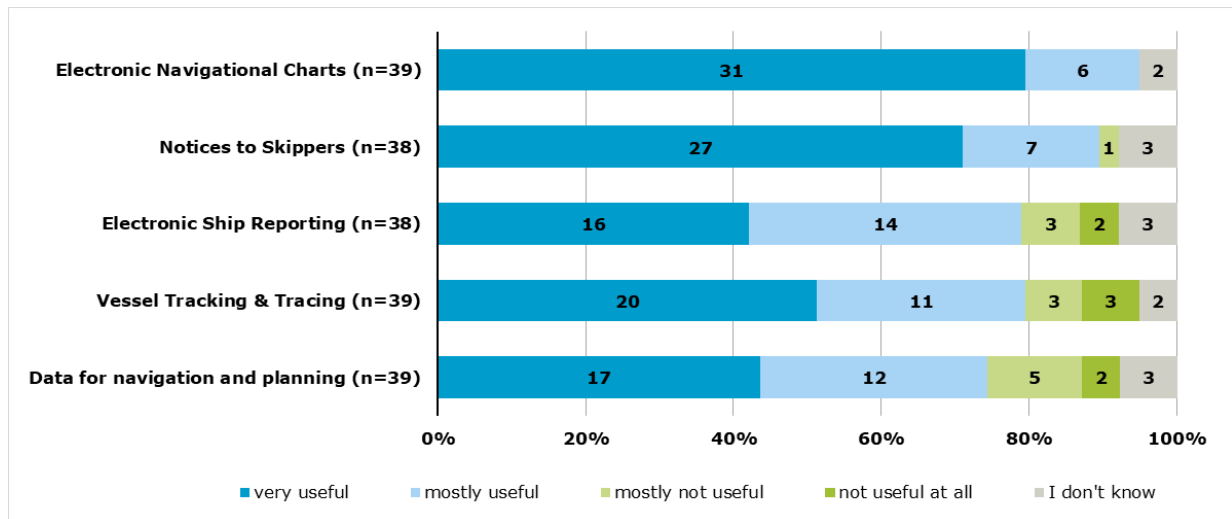
Table 6: Question 1 – additional information

Usefulness of key RIS technologies

Respondents were asked to indicate, on a four-point scale from “very useful” to “not useful at all”, the usefulness of data for navigation and planning, electronic navigational charts, notices to skippers, vessel tracking and tracing and electronic ship reporting.

Overall, all these RIS technologies are considered “very useful” or “mostly useful” by the majority of respondents.

In order of magnitude, when excluding “do not know” replies, respondents’ rate electronic navigational charts as most useful, followed by notices to skippers, electronic ship reporting, vessel tracking and tracing, and data for navigation and planning.



N=44

Figure 8. Question 2 - How useful are these main services in your day-to-day operation?

Respondent were given the opportunity to clarify their response to this question. Detail can be found as Annex to the Stakeholder Consultation Report.

Improvements to services

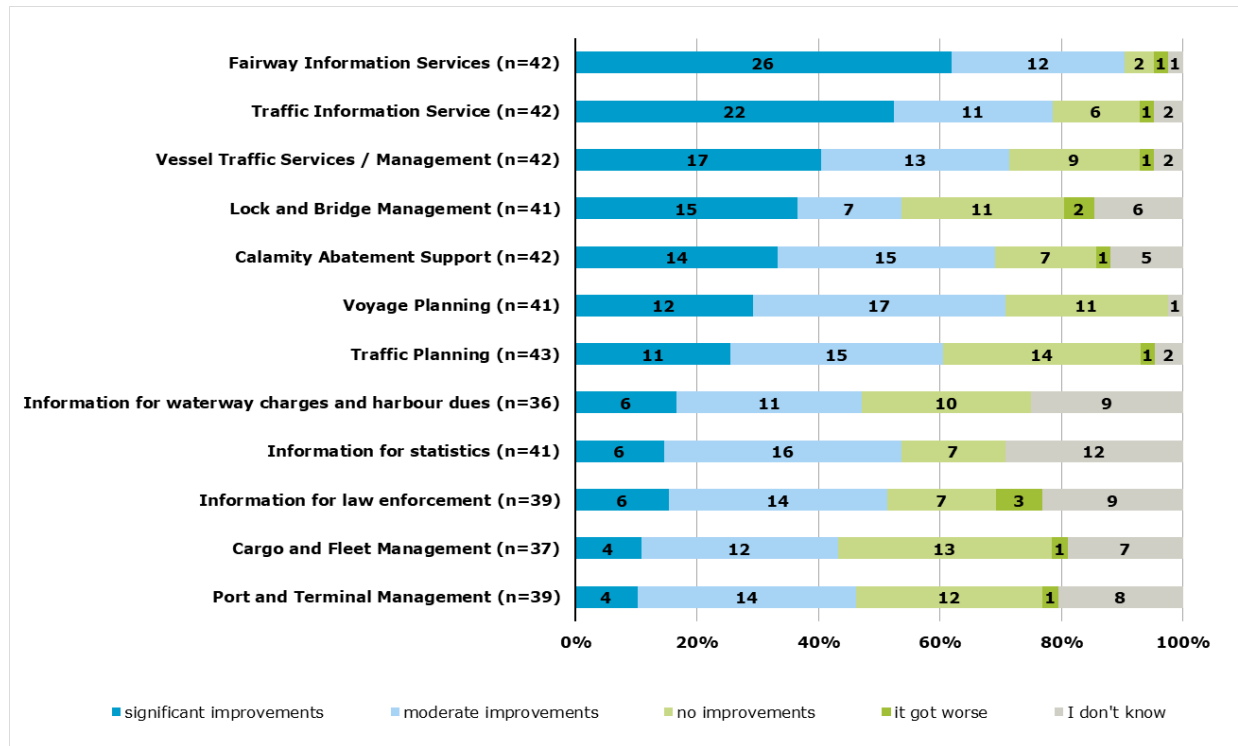
Respondents were asked to indicate, on a four-point scale ranging from “significant improvements” to “it got worse”, the extent to which the quality of river information services had changed since the introduction of the RIS Directive in 2005.

There is a degree of variance in the results. On the one hand (in order of magnitude, when not considering “do not know replies”), fairway information services, traffic information service, calamity abatement support, information for statistics and vessel traffic services/management are considered to have improved significantly or moderately by the large majority of respondents who provided input.

This is followed (in order of magnitude, when not considering “do not know” replies) by voyage planning, information for law enforcement, traffic planning, lock and bridge

management, information for waterway charges and harbour dues, port and terminal management, and cargo and fleet management. These are all considered to have improved at least moderately by more than half of the respondents who provided input, but to a lesser degree than those mentioned above.

A considerable number of respondents believe there have been no improvements to these services as a result of the RIS Directive. This is most notable for traffic planning, cargo and fleet management, and port and terminal management.



N=44

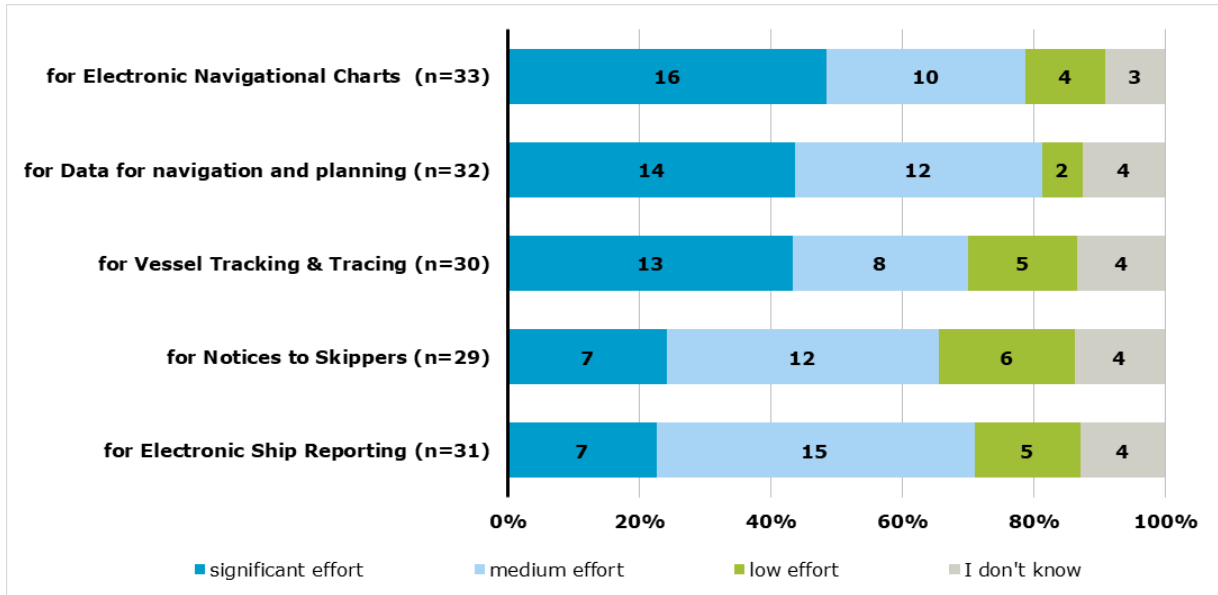
Figure 9: Question 3 - Changes in the services since the introduction of the RIS Directive in 2005?

Respondent were given the opportunity to clarify their response to this question. Detail can be found as Annex to the Stakeholder Consultation Report.

Benefits compared to costs

Respondents were asked to indicate how much effort the provision of electronic navigational charts, notices to skippers, electronic ship reports, vessel tracking and tracing, and data for navigation and planning involves for them.

In order of magnitude, when excluding “do not know” replies, the most effort was required for the provision of data for navigation and planning, followed by electronic navigational charts, electronic ship reports and vessel tracking and tracing (tied), and notices to skippers.

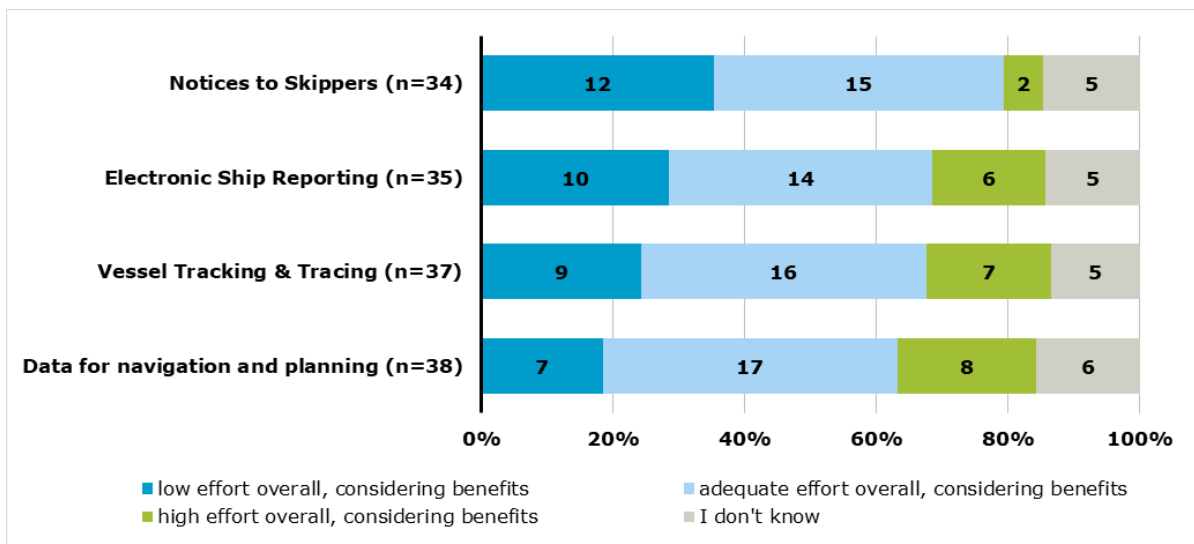


N=44

Figure 10: Question 4 - How much effort does providing the information for the following services/technologies involve for you?

Respondents were subsequently asked to compare the effort required to the benefits accrued. For the majority of respondents, the effort required for the provision of the abovementioned services/technologies is considered adequate or low considering the benefits brought about.

In order of magnitude, when excluding “do not know” replies, notices to skippers is most positively rated as having an adequate benefits-effort ratio. This is followed by electronic navigational charts, electronic ship reporting, vessel tracking and tracing, and data for navigation and planning respectively. In all five instances, however, at least three quarters of the respondents who provided input believes the effort is adequate or low compared to the benefits accrued.



N=44

Figure 11: Question 5 - Compared to the benefits, is the overall effort adequate?

Type approval of RIS equipment

Respondents who are using RIS equipment/applications were asked whether they are aware if their (on-board) equipment has been type-approved according to the RIS Directive. This resulted in 23 “does not apply” responses, i.e. from respondents who are not using RIS equipment/applications.

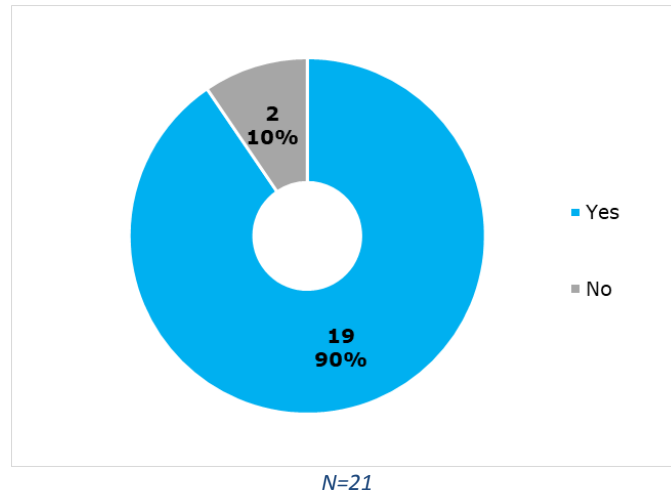


Figure 12: Question 7(a) - If you are using RIS equipment / applications: Do you know whether your (on-board) equipment has been type-approved according to the RIS Directive?

Among users, almost all (19 of 21) answered “yes”, and only two answered “no”. However, it is worth noting that due to the phrasing of the question, the “no” answer does not necessarily mean that their equipment is not type-approved, but rather that they are unaware whether it is.

Unfortunately, neither of the respondents who replied “no” to this question clarified their response. Among those who replied “yes”, two respondents provided relevant clarifications to their answers, namely that their AIS transponders are type-approved.

Respondents who are manufacturing RIS equipment/applications were asked whether they believe the benefits of type approval according to the RIS Directive outweigh the costs. This resulted in 37 “does not apply” responses, i.e. from respondents whom are not manufacturing RIS equipment/applications.

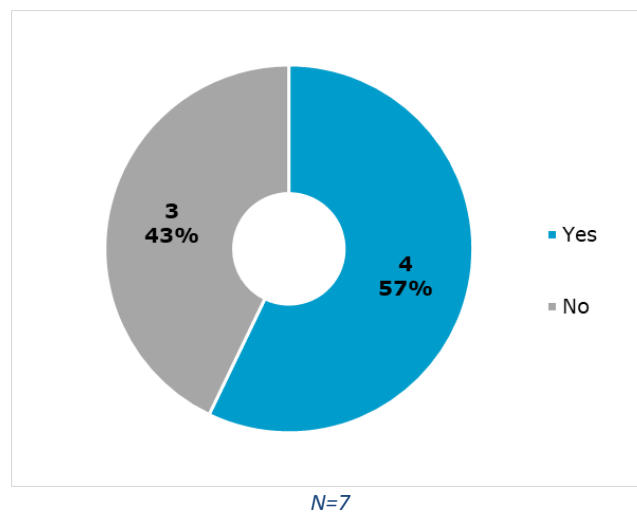


Figure 13. Question 7(b) - If you are manufacturing RIS equipment / applications: For you, do the benefits of type approval according to the RIS Directive outweigh the costs?

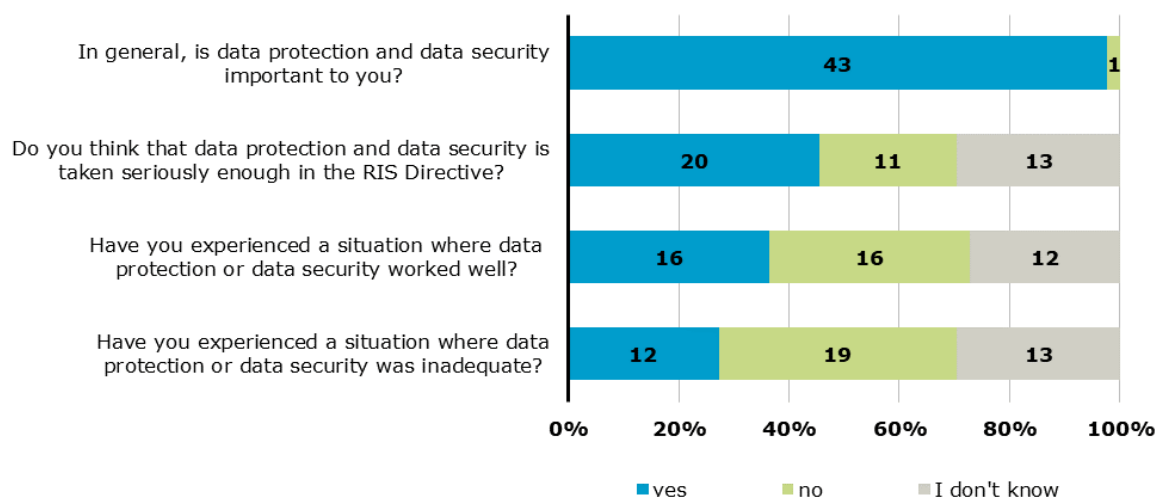
The manufacturers who provided input to this question are split in their beliefs. Four²⁰⁴ of them believe the benefits outweigh the costs, while the other three believe the benefits do not outweigh the costs.

Data protection, security and privacy

Respondents were asked to indicate their views on data protection, security and privacy in the context of RIS.

Almost all (43/44) respondents consider data protection and data security as important. Respondents' views on the degree to which this is adequately addressed by the RIS Directive, however, are more diverse.

Of the 31 people who provided input, 20 believe data protection and data security is taken seriously enough in the RIS Directive, while 11 believe it is not. A total of 16 people indicated having experienced a situation where data protection or data security worked well, and 12 have experienced a situation where it was inadequate.



N=44

Figure 14. Question 8 - Data protection, security and privacy in the context of River Information Services.

Respondent were given the opportunity to clarify their response to this question. Detail can be found as Annex to the Stakeholder Consultation Report.

Needs and problems

Respondents were asked whether they experienced any difficulties, inconsistencies or clashes in the way RIS are provided locally or between countries. They were asked to give concrete examples where this was the case. This resulted in text responses by 24 different respondents, which are summarised in the table below.

²⁰⁴ Note: one of them indicated being neither a user nor a manufacturer, but rather a body responsible for type approvals.

Answer category	Examples
Interaction between different authorities / actors (n=6)	<p>“in Romania, the River information services are concentrated into a single portal (which is fine), but the information provided there are distributed through links to other competent authorities (for example: waterway authorities) which is not good.”</p> <p>“Organisation of RIS / waterway information involving several governments is difficult and various data models do not match” [translated]</p> <p>“incompatibilities between systems developed by different suppliers and serving different RIS operators (within one country)”</p> <p>“RIS is under implementation in the Netherlands by the authorities in a good way, the partnership between the sector (being not only the skippers), the authorities and the private RIS/software suppliers could be much better”</p>
Differences in implementation (n=8)	<p>“depth information is still not published in the Inland ENC’s, even if there are isolated dangers below water”</p> <p>“In Germany AIS data are not used for infrastructure planning and management”</p> <p>“at present the development of UkrRIS is sluggish”</p> <p>“several countries do not even fulfil the minimum requirements of the EU RIS Directive, but at least basic RIS infrastructure is in operation in almost every country”</p> <p>“Important Information on the waterway network and fairway conditions is not available in all countries”</p>
Differences in data standards and interpretation (n=15)	<p>“Many countries provide very limited FIS data, or FIS data which is of poor quality. Many Danube countries have very limited ERI systems.”</p> <p>“The data quality and information provided varies from country to country due to the legislation in force and practices (e.g. many countries require different data, which are mandatory to be transmitted, only some countries provide actual data to the European Hull Database, data on the RIS Index is not always correct).”</p> <p>"Fairway information per country has often arisen differently and that leads to mutual incomprehension; In Flanders waterway codes are used in a way that was once established by Napoleon. In NL there is a waterway code from waterway descriptions from 1922. Methodology seems the same, but harmonization requires a lot of attention." [translated]</p> <p>“functions very badly because of different systems and interpretations between countries” [translated]</p> <p>“improve interconnection between standards towards harmonised reference data (position data, code tables etc.)”</p> <p>“Even though standards and definitions have been created in collaboration, we sometimes do not understand each other.”</p> <p>“Various understanding of the rules for encoding RIS Index”</p>
Limited data exchange (n=12)	<p>“for the elaboration of electronic navigation charts (Inland ENC’s), the exchange of data between Romania, Bulgaria and Serbia is difficult and sometimes hard to provide, because the information is private and can be provided to the partner.”</p> <p>“Major deficits as no common central systems are in operations; waterway users have to gather information from different sources; also reporting has to be done multiple times with almost the same data</p>

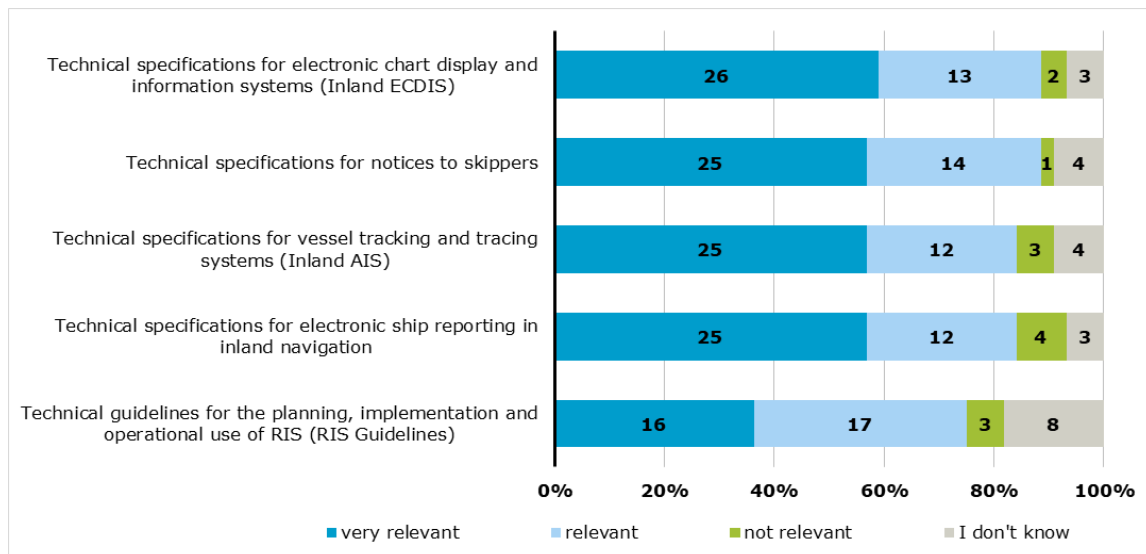
Answer category	Examples
	<p>content”</p> <p>“The RIS data exchange between different countries is not satisfying. The hope lies on RIS COMEX to improve the situation.”</p> <p>“cross-border data exchange is only applicable in limited scope, having a lot of problems in harmonisation and willingness for cooperation”</p>
Timeframe of adoption of RIS standards (n=6)	<p>“Due to the long period between publication of updated RIS standards, the technical situation is very different.”</p> <p>“unacceptable time spans since new standards are adopted and published”</p>
Other (n=3)	<p>“Inconsistency with regard to the import of the ERINOT 1.2 message.”</p> <p>“We have 60 pushers on the Danube constantly on the way and are able to see maybe 15-20 at any given time.”</p>

Table 7: Question 9 - If you found any difficulties, inconsistencies or clashes in the way how RIS are provided locally or between the countries, please let us know and give us concrete examples:

Respondents were asked to what extent the RIS guidelines and technical specifications remain relevant (on a scale from “very relevant” to “not relevant”) in light of technological developments that have taken place since 2005.

Overall, a very large majority of stakeholders agree that the technical guidelines and all four relevant technical specifications are still relevant and needed today.

In order of magnitude, when excluding “do not know” replies, the technical specifications for notices to skippers are considered most relevant and needed, followed by the specifications for Inland ECDIS, vessel tracking and tracing systems (Inland AIS), the RIS Guidelines and the technical specifications for electronic ship reporting.



N=44

Figure 15: Question 10 - Do you think the following guidelines and technical specifications of the RIS Directive are still relevant and needed today? (In your answer, please take technological developments since 2005 into account.)

Respondents were asked to specify whether they believe any important technical specifications are missing from the RIS Directive, or if it should cover any new developments. This resulted in 20 text responses, which are summarised in the table below.

Answer category	Examples
Need for additional/new technical specifications (n=6)	<p>“Annex 1 (network data) should be specified in a technical specification”</p> <p>“a technical specification for network data would be an important element. For the future also guidelines for the harmonised operation of RIS systems including data exchange and aspects like cyber-security and data protection would be useful.”</p> <p>“in the field of "automatic web guiding systems" we already have systems in the market which fall into the first stage of navigation automation in inland navigation ... it is urgently necessary to accompany these developments both operationally and on a technical level (such as the creation of minimum requirements), without stopping technical innovations.” [translated]</p>
Need for more detail (n=1)	<p>“Guidelines are important, but often details are also important. For example, when implementing the ERINOT, we see that different countries have interpreted the standard in different ways, which does not make it any easier for us as an application builder.”</p>
Need for flexibility (n=5)	<p>“The current technical specifications are too ‘coded’ and do not offer enough flexibility, so they cannot easily adjust to changing needs” [translated]</p> <p>“It is important to allow a suitable degree of flexibility in the standards in order to be able to adequately adapt to changing needs.”</p> <p>“Concerning standards and regulatory framework, it is important to have a flexible regulatory framework to enable the deployment of innovative solutions (without being hampered by a slow regulatory process)”</p> <p>“The RIS guidelines are very outdated, PIANC already published RIS guidelines edition 4 since the RIS directive is published. Updating of the RIS directive and the standards should be more dynamic.”</p>
Need for a more harmonised approach (n=2)	<p>“we need to get rid of national systems, we need to realise an EU FIS”</p> <p>“The European Union does not have a centralized portal dedicated to inland waterway navigation standards for all key RIS technologies.”</p>
Other comments (n=4)	<p>“It would be useful to allow data interchange with users of the IIW transport system (e.g. truck drivers). If/when this is done, it would be highly recommended that the same standard (data element and codification) used for maritime reporting is adopted.”</p> <p>“[The RIS Guidelines] are a nice-to-have introduction into RIS ... [but they] are not known to the end-users as this is not the main business for them ... RIS authorities/RIS Operators in cooperation with branch organisation [should] inform the stakeholders about the RIS and their benefits and to support them in making use of these benefits (e.g. support for digitalisation of processes of vessel operators).</p>

Table 8: Question 10(bis) – If you think that the RIS Directive is missing important technical specifications or should cover new developments, please mention (optional) (n=20)

Concerning the question on any problems or needs in the inland navigation sector linked to RIS that are not addressed, 22 respondents answered as follows:

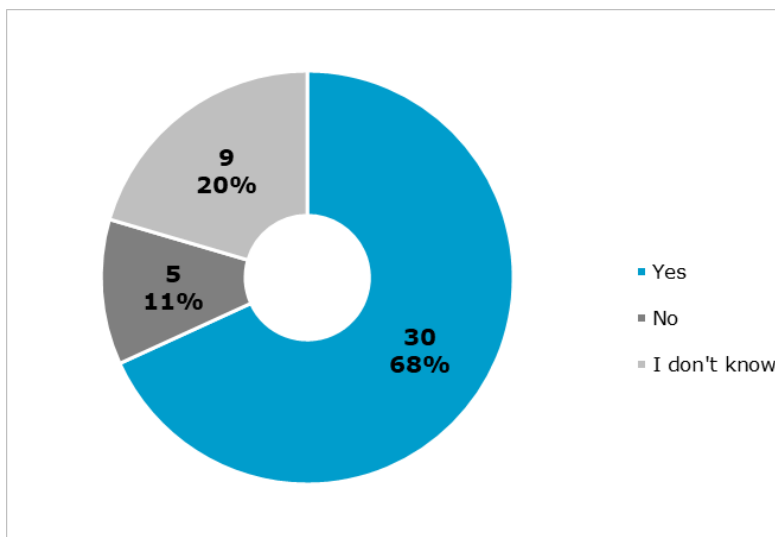
Answer categories	Examples
Integration of the logistical chain and other transport modes (n=9)	<p>“other logistics players in the logistic chain are forgotten, such as (fleet) operators and inland- and deep-sea terminals. ... The use of RIS, and the integration in the other modes of transport, by the different players in the logistics chain, certainly still requires a great deal of attention.”</p> <p>“Data exchanges with other modes of transport (maritime, rail, road) must be harmonized” [translated]</p> <p>“[need] links to developments in the transport sector (DTLF/eFTI) and other modes of transports.”</p> <p>“the RIS Directive consists of too many loose parts ... we need to consider how to use traffic and transport management to put the inland navigation sector on the map” [translated]</p> <p>“The review and revision should also be embedded in a new EU smart shipping/DINA strategy, which on the one hand develops tools for waterway transport to be competitive, safe, efficient and innovative, and on the other hand, fully takes into account what is happening across the mobility and supply chain with regard to synchro-modality, so inland waterway transport can be effectively integrated”</p>
Enforcement (n=3)	<p>“The initial aim of the RIS directive was to prevent a fragmented approach across borders for users when rolling out the first RIS services, which is still valid. This requires not only the development of technical standards but also the enforcement of harmonised implementation across borders at EU level. A regulation is a better legal instrument to ensure that there is no differing approach among Member States.”</p> <p>“AIS obligation is still missing.”</p> <p>“support of ‘mandatory ERI reporting’ in the near future in EU countries towards paperless navigation”</p>
Access to data (n=3)	<p>“[access to AIS data] would enable to use generated data and work with it for internal matters, such as track trace to customers, automated messages to customers, etc.”</p> <p>“data cannot be accessed by users of the transport system. Whether this should be considered by IIW Port Community System or taken into account in the RIS Directive is not for us to say.”</p> <p>“the data are not available in a digital way at the level of fleet operators, therefore they cannot benefit much from various services and data offered; they see mainly burdens as for example (additional) electronic reporting to RIS.”</p>
Automation and digitalisation (n=7)	<p>“New developments popping up: assistance systems, automation/digitalisation”</p> <p>“I would strongly encourage a discussion on how automation can be enabled on inland navigation from a legal point of view. Personally, I think that mandating the European Commission for passing a delegated or implementing act could ease the work of the member states in enabling/facilitating automation and avoiding a patchwork of legal frameworks.”</p> <p>“The automation of inland waterway navigation raises liability issues, similar to road traffic. I think it's important, as in the maritime world, to think about some sort of VDR (Voyage Data Recorder). The interfaces to such a system would have to be</p>

Answer categories	Examples
	standardized.” [translated] “digitalisation is in full swing and it will be important to adapt and update the RIS Directive and the accompanying regulations to this new reality.”
Concrete problems to be solved (n=4)	“Sometimes there are problems associated with the lack of understanding by captains of seagoing or mixed (seagoing/river) vessels, the need to use RIS. This is especially felt when these ships call from the sea to river mouth.” “AIS uses a lot of power and sometimes malfunctions abroad” [translated] “It is too much of a one-way street where a lot is expected from skippers but not enough is given back ... e.g. the ENC’s are outdated and take a long time to be updated”
Other comments (n=3)	It is essential that national and EU funded initiatives (DINA, CESNI/TI, DTLF etc.) are properly coordinated and that Horizon and CEF projects work in complementarity to create added value as part of an overall defined digital vision and execution strategy.

Table 9: Question 11 – From your experience, are there any problems or needs in the sector, linked to RIS, that are not addressed at all? (Please provide examples that illustrate the problem or need). (n=22)

Added value of regulating RIS at EU level

Respondents indicated that they believe there are aspects of RIS which have become easier in an EU-wide sense. Only five respondents do not believe this to be the case. A total of 9 respondents indicate that they do not know.



N=44

Figure 16. Question 12 - In your opinion, have any aspects related to RIS become easier in an EU-wide sense? (Please consider cross-border navigation and other aspects where EU-wide coordination plays a role.)

Respondents were subsequently asked to provide more information on their opinion on the EU added value of the RIS Directive. This resulted in 19 text responses, summarised as follows:

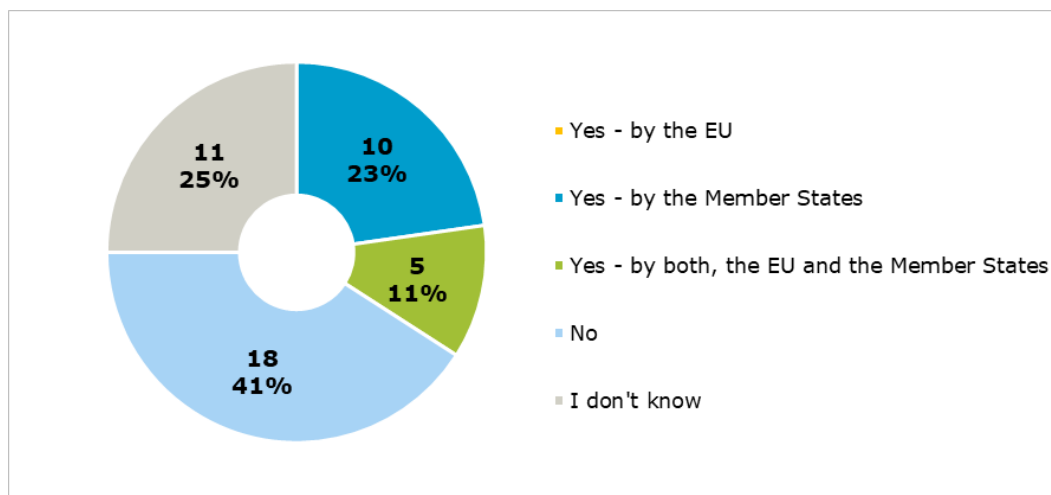
Answer categories	Examples
Yes, development of the sector (n=3)	<p>“without the standardisation based on the technical specifications ... Many countries would not have implemented RIS infrastructure in the time since 2005 without the clear will and obligations stated in the RIS Directive. Even though RIS has become standard this clear order from the EU (and of course the connected funding instruments!) have and still leverage RIS development and implementation.”</p> <p>“The EU RIS Directive has been the crucial trigger for the wide implementation of Electronic Navigational Charts, Notices to Skippers, Inland AIS and Electronic Ship Reporting at European level. These services are well received and appreciated by the inland navigation sector”</p> <p>“The European cooperation between European fairway authorities improved in an essential way during the last decades thanks to the RIS directive and only through the EC and RIS several steps are taken to improve the position of IWT.”</p>
Yes, through harmonisation and standardisation (n=7)	<p>“The RIS directive ensured that the same equipment can be used throughout Europe ... Deviating standards like the CCNR requirements for comparable chart systems are only valid on a single waterway.”</p> <p>“The establishment of the RIS expert groups as a consequence of the introduction of the RIS Directive in 2005 has established European standards ... This is extremely welcome, as shipping does not stop at borders.” [translated]</p> <p>“[RIS] work all over Europe. It is not necessary to buy / install different equipment aboard the vessels in different countries.”</p> <p>“Harmonisation of board technologies for IECDIS, VTT and partly NtS enable usage of single equipment throughout Europe. Single data standards enable use of charts, NtS etc. without borders”</p> <p>“Without the pro-active standardisation at European level, different systems and technologies would have emerged, such as in other modes of transport.”</p> <p>“without the standardisation based on the technical specifications, the production of on-board technologies would have been severely hampered.”</p>
Yes, but there are still issues (n=6)	<p>“Cross-border navigation and planning is still problematic due to massive administrative burden and lack of cross-border data exchange or central points of information.”</p> <p>“most ideas were very good, most pilots produced good results, but who is caring about sustainability of the results”</p> <p>“The initial idea of to develop RIS backed by harmonised implementation behind the RIS directive has enormous added value, but it has not been fulfilled in practice. This is an important attention point for the review and the revision.”</p> <p>“several essential steps ... have to be taken for the full deployment and full benefit of RIS and the RIS directive.”</p> <p>“Unfortunately, there are still examples of nation states advancing their own interests” [translated]</p>
No (n=2)	<p>“It would be nice to manage RIS regulation at EU level” [translated]</p> <p>“It is obvious to skippers that many countries still require re-reporting when crossing a border. Every Member State has its</p>

Answer categories	Examples
	own interests and interpretations”. [translated]
Do not know (n=3)	<p>“For the port of Rotterdam this added value can not be measured.”</p> <p>“We have only been sailing in the Netherlands for the last 6 years so we have no opinion” [translated]</p> <p>“I’m not sure we are the relevant target group” [translated]</p>

Table 10: Question 12(bis) - Please tell us more about relevant experiences since 2005, that could help us assess the actual "EU-added value". (optional) (n=19)

Respondents were asked to indicate whether the monitoring of the application of the RIS Directive in the Member States has been properly put in place, and by whom.

The majority of those who provided a response (i.e. excluding “do not know” answers) assessed this negatively. Among those who do believe the monitoring of the application has been properly put in place, most believe this was done by the Member States alone (10), or by the EU and the Member States both (5). None of the respondents believe this was done only by the EU.



N=44

Figure 17. Question 13 - Has the monitoring of the application of the RIS Directive in Member States been properly put in place (by EU or Member States)?

Eight of the nine respondents from Austria indicated that the monitoring has not been properly put in place. Among the other countries there is no noticeable pattern – they include the Netherlands (4), Belgium (3), Germany (1), Romania (1), and Czechia (1).

Respondents were given the opportunity to further clarify their responses, which resulted in a total of 17 text responses, which can be summarised as follows:

Answer category	Examples
No (n=13)	<p>“There is no monitoring that ensures that all member states meet the requirements of the RIS directive.”</p> <p>“several countries do not even fulfil the minimum requirements of the EU RIS Directive”</p>

Answer category	Examples
	<p>“Unfortunately, I have to consider the monitoring exercise as insufficient. Due to resource reasons at European Level, only a few RIS Committee meetings were organised. The RIS Expert Group Support certainly has helped and I assume that CESNI/TI will help in the standardisation.”</p> <p>“member states and companies consumed a lot of budget but did they still do not provide the services as required by the RIS directive.”</p> <p>“This is insufficient ... there has not been any check with regards to the regulations”</p> <p>“ERDMS - RIS Index data are not available from all countries; EHDB - not all countries delivered ‘their’ data sets. ‘Reporting only once’ does not yet apply. Not all countries provide NtS according to standard and in a machine-to-machine readable way. If data are delivered, some might not be of good quality - minimum levels for data quality need to be established and enforced.”</p> <p>“Not all Member States comply with the RIS Directive, some lack of services and do not fulfil their duty to make data/services available. There is no visible enforcement/pressure towards the Member States to comply with the RIS Directive and it’s implementing regulations for the technical RIS standards.”</p>
Yes, by Member States (n=1)	“Monitoring by EU suffers from lack of competence of the companies or institutions which were contracted to conduct monitoring.”
Yes, by EU and Member States (n=1)	“More stringent provisions could be envisaged for situations when Member States do not report on the progress of RIS implementation and/or implementation of different preconditions defined in relation to the implementation of RIS.”

Table 11: Question 13(bis) – Additional input on monitoring aspects (n=17)

Respondents were asked whether there were, in their opinion, any aspects covered by the RIS Directive that can be improved or simplified. They were given the opportunity to freely provide their views to this question in writing. This resulted in 20 text responses, which are summarised in an Annex to the Stakeholder Consultation Report.

Submitted position papers

Respondents were also given the opportunity to upload files in support to their responses. This resulted in three position papers.

All three position papers stress the need for a revision of the RIS Directive and its implementing acts in order to address digitalisation gaps and to set the direction for future technological developments. They motivate this opinion by signalling that since the introduction of the Directive in 2005, the IWT sector has undergone significant changes, with new requirements in terms of data formats, exchange and supporting technologies at the core of the changes. The increasing role of digitalisation in the IWT sector was highlighted, resulting in the need for an integrated digitalisation strategy for inland waterways. Concerning workforce, the need for developing new digital skills in the sector was mentioned, for example through training programmes and schemes. This applies to the providers of RIS and the consumers of RIS alike.

Interoperability of the IWT sector is considered a key element to maintain the sectors' competitiveness vis-a-vis other transport modes, whereas interoperability between sea and inland waterway systems (RIS/VTS) is perceived as a priority.

The position papers emphasise the importance of technical standards as part of the legal framework of the RIS Directive. They stipulate how keeping these standards as flexible as possible is crucial, so to ensure that the sector will quickly adapt to fast changing needs and new technological innovations. A lack of harmonisation in the way the RIS technical standards are implemented across countries and corridors is mentioned. A more harmonised approach is seen as fundamental to ensure future interoperability with other modes of transport.

The importance of multimodality is mentioned frequently. Multimodal cooperation should be a guiding principle of the RIS Directive. Therefore, the increasingly important goal of realising smart waterways and ports shall be taken in due consideration, supported by the following actions:

- pursuing integration and standardisation across Europe;
- ensuring interoperability of IWT with other transport modes;
- making access and collection of data easier and faster.

Another important aspect is the further development of the RIS Directive in relation to autonomous/automated navigation and smart logistics. The main principle of RIS was to facilitate the provision of information from authorities to the sector (A2B). In the future, RIS should also contribute to support the sector at the business-to-business (B2B) level.

Limited access to, and limited availability of reliable and updated data was mentioned as a hindering factor for RIS to reach its full potential. For example, difficulties around data protection laws are believed to have hindered the success of AIS for making available up-to-date position and identification information of vessels. To overcome these issues, the following suggestions are provided:

- the realisation of a single point of data access for all RIS users;
- inclusion of cybersecurity provisions in the Directive, if revised.

Conclusions

The consultation activities largely achieved their objectives, as all relevant stakeholder groups across a significant number of Member States and non-EU countries were asked for their views, suggestions for improving the legislative framework and quantitative evidence where available.

In general, the information collected corresponded to the objectives and expectations vis-à-vis each stakeholder group. However, due to the limited availability of quantitative data, certain gaps remained, particularly as regards detailed and comparable information on the costs and benefits of RIS services. While the lack of quantitative data was not unexpected, it shows the need for consistent, more harmonised monitoring and reporting.

Notwithstanding the remaining information gaps, the consultation activities can be regarded as successful in terms of response rate and stakeholder engagement.

Annex 3: Methods and analytical models

The analysis was based on an evaluation matrix (see below) that was used to identify operational sub-questions, potential indicators, success criteria and relevant data sources for each evaluation question. The matrix was developed at the start of the support study and refined throughout the study to take account of gaps in data availability and incorporate suitable mitigation measures.

Evaluation questions	Sub-questions	Indicators	Data sources & methods	Analytical strategy
EFFECTIVENESS				
<p>1. Compared to what would have happened in absence of the Directive, in quantitative and qualitative terms, to what extent have data for navigation and planning, electronic navigational charts, and notices to skippers</p> <p>a) been made available by Member States; and</p> <p>b) benefitted the resource planning of users of the inland waterways?</p>	<p>1.1. To what extent have data for navigation and planning been made available by Member States?</p>	<ul style="list-style-type: none"> Identified dissemination processes among the different MS, including comparison and contrast of any difficulties encountered in particular MS cases (if any) 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire Interviews with public bodies on national level Workshops and events 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> <i>Identification of RIS system connectivity with other MS (from fact-finding survey)</i> 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Qualitative data analysis
		<ul style="list-style-type: none"> Identified factors which helped MS in making the data available 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Identified factors which hindered MS in making the data available 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
	<p>1.2. To what extent have electronic navigational charts been made available by Member States?</p>	<ul style="list-style-type: none"> Identification of the dissemination processes among the different MS, including comparison and contrast of any difficulties encountered in particular MS cases (if any) 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire Interviews with public bodies on national level Workshops and events 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> <i>Qualitative information on how ENC's are made public to RIS users (from fact-finding survey)</i> 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Qualitative data analysis
		<ul style="list-style-type: none"> Identified factors which helped MS in making the electronic navigational charts available 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Identified factors which hindered MS in making electronic navigational charts available 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation

			level		
	1.3. To what extent have notices to skippers been made available by Member States?	<ul style="list-style-type: none"> • Identification of the dissemination processes among the different MS, including comparison and contrast of any difficulties encountered in particular MS cases (if any) 	<ul style="list-style-type: none"> • Workshops and events 	<ul style="list-style-type: none"> • Desk research and fact-finding study • Targeted questionnaire • Interviews with public bodies on national level • Workshops and events 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • <i>Qualitative information on means of NtS distribution (from fact-finding survey)</i> 	<ul style="list-style-type: none"> • Desk research and fact-finding study 	<ul style="list-style-type: none"> • Qualitative data analysis 	
		<ul style="list-style-type: none"> • Identified factors which helped MS in making the notices to skippers available 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level • Workshops and events 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation 	
		<ul style="list-style-type: none"> • Identified factors which hindered MS in making the notices to skippers available 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level • Workshops and events 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation 	
	1.4. To what extent have data for navigation and planning, benefitted the resource planning of users of the inland waterways?	<ul style="list-style-type: none"> • Extent to which the provided information is reported by RIS users (including end users; fairway authorities, waterway managers, skippers, terminal managers, lock managers, fleet operators, shippers, port operators) as actually having been of practical use with respect to resource planning • Identified factors which helped or hindered the practical use 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with private sector companies / representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation 	
	1.5. To what extent have electronic navigational charts benefitted the resource planning of users of the inland waterways?	<ul style="list-style-type: none"> • Extent to which the electronic navigational charts is reported by RIS users (including end users; fairway authorities, waterway managers, skippers, terminal managers, lock managers, fleet operators, shippers, port operators) as actually having been of practical use with respect to. resource planning • Identified factors which helped or hindered the practical use 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with private sector companies / representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation 	

	1.6. Have notices to skippers benefitted the resource planning of users of the inland waterways?	<ul style="list-style-type: none"> • Extent to which notices to skippers are reported by RIS users (including end users; fairway authorities, waterway managers, skippers, terminal managers, lock managers, fleet operators, shippers, port operators) as actually having been of practical use with respect to resource planning • Identified factors which helped or hindered the practical use 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with private sector companies / representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
2. Compared to what would have happened in absence of the Directive, in quantitative and qualitative terms, to what extent have electronic ship reports reduced re-submissions when crossing a border and led to cost savings for the users of the waterways and Competent Authorities?	2.1 To what extent have electronic ship reports reduced re-submissions when crossing a border?	<ul style="list-style-type: none"> • <i>Qualitative information on how electronic reporting is facilitated from a a) user b) authority perspective per country (from fact finding study), with specific focus on crossing a border</i> 	<ul style="list-style-type: none"> • Desk research and fact-finding study 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Qualitative data analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Identification of obstacles faced by skippers when submitting e-ship reports complying with the technical specifications 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • Identification of outcomes of processes which the competent authorities deploy for receiving, using, and passing on the e-ship reports 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Identification of opportunity costs (the benefits an individual, investor or business <i>misses out on</i> when choosing one alternative over another) saved (in non-monetary terms), per Competent Authority 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation • Cost-benefit analysis • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Identification of influencing factors to take-up / lack of take-up of the process 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation

			<ul style="list-style-type: none"> representative organisations Workshops and events Public Consultation 	
		<ul style="list-style-type: none"> Number of reduced resubmissions. 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Data triangulation
		<ul style="list-style-type: none"> Change in the activity of agents per trip (i.e. electronic reports led to a reduction of workload for agents performing reporting duties before) (through interviews with skippers, fleet operators, etc.) 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation Analysis of the counterfactual
		<ul style="list-style-type: none"> Share of electronic data compared to other ways of reporting: ERINOT, PAXLST, ERIRSP, BERMAN, (FFS) 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Change in numbers of resubmissions when crossing a border compared to what would have happened in absence of the Directive, in quantitative and qualitative terms. 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Data triangulation Analysis of the counterfactual
		<ul style="list-style-type: none"> Numbers of reduction of retransmission of information contained in e-ship reports compared to the time before the process has been set up or in counterfactual scenario. 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Data triangulation Analysis of the counterfactual
	<p>2.2 To what extent have electronic ship reports led to cost savings (through reduced resubmissions) for:</p> <ul style="list-style-type: none"> - the users of the waterways - the Competent Authorities? 	<ul style="list-style-type: none"> Cost per processing (reception + use + passing-on) a single e-ship report 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis Analysis of the

				counterfactual
		<ul style="list-style-type: none"> Costs saved by users of waterways compared to costs previously associated with resubmissions in terms of: Actual expenditure in monetary terms Costs expressed in manhours multiplied by average full-time equivalent salaries 	<ul style="list-style-type: none"> Targeted questionnaire Interviews (task 4.2) with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis Analysis of the counterfactual
		<ul style="list-style-type: none"> Costs saved compared to costs previously spent on resource planning (to the extent possible split for fairway authorities, waterway managers, skippers, terminal managers, lock managers, fleet operators, shippers, port operators), expressed in manhours multiplied by average full-time equivalent salaries 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis Analysis of the counterfactual
		<ul style="list-style-type: none"> Investment and maintenance expenditure in vessels and infrastructure (Eurostat & market observation reports of CCNR) 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> Share of national waterways covered by Electronic Navigation Charts (ENCs), differentiated according to the CEMT classification (fact-finding study) 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> Level of coverage of Notices to Skippers (NtS) messages in % per country (fact-finding study) 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> Share of messages encoded, downloadable, and machine-readable (fact-finding study) 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> <i>Interconnectivity of RIS systems and use of key RIS technology (fact-finding study)</i> 	<ul style="list-style-type: none"> Desk research and fact-finding study 	<ul style="list-style-type: none"> Descriptive statistical analysis
3.	Compared to what would have happened in absence of the Directive, in quantitative and qualitative terms, to what extent, with regard to the type-approval of equipment , has the implementation of the Directive led to the mutual recognition of RIS equipment as foreseen in Art. 7.1?	<ul style="list-style-type: none"> Comparative qualitative assessment of the Member States bodies for type-approval 	<ul style="list-style-type: none"> Desk research Targeted questionnaire to MS officials of IWT countries Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation

		<ul style="list-style-type: none"> Public Consultation 	
	<ul style="list-style-type: none"> Comparative assessment of the differences in the processes of type-approving the RIS terminals, network equipment and software applications between the MS 	<ul style="list-style-type: none"> Desk research Targeted questionnaire to MS officials of IWT countries Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
	<ul style="list-style-type: none"> Comparative assessment of equipment that needs to be type-approved 	<ul style="list-style-type: none"> Desk research Targeted questionnaire to MS officials of IWT countries Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
	<ul style="list-style-type: none"> Comparative assessment of equipment types that have been certified 	<ul style="list-style-type: none"> Desk research Targeted questionnaire to MS officials of IWT countries Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
	<ul style="list-style-type: none"> Identification of influencing factors to mutual recognition / non-recognition 	<ul style="list-style-type: none"> Targeted questionnaire to MS officials of IWT countries Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation

	<ul style="list-style-type: none"> • Number of type approvals carried out (all type approvals, independent if they were required or not) 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire to MS officials of IWT countries 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
	<ul style="list-style-type: none"> • Number of type approvals performed since the Directive 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire to MS officials of IWT countries 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
	<ul style="list-style-type: none"> • Number of companies that have applied for type approvals 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire to MS officials of IWT countries 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
	<ul style="list-style-type: none"> • Quantitative comparison of costs of type-approvals 	<ul style="list-style-type: none"> • Targeted questionnaire to MS officials of IWT countries • Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
	<ul style="list-style-type: none"> • Quantitative comparison of the numbers of type approvals since 2007 	<ul style="list-style-type: none"> • Targeted questionnaire to MS officials of IWT countries • Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
	<ul style="list-style-type: none"> • Number of type-approvals issued by a MS which are mutually recognised by other MS (comparison since the introduction of the Directive) 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire to MS officials of IWT countries 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
	<ul style="list-style-type: none"> • Number of type-approvals issued by a MS which were refused to be mutually recognised by other MS 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire to MS officials of IWT countries 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Data triangulation
4. Compared to what would have happened in absence of the Directive, in quantitative and qualitative terms, to what extent, has the Directive been overall effective in establishing an interoperable, harmonised RIS?	<ul style="list-style-type: none"> • <i>Composite indicator comprising of findings relating to questions 1-4</i> 		<ul style="list-style-type: none"> • Data triangulation
5. Compared to what would have happened in absence of the Directive, in quantitative and qualitative terms, to what extent, has the Directive had unintended <ul style="list-style-type: none"> • economic, • social, or • environmental effects? 	<ul style="list-style-type: none"> • Degree of supporting evidence from consultations (opinion of stakeholders) • Degree of supporting evidence from desk research 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Public Consultation 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Qualitative data analysis • Data triangulation • Analysis of the counterfactual

Horizontal question: When answering questions 1-5, focus on actual, attributable effects; also, determine which external factors have substantially helped or harmed positive change and whether there are substantial differences between Member States.	What has been the role of the technological developments since 2005?	<ul style="list-style-type: none"> Identified technological developments since 2005 which are relevant for the RIS environment 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research Targeted questionnaire Interviews with public bodies on national level and representative organisations 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation 	
		<ul style="list-style-type: none"> Degree of supporting evidence from consultations (opinion of stakeholders) 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level and representative organisations 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation 	
		<ul style="list-style-type: none"> Degree of supporting evidence from desk research 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation 	
	What has been the role of the policy developments since 2005 (e.g. carriage requirements for Inland AIS transponders, ECDIS requirements, etc.)?	<ul style="list-style-type: none"> Identified policy developments since 2005 which are relevant for the RIS environment 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research Targeted questionnaire Interviews with public bodies on national level and representative organisations 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation 	
		<ul style="list-style-type: none"> Degree of supporting evidence from consultations (opinion of stakeholders) 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level and representative organisations 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation 	
		<ul style="list-style-type: none"> Degree of supporting evidence from desk research 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation 	
	6. At the level of its general objectives and compared to what would have happened in	6.1. Has the Directive contributed to increased competitiveness of the inland waterway sector across Europe, particularly when looking	<ul style="list-style-type: none"> High-level overview of performance and developments of other transport modes over the evaluation period 	<ul style="list-style-type: none"> Desk research Interviews with public bodies on national level and private sector companies / 	<ul style="list-style-type: none"> Econometric modelling Qualitative data analysis Data triangulation

absence of the Directive, to what extent (in quantitative and qualitative terms):	at modal shift into inland waterway transport away from other modes?		<ul style="list-style-type: none"> representative organisations Testing, via an econometric relation, if there is a structural break in the IWT tonne.km development with a dummy year for the full implementation of the RIS directive Public Consultation 	<ul style="list-style-type: none">
		<ul style="list-style-type: none"> Identification of key trends across the transport modes (with Directive in place) 	<ul style="list-style-type: none"> Desk research Interviews with public bodies on national level and private sector companies / representative organisations Public Consultation 	<ul style="list-style-type: none"> Econometric modelling Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Identification of the likely state of sector's competitiveness over the evaluation period in absence of the Directive (Baseline) 	<ul style="list-style-type: none"> Desk research Interviews with public bodies on national level and private sector companies / representative organisations Testing, via an econometric relation, if there is a structural break in the IWT tonne.km development with a dummy year for the full implementation of the RIS directive Public Consultation 	<ul style="list-style-type: none"> Econometric modelling Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> GDP per country 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Econometric modelling
		<ul style="list-style-type: none"> Used in econometric study: tonne km; Dummy variable per country Modal split data between freight Number of users of Automatic Identification Systems (AIS) per country Number of users of river or cabin cruises where applicable 	<ul style="list-style-type: none"> Desk research Testing, via an econometric relation, if there is a structural break in the IWT tonne.km development with a dummy year for the full implementation of the RIS directive) 	<ul style="list-style-type: none"> Econometric modelling
	6.2. To what extent has the Directive contributed to an optimised use of existing infrastructures by supporting improved resource planning by waterway authorities, terminal managers and lock	<ul style="list-style-type: none"> Optimisation process of resource planning attributable to the RIS Directive for: fairway authorities (traffic) waterway managers (infrastructure) terminal managers lock managers 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Analysis of the counterfactual

	managers?	<ul style="list-style-type: none"> port operators skippers fleet / barge operators shippers 		
	<ul style="list-style-type: none"> Assessment of the likely state of existing infrastructure use over the evaluation period in absence of the Directive. 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation Analysis of the counterfactual 	
	<ul style="list-style-type: none"> Identified reduction of required trips, e.g. in a larger port / to container terminals 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Public Consultation 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Analysis of the counterfactual 	
	<ul style="list-style-type: none"> Change in percentage of lock utilisation (relative to baseline) (i.e. better utilisation of infrastructure thanks to better information) 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Analysis of the counterfactual 	
	<ul style="list-style-type: none"> Change in percentage in bridge utilisation (relative to baseline) (i.e. better utilisation of infrastructure thanks to better information) 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Analysis of the counterfactual 	
	<ul style="list-style-type: none"> Optimisation percentage in load factor (better vessel utilisation) 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Analysis of the counterfactual 	
	<ul style="list-style-type: none"> Vessel utilisation (tonnes cargo versus tonnes) and according to theoretical loading capacity 	<ul style="list-style-type: none"> Desk research and fact-finding study Targeted questionnaire 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Analysis of the 	

				counterfactual
		<ul style="list-style-type: none"> • Time trends in water way maintenance costs (Euro) 	<ul style="list-style-type: none"> • Desk research and fact-finding study • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Qualitative data analysis • Data triangulation • Analysis of the counterfactual
6.3. To what extent has the Directive contributed to improved safety in river navigation?		<ul style="list-style-type: none"> • Additional types of data protection rules and security measures to protect RIS put in place by MS due to the RIS Directive, relative to counterfactual. 	<ul style="list-style-type: none"> • Desk research and fact-finding study • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Public Consultation 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Qualitative data analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Identification of differences in application of the safety measures between the MS 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • Changes in RIS users' sense / feeling of safety over evaluation period (in light of implementation history of region) 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • <i>Coverage (in %) of the AIS network per country (fact finding study)</i> 	<ul style="list-style-type: none"> • Desk research and fact-finding study 	<ul style="list-style-type: none"> • Descriptive statistical analysis
		<ul style="list-style-type: none"> • Quantified levels of acceptance of vessel tracking & tracing systems among skippers from different MS 	<ul style="list-style-type: none"> • Desk research and fact-finding study 	<ul style="list-style-type: none"> • Descriptive statistical analysis
		<ul style="list-style-type: none"> • <i>Number of inland waterway accidents per year per MS (Eurostat)</i> 	<ul style="list-style-type: none"> • Desk research and fact-finding study 	<ul style="list-style-type: none"> • Descriptive statistical analysis
		<ul style="list-style-type: none"> • % change in number of waterway accidents 	<ul style="list-style-type: none"> • Desk research and fact-finding study 	<ul style="list-style-type: none"> • Descriptive statistical analysis
	6.4. Has the Directive led to a reduction of the sector's negative impacts on	<ul style="list-style-type: none"> • Qualitative evidence from consultations (opinion of stakeholders) on changes of environmental impacts. 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation • Analysis of the

	the environment?		<ul style="list-style-type: none"> Public Consultation 	counterfactual
		<ul style="list-style-type: none"> Qualitative evidence from desk research (other evaluations of IWW systems) on changes of environmental impacts. 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Qualitative data analysis Analysis of the counterfactual
		<ul style="list-style-type: none"> Comparison of electricity consumption by transport activities between IWT and other modes (EUROSTAT) 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> Comparison of Final Energy Consumption (Mtoe) per year between IWT and other modes (Statistical Pocketbook) 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> Greenhouse Gas Emissions (GHG) from Transport by Mode, including International Bunkers per year - comparison between IWT and other modes (Statistical Pocketbook) 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Descriptive statistical analysis
		<ul style="list-style-type: none"> CO2 Emissions from Transport (Inland navigation), between IWT and other modes, per year (Statistical Pocketbook) 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Descriptive statistical analysis
EFFICIENCY				
7. What costs/ negative impacts have been associated with the preparation of the relevant Regulations and how are they distributed amongst those involved? (excluding the comitology process for adopting implementing acts). Are there areas, including organisational aspects, with potential for efficiency gains?	7.1. What costs/negative impacts have been associated with the preparation of the relevant Regulations?	<ul style="list-style-type: none"> Number of FTE-DG staff involved in preparation of each of the Directive 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis
		<ul style="list-style-type: none"> Number of FTE-DG staff involved in preparation of each of the Implementing Acts 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Analysis of the counterfactual
		<ul style="list-style-type: none"> Number of public sector staff involved in preparation of the Implementing Acts from MS RIS side 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Analysis of the

				counterfactual
	7.2. How are the costs under EQ 8 distributed among those involved?	<ul style="list-style-type: none"> Evidence of process' evolution over the evaluation period 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> FTE salary rates 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Costs of any external contracts commissioned (monetised) 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders 	<ul style="list-style-type: none"> Cost-benefit analysis
	7.3. Are there areas, including organisational aspects, with potential for efficiency gains?	<ul style="list-style-type: none"> Identification of factors influencing the preparation process, driving costs and quality 	<ul style="list-style-type: none"> Interviews with public bodies on national level 	<ul style="list-style-type: none"> Qualitative data analysis
8. What costs/negative impacts has the Directive given rise to in order to advance resource planning of users of the inland waterways through improved data for navigation and planning, electronic navigational charts and notices to skippers? How do these compare to the benefits established?	8.1. What costs/negative impacts has the Directive given rise to in order to advance resource planning of users of the inland waterways through improved data for navigation and planning?	<ul style="list-style-type: none"> Administrative and Implementing costs (one-off and ongoing) per stakeholders groups: FTE of inland users' additional time dedicated to learning the new tools and technologies relative to time costs incurred in baseline scenario. Additional monetary costs associated with changes to the equipment relative to costs incurred in baseline scenario. Additional monetary implementing costs associated with creating services relative to costs incurred in baseline scenario. Additional number of FTE over the evaluation period in the Competent Authorities/implementing bodies for handling new processes. Additional operational costs over the evaluation period (not covered by FTEs) FTE equivalent spent by the MS authorities for creations/ set-up of the new data services for navigation and planning 	<ul style="list-style-type: none"> Desk research Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis Analysis of the counterfactual

		<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on unmonetizable costs and disbenefits split by user category 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
	8.2. How do these costs/negative impacts established under EQ 8.1 compare to the benefits established from the Directive's measures on "data for navigation and planning"?	<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on costs relative to benefits 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation Cost-Benefit-Analysis
	8.3. What costs/negative impacts has the Directive given rise to in order to advance resource planning of users of the inland waterways through improved electronic navigational charts?	<ul style="list-style-type: none"> Administrative and Implementing costs (one-off and ongoing) per stakeholder groups: FTE of inland users' additional time dedicated to learning the new tools and technologies relative to time costs incurred in baseline scenario. Additional monetary costs associated with changes to the equipment relative to costs incurred in baseline scenario. Additional monetary implementing costs associated with creating services relative to costs incurred in baseline scenario. Additional number of FTE over the evaluation period in the Competent Authorities/implementing bodies for handling new processes. Additional operational costs over the evaluation period (not covered by FTEs) FTE equivalent spent by the MS authorities for creations/ set-up of the new electronic navigational charts 	<ul style="list-style-type: none"> Desk research Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis Analysis of the counterfactual
	8.4. How do these costs/negative impacts established under EQ 8.3 compare to the benefits established from the Directive's measures on "electronic navigational charts"?	<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on unmonetizable costs and disbenefits split by user category 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation Cost-Benefit-Analysis
	8.5. What costs/negative impacts has the Directive given rise to in order to	<ul style="list-style-type: none"> Administrative and Implementing costs (one-off 	<ul style="list-style-type: none"> Desk research 	<ul style="list-style-type: none"> Descriptive statistical

	advance resource planning of users of the inland waterways through notices to skippers?	and ongoing) per stakeholder group: <ul style="list-style-type: none"> • FTE of inland users' additional time dedicated to learning the new tools and technologies relative to time costs incurred in baseline scenario. • Additional monetary costs associated with changes to the equipment relative to costs incurred in baseline scenario. • Additional monetary implementing costs associated with creating services relative to costs incurred in baseline scenario. • Additional number of FTE created in the Competent Authorities/implementing bodies for handling the new processes. • Additional operational costs over the evaluation period (not covered by FTEs) • FTE equivalent spent by the MS authorities for creations/ set-up of the new NtS processes. 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events 	<p>analysis</p> <ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation • Cost-benefit analysis • Analysis of the counterfactual
	8.6. How do these costs/negative impacts established under EQ 8.5 compare to the benefits established from the Directive's measures on "notices to skippers"?	<ul style="list-style-type: none"> • Evidence from consultations (opinion of stakeholders) on unmonetizable costs and disbenefits split by user category 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation • Cost-Benefit-Analysis
9. What costs / negative impacts has the Directive given rise to in order to advance cost savings through the reduction in re-submission of electronic ship reports when crossing a border? How do these compare to the benefits established?	9.1. What costs / negative impacts has the Directive given rise to in order to advance cost savings through the reduction in re-submission of electronic ship reports when crossing a border?	<ul style="list-style-type: none"> • Administrative and Implementing costs (one-off and ongoing) per stakeholder group: • FTE of inland users' additional time dedicated to learning the new tools and technologies relative to time costs incurred in baseline scenario. • Additional monetary costs associated with changes to the equipment relative to costs incurred in baseline scenario. • Additional monetary implementing costs associated with creating services relative to costs incurred in baseline scenario. • Additional number of FTE over the evaluation period in the Competent Authorities/implementing bodies for handling new processes. • Additional operational costs over the evaluation 	<ul style="list-style-type: none"> • FTE equivalent spent by the MS authorities for creations/ set-up of the new electronic reporting system. • Desk research • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events 	<ul style="list-style-type: none"> • Descriptive statistical analysis • Qualitative data analysis • Data triangulation • Cost-benefit analysis • Analysis of the counterfactual

		period (not covered by FTEs)		
		<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on unmonetizable costs and disbenefits split by user category 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
	9.2. How do these compare to the benefits established?	<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on costs relative to benefits 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation Cost-Benefit-Analysis
10. What costs/negative impacts has the Directive Given rise to in order to advance cost savings for users of the inland waterways brought about by changes in the way equipment is type approved? How do these compare to the benefits established?	10.1. What costs/negative impacts has the Directive given rise to advance cost savings for users of the inland waterways brought about by changes in the way equipment is type approved?	<ul style="list-style-type: none"> Administrative and Implementing costs (one-off and ongoing) per stakeholder group: FTE of inland users' additional time dedicated to learning the new tools and technologies relative to time costs incurred in baseline scenario. Additional monetary costs associated with changes to the equipment relative to costs incurred in baseline scenario. Additional monetary implementing costs associated with creating services relative to costs incurred in baseline scenario. Additional number of FTE over the evaluation period in implementing bodies for handling new type approval processes. Additional operational costs over the evaluation period (not covered by FTEs) FTE equivalent spent by the MS authorities for creations/ set-up of the new type-approval processes. Additional private sector costs (if any) 	<ul style="list-style-type: none"> Desk research Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Cost-benefit analysis Analysis of the counterfactual
		<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on unmonetizable costs and disbenefits by split by user category 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation

			<ul style="list-style-type: none"> Workshops and events 	
	10.2. How do the costs/negative impacts established under 10.1 compare to the benefits established from the Directive's measures on "equipment type approval"?	<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on costs relative to benefits 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative and quantitative data analysis Data triangulation Cost-Benefit-Analysis
11. What costs/negative impacts has the Directive given rise to overall in order to establish an inter-operable, harmonised RIS? How do these compare to the benefits established?	11.1. What costs/negative impacts has the Directive given rise to overall in order to establish an inter-operable, harmonised RIS?	<ul style="list-style-type: none"> Composite indicator including overall Administrative and implementing costs (one-off and ongoing), <i>comprising of findings relating to questions 7-10</i> 		<ul style="list-style-type: none"> Data triangulation
		<ul style="list-style-type: none"> Evidence from consultations (opinion of stakeholders) on unmonetizable costs and disbenefits by split by user category 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
	11.2. How do the costs/negative impacts established under 12.1 compare to the benefits the Directive has brought about in pursuit of an inter-operable, harmonised RIS?	<ul style="list-style-type: none"> Identification of factors influencing the overall efficiency of the Directive (and its Implementing Acts) – extrapolation of the bottom-up analysis of the indicators of sub-questions 8.1 to 8.6, 9, 14.1, 14.2. 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Extrapolation of costs / negative effects from the lower levels of the Intervention Logic Data triangulation
		<ul style="list-style-type: none"> Cost-benefit analysis' outcomes for the different types of activities introduced 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Targeted questionnaire Interviews with public bodies on national level 	<ul style="list-style-type: none"> Cost-benefit analysis Analysis of the counterfactual
12. Has the directive had unintended negative: <ul style="list-style-type: none"> economic social, or environmental effects? 	<ul style="list-style-type: none"> Degree of supporting evidence from consultations (opinion of stakeholders) Degree of supporting evidence from desk research 	<ul style="list-style-type: none"> Desk research Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Public Consultations 	<ul style="list-style-type: none"> Descriptive statistical analysis Qualitative data analysis Data triangulation Analysis of the counterfactual 	
13. Is there a potential for simplification and reduction of regulatory burden in the process?	<ul style="list-style-type: none"> Identified and quantified disproportionate administrative costs or regulatory burden in activities linked to the implementation of RIS Directive, to the extent possible specified for each stakeholder group involved: RIS Users (e.g. skippers, authorities (fairway 	<ul style="list-style-type: none"> Targeted questionnaire Interviews with public bodies on national level and private sector companies / representative organisations Workshops and events 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation 	

		<p>authorities, police authorities, lock managers), freight charterers and brokers (track and trace, planning))</p> <ul style="list-style-type: none"> • Competent Authorities • Member States 	<ul style="list-style-type: none"> • Public Consultation 	
14. What costs/negative impacts has the Directive given rise to in order to advance its general objectives and how do these compare to the benefits established under TOR EQ6 (benefits-at level of general objectives)?	14.1. What costs/negative impacts has the Directive given rise to in order to advance its general objectives?	<ul style="list-style-type: none"> • Identification of factors influencing the general efficiency of the Directive (and its Implementing Acts) with regards to: • Competitiveness • Optimised use of existing infrastructures • Improved safety • Reduction of negative impact on the environment 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Extrapolation of costs / negative effects from the lower levels of the Intervention Logic • Qualitative data analysis • Data triangulation • Cost-benefit analysis • Analysis of the counterfactual
	14.2. How do the costs established compare to the benefits established at the general objectives level?	<ul style="list-style-type: none"> • Identification of all contributing factors influencing the efficiency of the Directive? 	<ul style="list-style-type: none"> • Desk research • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Extrapolation of costs / negative effects from the lower levels of the Intervention Logic • Data triangulation
RELEVANCE				
15. Do the original objectives, incorporated in the RIS Directive and in the five related RIS regulations, match the needs of the sector today and in the foreseeable future? Please take into account legal, technological and market developments.	15.1. To what extent and in what ways have the needs of the IWT sector changed since 2005, considering legal, technological and market aspects, what are they today, how are they expected to change in the foreseeable future?	<ul style="list-style-type: none"> • Evidence from existing research on current and future legal, technological and market needs, including needs of sector in a wider sense from a societal point of view 	<ul style="list-style-type: none"> • Desk research: A detailed inventory of existing/ ongoing policy developments/ legislations, evaluations, impact assessments, and studies in this area 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • Evidence from consultations (opinion of stakeholders) on legal, technological and market needs, including needs of sector in a wider sense from a societal point of view 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
	15.2. Do the original objectives, incorporated in the RIS Directive and in the five related RIS regulations, match the needs of the	<ul style="list-style-type: none"> • Evidence from consultations (opinion of stakeholders) on the perceived alignment between identified needs and objectives set. 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation

	sector today and in the foreseeable future, taking into account legal, technological and market developments?		<ul style="list-style-type: none"> • Workshops and events • Public Consultation 	
		<ul style="list-style-type: none"> • Alignment between identified needs and objectives set in Directive and the identified needs of the sector. 	<ul style="list-style-type: none"> • Desk research: A detailed inventory of existing/ ongoing policy developments/ legislations, evaluations, impact assessments, and studies in this area • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • Alignment between identified needs and objectives pursued by RIS Implementing Acts and the identified needs of the sector. 	<ul style="list-style-type: none"> • Desk research: A detailed inventory of existing/ ongoing policy developments/ legislations, evaluations, impact assessments, and studies in this area • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations • Workshops and events • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
COHERENCE				
Internal Coherence				
16. To what extent is the RIS legislation (in scope of this evaluation) internally coherent? Are there any internal inconsistencies?		<ul style="list-style-type: none"> • Identified incoherencies within the Directive 	<ul style="list-style-type: none"> • Desk research 	<ul style="list-style-type: none"> • Qualitative data analysis
		<ul style="list-style-type: none"> • Degree of supporting evidence from consultations (opinion of stakeholders) 	<ul style="list-style-type: none"> • Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
External Coherence				
17. To what extent is the Directive coherent with the relevant international obligations of the Member States?		<ul style="list-style-type: none"> • Identification of overlaps between the Directive and international obligations of the MS 	<ul style="list-style-type: none"> • Desk research 	<ul style="list-style-type: none"> • Qualitative data analysis
		<ul style="list-style-type: none"> • Identification of incoherence with MS' international obligations. 	<ul style="list-style-type: none"> • Targeted questionnaire • Interviews with public bodies on national level and private sector companies / representative organisations 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation

<p>18. To what extent is the Directive coherent with other EU legislation in the areas of:</p> <p>a) inland waterway transport policy</p> <p>b) EU transport legislation</p> <p>c) other EU legislation in areas outside transport policy</p>	<p>16.1. Are there any inconsistencies or is there any duplication, particularly regarding the scope of application, between the RIS Directive and other EU inland waterway transport legislation? (e.g. the Professional Qualifications Directive and the Directive on Technical Requirements for Inland Waterway Vessels)?</p>	<ul style="list-style-type: none"> Evidence on areas of interactions, overlaps or duplications between the scope of the RIS Directive and other EU inland waterway transport policies 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Evidence of contradictory or adverse effects across the instruments 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
	<p>16.2. Are there any inconsistencies, complementarities or synergies or instances of duplication of the RIS Directive and EU legislation in other EU transport policy areas, in particular in the fields of maritime, multimodal logistics, data exchange, cyber security and IT policy (e.g. Reporting Formalities Directive, the Vessel Traffic Management Information System or the Cooperative, connected and automated mobility or the Digital Transport)?</p>	<ul style="list-style-type: none"> Evidence on areas of interactions, overlaps or duplications between the scope of the RIS Directive and other EU legislation for maritime & multimodal logistics, data exchange, cyber security and IT policy 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Evidence of contradictory or adverse effects across the instruments 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation

		<ul style="list-style-type: none"> Degree of supporting evidence from consultations (opinion of stakeholders) 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
	16.3. . Are there any inconsistencies or is there any duplication between the RIS Directive and other EU legislation in areas outside transport, such as the Digital Single Market, e-Government initiatives in relation to digitalisation, exchange of information and interoperability, and initiatives in the area of private data protection?	<ul style="list-style-type: none"> Evidence of overlaps or duplications between the scope of the RIS Directive and policies on: <ul style="list-style-type: none"> The Digital Single Market E-Government initiatives at EU level relating to digitalisation, exchange of information and interoperability The General Data Protection Regulation 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Evidence of contradictory or adverse effects across the instruments 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation
		<ul style="list-style-type: none"> Degree of supporting evidence from consultations (opinion of stakeholders) 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Desk research: An overview of existing/ongoing policy developments/legislations, evaluations, impact assessments, and studies in this area Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Data triangulation

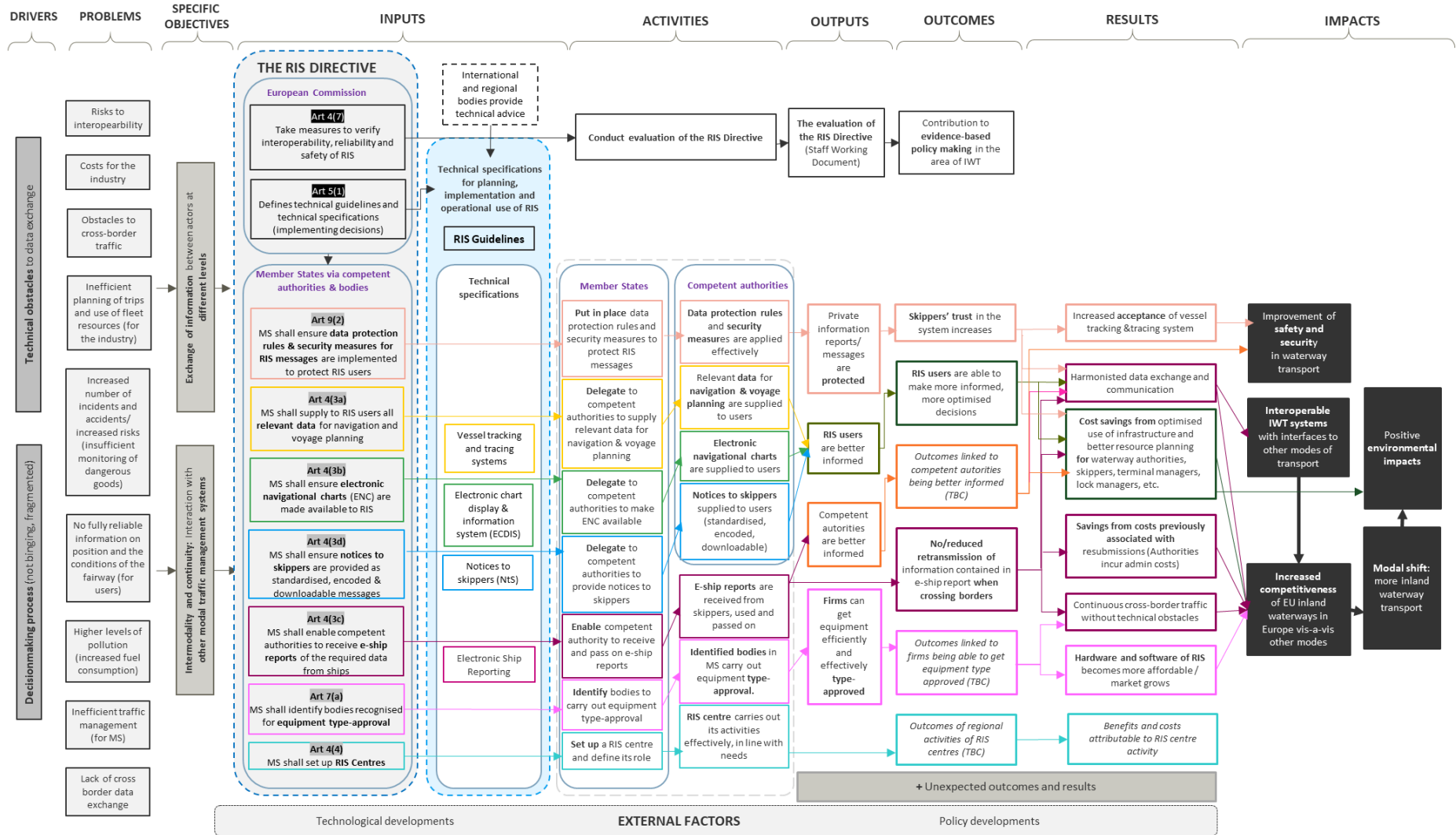
EU ADDED VALUE

19. What are the benefits of intervening at EU level, over and above what could have been reasonably expected from interventions at international level (UNECE structure), regional level (river commission) or local level alone? In other words, what is the rationale of public intervention at EU level underpinning the Directive?	19.1. What are the benefits of intervening at EU level, over and above what could have been reasonably expected from interventions at international level (UNECE structure), regional level (river commission) or local level alone?	<ul style="list-style-type: none"> • Identification of rationale for the intervention 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level 	<ul style="list-style-type: none"> • Qualitative data analysis • Cost-benefit analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Differences in the identified rationale as expressed by different stakeholders 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
20. In light of the above rationale, what evidence is there on actual EU added value having been created, also in terms of order of magnitude of the added value?	20.1. What have been the actual benefits of intervening at EU level against what could have been achieved by interventions at: <ul style="list-style-type: none"> - international level (UNECE structure), - regional level (river commission) and - local level 	<ul style="list-style-type: none"> • Objectives of comparable interventions at: <ul style="list-style-type: none"> • international level (UNECE structure) • regional level (river commission) • local level (MS) • compared to objectives on EU-level 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Data triangulation
		<ul style="list-style-type: none"> • Existence of international / national / local national funds available for policy implementation in the scope of RIS 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level 	<ul style="list-style-type: none"> • Qualitative data analysis • Cost-benefit analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Relation and balance between different types of effects 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Cost-benefit analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Indications of strongest types of added value by MS 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level • Public Consultation 	<ul style="list-style-type: none"> • Qualitative data analysis • Cost-benefit analysis • Data triangulation • Analysis of the counterfactual
		<ul style="list-style-type: none"> • Evaluation of added value per instrument established by the Directive 	<ul style="list-style-type: none"> • Exploratory and follow-up interviews with internal EC stakeholders • Interviews with public bodies on International, European and national level 	<ul style="list-style-type: none"> • Qualitative data analysis • Cost-benefit analysis • Data triangulation • Analysis of the

			<ul style="list-style-type: none"> Public Consultation 	counterfactual
		<ul style="list-style-type: none"> Reasons for absence of added value 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Cost-benefit analysis Data triangulation Analysis of the counterfactual
	20.2. What evidence is there on actual EU added value having been created in terms of order of magnitude of the added value?	<ul style="list-style-type: none"> Established volume effects 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Cost-benefit analysis Data triangulation Analysis of the counterfactual
		<ul style="list-style-type: none"> Established scope effects 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Cost-benefit analysis Data triangulation Analysis of the counterfactual
		<ul style="list-style-type: none"> Established role effects 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Cost-benefit analysis Data triangulation Analysis of the counterfactual
		<ul style="list-style-type: none"> Established process effects 	<ul style="list-style-type: none"> Exploratory and follow-up interviews with internal EC stakeholders Interviews with public bodies on International, European and national level Public Consultation 	<ul style="list-style-type: none"> Qualitative data analysis Cost-benefit analysis Data triangulation Analysis of the counterfactual

Annex 4: Intervention Logic

A detailed overview of the intervention logic for the evaluation of the RIS Directive is provided on the next page.



I. Overview of costs – benefits identified in the evaluation									
		Citizens/Consumers		Businesses		Administrations		[Other...]	
		Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
Benefits	Indirect social benefits	limited qualitative and quantitative evidence of improvements in perceived safety of waterways with weak attribution							
	Economic benefits (of electronic ship reports)			No positive economic impact on private sector RIS users Clear qualitative evidence that expected cost-savings did not materialise.		No positive direct economic impact Clear qualitative evidence that expected cost-savings for MS Authorities did not materialise."			
	Economic benefits (of data for navigation and planning)			Limited qualitative and quantitative evidence of time savings and resource cost savings					
	Economic benefits (of electronic navigational charts)			Limited qualitative and quantitative evidence on time savings and resource cost savings (excluding skippers).					
	Economic benefits (of notices to skippers)			Insufficient evidence found on expected time and cost savings for private sector RIS Users.					
	Benefits due to type-approval of RIS equipment			Insufficient evidence on expected economic benefits for technology companies.		Sufficiently robust qualitative evidence on administrative cost savings, but attribution to RIS Directive uncertain.			
	Environmental benefits	insufficient evidence found on expected environmental benefits							

	Competition benefit for sector			Expected indirect economic benefit for sector through improved competitiveness of sector unlikely to have materialised. (Modal share of sector stayed unchanged but baseline uncertain.)				
	Unintended benefits (economic/social)	Weak qualitative evidence of unintended indirect economic/social benefits for society through agenda setting: deepening market for (semi)-autonomous sailing technology and improving education on RIS technologies.						
	Indirect positive impact on economy	No evidence found on expected indirect positive economy impact that RIS Directive led to optimised use of existing infrastructure.						
	Indirect social benefit on safety	No quantitative evidence of expected indirect positive social impact that RIS Directive led to improved safety; Some limited qualitative evidence of improvements in perceived safety of waterways with very weak attribution;						
	Indirect environmental benefit	No evidence found on expected indirect positive environmental impact of RIS Directive.						
Costs	Implementing Acts - costs/negative impacts have been associated with the preparation of the relevant Regulations			Time cost: Consistent and strong qualitative evidence on considerable "cost" on private sector from slow/delayed technical standards due to time of development and updating of Implementing Acts.				

	Data for navigation and planning			No additional costs incurred by private sector RIS Users (qualitative evidence).	Very limited evidence available, which cannot be generalised across all countries: Reported one-off costs range from EUR 600,000 to EUR 2.9 million per country Reported ongoing costs range from EUR 17,000 to EUR 179,000 per year per country		
	Electronic Navigation Charts			Initial investment costs in Inland ECDIS application. No additional costs incurred by private sector RIS Users (qualitative evidence).	Very limited evidence available, which cannot be generalised across all countries: Reported one-off costs range from EUR 6,000 to EUR 1.5 Million per country. Reported ongoing costs range from EUR 4,200 to EUR 11,000 on average per year per country.		
	Notices to Skippers			No additional costs incurred by private sector RIS Users (qualitative evidence).	Very limited evidence available, which cannot be generalised across all countries: Reported one-off costs range from EUR 70,000 to EUR 422,000 from 2005 until 2019 per country Reported ongoing costs range from EUR 1,000 to EUR 10,200 per year per country		
	Electronic Ship Reports			No additional costs incurred by private sector RIS Users (qualitative evidence).	Very limited evidence available, which cannot be		

				evidence).	generalised across all countries: Reported one-off costs range from EUR 260,000 to EUR 480,000 from 2005 until 2019 per country. Reported ongoing costs range from EUR 1,500 to EUR 2,000 (year 2017) per country		
	Mutual recognition of type-approval of RIS equipment			Measure was expected to generate cost savings (see benefits) but additional attributable costs are likely close to zero.	Measure was expected to generate cost savings (see benefits) but additional attributable costs are likely close to zero.		